DEVELOPMENT OF A MODEL FOR THE MONITORING AND EVALUATION OF NUTRITION AND NUTRITION-RELATED PROGRAMMES IN SOUTH AFRICA

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Thesis submitted in fulfillment of the requirements for the degree Ph D in Dietetics at the Potchefstoomse Universiteit vir Christelike Hoër Onderwys

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Potchefstroom
2003

Potchefstroomse Universiteit
vir Christelike Hoër Onderwys

In dedication to my late father

Kota Wentzel

from whom I could never learn enough

ABSTRACT

Background and motivation

Evaluation research or programme evaluation was developed mainly for general use in social science, notably education and psychology, for understanding and addressing social problems. Rossi *et al.* (1999) defined programme evaluation or evaluation research as "... the use of social research procedures to systematically investigate the effectiveness of social intervention programmes that are adapted to their political and organisational environments and designed to inform social action in ways that improve social conditions". There are different types of evaluation, namely the evaluation of need, implementation evaluation, impact evaluation and efficiency evaluation. Several authors and international organisations developed tools and guidelines for measuring performance of nutrition programmes. However, a comprehensive model or framework, based on the existing theory of evaluation research to evaluate nutrition programmes in South Africa, is lacking.

The national Primary School Nutrition Program (PSNP) was introduced as one of the 100 day Presidential Lead Projects of the South African Reconstruction and Development Programme in 1994. This programme is implemented in all nine provinces of South Africa and costs the taxpayer approximately R500 million per year. The focus area of the PSNP is school feeding, nutrition education and health promotion through interventions such as parasite control and micronutrient supplementation. An evaluation component was never part of the design of the PSNP. However, in the beginning of 2000 the North West Province, and later in 2000, the National Department of Health, commissioned evaluation of the PSNP.

Aims

The aim of this study was, therefore, to develop a framework or model for the monitoring and evaluation of nutrition and nutrition-related programmes in South Africa, based on the theory of evaluation research and incorporating the researcher's experience gained in the evaluation of the PSNP.

Methods

The results of an in-depth study of available literature on evaluation research are synthesized and presented in Chapter 2. This formed the theoretical basis for the development of an evaluation framework.

A tender for the evaluation of the PSNP in the North West Province was allocated to the Potchefstroom University for CHE. The researcher acted as project leader and was responsible for the development of the evaluation framework and the execution thereof. The researcher was also part of the core team for the national evaluation of certain aspects of the PSNP and involved in the development of the evaluation framework, the gathering of data, the analysis and interpretation of the data as well as feedback to the relevant stakeholders.

For both studies, an evaluation framework was developed based on the tender specifications. Once this was done, appropriate instruments and measuring methods were developed. The fieldwork was done at national, provincial and school level. Once the relevant data were gathered, the data were coded, captured, analysed and interpreted. A final report of the evaluation, including conclusions and recommendations regarding the programme, was written for each evaluation. Consultation with the appropriate stakeholders was held and continuous feedback was given to the North West Province and the National Department of Health for the two evaluations respectively (Chapters 3 and 4).

Results

A comprehensive framework for the evaluation of nutrition and nutrition-related programmes was developed and discussed in Chapter 5.

It is suggested that the *theory based evaluation* (TBE) approach is followed for the evaluation of these. Weiss (1972; 1988; 1997) described theory-based evaluation as follows: "TBE aims to surface the theoretical underpinnings of the programme in advance and use the theories to help structure the evaluation. It aims to describe the actual mechanisms that are related to good outcomes". The evaluation is expected to collect data to see how well each step of the sequence in fact comes out. The developed framework of the evaluation shows that at least the following four principal components, namely: inputs, outputs, outcomes and impacts should be included. A very important and unique development in the framework is that it links all the steps of the evaluation process to all the phases in the development of a nutrition programme design, protocol and implementation.

Conclusions

It was possible to develop a framework for the evaluation of nutrition and nutrition-related programmes in South Africa based on TBE and the researcher's experience with the development of an evaluation framework for the PSNP. This framework could serve as a guideline to assist evaluators with the evaluation of nutrition programmes in the future.

Recommendations

Monitoring and evaluation should form an integral part of any nutrition and nutrition-related intervention programme. Especially in South Africa, a developing country with scarce resource, where its serious malnutrition and HIV/AIDS problems are addressed by multi-sectorial, mutli-level and multi-site intervention programmes, appropriate evaluation should be conducted. The evaluation component should be developed as part of the development of the programme. Billions of Rands are spend on these programmes and the funders should demand responsibility and accountability from the programme developers and implementers through appropriate evaluations.

OPSOMMING

Agtergrond en motivering

Evalueringsnavorsing of programevaluering is hoofsaaklik vir algemene gebruik in die sosiale wetenskappe ontwikkel, byvoorbeeld in opvoedkunde en psigologie om sosiale probleme beter te verstaan en aan te spreek. Rossi *et al.* (1999) definieer programevaluering of evalueringsnavorsing as "... die gebruik van sosiale wetenskap-prosedures om die effektiwiteit van sosiale intervensieprogramme sistematies te ondersoek. Hierdie intervensieprogramme is aangepas vir spesifieke politiese en organisatoriese omgewings en is ontwerp om sosiale intervensies in te lig oor metodes om sosiale toestande te verbeter ..." (eie vertaling). Daar is verskillende soorte evaluering, naamlik dié van behoefte, implementeringsevaluering, impakevaluering en effektiwiteitsevaluering. Verskeie outeurs en internasionale organisasies het reeds metodes en riglyne ontwikkel om die "prestasie" van voedingprogramme te meet. Daar is egter nie 'n omvattende model of raamwerk, wat op die bestaande teorie van evalueringsnavorsing gegrond is, beskikbaar om voedingprogramme in Suid-Afrika te evalueer nie.

Die nasionale Primêre Skool Voedingprogram (PSVP) is as een van die 100 Presidensiële Projekte van die Suid-Afrikaanse Rekonstruksie en Ontwikkelingsprogram in 1994 ingestel. Hierdie program word in al nege provinsies geimplementeer en kos die belastingbetaler ongeveer R500 miljoen per jaar. Die fokusarea van die PSVP is skoolvoeding, voedingopvoeding en gesondheidsbevordering met intervensies soos parasietbeheer en mikronutriënt-supplementering. Daar was nog nooit voorsiening vir 'n evalueringskomponent in die ontwerp van die program gemaak nie. Maar in die begin van 2000 het die Noordwes-provinsie, en later in 2000 die Nasionale Departement van Gesondheid, die evaluering van die PSVP aangevra.

Doelstelling

Die doel van hierdie studie was dus om 'n raamwerk of model te ontwikkel vir die monitering en evaluering van voeding- en voedingverwante programme in Suid-Afrika, wat op die teorie van evalueringsnavorsing berus en ook die navorser se ervaring in die evaluering van die PSVP in ag geneem het.

Metodes

Die resultate van 'n diepgang studie van beskikbare literatuur oor evalueringsnavorsing is saamgestel (Hoofstuk 2) om die teoretiese basis vir die ontwikkeling van 'n evalueringsraamwerk te vorm.

'n Tender vir die evaluering van die PSVP in die Noordwes-provinsie is aan die Potchefstroomse Universiteit vir CHO toegeken. Die navorser was die projekleier en as sodanig verantwoordelik vir die ontwikkeling van 'n evalueringsraamwerk en die uitvoer van die evaluering. Die navorser was ook deel van die kernspan wat aspekte van die program nasionaal geëvalueer het. Dit het weereens die ontwikkeling van 'n evalueringsraamwerk, die versameling en analise van data, asook die interpretering van data en terugvoer aan die relevante belanghebbers ingesluit.

In beide studies het die tenderspesifikasies die ontwikkeling van die evalueringsraamwerk beïnvloed. Na die ontwikkeling van die raamwerk is gepaste instrumente en metodes vir die meting van die gevraagde veranderlikes ontwikkel. Die veldwerk is op nasionale, provinsiale en skoolvlak gedoen. Die relevante data is versamel, gekodeer en gerekenariseer waarna dit geanaliseer en geinterpreteer is. 'n Finale verslag oor die evaluering wat ook gevolgtrekkings en aanbevelings oor die program ingesluit het, is vir elke evaluering geskryf. Konsultasie met alle belanghebbers en voortdurende terugvoer aan die Noordwes-regering en die Nasionale Departement van Gesondheid oor die twee evaluerings het plaasgevind (hier aangebied as Hoofstukke 2 en 3 van die proefskrif).

Resultate

'n Omvattende raamwerk vir die evaluering van voeding- en voedingverwante programme is ontwikkel en bespreek (Hoofstuk 5). Dit word voorgestel dat die "teorie-gebaseerde evalueringsbenadering" (TGE) gebruik word vir evaluering van sodanige programme. Weiss (1972, 1988, 1997) beskryf TGE as "... TGE het ten doel om die teoretiese onderbou van programme te gebruik in die struktuur van die evaluering. Dit beskryf werklike meganismes wat met goeie uitkomstes verband hou" (eie vertaling). Die evaluering moet data genereer wat kan aantoon hoe elke stap in die program presteer. Die raamwerk wat ontwikkel is, toon aan dat ten minste vier primêre komponente ingesluit moet word, naamlik: insette, uitsette, uikomstes en impakte. 'n Belangrike en unieke eienskap van die raamwerk se ontwikkeling, is die skakels tussen al die stappe van die evalueringsproses en al die fases in die ontwikkeling van die voedingprogram se ontwerp, protokol en uitvoering.

Gevolgtrekking

Dit was moontlik om 'n raamwerk vir die evaluering van voeding- en voedingverwante programme in Suid-Afrika te ontwikkel wat op die beginsels van TGE en die navorser se ervaring in die evaluering van die PSVP gebaseer is. Hierdie raamwerk kan in die toekoms as 'n riglyn vir die evaluering van sulke programme in Suid-Afrika gebruik word.

Aanbevelings

Monitering en evaluering moet 'n integrale deel van enige voeding- en voedingverwante program vorm. Dit is veral belangrik in Suid-Afrika, 'n ontwikkelende land met skaars hulpbronne, waar ernstige wanvoeding en MIV/VIGS-probleme met multisektoriese-, multivlak- en multiligging-intervensieprogramme aangespreek word. Die evalueringskomponent moet 'n deel van die programontwikkeling vorm. Biljoene Rande word op hierdie programme bestee. Programontwikkelaars en –implementeerders behoort hulle verantwoordelikheid en toerekenbaarheid te demonstreer deur gepaste evaluering van sulke programme uit te voer.

ACKNOWLEDGEMENTS

I wish to express my sincere appreciation to the following people:

- Prof. Esté Vorster for being a wonderful, caring and understanding mentor
- Prof. Johann Mouton for helping me to understand the role and importance of social sciences in evaluation research
- Mrs Rina Swart for her continuous support and expert input regarding the evaluation of the primary school nutrition programme
- The North West Province and National Department of Health for giving permission to use data gathered as part of the evaluation of the Primary School Nutrition Programme
- The fieldworkers of the two empirical studies for their dedication towards the collection of "perfect" data. The learners, principals and other officials who participated in the studies
- Mrs Cecilia van der Walt (accredited with the South African Translators Institute) for the final editing of the thesis
- My mother and family for believing in me, for their prayers and encouragement
- My friends and colleagues, especially Ernie, Rykie and Elize for their continuous interest and support, especially during those times I felt like giving up
- My best friend and husband, Ernst, for all his love and giving me the space and freedom to do what I believed I should do
- My Heavenly Father for giving me courage and strength to carry on.

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LIST OF ABBREVIATIONS

ACS	American Cancer Society
AIDS	Acquired Immune Deficiency Syndrome
ASSIST	The American Stop Smoking Intervention Study
CB	Community-based
CBA	Cost-benefit Analysis
CBE	Community-based Evaluation
CDC	Centre for Disease Control and Prevention
CEFP	Collaborative Evaluation Fellows Project
CPE	Confirmatory Programme Evaluation
EFNEP	Expanded Food and Nutrition Education Programme
FAO	Food and Agricultural Organisation
FMS	Financial Management System
GFE	Goal-free Evaluation
HIV	Human immunodeficiency virus
IDT	Independent Development Trust
INP	Integrated Nutrition Programme
INS	Integrated Nutrition Strategy
KPA	Key Performance Area
kJ	kilojoule
MP-CTI	Mobilising Physicians for Clinical Tobacco Intervention
MSE	Multi-site Evaluation
MTP	Marijuana Treatment Project
NCHS	National Centre of Health Statistics
NFCS	National Food Consumption Survey
NGO	Non-government Organisation
NPCC	National Project Coordinating Committee
NPPHCN	National Progressive Primary Health Care Network
PHC	Primary Health Care
RDA	Recommended Dietary Allowance
PSC	Project Steering Committee
PSNP	Primary School Nutrition Programme
RDP	Reconstruction and Development Programme
ROI	Return on Investment
SAS	Statistical Analysis System
SD	Standard Deviation

SMME	Small, Medium, Micro Enterprises
TBE	Theory-based Evaluation
TCP	Tobacco Control Programme
TN	Nutrition Team
TSP	Thousand Schools Project
UFE	Utilisation-focused Evaluation
VAT	Value Added Tax
WHO	World Health Organisation
WNJ	Winning New Jobs

CHAPTER 1

1 INTRODUCTION

1.1 Introduction and orientation

This thesis reports on the development of a model or framework for the evaluation of nutrition and nutrition-related programmes. In this introductory chapter a brief overview will be given of evaluation research, the Primary School Nutrition Programme (PSNP), evaluation of nutrition and nutrition-related programmes, the aims and objectives of this study and the structure of the thesis.

The framework presented in the thesis was developed, based on the literature (as discussed in Chapter 2) and the experiences gained by means of empirical studies (as discussed in Chapters 3 and 4).

A ***framework*** can be described as a set of facts, ideas, etc. from which more complicated ideas are developed, or on which decisions are based (Longman, 1995). It is also described as a conceptual scheme, structure, or system: the limits or outlines especially of a particular set of circumstances; a systematic set of relationships (Webster, 1993).

A ***model*** refers to a description, a collection of statistical data, or an analogy used to help visualize, often in a simplified way, something that cannot be directly observed and as a theoretical projection in detail of a possible system of human relationships (Webster, 1993).

Rogers (2000) defines a model as "a simplification of reality to help us understand, predict, make decisions and act".

1.2 Evaluation research

Evaluation research or programme evaluation was developed mainly for the general use of social science, notably education and psychology, for understanding and addressing

social problems. Although the development started in the 17th century, systematic evaluation research is a relatively modern development.

Rossi *et al.* (1999) defines "programme evaluation" or "evaluation research" as follows: "Programme evaluation is the use of social research procedures to systematically investigate the effectiveness of social intervention programmes that are adapted to their political and organisational environments and designed to inform social action in ways that improve social conditions".

According to Leonard Rutman, "program evaluation entails the use of scientific methods to measure the implementation and outcomes of programs for decision-making purposes" (Rutman, 1984).

Evaluations are important for many reasons and may have different purposes from one programme to another. They may be intended to help management improve a programme; support advocacy by supporters or critics; gain knowledge about programme effects; provide input to decisions about programme funding, structure, or administration; respond to political pressures; or have any of a number of such purposes individually or in combination (Rossi *et al.,* 1999). But the main objective of any evaluation is to influence decisions that are taken with regard to the programme. Demands for results-orientated accountability have promoted the importance of evaluation of programmes (Brazil, 1999).

Monitoring or implementation evaluation (also termed process evaluation) is concerned primarily with the ongoing collection and review of information on project implementation, coverage and use. It is the systematic documentation of key aspects of programme performance that are indicative of whether the programme is functioning as intended or according to some appropriate standard (Rossi *et al.,* 1999).

Outcome evaluation or impact evaluation measures whether interventions actually produce the intended effects (Rossi *et al.,* 1999).

Efficiency evaluation or cost-benefit and cost-effectiveness analyses provide a frame of reference for relating costs to programme results and are means of judging the efficiency of programmes. In cost-benefit analyses, the outcomes are expressed in monetary terms. In cost-effectiveness analyses, outcomes are expressed in substantive terms (Rossi *et al.,* 1999).

1.3 Primary School Nutrition Programme (PSNP)

The PSNP is an example of the need for developing appropriate evaluation methodology for intervention programmes in South Africa.

The Primary School Nutrition Program (PSNP) was introduced as one of the 100 day Presidential Lead Projects of the Reconstruction and Development Programme (RDP), on 24 May 1994 when the then President, Mr. Mandela, said "a nutritional feeding scheme will be implemented in every primary school where such a need was established". It has been funded from the RDP with a total annual national budget of R496 million from 1994/95 to 1997/98. The RDP allocation was distributed to the provincial health budgets according to the aggregated poverty gap. The RDP allocation has been replaced by a conditional grant in the 1998/99 financial year.

The focus area of the PSNP was school feeding, nutrition education and health promotion through interventions such as parasite control and micronutrient supplementation. Primary school nutrition interventions are conceptualised as a shared component of general education and health development, specifically nutrition development initiatives. Within this framework a holistic approach should be followed whereby the health problems affecting a child's active learning capacity, and, therefore, school achievement, should be addressed and analysed to design comprehensive responses.

Based on this, nutrition interventions in primary schools have the following aims:

- To contribute to the improvement of education quality and general health by:
    - Enhancing active learning capacity;
    - Alleviating short-term hunger;
    - Improving school attendance and punctuality;
    - Addressing micronutrient deficiencies;
    - Controlling parasite infestations;
- To improve nutritional knowledge, perceptions, attitudes and behaviour amongst primary school learners, their parents and their teachers;
- To enhance broader development initiatives.

At national level the PSNP forms part of the Integrated Nutrition Programme (INP). The INP follows a coordinated intersectoral approach whereby direct and indirect nutrition interventions are combined to address nutrition problems. The programme targets

nutritionally vulnerable communities and groups and provides appropriate nutrition education and promotion to all people.

The INP forms an integral part of primary health care. It requires an integrated service delivery process at the operational level that is organised around target groups, their needs, specific interventions and different points of service delivery. The intention is to scale down school feeding in a phased fashion in favour of programmes and projects that would lead to self-reliance with regard to people's food and nutrition needs. Food supplementation in schools should only be maintained in poverty-stricken areas where sustainable alternatives cannot be put in place.

Since the PSNP was funded from the Restructuring and Development Programme (RDP), the basic principles underlying the RDP had to be taken into consideration by the PSNP. These principles are:

- Community involvement and empowerment;
- A holistic approach, linking school nutrition activities to other initiatives to improve education quality and other community development and health initiatives;
- A multi-sectoral and interdisciplinary intervention, jointly managed by the Education and Health Departments;
- Sustainability (Kloka, 2000).

1.4 Evaluation of nutrition and nutrition-related programmes

It is only recently that there has been a growing recognition of the need for the monitoring and evaluation of nutrition and nutrition-related programmes. At a technical consultation meeting held in March 1999 to discuss the use of processed complementary foods in public health programmes, Habicht (2000) stated, after the presentations of past and current evaluations and from comments by authors, that "very few have shown interest in monitoring and evaluation to improve the implementation of an ongoing programme". Levinson *et al.* (1999b) reported that Musgrove analysed 97 feeding programmes in Latin America. Only 10 of the programmes included an evaluation, and, of these, only three used generally accepted evaluation procedures.

Ismail *et al.* (2002) also stated that few programmes make provision for adequate monitoring and evaluation.

1.5 Broad aim of the study

The aim of this study was to develop a framework or model for the monitoring and evaluation of nutrition and nutrition-related programmes in South Africa.

1.6 Specific objectives of this study

The objectives of this study were:

- To study the literature on the theory of evaluation research;
- To use the theory of evaluation research as background for the development of a framework;
- To use the experience gained by means of the "Evaluation of the Primary School Nutrition Programme in the North West Province" as background information for the development of the framework;
- To use the experience gained by means of the "External evaluation of certain aspects of primary school feeding" on a national sample as background information for the development of the framework.

The theoretical framework which was developed is based on the theory of and different approaches to evaluation research in social sciences and the applications of monitoring and evaluation in public health programmes. The experience gained by means of the evaluation of the PSNP in the North West and the National tender has been used to develop a theoretical framework.

1.7 Structure of the thesis

In Chapter 2 the different approaches to evaluation research are explored as well as the application of these approaches in nutrition. Chapter 3 summarizes the empirical study completed by the researcher as the project leader i.e. "Evaluation of the Primary School Nutrition Programme in the North West Province" and Chapter 4 summarizes the other empirical study under the leadership of Rykie Louw i.e. "External evaluation of certain aspects of primary school feeding". Chapter 5 offers the suggested framework for the evaluation of nutrition programmes in South Africa and includes the conclusions and recommendations.

1.8 Multidisciplinary participants

The empirical studies were done in collaboration with other researchers. Table 1.1 gives an indication of the other researches and the functions of each.

Table 1.1 Participants in empirical studies

Name of study / Participant	Function
Evaluation of the Primary School Nutrition Programme in the North West Province	
E Wentzel-Viljoen	Project leader
EC Swart	Consultant
HS Steyn	Statistical consultant
External evaluation of certain aspects of primary school feeding	
R Louw	Project manager/leader
E Bekker	Consultant/Core team member
E Wentzel-Viljoen*	Nutrition consultant/Core team member
HS Steyn	Statistical consultant

* This researcher was actively involved in the development of the evaluation framework, execution of the evaluation, analysis and interpretation of the results and the final writing up of the report.

The full reports of the "Evaluation of the Primary School Nutrition Programme in the North West Province" (Wentzel-Viljoen *et al.*, 2000) and the "External evaluation of certain aspects of primary school feeding" (Louw *et al.*, 2001) are available from the project leaders.

1.9 Funding

Funding for the studies were obtained from various sources. Table 1.2 gives an outline of the different sources of funding for the different studies.

Table 1.2 Funding received for the studies

Name of study	Funding
Evaluation of the Primary School Nutrition Programme in the North West Province	Tender 220/99 Department of the Premier, North West Province
External evaluation of certain aspects of primary school feeding	Tender GS 5/2000 Department of Health
For completion of PhD studies	NRF study grant*

* NRF: National Research Foundation, Grant holder: Prof HH Vorster

1.10 Permission to use the empirical studies

Permission has been obtained from the Department of the Premier, North West Province (Evaluation of the Primary School Nutrition Programme in the North West Province), the National Department of Health (External evaluation of certain aspects of primary school feeding) as well as from Rykie Louw (External evaluation of certain aspects of primary school feeding) to use the projects for further studies.

The Executive Council of the Faculty of Health Sciences of the Potchefstroom University for Christian Higher Education approved the use of these empirical studies for a PhD thesis.

CHAPTER 2

2 LITERATURE REVIEW – EVALUATION RESEARCH

2.1 Orientation

In this chapter the literature on programme evaluation is reviewed. In the first part of the chapter will cover "general" evaluation issues while the second part will cover health related evaluation. The first part of the chapter begins with the purposes of evaluation and the different approaches that can be taken. Political issues surrounding evaluation and multi-level and multi-site evaluations will be briefly discussed because the PSNP was developed after a political announcement and the programme was developed at multi-level and implemented across the country (multi-site). This is followed by a short discussion on design and methods and then the different types of possible evaluations. A very short discussion on "who should do" the evaluation and the cost of evaluation research is also included. In the second major part of the chapter, existing frameworks specific to health programmes will be briefly reviewed. This literature review serves to motivate the development of a framework suitable for evaluation of nutrition-related programmes that will be given in Chapter 5.

2.2 Introduction

Programme evaluation has progressed from early years to the present from applying the simple input/output, or "black-box" model of evaluation to moving "inside" the box to try and understand what goes on in the programme.

According to Leonard Rutman (1984) "programme evaluation entails the use of scientific methods to measure the implementation and outcomes of programmes for decision-making purposes". Rossi *et al.* (1999) defines programme evaluation as follows: "Programme evaluation is the use of social research procedures to systematically investigate the effectiveness of social intervention programmes that are adapted to their political and organisational environments and designed to inform social action in ways that improve social conditions".

According to Posavac and Carey (1992) there is a logical sequence in evaluation questions that should be addressed: "Without measuring need, programmes cannot be planned rationally; without effective implementation, successful outcomes cannot result from the programme; and without valued outcomes, there is no reason to worry about cost-effectiveness". They distinguish between four types of evaluation, namely: **Need** evaluation, **Process** or implementation evaluation or programme monitoring, **Impact** or outcome evaluation and **Efficiency** evaluation.

The evaluation process can be conceptualised as consisting of three main steps:

- Setting the evaluation agenda;
- Formulating and implementing the research;
- Termination and dissemination, and use of the results (Thompson, 1992).

2.3 Purpose of evaluation

The worth of evaluations must be judged by their utility. Programmes are evaluated for different reasons for example to improve a programme for accountability, political reasons or public relations.

Evaluation research is a purposeful activity, undertaken to affect policy development, to shape the design and implementation of social interventions, and to improve the management of social programmes. In the broadest sense of politics, evaluation is a political activity (Rossi *et al.*, 1999).

According to Patton (1997) the purpose of evaluation can be reduced to three main reasons, as summarised in Table 2.1.

Table 2.1 Reasons for evaluation of programmes*

Type of evaluation	Examples
Judgement-orientated evaluation Success of the programme Effectiveness Achieve its objectives? Reached the intended target group?	**Summative evaluation** Accountability Audits Quality control Cost-benefit decisions Deciding the future of a programme Accreditation/Licensing
Improvement-orientated evaluation Programme properly implemented Constraints on proper implementation	**Formative evaluation** Identifying strengths and weaknesses Quality enhancement Managing more effectively Adopting a model locally
Knowledge-orientated evaluations Clarifying a programme model or underlying theory A better understanding of the programme	**Generalizations about effectiveness** Extrapolating principles about what works Building new theories and models Informing policy

* Adapted from Patton (1997)

Programme evaluation is fundamentally a process to gather and interpret information about programme performance. Certain criteria or standards are used against which a dimension of programme performance is compared so that it can be evaluated. Performance indicators are collected, reported and interpreted for a programme to assess how well the programme performs, particularly with regard to the delivery of service (outputs) and achievement of results (outcomes) (Rossi, *et al.*, 1999).

Telfair and Leviton (1999) reported on the view of the leaders of community-based programmes on evaluations. One of the leaders interviewed who has been involved with community-based programmes for close to thirty years, responded as follows: "I became involved pretty early, as I help to determine the indicators. I have had a problem with evaluations because, frankly, I haven't seen an evaluation being useful. I was not cooperative with the evaluators, say eight years ago, because I saw them adjusting my programmes, determining success or failure. Now I know evaluations to be useful for their feedback. They help to inform me if I am on the path to achieve what I want to achieve".

All the leaders interviewed in this study agreed that communities could get feedback about their programmes as a result of the community-based evaluation. It becomes a tool for community members' own empowerment. One of the community-based programme leaders said that he wants to know the following from an evaluation, "Are we achieving

what we want to achieve? And if not, why? Those are the important issues". The evaluation must leave some markers of success or failure in the community. The same leader remarked "If a community is involved from the beginning, it is open to hearing the negative, especially if it agrees with the indicators used".

The different approaches to evaluation research will now be discussed.

2.4 Approaches to evaluation research

2.4.1 Utilization-focused evaluation (UFE)

2.4.1.1 The theory of UFE

Michael Quinn Patton has advocated the use of a "Utilization-focused evaluation" strategy for over 20 years. ***The focus is on intended use by intended users.*** UFE is not a recipe or even a "model" – it is a strategy for making evaluation decisions. It describes an evaluative process for making decisions about the content, focus, and methods of an evaluation – but the content, focus, and methods are not specified or implied in advance (Patton, 1997; 2001).

It begins with identification and organisation of relevant decision makers and information users who will use the information that the evaluation produces. The evaluator works with these intended users, preferably organised into an evaluation task force, to focus relevant evaluation questions and partake in decision-making about the evaluation. The evaluator and intended users commit to plans for the intended uses of the evaluation and decide the focus of the evaluation. Options are reviewed and, in the light of political and ethical considerations, a range of approaches is selected. The evaluator then helps intended users to focus on deciding whether, given expected uses, the evaluation is worth doing, and to what extent and in what ways intended users are committed to the intended. Given that the evaluator and intended users decide to proceed with the evaluation use, the appropriate research methods and data-analysis techniques should be decided upon. UFE plans for use before data are even collected. The underlying question is: "What difference will this study make?" The evaluator asks: "What would you DO if you had answers to the questions you are asking?" A range of methodological options is considered with particular emphasis on issues of validity, reliability and utility. Further, the discussion focuses on questions of methodological appropriateness, believability of the

data, understandability, accuracy, balance, practicality, propriety and cost. Prime consideration is given to utility. In answering the evaluation questions of specific intended evaluation users, UFE does not preclude the use of any of the full variety of methodological options open to evaluators. Patton has advocated methodological flexibility and UFE has sometimes been closely associated with qualitative methods. UFE was developed by studying the factors that seemed to explain variations in the actual use of evaluations, and qualitative methods were used in this study. Each evaluation situation is approached as a problem to be solved and the resulting design reflects their thinking about the problem as opposed to an attempt to carefully follow a prescriptive model. Experienced evaluators described how the practice of evaluation research requires more flexibility than is likely to be provided by any single method.

The next stage of the process is data collection and analysis. Following this, intended users actively participate in interpreting findings, forming judgments, and making recommendations. In the light of actual findings, previously agreed plans for their use are implemented in practice. Finally, decisions about public dissemination of the evaluation report are enacted.
UFE is a process for creative and flexible interacting between the intended evaluation users and the stakeholders about their research needs and the situation in which the study would be undertaken.

Utilization is the overriding concern and advocate evaluation that is designed around the specific information needs of individually identified target consumers with whom the evaluator collaborates very closely (Patton, 1987; 1997; 2001; Gregory, 2000).

While Gregory (2000) recognised that the primary aim of Patton's Utilization-Focused Evaluation is not to promote *participatory practices*, she argues that Patton seems to recognise the importance of a participatory approach, but that the methodology of UFE does not really support this.

Stufflebeam (2001) stated in his review of evaluation models that, "according to Patton, when the evaluation process is sound and functional, a printed final report may not be needed".

2.4.1.2 Application of UFE

The Collaborative Evaluation Fellows Project (CEFP) is an example of Utilization Focused Evaluation. This initiative developed from the need of the American Cancer Society (ACS) to evaluate their programmes at national, regional and community levels. The collaboration developed between the need of the ACS for evaluation at low cost and the need of the Rollins School of Public Health of Emory University's graduate students for thesis topics and practicum experience. Rollins also offered a faculty with substantial social science expertise and evaluation experience. Based on the utilization-focused evaluation approach advocated by Patton, a 15-step evaluation process was developed, involving all stakeholders, to serve as a protocol for participants to follow. It was designed to foster the use of evaluation findings by programme stakeholders. The key steps were divided in four stages, namely groundwork, formalisation, implementation and utilisation. In Table 2.2 the 15-step evaluation process is given (Compton *et al.*, 2001).

Table 2.2 CEFP 15-step evaluation process*

Stage	Steps
I. Groundwork	1. Identify evaluation project, faculty, and student
	2. Hold telephone conference or meeting to discuss proposal
	3. Convene evaluation advisory group to develop the evaluation proposal
II. Formalisation	4. Approve the proposal
	5. Complete and sign memorandum of agreement (MOA)
	6. Sign contracts with faculty and student
III. Implementation	7.Develop and approve data collection instruments
	8. Collect and analyse data
	9. Review preliminary findings with evaluation advisory group
	10. Prepare and distribute draft report
IV. Utilization	11. Convene meeting to "wrap up" evaluation study and discuss utilization of findings
	12. Distribute final report with utilization recommendations
	13. Forward report to appropriate persons or identify task force if no appropriate person/group exists
	14. Track the progress of the action plan from step 13 and modify if necessary
	15. Summarise how findings were used, lessons learned, likely next steps

* Adapted from Compton *et al.* (2001)

Preskill *et al.* (2001) explained how the Conceptual Model of Collaboration of Himmelman and the Evaluative Inquiry for Learning in organisations of Preskill and Torres were integrated with UFE to develop the model used in the CEFP. In combination, these three

conceptual frameworks have offered a common language and a common set of processes that have guided the development and implementation of the CEFP.

One of the distinct features of the CEFP is its lack of a directive model for how evaluation should be done. The approach employs a flexible planning approach and created an atmosphere in which evaluation could prosper on multiple levels. Furthermore, the CEFP has proved to be an excellent capacity building exercise (Milstein, 2001). The CEFP has been worthwhile to the American Cancer Society, to the faculties of participating universities and to students. The ACS has developed relationships with 19 universities nationwide. The 41 faculties and 99 graduate students of these universities have worked on a local level with all 17 divisions and the National Home Office of the ACS to produce 82 evaluation studies three years into the project. The Arthritis Foundation, a national voluntary health organisation, has chose to replicate the CEFP model (Compton *et al.*, 2001).

Bonnet (2001) did an external evaluation of the CEFP. In the spirit of the CEFP, the overall evaluation was a collaborative effort. The evaluation was based on the 14 studies conducted in the first year of implementation. The author was commissioned as the external evaluator early on and has participated in the CEFP planning. She formulated the logic model of the CEFP based on the theory of the intervention and design model. Eighteen evaluation questions were developed in collaboration with the evaluation advisory committee. Figure 2.1 gives a summary of the Logic Model of the CEFP.

	American Cancer Society	**Universities**
Inputs	Expertise in cancer control	Expertise in evaluation
	Need for evaluative information	Need for field experience
Activities	Director manages project, provides technical assistance	
	Planning Group gives input, monitors progress, advises	
	Facilitators bridge ACS with universities; Identify and select projects; Promote utilization	Campus liaisons bridge universities with ACS; Recruit faculty Promote field experience as part of curriculum
	ACS/university partnerships are created	
	Programme staff & advisory groups request evaluations; Help plan evaluations; Supply data; Arrange access	Faculty advisors recruit students; Coach and supervise fellows; Ensure technical quality of evaluations
	Participants in ACS programmes supply data; May advise on evaluation	Students conduct evaluations
	CEFP is evaluated; lessons are shared	
Output	75+ practical and usable evaluation reports are produced	

Initial outcomes	Evaluation is used - process use - instrumental use - conceptual use	Students gain practical evaluation experience; Students learn about ACS and cancer control
	Experience with evaluation projects is rewarding for all	
Intermediate outcomes	ACS programme improve	University curriculum adapts to capitalise on field experience
	ACS demands more evaluation	Universities demand more field opportunities
	ACS programme managers come to value and use evaluation regularly	Some students pursue careers or volunteer work in cancer control
Long-term outcomes	Partnerships between ACS and universities for programme evaluation are institutionalised; they perpetuate	
	Former CEFP students fill ACS's growing demand for professional evaluation services	
	Additional non profit-university partnerships are formed	

Figure 2.1 Logic model of the Collaborative Evaluation Fellows Project (Bonnet, 2001)

The findings of the evaluation are based principally on 55 telephone interviews held with evaluators and stakeholders associated with the 14 evaluation projects completed during the first year. She found that all of the basic premises of the CEFP model have proven to be feasible. It has been well received within the ACS and universities. The staff and volunteers of the ACS generally regarded CEFP evaluations as trustworthy and useful and in most cases, actually used them. The students placed a high value on CEFP as a learning experience. Due to the careful design of the CEFP model, conflict between the practical needs of the ACS and the academic orientations of its partners, was kept to a minimum.

2.4.2 Theory driven approach or Theory-based approach to evaluation (TBE)

2.4.2.1 Introduction

Many terms have been used to describe this approach to evaluation namely outcomes hierarchies, theory-of-action, programme theory or logic model, theory-based evaluation, programme logic and programme theory evaluation (Rogers *et al.*, 2000).

In this thesis the term theory-based evaluation (TBE) will be used.

2.4.2.2 The theory of TBE

Carol Weiss suggested a theory driven approach in the early 1970's and has ever since defended and debated the logic and use of this approach. The basis of TBE is that the beliefs and assumptions underlying an intervention can be expressed in terms of a phased sequence of causes and effects. "TBE aims to surface the theoretical underpinnings of the programme in advance and use the theories to help structure the evaluation. It aims to describe the actual mechanisms that are related to good outcomes". The evaluation is expected to collect data to see how well each step of the sequence in fact comes out (Weiss, 1972; 1988; 1997).

Chen and Rossi (1980) suggested the use of theory-driven evaluation because evaluation based on methodological choices instead of on programme design tended to provide little evidence of programme effectiveness. They argued that theory-driven evaluations would be more likely than methods-driven evaluations to discover programme effects on the grounds that theory-driven evaluations would identify and examine a larger set of potential programme outcomes. The theory might be psychological (e.g. child development), or social-psychological (e.g. attitude change theories), or philosophical (Fitz-Gibbon & Morris, 1996). Chen (1990) identified two major types of theory-driven evaluations. The first, *normative evaluation,* compares a prescriptive theory of what the programme should be to data on the programme in operation in order to discover any inconsistencies between the two. In contrast, *causative evaluation* focuses on the causal relationship underlying a programme in order to assess programme impact and understand the causal mechanisms associated with programme effects.

The term theory refers to a systematic delineation of cause-and-effect relationships. Programme theory is one or more sets of causal assumptions that provide the rationale for a programme intervention (Scheirer in Bickman, 1987). Rossi *et al.* (1999) defined programme impact theory as follows: "It describes a cause-and-effect sequence in which certain programme activities are the instigating causes and certain social benefits are the effects they eventually produce. Evaluators usually use a causal diagram showing the pattern of cause-and-effect linkages presumed to connect programme activities with the expected outcomes".

Bickman (1987) defined programme theory as the construction of a plausible and sensible model of how a programme is supposed to work. Programme theory can specify the intermediate effects of a programme before it has manifested its ultimate effects. For

Thus, the evaluator must often develop the theory in order to address measurement and design issues. The theory must be developed to create a valid measurement and design plan (Bickman, 1987). According to Reynolds (1998) who reviewed TBE, specification of programme theory is helpful at all stages of evaluation including planning, implementation and impact assessment.

Bickman (1987) summarised ten functions of programme theory, namely:

1. Contributing to social science knowledge;
2. Assisting policymakers;
3. Discriminating between theory failure and programme failure;
4. Identifying the problem and target group;
5. Providing programme implementation description;
6. Uncovering unintended effects;
7. Specifying intervening variables;
8. Improving formative use of evaluation;
9. Clarifying measurement issues;
10. Improving consensus formation.

In later years Bickman (2000) pointed out that the strength of programme theory depends on the substantive knowledge of the field. He suggested the development of programme theory should be the responsibility of the programme planner (with the expert knowledge of the field) and not of evaluators. He noted that evaluators have done it "because the advocates and developers have not done a satisfactory job in conceptualising the programme". He requested planners to provide evaluators with "sensible, coherent and evaluable programmes".

2.4.2.3 Ascertaining causality in TBE

The attribution of causality to programmes and other types of evaluand is very difficult. Programme theory usually involves a diagram representing cause-and-effect relationships.

TBE has been used to answer the question of whether the programme caused the observed outcomes. Evaluators used this method to develop better evidence for attributing outcomes to a programme in circumstances where random assignment is not possible. Support for causal attribution can come from different types of evidence, for

example from achievement of intermediate outcomes, investigation of alternative explanations for outcomes, pattern matching, programme stakeholder assessments and data on different indicators (Rogers *et al.*, 2000).

For the practicing evaluator it is important to determine whether observed changes are due to the programme (and can correctly be referred to as programme effects), are due to some other cause, or are purely coincidental. Causality is important, because if an evaluator concludes that a programme is not commendable, money, human and other resources may be wasted on continuing or expanding the programme (Davidson, 2000).

Davidson (2000) described the problems that could be encountered when testing causal mechanisms with TBE. She stated that many evaluations appear to use programme theory as a framework for determining the variables that should be measured in an evaluation or as a means of better understanding the evaluand. As an example she reviewed an evaluation of Project TEAMS (Technology Enhancing Achievement in Middle School), meta-evaluated by Cooksy in 1999. Cooksy used a logic model to provide a conceptual representation of the programme, of which a small fraction of the variables was measured. The model provided a useful conceptualisation of the programme, although the causal links specified in the model were not tested. The evaluator (Cooksy) noted therefore, that one of the major weaknesses of the evaluation was "the inability to attribute the changes reported to TEAMS". Davidson also used the evaluation of Fighting Back, a series of community programmes designed to combat alcohol and drug use, done by Saxe & Tighe in 1999 to demonstrate this. The authors used a wide range of important variables that were measured as part of the evaluation, thereby ensuring good coverage of key performance criteria, attributing this to their inability to use randomised designs and the unavailability of control groups.

Davidson (2000) proposed a five-stage process for causal tracing using theory-based evaluation:

1. Information needs assessment, which determines required level of certainty to which conclusions about causality must be drawn;
2. Goal-free search for all important changes (positive and negative);
3. Inductive hunt for the causes of those changes - which builds draft logic model, possibly using input from programme staff in the later stages;
4. Supplementation of inductive programme theory with additions of possible effects and causal chains from the literature;

5. Test of the revised logic model, preferably using information sources and recipients not used to build the inductive model. The focus here is on testing and elimination of alternative causal explanations for the observed effects, using both qualitative and quantitative methods.

Rogers (2000) reminded us that any causal model is indeed only a model – "a simplification of reality to help us understand, predict, make decisions, and act".

2.4.2.4 Benefits or advantages or TBE

Theory is primarily a guide to the evaluation. Theory development at the start of the evaluation may be in and of itself the most beneficial aspect of the theory-based approach. The evaluator usually undertakes this theory-surfacing exercise in conjunction with programme planners and programme staff. When programme staff describe their assumptions about the mechanisms by which the programme will bring about change, the evaluator has to see whether the theories offered are operative. A TBE study should include a description of programme implementation (Birckmayer & Weiss, 2000).

Birckmayer and Weiss (2000) listed three kinds of benefits that advocate a TBE approach, namely:

1. Advantages to programme planning and modification;
2. Advantages for the growth and knowledge about human behaviour and behaviour change;
3. Advantages for planning and conducting of the evaluation of the specific programme.

One of the major advantages of TBE is that it provides some clues to answer the questions of why a programme works or fails to work. The evaluator should distinguish whether programme failure was due to theory failure or implementation failure. The different types of programme failures are illustrated in Figure 2.2.

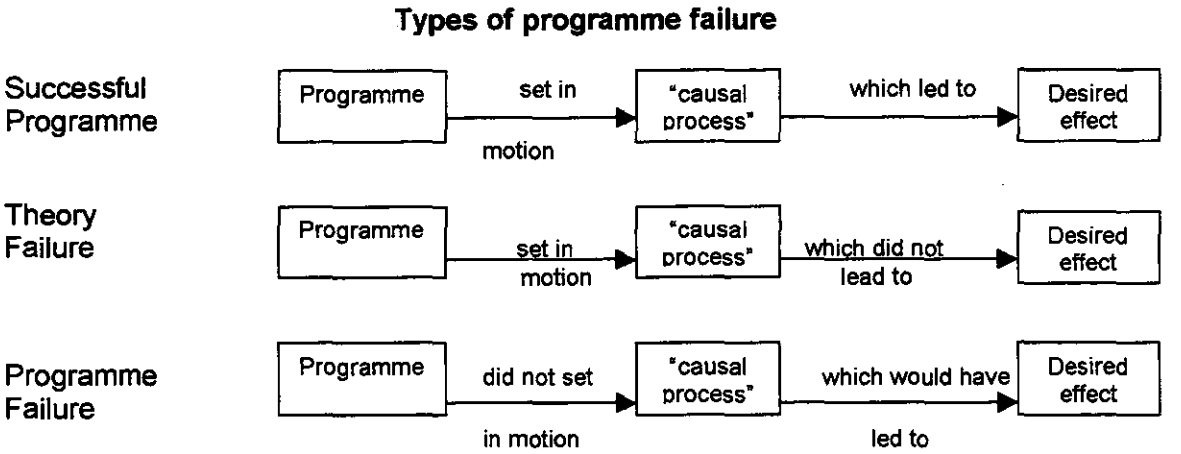


Figure 2.2 Types of programme failure according to Weiss (1972)

Theory failure occurs when the achievement of proximate goals does not lead to final desired outcomes (Weiss, 1972). With design failure the design, measurement and statistical power problems could produce a type II error, that is, finding no difference when in fact the programme was effective (Bickman, 1987).

Implementation failure takes place when the programme does not adequately perform the activities specified in the programme design that are assumed to be necessary for bringing about the intended social improvements and to achieve the set goals. It include situations in which no service, not enough service, or the wrong service was delivered, or the service varies excessively across the population or the service was delivered to the wrong target group (Rossi *et al.,* 1999).

More advantages of TBE have been identified by Fitz-Gibbon and Morris (1996):

1. Exposure of assumptions – in TBE the evaluator should give a rationale for the choice of variables to study;
2. Comparability – if the same variables are studied as part of the evaluation of different programmes, it could enable cross-site comparisons to be made in a way that would have been impossible using atheoretical (no theory) evaluations;
3. Advancing knowledge – the touchstone of a theory is its power to predict. If a theory could consistently discriminate between effective and ineffective programmes, it would provide a solid foundation on which to base both the planning and the evaluation of programmes.

2.4.2.5 Disadvantages or problems encountered with TBE

One of the disadvantages of TBE is that it is often difficult to get a good perspective on what is actually happening to the people involved in the programme (Lipsey & Pollard, 1989).

TBE can also have practical implementation problems. For example, in a small project staff may not have the time or skills to collect and analyse data in ways that test programme theory (Rogers *et al.,* 2000).

When evaluating programmes, identifying unintended consequences are just as important as goal-related outcomes. Using TBE inevitably focuses primarily on intended outcomes, and unintended consequences can easily be overlooked (Davidson, 2000).

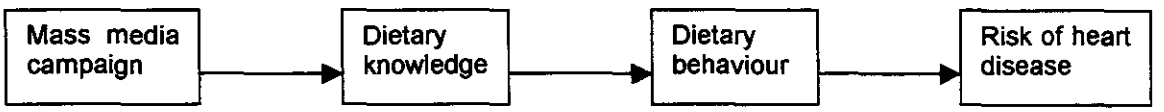
Stufflebeam (2001) reviewed all the existing approaches to programme evaluation including TBE. He concluded that, "... there really is not much to recommend theory-based evaluation, since doing it right is usually not feasible and since failed or misrepresented attempts can be highly counterproductive". He does, however, admit that "modest attempts to model programmes can be useful for identifying measurement variables, as long as the evaluator does not spend too much time on this and as long as the model is not considered as fixed or as a validated theory". He stated that "in the rare case where an appropriate theory already exists, the evaluator can make beneficial use of it to help structure and guide the evaluation and interpret the findings".

2.4.2.6 Application of TBE

When using an integrative framework for a multi-method evaluation, a logic model offers two ways to look at the data as summarized by Cooksy *et al.* (2001). First, evidence from different data sources and methods are organised by *programme element* rather than by the source or method used to obtain the data. This offers the opportunity to investigate the consistency of findings from different data sources and methods, thereby facilitating the process of triangulation. Secondly, each programme element is defined in relation to its antecedents and consequences. Evidence about a programme element is thus not interpreted in isolation, but in light of its expected relationships. Cooksy *et al.* (2001) used the multi-method evaluation of Project TEAMS to illustrate the use of the programme logic model as an integrative framework for analysis. Project TEAMS is a

middle school curriculum delivery programme. Three schools were evaluated, using multiple data sources which implies a strong design because patterns of outcomes based on differences in school implementation could be predicted and the consistency of a finding across data sources could be examined. Several weaknesses of this approach in this evaluation were, however, identified by the authors. For example, only initial outcomes were examined with multiple data sources and methods. The bases for attributing observed outcomes to Project TEAMS were weak and varied across the three schools evaluated. The integrative framework of the logic model did not overcome these weaknesses. But it highlighted the limitations of the data by organising analysis and interpretation around the programme elements instead of by data source or by site. As a result, systematic biases are more likely to be revealed and considered in evaluation findings.

In 1989 Lipsey and Pollard studied the use of a theory-based approach in evaluation research. They studied 122 evaluation studies that used relatively formal quantitative comparison-group designs for which some level of explicit theorizing about programme process would be appropriate. They found that nearly 20% presented the programme or treatment under investigation as a "black box", fewer than 30% developed any theoretical or conceptual propositions about the causal process by which programme was expected to work and tow-thirds of these were simple *ad hoc* hypothesis testing formulations of limited scope. Only 9% of the studies overall provided any integrated theory within which the specific formulation of programme elements, rationale, and causal process were embedded. The authors also studied the work of Judd and Kenny. They (Judd & Kenny) used a causal model in 1981 to identify the process that mediated the effects of the Stanford Heart Disease Prevention Project conducted in the 1970s to reduce the risk of heart disease. The treatment was a mass media campaign in two towns and the desired outcome was lowered heart disease risk as assessed by levels of serum cholesterol and serum triglycerides. Based on previous research and theory, a theoretical model was developed linking the treatment with the outcome using a causal chain. The conceptual component of this causal model can be described as follows:



Lipsey and Pollard (1989) argued that to actually test this model within an analytical frame, additional variables should be postulated to account for the measurement of error and extraneous influence of knowledge, behaviour and heart disease risk.

Miller *et al.* (2002) implemented and evaluated a food label nutrition education programme for people aged 65 years and older with type 2 diabetes. Theoretical concepts were used to develop the nutrition intervention. The theoretical framework integrated concepts from Social Cognitive Theory, the Theory of Meaningful Learning, and the Information Processing Model. Study data were collected using a randomised pretest-posttest control group design. For example: Self-efficacy is how confident a person feels about performing a specific behaviour in a particular situation. Those with greater degrees of self-efficacy are more likely to persist in the face of obstacles. For the development of self-efficacy (a cognitive theory) the nutrition intervention included two applications, namely firstly, curriculum activities allowed participants to apply each new concept and included measuring of portions of foods, label reading and meal planning; and secondly, one session held at the supermarket to facilitate application of intervention messages in the context of supermarket shopping and food selection. Those randomised to the experimental group proceeded through the intervention, and participants randomised to the control group did not receive further contact from programme staff until post-test data collection. The intervention was held in an outpatient setting and included 10 weekly group sessions led by the same dietitian. Each session lasted 1½ to 2 hours. Three instruments were developed and pilot tested to assess outcome expectations, self-efficacy, and nutrition-and-diabetes-related knowledge. A 17-item questionnaire assessed participants' outcome expectations about using food labels to make healthy food choices and achieve glycemic control on a 5-point Likert scale. A 19-item questionnaire assessed participants' level of self-efficacy for diabetes management with an 11-point Likert scale. A 30-item multiple-choice test was used to assess participants' knowledge. The study demonstrated that nutrition education could improve outcomes among older adults with diabetes. The authors showed that incorporating principles from learning theory proved to be useful to the evaluation of the intervention.

Cole (1999) wrote an article on "Advancing the development and application of theory-based evaluation in the practice of public health". He argued that, since evaluations generate information on the extent of the discrepancy that exists between a standard and what is happening in real life, in TBE the standards are the ***programme theories***, and the ***theories of the problem*** are the programme that is designed to address the problem. Therefore, before TBE can be conducted, the ***programme theory*** and ***problem theory***

must be constructed. Programme theory refers to how programme activities should be developed and implemented and how these components work together or independently to produce intended effects. This can be based on "best guesses" based on either objective or subjective information. Once a theory is described, the evaluator can measure the discrepancy between how the programme is supposed to work and how it actually works. Only one programme theory is necessary if the programme is examined as a whole. If a TBE must be conducted on one or more components or activities of a programme, a sub-theory must be constructed for each programme activity (activity theories). He stressed the importance that one must first clearly understand the health-relevant problem before devising a plan to resolve it. If the problem is not clearly understood and "theorized", those responsible for planning the programme may design an intervention in such a way that it does not adequately address the root causes of the problem and will thus not have the intended effect. TBE can aid in preventing this type of miscalculation by systematically gathering information concerning the nature of the problem which can, in turn, be compared to a theory of the problem for purposes of ascertaining whether discrepancies exist between what programme developers think the problem is (theory of the problem) and the actual nature of the problem. He proceeded to describe how to construct an expected programme theory of action (that is the standard of comparison) that accurately reflects how a programme is supposed to perform or an aetiology theory that accurately reflects the nature of the problem the programme is designed to overcome. He used two case studies, namely Teen Smoking and Homicide, to illustrate the use of the "Aetiologic Theory Structuring Guide", the "Intervention Theory Structuring Guide" and the "Cause/effect Theory Structuring Guide" to develop the different programme theories. These strategies are then linked together in a conceptual framework.

Recently, the use of programme theory for the evaluation of the Work and Health Initiative funded by The California Wellness Foundation was described (Donaldson & Gooler, 2002). They used one of the programmes, Winning New Jobs (WNJ), to illustrate the use of a *participatory theory-driven evaluation approach.* Stakeholders were involved in the decisions concerning evaluation design, goal setting, data collection, programme monitoring, data analysis, and report development and dissemination. The approach rested on developing programme theories for each programme, of which the WNJ was one, in collaboration with and based on the stakeholders' views and experiences, prior evaluation and research findings, and more general theoretical and empirical work related to the phenomena under investigation. The core programme theory used to guide the evaluation of the WNJ is shown in Figure 2.3.

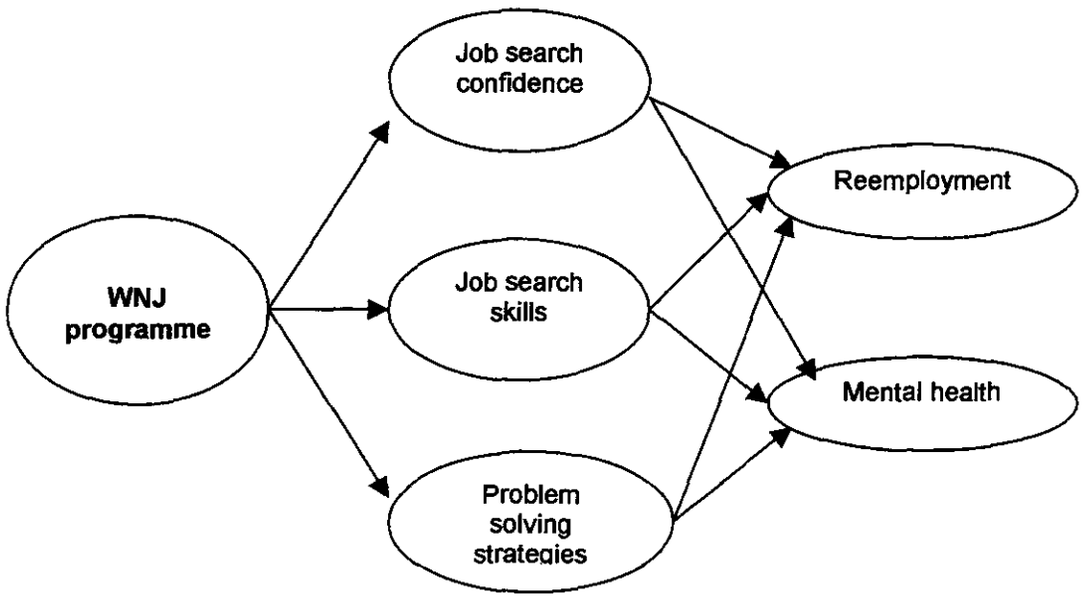


Figure 2.3 Winning New Jobs Programme Theory (Donaldson & Gooler, 2002)

Using the core programme theory in Figure 2.3, involving the stakeholders and making compromises, evaluation questions were formulated. The core evaluation questions decided on, included:

1. *Programme implementation:* Can one JOBS programme be implemented in different types of service organisations? What does the implementation look like? What are the key challenges to and success factors of implementation?
2. *Programme service:* Who are the sites serving? How many people are served at each site?
3. *Short-term outcomes:* Does WNJ increase people's confidence in their ability to use their newly acquired/enhanced job seeking skills?
4. *Reemployment outcomes:* Do people find employment? And, what does their employment situation look like?
5. *Programme sustainability and replication:* Does WNJ generate resources for programme sustainability beyond the life of a grant? Do other organisations learn about and adopt the WNJ model?

In 2000 Birckmayer and Weiss (2000) examined six published studies that took a theory-based approach. All the programmes were in health promotion including programmes on nutrition education, antismoking (two programmes), sex education, prevention of alcohol-

related injuries and death, and heart disease prevention. They found that the authors of the studies did not always make explicit the relation of their data to the theory of the programme. They reported their results in traditional ways without necessarily emphasising insights into mechanisms of change that the theory-based approach provides.

Weiss concluded in 1997 in an article about how TBE can make greater headway, that "because it is still early in the development and practice of theory-based methods, considerable trail-and-error work will undoubtedly be needed" (Weiss, 1997). Despite all the debate about this model, Weiss acknowledged that it is only occasionally practised (Birckmayer & Weiss, 2000). Weiss (2000) also realised that the routine use of TBE in every programme is unlikely, because in many programmes and for many purposes, the investigation of theoretical assumptions is too elaborate, too demanding, and probably irrelevant. Based on the literature, Reynolds (1998) identified three reasons for the lack of TBE in practice: Firstly, the field of programme evaluation remains significantly with research methodology. Secondly, because programme evaluation is an inherently practical activity, it is widely believed that theoretical evaluations are inconsistent with stakeholder and policymaker concerns. Thirdly, there is confusion about the meaning and implementation of the approach itself. Some evaluators could consider TBE as superior to other approaches. He stated that, "to date, there is no consensus about how to conduct a theory-driven approach".

2.4.3 Goal-free evaluation (GFE) vs. Goal-based evaluation

2.4.3.1 The theory of goal-free vs. goal-based evaluation

Michael Scriven proposed the idea of "goal-free" evaluation in the 1970's. It means gathering data directly on programme *effects* and *effectiveness* without being constrained by a narrow focus on stated goals. Evaluation should not focus on whether a programme has "attained its goals" but should emerge from observing the programme. Qualitative methods can be used since GFE relies heavily on description and direct experience with the programme. With GFE, the evaluator should not have any judgement about what it is that actually happens in the programme or as a result of the programme. The evaluator thus can be open to whatever data emerge from the programme (Patton, 1987).

According to the goal-free philosophy, theory construction and development allows the evaluator to look for either positive or negative effects where they might not be expected by programme designers and implementers (Bickman, 1987).

Patton (1987) described four reasons for doing GFE:

1. To avoid the risk of narrowly studying stated programme objectives and thereby missing important unanticipated outcomes;
2. To remove the negative connotations attached to the discovery of unanticipated effects;
3. To eliminate the perceptual biases introduced into an evaluation by knowledge of goals;
4. To maintain evaluator objectivity and independence through goal-free conditions.

Goal-free evaluation, in its search for "actual effects", is an inductive and holistic strategy aimed at countering the logic-deductive limitations inherent in the usual quantitative goals-based approach to evaluation. Scriven has proposed that GFE might be conducted along with goals-based evaluations, but with separate evaluators using each approach to maximize its strengths and minimize its weaknesses.

On the other hand, Guild (1990) recommended the use of goal-orientated evaluation as a programme management tool in health promotion programmes. With reduced financial resources to support new programmes and sustain old ones, it is important to demonstrate the efficiency with which available resources are used to meet programme goals and objectives. Goal-orientated evaluations are thus procedures by which quantitative values may be assigned to relative degrees of performance of a programme over a defined period of time.

James and Roffe (2000) argued that goal-based evaluation cannot be used in the evaluation of "training in creativity and innovation" and "innovative training initiatives". The reasons being that the full set of outcomes to the innovation cannot be predicted at the outset and more frequently the results are a mix of "goal" and "goal-free" outcomes.

Goal-based evaluation, on the other hand, measures the extent to which a programme or intervention has attained clear and specific goals and objectives.

2.4.3.2 Application

Guild (1990) defined goal-orientated evaluation as a term that refers to a set of techniques by which the effectiveness and efficiency of programmes in meeting their goals and objectives may be measured. It gives a framework within which the goals and objectives of a programme can be organised and a quantifiable way to measure progress in meeting these goals and objectives. The conceptual model is illustrated in Figure 2.4.

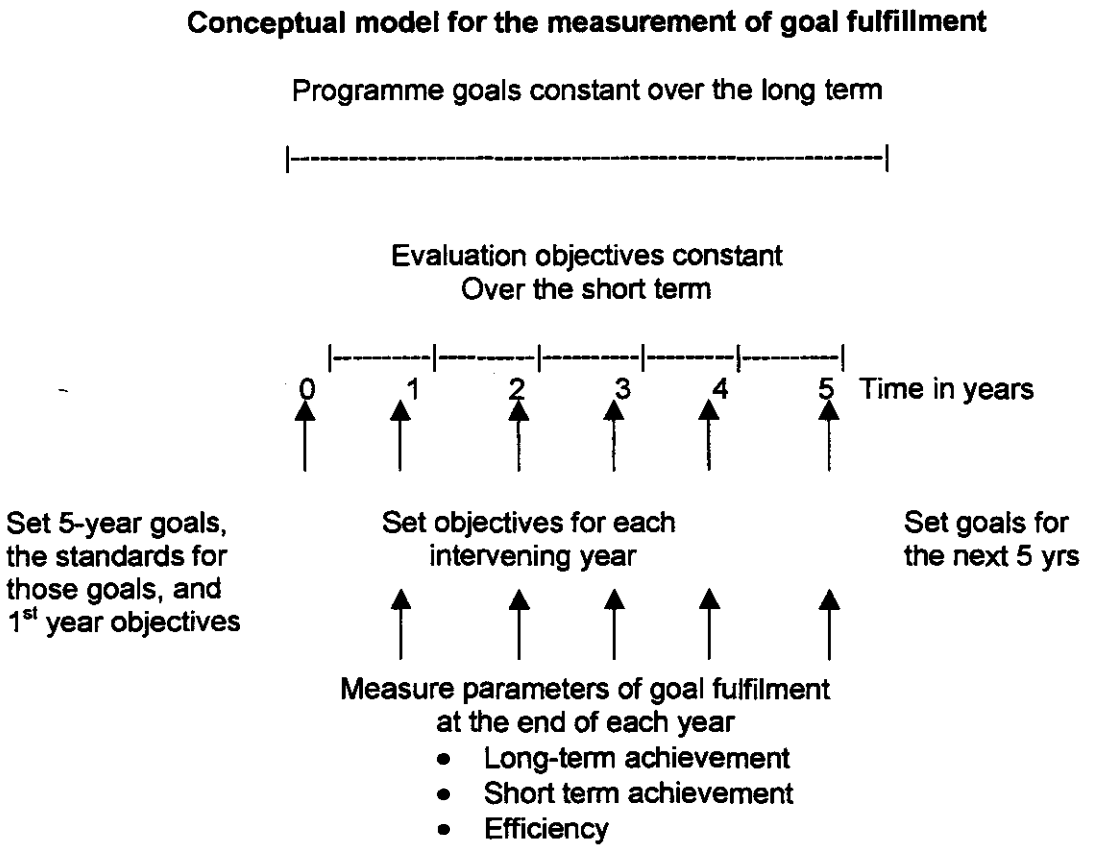


Figure 2.4 Conceptual model for the measurement of goal fulfilment (Guild, 1990)

The long-term (five-year) goals of a health promotion programme are stated, followed by standards for each long-term goal. These standards are criteria by which one may judge that a given goal has been reached. For example, in a programme to decrease the percentage of the target population who smoke, the long-term goal could be "to decrease the percentage of the target population who smoke" and a standard could be "60% of the target population will be exposed to some form of mass media presentation on the dangers of smoking". Once the standards are clearly stated, it is possible to set up a long-term plan for project operations within which annual objectives can be specified. These objectives are short-term, specific statements of how a programme plans to progress

towards meeting its goals. Objectives addressing the structures, process and outcome should be stated.

A suitable health related example of a goal-free evaluation could not be found in the literature.

2.4.4 Empowerment evaluation

2.4.4.1 The theory of empowerment evaluation

Fetterman (1997) stated that empowerment evaluation represents a shift from the exclusive focus on merit and worth alone to a commitment to self-determination and capacity building. He described it as "the use of evaluation concepts, techniques, and findings to foster improvement and self-determination". The main focus of the approach is to help people to help themselves and improve their programme using a form of self-evaluation and reflection. This shift is much like the shift in medicine from a focus on disease to a focus on wellness. It is appealing to evaluators committed to democratic forms of participation and decision making, building capacity, fostering independence and self-determination and fostering a community of learners. It may not be appropriate for evaluators who value the role of the external, distant expert above group interaction and participation. It is an innovative approach that recognises the importance of multi-channel relationships existing in governmental settings and other multi-organisational settings. This approach provides a valuable theoretical framework for understanding and solving many of the challenges associated with programme evaluation in this milieu.

Four major steps can be identified in empowerment evaluation:

1. Taking stock or self-rating the state of the programme;
2. Setting goals that illustrate potential improvements of the programme in the future;
3. Developing strategies to meet the goals;
4. Documenting progress by monitoring the programme.

With the empowerment approach programme staff members, collaborating with outside evaluators, perform a self-assessment. Fetterman further recognised five facets of empowerment evaluation, namely training, facilitation, advocacy, illumination and

liberation. It is these five facets that distinguish empowerment evaluation from more traditional evaluation.

Rossi *et al.* (1999) defines empowerment evaluation as follows: "A participatory or collaborative evaluation in which the evaluator's role includes consultation and facilitation directed toward the development of the capabilities of the participating stakeholders to conduct evaluation on their own, to use it effectively for advocacy and change, and to have some influence on a programme that affects their lives". In practice it means that the evaluator-stakeholder relationship is participatory and collaborative. The role of the evaluator is expanded to include activities towards development of the capabilities of the participating stakeholders to conduct evaluation on their own, to use it effectively for advocacy and changes, and to experience some sense of control over a programme that affects their lives (Rossi *et al.,* 1999).

2.4.4.2 Application of empowerment evaluation

Tang *et al.* (2002) described the evaluation of the California Department of Health Services Tobacco Control Programme (TCP). In this programme the TCP staff intentionally used the empowerment approach to local programme evaluation as a means to achieve maximum local programme effectiveness. The California TCP is a comprehensive health education programme that uses a "social norm change" approach, aimed at reducing both tobacco use and the exposure to second-hand tobacco smoke. The programme started in 1989. Evaluation of the programme is a mandatory requirement for funding. The TCP and its evaluation faced many challenges over the years and evolved through three stages to empower the local programme with proper resources and requirements to conduct self-evaluations. In the first two stages, TCP searched for an effective approach to improve local programme evaluation from its own experiences because there was no known example to draw from – that is a large-scale, multi-level, and multi-site programme in a complex authorizing environment. In the third stage, TCP formally introduced the concept of empowerment evaluation to local programme evaluation practices. Based on the problems encountered during the first and second stages, TCP staff introduced a community planning model *"communities of excellence"* which explicitly incorporated empowerment evaluation as the basis. The complete empowerment evaluation process is depicted in Figure 2.5.

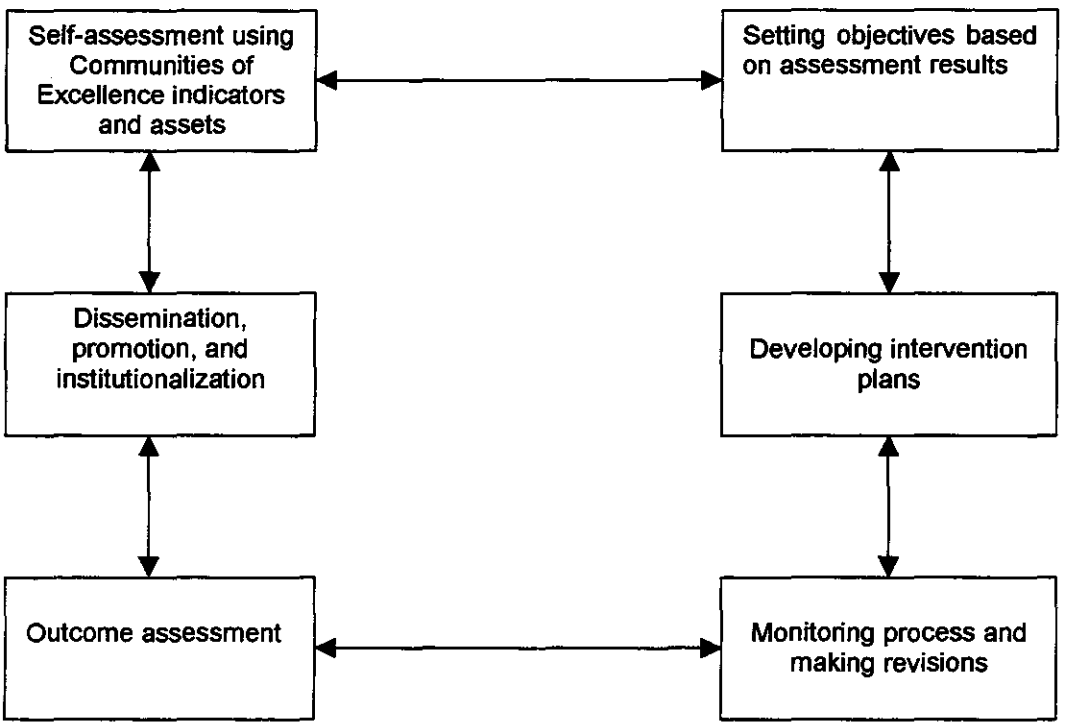


Figure 2.5 The process of empowerment evaluation for local TCP (Tang *et al.*, 2002)

The different approaches to evaluation have been discussed. Other factors that influence evaluation research subsequently come under discussion.

2.5 Political issues in evaluation

Although this is not an approach to evaluation a brief discussion is included because the Primary School Nutrition Programme (PSNP) was a political decision (see 1.3).

The influence of politics on evaluation is best summarized and described by Carol H Weiss (1993):

> Evaluation is a rational enterprise that takes place in a political context. Political considerations intrude in three major ways, and the evaluator who fails to recognise their presence is in for a series of shocks and frustrations:
>
> First, the policies and programs with which evaluation deals are the creations of political decisions. They were proposed, defined, debated, enacted, and funded through political processes, and in implementation

they remain subject to pressures – both supportive and hostile – that arise out of the play of politics.

Second, because evaluation is undertaken in order to feed into decision-making, its reports enter the political arena. The evaluative evidence of program outcomes has to compete for attention with other factors that carry weight in the political process.

Third, and perhaps the least recognised, evaluation itself has a political stance. By its very nature, it makes implicit political statements about such issues as the problematic nature of some programs and the unchallengeability of others, the legitimacy of program goals and program strategies, the utility of strategies of incremental reform, and even the appropriate role of the social scientist in policy and program formation.

Knowing that political constraints and resistance exist is not a reason for abandoning evaluation research; rather, it is a precondition for usable evaluation research. Only when the evaluator has insight into the interests and motivations of other actors in the system, into the roles that he himself is consciously or inadvertently playing, the obstacles and opportunities that impinge upon the evaluative effort, and the limitations and possibilities for putting the results of evaluation to work – only with sensitivity to the politics of evaluation research – can the evaluator be as creative and strategically useful as he should be.

Rossi *et al.* (1999) stated that sometimes the true purpose of the evaluation has little to do with actually obtaining information about programme performance. Evaluation of a programme is sometimes called for because it will be good public relations and might impress funders and political decision-makers. Even worse, sometimes an evaluation is commissioned to provide a public context for a decision that has already been made behind the scenes to terminate a programme, fire an administrator, or the like. Or it could be used as a delaying tactic to appease critics and defer difficult decisions.

Chelimsky (1998) also held this view and stated that the use of evaluation findings by politicians are embedded in other issues, namely:

- The general political environment;
- The history of the topic being studied;
- The political, social and economic values embodied in that topic.

She suggested, based on their experience with the US Department of Chemical Weapons Programme, to not only include the typical literature review, but to include programme history and values, past and current controversies, and political positions taken by earlier research. She also advises to investigate the political underpinnings of both the programme and its evaluations, especially the controversies of the past that remained relevant, the major stakeholder's position today and the likelihood of new controversy awaiting the evaluation.

Thompson (1992), however, suggested that programme evaluation is an excellent method of building bridges between researchers on the one hand and practitioners and policy makers on the other hand.

From these viewpoints it is clear that the evaluator should be aware of the political issues involved, and could even use these to strengthen the evaluation and its application.

2.6 Multi-level and multi-organisational evaluation

2.6.1 Introduction

Fredericks *et al.* (2002) reviewed the factors that challenge the evaluator when dealing with intergovernmental and inter-organisational programmes. Service delivery systems have evolved in such a way that programmes are designed across multiple organisations and delivered at multiple sites, making service delivery and programme evaluation even more complex. These conditions serve to exacerbate many of the problems that often occur when evaluating even the simplest programme. Problems include stakeholders with different priorities and goals for both the programme and the evaluation, competing and conflicting demands for reporting and evaluation, difficulties developing outcome measures, data availability and data analysis issues, data ownership, access, sharing and dissemination issues. These difficult issues should be addressed early in the evaluation through careful planning and coordination among all stakeholders.

Social structures have serious implications for whether and how stakeholders will allow the process of evaluation to develop. As Guzman and Feria (2002) explained Bronfenbrenners' ecological model, human behaviour is embedded in a hierarchy of metaculture. This hierarchy ranges from the macro system-level (e.g. national norms and

values), through exosystem-level forces (e.g. provincial norms), down to mesosystem-level forces (e.g. community norms), and finally to microsystem-level forces (e.g. guiding principles of a Community Based Organisation). Evaluators must therefore clearly define the metaculture of each of the key stakeholders. It is also important to identify the hierarchy of authority of the key stakeholders. Large authorising environments such as the state should be approached with neutrality and calm. They (Guzman & Feria, 2002) made the following recommendation for conducting an evaluation that involves multi-level stakeholders:

- Identify the key stakeholders and their needs;
- Research the environment in which the programme will be implemented;
- Negotiate through the hierarchy (begin with the most influential stakeholders and get them to support the evaluation plan);
- Seek out the support of people who indirectly influence the stakeholders (e.g. key individuals in a community);
- Be willing to renegotiate the plan on an ongoing basis.

By recognising the multicontextual environments and by knowing the best tactics to use when dealing with different authorising environments, the evaluator can both significantly alleviate the difficulty of dealing with multiple stakeholders and increase the usefulness of the evaluation findings.

2.6.2 Application

Rowan *et al.* (1999) demonstrated that a large, multi-centre and multi-level project evaluation could be performed successfully. They evaluated the Mobilising Physicians for Clinical Tobacco Intervention (MP-CTI) project. The project was initiated in 1995 in Canada by the national and provincial medical associations with the aim to influence physicians to improve stop-smoking advice to patients. The purpose of the evaluation was to judge the merit and worth of the MP-CTI project.

The framework of the evaluation, as outlined in Table 2.3 was identified and agreed upon by all the stakeholders.

Table 2.3 Main evaluation issues and questions*

Evaluation issues	Questions
A. Implementation	Was the project implemented appropriately?
	Did the project reach its intended target audiences?
B. Achievement of objectives	Did the project meet its stated objectives?
C. Impacts/outcomes	What happened as a result of the project?
D. Programme relevance	Are the project activities relevant for other provinces to apply?
E. Alternatives	Were there better ways of achieving the objectives, in terms of cost-benefits?

* Adapted from Rowan *et al.*, 1999

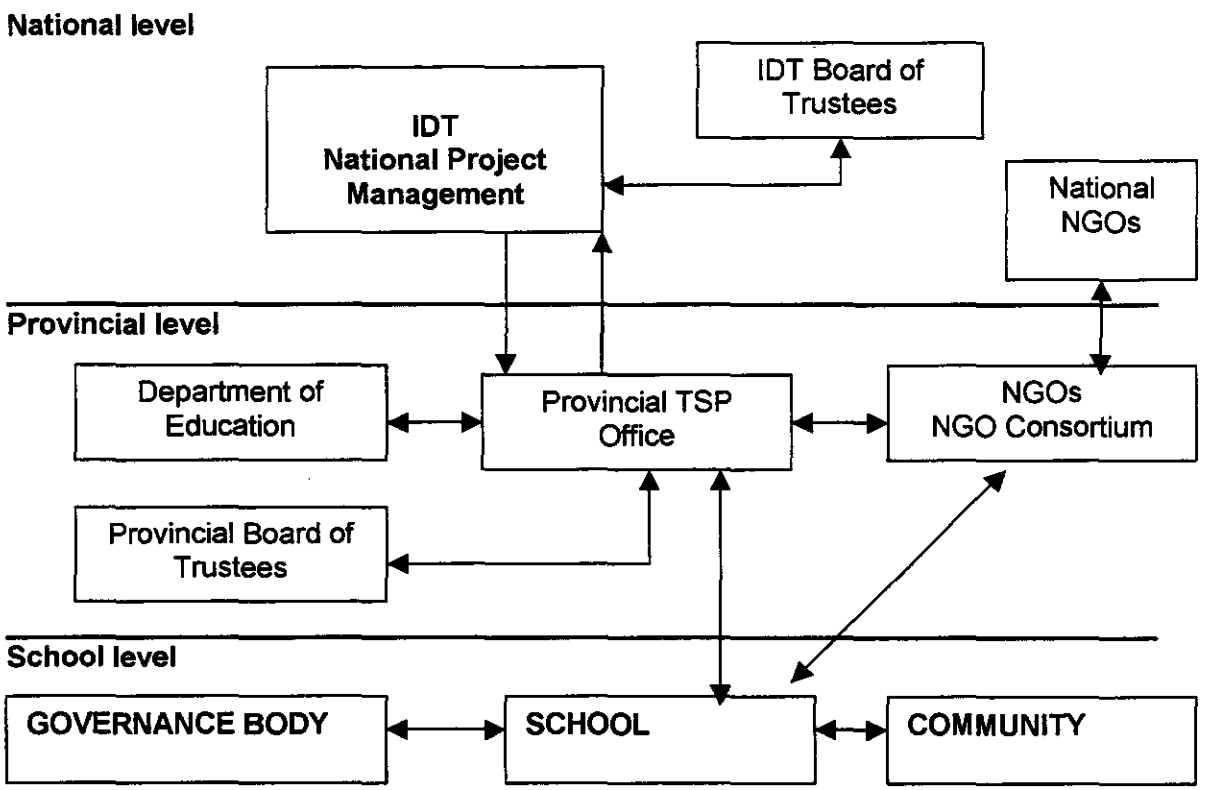
The evaluation was a multi-level case study of national and provincial project activities with the focus primarily on activities at macro- and meso-levels. A decision was taken that cross-comparisons among and between provinces would not be appropriate as each province was at a different progress level of CTI implementation. A variety of methods were used to obtain the data ranging from document reviews, discussion of project activities and objectives, surveys of national and provincial partners, baseline surveys in the provinces to a workshop with different stakeholders. The data were analysed using both qualitative and quantitative methods.

Based on the findings of the evaluation the evaluators concluded that the MP-CTI was successfully implemented and accomplished its objectives in an appropriate and timely manner. The evaluators also recommended some methods for improving the evaluation and increasing utilization of results:

- *Development of a program logic model.* Although evidence suggested that if physicians addressed the problem of tobacco use systematically, their patients would be more likely to quit smoking. The link, however, between the physicians' clinical behaviour and the cessation of smoking by the patient is not clear. The use of a theory-based evaluation could have helped to clarify this relationship;
- *Actively involve a wider range of users.* Although several core stakeholders were involved in planning and conducting the evaluation, other groups could have been consulted to a greater extent which could have lead to wider use of the evaluation;
- *Make evaluation part of medical associations' service orientation for members.* Another way to improve the evaluation would be to help participating medical organisations better understand the needs of their members regarding CTI. Further evaluation could have been done to determine what else is needed to motivate physicians to practise more CTI.

The success of the evaluation can be contributed to the fact that a dedicated evaluation subcommittee has clearly stated project objectives up front, developed a comprehensive set of evaluation issues and questions that included and gone beyond studying implementation and outcomes, used a variety of information-gathering methods, and involved management groups throughout the evaluation process.

The Thousand Schools Project (TSP) is another example of a multi-level, multi-organisational project that was funded by the Independent Development Trust (Mouton, 1999). The fundamental concept of the TSP was to identify a thousand needy schools throughout South Africa and then to arrange for non-government organisations (NGOs) to deliver services and materials to these schools, within the context of whole school development. Figure 2.6 gives the analytical framework developed by the evaluators indicating the roles of each of the three levels of role players, namely the national level, provincial level and school level.



TPS = Thousand Schools Project

IDT = Independent Development Trust

NGO = Non governmental organisation

Figure 2.6 The analytical framework used to evaluate the Thousand School Project (Mouton, 1999)

The evaluation team identified multi-level evaluations to be conducted based on discussions between them and the IDT, namely:

- The overall management and implementation system: both at national and provincial levels;
- The NGOs and their involvement in the TSP;
- The actual services delivered by the NGOs within the provinces, and specifically within the schools.

Due to various factors, it was not possible in the end to conduct a comprehensive evaluation of the TSP, including all the different stakeholder levels.

2.7 Multi-site evaluations

2.7.1 Introduction

According to Straw and Herrell (2002), Turpin and Sinacore were the first to use the term multi-site evaluation (MSE) in 1991 and to note the unique demands of evaluating programmes at different geographical locations. They distinguished between MSEs examining interventions that are implemented in the same way across all sites and those that examined different interventions or variations of the same intervention across sites. Presently there are no accepted criteria for defining MSEs, no accepted terminology for distinguishing among such evaluations, and no general guidelines for determining the most appropriate type of MSE for a given purpose. Two factors differentiate MSEs from other evaluation activities, namely the involvement of multiple sites and the conduct of a cross-site evaluation activity. The number of sites can vary from two to fifty or more. A site can vary from individual classrooms in a school to different geographical locations. The intervention being studied may be required to be the same in each site, or be allowed to vary across sites. Three relatively distinct types of evaluations have been identified over the past few years, namely cluster evaluations, multi-site evaluations (also called cross-site evaluations), and multi-centre clinical trails. Table 2.4 summarizes some of the important differences among the types of MSE.

Table 2.4 Variations across types of multi-site evaluation on important dimensions (Straw & Herreil, 2002)

Dimension	Cluster evaluation	Multi-site evaluation	Multi-centre clinical trial
Principal purpose	Examine variation	Estimate impact or examine variation	Estimate impact
Phase or research	Exploratory	Exploratory to confirmatory	Confirmatory
Source of intervention	Programme driven	Programme, early data driven	Research driven
Standardisation	Extensive variation	Some to extensive variation	Extensive standardisation
Timing of cross-site evaluation	Planned to retrospective	Planned to retrospective	Planned
Role of cross-site evaluation	Formative	Summative	Summative
Model of cross-site evaluation	Collaborative	National evaluator to collaborative	Collaborative

The evaluator is confronted with many challenges when designing and implementing multi-site evaluations. These include:

- Is the primary evaluation question one that requires an MSE?
- Will the same interventions be employed at all sites?
- Will the same inclusion and exclusion criteria be used across sites?
- What requirements will be placed on sites in terms of evaluation design parameters?
- How will the activities undertaken at the various sites be coordinated?
- How will adherence to the protocol across sites be ensured?
- What strategy will be used to combine and centrally analyse the data across the various sites?

The purpose of publicly funded MSEs is bringing interventions that are proven safe and effective to the public. A MSE rests on two principles, namely that the intervention should be science-based and it should have a broad participation by various stakeholders. The concept of science-based practice is that to bring safe, effective interventions to the public, MSEs should contribute to an orderly, phased process of scientific investigation. The participatory principle is that MSEs should reflect the interest and values of the various stakeholder groups in public systems, ranging from the public officials, to the evaluators and family members. These two principles present challenges to the evaluation of behavioural interventions. On the one hand is science that demands a sustained, deliberated approach to the accumulation of evidence and on the other hand is

consumers and providers of services that are eager for new and promising interventions to be offered to the public. The delivery of science-based interventions to the public that is effective and efficient is not easy (Leff & Mulkern, 2002).

2.7.2 Advantages of multi-site evaluations

Babor *et al.* (2002) mentioned that Meinert indicated in 1986 that the traditional model of the multi-centre randomised clinical trial is considered to be the gold standard for scientific evaluation of therapeutic interventions.

There are a number of advantages when one compares the power of a prospective, well-executed multi-site study with what can be learned from a set of individual, stand-alone studies. Collecting data from a large number of participants, using standardised protocols that have been administered in a uniform manner and monitored for data accuracy and consistency offers the following advantages:

- The ability to conduct a wide range of statistical analyses that are far more powerful and informative than the typical meta-analytic approaches used to compare stand-alone studies;
- The creation of a large, well-documented database that can be used to address questions beyond the original focus of the study;
- The opportunity presented by multi-site studies to increase the relevance of study findings by combining multiple perspectives (from the various stakeholders) in the design and conduct of the investigation (Cook *et al.*, 2002).

2.7.3 Application

Babor *et al.* (2002) described the use of a multi-site, randomised clinical trial to evaluate a programme of treating marijuana dependence in adults. The Marijuana Treatment Project (MTP) was a three-year, randomised clinical trail to investigate the effectiveness of brief interventions for individuals who are dependent on marijuana. Three different sites participated in the study. The study sample at each site was randomly assigned to three study protocols using individual (rather than group) therapy on an outpatient basis: a two-session brief intervention, a nine-session extended treatment, or a delayed treatment group (control group). Results obtained from follow-up evaluations at four months after the initiation of treatment indicated significant improvements in both treatment groups

relative to the control group, with the nine-session groups showing better outcomes than the two-session group at all subsequent follow-up evaluations.

Valuable lessons were learned with the evaluation regarding the design and execution of the MTP. The participatory and collaborative decision making process proved very valuable to minimize the potential conflict that sometimes develop between an autocratic coordinating centre and passive clinical sites. Mutual trust between the different stakeholders at the different sites provided a forum to resolve differences and maintain a common vision.

Although this type of evaluation is used as the gold standard, internal and external validity can be a problem when the evaluation is conducted in the form of multi-site evaluations. MTP tried to overcome this problem by including a number of methodological safeguards designed to increase the validity of the study, namely: a waiting list control group, cross-site standardisation measures, randomisation to balance comparison groups, the use of standardisation assessments, and validity enhancement procedures. The lack of site differences on any of the study's outcome measures is an indication of the benefit of these procedures.

Randomised clinical trials are usually employed to answer questions such as "is there a causal relationship between the invention and the outcome (efficacy questions) rather than "does the relationship replicate under real-world conditions (effectiveness questions) because of their internal versus external validity. In the MTP study, the evaluators found that it is possible to conduct a multi-site evaluation with a heterogeneous sample in community treatment settings.

The intervention used in the MTP involved the use of a manual-guided rather than manual-driven approach to deliver the study treatments. In other words, the therapists used the manual for the theoretical framework of the study therapies, but they could integrate it with their own way of working with participants. The evaluators found that the therapists were able to deliver core therapeutic components without compromising their own style of conducting psychotherapy. The evaluators concluded by saying that "the combination of methodological rigor and clinical relevance in a rapidly executed multi-site evaluation has the added advantage of translating scientific findings into treatment policy because the results are often timely and unambiguous".

The evaluators of the Thousand Schools Project (TSP) also had to deal with multi-site evaluations (Mouton, 1999). The programme was implemented in nearly one thousand schools in nine different provinces in South Africa with more than 80 non-governmental organisations (NGOs) responsible for the delivery of the service. A high level of standardisation for the data-collection was needed. More than thirty field workers collected information over a period of 10 months in the different provinces. If some degree of standardisation of methodology were not achieved, it would not have been possible to compare data and draw valid conclusions from the data. The evaluation team acknowledged the following three levels of variability that would affect standardisation:

- Variability in field-workers;
- Variability in time frame;
- Variability in geographic sites.

To overcome these problems they distinguished three forms of standardisation:

- Standardisation of instrumentation;
- Standardisation of data-collection instructions;
- Standardisation of data-capturing and -editing.

Although no piloting of the instrument was done, it was discussed at national workshops. Standardised instructions were formulated to guide data-collection. The data was captured and edited centrally to minimise capturing errors. Although the TSP teams went to great lengths to ensure the integrity of data collected, they could not guarantee an error-free end-product.

In the following section the different design and methods applicable to evaluation research will be discussed briefly.

2.8 Design and methods

2.8.1 Introduction

The purpose of the evaluation, the use to which results will be put, should determine the design of the evaluation study.

Research methodology should form an intergral part of any research. There are different types of study design as well as different methods to gather data needed for the research.

The two broad generic types of methodology is graphically summarised in Figure 2.1 as described by Leedy (1993).

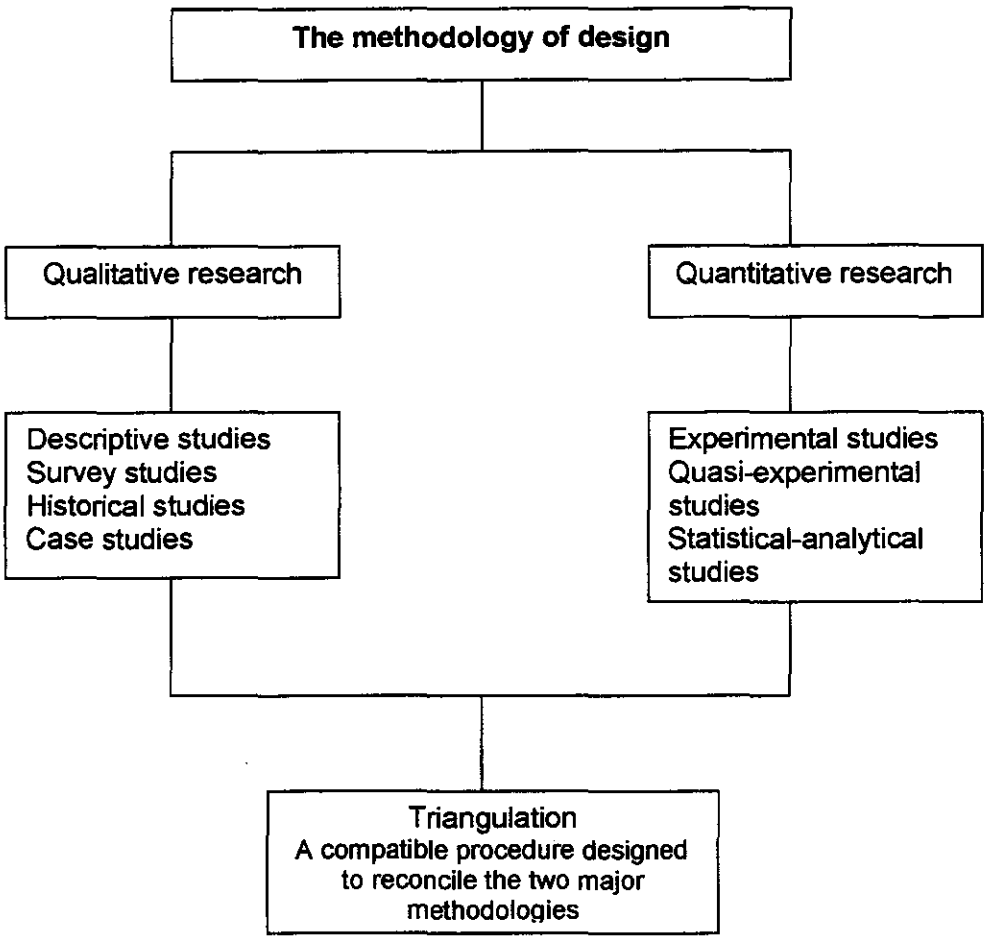


Figure 2.7 Methodology of design

Only some of the applicable methods to evaluation will be briefly discussed in the next part of this chapter.

2.8.2 Experimental design

According to Patton (1987) experimental designs are selected to test the effects of controlled treatments, reduce variation in extraneous variables and focus on a limited set of predetermined measures.

The experimental design is given in Table 2.5.

Table 2.5 Experimental design (Adapted from Weiss, 1972)

	Outcome measured	
	Before	**After**
Experiment	a	b
Control	c	d

If the difference between a & b is greater than the difference between c & d, then the programme is a success.

Weiss (1972) has the following problems with this type of evaluation design:

1. It requires holding the programme constant rather than facilitating its continual improvement;
2. It is useful for making decisions only after a project has run full cycle and not during its planning and implementation.

The basic elements of an experimental design can be summarized as follows:

- Selection of subjects;
- Assignment of them into treatment and control conditions (randomise assignment);
- Application of the intervention to the treatment group but not to the control group (independent variable);
- Experimental control of the research situation to ensure that there are no differences between the treatment and control conditions other than the intervention;
- Measurement of selected outcomes for both groups (dependent variables);
- Statistical analysis to determine whether the groups differ on those dependent variable measures.

This type of study was used frequently in programme evaluations during the late 1960's and early 1970's in the USA when there were federal requirements to assess the effectiveness of federal funded innovations in schools and social service organisations. It fell into disfavour and disuse because educators, social workers and other social service providers could rarely meet the required experimental conditions and assumptions needed for an experimental design. This method has a number of advantages, namely: it

focuses on results and not just intentions or judgements; it establishes relatively unequivocal causal relationships between treatment and outcome variables; and it has credibility (mainly because of the prevalent use and success of experiments in fields such as medicine). One of the major disadvantages is, however, the serious objections to experimenting on school students and other human subjects. It is also not always possible and practical, for example, to randomly assign learners in a school to treatment or control groups and to hold treatments constant throughout the study period. Experimental designs also provide a much narrower range of information than organisations often need to assess and strengthen their programmes (Stufflebeam, 2001).

2.8.3 Quasi-experimental design

A quasi-experiment can be described as an impact research design in which "experimental" and "control" groups are formed by a procedure other than random assignment. Comparisons are made between targets who participated in a programme and those who did not participate who are presumed similar to participants in critical ways. Four quasi-experiment designs are available: regression-discontinuity designs, matched constructed control groups, statistically equated constructed controls, and designs using generic outcome measures as control. The goal is to be able to compare the programme participants with non-participants that resemble them on those characteristics and experiences related to the evaluation's outcome measures. In quasi-experimentation it will always be arguable to some degree whether the comparison group is sufficiently comparable to the intervention group on all relevant characteristics and experiences to provide an unbiased estimate of net programme effects (Rossi *et al.*, 1999).

A major distinction for quasi-experiments is related to the time points at which the evaluation is designed and its implementation undertaken. In *Ex Ante Quasi-experiments* the evaluators are able to plan how they will select the control group before the programme is provided to the intervention group. The opportunity is there to identify and plan the data collection procedures for *both* the intervention and control groups prior to programme participation by the selected target group. This maximizes the likelihood of constructing comparison groups that are equivalent to those who received the intervention ((Rossi *et al.*, 1999). The evaluator should know in advance what they do and do not control for and that misinterpretation of results are possible. Taking these into

account the evaluator can draw conclusions carefully (Weiss, 1972). Leedy (1993) stated "... it is imperative that the researcher be thoroughly aware of the specific variables the design fails to control and take these into account in the interpretation of the data".

In *Ex Post Quasi-experiments* it is not possible to construct the comparison group before the programme is delivered to the participants in the intervention group. The control group must then be constructed after the beginning of the programme and sometimes after the termination of the programme. This usually is the case when the decision to undertake and evaluation is made after a programme has already enrolled all the targets.

The time-series design is a quasi-experimental design. It involves a series of measurements at periodic intervals before the programme begins and continuing measurements after the programme ends. The evaluator can thus see whether the measures immediately before and after the programme are a continuation of earlier patterns or whether they mark a decisive change (Weiss, 1972).

2.8.4 Naturalistic/qualitative design

Patton (1987) stated that qualitative designs are naturalistic to the extent that the evaluator does not attempt to manipulate the programme or its participants for purposes of the evaluation. Evaluators engaged in naturalistic inquiry study naturally occurring activities and processes. These activities are "natural" in the sense that they are not planned and manipulated by the evaluator as would be in the case of an experiment. Naturalistic inquiry evaluators focus on capturing programme processes, documenting variation and exploring important individual differences between various participants' experiences and outcomes. A naturalistic inquiry strategy is selected to describe naturally unfolding programme processes and impacts.

Qualitative analysis is guided not by hypotheses but by questions, issues and a search for patterns. Evaluators using qualitative methods strive to understand programmes and situations as a whole.

The qualitative-naturalistic-formative approach is especially appropriate for programmes that are developing, innovating or changing, where the focus is on programme improvement, facilitating more effective implementation, and exploring a variety of effects on participants (Patton, 1987). Therefore, naturalistic inquiry evaluators focus on

capturing process, documenting variations and exploring important individual differences in experiences and outcomes (Patton, 1990).

2.8.5 Triangulation

Triangulation is not a study design but a method for gathering information. It is, however, included year because it is of importance in the methodology of health related programmes. Leedy (1993) defines triangulation as "a compatibility procedure designed to reconcile the two major methodologies".

The logic of triangulation is based on the premise that no single method ever adequately solves the problem of rival explanations and therefore triangulation describes a three-way comparison. Triangulation is an ideal method for evaluation research, but it can be very expensive (Patton, 1999).

Denzin, as quoted by Patton (1987), has identified four basic types of triangulation:

- Data triangulation: the use of a variety of data sources in a study, for example, interviewing people with different status positions or with different points of view;
- Investigator triangulation: the use of several different evaluators;
- Theory triangulation: the use of multiple perspectives to interpret as a single set of data;
- Methodological triangulation: the use of multiple methods to study a single problem or programme, such as interviews, observations, questionnaires and documents.

2.8.6 Summary of various evaluation designs

Levinson *et al.* (1999b) gave an overview of the various evaluation designs that could be used in evaluation studies of nutrition intervention programmes. In Table 2.6 these designs are shortly discussed.

Table 2.6 Summary of various evaluation designs*

Evaluation design	Change can be attributed to project activities	Magnitude of change can be determined	Comments
Pre-post design with a randomised control group (experimental design)	Yes	Yes	The most rigorous evaluation design, yet often not feasible or ethical for field-based nutrition projects
Pre-post design with a non-randomised control group	Yes, if the control group is a valid comparison group	Yes	Generally the most rigorous design possible for field-base nutrition projects. If the control group is valid and the evaluation is properly conducted, strong conclusions can be reached
Pre-post design without any control group	No	Yes	This design can be strengthened by examining exogenous factors which may have influenced the nutritional status of project participants. Another possible method is to establish a comparison group after the fact using secondary data sources
Post-project design with a non-randomised control group	Possibly though conclusions are often weak	No	Conclusions about the effects of the project can only be drawn if pre-project information demonstrates that project and control groups were the same in terms of relevant variables before the project began
Post-project design without any control group	No	No	Descriptive assessment of the project. Can yield useful information but no conclusive results
Time series design	Possibly	Yes	This design can provide strong conclusions if properly planned and executed
Institutional cycle design	Yes, if implementation phasing is randomised rather than based on need	Yes	This method is comparable to pre-post with a control

* Adapted from Levinson *et al.*, 1999b

In there study of an integrated nutrition programme in rural Viet Nam, Marsh *et al.* (2002) used a longitudinal, prospective, randomised, "probability effectiveness" design. They randomised at commune level and then followed a total of 240 children longitudinally for six months with a re-survey at 12 months.

The different types of evaluation studies that can be conducted will subsequently come under discussion. Firstly the theory will be discussed followed by an application in the health setting.

2.9 Types of evaluation studies

2.9.1 Introduction

Evaluation practice can be applied to all aspects of the life cycle of a programme as indicated in Table 2.7. Based on this framework, evaluations are undertaken for a variety of reasons.

Table 2.7 Programme cycle and relevant evaluation models*

Programme cycle	Evaluation methods	Evaluation tools
Programme planning	Needs assessment	Surveys Population statistics Structured groups Utilization statistics
Programme design	Evaluability assessment	Interviews Document reviews
Programme implementation	Programme monitoring	Performance measurement systems
Programme completion/ accountability	Outcome evaluation	Experimental designs Quasi-experimental designs

* Adapted from Brazil (1999)

2.9.2 Evaluation of need

2.9.2.1 The theory of evaluation of need

Posavac and Carey (1992) described need evaluation as follows: " Is the programme conceptualised and designed in such a way that it addresses the real needs of the intended beneficiaries (the target group)". They emphasised the importance of assessing need as a precondition to effective programme planning, and therefore also for programme evaluation.

Evaluation of need should be a systematic approach to identifying a problem, determining the extent of the problem, and accurately defining the target population to be served and the nature of the services needed. Needs assessments may also be used to determine whether there is a need for a new programme and to compare or prioritise needs within and across programme areas (Rossi *et al.*, 1999).

2.9.2.2 Application

An example of the application of needs assessment evaluation comes from the Scottish Health Promotion School programme.

The health promoting school concept is now a well-established framework for the development of health promotion initiatives in schools. Scotland joined the European Network of Health Promoting Schools in 1993 and invited schools to participate in the project. Four schools were selected to participate according to pre-determined criteria. A baseline needs assessment was carried out in each of the four schools. Initially, focus group discussions were held with pupils and staff at each school in order to identify key issues in relation to healthy eating and food provision at the school. Based on this information, and incorporating questions from established, validated questionnaires, a set of questions was developed for use with pupils, parents and school staff. The questionnaires covered a range of issues, including food and drink consumption, eating habits, dieting behaviour, body image, physical activity and so on. Results from this comprehensive needs assessment was used in combination with local priorities and school development plans and based on the health promoting school concept to develop overall aims. Each school then developed action plans for specific activities, with identified objectives, progress indicators and links to the overall aims (Inchley *et al.*, 2000).

2.9.3 The evaluation of process (process or implementation evaluation)

2.9.3.1 The theory of process or implementation evaluation

Process evaluations are aimed at elucidating and understanding the internal dynamics of programme operations and typically require a detailed description of programme operations. Such descriptions may be based on observations and/or interviews with staff, clients, and administrators. Many process evaluations focus on how the programme is perceived by participants and by staff. The effort to generate an accurate and detailed description of programme operations particularly lends itself to the use of qualitative methods. The "process" focus in evaluation implies an emphasis on looking at "how" a product or outcome is produced rather than looking at the product itself – it is an analysis of the processes whereby a programme produces the result it actually does. Process evaluation is developmental, descriptive, continuous, flexible and inductive. Process

evaluation looks not only at formal activities and anticipated outcomes, but it also investigates informal patterns and unanticipated consequences in the full context of programme implementation and development (Patton, 1987).

Process evaluation verifies what the programme is and whether or not it is delivered as intended to the targeted recipients. It does not, however, attempt to assess the effects of the programme on those recipients. Programme monitoring is the systematic documentation of key aspects of programme performance that are indicative of whether the programme is functioning as intended or according to some appropriate standard (Rossi *et al,* 1999). Continuous monitoring of indicators of selected aspects of programme process can be a useful tool for effective management of social programmes by providing regular feedback about how well the programme is performing its critical functions.

Process evaluation refers to the knowledge on how and the extent to which the programme was actually implemented. Unless one knows that a programme is operating according to design, there may be little reason to expect it to provide the desired outcomes. Furthermore, until a programme is implemented and a "treatment" is believed to be in operation, there may be little reason to even bother evaluating outcomes. It is important to know the extent to which a programme is effective after it is fully implemented, but to answer that question it is important to learn the extent to which the programme was actually implemented. When outcomes are evaluated without knowledge on implementation, the results seldom provide a direction or action because the decision maker lacks information about what produced the observed outcomes (or lack of outcomes). Pure pre-post outcomes evaluation is the "black-box" approach to evaluation. Implementation evaluation tells decision makers what is going on in the programme and how the programme has developed. An important way of studying programme implementation is to gather detailed, descriptive information about what the programme is doing. Implementation evaluations answer the following kinds of questions: What do clients in the programme experience? What services are provided to the clients? What does the staff do? What is it like to be in the programme? How is the programme organized? Does it focus on inputs, activities, processes and structures (Patton, 1987; 1990)?

Formative evaluation is a term used to describe evaluation activities undertaken to give information that will guide programme improvement (Rossi, *et al.,* 1999).

Process evaluation is also important because the implementation of programmes could be adapted or changed based on formative evaluation. Accurate information about the "re-invented" intervention is crucial to the interpretation of findings from outcome evaluations. If an intervention programme is changed midway, it could affect the outcome and impact of the programme. Without process evaluation it will not be possible to know whether observed effects could be attributed to the programme or other factors. To be able to identify the actual independent variable(s) of an intervention, accurate information is needed from the implementation of the intervention as well as the re-invented intervention (Brunk & Goeppinger, 1990).

2.9.3.2 Application

The need for accurate description of community interventions was demonstrated by Brunk and Goeppinger (1990) by using the Arthritis Self-Care project as a case study. This project is a community-based intervention study conducted in rural Virginia, USA. The researchers were interested in determining the effectiveness of arthritis self-care education for rural persons with arthritis as well as its acceptability. Process evaluation of the programme included a detailed description of what actually occurred during the intervention or service delivery part of the programme. Data were collected from several sources, for example tape recordings of the classes offered, phone contact with the trained volunteers, worksheets, and verbal and written contacts with the stakeholders. The data was analysed by the project staff. With this process, five areas of re-intervention were identified. These included changes in the method of identifying community leaders for direct caregiver roles and in the use of these caregivers, variations in curriculum content, unplanned diffusion of information among research subjects and variable occurrence of the "attention placebo". For each of these five areas, a response was developed to deal with the re-intervention. The authors suggested six points that could be incorporated during process evaluation to assist the evaluator in determining what is actually occurring during programme intervention as well as in monitoring the implementation of research protocol, namely: acknowledge that programme re-invention will occur; solicit information about re-invention; maintain accurate records of programme implementation; monitor the direct caregivers (programme deliverers); use research processes to determine the extent and impact of the re-invention; and view re-invention as a positive force likely to result in programme improvement.

Levine *et al.* (2002) described the implementation evaluation of the Team Nutrition (TN) pilot study in seven school districts. Team Nutrition is a comprehensive school-based intervention that focussed on changing eating behaviour through interactive classroom lessons that are reinforced by activities and messages in a variety of settings. It was designed to reduce fat consumption and increase the intake of fruits, vegetables, and grains as well as to broaden the variety of foods that are eaten. The goal of the implementation evaluation was to assess whether the intervention could be implemented as intended and determine what impact such an intervention had on student eating behaviour. Both qualitative and quantitative methods were used. The participating stakeholders included the community and school, TN coordinators, principals, food service managers, teachers and parents. The evaluation activities included interviews, surveys, teacher activity logs, core activity logs, food service observations and teacher observations. A variety of instruments were used including studying documents, semi-structured interviews, surveys with open and closed responses, self-administered surveys with closed and open responses, telephone surveys with closed responses, structured forms and semi-structured forms. In addition, six core process evaluation questions were formulated, namely:

- To what extent were the major Team Nutrition components implemented in each district?
- How well was TN received by school food service managers and staff, teachers, and school administrators?
- How were community partners, such as chefs, businesses and health organisations, recruited and involved in TN activities?
- How successful were the districts in garnering media attention for TN efforts?
- What kinds of organisational features characterised TN implementation approaches and how did stakeholders react to them?
- What were the key challenges for institutionalising TN or nutrition education in general, and what were the suggestions for overcoming them?

The evaluators reported the key findings and lessons learned based on these six questions. They concluded that the implementation evaluation stressed the importance of providing a support system for the teachers, food service managers and staff, community partners and other team members. They recommended that nutrition education campaigns should aim to be more user friendly by borrowing from social marketing and customer satisfaction models. They recognised that the labour required to provide and coordinate this level of support and the combination of skills needed are considerable.

A unique programme in South Africa, the loveLife's AIDS prevention programme demonstrated that programme implementation evaluation can be used effectively to constantly improve programme implementation. All aspects of programme implementation were monitored including broadcast of radio and television programmes, outdoors and newsprint advertising, the distribution of materials and booklets, the services established for adolescents and patterns of use (Stadler & Hlongwa, 2002).

2.9.4 The evaluation of outcome or impact evaluation

2.9.4.1 The theory of outcome or impact evaluation

Impact evaluation, also called impact assessment or an outcome evaluation, gauges the extent to which a programme produces the intended improvements in the social conditions it addresses. Impact evaluation has the basic aim of producing an estimate of the net effects of an intervention – that is, an estimate of the impact of the intervention uncontaminated by the influence of the other processes and events that also affect the conditions the programme attempts to change. Impact evaluation is most appropriate for mature, stable programmes with a well-structured and well-documented programme model (Rossi *et al.*, 1999). The questions asked will be for example: Have the intended outcomes of the programme materialised as indicated by the criteria of success? Can the impact be attributed to the programme?

Summative evaluation is a term used to describe evaluation activities undertaken to render a summary judgement on certain critical aspects of the programme performance, for instance to determine if specific goals and objectives were met (Rossi *et al.*, 1999).

2.9.4.2 Confirmatory programme evaluation (CPE)

Reynolds (1998) advocated the use of confirmatory programme evaluation (CPE). CPE is one method of conducting theory-driven evaluation. The objective is to facilitate causal inference about the relationship between programme participation and measured outcomes. It is thus an outcome or impact evaluation focusing on outcomes by quantitatively estimating programme impact. The programme theory is used to test the hypotheses about the programme by using a systematic process of programme analysis. CPE is designed for investigating effects at the post-programme stage and during post-

programme follow-up periods. CPE attempts to strengthen causal inference through systematic investigation of the nature of the relationship between treatment and outcome. The evaluator investigates the empirical relationships among programme, intervening, and outcome variables. The causal inferences concerning the effects of programmes can be facilitated by empirically verifiable criteria. Satisfaction or affirmation of these criteria in a CPE strengthens the likelihood that the relationship between programme participation and outcomes is causal. One of the limitations of this approach is that it only evaluates outcome or impact.

2.9.4.3 Application

Brunner *et al.* (2001) evaluated the impact and acceptance of a nutrition programme in an HIV community clinic. The programme was designed to develop an effective, practical, replicable model for the delivery of nutrition services in the ambulatory HIV care setting. The purpose of the programme was to educate the participants on preventing weight loss and wasting, assessing nutritional status and offering feedback and nutritional counseling. In an effort to determine the best way of providing nutrition services to HIV-infected patients, continual evaluation and feedback systems were built in to provide information for improving programme services. The authors also understood the importance of conducting evaluations of stakeholder perceptions in HIV/AIDS service delivery models. The objectives of evaluating the model were to define the ways that nutrition services in HIV/AIDS impacted clients, the clinic, and referral sources, and to continually refine the model by determining what services provide greatest benefit to clients, especially in view of the changing landscape of HIV therapy. Four different methods were used for the evaluation during the study period of 5 years. These included a focus group of clients (year 2); a semi-structured interview with clients (year 3); a semi-structured interview with community workers (year 4); and a client satisfaction questionnaire (year 5). These activities investigated how well the programme was understood and accepted at various stages and assessed perceived strengths, weaknesses, barriers and needs to help to improve the services of the programme. The intent of the focus group was to assess various aspects of the nutrition programme after one year of operation that could assist in improving the this part of the programme. The purpose of the semi-structured interview with the clients was to assess clients' opinion about the study, to have a client orientated basis for modifying the study and to learn more about elements of the study that potential clients might find attractive. The aim of the semi-structured interview with the community workers was to assess impact of and attitudes towards the nutrition programme. During

the course of the development of the nutrition programme, several changes had been made. These changes were based on feedback received from the evaluations conducted, changes in the treatment and a growing understanding of HIV disease. The programme developers therefore found it necessary to evaluate overall participant acceptance of the nutrition intervention programme. Although clients' and workers' priorities differed in some details of programme implementation, there was strong agreement on the value of addressing nutrition concerns in HIV. It was found that more than 90% of the clients and 68% of community workers would recommend the programme to others in support of the idea that there was general satisfaction with the nutrition programme. The authors concluded, "these evaluation methods have provided abundant information that a responsive development of this nutrition model has served clients and communities while enhancing the awareness and status of nutritional health in HIV disease".

Bhandari *et al.* (2001) reported on the impact of two interventions on the growth of infants in South Delhi using a randomized, controlled trail. The first intervention was provision of a precooked complementary food appropriate in quality and to be given daily from 4 to 12 months of age with encouragement to use in optimal amounts. The second intervention was nutritional counseling alone. Four hundred and eighteen subjects were enrolled as they reached the age of 4 months if written informed consent was available. Children were randomly assigned to one of the four study groups, namely a food supplementation group; a nutrition counselling group; a visitation group; and a no-intervention group. Enrolled infants were visited at home at 6, 9 and 12 months for 24-hour recall and weight and length measurements. At the twice-weekly morbidity visits, mothers were queried about cough, fever and diarrhea and the child was examined for respiratory rate, lower chest indrawing and signs of dehydration. The visitation group was chosen a priori as the control group for comparison with intervention groups to eliminate the unintended effects of repeated household visits. The authors found that increasing food intakes form 4 to 12 months of age through food supplementation and encouragement to feed resulted in substantial increase in weight gain between 6 and 9 months of age with little additional increment in the 16- to 26-week and 38- to 52-week periods. They concluded: "To improve the impact of food supplementation, careful attention must be paid to the possible detrimental effect on breastfeeding, intake of usual foods and morbidity."

2.9.5 The evaluation of efficiency

2.9.5.1 The theory of evaluation of efficiency

Efficiency evaluation, including cost-benefit and cost-effectiveness analyses, provides a frame of reference for relating costs to programme results. In cost-benefit analyses, the outcomes of programmes are expressed in monetary terms, and in cost-effectiveness analyses, outcomes are expressed in substantive terms (Rossi *et al.*, 1999).

Barry and DeFriese (1990) reflected on the cost-benefit and cost-effectiveness of health promotion programmes. Cost-benefit analysis is a method for determining whether or not a programme is "worth it". The monetary costs of a programme are compared with the expected benefits, also expressed in monetary terms. Cost-benefit analysis is useful if the costs and benefits can be expressed in monetary terms. For example, if such information is available for two programmes, a comparison may be made through the use of the benefit/cost ratio to decide which one of the programmes are "better". The more tangible the programme benefits, the easier it is to translate them into monetary terms. But it is impossible to decide on the monetary value of a life saved by a programme. It is therefore not always possible to calculate the cost-benefit of a programme.

In cost-effectiveness analysis monetary values are not assigned to programme outcomes. The analysis is based on the principle that "even if we do not know the value of achieving an objective, we do know that we wish to achieve the objective in a way that minimizes costs". This type of analysis is an evaluation method specially suited for making comparisons of the relative costs of different strategies or programmes for the achievement of similar outcomes. It is, therefore, the easier approach to use in health promotion programme evaluation (Barry & DeFriese, 1990).

Barry and DeFriese (1990) provide a four-step method of elementary cost-effectiveness analysis that includes the following:

- Define programme objectives;
- Compute the programme's net monetary costs;
- Define programme outcomes;
- Do a sensitivity analysis.

2.9.5.2 Application

Economic evaluations, especially cost-benefit analysis, reported for health care programmes are few and those conducted with nutrition education are even fewer. The Expanded Food and Nutrition Education Programme (EFNEP) is a federally funded programme administered through Cooperative Extensive and is designed to assist limited-resourced homemakers and other family members to acquire the knowledge, skills, attitudes, and practices necessary for a sound diet, with the long-term goal of improved health and disease prevention. The programme was established in 1969 and entry and exit assessment of food-related behaviours and dietary change has been emphasized in the programme since the beginning. The programme was evaluated for efficacy of programme methodology, content, and assessment of diet-related change and accomplishments of positive food-related behaviours. Rajgopal *et al.* (2002) reported on the economic efficiency of the Virginia EFNEP, USA. They compared the monetized health benefits of the programme with the programme implementation costs during one year. The design was a retrospective cost-benefit study using demographic, food and nutrient intake, and food-related behaviour data previously collected on programme participants by trained paraprofessionals, before and after an intervention. The actual costs of implementing EFNEP for one year were also used. The sample comprised of 3100 female and male adults who had participated in the programme in 1996. The programme implementation costs were compiled and compared with monetized benefits of disease prevention to produce benefit-to-cost ratios. Standard computer programmes were used to compute cost-benefit ratios based on standard procedures used in the field of economics. The researchers found that the initial benefit/cost ratio of $10.64/$1.00 indicated that, for every dollar spent on the programme, the potential exists that over 10 dollars may be saved in future health costs. This represents a significant return on investment for the Virginia EFNEP. The results of the EFNEP intervention translate into a positive cost-benefit based on potential prevention of diet-related chronic disease and conditions.

2.9.6 Comprehensive evaluation

Babbie and Mouton (2001) stated that an evaluation that covers the objectives of all four types of evaluation, namely evaluation of need, the evaluation of programme, the evaluation of outcome or impact evaluation and the evaluation of efficiency, is a "comprehensive evaluation". Therefore it is necessary to assess the need for the

programme, programme conceptualisation and design, programme coverage and delivery, intended as well as unintended impacts and programme cost effectiveness. According to Thompson (1992), comprehensive evaluation typically excludes organisational analysis and, often, needs analysis.

2.10 Who should be responsible for evaluation?

2.10.1 External evaluation

For large expensive nutrition projects or programmes it will be best to contract an external institution that would be actively involved in evaluation-related activities throughout the life of the project. Such evaluators should work closely with the programme staff and could be responsible for the following: selection of control groups; collection of baseline data; collection of midterm and end-point data; regular quality checks on the monitoring data; periodic disaggregation of the monitoring data to assure that particular groups are not excluded; special studies identified at the design stage or during project implementation; periodic assessments of the perceptions of service providers and beneficiaries on project effectiveness; analysis of evaluation data together with the programme staff (Levinson *et al.*, 1999b).

2.10.2 A mix of external and internal evaluation

In medium-size projects it could work best to combine external and internal evaluation. The external evaluators could take responsibility for designing the evaluation, assisting in identification of control groups, participating in the baseline, mid-term and end-point data collection and participating in the analysis. The programme staff could take responsibility for the monitoring of the programme (Levinson *et al.*, 1999a).

2.10.3 Internal evaluation

In smaller projects an internal evaluator could act as a consultant and assist in the beginning with the development of the monitoring and evaluation of the programme. The external evaluator can then again, at the end, assist with reviewing the monitoring and evaluation data collected, the analysis carried out, and discuss the whole process and conclusions with all the stakeholders (Levinson *et al.*, 1999b).

2.10.4 The profile of a good evaluator

Telfair and Leviton (1999) interviewed leaders of community-based programmes (CBP) and asked the leaders what the characteristics of a good evaluator are. Most of the leaders interviewed agreed that good evaluators "are not so focussed on what they are looking at that they loose their peripheral vision". Evaluators should have a good knowledge of the community and lay people, not become too task orientated, and conduct the evaluation in participant-observer, anthropologic terms. Good evaluators will pilot-test any evaluation design with local input first to "demystify" the evaluation and gain the support of community leaders. Community leaders should understand clearly what the evaluators do and try to accomplish. The leaders interviewed argued that a good CBP evaluator is willing to interact with community members and leaders on a routine basis, as an integral part of the evaluation process.

Trust is one of the most important aspects in any evaluation. The evaluator should be trusted by the stakeholders, otherwise it will not be possible for the evaluator to have full access to the programme network. If this is not possible, the evaluator will not have a thorough understanding of the programme or the ability to complete a thorough and meaningful evaluation. Efforts to build trust and open communication with stakeholders are key elements to evaluation, because without trust, cooperative relationships cannot be established and maintained (Fredericks *et al.*, 2002).

2.11 The cost of evaluation research

Bickman (2000) concluded that programme theory could assist in tracking the linkages from programme activities to the expected outcomes, provided that enough resources are available. There is thus a need to educate and persuade funders that providing the additional resources needed for an evaluation is worth it. Evidence that evaluations that include programme theory result in more informed use of the results should be presented to strengthen the argument.

Levinson *et al.* (1999b) suggested that monitoring and evaluation costs should total 3%-5% of total project costs. If the costs are much higher, less expensive options should be considered.

Card *et al.* (1992) attempted to estimate the staff time required for programme evaluation based on the technical requirements for each step of the evaluation as given in Table 2.8. They stressed that it is more important to do a small evaluation well rather than a large evaluation poorly.

Table 2.8 Estimated time required for programme evaluation*

Evaluation steps	Estimate of required staff time
Programme model development	1 – 5 days per year per staff member
Research design planning	1 – 10 days for the programme director and evaluation expert
Instrumental selection/ development	Varies widely: from one week to several months
Instrument pre-test	One day to one month
Interviewing training	Half day to 14 days
Sampling & subject identification	Varies widely: from one week to several months
Data collection	Varies widely: from one week to several months
Data management	Varies widely: from one week to several months
Data analysis	Varies widely: from one week to several months
Report writing	Varies widely: from 2 days to several months

* Adapted from Card *et al.* (1992)

Gilliam *et al.* (2002) reviewed the value of engaging stakeholders in the planning of implementation evaluation. The Institute of Medicine, based on a report on HIV prevention recommended that "evaluation should be a major component of resource allocation decision-making. With better evaluation data reflecting the cost, efficacy, and reach of programme objectives, resources could be more profitable if invested in interventions that work. Interventions that do not work, or that are very expensive relative to the number of infections prevented, could be abandoned".

The theory of evaluation research has been discussed. The use of conceptual frameworks for the evaluation of health programmes will be discussed.

2.12 Conceptual frameworks for evaluation of health programmes

2.12.1 Introduction

Many models and frameworks have been developed to assist evaluators in the evaluation process. The frameworks included in this part of Chapter 2 are mainly for public health programmes, including health promotion programmes. The intent is not to describe in

detail the frameworks, but rather to inform the reader of the developments in framework development for public health programmes that took place over the last couple of years.

The first paper reported here is that of Habicht *et al.* (1999) who proposed a framework for deciding upon appropriate evaluation designs.

2.12.2 Evaluation designs for adequacy, plausibility and probability of public health programme performance and impact (Habicht *et al.*, 1999)

The authors developed a conceptual framework to assist evaluators on how to design the evaluation research. The proposed classification is based on two axes where the first refers to the indicators and the second to the type of inference to be drawn.

First axis: What do you want to measure? Indicators of provision, utilization, coverage and impact

Depending on what it is to be evaluated, the indicators will be decided upon. For each outcome, Table 2.9 presents a relevant question and an example of an indicator. The examples are drawn from the evaluation of a programme for the control of diarrhoeal diseases aimed at young children with emphasis on the promotion of the use of oral rehydration solution (ORS). The authors used a collective term *performance evaluation* that includes evaluations of provision (implementation), utilisation and coverage, as separate from impact evaluations. The choice of indicators will depend on the needs of the stakeholders and the purpose of the evaluation.

Table 2.9 Example of indicators for evaluating a diarrhoeal disease control programme*

Indicator	Question	Example of indicators
Provision	Are the services available?	Number of health facilities offering CDD activities per 100 000 population
	Are they accessible?	Proportion of population <10km of a health facility with CDD activities
	Is their quality adequate?	Proportion of health staff with recent CDD training
Utilisation	Are the services being used?	Number of attendance of under fives with diarrhoea per 1000 children Number of ORS packets distributed
Coverage	Is the target population being reached?	Proportion of under fives with diarrhoea who used ORS
Impact	Were there improvements in disease patterns or health related behaviours?	Time trends in diarrhoeal deaths and hospital admissions

CDD = control of diarrhoeal disease ORS = oral rehydration solution

* Adapted from Habicht *et al.*, 1999

Second axis: How sure do you want to be? Type of inference: adequacy, plausibility, probability

The second axis refers to the kind of inference as well as to how confident decision-makers need to be that the observed effects are in fact due to the project. Both the performance evaluation and impact evaluation may include adequacy, plausibility or probability assessments.

Adequacy assessments: Did the expected changes occur?

Inferences about the adequacy of programme outcomes depend on the comparison of the performance or impact of the project with previously established adequacy criteria. These criteria may be absolute or may refer to a change. The main characteristics of adequacy evaluations are summarised in Table 2.10. Despite their inability to causally link programme activities to observed changes, adequacy evaluations may provide all the reassurance necessary that the expected goals are being met.

Table 2.10 Characteristics of adequacy evaluations*

Type of evaluation	Measurements	In whom?	Compared to what?	Inferences
Adequacy			Predefined adequacy criteria	Objectives met
Performance	Programme activities	Implementation workers Programme recipients		Activities being performed as planned in the initial implementation schedule
-Cross-sectional	Once		Absolute value	
- Longitudinal	Change		Absolute and incremental value	
Impact	Health & behavioural indicators	Programme recipients or target population		Observed change in health or behaviour is of expected direction and magnitude
-Cross-sectional	Once		Absolute value	
- Longitudinal	Change		Absolute and incremental value	

* Adapted from Habicht *et al.*, 1999

Plausibility assessment: Did the programme seem to have an effect above and beyond other external influences?

Plausibility assessments go beyond adequacy assessments by excluding any confounding factors that might have caused the observed effects. Table 2.11 summarises the main types of plausibility evaluations. One of the main shortcomings of plausibility assessments is that one cannot completely rule out all alternative explanations for the observed differences.

Table 2.11 Characteristics of plausibility evaluations*

Type of evaluation	Measurement	In whom?	Compared to what?	Inferences
Plausibility			'Opportunistic' or non-randomised control group	The programme appears to have an effect above and beyond the impact of non-programme influences
Performance	Programme activities	Implementation workers Programme recipients		Intervention group appears to have better performance than control
-Cross-sectional	Once		Control group	
- Longitudinal	Change		Before-after	
- Longitudinal-control	Relative change		Comparing before-after between intervention and control	
Impact	Health & behavioural indicator	Programme recipients or target population		Changes in health or behaviour appear to be more beneficial in intervention that control group
-Cross-sectional	Once		Control group	
- Longitudinal	Change		Before-after	
- Longitudinal-control	Relative change		Comparing before-after between intervention and control	
- Case-control	Once	Target population	Comparing exposure to programme in diseased (cases) & non-diseased (controls)	

* Adapted from Habicht *et al.*, 1999

Probability assessment: Did the programme have an effect

Probability evaluations aim at ensuring that there is only a small known probability that the difference between programme and control areas were due to confounding, bias, or to chance. This type of evaluation requires randomisation of treatment and control activities to the comparison groups, being the gold standard of academic efficacy research. The main characteristics of probability assessments are listed in Table 2.12.

Table 2.12 Characteristics of probability evaluations*

Type of evaluation	Measurements	In whom?	Compared to what?	Inferences
Probability			Randomised control group(s)	The programme has an effect (P<0.05)
Performance	Programme activities	Implementation workers Programme recipients		Intervention group has better performance than control
- Longitudinal-control	Relative change		Comparing before-after between intervention and control	
Impact	Health & behavioural indicators	Programme recipients		Changes in health or behaviour are more beneficial in intervention than control group
- Longitudinal-control	Relative change	Target population	Comparing before-after between intervention and control	

* Adapted from Habicht *et al.*, 1999

Each of the four components of the indicators may be assessed according to the three types of inference. An example, based on the diarrhoeal diseases control programme is given in Table 2.13.

Table 2.13 Examples of possible evaluations of diarrhoeal diseases control programme*

Type of evaluation	Provision	Utilisation	Coverage	Impact
Adequacy	Changes in availability of ORS in health centres	Changes in numbers of ORS packets distributed in health centres	Measurement of % of all diarrhoeal episodes treated with ORT in the population	Measurement of trends in diarrhoeal mortality in intervention area
Plausibility	As above, but comparing intervention with control services	As above, but comparing intervention with control services	Comparison of ORT coverage between intervention and control areas	Comparison of diarrhoeal mortality trends between intervention and control areas
Probability	As above, but intervention and control services would have been randomised	As above, but intervention and control services would have been randomised	As above, with previous randomisation	As above, with previous randomisation

ORS = oral rehydration solution

ORT = oral rehydration therapy

* Adapted from Habicht *et al.*, 1999

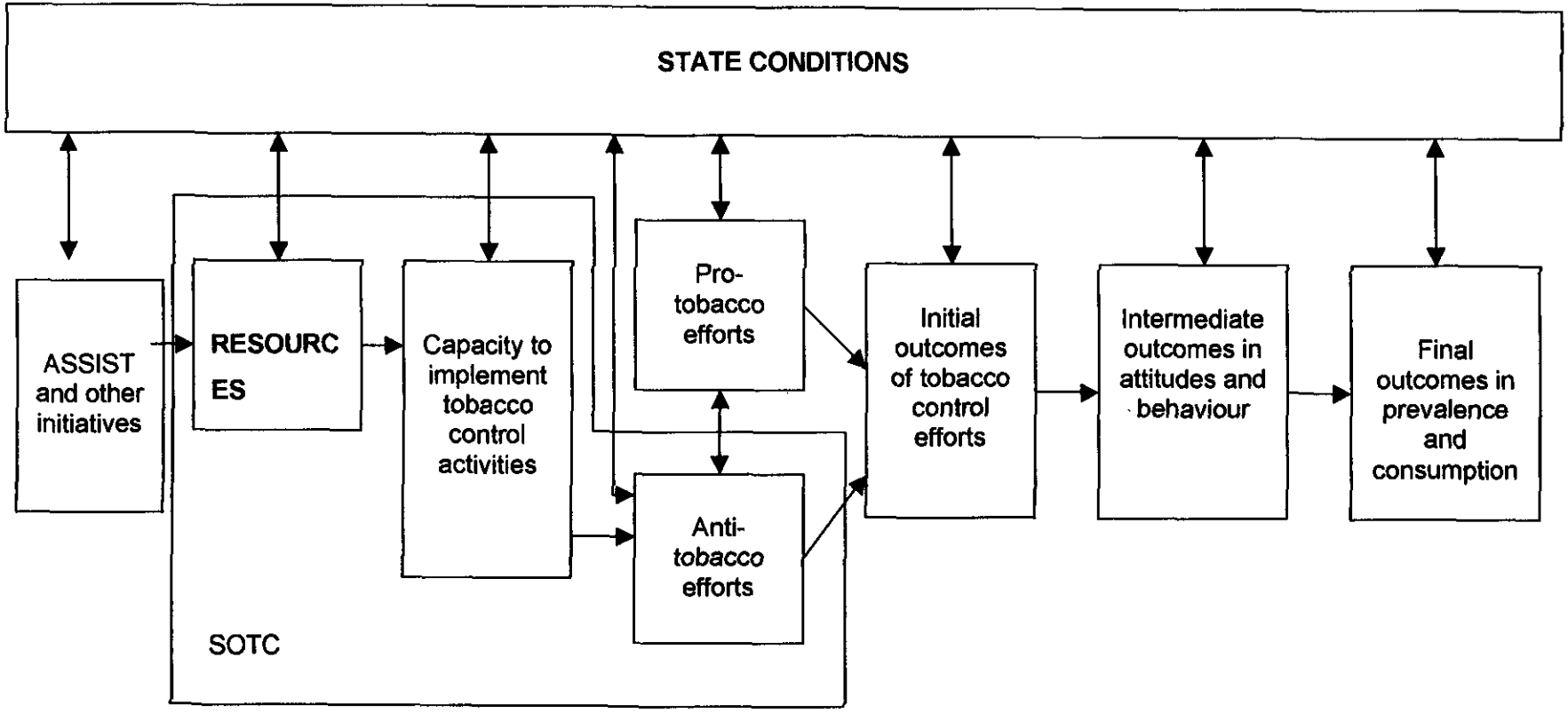
The authors stressed that the objective of an evaluation will influence the type of evaluation. They also pointed out that other factors, such as the efficacy of the intervention, the field of knowledge, timing and costs will affect the choice of evaluation design. Especially costs could be a major factor, since costs increase rapidly with complexity so that often a compromise must be reached.

2.12.3 The American Stop Smoking Intervention Study (ASSIST) (Stillman *et al.*, 1999)

ASSIST is the largest, most comprehensive tobacco control programme ever undertaken in the USA government with the overall goal to demonstrate that the application of state-wide tobacco prevention and control programmes and policies would reduce cigarette consumption and smoking prevalence. The National Cancer Institute formed a partnership with the American Cancer Society to accomplish this goal. Stillman *et al.* (1999) reviewed the development of the conceptual framework and evaluation design of the American Stop Smoking Intervention Study (ASSIST).

The conceptual design of the evaluation model represented an ecological systems model (also called "the new public health"). This is an approach that focuses on changing the social, cultural, economic, and physical environmental factors that influence health behaviours. An ecological systems model is dynamic and synergistic and helps to explain complex, non-linear processes. The ecological change (macro-level change) occurs incrementally and at a modest pace, and therefore multiple outcome points (initial, intermediate, and final) are needed for tracking the continuum of changes as it occurs over the course of the project. For example, it might be expected that reductions in smoking prevalence would lag behind modifications in policy.

The research framework as shown in Figure 2.8 has been developed to explain the sequential process of the change resulting form state-wide tobacco control efforts.



ASSIST = American Stop Smoking Intervention Study; SOTC = Strength of Tobacco Control

Figure 2.8 Tobacco Control Research Framework (Stillman *et al.*, 1999)

The key constructs (groupings of related variables used to measure an abstract concept) are indicated in the framework. These constructs may impede or promote progress toward the final outcomes of reducing cigarette consumption and smoking prevalence. Table 2.14 describes some of these key constructs and the variables that will be used to measure them.

Table 2.14 Key elements and outcome measures of the tobacco control research framework*

	Variables
Key contructs	
*Resources***	Dollars expended for tobacco control Sources of funds for tobacco control
*Capacity to implement tobacco control activities***	Number of state-level tobacco control personnel Capability of state organisation to provide surveillance, training, and technical assistance Number of state organisations involved in tobacco control Frequency and type of contact between organisations Linkages between state and local tobacco control
*Anti-tobacco efforts***	Quality of state tobacco control plan Comprehensiveness of state tobacco control plan Type of tobacco control strategies Comprehensiveness of state tobacco control effort
Pro-tobacco efforts	Advertising dollars Legislative activities Other activities
State conditions	Age, education, population size, poverty status, race/ethnicity, gender, urban/rural Economic value of tobacco from agricultural, manufacturing, and processing (% of gross state product)
Outcome measures	
Initial outcomes	Rating of local and state tobacco control policies % of workers covered by clean indoor air policies and workplace smoking bans Media advocacy score Cigarette price/tax
Intermediate outcomes	Behaviour change Attitudes
Final outcomes	Prevalence Consumption

** Summarised to form Strength of Tobacco Control (SOTC)

* Adapted from Stillman *et al.*, 1999

The ASSIST evaluation is further guided by a series of research questions as indicated in Table 2.15.

Table 2.15 American Stop Smoking Intervention Study research questions*

Primary evaluation questions
• What is the effect of ASSIST on cigarette consumption and smoking prevalence rates (final outcomes)?
• What is the relationship between ASSIST and SOCT (resources, capacity, and anti-tobacco efforts)?
• What is the relationship between SOTC and cigarette consumption and smoking prevalence rates?
• What is ASSIST's effect on initial outcomes (work site smoking bans, legislative scores, media advocacy scores, cigarette price)?
• How are the initial outcomes related to the final outcomes?
• Did ASSIST modify the effects of the initial outcomes and/or SOTC's effects on the final outcomes?
Selected secondary questions
• Which key variables of SOTC are associated with final outcomes?
• Which key variables of the initial outcomes are associated with the final outcomes?
• What is the relationship between pro-tobacco influences and state conditions, and how are they associated with SOTC, initial outcomes, and final outcomes?

ASSIST = American Stop Smoking Intervention Study

SOTC = Strength of Tobacco Control

* Adapted from Stillman *et al.*, 1999

A complex forward stepwise regression approach will be used to analyse the data obtained.

The authors concluded that "the lessons to be learned from this evaluation have the potential to enhance tobacco control programme development in the future as well as other kinds of initiatives that seek to change health behaviour through a macro-level, systems-wide approach".

2.12.4 CDC Framework for programme evaluation in public health (Anon, 1999)

The USA Centre for Disease Control and Prevention (CDC) realised that a basic organisational framework for programme evaluation in public health practice had not been developed. The CDC convened an Evaluation Working Group in May 1997 that recognised the need:

- to develop a basic organisational framework for the programme evaluation in public health;
- to combine evaluation with programme management ;
- for evaluation studies that demonstrate the relationship between programme activities and prevention effectiveness.

The *Framework for Programme Evaluation in Public Health* will now be described as published in Morbidity and Mortality Weekly Report, 09/17/99 Supplement (Anon, 1999).

The framework is composed of six steps. The steps are all interdependent and the best is to do them in a linear order since earlier steps provided the basis or foundation for subsequent progress. Each step will be described briefly.

Step 1: Engage stakeholders

The following stakeholders should be involved in the evaluation: Those involved in the programme operations, those served or affected by the programme and the primary users of the evaluation.

Definition: "Fostering input, participation, and power-sharing among those persons who have an investment in the conduct of the evaluation and findings; it is especially important to engage primary users of the evaluation".

Role: "Helps increase chances that the evaluation will be useful; can improve the evaluation's credibility, clarifies roles and responsibilities, enhances cultural competence, helps protect human subjects, and avoids real or perceived conflicts of interest".

Step 2: Describe the programme

In order to adequately describe the programme, not only the mission and objectives of the programme should be described, but also the need for the programme, the expected effects, the programme activities, the resources available, the stage of the development of the programme, the programme's context and the sequence of events for bringing about change (logic model or theory based evaluation).

Definition: "Scrutinizing the features of the programme being evaluated, including the purpose and place in a larger context. Description includes information regarding the way the programme was intended to function and the way that it actually was implemented. Also includes features of the programme's context that are likely to influence conclusions regarding the programme".

Role: "Improves evaluation's fairness and accuracy; permits a balanced assessment of strengths and weaknesses and helps stakeholders understand how programme features fit together and relate to a larger context".

Step 3: Focus the evaluation design

To be able to decide on the most suitable evaluation design, the following should be considered: the purpose of the evaluation (for example to gain insight, to change practice or to assess effects); intended users should participate in choosing the evaluation focus; how the information gathered will be used; questions to assist with the establishment of boundaries for the evaluation; the methodology to be used to answer the evaluation questions; agreements among those who will execute the evaluation to clarify roles and responsibilities.

Definition: "Planning in advance where the evaluation is headed and what steps will be taken; process is iterative (i.e. it continues until a focused approach is found to answer evaluation questions with methods that stakeholders agree will be useful, feasible, ethical and accurate); evaluation questions and methods might be adjusted to achieve an optimal match that facilitates use by primary users".

Role: "Provides investment in quality; increases the chances that the evaluation will succeed by identifying procedures that are practical, politically viable, and cost-effective; failure to plan thoroughly can be self-defeating, leading to an evaluation that might become impractical or useless; when stakeholders agree on a design focus, it is used throughout the evaluation process to keep the project on track".

Step 4: Gather credible evidence

Information that conveys a complete picture of the programme should be collected. The following should be considered: indicators should be developed that translate the general concepts of the programme; different sources should be used to gather the information; the data should be of high quality; the amount of information should be estimated in advance and the logistics must be clarified.

Definition: "Compiling information that stakeholders perceive as trustworthy and relevant for answering their questions. Such evidence can be experimental or observational, qualitative or quantitative, or it can include a mixture of methods. Adequate data might be available and easily accessed, or it might need to be defined and new data collected. Whether a body of evidence is credible to stakeholders depends on such factors as how the questions were posed, sources of information, conditions of data collection, reliability of measurement, validity of interpretations and quality control procedures".

Role: "Enhances the evaluation's utility and accuracy; guides the scope and selection of information and gives priority to the most defensible information sources; promotes the collection of valid, reliable, and systematic information that is the foundation of any effective evaluation".

Step 5: Justify conclusions

The conclusions should be linked to the evidence gathered and judged against agreed-upon values or standards set by the stakeholders. This step includes the following: setting standards; analysis and synthesis of the evaluation findings; interpretation of the findings; judgement concerning the merit, worth, or significance of the programme and recommendations.

Definition: "Making claims regarding the programme that are warranted on the basis of data that have been compared against pertinent and defensible ideas of merit, worth, or significance (i.e. against standards of values); conclusions are justified when they are linked to the evidence gathered and consistent with the agreed on values or standards of stakeholders".

Role: "Reinforces conclusions central to the evaluation's utility and accuracy; involves value clarification, qualitative and quantitative data analysis and synthesis, systematic interpretation, and appropriate comparison against relevant standards of judgement".

Step 6: Ensure use and share lessons learned

Evaluation results are not automatically translated into informed decision-making and action. The following factors will play a role in the eventual use of evaluation results: the design of the evaluation questions, methods and procedures followed; preparation or the ability to translate new knowledge into appropriate action; feedback to stakeholders; follow-up (the technical and emotional support that users need during the evaluation and after they receive the evaluation findings); and the dissemination of the evaluation report.

Definition: "Ensuring that:

- Stakeholders are aware of the evaluation procedures and findings;
- The findings are considered in decisions or actions that affect the programme;
- Those who participated in the evaluation have had a beneficial experience".

Role: "Ensures that evaluation achieves its primary purpose – being useful. However, several factors might influence the degree of use, including evaluator credibility, report

clarity, report timeliness and dissemination, disclose of findings, impartial reporting, and changes in the programme or organisational context".

The second part of the framework is a set of 30 standards for assessing the quality of evaluation activities, organised in four groups:

Standard 1: Utility

These standards ensure that information needs of evaluation users are satisfied and address such items as identifying those who will be influenced by the evaluation, the amount and type of information collected, the values used in interpreting evaluation findings, and the clarity and timeliness of evaluation reports.

Standard 2: Feasibility

These standards ensure that the evaluation is viable and pragmatic and emphasize that the evaluation should employ practical, non-disruptive procedures; that the differing political interests of those involved should be anticipated and acknowledged; and that the use of resources in conducting the evaluation should be prudent and produce valuable findings.

Standard 3: Propriety

These standards ensure that the evaluation is ethical and address such items as developing protocols and other agreements for guiding the evaluation, protecting the welfare of human subjects; weighing and disclosing findings in a complete and balanced fashion; and addressing any conflicts of interest in an open and fair manner.

Standard 4: Accuracy

These standards ensure that the evaluation produces findings that are considered correct and include items as describing the programme and its context; articulating in detail the purpose and methods of the evaluation; employing systematic procedures to gather valid and reliable information; applying appropriate qualitative and quantitative methods during analysis and synthesis; and producing impartial reports containing conclusions that are justified.

2.12.5 A framework for monitoring and evaluation (Levinson *et al.,* 1999b)

Levinson and co-workers (1999b) combine monitoring and evaluation and suggest a framework where the systems are divided into four principle components that appear

particularly well suited for utilization in nutrition projects. The framework is illustrated below in Figure 2.9.

Inputs →	Outputs →	Outcomes →	Impacts →	Benefits
Resources used to support the primary activities of the project	The delivery of goods and services	Changes in behaviours / practices	Nutritional status measure	Broader effects
Assumptions Expectations regarding the effectiveness and quality of the project inputs	**Assumptions** Expectations regarding the ways these goods and services will be used by the target population	Links provision of goods and services to impact	Effects resulting directly from project outputs or indirectly through outcomes	Effects resulting from the achievements of impacts, usually in combination with other factors

Figure 2.9 Framework for monitoring and evaluation (Levinson *et al.*, 1999b)

Inputs

Inputs are the material, goods and actions necessary to carry out the primary project activities and include, for example, the following: items to be delivered to the target population, training of the project personnel, and preparation of project sites or equipping factories. Monitoring should give information on questions regarding procurement, production, delivery and costs of these resources.

Outputs

Outputs refer to the provision of project goods and services to the target population and are the primary project activities. The types of questions that can be answered with information on outputs include, for example, in a Vitamin A supplementation programme: How many of the children eligible for the project were given vitamin A capsules last month?

Outcomes

Outcomes are defined as the intermediate effects resulting directly from project outputs that may be necessary to achieve a desired impact. In nutrition projects this could take the form of behavioural changes in the target population.

Impacts

Impacts are the more meaningful changes in the condition of the target population and generally reflect the primary objectives of the project. For nutrition purposes, it is generally convenient to speak of impact in terms of change in nutrition status using suitable indicators.

Benefits

Benefits are the broader, sustainable changes in public health or economic status that a programme seeks to achieve but that are inevitably influenced by a wide range of other factors and are often only seen many years after the project is completed. For example, decreased infant, child and maternal mortality.

2.12.6 Program evaluation within a health promotion framework (Thompson, 1992)

Health promotion is an evolving, broad, integrated concept and has its own unique evaluation requirements.

The field of health promotion has developed tremendously over the last two decades. Of special interest is not only the impact of health promotion, but also the cost-effectiveness of health promotion in the worksite.

Evaluation research activities relevant for evaluating health promotion include examining programme concept and design, assisting with programme planning, research on programme processes, and research on programme impact. A health impact evaluation model is presented in Figure 2.10.

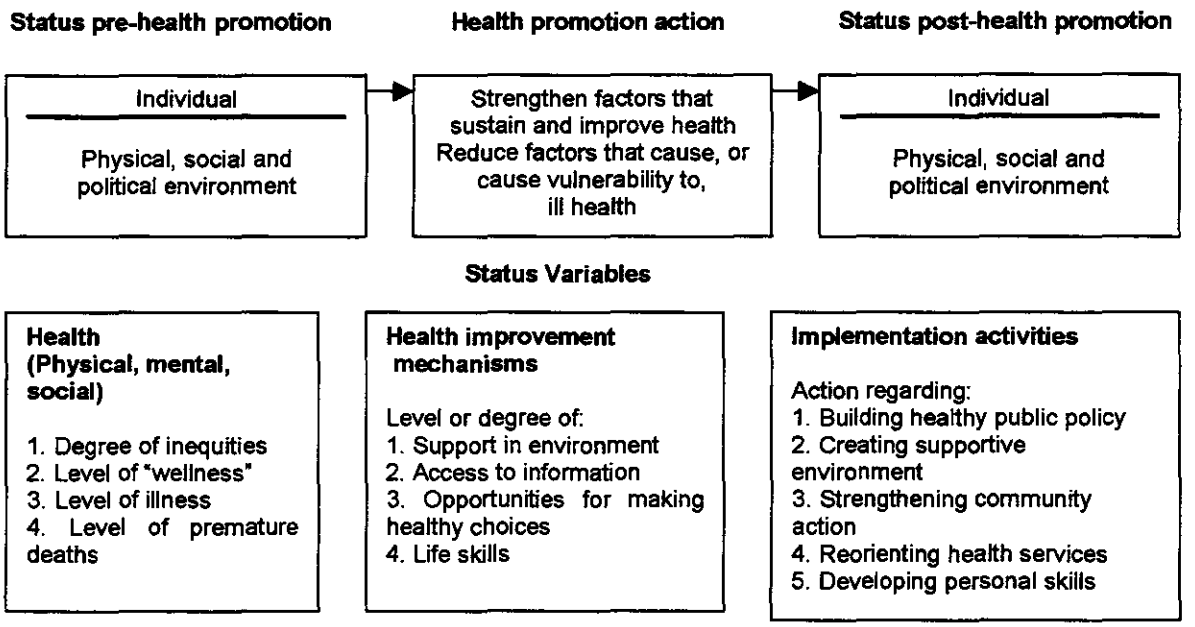


Figure 2.10 Health promotion impact model (Thompson, 1992)

This framework illustrates that health promotion strategies can be directed both to strengthen factors that improve or sustain health, and to reduce or weaken factors that cause, or cause vulnerability to, ill health. The model also emphasises that health promotion strategies are designed to produce changes in the physical, social and political environment, as well as individual level changes. Therefore, status pre- and post-health promotion should be evaluated at different levels using appropriate evaluation designs.

2.12.7 Conceptual framework in conducting research on the financial impact of worksite health promotion (Anderson *et al.*, 2001)

The return on investment (ROI) is critical to any company offering worksite health promotion. Research on the cost-benefit of health promotion in the worksite indicated that the long-term benefits are $3 to $8 per dollar invested.

Anderson and co-workers developed a conceptual framework for evaluating worksite health promotion programmes that incorporates key concepts of the major theories of change. This framework is illustrated in Figure 2.11.

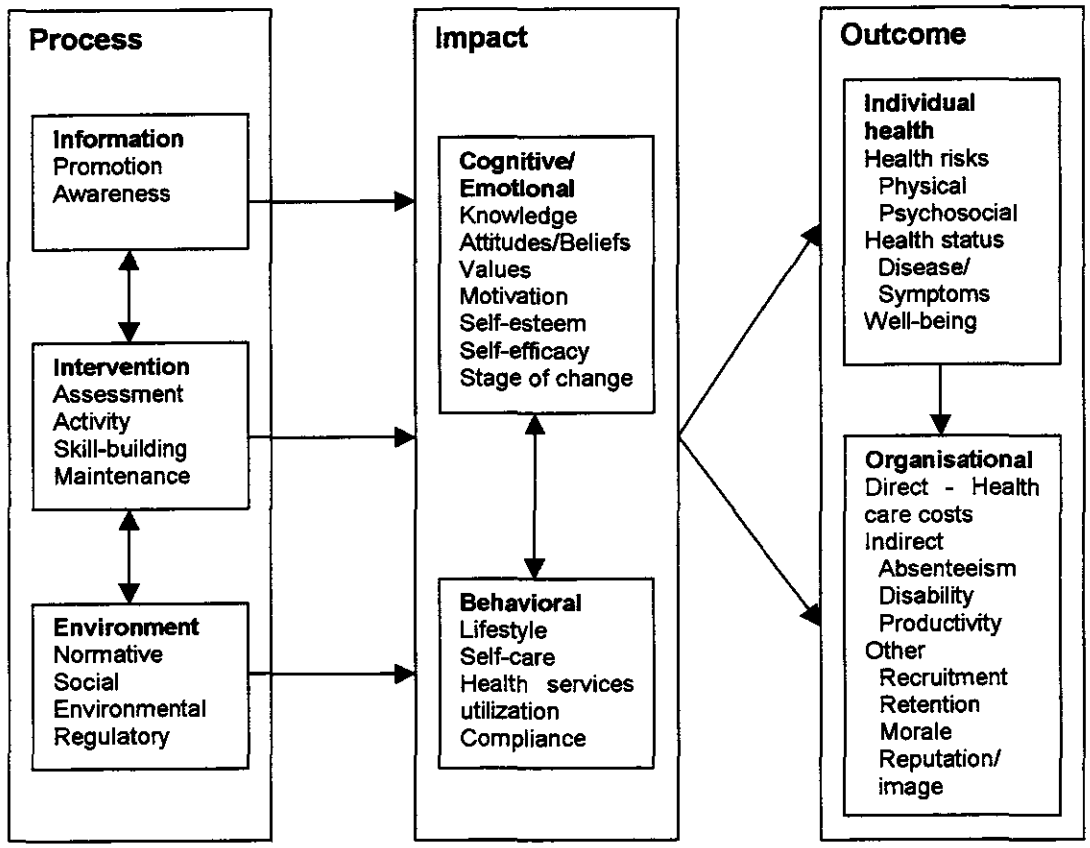


Figure 2.11 Conceptual framework for evaluating worksite health promotion programmes (Anderson *et al.*, 2001)

The model includes health promotion process (the operation of the programme), impact (defined here as the direct results of the programme) and outcome (defined here as the desired goal of the programme). According to the authors a conceptual model or theory of change is important in guiding the evaluation of the financial outcomes of health promotion for the following reasons:

- The model explains how the programme works. Without knowledge of how the programme achieves its impact and outcomes, it is difficult to enhance or replicate success in a new setting;
- It is often impossible to directly measure the financial outcomes of a programme, but if it can be demonstrated that the process works as designed, gives the impact as expected and results in the expected health outcomes, the model can be quantified through research results to estimate the financial outcomes of the programme;
- Without a conceptual model it will be difficult to determine what went wrong if the programme does not deliver the expected impact and outcomes.

2.13 Concluding remarks

2.13.1 Introduction

From the literature on the different mentioned approaches, it seems that each has its own advantages as well as disadvantages, and that the evaluator should have a clear objective as to the outcomes of the evaluation to choose the appropriate approach.

Although programme evaluation is a relatively new domain and not always properly implemented, the study of the literature clearly shows that sufficient research has been done and some frameworks are available to use as basis for this study.

In South Africa evaluation of national interventions is not the norm. It is only in the last few years with the change in government that evaluation of government-funded programmes has been done and then only to a limited extent. Traditionally, social and education programmes were more regularly evaluated for accountability. Evaluations of public health programmes have not been done regularly.

2.13.2 Timing of the evaluation

The involvement of the evaluator or evaluation team is of utmost importance to ensure an objective, evaluable assessment. In the literature evaluators stressed the importance of joining the process from the very beginning. This is not always the case. Sometimes evaluation only commenced when implementation has already begun, or even worse, is "added-on" as an afterthought. Evaluators should be part of the process from the very beginning, starting at the conceptualisation and design phases of a programme.

2.13.3 Theory-driven approach

The underlying theory and principles of the theory-driven approach to evaluation is acceptable for the evaluation of nutrition and nutrition-related programmes. It is necessary to know how programme components and outcomes are causally linked. Otherwise it would be difficult to make strong causal inferences from programme evaluation studies.

2.13.4 Multilevel and multi-site evaluations

Conducting a multilevel and/or multi-site evaluation adds to the complexity of evaluation. The involvement of all the stakeholders at the different levels and sites are extremely important to conduct a successful evaluation.

2.13.5 Conceptual frameworks

Various frameworks have been developed to evaluate large intervention studies, using different types of design. None of these frameworks are cast in stone, and a conceptual framework should be designed to address the needs and requirements of each programme.

CHAPTER 3

3 EVALUATION OF THE PRIMARY SCHOOL NUTRITION PROGRAMME (PSNP) IN THE NORTH WEST PROVINCE

3.1 Introduction

The content of this chapter is based on the final report of the Tender 220/99 to the Department of the Premier, North West Province, namely "Evaluation of the primary school nutrition programme (PSNP) in the North West Province" (Wentzel-Viljoen *et al*, 2001).

3.1.1 Orientation

In 1999 the sub-directorate: Monitoring and Evaluation in collaboration with the Department of Health of the North West Province has identified the need to evaluate the PSNP.

The Strategic Planning and Development section in the Department of the Premier and the Department of Health & Social Welfare of the North West Province invited proposals from suitably qualified social/development service providers to undertake an evaluation of the PSNP in the Province.

The researcher, on behalf of the Potchefstroom University for Christian Higher Education, tendered according to the tender specifications. The tender (220/99) was allocated to the University and the contract between the North West Province and the University was signed on 23 February 2000.

The experience gained with the evaluation of this programme is used in this thesis to develop a framework for evaluating nutrition and nutrition-related programmes in South Africa.

3.1.2 The PSNP in the North West Province

The North West Province is one of the nine provinces of South Africa. It is a largely rural area, with 68% of the population living in non-urban areas. Its average annual per capita gross geographic product is relatively low at R4092.00 in 1993. It occupies 10% of the land, and there are 3,5 million people living in the North West, of whom 2,9 million (83%) are African. Most of the former "independent state" of Bophuthatswana is found within its boundaries. There are, on average, 28 people per square kilometer (Hirschowithz & Orkin, 1995). The Province is divided into 5 regions and each region is divided into districts.

The total PSNP budget for the North West Province was R33 546 474 since 1994. Funds from the National Department of Health are allocated to the Provincial Department of Health based on the aggregated poverty gap. The aggregated poverty gap is the average poverty gap (the average amount by which poor household's incomes differ from the poverty line) multiplied by the number of poor households (households living below the poverty line). The advantage of this method above other poverty methods is that it indicates both incidence and severity of poverty.

Information on the nutritional status of children in the North West Province is limited. The SAVACG study completed during 1994 indicated a low prevalence of wasting (4.5%) and a moderate prevalence of underweight (13.2%) and stunting (24.7%) in children between the ages of 6 months and 6 years (SAVACG, 1995). The prevalence of wasting, underweight and stunting was higher in the North West Province in comparison with the total of South Africa.

The same study also reported the prevalence of iron deficiency in children:

• Percentage anemic	-	Hb<11g/dl	24.5%
• % Iron depleted	-	Ferritin<12Ug/dl	8.1%
• Iron deficiency anemia	-	%Hb<11 & ferritin<12	5.0%

The SAVACG study also determined the Vitamin A status of the children. Thirty two percent of the children had a serum retinol of less than 20 μg/dl. The prevalence of night blindness was 12.7% in this population. According to the guidelines of the WHO/UNICEF (1994) the high prevalence of these two biological indicators put this population at severe risk for Vitamin A deficiency. Bitot spots were observed in 0.4% of the children studied.

The National Food Consumption Survey, completed during1999, on children between the ages of 1 and 9 years did not include biochemical analysis, but only anthropometric assessment and dietary intake. This study found that in the North West Province 5.2% of the children were severely stunted, 24.9% were stunted, 1.3% were severely underweight, 15.3% were underweight, 0.9% were severely wasted and 5.7% were wasted. Based on a 24-hour recall dietary intake, the authors concluded: "... it would appear that, in general, one out of two children had an intake of approximately less than half of the recommended level for a number of important nutrients. Indeed, the great majority of children consumed a diet deficient in energy and of poor nutrient density to meet their micronutrient requirements" (Labadarios, 2000).

The National Household Survey of Health Inequalities in South Africa (Hirschowithz & Orkin, 1995) documented that 21% of the African households in the North West Province live above the minimum living level (MLL), with 79% below the MLL. These figures are in the same order as the National figures. Thirteen percent of the children between the ages of 6 and15 years in the North West Province reported not to have eaten breakfast, in comparison to 10% of all the children in SA. Sixty-two percent of the children in the North West Province reported that they received food at school, while the national figure is 63%.

Some of the contributing factors to malnutrition have been identified as poverty, lack of food, insufficient household food security and the lack of knowledge with regard to nutrition issues.

In the North West Province the PSNP is also seen as part of the Integrated Nutrition Programme.

The overall goals of the PSNP in the North West Province are indicated in the Business plan 1999/2000 of the Department of Health. These are:

- To contribute to general health development by alleviating pupils' temporary hunger by providing them with approximately 25% of the required Recommended Dietary Allowances (RDA) for energy and by educating pupils concerning nutrition;
- To contribute to the improvement of education quality by enhancing the "active learning capacity", school attendance and punctuality of the needy primary school pupils;
- To enhance broader development initiatives, particularly in the area of combating poverty.

The concrete objectives are:

- To feed 345 721 rural primary school pupils from a total of 384 135 rural primary school pupils in a total of 1312 rural primary schools in the province;
- To feed 30 234 urban primary school pupils from a total of 151 174 urban primary school pupils in a total of 261 urban primary schools in the province;
- Total number of primary school children to be fed is 375 955 children.

3.1.3 Background to the evaluation

The Strategic Planning and Development section in the Department of the Premier is responsible for the Monitoring and Evaluation of public sector programmes and projects. The sub-directorate: Monitoring and Evaluation has been established to monitor and evaluate public sector programmes/projects continuously. This is done in collaboration with the relevant department. To achieve efficiency and quality of outputs of programmes, the sub-directorate monitors and evaluates such public programmes. This responsibility involves among others the following key performance areas:

- Monitor and evaluate programmes/delivery so as to ensure efficiency and quality of outputs;
- Track implementation process of all programmes, measure efficiency and speed of delivery, identify bottlenecks and successes and suggest processes that will bring about efficiency and therefore bring about qualitative service delivery;
- Evaluate programmes against the objectives outlined in the policy framework. Find out whether things are working as intended. Assess impact on targeted beneficiaries and any unintended consequences;
- Assess the extent to which programme objectives are being met and identify any shortcomings or bottlenecks that need remedial action.

3.1.4 The purpose of the evaluation

The overall objectives of the evaluation were indicated in the Tender. These were to:

- Evaluate the programme against the criteria outlined in the policy framework;
- Find out whether the implementation of the programme is in line with Reconstruction and Development Programme (RDP) principles;
- Assess impact on the target population and any unintended consequences;

- Assess the extent to which programme objectives are being met and identify any shortcomings or bottlenecks that need remedial action;
- Cost effectiveness of the programme.

Findings and recommendations of the evaluation were given to policy-makers and strategic managers for decision-making.

3.1.5 Aims and objectives of the evaluation

The aims and objectives of the evaluation have been spelt out in the tender specifications.

These were:

- To determine whether the school feeding intervention is functioning as designed according to standards and norms;
- To assess efficiency of the school feeding intervention in terms of reaching the targets set for RDP specific and program specific indicators;
- To do a project audit, impact assessment and cost-benefit analysis;
- To make recommendations to improve the efficiency of the programme and to suggest further programme development.

3.2 Designing the PSNP evaluation

3.2.1 Frameworks

Although the overall aims and objectives of the evaluation were spelt out in the Tender, discussions were held with the staff of the Sub-directorate: Monitoring and Evaluation as well as of the Departments of Health and Education to avoid any misunderstanding and to build a trusting relationship between the Departments and the evaluation team.

The PSNP was introduced as part of the 100 day Presidential Lead Projects of the RDP and was implemented without the necessary development of a logic model or a comprehensive needs evaluation. Since no baseline data were available, it was not possible to do a proper impact assessment or cost-benefit analysis as required by the Tender. It will, however, be possible to describe trends of change, if any.

The PSNP was implemented as a multi-level, multi-organisational and multi-site programme. Both the Departments of Health and Education at national and provincial level were involved. The programme was implemented in all nine provinces and in different geographical sites in all the provinces. In the North West Province alone the aim was to implement the PSNP in 1312 rural primary schools and 261 urban primary schools.

Based on these discussions and taking into consideration the Tender specifications and other factors, it became clear that it would not be possible to implement a comprehensive evaluation.

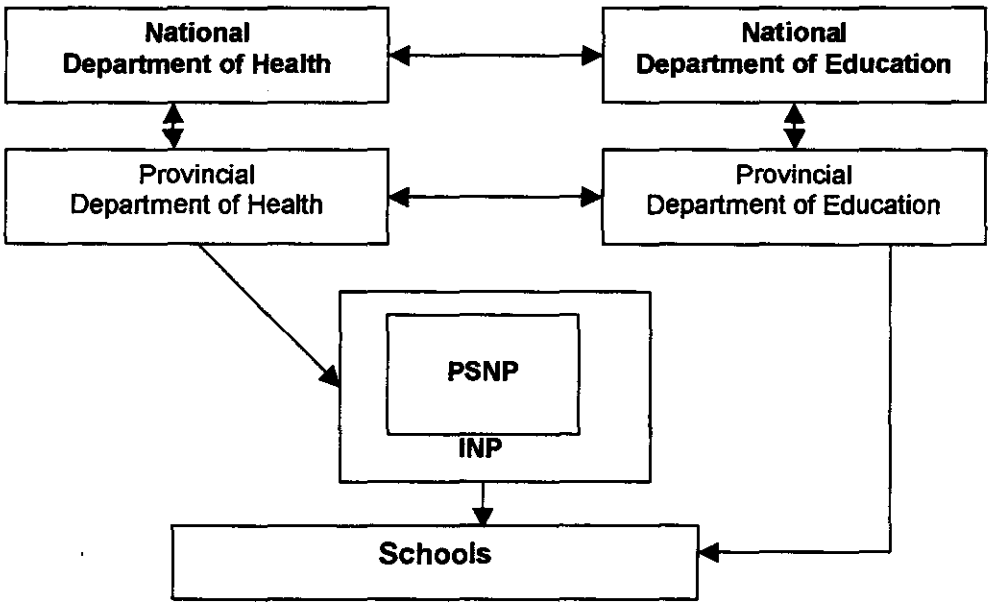
The overall goals of the evaluation were therefore agreed on as follows:

- Evaluate the programme against the criteria outlined in the policy framework;
- Find out whether the implementation of the programme is in line with RDP principles;
- Assess any unintended consequences;
- Assess the extent to which programme objectives are being met and identify any shortcomings or bottlenecks that need remedial action.

Aims and objectives of the evaluation:

- To determine whether the school feeding intervention is functioning as designed according to standards and norms;
- To assess efficiency of the school feeding intervention in terms of reaching the targets set for RDP specific and programme specific indicators;
- To do a project audit;
- To make recommendations to improve the efficiency of the programme and to suggest further programme development.

The intervention framework is given in Figure 3.1.



INP = Integrated Nutrition Programme

PSNP = Primary School Nutrition Programme

Figure 3.1 Intervention framework

Documents regarding the PSNP from the Department of Health, from national and provincial levels were studied as well as documentation from the Department of Education at provincial level. Previous evaluations of the PSNP, although on a very small scale and of limited dimension, were also studied.

Based on this background information, the scientific nutrition literature, as well as on the specifications of the tender, a programme theory framework was developed for identification of project inputs, project outputs, primary outcomes, secondary outcomes, key outcomes and impact. Based on the programme theory framework the objectives of the evaluation, evaluation indicators or proxy indicators, data collection and analysis at each input, output and outcome phase were then identified.

Figure 3.2 explains the programme theory framework indicating the project inputs, project outputs, primary outcomes, secondary outcomes, key outcomes and impact.

Table 3.1 gives the objectives of the evaluation, the evaluation indicators and methods to collect the data.

The development of the study design and methodology was based on the implementation framework and programme theory framework.

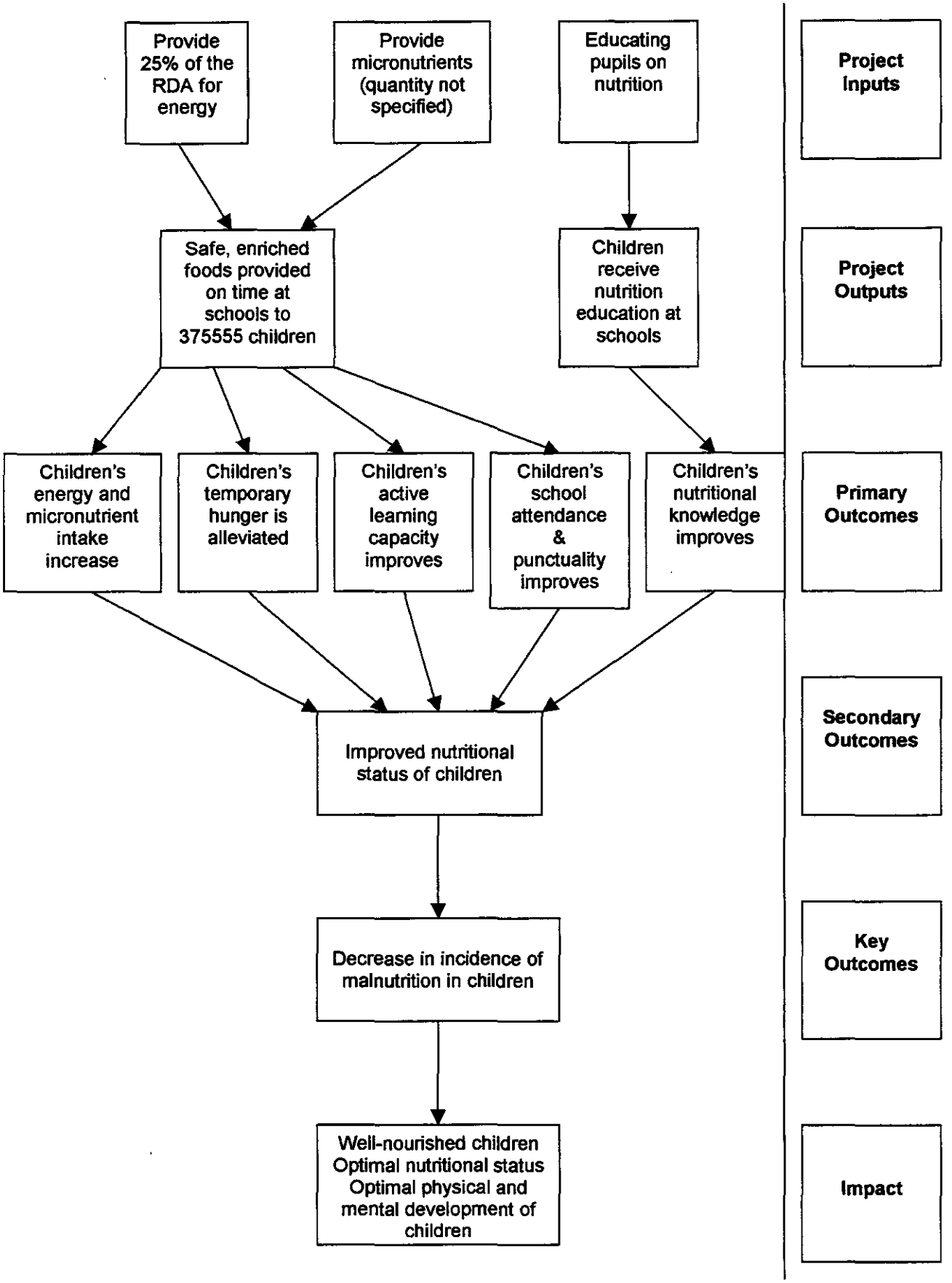


Figure 3.2 Programme theory framework

Table 3.1 Evaluation objectives, evaluation indicators and method of data collection

Objectives of evaluation	Evaluation indicators	Data collection
Project inputs		
1. To what extent is the PSNP reaching the target population. 2. Is the delivery of the PSNP consistent with the specifications * RDP * PSNP 3. What resources have been expended in the conduct of the programme Human Resources and costs.	1. Energy and micronutrient content of PSN 2. Content of nutrition education (not done and will not be evaluated) 3. Project audit. 4. Expenditure: Human resources & costs 5. RDP principles	1. Check lab results vs. specifications 2. Not done 3. Check operational process • Manufacturer/Supplier • Transport • Depot and sub-depot, schools • Quality control • Hygiene 4. Info from Dept of Health & Education 5. Community involvement
Project outputs		
	1. Nr. of children receiving PSNP. 2. Targeting criteria 3. Nutrient composition of enriched foods 4. Quality control, hygiene control	1. Stats at schools. Nr of feeding days 2. Process at schools 3. Nutrient analysis of foods 4. Check lists at school, manufacturers, suppliers, depots
Primary outcomes		
1. PSN contribution to total energy and nutrient intake 2. What are attendance and pass rates	1. Energy and micronutrient intake of children and eating patterns 2. Acceptability 3. Alleviate temporary hunger 4. School attendance/ punctuality 5. Active learning capacity 6. Leakage	1. 24-hour recall – children (including PSNP) 2. Quest → children/educators/community 3. Quest → children/educators/community 4. Quest → school/educators/ community 5. Quest children/educators 6. Questionnaires
Secondary outcomes		
	1. Nutritional status of children - height - weight - dietary intake	1 Age, Measure height, Measure weight, obtain 24-hour recall
Key outcome		
	1. Change in the incidence of malnutrition 2. Comparison with other data: • NFCS • SAVACG study	1. and 2. Obtain data from the NFCS, SAVACG study and other available data.
Impact		
	1. Impact evaluation 2. Cost-benefit analysis 3. Cost-effectiveness	1. Direction in the change of nutritional status 2. Input costs vs. impact costs 3. Input costs vs. impact

RDP = Reconstruction and Development Programme
PSNP = Primary School Nutrition Programme
NFCS = National Food Consumption Survey
SAVACG = South African Vitamin A Consultative Group
Quest = Questionnaire

3.2.2 Study design

The study was a non-experimental, post test-only design (Levinson *et al.*, 1999b). It is a descriptive study. Since a control group is not available or a pre-test measurement was not made, there was no possibility of comparison. Control schools were not available because all the schools in the same socio-economic position were targeted. The schools who did not partake in the PSNP were from high socio-economic areas where malnutrition in the children was unlikely. These schools were thus not suitable as control schools.

3.2.3 Methodology

3.2.3.1 Sample size: Schools

According to the tender specifications (Terms of Reference 220/99) a random sample of 10% of the 1556 schools receiving PSNP had to be selected. On average, 26 schools in each of the 5 regions were included.

A detailed list of the schools that received food during 1999 and 2000 was provided by the Department of Education. This list included the name and unique number of the schools, the type of school (urban, rural or farm), Education district and circuit, magisterial district, number of learners and the number of learners targeted in the school. The addresses of the schools were also supplied by the Department of Education.

Based on the total number of schools and the number of schools targeted for the PSNP, a ratio of 80:20 of rural:urban schools was calculated to be included in the sample. This distribution was not specified in the tender specifications.

The 5 regions of the North West Province with magisterial districts are:

- Eastern region: Rustenburg, Bafokeng, Koster, Madikwe, Mankwe, Swartruggens;
- Far Eastern region: Moretele, Odi 1, Odi 2, Brits;
- Central region: Coligne, Lichtenburg, Delareyville, Ditsobotla, Molopo, Lehurutshe, Marico;
- Southern region: Klerksdorp, Potchefstroom, Wolmaransstad, Ventersdorp;
- Western region: Ganyesa, Kudumane, Bloemhof, Christiana, Schweizer-Reneke, Vryburg, Taung.

A statistician using the following standard statistical methodology did the random sampling:

- Stratification for regions;
- Within each region a cluster sample was randomly selected for magisterial districts;
- Within each magisterial district a random sample of schools were selected.

To comply with requests from the Departments of Health and Education to include the most western part of the Western region and the former Bophuthatswana in the Eastern region, these two areas were each subdivided into two regions. A cluster sample was then randomly selected after which the schools in each area were randomly selected. There were now, statistically speaking, 7 regions. The final sample of the randomly selected schools is given in Table 3.2.

The following principles were used:

- The schools were used as the units and not the number of learners;
- The number of schools selected within a magisterial district were proportionate to the total number of schools within that district;
- More schools were selected to provide for dropouts.

Table 3.2 Final sample of randomly selected schools

Region	Districts (from 28 in total)			Total selected	Total to be done
Far Eastern	Odi 1	Odi 2			
	23	6		29	27
Eastern	Mankwe	Rustenburg	Swartruggens		
	13	10	4	27	26
Southern	Klerksdorp	Wolmaransstad			
	18	11		29	21
Central	Lichtenburg	Delareyville	Lehurutshe		
	18	11	11	40	40
Western	Christiana	Schweizer-Reneke	Vryburg		
	2	13	28	43	42
Total				**168**	**156**

3.2.3.2 Sample size: Subjects

3.2.3.2.1 Person responsible for the administration of the PSNP at schools

The principal or another educator responsible for the PSNP at each school was interviewed by a field worker to obtain information on logistic arrangements at the school.

3.2.3.2.2 Learners

Only 10-year-old learners (majority grade 4) were to be included in the study. A previous study (Steyn *et al.*, 1996) on the perception of school children regarding the PSNP suggested that children younger than 9 years old would not give reliable information. In an attempt to evaluate the impact of the PSNP, data from this study will be compared with data of the 6-year olds of the SAVACG study (1995) and the data of the 9-year-olds of the National Food Consumption Survey completed in 1999. These children will now be 10 years old.

Five learners from each school, receiving food, were included. The anthropometric measurements and dietary intakes were done in some, but not all of the schools, due to financial and logistical reasons.

3.2.3.2.3 Educators at the schools

At least one educator at each school, other than the person in 2.4.1 and who was involved with the PSNP in some or other way, was interviewed by a field worker to obtain information regarding the running of the feeding scheme at the school.

3.2.3.2.4 Parents and Community members

At least one parent/caregiver of a learner who received food at school, community leaders or a member of the school committee was interviewed by a fieldworker.

3.2.3.2.5 Traditional leaders

The Project Manager interviewed traditional leaders in person and over the telephone.

3.2.3.3 Questionnaires

Four different types of questionnaires were developed for completion at each school. The questionnaires were designed to address specific aspects of the evaluation. The trained fieldworkers conducted the structured interviews. See the Conceptual framework (Figure 3.2 and Table 3.1) for details.

3.2.3.3.1 Schools

This questionnaire covered logistical arrangements at the school, targeting procedures, purpose of the PSNP, problems experienced with delivery of food at the school, record keeping, number of feeding days, distribution of the food at the school and general administration questions.

3.2.3.3.2 Checklist

The checklist was completed by a field worker based on observations and information received from the principal or other person involved with the PSNP. The checklist dealt mainly with the storage of the food, hygiene and quality of the food at the school.

3.2.3.3.3 Educators

The field worker interviewed at least one of the educators involved with the feeding scheme at the school. Questions were asked on the advantages and disadvantages of the feeding scheme, school attendance, concentration, school performance and punctuality of the learners, wastage of the food, preparation and serving of food to the learners and general issues.

3.2.3.3.4 Parents/Community member

At least one parent or member of the community was interviewed by a field worker asking questions about the advantages and disadvantages of the feeding scheme, eating patterns of the children, improvement of the feeding scheme, community perception of the PSNP,

involvement of the community in the PSNP and community projects that developed as a result of the feeding scheme.

3.2.3.3.5 Learners

A field worker at each school interviewed five learners. Questions asked covered eating patterns, the food that they received at school as part of the PSNP, nutrition knowledge, and leakage.

3.2.3.4 Energy and nutrient content of the PSNP menu

The nutrient composition of the foods as specified by the Department of Health for the PSNP was compared to the information provided by manufacturers on the products. Due to financial constraints it was not possible to have independent random analyses of selected foods done.

The two types of menus provided by the North West Province was analysed based on the specifications of the Department of Health and compared to the Recommended Dietary Allowances (RDA) for children 7 – 10 years of age.

3.2.3.5 Dietary intake

The dietary intake of the children was assessed using the 24-hour recall method. This method was used to obtain information from the children on what they had to eat the previous day for a 24-hour period, starting at the first food/liquid that they had the previous morning.

3.2.3.6 Anthropometric measurements

The birth date and gender of the child was obtained from school records or the birth certificate. In cases where only the year of birth was known, the month and day of birth was assumed to be the first day of January of that year. For the purpose of this survey the age of

the child was defined according to completed years of life i.e. a ten-year-old child was 120 – 131.9 months of age.

Weight and height was determined for all the selected learners from only some of the schools due to logistical and financial constraints. Weight was determined by trained fieldworkers using electronic scales and standard procedures.

The standing height of learners was taken by trained fieldworkers using a stadiometer and standard procedures.

The data was compared with the National Centre of Health Statistics of the USA (NCHS, 1977) as discussed in 3.2.3.10. Ages of learners were re-calculated into biological month categories.

3.2.3.7 Operational process

Most of the aspects of the evaluation of the operational process or project audit were covered by the questionnaires. The Project Manager visited some of the manufacturers, depots and sub-depots.

3.2.3.8 Field workers

Thirteen Setswana speaking field workers were trained over one day to complete the questionnaires. A training manual was developed for this purpose. An additional six field workers, previously trained to obtain dietary data, were retrained to complete the 24-hour recall and do the anthropometric measurements.

Mr. Dlamini, the then Deputy Director Subdirectorate: Monitoring and Evaluation attended the training and addressed the field workers on the importance of the evaluation. He also thanked them for their participation.

3.2.3.9 Logistical arrangements

The Project Manager made all practical and logistical arrangements.

3.2.3.10 Statistical analysis

The Project Manager coded all the open-ended questions on all the questionnaires. All data was computerized and controlled for punching errors. The Statistical Analysis System (SAS) programme was used to provide descriptive statistics on the questionnaires and statistics on the dietary data.

The Epi Info 6 programme was used to analyse the anthropometric data according to the US National Centre for Health Statistics reference standards (NCHS, 1977).

For each child a z-score using standard deviations from the reference population median for that particular age (in months) for height-for-age, weight-for-age and weight-for-height was calculated using EPI Info 6. If the z-score for any of these indicators were less than –6SD or greater than +6SD, the z-score was set as missing and not included in the analyses. The number of records with such extreme z-scores were 11 for height-for-age, 0 for weight-for-age and 10 for weight-for-height. In addition, a z-score for weight-for-height could not be calculated for 205 learners as no NCHS standards are available for children during puberty.

3.2.3.11 Challenges and constraints

The tender specified that the project had to be completed in three months. Due to all the school holidays and public holidays during this period it was agreed to extend the time to four months. The total evaluation, from the conceptualisation to the presentation of the final report, had to be done in these four months. The limited time available made the execution of the project extremely difficult.

The long distances that the fieldworkers had to travel to reach the schools limited the available time even more.

The methodology used in the evaluation was described. The different components of the evaluation will now be discussed in detail.

3.3 Management of the PSNP

3.3.1 Introduction

This part gives an overview of the management of the PSNP in the North West Province.

3.3.2 Management strategies

The Province adopted the policy as prepared by the National Department of Health and adapted the policy to include provincial specific aspects. As on national level, the North West Province sees the PSNP as part of the Integrated Nutrition Programme (INP). The Department of Health developed a Business Plan for the INP 1999/2000 in January 1999. This business plan allowed for approval by the Department of Health and Development Social Welfare, the Department of Finance, as well as the Department of Education. The Business Plan in the possession of the researcher has not been signed by any of these officials.

The Business Plan addressed the following:

- Introduction and background;
- Scope of malnutrition and socio-economic factors in the Province;
    - Scope of the Integrated Nutrition Programme in the Province;
- Management and accountability chains for the programme
    - Provincial levels;
    - Regional and district level;
    - Management decentralization;
- Key performance areas (KPA);
- Primary school feeding intervention;
    - Community based nutrition development projects;
- Monitoring and evaluation;
- Training and capacity building;
    - Nutrition education;
- Financial summary and funding plan;
    - Special RDP requirements.

3.3.3 Management structures

According to the Business Plan 1999/2000 the North West Province utilises the participatory management style and teamwork approach for decision making as well as in the execution of programme operations.

3.3.3.1 Provincial level

In the Business Plan 1999/2000 it is stated that the Department of Health and Developmental Social Welfare is the accountable department for the INP, including all its sub-components. It is stated that inter-sectoral structures will be created at the Provincial level to focus on specific operational management and implementation issues per Key Performance Area (KPA). The Department of Education is mentioned as one of these stakeholders.

- **Historical background:**

The Department of Health and the Department of Education co-managed the PSNP since its inception in July 1994. Initially the role of the Department of Education was limited to the provision of school statistics and to attend meetings together with the Department of Health. One of the two officials of the Department of Education had only a part time responsibility towards the programme. This structure was replaced in 1996 by the Provincial Steering Committee, and its executive, the Provincial PSNP Secretariat. The PSNP Secretariat functioned well for some time, but a breakdown in communication and working relationship occurred somewhere during 1999.

- **Problems experienced by the Department of Education:**

The Department of Education is experiencing a lot of frustration regarding its role at present and in the future of the PSNP. Some of these concerns include:

- Resources for PSNP: In February 1999 it was agreed between senior management of the two Departments that resources, for example motor transport, equipment and computer, stay and travel (S & T) allowances and others, required by the Department of Education would be provided and catered for by the Department of Health. The Department of Health had to affect this not later than 1 April 1999. To date, this matter has not been solved. This problem is acknowledged by the Department of Health (personal communications, 2000);

- The Department of Education does not have representation on the internal tender committee. This matter was already mentioned at a meeting in August 1998 and the suggestion was that the tender committees of both departments should participate in the tendering process for the PSNP. This has not yet happened;
- A letter from the Deputy Director General (DDG) of the Department of Education, Dr AM Karodia, to the Acting DDG of the Department of Health, Dr H Gosnell, dated 10 February 2000, regarding the future of the PSNP has not yet been replied to by the Department of Health;
- The management consultants, Ernst & Young, suggested restructuring of the provincial Secretariat. The new structure has not been changed officially. However, since July 1999 it has not been functioning efficiently. The last meeting of the provincial Secretariat was held in October 1999. Currently the two departments are functioning separately for the most part as far as PSNP operations are concerned.

3.3.3.2 Regional and district level

The demarcation for the Department of Health and the Department of Education is different and makes it difficult for collaboration between these two departments at this level.

Provincial commitment and role definition is needed on the provincial level before any meaningful collaboration on regional and or district level can take place.

3.3.3.3 Management decentralization

Decentralization of the INP management has been envisaged by the Department of Health to at least regional level during the 1999/2000 financial period. A decentralisation model has been formulated and is used as basis for implementing the decentralisation process. A process of decentralization is also being undertaken by the Department of Education. The Department of Education is concerned that these efforts, as far as the PSNP is concerned, are not coordinated on the highest level of both Departments.

3.3.3.4 Community/school level

No details are given in the Business Plan 1999/2000 of the Department of Health on how the community or School Governing Bodies could be used for the management of the PSNP/INP.

3.4 Implementation evaluation

3.4.1 Introduction

This evaluation covers the implementation from the management through to the actual operational process at the schools.

Problems regarding the operational process of school feeding programmes across the world are well known and include the following (Del Rosso & Marek, 1996):

- Irregular supplies;
- Food lost through spoilage or the black market and theft;
- Disruption of teaching for meal preparation;
- Burdensome reporting/monitoring;
- Burden on school staff;
- Logistical difficulties of transporting large quantities of food with poor transportation and communication systems.

Monitoring at school level is one of the main responsibilities of the Department of Education. The consultants, Ernst & Young (1997), implemented a management information system in the form of the PER-FORM Developer software system. They regarded the installation of the system as a critically important initiative for the province as it would have addressed and assisted in the rectification of most of the control issues that existed at the time. The system, once it had been installed and fully implemented, should have provided provincial managers with the required information in terms of nutritional, educational, financial and other management impact indicators. The system was also supposed to monitor quality and quantity of food delivered, as well as the number of learners fed on a daily basis. The Department of Health ensured the smooth implementation through a maintenance contract with the supplier, but after expiry of that contract in August 1998 the lack of resources

caused the programme to collapse. The monitoring of the PSNP was seriously affected by this and no impact indicators were measured.
In general, sufficient capacity to monitor all processes provincially and locally is not available.

3.4.2 Tender procedures

The North West Province follows the standard procedures to call for tenders in terms of specifications drawn up by them. Tenders are invited from the North West Province Tender Board for perishable and non-perishable foodstuffs according to the specifications supplied by the Department of Health. A contract is entered into between the Department of Health of the North West Province and the successful product supplier and money flow from the Department of Health to the supplier upon receipt of specific documentation e.g. proof of delivery. It was not within the scope of this evaluation to audit the financial aspects of the Tendering process or the contracts between the Department of Health and the suppliers.

As part of the tender specifications, all suppliers had to have their products analysed at own costs at a reputable laboratory for nutritional content.

According to the Department of Health (personal communications, 2000) approximately 500 direct (companies on tender) and an additional 200 indirect jobs have been created. This is based on the proposed formula of Ernst & Young (1997) stating that for every R10 000.00 spent on the programme, five jobs are created.

The Department of Health experienced problems with the tender system including, among others, the following (personal communications, 2000):

- Short tender periods;
- Delays in awarding tenders. This resulted in delays of food deliveries, because companies had too little time for preparations, new transporters had no time to familiarise themselves with the location of schools, etc.;
- Lack of capacity of some companies that were awarded tenders;
- Small, Medium, Micro Enterprises (SMME's) depend on larger companies for their supplies of food items and financial support to render a service. However, without the larger companies supplying the SMME's on tender, the programme would have collapsed or the small companies, due to their lack of financial and logistical capacity might not have been able to render the service and benefit from the programme;

- The tender system, because it is implemented and administrated at the provincial level, had to some extent standardize food options and is less flexible than desired;
- Difficulty in obtaining approval from the Tender Board for replacement of products when problems occurred.

These processes were to a large extent beyond the control of the Sub-directorate: Nutrition.

Tenders are usually allocated for a year, but problems with awarding the tenders had the effect that food was not delivered to the school in the first three months of 1999. In order to address this, the amount of food supplied to the learners was increased around September 1999. For example, the original serving size of the biscuits was 100 gram per day, which was then increased to 150 gram per day.

3.4.3 Methodology

Information was collected by personal visits to manufacturers, regional depots, sub-depots and schools. The questionnaires completed also provided information on the operational process at the schools. Questions with regard to PSNP food being taken home and shared were also included on the questionnaire of the learners.

3.4.4 Results of the implementation evaluation

The Department of Health drew up an operational process chart for the PSNP indicating the flow of food from the supplier (manufacturer of food) to the schools. It also outlines the control points for the processing of payment.

3.4.4.1 Tenders

The 1999 tender (NW 539/96) that started in July and expired on 31 December 1999 has been extended until 31 March 2000. A new tender was advertised at the end of November 1999 for implementation as of 1 April 2000 until 31 March 2001. This new tender started in the beginning of May 2000. New contracts were allocated to manufactures of for example the cool drink powder (Nutritional Foods) and to new depots, sub-depots and transporters.

It was not possible to visit all the manufacturers, depots and sub-depots of the 1999 contracts due to the time limit of the project. When the Project Manager started to visit these, she was informed by one of the manufacturers that the new contracts started at the beginning of May. The Department of Health did not inform the Project Manager of any changes in the tenderers.

3.4.4.2 Suppliers and manufacturers

In some cases the Manufacturers delivered the food directly to each of the five depots. The plants visited were clean and well operated. The Project Manager had telephonic and personal discussions with two other manufacturers.

3.4.4.3 Regional and sub-depots

The Project Manager visited one of the new regional depots and found it clean and organized.

One of the sub-depots in the Western Region was visited. The building was clean with no stock of foods. The depot manager seemed organised and had copies of documents of deliveries, etc. He indicated that he did not always receive food on time from the regional depot. He transported the food in a closed truck from the depot to the schools, mainly on gravel roads.

3.4.4.4 Local transporters

The persons responsible for the administration of the PSNP at the schools were asked whether they knew the transporters, and 81.4% indicated that they knew the person. Seventy six percent of the schools indicated that the transporters were not from the local community.

3.4.4.5 Participating schools, educators, parents and learners

A total of 156 schools were visited. A total of 256 educators completed the questionnaire. More than two hundred (n = 215) parents and community members were interviewed. Five learners were interviewed on average per school with a total of 764 learners.

3.4.4.6 Implementation process at the schools

Ninety three percent of the parents thought that the schools are managing the school-feeding scheme well.

- **Reasons given by parents that the schools are managing the PSNP well**

Table 3.3 give the reasons offered by the parents that the schools are managing the PSNP well. The majority based their reasons on the fact that "all the learners get food at school".

Table 3.3 Reasons given by the parents that the schools are managing the PSNP well

Positive reasons	Percentage of parents (n = 215)
Children not hungry anymore	12.3
All the learners get food	58.3
Learners/community do not complain	16.0
Educators/community controls food	2.7
Negative reasons	
Interrupts school activities	0.5
Schools do not complain if delivery is not correct	1.1
Educators take food home	1.1
Not all the learners receive food/learners are still hungry	3.7

- **Person responsible for administration of PSNP**

At most of the schools an educator (64.9%) was responsible for the administration of the PSNP, followed by the principal (34.4%), a Head of Department (9.9%), the vice-principal (2%), and/or a community member (1.3%). In seven of the schools (4.5%) the secretary was responsible for the administration of the PSNP. In some of the schools the person responsible for the administration of the PSNP did not always receive the food. The different foodstuffs were received by an educator at 59.2% of the schools, while the principal received the food at 38% of the schools. A Head of a Department received the food at 8% of the schools and in 2% of the schools a community member was responsible for receiving the food. At seven (4.5%) schools the secretary was responsible for receiving the food.

- **Delivery of food**

The questionnaire covered questions on problems regarding the delivery of the food. These problems indicated by schools are given in Table 3.4. The majority of the schools listed irregular delivery of food as the main problem followed by non-delivery of food.

Table 3.4 Delivery problems experienced by the schools

Problem	Percentage of schools (n = 156)
Non-deliveries	57.3
Irregular deliveries	71.5
Early deliveries	32.5
Late deliveries	59.9
Incomplete food packages delivered	16.7
Incorrect quantities delivered	22.0
Food not delivered at school premises	13.2
Contractors/sub-contractors interfere with school activities	9.3
Expired food delivered	24.5

If not enough food was delivered or the food was delivered late, the educators made different kinds of plans to provide food to the learners as indicated in Table 3.5. More than half of the educators reported that they divided the food between the learners.

Table 3.5 Plans made by the educators to feed the learners

Plan of action	Percentage of schools (n = 156)
Nothing, the learners did not get food	22.8
Divide what was available between the learners	43.0
Asked the parents to give their children food	1.8
Learners bought food or brought their own food	1.8
Schools supplied food to the learners	4.4
School fed only the really needy/young learners	1.8

The other schools (24.6%) received enough food and did not have to make alternative arrangements.

- **Record keeping**

Only forty eight percent of the schools kept record of the food that they received. In the majority of the cases the information was very scanty and written in a specific book. The duplicate delivery slips were not always available at the schools, and only in a few cases were they organised and filed in one place.

Despite the high percentage of schools that had no records, only twenty seven percent of the schools acknowledged that they had problems with record keeping. The main reasons were that they did not have time or proper books to do it in.

- **Storage space at schools**

Forty nine percent of the schools said that they experienced problems with the storage of food. Twenty percent said that they had problems with stock control, mainly because of theft. Due to lack of storage space, some schools stored the food in more than one place. A third of the schools reported that they stored the food in the classroom.

- **Preparation of food**

The majority of schools (85.2%) mixed the porridge and cool drink in a big container and then dished it out to the learners. Fifty six percent of the schools did not have enough cups available for the learners and they had to share cups.

Four percent of the schools never mixed the porridge with water and gave it to the learners in the dry form. Only a small percentage (2.6%) of the schools never mixed the cool drink with water and gave it to the learners in the dry form.

Of the schools visited, thirteen (8.6%) did not have clean water available.

- **Serving of the food at the schools**

The educators were mainly responsible for the distribution of the food. Only thirteen percent of the schools reported some problems with the distribution of the food.

In 65.4% of the schools the class teachers were responsible for the distribution of the food. At 9 (5.8%) schools the parents and members of the community were responsible for the distribution of the food.

More that fifty percent (57.7%) of the educators spent less than 15 minutes per day on the preparation and distribution of the food. Forty one percent only supervised the distribution of the food while 59% spent the time on the preparation and distribution of the food.

Girls and boys assisted the educators in the preparation and distribution of the food. Fifty two percent of the 171 girls reported to help, spent more that 15 minutes per day on this. The activities of 149 girls were reported and 44% helped with the distribution of the food,

37.6% were involved in the preparation of the food and 18.8% helped with cleaning up afterwards.

Over one hundred and fifty (157) of the educators reported that the boys also helped. Over fifty percent (52.9%) of them spent more than 15 minutes per day on the feeding scheme. The main responsibility of the boys was to fetch water for mixing the porridge and cool drink (60.1%), followed by distributing the food (37.7%).

- **Distribution of food to the learners**

According to 74.7% of the learners they received some food every day of the week, provided there was food available at the school. One percent of the learners reported that they, although they were supposed to receive food, in fact never received any food at all.

The learners were asked how often they received food and the frequency is given in Table 3.6. The learners who reported that they never received bread were probably in the schools where they did in fact not receive any bread at all.

Table 3.6 Frequency of receiving food as reported by the learners

Food item	1x/week	2x/week	3x/week	4x/week	Every day	Never
Bread	27.7	16.3	5.8	0.9	11.3	38.0
Biscuits	14.1	32.2	30.3	4.2	17.3	1.9
Porridge	25.1	37.3	14.1	1.0	15.8	6.7
Cool drink	14.9	27.5	24.9	3.0	22.3	7.5

3.4.4.7 Leakage

More than fifty percent (54.6%) of the learners indicated that they took food home. They usually took home biscuits (88.2%), porridge (20.7%) and bread (19.4%), while 16.3% took home cool drink.

The majority of learners (75.4%) who took food home, gave it to the other, usually younger, children at home. A small percentage (4.8%) indicated that they did not like the food and therefore took it home. Fifteen percent kept the biscuits to eat at home later with tea and 3.8% took it home for their parents.

A high percentage of the learners (47.9%) indicated that they have seen an educator eating some of the food that the learners usually received at school. Nearly a quarter (22.5%) of the learners reported that they have seen an educator taking food away from school.

3.4.5 Discussion of the implementation evaluation

The PSNP is still a vertical programme and not part of the Integrated Nutrition Programme (INP).

Different people are responsible for receiving the food and the administration of the PSNP at the schools. Community involvement at this level is practically non-existing.

The majority of parents thought that the schools are managing the PSNP well, mainly because all the learners get food at school.

From the results it is clear that the food did not reach the schools, and therefore the learners, as intended. This happened despite various control points having been built into the system. Somewhere between the manufacturer and the school, food disappeared from the system. The breakdown in the service contract with the supplier of the PER-FORM Developer software system had a negative effect on the proper monitoring of the system, especially at school level. The delivery of the food seems to be one of the biggest problems that should be addressed. This problem has been described by the World Bank as one of the common problems of school feeding programmes worldwide (Del Rosso & Marek, 1996).

Schools did not know how much and when they were supposed to receive food. This made it impossible for the person responsible for the administration of the PSNP at school level to control the quantity of food delivered. The schools did not keep proper record of the quality and quantity of the food delivered or the date of delivery. Ernst & Young (1997) recommended that proper record keeping and reporting should be developed and put in place.

Food was delivered every two weeks and in some schools once a month. This meant that the food had to be stored at the schools. Appropriate, safe storage place was not available in many of the schools. This led to unacceptable practices, for example storing the food off the premises of the school and in one case at a nearby grocery store. Food was also stored

under unhygienic conditions in classrooms and cupboards. Theft of the food became a serious problem at some of the schools.

The availability of clean water should be considered when decisions are made about the type of food to be served to the learners.

Although there were gender specific tasks, it appears that most schools involved both boys and girls in the preparation and distribution of the food.

According to the learners they did not receive the menu as specified by the aims of the PSNP. Learners were supposed to receive cool drink every day of the week, but only 22.3% of the learners reported that this was the case. This problem has been reported previously by Steyn *et al.* (1996). They found in their study on 5 rural and 5 urban schools in the North West Province, that only 25% of the children (n=50) received food every day and 50% received food on 2–3 days per week only. In 16 rural schools in Jamaica, the mean availability of school meals over three school terms was 24.6% (Walker *et al.*, 1998).

An alarming high percentage of learners reported that the educators ate food meant for the learners. Even more disconcerting is that a high percentage of the educators took food away from the school, most likely for personal use. These practices of the educators are unacceptable and unprofessional and contributed further to leakage, resulting in many learners not receiving a nutritious snack at school.

Various criticisms have been directed at feeding programmes. It is argued that programmes might not reach the entire community at risk as participants may share, exchange or sell their rations (McNaughton, 1983 in Richter, 1994). The same phenomenon was found in this survey. It is of great concern that almost a quarter of the learners indicated that the educators took food home. Nearly half of learners also admitted that they took food home (usually the biscuits) to share with siblings and parents at home.

Similar problems were perceived by the educators in a study on the perception of learners regarding the PSNP (Steyn *et al.*, 1996). These problems included needy children not always well targeted, food supply too little or of poor quality, conflict between volunteers and educators, educators not involved in decision-making, insufficient labour and/or time to prepare and serve food, lack of water at schools, lack of cooking utensils and lack of storage facilities.

Learners did not receive food as intended during 1999 because of various reasons. It was therefore impossible for the PSNP to contribute to the nutritional needs of the learners as intended by the overall aims of the PSNP.

The problems identified by the implementation evaluation on for example the delivery of the food items to the schools, highlights the need for continuous monitoring of the programme. With continuous monitoring of the programme it is possible to rectify any problems (for example the lack of timely delivery of food items to the schools) immediately.

3.4.6 Conclusions of the implementation evaluation

Based on these results the major conclusions for this part are:

- Co-management by the Department of Health and the Department of Education of the PSNP is not optimal;
- The monitoring of the operational system is not in place;
- Food did not reach the school and learners as intended;
- Leakage of food occurred.

3.5 Programme (input and output) evaluation

3.5.1 Methodology

The frameworks and methodology have been explained in 3.2.1 and 3.2.3.

3.5.2 Results

3.5.2.1 Socio-demographics

3.5.2.1.1 Introduction

As mentioned in 3.1.2, the North West Province is a largely rural area, with 68% of the population living in non-urban areas. Its average annual per capita gross geographic product was relatively low at R4 092.00 in 1993. It occupies 10% of the land in South Africa, and there are 3,5 million people living in the North West, of whom 2,9 million (83%) are African.

Most of the former "independent state" of Bophuthatswana is found within its boundaries. Fifty three percent of the population lives in rural households, 21% on rural farms and 20% in formal urban households. In the North West Province 49% of the African households are overcrowded. Only 9% of the African households do not have access to a toilet. There are, on average, 28 people per square kilometer (Hirschowitz & Orkin, 1995).

The Province is divided into 5 regions and each region is divided into districts. The demarcation of the various provincial departments is not always the same. In 1999 the PSNP had 1561 primary schools with 299778 learners as beneficiaries of the programme. The Business Plan of the Department of Health for 1999/2000 indicated that they want to feed 375 955 primary school learners in a total of 1573 schools.

3.5.2.1.2 Results

A total of 155 schools were visited in all five regions of the North West Province. Not all the magisterial districts were included because a clustered sampling method was used. In Tables 3.7, 3.8 and 3.9 details are given of the participating schools.

Table 3.7 Number and percentage of schools per region included in the study

Region	Number of schools	Percentage of schools
Far Eastern Region	26	16.8
Eastern Region	25	16.1
Central Region	38	24.5
Southern Region	25	16.1
Western Region	41	26.5
Total	155	

Table 3.8 Number and percentage of schools per magisterial district included in the study

Magisterial district	Number of schools	Percentage of schools
Odi 1	19	12.2
Odi 2	6	3.9
Mankwe	11	7.1
Rustenburg	10	6.5
Swartruggens	4	2.6
Lichtenburg	18	11.6
Delareyville	10	6.5
Lehurutse	10	6.5
Klerksdorp	15	9.6
Wolmaransstad	11	7.1
Christiana	2	1.3
Schweizer Reneke	13	8.3
Vryburg	26	16.8
Total	**155**	

More rural/farm schools were included in the sample.

Table 3.9 Number and percentage of schools per type of school

Type of school	Number of schools	Percentage of schools
Urban	32	20.6
Rural	48	31.0
Farm	75	48.4

More rural/farm schools were visited than urban schools. The ratio of urban: rural/farm schools visited are in agreement with the ratio of 20:80 as planned. The total of 123 (79.4%) rural and farm schools were visited.

The school questionnaire was mainly completed by the principal of the school (78.7%), followed by the vice-principal (12.9%) and the rest by educators. The educators were interviewed only when the principal was not available, for example away for the day to meetings or sick.

A total of 256 educators were interviewed. At some of the schools, especially the smaller farm schools, the principal was the only educator or the principal and one educator were the only personnel. In these schools only one educator questionnaire was completed. A total of 215 parents and members of the community were interviewed. Five learners were interviewed on average per school with a total of 764 learners. The percentage breakdown is given in Table 3.10.

Table 3.10 Number of participating educators, parents and learners per region

Region	Educators		Parents		Learners	
	Number	%	Number	%	Number	%
Far Eastern Region	47	18.4	37	17.2	130	17.0
Eastern Region	43	16.8	35	16.3	119	15.6
Central Region	67	26.2	48	22.3	192	25.1
Southern Region	38	14.8	38	17.7	128	16.8
Western Region	61	23.8	57	26.5	195	25.5
Total	256		215		764	

More females than males were interviewed among the educators and parents, while more or less the same number of boys and girls were interviewed (Table 3.11)

Table 3.11 Gender of participating educators, parents and learners

Gender	Educators		Parents		Learners	
	Number	%	Number	%	Number	%
Male	51	19.9	33	15.3	359	47.5
Female	204	79.7	182	84.7	401	52.5

The gender of four learners was not recorded.

Although only 32% of the schools were visited by a person from either the Department of Health or the Department of Education, nearly all the principals indicated that they knew what the PSNP is about. More than half of the principals thought that the food supplied to the learners was enough food for the day.

The understanding of the person who completed the school questionnaire is summarized in Table 3.12. The majority said that the purpose of the PSNP is to "just give food away".

Table 3.12 Understanding of the person who was interviewed for completion of the school questionnaire

Statement	Percentage (n = 256)
Purpose is to just give food away	**93.1 (FALSE)**
Purpose is to alleviate temporary hunger	91.7 (true)
Purpose is to supply enough food for the day	53.5 (false)
Purpose is to supply enough food for a meal	51.0 (true)

The tenders for the running of the depots, sub-depots and transporters were allocated to smaller companies or individuals and thus meeting one of the RDP principles. A problem is that these people were not always from the local community.

3.5.2.2 Project inputs: Energy and nutrient content of the PSNP menu

3.5.2.2.1 Introduction

The project inputs included the provision of 25% of the Recommended Dietary Allowances (RDA) for energy and the micronutrients to the learners and nutrition education to the learners (Conceptual framework). Some of the RDP principals are also addressed in this chapter.

One of the goals of the PSNP in the North West Province is to contribute to general health development by alleviating pupils' temporary hunger by providing them with approximately

25% of the required RDA for energy (Business Plan 1999/2000). The micronutrient supplementation is also set at 25% of the RDA (Personal communications, 2000). No indication is given of the provision for protein.

The original national objective was that this meal had to meet 30% of the energy need of the learners. Due to budgetary constraints, by 1995 the guidelines stipulated that meals should provide not less than 25% of the RDA for energy for 7–10 years-olds, and 20% for 11–14-year-olds, which is approximately the energy contribution equivalent to one meal.

Decisions regarding the type of food for inclusion in the feeding scheme are left to the provinces. National guidelines on the criteria to consider for menu planning for food supplementation are, however, given and should be taken into consideration. These include:

- Nutritional contribution: provide not less than 25% of the RDA for energy for the 7–10-year-olds and not less than 20% of the RDA for the 11–14-year-olds;
- Although the focus is on energy contribution, the food should provide a balance of nutrients, vitamins and minerals;
- Where resources allow, the basic options should be supplemented with additional nutrient-dense foods. This would also provide opportunities for community contributions;
- The use of the following foodstuffs is not encouraged for the reasons stated:
    - Non-milk creamers, blends or any other imitation milk products, because of their lower nutritive value;
    - Commercial food products such as cool drinks, biscuits and soup powder, because the message to children via such foods can oppose basic nutrition education messages and undermine household food security. In addition, such food products seldom fit in with local eating habits and seldom contribute to community involvement. In some cases, the energy content is low and the products are more expensive.

Two different menus were provided to the learners in the North West Province. The menu provided to the Western region did not include bread with peanut butter because suitable tenders for the delivery of bread in these far away areas were not available (Business Plan 1999/2000).

Table 3.13 gives the menus provided per week in each of the regions.

Table 3.13 Menus provided per week

Food item	Western region		Other regions	
	Times per week	Quantity per week	Times per week	Quantity per week
Fortified bread	Not supplied	Not supplied	4 slices once per week	140 gram
Peanut butter mixed with margarine	Not supplied	Not supplied	23 gram once per week	23 gram
Fortified porridge	70 gram twice per week	140 gram	70 gram twice per week	140 gram
Fortified biscuits	100 gram three times per week	300 gram	100 gram twice per week	200 gram
Fortified cool drink	10 gram five times per week	50 gram	10 gram five times per week	50 gram

3.5.2.2.2 Results of the energy and nutrient content of the PSNP menu

Comparisons between the specifications per 100 g portion and the laboratory analysis as supplied by the manufacturers are illustrated in Tables 3.14 to 3.18.

Table 3.14 Fortified brown bread, per 100 gram at the time of packing

Nutrient	Unit	Specification: Fortified brown bread	Laboratory analysis SASKO Brits and Phokeng Bakery
Energy	kJ	1136	1154
Protein	gram	9.33% by mass	9.48
Carbohydrate	gram	56.42% by mass	57.11
Dietary Fibre	gram	0.75% by mass	0.87
Fat	gram	2.04% by mass	2.15
Thiamin	mg	0.49	0.68
Riboflavin	mg	0.40	0.52
Niacin	mg	7.20	7.68
Vitamin B6	mg	0.70	0.73
Vitamin B12	µg	-	-
Vitamin C	µg	-	-
Vitamin A	IU	-	-
Vitamin D	µg	-	-
Vitamin E	IU	-	-
Pantothenic acid	mg	-	-
Folic acid	µg	60	91
Iron	mg	8.8	12.8
Calcium	mg	200	286
Phosphorus	mg	-	-
Magnesium	mg	-	-
Zinc	mg	-	-

Comments

- In the specifications a vitamin B5 is mentioned with a value of 7.20 mg;
- To our knowledge there is no known vitamin by the name of B5.

Table 3.15 Peanut butter, per 100 gram at the time of packing

Nutrient	Unit	Specifications: Peanut butter*	Laboratory analysis SASKO Brits and Phokeng Bakery#
Energy	kJ	1880	2913
Protein	gram	0.2	26.9
Carbohydrate	gram	0.6	19.82
Dietary Fibre	gram	0	0.79
Fat	gram	50.5	57.8
Saturated fat	gram	9.87	9.26
Monounsaturated fat	gram	12.08	22.38
Polyunsaturated fat	gram	26.31	25.7
Vitamin D	µg	5	
Vitamin E	IU	45	
Calcium	mg	6	
Magnesium	mg	1	

* as for medium fat margarine

the peanut butter: margarine ratio is 50:50

Table 3.16 Fortified biscuits, per 100 gram at the time of packing

Nutrient	Unit	Specifications: Fortified biscuits	Laboratory analysis: Vitabisc
Energy	kJ	1700	1962.3
Protein	gram	9.0	14.6
Carbohydrate	gram	65.0 (excl fibre)	62.5
Dietary Fibre	gram	11.0	14.9
Fat	gram	9.5	19.3
Thiamin	mg	0.15	-
Vitamin B1	mg	0.71	0.79
Riboflavin	mg	0.08	-
Vitamin B2	mg	1.6	0.92
Niacin	mg	2.5	6.38
Niacin	mg	9.4	6.38
Vitamin B6	mg	0.85	0.88
Vitamin B12	µg	1.6	3.46
Vitamin C	mg	37.3	42.2
Vitamin A	IU	-	1760
Vitamin D	µg	-	-
Vitamin E	IU	6.6	8.13
Pantothenic acid	mg	3.8	3.87
Folic acid	µg	183mg	206mg
Iron	mg	-	5.3
Calcium	mg	-	227
Phosphorus	mg	-	60.5
Magnesium	mg	-	9.7
Zinc	mg	-	1.6

Comments

- Although thiamin and vitamin B1 is the same vitamin, two different values for this vitamin were given in the specification. This must be very confusing for the manufacturer to decide on the fortification level of the product;
- The same applies to the nutrient riboflavin/vitamin B2;
- Two complete different values are given for niacin;
- The correct unit for folic acid is µg and not mg - a difference of 1000!

Table 3.17 Fortified instant porridge, per 100 gram at the time of packing

Nutrient	Unit	Specification: Fortified instant porridge	Laboratory analysis: Insto Porridge	Information on package: Instant Morvite
Energy	kJ	1700	1774	1519
Protein	gram	12	12.2	6.05
Carbohydrate	gram	70	69.5	86.07
Dietary Fibre	gram		2.6 (crude)	0.99
Fat	gram	12	12.3	1.06
Thiamin	mg	0.71	1.59	0.53
Riboflavin	mg	1.6	1.73	0.81
Niacin	mg	9.4	20.16	5.99
Vitamin B6	mg	0.85	1.96	0.26
Vitamin B12	µg	1.6 (mg)	1.89	1
Vitamin C	mg	37.3	71.42	53
Vitamin A	IU	2336	2616	666
Vitamin D	µg	-	-	1.3
Vitamin E	IU	6.6	7.52	3
Pantothenic acid	µg	3.8	6.18	1.3
Folic acid	µg	183	192	100
Iron	mg	8.8	19.58	5.64
Calcium	mg	516	950	68
Phosphorus	mg	433	500	77
Magnesium	mg	115	260	36
Zinc	mg	2.8	12.77	1.16

Comment

- The unit of vitamin B12 was given in mg instead of µg in the specifications.

Table 3.18 Fortified cool drink powder, per 100 gram at the time of packing

Nutrient	Unit	Specification: Fortified cool drink powder	Laboratory analysis: Pusela Powder drink	Laboratory analysis: Vita Juice
Energy	kJ	1600		1596
Protein	gram			0.95
Carbohydrate	gram	95.0		97.06
Thiamin	mg	3.0		4.46
Riboflavin	mg	5.0		6.38
Niacin	mg	40.0		
Vitamin C	mg	140 - 200	96.7	
Vitamin A	IU	2000		
Calcium	mg			330
Phosphorus	mg	100		180
Magnesium	mg	100		

The average energy and nutrients as provided by the PSNP menus per day are compared to the RDA in Table 3.19.

Table 3.19 Average energy and nutrients provided by the PSNP menus based on the tender specifications (and not the laboratory analysis)

		Bread, peanut butter, biscuits, porridge and cool drink		Biscuits, porridge and cool drink	
Energy and Nutrients	**Unit**	**Energy and nutrients**	**As % of the RDA (7 - 10 year old)**	**Energy and nutrients**	**As % of the RDA (7 - 10 year old)**
Energy	kJ	1720	20.4	1656	19.7
Protein	gram	9.56	34.1	8.76	31.3
Carbohydrate*	gram	70.92	70% of the total energy	68.1	70% of the total energy
Dietary Fibre*	gram	4.62	13% of the recommendation	6.6	18.9% of the recommendation
Fat*	gram	10.04	22% of total energy	9.06	21% of total energy
Thiamin	mg	0.92	92	0.924	92.4
Riboflavin	mg	1.7	141.7	1.91	159
Niacin	mg	12.42	95.5	12.28	94.5
Vitamin B6	mg	0.774	55.3	0.748	53.4
Vitamin B12	µg	0.82	58.6	0.8	57.1
Vitamin C	mg	39.2	87.1	46.6	103.6
Vitamin A	IU	854	25.9	854	25.9
Vitamin E	IU	6.558	93.7	5.8	83
Pantothenic acid	mg	2.584	64.6	3.344	83.6
Folic acid	µg	141.2	141.2	161	161
Iron	mg	4.92	49.2	2.46	24.6
Calcium	mg	200.6	16.7	144.4	18.1
Phosphorus	mg	131	16.4	131	16.4
Magnesium	mg	42.2	24.8	42.2	24.8
Zinc	mg	0.784	7.8	0.78	7.8

* not a Recommended Dietary Allowance

3.5.2.3 Project inputs: Nutrition education

3.5.2.3.1 Introduction

There are numerous definitions for nutrition education. In course of time there has been a shift from only imparting knowledge to focus on behavioural change and lately the additional consideration of the promotional factors (i.e. environmental, socio-political, economical, etc.) facilitation or hindering behaviour changes (FAO, 1997). With regard to nutrition education of school children and especially as part of a programme such as the PSNP, it is important to provide information on healthy food choices (knowledge + application to facilitate behavioural change + experience to facilitate enhancing attitudes), but also the implied nutrition message conveyed through the choice of food items and the practices of the educators.

No formal nutrition education has taken place linked to the PSNP. Therefore this component was not included in the evaluation. However, questions covering aspects of nutrition knowledge and perceptions that might have been general knowledge of learners, educators and parents or could have been influenced by their perception of the food provided at schools, were included as part of the questionnaire for the educators, parents and learners.

3.5.2.3.2 Results of the nutrition education

Most (95.2%) of the educators indicated that nutrition education is needed at schools. The majority said that it should already begin in Grade 1. They thought that they could do the teaching themselves or that it could be done by nurses and one even thought that the cleaners could be responsible for the nutrition education of the learners.

Half the parents had a good idea of what healthy foods are. Most of them (86%) thought that the food that their children got at school was healthy.

Less than half of the learners (40.6%) had some idea of what "healthy foods" meant. The rest could not explain or did not know the meaning of healthy foods.

Sixty two percent indicated that the bread group (bread, porridge, rice, samp, etc.) is healthy, followed by 56% for the fruit/vegetable group, 49% for the milk group and 37.5% for the meat group. Ten percent said they did not know which foods are healthy.
The learners mentioned more than one source of information. The majority (78.4%) of the learners said that they obtained their knowledge on healthy foods at school and 48.3% said they learned from their mothers/grandmothers.

Table 3.20 Percentage of learners who thought that the food that they received at school was healthy

Food	Percentage (n = 764)	Most important reasons given
Bread with peanut butter	91.2	57.1%: Healthy, gives energy, gives power
Biscuits	89.4	49.3%: Likes it, tastes nice
Porridge	62.3	36%: Healthy, gives energy, gives power 31.9%: Not healthy, make them sick, no vitamins
Cool drink	76.5	57.6%: Likes it, tastes nice, quench thirst

Table 3.20 gives the percentage of learners who thought that the food they received at school was healthy. Nearly all (89.4%) of the learners thought that all biscuits are healthy.

The main reasons given were that they liked it/it tasted nice (49.3%) and that it alleviated hunger/gave energy (26.9%). Nine percent said it is healthy because it is sweet and contains sugar.

More than 75% (76.5%) of the learners said that all cool drinks are healthy. The main reasons given were that they liked it/it tasted nice (57.6%%) and that it gives energy and makes you strong (18.9%). Fifteen percent (15.4%) said that it is healthy because it is sweet and contains sugar.

3.5.2.4 Project inputs: Application of the RDP principles

3.5.2.4.1 Introduction

The Integrated Nutrition Programme aimed at facilitating a coordinated intersectoral approach to solving nutrition problems in South Africa. Nutrition policies, strategies and interventions followed the application of the fundamental nutrition programming process of assessment, analysis and action to the different elements of the Conceptual Framework in any given context and at all levels. The emphasis is on building long-term capacity of communities to be self-sufficient in terms of their food and nutrition needs while at the same time protecting and improving the health of the most vulnerable parts of the population – women and young children. Intersectoral collaboration and cooperation with other departments, other sectors within health, the private sector and non-governmental organisations is required to make the programme a success. Moreover, emphasis is placed on building knowledge and skills within communities and within government structures so that accountability for public funds can be maintained at the same time that decision-making is being devolved to local level.

The RDP principles addressed through this evaluation includes:

- Community involvement and empowerment;
- A holistic approach, linking school nutrition activities to other initiatives to improve education quality and other community development and health initiatives;
- A multi-sectoral and interdisciplinary intervention, jointly managed by the Education and Health Departments;
- Sustainability.

Questions pertaining to the specific aspects of the RDP were included as part of the questionnaires to the schools, educators and parent communities.

3.5.2.4.2 Results of the application of the RDP principles

3.5.2.4.2.1 Community involvement and empowerment

The majority of schools (81.4%) knew the person who delivered the food to the school, but only 23.1% of the people were from the local community. When new tenders were allocated, foods were sometimes delivered late, because the transporters could not locate the schools.

3.5.2.4.2.2 Benefits of the PSNP as seen by the educators

Nearly all (99.2%) said that the feeding scheme benefited the learners, 73.9% said that it benefited the community and 84.9% said that it benefited the school.

- **Benefits as seen by the educators for the:**
  - **Learners (n=42)**

Increased school attendance: 12.9%
Physically improved/more energy/stay awake in class: 8.1%
Improved learning/concentration: 21%
Increased food intake/learners not hungry anymore: 53.6%
Improved health: 2.4%
Learners liked the food/happy to get food: 0.8%

  - **Community (n=26)**

Parents did not have to feed children: 88.3%
Parents had contact with the educators: 1.6%
Decrease in theft: 2.1%
Leftovers went to the community: 1.1%

  - **School (n=26)**

Increased school attendance: 50.5%
Learners not hungry/feeding the learners: 10.6%
Improvement in learning/concentration: 30.1%

Educators could teach learners on hygiene: 0.5%
School did not have to provide/buy food: 1.9%

3.5.2.4.2.3 Disadvantages of the PSNP as seen by the educators

Sixteen percent of the educators said that the feeding scheme put the learners at a disadvantage, 10.4% said it put the community at a disadvantage and 11.2% that it put the school at a disadvantage.

- **Disadvantages as seen by educators for the:**
  - **Learners (n=42)**

Learners disliked some of the food: 14.3%
Some of the food made the learners sick: 14.3%
Not enough food: 45.2%
Some of the food not healthy: 7.1%
If there was no food at the school, the learners stayed away: 7.1%
Learners did not bring own food: 2.4%

  - **Community (n=26)**

Parents did not give lunch boxes: 14.3%
Parents became dependent on PSNP: 39.3%
Not enough food was supplied: 3.6%
Caused problems: criminals now at school: 10.7%
Food was not always fresh/healthy: 10.7%
Parents had to take children to clinic, because they were sick as a result of the food: 3.6%

  - **School (n=26)**

Food not enough: 19.2%
Took a lot of time of the educator: 26.9%
Unhygienic: Cockroaches/untidy: 3.8%
Learners became sick as a result of food: 7.7%
Increase in theft at the school: 11.5%
If no food was available, decrease in school attendance: 3.8%

Only 30.3% of the parents interviewed indicated that they were involved in the PSNP. The majority of these parents (54%) helped with the distribution of the food, while 30.2% helped

with the preparation of the food. Only 6 parents/community members were involved with the management of the feeding scheme.

Some of the parents suggested that they should be paid for preparing/serving the food at the schools.

Half of the parents (50.9%) indicated that they would like to become involved with the feeding scheme. Of the 76 parents who indicated that they would like to become involved, 60.5% were prepared to distribute the food, 35.5% to prepare food and 18% to clean and wash up.

Two-thirds of the parents (67.1%) thought that the community benefited from the scheme. The majority (75.2%) said that it helped the parents who were unemployed and that the parents did not had to feed their children. A small percentage (3.8%) indicated that the parents also got food from the school.

Two of the 212 parents indicated that community projects developed because of the PSNP, but not one could give details of such projects.

3.5.2.4.2.4 Dependency

Forty-one percent of the educators said that the provision of food led to dependency. Forty-two percent of the parents said that they became dependent on the feeding scheme.

3.5.2.5 Project outputs: Number of learners receiving food

3.5.2.5.1 Introduction

This part deals with the results of the primary outputs of the project. These include the provision of safe, enriched foods to 375 955 learners at primary schools.

The North West Province aimed at providing 375 955 learners in 1573 primary schools. Ninety two percent of these learners are from rural schools and the rest from urban schools. Farm schools are classified as rural schools. These learners should receive food every day

of the school year. For 1999 the actual number of school days was 200 days as indicated in Table 3.21.

Table 3.21 Breakdown of the number of possible feeding days for 1999

Term	Duration	No of weeks	No of days	No of public holidays	Actual no of school days
1	11 Jan – 26 March	11	55	1	54
2	12 April – 25 June	11	55	2	53
3	19 July – 24 Sept	10	50	2	48
4	4 Oct – 3 Dec	9	45	0	45
Total		41	205	5	200

The records of the number of feeding days were given to the fieldworkers at the schools.

3.5.2.5.2 Results of the number of learners receiving food

Not all the schools kept record of the number of feeding days for 1999. Sixty percent of the schools had either a record or some idea of the total number of feeding days for 1999. Eleven percent of the educators said that they gave needy children food over the holidays.

In Table 3.22 the average number of feeding days per school for 1999 is given. In the Business Plan 1999/2000 of the Department of Health, 190 possible feeding days were used in the calculations.

Table 3.22 Average number of feeding days per school for 1999

Time period	Number of schools that kept record	Percentage of schools	Average number of feeding days
First quarter of 1999	79	51.0	34
Second quarter of 1999	78	50.3	35.6
Third quarter of 1999	88	56.8	35.5
Fourth quarter of 1999	85	54.8	33.9
Holidays during 1999	6	3.9	3.8
Total for 1999	93	60.0	125.3

The average of 125 days represented 65.8% of the possible 190 feeding days.

3.5.2.6 Project outputs: Targeting

3.5.2.6.1 Introduction

According to the National Department of Health guidelines, the focus is on addressing short-term hunger that is a direct result of poverty. Therefore geographic areas where poverty levels are the highest are targeted. The next level is the selection of schools based on established need. Priority is given to schools serving rural and peri-urban areas, including schools serving informal settlements. Targeting is done within the limits of affordability.

In the North West Province the objective, according to the Business Plan 1999/2000, was:

- To feed 345 721 rural primary school pupils from a total of 384 135 rural primary school pupils in a total of 1312 rural primary schools in the province;
- To feed 30 234 urban primary school pupils form a total of 151 174 urban primary school pupils in a total of 261 urban primary schools in the province;
- Total number of primary school children to be fed was 375 955.

The aggregate poverty gap was not used for targeting as indicated in the Business Plan 1999/2000. The Business Plan 1999/2000 did, however, include criteria for targeting. Due to financial constraints only needy primary schools were considered, priority was given to rural/farm schools, and only pupils from grades 1–7 were to be considered.

The build-in implication of working with a static budget for the PSNP within the inflationary environment is that funds will be decreasing annually. To cope with this decrease, provinces must either find cheaper food options, feed the children less, or feed fewer children. Alternatively, redistribution of funds can take place at national level when allocations to provinces are made. The latter could be an option if improvements in nutritional status are experienced in some provinces. To have access to changes in nutritional status, monitoring of nutritional status has to be done in the provinces. The principle of diminishing funds is acceptable in view of the underlying RDP principle of community empowerment. Income generating and other RDP activities are therefore supposed to take off and overtake the need for a feeding scheme at schools.

Questions relating to the targeting process at schools were included in the school questionnaire and the educator questionnaire. Information on the process at the Departments of Health and Education was obtained from existing documentation.

3.5.2.6.2 Results of targeting

3.5.2.6.2.1 Process at the Department of Health and Education

The Secretariat, comprising of staff of the Department of Health and the Department of Education, were responsible for targeting schools. At the beginning, in 1994, the MEC for Health held a meeting with all the stakeholders and the decision was reached that all primary schools in the North West Province would be targeted. A list of all the primary schools in the previous Bophutatswana and within the new boundaries of the Province was compiled. Old Model C schools were given the choice whether or not they wanted to be part of the PSNP. If they indicated that they want to receive food, they had to provide specific numbers. The Department of Education had problems in compiling the list of all the schools. Around 1997 the decision was made to target only 80% of the children of farm/rural schools and 20% of the urban schools. The reason was that the need was higher in farm/rural schools than in urban schools. Schools were continuously added to and deleted from the list, because new schools opened and farm/rural schools amalgamate (because of the decrease in the number of learners). Schools may apply to be added. A fieldworker of the Department of Education then visited and evaluated the school for inclusion or exclusion. Schools also had to apply to be removed from the list of schools receiving food as part of the PSNP.

Targeting of the needy learners in a school is left to the discretion of the principal of the school.

3.5.2.6.2.2 Process at the schools

Seventy-two percent of the schools indicated that they did not target, but gave food to all the learners in the school. Thirteen percent said that they targeted more than 50% of the learners and 15.6% said that they targeted less than 50% of the learners. Eighty three percent of the schools said that all the learners from grades 1 to 7 received food during 1999.

Only 30 of the 38 schools that were targeted, were able to explain how targeting was done. In 50% of these schools, class educators identified needy learners, in 26.3% of the schools the principal was responsible for targeting and in 23.3% of the schools only needy children

and only certain grades were targeted. In 23.3% of the schools only certain grades were targeted. In one school the hungry learners had to ask for food.
Seventy percent of the schools thought that targeting was not necessary.

Most of the schools (63.3%) said that targeting had a negative effect on the learners. Reasons offered for this statement included:

- Targeting led to stealing, conflict between the learners, learners felt neglected, stigmatisation: 48.9%;
- Everybody needed food: 22.6%.

More than ten percent of the schools (11.3%) said that the provision of food led to intimidation, victimization and stigmatisation. Thirteen percent of the parents said that the provision of food led to intimidation, 12.1% said it led to victimization and 11.8% said it led to stigmatisation.

Most of the educators (96.9%) and learners (95.6%) felt that all the learners from grades 1 to 7 should receive food.

3.5.2.7 Project output: quality control and hygiene control

3.5.2.7.1 Introduction

It is important that environmental conditions in schools ensure a safe food supply. Such conditions are supported by clean and safe water and food, safe means of waste disposal, good standards of hygiene, cleanliness, tidiness and adequate ventilation. Applying rules for safe food preparation is also essential for learners, educators and service providers. Some general guidelines for safe food preparation include:

- Foods should have been processed for safety;
- Store food under hygienic conditions;
- Wash hands repeatedly with soap and water before handling of food for preparation or eating;
- Keep area of food preparation meticulously clean;
- Protect food from insects, rodents and other animals;
- Use safe water.

No samples of food were analysed for microbial safety. Assessment of the quality and hygiene standards was based on structured observations by the fieldworkers. Fieldworkers also asked the person responsible for food preparation about the freshness of produce.

3.5.2.7.2 Results on quality control and hygiene control

The schools indicated that they sometimes received food that they were not able to use as indicated in Table 3.23.

Table 3.23 Percentage of schools that received food that they were not able to use

Food	Percentage of schools (n = 156)
Bread	3.6
Peanut butter	2.1
Biscuits	7.0
Porridge	3.5
Cool drink	3.5

Three schools said that they gave the food to the learners to eat, and four said that they threw it away or fed it to the pigs.

Table 3.24 gives an indication of where food is stored at the schools. Almost half the schools (47,3%) stored food in a separate storeroom, while the other half did not have adequate storage space. A small number of schools (9.3%) stored food off the school grounds or at the principal's or educator's home. The majority of schools (78.4%) did not have refrigeration available for storage of food for the PSNP. The majority of schools (70%) did apply basic hygienic principles with regard to cleanliness of storage and preparation areas, although the means were not always available. Sixteen percent of the schools did not have clean water available on the school premises for the preparation of food or cleaning of the preparation and feeding equipment. Half the schools (44%) did not have a washbasin available, 67% of the schools did not have clean towels or paper towels available. As far as the edibility of food products is concerned, 27,9% of the schools had stock with an expired date in stock and almost 30% of the schools had stock (porridge 28.6%, cool drink 31.8%, peanut butter 33,3%) with no expiry date on the package. At least 25% of the schools indicated that the peanut butter in stock became rancid ("colour changed to black") and 14% indicated that bread and biscuits delivered (11.7%) were stale.

Table 3.24 Place of storage of food at schools

Place of storage	Percentage of schools (n = 156)
Separate room/storeroom/bookstore	47.3
Cupboard	10.7
Drawer	1.3
Office of principal	13.3
Classroom	15.3
Not on school ground	7.3
House of principal or educator	2.0
Staff room	2.0
Library	0.7

Table 3.25 gives a summary of the responses received on the check list used.

Table 3.25 Responses to the checklist

Statement	% Yes	% No	% Don't know or N/A
Is the food stored in a specific place?	59.1	33.8	7.1
Is the food stored in a separate room?	43.8	49.7	6.5
Is the food stored in a cupboard?	16.2	77.9	5.8
Is refrigerated storage available?	13.7	78.4	7.8
Is the storage area locked?	72.7	22.7	4.5
Is the storage area big enough for the quantity of food that must be stored?	47.7	47.1	5.2
Has more than one person a key to the storage area?	37.7	50.6	11.7
Is the floor of the storage area clean? (Floor, walls, windows, surfaces)	69.5	25.3	5.2
Are the walls of the storage area clean?	70.8	24.0	4.5
Are the windows of the storage area clean?	75.3	18.8	5.8
Are the surfaces of the storage area clean?	70.8	24	5.2
Is the food stored in an orderly manner?	63.0	31.2	5.8
Are the different foods stored separately from each other?	47.7	42.5	9.8
Are the containers and cups stored in the same place?	35.7	48.1	16.2
Are the utensils and containers clean?	73.9	13.1	13.1
Is clean water available at the site of the food preparation?	81.2	16.2	2.6
Does the person preparing the food wash hands before the food is handled?	81.2	7.1	11.7
Is a separate surface (table/etc.) available for the preparation of the food?	62.3	27.9	9.7
Is a hand basin in or near the preparation area?	48.7	44.2	7.1
Is soap available?	43.5	44.8	11.7
Is a clean towel or paper towels available?	14.9	67.5	17.5
Is there a container for used paper towels?	13.6	64.9	21.4
Does the person smoke while handling the food?	6.6	78.1	15.2
Is the food given to the children in a plastic container (cup / plate)?	59.9	28.9	11.2
Is the food given to the children in disposable containers (paper)?	18.8	64.3	16.9
Is the bread fresh?	42.9	16.2	40.9
Is the bread stale?	14.3	42.9	42.9
Is the peanut butter rancid?	25.0	25.0	50
Are the biscuits fresh?	79.2	11.7	9.1
Is the dry porridge powder free of foreign materials?	68.2	18.8	13
Is the dry cool drink powder free of foreign materials?	72.7	15.6	11.7
Do the children wash their hands before eating?	79.2	9.7	11
Are washing facilities available?	53.2	38.3	8.4
Do the learners share utensils?	20.8	65.6	13.6
Do the learners share containers?	31.8	59.7	8.4
Is the old stock of food used before the new stock?	67.5	20.5	11.9
Is there an "expires before" or "use before" date on the box or wrapping of the biscuits?	68.6	20.9	10.5
Is there an "expires before" or "use before" date on the box or wrapping of the porridge?	61.0	28.6	10.4
Is there an "expires before" or "use before" date on the box or wrapping of the cool drink?	56.5	31.8	11.7
Is there an "expired before" or "use before" date on the box or wrapping of the peanut butter?	31.4	33.3	35.3
Is there any stock with an expired date in stock?	27.9	59.1	13.0

3.5.2.8 Primary outcome: Eating patterns and alleviation of temporary hunger

The Primary outcomes of the evaluation are subsequently described and include the eating patterns of the learners, alleviation of temporary hunger, school attendance, active learning capacity of the learners and unintended consequences of the feeding scheme.

3.5.2.8.1 Introduction

Children who participate in school breakfast programmes are more likely to eat breakfast, and children who eat breakfast are more likely to have significantly higher intakes of nutrients than children who skip breakfast. Children who participate in school feeding programmes have a higher intake of energy and many other nutrients compared to non-participants. Schools' feeding programmes could also contribute to local agricultural production through increased food expenditure. Participation of children in a breakfast programme did indicate a beneficial effect on children associated with the school breakfast programme (measured by attention, short-term memory and classroom behaviour (Richter *et al.*, 1994).

Hunger is defined as the psychologic and physiologic state resulting when there is insufficient food to meet immediate energy needs (Read, 1973). One of the immediate criteria for the PSNP is to address the short-term effects of hunger and therefore the emphasis is on energy intake. Hunger reduces the ability of learners to pay attention, concentrate, learn and remember, and therefore diminishes the benefit of attending school (Pollitt, Gersovitz & Gargiulo, 1978 in Richter *et al.*, 1994).

Information on the eating patterns of schoolchildren, specifically pertaining to number of meals eaten, bringing of food to school and frequency of consumption of specific types of food at home has been obtained using structured questionnaires for the educators, parents and learners.

A few questions on the experience of hunger by the learners as perceived by the educators, parents and learners were included in the questionnaires.

3.5.2.8.2 Results: Eating patterns and alleviation of temporary hunger

3.5.2.8.2.1 Eating patterns

A third of the parents (31.3%) indicated that their children did not eat breakfast before school and 30.4% indicated that they did not eat lunch after school.

Forty-six percent of the 63 parents whose children did not eat breakfast said that the children got food at school, 33.3% said that there was no food at home and 17.5% said that the children did not have time to eat in the morning. Nearly three quarters of the 63 parents (73.8%) indicated that their children did not eat lunch, because they got food at school and 24.6% indicated there was no food at home.

Twenty-one percent of the learners reported that they never ate breakfast and 61% that they always ate breakfast.

If they ate breakfast it was usually between 6:00 and 7:00 in the morning (58.3%), while 20% ate before 6:00 in the morning and 19.3% ate between 7:00 and 8:00 in the morning.

Nearly all the learners (94.7%) walked to school and it took the majority 15–30 minutes (32.5%). More than a quarter (26.6%) walked between 30 minutes and 1 hour to get to school. Twelve learners reported that it took them more than 3 hours to get to school and 10% walked to school for 1–1½ hour.

Nearly a quarter of the learners (24.2%) reported being hungry when they got to school and 6.4% sometimes were hungry.

Forty percent of the learners got home between 13:00 and 14:00 in the afternoon and 43.4% between 14:00 and 15:00. More than three quarters (78.7%) ate lunch when they got home in the afternoon and 9% never ate lunch.

Of those who did not eat lunch, 40.3% were not hungry and 25.2% indicated that there was no food at home.

More than a quarter of the educators (26.4%) reported that parents stopped to give lunch boxes to their children because they were receiving food at school in the morning. Fifty percent of the educators said that the learners still bring lunch boxes to school.

Half of the educators indicated that the learners brought money to school. A third of the learners brought 50 cents, 25% brought R1.00 and 25% brought R2.00 to school daily.

According to the educators 29.6% of the learners who received food at school brought money to school.

Only 10.2% of the educators reported that the school has a tuck shop. Food items most frequently sold are sweets/cake/cookies followed by potato chips (crisps)/Niknaks and then cool drinks.

Forty-two percent of the learners indicated that they did not get money to take to school, but 17.5% always brought money to school. Sixteen percent of the learners got money twice per week.

More than 400 learners (52%) said that they bought something to eat at school. The majority bought chips / Fritos / Niknaks (49.5%), followed by sweets/chocolates (41.2%), biscuits / cookies / cake (34.6%), and bread (24.6%). The majority (50.5%) usually bought it from the vendors at the school.

Thirty-nine percent of the learners brought a lunch box to school. Of these, 49.7% always brought a lunch box, 19.7% three times per week and 15.9% twice per week.

The majority of learners brought bread (66.6%) to school, followed by a protein source such as meat, fish, egg, peanut butter (49.3%) and maize meal porridge (40.5%). Twenty percent of the children brought either a fruit or a fruit juice to school and 20% also brought either Polony or Russians (sausages) to school.

Forty-two percent of the learners who brought food to school ate the food supplied at school as well as their own food, while 48% ate only their own food.

3.5.2.8.2.2 Alleviation of temporary hunger

The perception of most of the educators (82.3%) was that the learners are less hungry at school since they received food at school. Sixty-five percent of the educators thought that

the food was enough to still the hunger of the learners, but 27.8% were of the opinion that there still were learners who went hungry at school.
Table 3.26 indicates the proportion of learners still hungry.

Table 3.26 Proportion of learners still hungry (n=59)

Proportion	Percentage educators
All the learners	1.7
>60% of the learners	6.8
40 – 60% of the learners	37.3
<40% of the learners	54.2

Nearly fifty percent of the parents (46%) reported that one of the advantages of the feeding scheme was that it helped the needy children to get food and thus alleviate temporary hunger.

The food served at the school helped to alleviate hunger as 75.2% of 536 learners said that they felt less hungry after they had eaten the food supplied by the school.

3.5.2.9 Primary outcome: acceptability of the food items on the menu

3.5.2.9.1 Introduction

According to the National criteria for the PSNP, the guidelines for a healthy diet should be followed in selecting food options. The use of commercial food products such as cool drinks, biscuits and soup powder should be limited because the message to children via such foods can oppose basic nutrition education messages and undermine household food security. It is stated that such foods seldom fit in with local eating habits and seldom contribute to community involvement.

Questions on food preferences and perceptions of the health aspects of food were included in the questionnaire for educators, parents and learners.

3.5.2.9.2 Results of the acceptability of the food items on the menu

The educators thought that the food served as part of the PSNP was acceptable. The majority (77.6%) found the food palatable. Nearly all of the educators (94.9%) thought that

the food was acceptable to the learners and 82.7% said it was also acceptable to the community.
Most of the parents (80.3%) said their children liked the food.

The majority of both educators and parents thought that the food was healthy for the learners.

The educators (31%) reported that the learners did not like the porridge and cool drink. Some of the food was also wasted by the learners. Twenty-six of the educators said that the porridge should not be included on the menu.

The learners usually ate the food that they received at school. Of the 48 learners who said that they did not eat the food, 39.6% did not like it, 34% took it home, and 14.9% said it made them sick.

The food item most liked by the learners was the biscuits (64.2%). The main reason given was that it tasted nice (88.8%), while 39.4% said they like the food because it is healthy.

The porridge was liked least by 60.8% of the learners followed by the cool drink and biscuits (both 13.8%). They disliked the food because it did not taste nice (67.3%), made them feel sick (29.7%) and was perceived as not being healthy (23.8%).

- **Suggestions for new food items on the menu**

Open-ended questions to the educators and parents indicated that the fruit, milk and bread group should be included on the menu (Tables 3.27 and 3.28). The parents also suggested soup, especially in the winter. The learners suggested bread, fruit and milk for inclusion on the menu (Table 3.29).

Table 3.27 Alternative suggestions by the educators on new food items

Suggested food	Percentage of educators suggesting it (n = 256)
Fruit	55.2
Milk/cheese	48.9
Meat/fish/chicken/peanut butter/soya	25
Bread/porridge/rice/samp	38
Jam/sugar/syrup/sweets	11.5
Soup	36.4
Snacks	1.6
Give more food	0.5

Table 3.28 Alternative suggestions by the parents on new food items

Suggested food	Percentage of parents suggesting it (n = 215)
Fruit/vegetables	69.5
Milk/cheese	45.3
Meat/fish/chicken/peanut butter/soya	21
Bread/porridge/rice/samp	34.7
Jam/sugar/syrup/sweets	6.3
Soup	36.3

Table 3.29 Suggestion by the learners for alternatives on the menu

Food item	Percentage of learners suggesting it (n = 764)
Bread	60.6
Fruit or fruit juice	52.8
Milk	37.6
Cake/biscuits/cookies	32.9
Potato crisps/Fritos/Niknaks/etc.	25.2
Canned cool drinks	24.1
Maize meal porridge	21.3
Cooked food	14.6

The eating pattern of certain foods at home of the learners is illustrated in Table 3.30. Bread was eaten by nearly half the learners (46.7%) 1–3 times a week. Nearly half the learners said that they regularly drink cool drink at home (45.1%) and eat fruit (45.8%). Two-thirds of the learners (67.1%) said that they never eat the type of porridge at home that they receive at school.

Table 3.30 Response of learners (n = 764) on how often they ate certain foods at home

Food	1-3x/week	>3x/week	Never
Bread	46.7	44	9.3
Peanut butter	24.7	19.5	55.8
Biscuits/cookies	38.2	27	34.8
Porridge as you get at school	11.3	21.6	67.1
Maize meal porridge	12.1	84.2	3.6
Any type of cool drink	45.1	31.9	23
Milk	23.9	70.2	5.9
Fruit	45.8	39.3	14.9
Vegetables or potatoes	35.9	57	7.2

3.5.2.10 Primary outcome: School attendance

3.5.2.10.1 Introduction

Improved school attendance is often stated in literature as a possible outcome of any school feeding programme. However, it is not always easy to illustrate a direct link.

A question on improved school attendance as a result of the PSNP was included in the questionnaires to the educators, parents and learners.

3.5.2.10.2 Results: School attendance

Nearly all the educators (96.1%) felt that school attendance improved and 73.5% that punctuality improved.

Twenty percent of the parents reported that the improvement in school attendance is one of the advantages of the school feeding scheme. Twenty-two percent of the parents reported a negative effect of the feeding scheme, namely that school attendance decreased when no food was available at the schools. A very small percentage (5%) of the learners said that they came to school just to get food.

3.5.2.11 Primary outcome: Active learning capacity

3.5.2.11.1 Introduction

Active learning capacity is defined as a child's propensity and ability to interact with and take optimal advantage of the full complement of resources offered by any formal and informal learning environment. Changes in mental performance occur within an hour or so eating a meal and as a direct consequence of the meal (Craig, 1986). Cognitive functions are more vulnerable to missing breakfast in poorly nourished children (Simeon & Grantham-McGregor, 1989).

Although no mention was made in the Business Plan 1999/2000 of the Department of Health on the appropriate serving time of the food at the schools, the national guideline suggested that it should be served early (preferably before 09:00), otherwise the impact on maintaining

the blood glucose level at an even level will be limited, thus minimizing the impact on a learners' active learning capacity.

Questions pertaining to aspects of active learning capacity were included in the questionnaire for the educators. In the questionnaire for parents they were asked to list possible advantages and disadvantages of the PSNP. Questions directed at the schoolchildren centered on how the food made them feel.

3.5.2.11.2 Results: Active learning capacity

The results are subjective data based on the perception of the educators, parents and learners. The majority of educators (93.3%) reported that the learners' concentration improved as indicated in Table 3.31.

Table 3.31 Changes observed by the educators

Statement	Percentage of educators who observed an improvement (n = 256)
Concentration in class	93.3
Discipline	75.9
School performance	84.3
Alertness and participation in class	88.2

Fifteen percent of the educators (15.4%) said that they have used the promise of food to discipline the learners.

Some parents (15.9%) stated improved concentration of the children as one of the advantages of the school feeding scheme.

The perception of nearly all of parents (95.8%) was that the food that their children got at school helped them to learn better. Over fifty percent (53%) said that the children could concentrate better and obtained better results.

More than fifty percent of the learners experienced a positive feeling regarding active learning capacity after they had eaten the food supplied to them at school (Table 3.32).

Table 3.32 Comments from the learners on how the food made them feel

Statement	Percentage of children (n = 764)
Could concentrate better	59.4
Could learn better	55.7
Could listen better	52
Could stay awake in class	54.2

According to the educators between 77% and 92% of the schools gave the food between 10:00 and 12:00 depending on the Grade. On average only 10% of the learners received the food before 10:00 in the morning and the learners usually ate outside.

According to the learners they usually received the food during the first break (67.5%), between 10:00 and 11:00. Twenty six percent received their food during the second break (12:00) and 2.8% received the food after school. Only 3.7% reported to receive food before school or early morning. The majority of learners (91%) were satisfied with the time when they received the food.

3.5.2.12 Primary outcome: Leakage

3.5.2.12.1 Introduction

Various criticisms have been directed at feeding programmes. It is argued that programmes might not reach the entire community at risk as participants may share, exchange or sell their ration (McNaughton, 1983 in Richter *et al.*, 1994).

Questions with regard to PSNP food being taken home and shared were included for the learners.

3.5.2.12.2 Results: Leakage

More than half the learners (54.6%) indicated that they took food home. They usually took biscuits (88.2%), porridge (20.7%) and bread (19.4%) home. Sixteen percent said they took cool drink home.

The learners took food home mainly (75.4%) to share it with other children, usually younger siblings, at home. A small percentage (4.8%) said that they did not like it. Of 116 learners 73.3% said that they kept the biscuits to eat later with tea at home and 25% said they took it home for their parents.

Nearly half the learners (47.9%) said that they saw an educator eating some of the food that they received at school. Almost a quarter of the learners (22.5%) said that they saw an educator taking food away from school.

3.5.2.13 Primary outcome: Unintended consequences - the glycaemic response of 10-year-old children to products used in the PSNP in the North West Province

3.5.2.13.1 Introduction

One of the primary aims of the PSNP is to ensure that hungry children who missed breakfast are enabled to benefit from learning opportunities. The response of many children to questions on how they feel after eating some of the products in the PSNP, motivated this part of the evaluation of the programme. Several children reported that they felt nauseous, experienced trembling and lack of concentration after eating some products. These symptoms are typically associated with reactive low blood glucose levels (Kumar & Clarke, 1994). The underlying mechanisms are that in healthy persons, refined carbohydrates (starch and sugars) are rapidly digested and absorbed. The resultant increase in blood glucose levels stimulates insulin secretion. High levels of insulin will facilitate rapid uptake of glucose from the blood by muscle and fat cells. The result is a rapid decrease in blood glucose level. This fall in blood glucose stimulates the secretion of a battery of "stress" hormones including glycagon, adrenalin (epinephrine) and cortisol. These hormones will influence the liver to convert glycogen and amino acids to glucose, and to secrete this glucose into the circulation. The result is that blood glucose levels are increased. In undernourished individuals liver glycogen stores are often depleted and the body is therefore not able to adequately respond to the stress hormones. Many well-nourished individuals will not be able to produce enough glucose to restore blood glucose levels. The sustained low blood glucose level means that the brain and other nervous tissue do not obtain sufficient glucose, the only short-term metabolic fuel for these tissues, and nervous dysfunction such as a lack of concentration, ensues. The stress hormones are further responsible for the symptoms of nausea and trembling. This phenomenon is known as reactive hypoglycaemia. Reactive hypoglycaemia can be prevented by small frequent meals, or by eating

carbohydrate foods that also contain dietary fibre (whole grain foods), protein and/or fat. These substrates delay the digestion and a slow sustained increase in blood glucose levels and low insulin responses between meals (Liljeberg *et al.*, 1999). There is convincing evidence (Heller & Macdonald, 1996; McCrimmon *et al.*, 1997) that mental and physical performance is impaired during episodes of hypoglycaemia. From the above it is clear that if the products of the PSNP evoke hypoglycaemia in the participating children, the purpose of feeding the children will be defeated. The aim of this sub-study was therefore to determine the effect of two of the products (instant porridge and cool drink) on blood glucose levels of 10-year-old children.

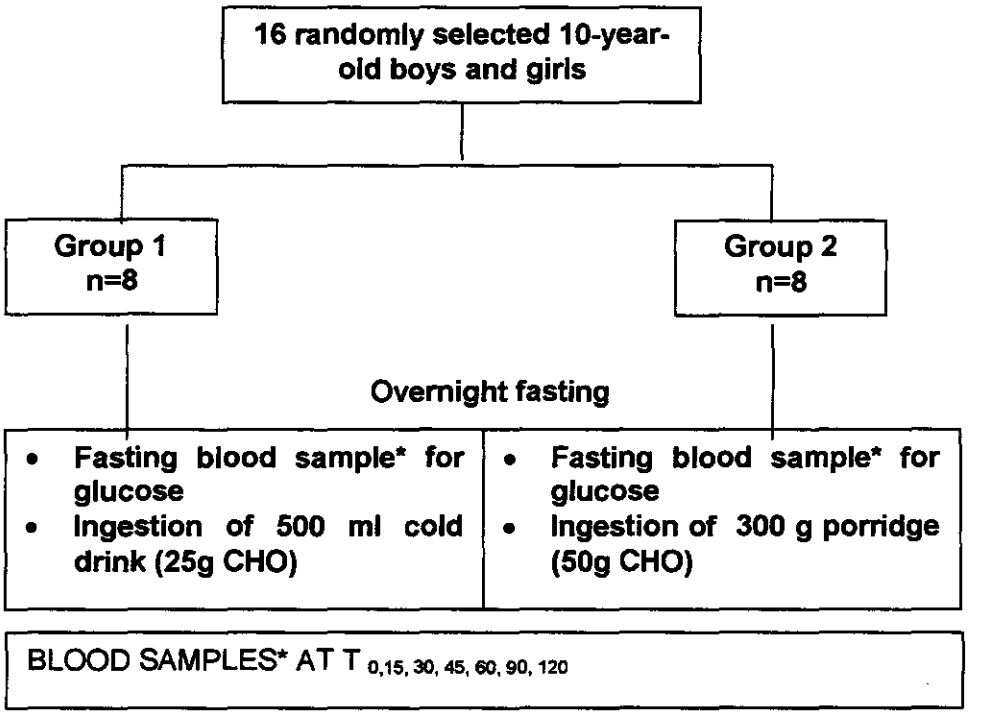
Morvite instant porridge was used because it is presently used as part of the PSNP. The cool drink powder, supplied by Pusela was used, because it was still used up to the end of April 2000. The composition of the new cool drink powder supplied by Nutritional Foods will probably be exactly the same.

A 58-gram portion of the porridge, providing 50 gram of carbohydrate was chosen, because 50 g carbohydrate is routinely used in determining the glycaemic effect of foods (Joint FAO/WHO Consultation Group, 1998). This amount of carbohydrate in the cool drink was unrealistically high and a portion of powder providing 25 grams of carbohydrate diluted in 500 ml of water was chosen.

3.5.2.13.2 Methodology

3.5.2.13.2.1 Study design

The design of the study is given in Figure 3.3.



* Blood samples: Finger prick, sterilised needle, using an Autoclix device
Glucose: Automatic enzymatic, using the Lifescan Glucometer.

Figure 3.3 Design of the study

3.5.2.13.2.2 Ethical approval

The study was approved by the Ethics Committee of the PU for CHE (ethics number: OOM 13). Subjects were under aged and the children's parents signed an informed consent form, giving permission to do finger prick testing.

3.5.2.13.2.3 Subjects

Sixteen learners from a local primary school in Potchefstroom were recruited for the study. Eight boys and eight girls participated in the study.

3.5.2.13.2.4 Procedures

The quantities of the dry porridge and cool drink were weighed on an electronic scale accurate to 0.01 gram and mixed with the correct quantity of clean water at room temperature.

The children fasted overnight for at least 10 hours. The children were picked up at their houses and at the school and brought to the lipid clinic at the Potchefstroom University. The experiment started at 07:00. A qualified nursing sister was in charge of the experiment. The children were divided into two groups. The one group received porridge mixed with clean water and the other group cool drink mixed with clean water. The children ate their porridge and drank the cool drink immediately after the first finger prick and blood sample was taken.

Sterilised needles were used only once for each finger prick.

The children were weighed on a standardized electronic scale. Three measurements were taken and the average calculated. An experienced researcher using a stadiometer and standard procedures took the height of the children.

3.5.2.13.2.5 Glucose measurements

Four researchers, standardized for the procedure, were responsible for the finger pricking and measurement of the blood glucose levels. Standardized equipment was used for the measurements.

3.5.2.13.2.6 Statistical analysis

Descriptive statistics, using the Excel programme was done. Means (±SD) were calculated and data presented in tables and figures.

3.5.2.13.3 Results

The personal details of the participating children are given in Table 3.33.

Table 3.33 Details of participating children

Variable	Porridge	Cool drink
Gender	**n=8 girls**	**n=8 boys**
Mean age (months)	125 ± 5.4	128 ± 10.8
Mean height (cm)	137.6 ± 7.25	134.1 ± 6.54
Mean weight (kg)	32.8 ± 5.07	28.7 ± 5.35
Height/age number normal	7	8
Height/age number abnormal	1 stunted	0

The times of a hypoglycaemic event occurring for particular children are summarised in Table 3.34. A hypoglycaemic event was defined when blood glucose level was below the fasting (t_0) level.

Table 3.34 Times of hypoglycaemic events

Porridge		Cool drink	
Subject number	**Time of hypoglycaemia**	**Subject number**	**Time of hypoglycaemia**
1	t15	9	t45 and t120
7	t120	10	t120
8	t120	11	t15 and t120
		12	t120
		13	t15, t90 and t120
		14	t120
		15	t60

The mean response of the children to the porridge was a gradual increase in blood glucose level, reaching a maximum at 60 min after ingestion, and a gradual decrease over the next 60 min. The mean glucose value of 4.69 mmol/L was higher at t120 than the fasting mean value of 4.33 mmol/L. However, Table 3.34 shows that three of the eight children (37.5%) experienced a hypoglycaemic incident after eating the porridge.

Table 3.34 shows that seven of the eight children (87.5%) experienced a hypoglycaemic incident after drinking the cool drink.

3.5.2.14 Secondary outcome: Anthropometric status of the learners

3.5.2.14.1 Introduction

Physical growth is regulated by two factors, namely genetics and the environment (Mahan & Arlin, 1992). Macronutrient components of foods such as protein, carbohydrate and fat, which are the sole contributors to energy intake, are the principle determinants of growth rate. For this reason the anthropometric determination of nutritional status is indicative mainly of the availability of protein and energy foods.

In 1987, the United Nations sub-committee on nutrition and the World Health Organisation estimated that one-third to two-thirds of children in developing countries show some degree of growth retardation.

3.5.2.14.2 Results: Anthropometric status of learners

The results of the anthropometric data are given in Tables 3.35, 3.36 and 3.37.

Table 3.35 Height-for-age: Proportion of learners

	Girls <11years (n= 85)	Girls ≥11years (n= 68)	Boys <11years (n= 87)	Boys ≥11years (n= 34)	TOTAL (n=274)
Severely stunted (<-3SD)	7 8.2%	4 5.9%	9 10.3%	6 17.6%	26 10%
Stunted (<-2SD)	11 13.0%	7 10.3%	8 9.2%	2 5.9%	28 10.2%
Lower normal (-2SD – 0)	65 65.0%	40 58.8%	53 65.5%	24 70.6%	175 63.8%
Upper normal (0 - +2SD)	11 12.9%	17 25%	14 16.1%	2 5.9%	44 16%
Tall (>+2SD)	0	0	1 1.1%	0	1 0.4%
>- 3SD	0	0	0	0	0

No statistically significant ($p<0.05$) differences were observed between the different age categories or between the boys and girls.

Table 3.36 Weight-for-age: Proportion of learners

	Girls <11years (n=102)	Girls ≥11years (n=84)	Boys <11years (n=81)	Boys≥11 years (n=34)	TOTAL (n=301)
Severely underweight (<-3SD)	0	0	0	0	0
Underweight (<-2SD)	6 5.9%	15 17.9%	6 7.4%	4 11.8%	31 10%
Lower normal (-2SD – 0)	90 88.2%	64 76.2%	71 86.4%	28 82.3%	253 84%
Upper normal (0 - +2SD)	3 3%	5 6%	4 5%	2 5.9%	14 4.7%
Overweight (>+2SD)	3 3%	0	1 1.2%	0	4 1.3%
Obese (>+3SD)	0	0	0	0	0

No statistically significant ($p<0.05$) differences between the different age categories or between the boys and girls were observed.

Table 3.37 Weight-for-height: Proportion of learners

	Girls <11years (n=9)	Girls ≥11years (n=17)	Boys <11years (n=81)	Boys≥11 years (n=34)	TOTAL (n=141)
Severely wasted (<-3SD)	0	0	2 2.5%	0	2 1.4%
Wasted (<-2SD)	0	1 5.9%	2 2.5%	2 5.9%	5 3.5%
Lower normal (-2SD – 0)	7 77.8%	11 64.7%	52 64.2%	19 55.9%	83 58.1%
Upper normal (0 - +2SD)	1 11.1%	5 29.4%	18 22.3%	7 20.6%	31 22.1%
Overweight (>+2SD)	0	0	3 3.7%	0	3 2.1%
Obese (>+3SD)	1 11.1%	0	4 4.9%	6 17.6%	11 7.8%

No statistically significant ($p<0.05$) differences between the different age categories or between the boys and girls were found.

Stunting (height-for-age <-2SD) affects 20% of the learners in the study population. Severe stunting (<-3SD) is more prevalent in boys ≥11 years of age (17.6%). Underweight (weight-for-age <-2SD) is affecting 10% of all learners with no severe underweight (<-3SD) in any of the groups. Girls ≥11 years of age are more affected by underweight (17.9%). Weight-for-height could only be calculated for 141 of the learners and wasting (weight-for-height <-2SD) is affecting 4.9% of them. Twenty-eight percent of the overweight learners (>+2SD) are stunted.

It should be noted that for all the anthropometric indices there is a significant shift to the lower end of the "normal" scale i.e. the greatest proportion of all learners has a height-for-age, weight-for-age and weight-for-height between –2SD and 0.

In general there was no difference in the proportion of learners being underweight, wasted or stunted between the rural/farm and urban boys and girls.

3.5.3 Discussion of the programme (input and output) evaluation

3.5.3.1 Socio-demographic

The Project Manager sent a letter to all the selected schools regarding the evaluation of the Primary School Nutrition Programme. The aim of the evaluation was described in the letter, but no indication was given of when the school would be visited. Each of the fieldworkers also carried a copy of the letter from the Deputy Director General of the Department of Education, Dr Karodia, to the schools informing the schools that the fieldworkers are busy with an official study supported by the Department of Education. The fieldworkers experienced no problems entering a school and interviewing the principal or any of the educators or learners. In one school the principal did not give permission to interview learners, since they were busy writing exams.

Detailed maps with an indication of the location of the schools were obtained from the Department of the Premier. This was of tremendous help in locating the schools in the different areas, especially the farm schools.

Schools which were selected to be included, but had closed down, were replaced by the next school on the list of selected schools. In one case a school functioning in the afternoon was replaced by the school that used the same site in the morning. In the Swartruggens area two of the selected schools were replaced by other schools because they could not be located. In the Vryburg area two schools amalgamated in the beginning of 1999. The school geographically closest was then included in the study. This school was more than 50km away.

Three schools were replaced because the schools could not be located and was not on any of the maps.

Mr Dlamini, the then Deputy Director Subdirectorate: Monitoring and Evaluation, visited the field workers on 16 March 2000 at Tshwarajalo Primary School.

One school did not receive any food as part of the PSNP although it had been on the list.

It was not possible to interview two educators at all the schools, because most of the farm schools had only the principal and one educator. At some of the smaller farm schools only the principal was present. The ratio of male to female reported is probably an indication of the distribution of male and female educators in the Province.

A total of 215 parents and members of the community were interviewed. It was not possible to interview a parent at each of the schools, because the parents were at work or lived very far from the school. More mothers than fathers were interviewed because the fathers were away at work.

Five learners were interviewed at all the schools except for one school where only 4 learners were interviewed and in two schools where no learners were interviewed. In one of the schools the learners were writing examinations and in the other school the learners did not receive any food during 1999. This school is in fact still not receiving food. More learners were interviewed in the Western region because more schools were visited in this region. The percentage of boys and girls interviewed is nearly 50% each.

3.5.3.2 Energy and nutrient content of the PSNP menu

There are definite limitations regarding the use of information provided by manufacturers on the composition of their food products. No information was available on the sampling method of the food. The ideal would have been that a random sample was drawn at the sites of use, namely the schools, to allow for any loss of vitamins due to manufacturing processes, transport, storage and preparation. Some vitamins are very unstable under certain conditions, for example riboflavin that is unstable in sunlight.

Different menus were offered to the various regions in the North West Province. Reasons for this were due to logistical considerations and available infrastructure.

The type of foods included in the PSNP need to be carefully considered. Even though 64% of the children indicated that they liked the biscuits, it does not meet the explicit national guidelines of "no commercial food items".

The nutrient composition of the fortified bread met more or less the specifications except for folic acid, iron and calcium that were higher than the specifications. The iron content of the bread was 4 mg per 100 gram higher than the specifications. This contributed an extra 5.6 gram to the average iron provided by the menu, representing 56% of the RDA.

The specification for the peanut butter mixture with margarine was the same as for medium fat margarine. This is totally unacceptable since the protein content of margarine is usually below 0.5% and that of peanut butter in the order of 25% (Langenhoven *et al.*, 1991). If the mixture was 50:50 then the protein specification should have been 12.5%. The specification for protein was 0.2% protein and the laboratory value was 26.9%. The same line of argument applies to the rest of the nutrients. The energy value according to the laboratory analysis was much higher than the specification, 2913 kJ vs. 1880 kJ. In the specifications, under chemical requirements, the energy value was given as 2500 kJ. This is very confusing, but the value of 2500 kJ is probably more correct. All the macronutrients were higher according to the laboratory analysis in comparison with the specification. No specification was given for any of the vitamins or minerals.

The energy and carbohydrate content of the biscuits were in agreement with the specifications. The protein, fat and fibre content were higher than the specifications. Although no specification was given for the vitamin A content of the fortified biscuits, it contained 1760IU per 100 gram. The same applied to iron, calcium, phosphorus, magnesium and zinc. The learners received 100 gram of the biscuits per day. This will contribute an extra 5.3 gram of iron and 1760 IU of vitamin A per day, representing 53% of the RDA for iron and 53% of the RDA for vitamin A. The biscuits will contribute an extra 28% of the RDA for calcium per day.

The reason for the higher than specified nutrient content of the biscuits should be investigated, because it could contribute to an imbalance in the nutrients offered daily to the learners and could also increase the costs of the product.

No laboratory analysis was available for the Morvite Porridge and the values as indicated on the package were used. The fat content of the Insto Porridge was in line with the specifications, but that of the Morvite Porridge was lower. This is also reflected in the lower

energy value of the Morvite Porridge. The niacin, vitamin C, pantothenic acid, iron, calcium and zinc content of the Insto Porridge were higher than the specifications. This could contribute to an imbalance of the nutrient supplied to the learners. The Morvite Porridge also did not meet the specifications. All the nutrients were less than the specifications except for carbohydrate and vitamin C that were higher than the specifications. The laboratory analysis of the Pusela cool drink powder was unfortunately not complete. Although the cool drink was included to improve the vitamin C intake of the learners, no laboratory vitamin C value was given for the Vita juice.

The specifications of the different foodstuffs need urgent discussion to rectify and clarify incorrect specifications. In general the nutritional content of the food products provided to the schools did not meet the tender specifications.

The menus contributed on average 20% of the RDA for energy for 7–10 year olds and did not meet the national or the North West Province guideline of 25% of the RDA for 7–10 year-old children. The protein contribution was 34% and 31% of the RDA for the two menus. No guideline for protein was given on national or provincial level. Vitamin contribution as a percentage of the RDA ranged from 25.9% for vitamin A to 161% for folic acid on the "bread menu". The "non-bread menu" ranged from 25.9% for vitamin A to 159% for riboflavin. The mineral contribution ranged from 7.8% for zinc to 49.2% for iron. These calculations were made using the values as stipulated in the specifications. It is expected that the vitamin A, iron and calcium contributions were in fact higher because the laboratory analyses of two products were higher for these nutrients than the specifications.

The micronutrient supplementation exceeded the guideline of 25% of the RDA for most of the nutrients. It is questionable whether this level of fortification is necessary even in situations of micronutrient deficiencies as is currently the situation in the country. Even more concerning is the obvious imbalance in the micronutrient supplementation. The composition of the food items with regard to other nutrients, for example fat, should not be overlooked in the strive for provision of micronutrients.

Fortification of food items is stated as one of the specific objectives in the North West PSNP. This would not be possible to achieve through home-based community projects. In view of the National Fortification Recommendations awaited (as part of the NFCS), these specifications might be not be needed in the future. The use of costly food items specially produced for the purpose of this objective is questionable.

3.5.3.3 Nutrition education

The high proportion of parents and learners that indicated that the food provided at school were healthy, reflects that people attach a certain value to the food provided. This reinforces the concern that the absence of known home-based traditional foods in the feeding scheme might contribute to these foods as being viewed as less desirable or unhealthy. The long-term implications of this perception on eating habits and capacity to provide for your own, needs to be considered in the choice of food items to be included as part of a feeding scheme.

The high proportion of learners indicating the school as their source of nutrition information might reflect that some related information is included as part of the different subjects taught at school. It is also indicative of the capacity of educators to influence nutrition knowledge and practices of learners. Assessment of an educator-facilitated nutrition education programme in the Northern Cape (Swart, 2000 personal communication) indicated that this could be achieved at a reasonably low cost (28 cents per child for the first year – including training of educators, resource material, etc.; and 5 cents per child per year for continuation). The introduction of outcome based education through Curriculum 2005 or 2021 further facilitates the incorporation of nutrition information into the school syllabus. A primary school nutrition education programme was developed in conjunction with the Department of Education with the intention to have it incorporated in the primary school nutrition curriculum.

In Chili it was shown that the mothers of school-age children did not know food and nutrition is important in fundamental aspects related to the observance of a healthy lifestyle, both for themselves and their family. The researchers suggested that there is a need to introduce, during school age, nutrition education programmes focused on mothers and children to improve the quality of life of the population (Ivanovic *et al.*, 1997). Programmes that include expanded micronutrient supplementation and increased knowledge about nutrition are among the most cost-effective investments in health (WHO, 1998).

Nutrition education was one of the major objectives from the very beginning of the national PSNP. It is of major concern that 6–7 years after the implementation of the PSNP no attempt to provide any nutrition education at schools in the North West Province has been made.

3.5.3.4 Application of RDP principles

The biggest advantage of the feeding scheme as seen by both the educators and parents were the actual feeding of the children per se. The educators also mentioned increased school attendance and improvement in learning capacity and concentration as advantages. The positive contribution of the feeding scheme to improve school attendance was hampered when no food was available at the schools due to delivery problems.

Community involvement was very limited, but more than half the parents were prepared to become involved. This is a very positive aspect and community involvement should be investigated.

There seems to be agreement between educators and parents about dependency that was created as a result of the PSNP. This dependency is a concern as it contradicts the principle of community empowerment stated as a RDP principle. A positive aspect is the fact that more than half the parents indicated that they are prepared to become involved in the PSNP. Community involvement is currently very limited. It was not explored whether this desire for involvement is motivated by an unspoken expectation of payment. This expectation of payment was expressed by some of the parents already involved in the PSNP.

Decentralization of the PSNP to the district and community level should result in greater community involvement and empowerment. It is, however, important to understand that the PSNP (as any other feeding scheme) will result in some dependency – even if limited to the investment of money from the National or Provincial Governments into community based small enterprises. This would, however, at least impact more directly on a larger number of local community members than awarding tenders to Provincial or National manufacturers. Capacity (financial, equipment and management skills) needs to be addressed together with the decentralization process to assist the viability and sustainability of these small enterprises.

3.5.3.5 Number of learners receiving food

Ernst & Young (1997) recommended that a record system be introduced at the schools to monitor the number of feeding days. This system is not in place yet. Fewer schools reported feeding during the first two quarters of the year. A possible reason is that food was not delivered to these schools because of a problem with the allocation of tenders.

Feeding during holidays was not an objective of the Business Plan 1999/2000. Feeding during holidays immediately raises questions about targeting/selection criteria, security and access to food, and equity regarding access for children.

The percentage coverage efficiency defined as

$$\% \text{ Coverage efficiency} = 100 \times \frac{\text{number in need served}}{\text{total number in need}} - \frac{\text{number not in need served}}{\text{total number served}}$$

should be calculated for the PSNP. This is, however, not possible due to the lack of correct information.

The list of schools obtained from the Department of Education that received food during 1999 also included the quantities of food that the schools were supposed to receive. According to this list, dated September 1999, the learners were supposed to receive 150 gram of the fortified biscuits per day (3 or 5 times per week) and 75 gram of porridge (twice per week). This is more than the quantities specified in the Business Plan 1999/2000. Apparently the reason for this is that food was not delivered to all the schools during the first three months of 1999 due to tender problems. The money "saved" had to be used during the rest of the year and the decision was taken that the learners will receive more food.

Comparisons based on the feeding days, the number of schools, and the number of learners, and the expenditure for the corresponding period need to be made. This cannot be done in this report as firstly, the records are incomplete and secondly, no expenditure figures were available.

3.5.3.6 Targeting

It is clear from the results that targeting is not done in most of the schools. Almost all the schools, educators and learners indicated that targeting is not desirable. The main reasons were that all the learners needed the food and that targeting led to conflict between the learners. The learners who did not receive food felt neglected and started stealing food.

The high percentage of schools that used 100% targeting indicated that the criteria for targeting is not always appropriate. During personal communications with some of the educators they said it is extremely difficult and inhumane to give food to certain children when you know that everyone is hungry and needs the food. This was specifically applicable

to the smaller farm school. At one school the principal explained that the children stayed at the school for the week with a limited quantity of food coming from home. Once this was depleted, the school feeding food was the only food available and they gave the children food three times a day when available.

The targeting policy of Provinces is for their own decision. Saasa-Modise (1997) reported different targeting policies in four provinces of South Africa. In the Northern Province only rural and farm children were fed, but the policy changed after a year to that of feeding all children. In Gauteng only needy children were fed. The Eastern Cape targeted only children in grades one and two, and in the Free State all schools were targeted.

3.5.3.7 Quality control and hygiene control

The absence of storage space and availability of clean water needs to be considered in the choice of food items provided as part of the feeding scheme. Utilization of local community based operations to prepare and serve food to children on a daily basis might alleviate the demand for storage and preparation space at schools. The quality of the produce delivered needs to be checked more regularly. Anecdotal reports on stale bread delivered at the schools were often heard during the study. Produce going off might contribute to children not receiving food regularly. The ordering and delivery system needs to be monitored to ensure that stock does not have to be stored for too long. A policy regarding the return of unusable food should be put in place to ensure that payments are not made for food that cannot be used.

3.5.3.8 Eating patterns and alleviation of temporary hunger

The reports from parents and children seem to indicate that the school feeding programme does impact on the distribution of food at home as many children do now not eat either breakfast or lunch at home. According to the educators a small percentage of the learners did not bring a lunch box to school.

According to the learners, 21% of them did not eat breakfast. This is higher than the 14% of Sub A and 17% of Standard 3 learners reported for urban black children (Wolmarans *et al.*, 1995). Another study in a rural area found that 18% of 6–10-year-old black boys did not eat breakfast (Steyn *et al.*, 1993). Some researchers (Steyn & Labadarios, 1997) argued "that

despite the accumulating evidence in favour of potential and actual benefits children may derive from eating breakfast, there exits a paucity of confirmed data in the literature on the translation of these benefits into proven improvements in scholastic achievement". Pollitt (1995) reported that for nutritionally at risk children (defined by clinical history and anthropometry), especially in the 9–11-year-age group all evidence appears to support the concept that eating breakfast ameliorates the adverse effects of an overnight and morning fast on attendance rate and on cognition, particularly in respect of the speed and accuracy of information retrieval in working memory. Contradictions in the data from different studies prevent definitive conclusions on whether well-nourished children experience similar functional deficits (Pollitt, 1995). Benton and Sargent (1992) found that university students who ate breakfast completed a memory test in a shorter time-span than those who did not eat breakfast.

Although 21% of the learners did not eat breakfast, 24.2% were hungry when they got to school. Possible reasons for this increase in the percentage of hungry learners are the long distances that the learners had to walk to school and that the breakfast did not meet their energy requirements.

Although "hunger" was a subjective perception of the learners, 24% reported that they were hunger when they arrived at school. This is in agreement with the findings of a study by Wolmarans *et al.* (1995). They reported that 34.1% of black grade 1 and 17% of black standard 3 (grade 5) learners were still hungry when they arrived at school. The same trend was also reported by Steyn *et al.* (1996) in their study on the perception of school children on the PSNP. Primary schools of the North West Province were also included in this study.

Educators and learners agreed that the food supplied at school assisted in alleviating hunger although a quarter still reported to be hungry at school despite the PSNP food.

3.5.3.9 Acceptability of the food items on the menu

The fortified biscuits were the most favoured food, because it "tasted nice". The porridge and cool drink were not popular, because it did not "taste nice" and made them sick. As early as in 1996 Steyn *et al.* reported that learners in the North West Province disliked the cool drink provided as part of the PSNP.

The two foods that educators and parents listed most frequently as alternative options to be served as part of the PSNP were fresh fruit and milk/cheese. These items were also high on the list filled out by learners, following after bread. Of interest is the inclusion of milk suggested by the educators, learners and parents. Vorster and Venter (1992) argued in their article on strategies for school feeding programmes that a milk supplement should be considered.

The presence of snack items on the list of learners might reflect differences in motivations for food selection in the differing stages of the life cycle as the food choices of parents were more motivated by "health" related reasons.

Types of food selected for the feeding scheme might have introduced new items into the diets of these learners as more than half of the learners indicated that they never ate peanut butter at home and even more (67%) said that they never ate porridge similar to what they received at school at home compared to 83% of the learners indicating that they did eat maize meal porridge >3x/week at home. Cool drinks were consumed >3x/week by 31.9% of the learners and less frequently by another 45%.

3.5.3.10 School attendance

Although the results are very subjective, they do reflect the perceptions of the educators, parents and learners. No hard data on school attendance was available at the schools.

Opinions on the relationship between school attendance and the PSNP were very different for the different groups. It is, however, clear that the availability of food at school affected school attendance positively.

The effect of a school feeding programme on the attendance of the learner is not clear-cut. Richter *et al.* (1994) could not illustrate a decrease in absenteeism during the time a school breakfast programme was implemented in a farm school. A study on 177 disadvantaged elementary school children receiving a low-lactose liquid flavoured nutritional supplement showed that the rate of absenteeism was 29% lower than in the control group (Paige *et al.*, 1976). A randomised, controlled trail in Jamaican schools showed a significant better attendance in the group receiving breakfast than the control group (Powell *et al.*, 1998).

3.5.3.11 Active learning capacity

Learners, educators and parents all said that concentration, learning, and attention in class had improved as a result of the PSNP. This was also found in the study by Steyn *et al.* (1996) who investigated the perception of school children regarding the PSNP. More than 80% of the educators perceived an improvement in concentration of the learners.

It is, however, not possible to attribute all changes to the feeding of the learners at school, since various other factors could have influenced this.

The time of the day when the food was given to the learners is not in accordance with the objectives of the PSNP. It should be an early morning snack to alleviate temporary hunger and improve concentration. If the food is served between 10:00 and 12:00, the positive effect of an increase in the blood glucose to improve concentration will only be experienced late in the morning and closer to the time the learners went home. The late serving of the food was thus failing to achieve the objective of relieving hunger early in the school day and improving active learning capacity (ALC) during the morning. The relationship between meal content, feeding time and scholastic performance was investigated in 569 children, aged 11–13 years. After 15 days children who ate breakfast at school scored notably higher on most test modules than did children who ate breakfast at home and children who did not eat breakfast (Vaisman *et al.*, 1996).

Studies on the impact of school meals on school performance showed inconsistent results. Richter *et al.* (1994) could not conclude in their study on 55 farm school children that there were cognitive and behavioural benefits for children who received breakfast at school. A significant improvement in arithmetic was shown in Jamaican school children after receiving breakfast at the school in comparison with controls. This benefit was seen mainly in young children. No significant effect on spelling or reading was observed between the experimental and control group (Powell *et al.*, 1998). After the administration of a multivitamin/mineral supplement for eight months to 60 school children (12–13 years old), a significant increase in non-verbal intelligence was observed in comparison to the placebo group (Benton & Roberts, 1988). Although very subjective, more than 70% of the children indicated that they felt less hungry and were able to concentrate better after receiving food at school as part of the PSNP (Steyn *et al.*, 1996).

3.5.3.12 Leakage

It is of concern that almost half the learners indicated that educators ate some of the food meant for the learners at school and that nearly 25% reported that the educators took some of this food home. The learners also admitted that they took food home (usually the biscuits) to share with siblings and parents at home. During the evaluation, statements were made by the community that PSNP food was sold at taxi ranks and one person reported that food was exchanged for bricks by a principal to build his house. This confirms that leakage was present. Leakage was also reported by Steyn *et al.* (1996) in their study on the perceptions of school children regarding the PSNP. Nearly 30% of the children in the North West Province admitted that they took food home to share with younger siblings and because too much food was supplied at the school.

Del Rosso and Marek (1996) listed the loss of food through the black market and theft as one of the common problems of school feeding programmes across the world.

3.5.3.13 Unintended consequences - the glycaemic response of 10-year-old children to products used in the PSNP in the North West Province

The results on the sub-study of 16 children clearly demonstrate that consumption of the cool drink caused a hypoglycaemic incident in most of those healthy children, and porridge in some. As mentioned in the introduction, this hypoglycaemic state is *inter alia* associated with a lack of concentration ability. Using the present formulations of these products in the PSNP would prevent achieving the objectives of the scheme. It is suggested that the formulations of the porridge could be changed to include more fat and protein (e.g. by adding skim milk powder, soya flour etc.) in order to delay digestion and absorption of carbohydrate. This will result in sustained release of glucose and prevention of hypoglycaemia. At the same time it will increase the nutritive value of the product, but could influence price and shelve life of the products.

It is also recommended that the cool drink should never be consumed on its own, but always with another food - such as bread with peanut butter. It would probably not be possible to change the formulation of the cool drink.

3.5.3.14 Anthropometric status of the learners

In this study, for the total population of learners studied, the prevalence of wasting was low [(<5.0%) (WHO, 1986)], the prevalence of underweight was moderate [(<10.0%) (WHO, 1986)], and the prevalence of stunting was also moderate [(20.0 – 29.9) (WHO, 1986)]. There was a shift to the lower end of normal for all the indicators.

The prevalence of wasting and stunting were higher for the boys 11 years and older than for any of the other age groups. The prevalence of obesity was also the highest in this group indicating that both under- and over nutrition are prevalent in this group.

A study on 114 black boys and 166 black girls in a low socio-economic area showed that the prevalence of wasting was very low. The prevalence for stunting was 16.7% and 17% and for underweight it was 15.6% and 8.5% for boys and girls respectively (Wolmarans *et al.*, 1995).

3.5.4 Conclusions of the programme (input and output) evaluation

The following conclusions are based on the results and discussions:

- Random sampling techniques resulted in selecting a sample of schools as specified in the Tender Specifications;
- With a few exceptions, each with a stated reason, all the educators, parents and learners as specified in the sample were interviewed;
- Some menu items did not meet the criteria of the national guidelines;
- The nutrient specifications of some of the food items were confusing;
- The nutritional content of some of the food items did not meet the specifications;
- The menu, as offered to the learners, did not meet the aim of 25% of the energy requirement. More than 25% of the recommendation for the vitamins and minerals were offered;
- Nutrition education was not introduced in the schools;
- The learners had a good idea what healthy foods are;
- The learners thought that all biscuits and cool drinks are healthy;
- The communities have a positive perception of the PSNP;
- Community involvement in the PSNP was very limited;
- No community project developed because of the PSNP;
- The specific RDP principles, as mentioned in the text, were not adhered to;

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- The majority of schools did not keep proper record of the number of feeding days;
- The percentage coverage efficiency could not be calculated;
- The learners did not receive food on each of the possible 190 feeding days during 1999;
- The majority of schools did not target;
- Targeting had a negative effect on the learners;
- Most of the educators and learners suggested that all the learners from grades 1–7 should receive food;
- Storage space for the food was a problem at many schools;
- Not all the schools had clean water available;
- The quality of the food delivered to the school was not always acceptable;
- The food was not always stored under hygienic conditions;
- Over 20% of the learners did not eat breakfast at home and more than 24% were hungry when they arrived at school;
- Learners stopped eating breakfast and bringing lunch boxes to school as a result of the PSNP;
- Learners bought "snacks" at the school, mainly from vendors;
- The PSNP food alleviated hunger in the majority of the learners;
- The food most liked by the learners was the biscuits;
- The food least liked by the learners was the porridge and cool drink;
- Some of the learners reported that the porridge and cool drink made them sick;
- Educators, parents and learners suggested the inclusion of fruit, milk and bread/porridge/samp/etc. on the menu;
- The majority of learners ate maize meal porridge and milk at home more than three times per week;
- School attendance and punctuality improved because of the PSNP;
- Improved concentration, discipline, school performance, alertness and class participation of the learners were perceived by the majority of the learners;
- Between 50% and 60% of the learners experienced a positive feeling regarding active learning capacity after having eaten at school;
- Some educators used the promise of food to discipline the learners;
- The serving time of the food at the school did not meet the national guideline of before 09:00;
- The learners took food home, mainly to share with younger siblings;
- The educators share in the food meant for the learners by eating it and taking it home;

- The cool drink and porridge supplied to the learners caused a hypoglycaemic incident in most of the healthy subjects;
- The formulation of the porridge and cool drink should be investigated;
- Based on the anthropometric results the learners showed
  - a low prevalence of wasting;
  - a moderate prevalence of underweight; and
  - a moderate prevalence of stunting.

3.5.5 Recommendations

The recommendations made to the Office of the Premier in the North West Province were not new, nor unique. Some of these recommendations have been made previously by the NPPHCN (1995), Steyn *et al.* (1996), McCoy *et al.* (1997) and Ernst & Young (1997). We suggest that all these recommendations are considered to optimize the impact of the PSNP in the North West Province.

3.5.5.1 Short-term strategies

Political commitment

Reaffirmation of the political commitment and collaboration between the Department of Health and the Department of Education is needed on the highest level. This commitment should be reflected in the actions of everyone involved with the INP or PSNP at all other levels in both departments. Discussion and decisions on how to proceed with the PSNP are required.

Co-management of the PSNP

The communication between the Department of Health and Education regarding the PSNP should be addressed as a matter of urgency. The specific problems that the Department of Education are experiencing should be discussed and an agreement should be reached.

Human resources: Management

The vacant posts at Provincial level in the Department of Health should immediately be filled with people with appropriate nutrition and management knowledge and skills. Research experience should be a recommendation for these positions.

Monitoring of the operational process

The PER-FORM Developer Software System should be revitalized as a matter of urgency to assist in the monitoring of the operational process, provided that it meets all the requirements for appropriate monitoring. The schools should be informed about the quantity and time of food delivery for control. Record keeping at the schools must improve and include records on the quantity and quality of food delivered and the number of learners fed on each day of feeding. A policy regarding the return of food not fit for human consumption should be developed. Guidelines should be given to the school on the time of feeding for the best possible effect of the feeding scheme. Regular monitoring visits or spot checks need to be done.

3.5.5.2 Medium term strategies

Targeting

Targeting only 80% of the learners in the rural and farm schools is not acceptable. All the learners in these schools should be targeted. A suitable targeting policy for the urban schools should be developed, taking into consideration the problems regarding targeting experienced in the schools. Targeting urban schools based on the greatest need and only grades 1 – 5 should be considered. The total number of schools and learners targeted must be based on sound financial planning that takes into account the decrease of money available for school feeding schemes.

Menu options and specifications of food products

Menu options should be in line with the National guidelines and the acceptability of foods by the learners and community. The negative effect of the cold drink and porridge on the blood glucose levels of the learners justifies discussion on the use of these products in the future. Milk was given as a "healthy" and "desired" food by the learners, educators and community. Serious consideration should be given to the inclusion of milk on the menu, since milk can make an important contribution to nutrients such as protein, calcium, riboflavin and vitamin B12.

The specifications of the foods regarding micronutrient fortification should be readdressed in view of the national fortification of foodstuffs in the future. This will also influence the choice of food for inclusion on the menu. The quantity of micronutrient fortification in the present foods should be in balance.

The cost per nutrient should be taken into consideration when decisions are taken concerning menu options. Community involvement in terms of menu options, preparation and serving of food should be actively pursued.

Nutrition education

The Department of Health and the Department of Education should reach a joint decision on the implementation of nutrition education at schools. This important part of the PSNP and the INP cannot be delayed any further. The publication of the WHO (1998) on school health provides valuable information on the integration of health in the school system.

3.5.5.3 Long-term strategies

Integration of the PSNP as part of the Integrated Nutrition Programme

The PSNP is still a vertical program with no community involvement and not, in practice, part of the Integrated Nutrition Program. The decentralization process as spelt out in the Business Plan 1999/2000 should be speeded up. Decentralisation of the INP and therefore the PSNP will not be feasible unless the 10 vacant posts at regional level and the 10 vacant Community Liaison Officer posts and the 17 Community Dietitians posts on district level are filled. These posts should be filled by appropriately trained people with nutritional and management knowledge and skills. The infrastructure at regional and district level should also be in place before decentralization can be attempted.

Inter-sectoral collaboration with the Department of Agriculture should be seeked, for example to begin with school and community vegetable gardens.

Community involvement is of the utmost importance on all levels. Menu options should be negotiated with communities and assessed by the district community dietitians to ensure that it meets the specified criteria (nutritional) and costs per nutrient. The tender system should be streamlined and changed into a more community based (CB) approach. A district based approach for tenders need to be investigated. The tenderer should include a specified

business plan indicating the use of sub-contractors, transport, food provision, provision/serving at schools and reporting.

Monitoring impact indicators

The lack of monitoring impact indicators is a fundamental flaw in the design of the PSNP. An appropriate programme design and impact indicators should be developed and used for impact assessment. These should be based on the objectives of the PSNP in the North West Province. For nutrition purposes, it is generally convenient to speak of impact in terms of change in nutrition status using anthropometric and micronutrient status indicators.

Ongoing research and evaluation

Ongoing research and evaluation of the programme is recommended. Ideally a proportion of the funds available for the INP should be earmarked for continuous evaluation of the PSNP and all other programmes. Resources spent to evaluate a project may result in far more effective use of the remaining resources available to the project.

3.5.6 Critical appraisal of some aspects of the evaluation of the PSNP in the North West Province

3.5.6.1 Timing and time-frame of the evaluation

This evaluation is an excellent example of the lack of understanding of the role of evaluation as part of the conceptualisation and development of a programme of this magnitude. The evaluation was called for five years after the implementation of the PSNP at national level.

Had evaluation been part of the programme from the beginning, valuable feedback could have been given to the Departments of Health and Education at an early stage, regarding implementation problems.

Because no baseline data or control schools were available, it was not possible to evaluate the impact or cost-effectiveness of the programme.

Mouton (1999) summarised this very clearly by saying that, "the later an evaluation team becomes involved in the implementation process, the weaker the evaluation design and the less valid and useful the results. Ideally, an evaluation must commence prior to implementation and be terminated after the completion of the programme".

3.5.6.2 Theory-driven evaluation

Due to the lack of a program theory the evaluators had to develop the programme theory to base the evaluation on. It will, however, not be possible to draw any conclusions on the causal relationship of the programme, for various reasons. Firstly, no baseline data is available and secondly, no implementation data of the programme is available. It was therefore not be possible to contribute any changes in the nutritional status of the learners to the PSNP.

It is recommended that "Improved active learning capacity" is one of the key outcomes and not a primary outcome as given in Figure 3.2.

There was a lack of clear goals and objectives, for example "to contribute to the improvement of education quality by enhancing the 'active learning capacity', school attendance and punctuality of the needy primary school pupils". The goal is very vague and a typical "political slogan". Mouton (1999) noted that the "best" programme goals meet two requirements: they are linked to a strong theoretical paradigm and they are empirically measurable.

Caracelli and Green (1997) identified programme theory as a potential integrative framework for the design and analysis of evaluations using quantitative and qualitative methods. By examining data from multiple methods within a single framework, integrated designs are intended to leverage greater insight into a programme's operations and effectiveness than evaluation designs in which data, collected by different researchers and by different sources, are not analysed or interpreted together. They noted that despite its potential as an integrative framework, the use of programme theory as a framework for mixed-method evaluations is not well documented. In this study both qualitative and quantitative methods were used to collect the data and an attempt was made to interpret it together.

3.5.6.3 Multilevel and multi-site evaluations

The evaluation of the PSNP in the North West Province illustrated the difficulty of evaluations on a multilevel and at multi-sites. In the North West Province the PSNP is delivered to more than 1300 schools at farms, rural areas and urban areas. Some of these schools are more than a hundred kilometres from the nearest town and differ largely from each other.

An attempt was made by the evaluators to minimise the variability in the data collected by using the same field workers at the different sites. The fieldworkers were also trained and standardised in the methods used to collect the data. A training manual was also produced to which the fieldworkers could refer while collecting the data. Sensitive data collection, for example the anthropometry, was done by the project leader to prevent fieldworker variability. Only one person captured the data in an effort to minimize capturing errors.

3.5.6.4 Conceptual frameworks

Various frameworks have been developed to evaluate large intervention studies using different types of design. None of these frameworks is cast in stone and should serve only as a guideline. A conceptual framework should be designed to address the needs and requirements of each programme.

3.5.6.5 Goal-based vs. goal-free evaluation

One of the disadvantages of using goal-based evaluation is the possibility of missing unintended consequences. The evaluation of the PSNP discovered a very serious unintended consequence of one of the food items served to the learners as part of the PSNP. We showed that the serving of a commercial cool drink to the learners could cause a hypoglycaemic reaction that is detrimental to "enhancing the active learning capacity of learners".

In this chapter the evaluation of the PSNP in the North West Province was discussed. The development of the framework, indicators and measuring instruments were discussed followed by the results and discussion of each component of the framework. The recommendations made were discussed briefly. A critical appraisal of some aspects of the evaluation of the PSNP in the North West Province closed this chapter.

In the following chapter the external evaluation of certain aspects of primary school feeding will be discussed.

CHAPTER 4

4 EXTERNAL EVALUATION OF CERTAIN ASPECTS OF THE PRIMARY SCHOOL NUTRITION PROGRAMME (PSNP)

4.1 Introduction

The content of this chapter is based on the final report of Tender GES 5/2000-2001 to the Department of Health, namely "External evaluation of certain aspects of primary school feeding" by R Louw, E Bekker and E Wentzel-Viljoen (Louw *et al,* 2001). R Louw acted as the project manager and leader and was responsible for the overall conseptualisation, development, execution, interpretation of the results and report writing of the evaluation.

4.1.1 Orientation

Since its inception, the PSNP has been subjected to two national evaluations. A rapid perception evaluation of the impact of the programme on beneficiaries was commissioned by the RDP Office, conducted by the National Progressive Primary Health Care Network and completed in October 1995. The national evaluation of the programme was conducted by the Health Systems Trust and completed in August 1997. The results of both the national evaluations indicated the need for further evaluation of some aspects of school feeding.

The National Department of Health, Sub-directorate: Nutrition thus identified the need to evaluate certain aspects of the PSNP at a national level. They invited proposals for the "External evaluation of certain aspects of primary school feeding (Tender GES 5/2000 – 2001).

The tender was awarded on 2 August 2000 to Entire Business Solutions CC (member Rykie Louw). The time frame for completion of the project was 2 August 2000 to 31 December 2000. Changes to the given evaluation framework as indicated in the tender were not allowed by the Department of Health. The fieldwork had to be completed by the first week of November 2000 to allow enough time for the coding and capturing of the data, analysis and interpretation of the data and writing of the report.

The experience gained with this evaluation is used in this thesis to develop a framework for evaluating nutrition and nutrition-related programmes in South Africa.

4.1.2 The PSNP at National level

The Primary School Nutrition Programme (PSNP) was implemented on 1 September 1994 following the President's announcement in the State of the Nation Address on 24 May 1994 that a nutritional feeding scheme would be implemented in every primary school where such a need was established. It was one of the 100 day Presidential Lead Projects of the Reconstruction and Development Programme (RDP). The PSNP focused on improving the health and active learning capacity of primary school learners through school feeding.
In August 1994 the Minister of Health appointed the National Committee on Nutrition to develop a nutrition strategy for South Africa. In considering the multi-sectoral and complex causes of malnutrition, the Committee recommended an Integrated Nutrition Strategy (INS). The INS has been adopted in the Department of Health's White Paper for the Transformation of the Health System in South Africa and has been translated into the Integrated Nutrition Programme (INP) for South Africa.

The INP is implemented as an integral part of the Primary Health Care (PHC) approach and at the different levels of health management structures. The INP aims at improving the nutritional status of all South Africans.

Targeted supplementary feeding, which includes school feeding, forms a specific focus area of the INP, and primary school learners from poor households are indicated as a specific target group. Nutrition interventions in schools are conceptualised as a shared component of general education and health development. It is generally acknowledged that learning achievements rest on three legs:

- child quality/active learning capacity;
- quality of instruction/learning process;
- quality of school facilities/school environment.

Research has shown that a child's active learning capacity, and therefore school achievement, is negatively affected by, amongst others, hunger, low energy diets, parasite infections and micronutrient deficiencies.

It is within this context that primary school nutrition aims at:

- Contributing to the improvement of education quality and general health by:
  - enhancing active learning capacity;
  - alleviating short term hunger; and
  - improving school attendance and punctuality;
- Improving nutritional knowledge, perceptions, attitudes and behaviour amongst primary school learners, their parents and their educators;
- Enhancing broader development initiatives.

4.1.3 The purpose of the evaluation

The purpose of this evaluation was to contribute to improving the efficiency and effectiveness of the primary school feeding.

4.1.4 Aims and objectives of the evaluation

The specified aims of the evaluation were the following:

- To assess the efficiency and effectiveness of school feeding in terms of specific implementation and operational issues;
- To make recommendations to improve the efficiency and effectiveness of school feeding;
- To inform decision making on critical issues.

The objectives of the evaluation, as specified in the Terms of Reference, were the following:

- Conduct an external evaluation of school feeding of 149 primary schools before 31 December 2000;
- Attend an orientation meeting at the Directorate: Nutrition at the start of the project.
- Submit a Business Plan at the start of the project;
- Attend the National Project Coordinating Committee (NPCC) meetings to discuss progress;
- Submit three written progress reports in English to the Directorate: Nutrition one week prior to the NPCC meetings (20 copies in total);
- Arrange and conduct one workshop with the NPCC and provincial departments of health and education at the end of the project;

- Make a formal presentation of the findings and recommendations to management structures of the Department of Health and the Department of Education at the end of the project;
- Submit a final report in English with 40 sets of documents.

4.1.5 Scope of the evaluation

The evaluation covered the following implementation/operational issues:

- Food quality and food safety;
- Compliance of menu options to criteria;
- Food quantity;
- Consistency of feeding;
- Coverage and efficiency of targeting;
- Perceptions of learners and educators, including reported adverse effects;
- Cost benefits and cost-effectiveness.

4.1.6 Location of the evaluation

When fully operational, school feeding takes place in approximately 15 500 primary schools with approximately 4.8 million primary school learners benefiting from this intervention. The evaluation was conducted in 149 primary schools, which presented a 1% sample of participating schools at the time of the evaluation.

The project was coordinated from Pretoria, while the fieldwork was conducted in the nine provinces.

4.2 Designing the evaluation

In designing the evaluation, the following factors needed to be addressed:

4.2.1 Decision making process and hierarchy

The national Department of Health, Directorate: Nutrition administered the project in collaboration with the Department of Education at national and provincial level, the provincial sub-directorates of nutrition and other relevant directorates.

A Project Steering Committee (PSC) was set up to guide the project according to the specifications. Representatives of the Directorate: Nutrition and Directorate: Food Control of the national Department of Health as well as representatives of the national Department of Education formed the PSC.

The NPCC was established comprising members of the PSC and representatives of the Core Project Team. The role of the NPCC was to approve each phase according to the development path of the evaluation project.

The Project Coordinator, Ms D Kloka of the Directorate: Nutrition, was responsible for the day-to-day coordination of the project with the assistance and support from the provincial heads of nutrition and the primary school nutrition coordinator of the national Department of Education.

The Core Project Team consisted of the Project Manager/Leader (Rykie Louw) and two other members.

4.2.2 Development path of the evaluation

All the stakeholders agreed on the development path of the evaluation as indicated in Table 4.1.

Table 4.1 Phases of the evaluation

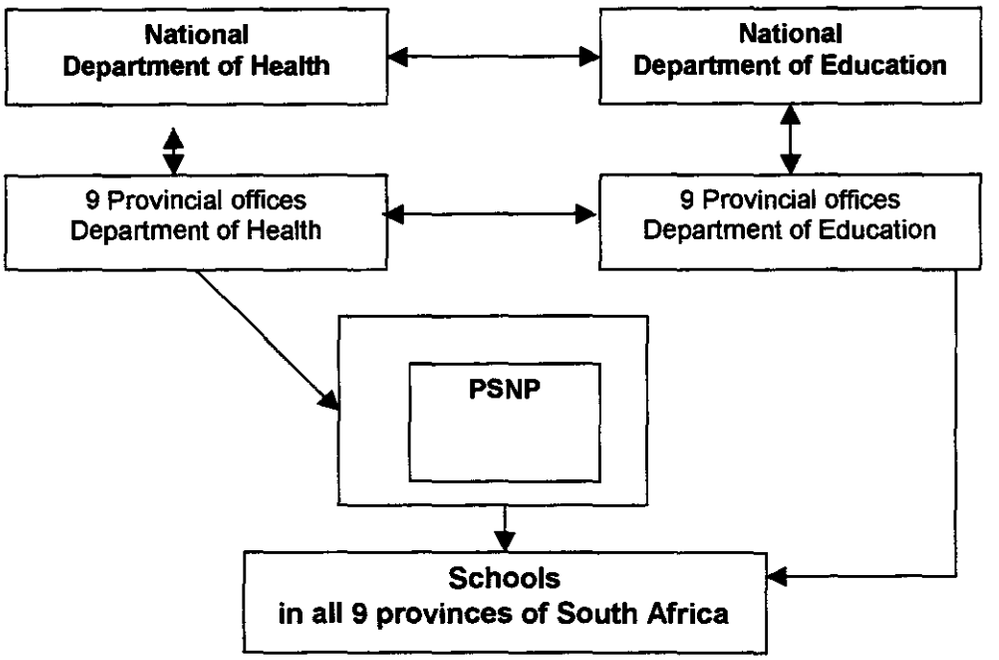
Phases	When	Where
Planning	August 2000	Pretoria
Pilot	August 2000	Gauteng
Training of fieldworkers	August 2000	Gauteng, Potchefstroom; East London, Nelspruit
Fieldwork • Schools	3rd and 4th school terms	In all provinces
Fieldwork • Provinces • National	October 2000 November 2000	In all provinces and Pretoria
Analysis	September 2000 – November 2000	Pretoria Potchefstroom
Report writing	November 2000	Pretoria Potchefstroom
Preliminary report	November 2000	Pretoria
Workshop	November 2000	Pretoria
Workshop report	December 2000	Pretoria
Draft report	31 December 2000	Pretoria
Final report	31 January 2001	Pretoria

4.2.3 Intervention and programme theory frameworks

The PSNP was developed as a multi-level, multi-organisational and multi-site intervention programme. Both the Departments of Health and Education, at national and provincial level, were involved. The programme was implemented in all nine provinces and in different geographical sites in all the provinces.

Based on these discussions and taking into consideration the tender specifications and other factors, it became clear that a comprehensive evaluation was not called for.

The intervention framework is given in Figure 4.1.



INP = Integrated Nutrition Programme

PSNP = Primary School Nutrition Programme

Figure 4.1 The PSNP intervention framework

The Department of Health, Sub-directorate: Nutrition did not develop a programme theory framework as part of the overall programme. A theory-based evaluation approach was also not used in this evaluation due to various reasons. A theory-based evaluation framework could, however, be developed based on the background information available on the PSNP from the National Department of Health (Kloka, 2000) and the scientific nutrition literature. This framework is presented in Figure 4.2.

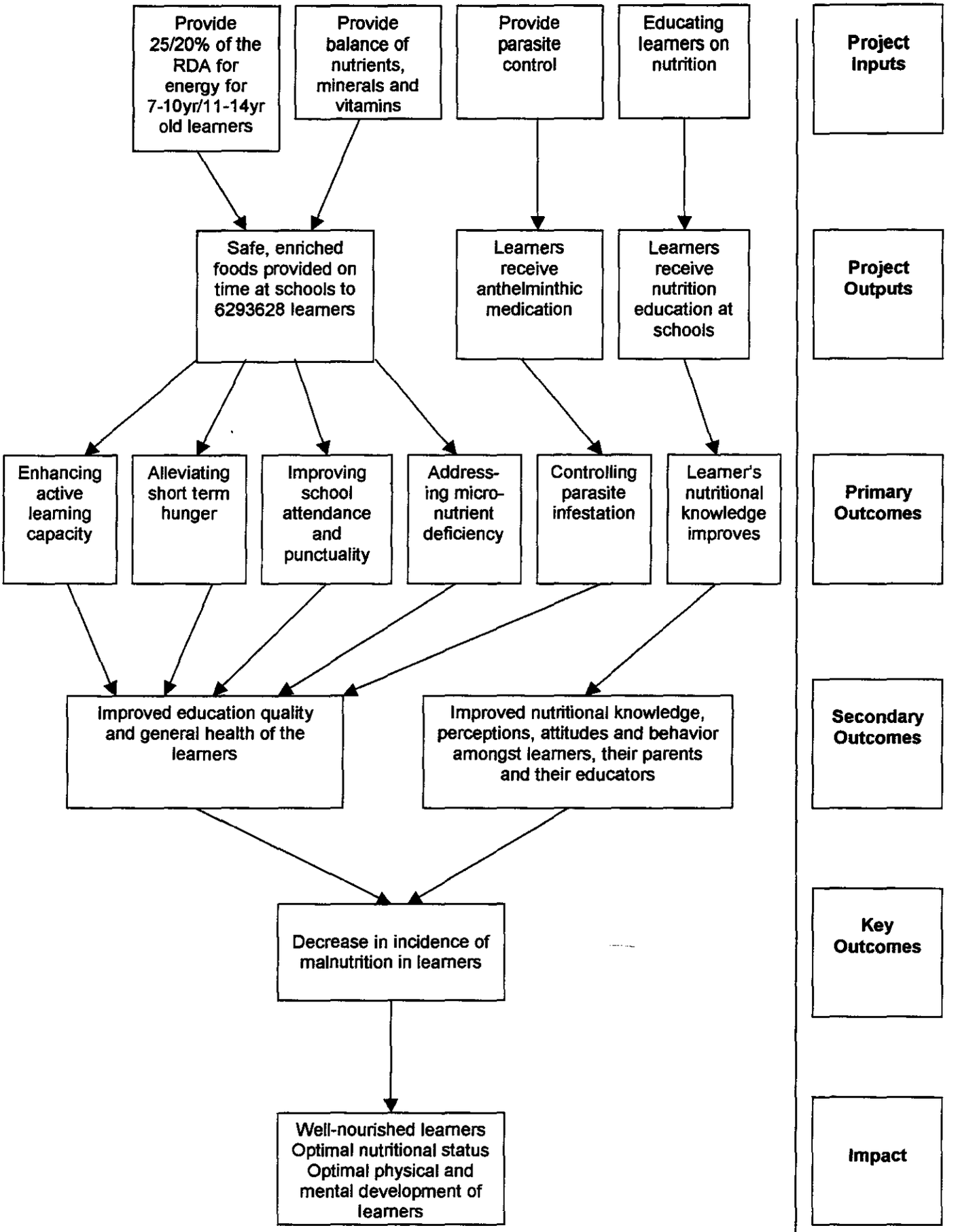


Figure 4.2 Programme theory framework

4.2.4 Focus areas, descriptions and method of data collection

The tender specifications indicated the focus area, description and method of data collection. This is summarised in Table 4.2.

Table 4.2 Focus areas, descriptions and methods of data collection

Focus area	Description	Method of data collection
Food quality and safety	Assess and inspect the conditions during storage, distribution and preparation of food to establish whether it was safe and fit for human consumption	Inspection of food items General assessment on the state of * Food preparation facilities * Storage facilities * Personal hygiene * Utensils Assessment of arrangements for testing of food items
Compliance of menu options	Assess menu options to determine compliance with national criteria	Analyse each province's menu Compare with national guidelines
Food quantity	Determine to what extent the actual portions served comply with menu specifications regarding: * Amounts, volumes and weights * % Recommended Dietary Allowance (RDA) for energy * Nutrients where specified	Weigh, count and measure food at schools Compare with national guidelines and menu specifications Compare nutritional analysis with % RDA for energy
Consistency and coverage	Assess consistency and coverage of school feeding Determine reasons for problems Assess arrangements during school holidays and perceived effect this has on hunger status of learner	Assess how consistent school feeding is and how many feeding days were missed during the year
Targeting	Investigate existing targeting policies and practices as well as ways of effective targeting	Determine the national guidelines on targeting Determine provincial targeting policies Determine educators' perception of targeting Determine the learners' perception of targeting
Adverse effects	Investigate the possible adverse effects of school feeding	Determine adverse effects in terms of: * Food poisoning * Littering * Trade of school vendors * Replacement of home meals * School programmes Assess the effects of targeting strategy in terms of: * Quality and quantity of food * Intimidation * Victimisation * Stigmatisation * Sharing of food

Focus area	Description	Method of data collection
Cost benefit and cost-effectiveness	Conduct a cost benefit analysis by indicating the benefits in monetary terms Conduct a cost-effectiveness analysis by comparing costs with outputs/outcomes	Determine cost range of menu options Compare actual cost with specified cost Analyse the cost per serving Determine the total cost per serving, purchasing cost, preparation cost, serving cost and transportation cost Assess and describe the benefits of the different menu options – cooked versus uncooked options Assess and describe the benefits of the different procurement operations – quotation vs. tender system

4.2.5 Evaluation framework

Although the overall aims and objectives of the evaluation as well as the focus areas and methods of data collection were spelt out in the tender, discussions were held with the members of the PSC. This assisted in understanding the needs of the Department of Health regarding the evaluation and in avoiding any misunderstanding. It also helped to build a trusting relationship between the Project Coordinator, the PSC and the evaluation team. The evaluation, as requested by the tender specifications, called for different types of evaluation, namely implementation evaluation and efficiency evaluation (cost benefit and cost-effectiveness).

After in-depth discussions all the stakeholders agreed that the evaluation should provide feedback on the following:

- The future of school feeding;
- Distribution of funds;
- Targeting;
- Consistency and coverage;
- Compliance of menu options to criteria;
- Food quantity;
- Food quality and safety;
- Adverse effects;
- Cost benefit and cost-effectiveness analysis.

Based on this, an evaluation framework was developed to guide the evaluation team in the planning and execution of the evaluation as indicated in Figure 4.3.

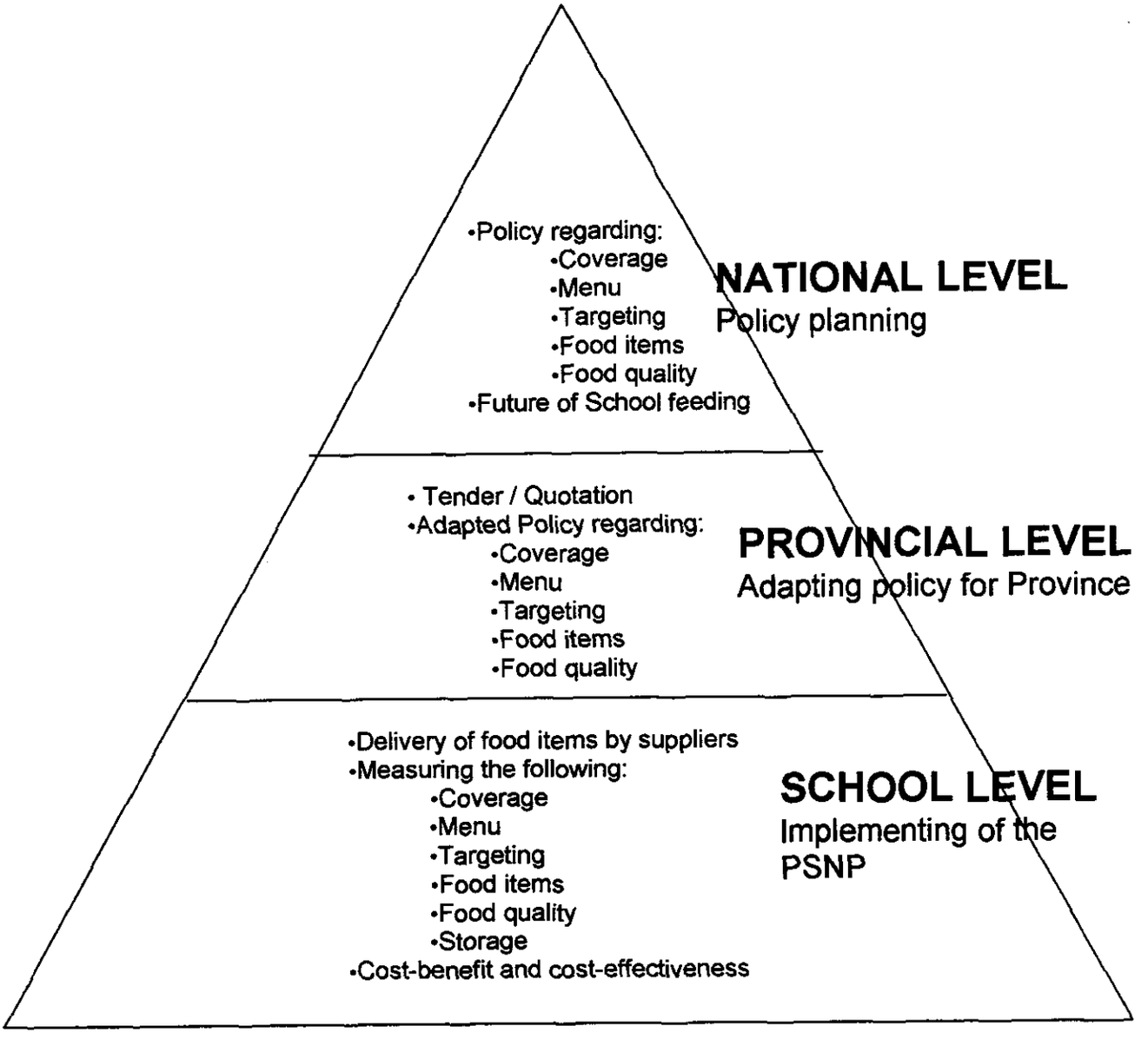


Figure 4.3 Evaluation framework

Based on the evaluation framework, six questionnaires and one checklist were developed to gather the necessary information at national, provincial and school level. Information on the questionnaires and checklist is given in Table 4.3.

Table 4.3 Information on the questionnaires and checklist

Level	Questionnaire or checklist	Person to complete
National – in Pretoria	National questionnaire	Interview with Department of Health Interview with Department of Education Interview with Environmental Health
Provincial – in all nine provinces	Provincial questionnaire	Interview with Department of Health Interview with Department of Education Interview with Environmental Health
School	Administrative questionnaire	Person who administrates school feeding
School	Education questionnaire	Educator
School	Helper questionnaire	Person who prepares food
School	Learner questionnaire	Learners of 10 years or older Only children who received food at school
School	Checklist	Fieldworker to observe

4.2.6 Study design

The research was non-experimental by nature. It was a post-test only design. The descriptive research was designed to provide answers to "who, what, where and how" questions. Comparison was not possible as no control groups was available nor any baseline data. Control schools were not available because the policy of the Department of Health is that all schools in the lower socio-economic group should be targeted. Schools who did not received food as part of the PSNP were in the higher socio-economic group and the learners not malnourished. These schools were not suitable to use as control schools to evaluate the impact of the PSNP.

This type of research includes both facts that can be verified and perceptions that can be verified. Perreault and McCarthy (1996) defined perception as how we gather and interpret information from the world around us. Individuals act and react on the basis of their perceptions, not on the basis of objective reality (Du Plessis *et al.*, 1990).

4.2.7 Methodology

The following aspects each form part of the methodology followed by the research:

4.2.7.1 Sample size at national and provincial level

National sample size

The NPCC agreed that the following interviews be held on a national level:

- One official from the Department of Education responsible for school feeding
- Four officials from the Department of Health:
  - One official responsible for policy aspects of school feeding;
  - One official responsible for financial aspects of school feeding;
  - One official responsible for nutritional aspects of school feeding;
  - One official responsible for food control.

Provincial sample size

The NPCC further agreed that all nine provinces would be consulted on the status of school feeding in their respective provinces. A decision was made to obtain the necessary inputs per province from:

- One official from the Department of Education responsible for school feeding;
- One official from the Department of Health responsible for school feeding;
- One official responsible for environmental health services.

4.2.7.2 Sample size at school level

The sample methodology and sample size were determined by the national Department of Health and specified in the tender specifications.

The three levels of selection used by the national Department of Health to determine the sample size were:

- Determination of the national sample size and provincial sample size of schools;
- Determination of the geographic distribution of sample schools;
- Random selection of individual sample schools.

Determination of national sample size and provincial sample size

The sample size was specified in the tender document. One percent of the participating schools as on 6 July 2000, were randomly selected by the national and provincial departments of health. The sample size of 149 schools consisted of the following representation as indicated in Table 4.4.

Table 4.4 National and provincial sample size of schools

Province	Provincial participating schools	Provincial number of sample schools (1% sample)	National sample size
Eastern Cape	5,028	50	
Free State	540	5	
Gauteng	1,049	10	
KwaZulu-Natal	2,287	22	
Mpumalanga	1,325	13	**149**
Northern Cape	317	3	
Northern Province	2,242	22	
North West	1,592	15	
Western Cape	931	9	
Total	15,311	149	

Determination of geographic distribution of sample schools

The geographic distribution of sample schools was done proportional to the distribution of primary schools in terms of the area classification of school location used by the Department of Education. Where the percentage was too low to indicate a number, one school was allocated in that category to ensure that all categories were represented.

The Department of Education used the following classification:

- Within the boundaries of municipalities/local authorities:
    - Ordinary town or city areas as well as vacant areas within municipal boundaries. Various structures, e.g. houses, flats, hotels, boarding houses, old age homes, caravan parks and school and university hostels may be found;
    - Area with informal dwellings (the so-called squatter areas);
    - Area with mainly hostels, e.g. mine, factory and municipal hostels;
    - Area with mainly hospital and prison institutions within municipal/local authority boundaries;

- Adjacent to the boundaries of municipalities/local authorities:
    - Semi-towns (i.e. a town without a local authority) with predominantly formal dwellings;
    - Area with informal dwellings (the so-called squatter areas);
    - Area in which mainly hostels are found;
    - Area with mainly hospital and prison institutions;
- Rural:
    - Semi-towns (i.e. a town without a local authority) with predominantly formal dwellings such as a mining and industrial town where housing for employees is provided by the employers;
    - Town ("village") without a local authority and which is not situated within a tribal area and with formal and semi-formal dwellings such as houses, huts and rondavels;
    - Villages/settlements within a tribal area;
    - Area with population concentration in informal dwellings (the so-called squatter areas);
    - Areas with mainly hostels where housing for employees is provided by the employers (such as mines, factories and power stations);
    - Area with mainly hospital and prison institutions;
    - Areas with farms, agricultural holdings, holiday resorts, agricultural schools and colleges and other rural areas;
    - Those area(s) that fall within the borders of tribal areas but outside a village settlement or in cases where there are no villages/settlements in a tribal area.

Table 4.5 shows the distribution of sample schools according to the area classification, using the figures that were calculated in Table 4.4.

Table 4.5 Distribution of sample schools

Province	Sample size	Within boundaries		Adjacent		Rural	
		School % Distribution	Sample Size	School % Distribution	Sample Size	School % Distribution	Sample Size
Eastern Cape	50	7%	3	5%	3	88%	44
Free State	5	14%	1	2%	1	84%	3
Gauteng	10	66%	6	18%	2	16%	2
KwaZulu-Natal	22	20%	4	8%	2	72%	16
Mpumalanga	13	14%	2	10%	1	76%	10
Northern Cape	3	36%	1	8%	1	56%	1
Northern Province	22	4%	1	3%	1	94%	20
North West	15	11%	2	7%	1	82%	12
Western Cape	9	56%	5	2%	1	42%	3
Total	149		25		13		111

Random selection of individual sample schools

The sample schools were randomly selected from the 2000/01 participating schools according to the above selection framework. To ensure an even distribution, schools were mapped and, where necessary other schools were selected to replace schools that were in close proximity to each other.

The list of sample schools was sent to the provincial departments of health for confirmation that the schools were still on the programme. In the case of the North West Province, schools that were included in the evaluation by the recent provincial tender were excluded from the sample. If, for a valid reason, a selected school could not be included in the evaluation, a replacement school was selected.

4.2.7.3 Evaluation tools and process

Six questionnaires and a checklist were developed as indicated in Table 4.2. The Project Steering Committee approved the questionnaires and checklist.

National level

The questionnaire was developed to be completed in a formal interview with each of the four officials from the national Department of Health, one official from the Department of

Education and one official from the Environmental Health. The Project Manager conducted the interviews.

Provincial level

The three provincial questionnaires are described below. The Core Project Team conducted the provincial interviews. Where interviews could not take place in person within the available time frame, telephonic interviews took place or officials submitted the questionnaires in writing.

- *Provincial Department of Health*

A questionnaire was developed to obtain inputs from the different provinces with regard to school feeding.

- *Provincial Department of Education*

The Department of Education in each province was requested to provide inputs on the progress of school feeding.

- *Environmental Health*

Environmental health officials in each province were requested to provide their inputs on the progress of school feeding.

School level

The following four questionnaires and a checklist were used at school level. All 149 sample schools were visited by the fieldworkers who administered the questionnaires.

- *Administrative*

This questionnaire targeted the person responsible for the administration of school feeding at the school. In most instances the individual interviewed, was an educator.

- *Educational*

This questionnaire targeted the principal or, where no principal was available, an educator nominated by the school.

- *Helper*

This questionnaire targeted the volunteer worker who prepared and served the food to the learners. Where no volunteer worker was available or where the sample schools did not

use volunteer workers, the educator nominated by the school and/or principal was interviewed.

- *Learner*

This questionnaire targeted the learners receiving food as part of school feeding. Three learners per sample school were interviewed. Translators assisted with the interviews where necessary.

- *Checklist*

The checklist was used by the fieldworkers to indicate the practices and arrangements at the sample schools. Observations included the practices and arrangements for storage, food preparation, handling and serving of the food as well as the actual feeding.

4.2.7.4 Fieldworkers

A total of 15 people participated in the evaluation as fieldworkers and/or translators. A training manual was developed and training of the fieldworkers took place in Pretoria, Potchefstroom, East London and Nelspruit. Members of the Core Project Team accompanied fieldworkers to at least one school as part of their training.

4.2.7.5 Statistical analysis

The Core Project Team ensured that the questionnaires were fully completed. In those instances where the required information could not be obtained due to the absence of the educator or principal on the day of the visit, assistance was requested from the provincial Department of Education to obtain the information over the telephone from the schools. The Project Manager coded all open-ended questions on the questionnaires. The data was computerised and controlled for capturing errors.

Data was captured in MS Excel 2000. The package's statistical features in combination with pivot tables were used to produce the results. Professor HS Steyn of the Statistical Consultation Services, Potchefstroom University for Christian Higher Education (PU for CHE) was consulted on the processing of the results.

4.2.7.6 Challenges and constraints

It was a major challenge to complete the project within the agreed time frame, given the low tender amount and therefore the limited resources that could be utilised, the vast distances between schools due to the geographic distribution of the sample schools, the limited information regarding the location of schools, poor road conditions and lastly the long funding cycle involved in the reimbursement of funds.

The time frame for the completion of the project was five months. The approved time frame (2 May to 3 November 2000) as per the tender specifications had to be amended as the tender was only awarded on the 2nd of August 2000. Because the time schedule had to be moved forward, most of the research aspects at school level had to be completed in the third school term, which meant that the field visits to the 149 sample schools had to be completed within an eight-week period.

The geographic distribution of the sample schools made it very difficult to visit more than one school a day. In addition, each province had its own feeding day calendar and each sample school, its own time scheduled for feeding. The times scheduled for feeding at sample schools, which were not known prior to the actual school visits, ranged from 08:00 to 13:30.

Very few physical addresses of sample schools were available. Postal addresses were provided but in most instances offered very little help in locating the schools, which sometimes were several hours' drive from the nearest town. Many telephone numbers provided were incorrect. Local police stations and businesses were approached where provincial officials could not provide any information with regard to the location of the schools.

Road conditions in rural areas were very poor in general and sometimes non-existing. Access to schools, mostly via dirt roads, was made even more difficult with the heavy rain experienced in Kwa-Zulu Natal, Northern Province and the Eastern Cape. The visit to sample schools also coincided with the outbreak of cholera and foot and mouth disease in Kwa-Zulu Natal, which resulted in the postponement of visits until it could be verified which schools were affected by the foot and mouth disease.

The biggest challenge, however, was to keep the project operational while awaiting claims to be paid out. The agreement with the Department of Health was that claims would be paid out within two weeks after submission thereof. The unexpected long waiting periods before

claims were paid out created a serious cash flow problem, which placed considerable constraints on the operational aspects of the project.

The rest of this Chapter will provide information on the following focus areas:

- The future of school feeding
- Distribution of funds
- Targeting
- Consistency and coverage
- Compliance of menu options to criteria
- Food quantity
- Food quality and safety
- Adverse effects
- Cost benefit and cost-effectiveness analysis

For each of the focus areas the objectives, introduction, methodology, results, discussion and conclusion will be described.

4.3 Future of school feeding

4.3.1 Objectives

The objective of this section is to provide an overview of school feeding in terms of the:

- Future of school feeding
- Aims of school feeding
- Areas of concern
- Collaboration between the health, education and environmental health sectors.

4.3.2 Introduction

According to Steyn *et al.* (1996) a feeding scheme was introduced in 1944, providing one free meal per day to primary school learners of all races. "Expenditure on South African black children amounted to about 45% of total expenditure between 1944-1947. However, the promulgation of the Bantu Education Act No 47 of 1953 effectively led to the

disintegration of the scheme for black kids, even though school feeding of white, 'coloured' and Indian children continued for nearly a decade".

In 1994 school feeding, on a national scale, was once again introduced by President Mandela and has been in operation since 1995. The aims were "to contribute to the improvement of educational quality by enhancing primary school pupils' active learning capacity, school attendance and punctuality; to contribute to general health development by alleviating temporary short-term hunger; to educate pupils on nutrition and also improve their nutritional status through micronutrient supplementation and parasite eradication where indicated; and to develop the nutrition component of the general curriculum."

McCoy *et al.* (1997) stated that school feeding (PSNP) has, however, been modified in a number of ways since its inception in 1994. The objective of this section is to provide an overview on the current status of school feeding in terms of the aims, areas of concern, inter-sectoral collaboration and the future of school feeding from a national, provincial and school perspective.

School feeding is a highly politicised and complex programme that runs across different government institutions such as the Department of Health, which includes nutrition, environmental health and finance sections, Department of Education, Department of Public Works, the Provincial Tender Boards and the Department of Finance. The Department of Health delivers school feeding in the Department of Education's schools and environmental health provides services in terms of food safety. An overview of the collaboration between the health, education and environmental health sectors will also be provided.

4.3.3 Methods

4.3.3.1 Future of school feeding

Inputs were obtained from national and provincial officials on the future of school feeding within the framework of the INP. One hundred and forty-nine schools gave their views on the future of school feeding.

4.3.3.2 The aims of school feeding

The national policy guidelines on school feeding were obtained and used as the standard. The provincial aims for school feeding were obtained from the provincial Business Plans and verified by the respective provinces. Principals, educators and learners at the 149 sample schools provided their understanding of the purpose of school feeding.

4.3.3.3 Collaboration between the health, education and environmental health sectors

Officials from both Environmental Health and the Department of Education were interviewed on national level and inputs were received from provincial officials.

4.3.4 Results

4.3.4.1 Future of school feeding

4.3.4.1.1 National level

The national Department of Health adopted an exit strategy to scale down school feeding in a phased fashion in favour of sustainable development projects to ensure household food security. Although primary school feeding was not specifically mentioned in the 5 Year Strategic Plan for Nutrition, it fell under one of the eight focus areas of the INP, i.e. Targeted Supplementary Feeding.

4.3.4.1.2 Provincial level

The provinces have uniformly indicated that school feeding should continue. Different opinions were expressed with regard to the future of school feeding within the framework of the INP. Some provinces indicated that community based projects should be developed to cater for school feeding. Others indicated that school feeding should be used as a vehicle to promote other interventions such as nutrition promotion and micronutrient supplementation. Two provinces expressed the view that school feeding did not belong with the Department of Health, but rather with the Department of Education or Department of Social Welfare.

4.3.4.1.3 School level

Schools indicated that school feeding had an enormously positive impact on the general well being of the learners, their active learning capacity and school attendance. School feeding and the involvement of the educators were viewed as part and parcel of the everyday school activities and accepted as such. Schools also indicated that the suffering of learners, malnutrition, poor school performance and crime would increase should school feeding be discontinued.

4.3.4.2 The aims of school feeding

4.3.4.2.1 National level

Primary school feeding has the following aims:

- To contribute to the improvement of education quality and general health by:
    - Enhancing active learning capacity;
    - Alleviating short term hunger;
    - Improving school attendance and punctuality;
- To improve nutritional knowledge, perceptions, attitudes and behaviour amongst primary school learners, their parents and their educators;
- To enhance broader development initiatives (Kloka, 2000).

4.3.4.2.2 Provincial level

Table 4.6 gives the provincial guidelines pertaining to the aims of school feeding

4.3.4.1.3 School level

Schools indicated that school feeding had an enormously positive impact on the general well being of the learners, their active learning capacity and school attendance. School feeding and the involvement of the educators were viewed as part and parcel of the everyday school activities and accepted as such. Schools also indicated that the suffering of learners, malnutrition, poor school performance and crime would increase should school feeding be discontinued.

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4.3.4.2.1 National level

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    - Enhancing active learning capacity;
    - Alleviating short term hunger;
    - Improving school attendance and punctuality;
- To improve nutritional knowledge, perceptions, attitudes and behaviour amongst primary school learners, their parents and their educators;
- To enhance broader development initiatives (Kloka, 2000).

4.3.4.2.2 Provincial level

Table 4.6 gives the provincial guidelines pertaining to the aims of school feeding

Table 4.6 Summary of the provincial guidelines pertaining to the aims of school feeding

Province	Aims
Eastern Cape	To contribute to the improvement of education quality by enhancing primary school pupils' "active learning capacity", as well as their school attendance and punctuality through alleviating temporary hunger To contribute to general health development by alleviating pupils' temporary hunger, offering appropriate micro-nutrient supplementation programmes through health facilities and to ensure that pupils severely infected by parasites benefit optimally from nutritional interventions by offering parasite control programmes through health facilities To improve nutrition knowledge, perceptions, attitudes and eating patterns amongst primary school children, their parents and educators through nutrition education as part of the general education curriculum and through other nutrition education initiatives To enhance broader development initiatives, particularly in the area of combating poverty To implement the program in the most cost-effective and efficient way possible
Free State	To enhance school attendance, active learning capacity and alleviate temporary hunger by providing at least 20% (2000kJ) of the child's daily requirements for energy
Gauteng	To alleviate temporary hunger To encourage broader initiatives To encourage the self-sustainability of school feeding To implement interventions in the most cost-effective and efficient way possible
KwaZulu-Natal	To reduce the prevalence of malnutrition and hunger in primary school learners. To enhance broader initiatives
Mpumalanga	To contribute to the improvement of education quality by enhancing primary school pupils' "active learning capacity", as well as their school attendance and punctuality through alleviating temporary hunger To enhance broader development initiatives, particularly in the area of combating poverty To implement the programme in the most cost-effective and efficient way possible To encourage the self sustainability of the school feeding
Northern Cape	Alleviate hunger amongst needy primary school children and thereby contributing to improvement on their learning capacity Contribute to the general health development of primary school children by improving their nutritional status Improve nutritional knowledge, perceptions and attitudes amongst primary school children by including nutrition education in all projects Improve programme efficiency by providing management skills of all project committees
Northern Province	To alleviate temporary hunger of targeted primary schools To encourage good eating habits amongst primary school children
North West	To contribute to general health development by alleviating pupils' temporary hunger by providing them with approximately 25% of the required RDA for energy and by educating pupils concerning nutrition To contribute to the improvement of education quality by enhancing the "active learning capacity", school attendance and punctuality of the needy primary school pupils To enhance broader development initiatives, particularly in the area of combating poverty
Western Cape	To contribute to the improvement of education by enhancing Primary School pupils' "active learning capacity" and school attendance To contribute to the general health of the Primary School pupils To enhance broader development initiatives To phase out food interventions with RDP activities

There appears to be a difference in focus on a provincial level in terms of the aims of school feeding. In addition, not one of the provincial business plans provided for objectives and measurable deliverables to support the successful achievement of the provincial or national aims of school feeding. The impression is created that the purpose of the business plan is

merely to access funding and not to be used as a management tool to measure whether the aims were achieved.

4.3.4.2.3 School level

Nearly all (82%) of the principals and/or educators interviewed indicated that they knew what the purpose of school feeding was, as indicated in Table 4.7.

Table 4.7 Do you know what the purpose of school feeding is?

Province	Yes	No	Total
Eastern Cape	65.31%	34.69%	100%
Free State	100.00%	0.00%	100%
Gauteng	100.00%	0.00%	100%
KwaZulu–Natal	86.36%	13.64%	100%
Mpumlanaga	91.67%	8.33%	100%
Northern Cape	100.00%	0.00%	100%
Northern Province	86.36%	13.64%	100%
North West	85.71%	14.29%	100%
Western Cape	100.00%	0.00%	100%
Average	**82.19%**	**17.81%**	**100%**

This 82% of the principals and/or educators stated the following as the purpose of school feeding (Table 4.8).

Table 4.8 Purpose of School feeding

Purpose of school feeding	%
Increase learners' concentration	97%
Alleviate temporary hunger	94%
Promote learners' health	94%
Decrease absenteeism	86%
Treat malnutrition	85%
Teach basic nutrition	82%
Provide food for learners	79%
Enough food for a meal	50%
Enough food for the day	41%

The reasons given by learners as to why they received food at the schools could be summarised as follows:

- To address the effects of poverty and short-term hunger (86%);
- To increase the learners active learning capacity (7%);
- To encourage school attendance (1%);

- The government's responsibility (3%);
- Don't know (1%).

4.3.4.3 Areas of concern

4.3.4.3.1 National level

The areas of concern identified, included the following:

- Decentralisation of school feeding activities in provinces made technical support from a national level difficult;
- Lack of policy on collaboration with the Department of Education;
- Implementation of targeting policies;
- Number of school feeding days per province;
- Lack of monitoring and evaluation of school feeding.

4.3.4.3.2 Provincial level

The provinces identified the following areas of concern that need to be addressed:

- The measurement and assessment of the impact of school feeding;
- To define the respective roles and responsibilities of the Department of Education and the Department of Health;
- To define the roles and responsibilities of environment health/local authority health inspectors and the nutrition section;
- To what extent services should be centralised or decentralized;
- Whether to follow the tender or quotation system;
- Whether to provide a meal or snack;
- How to apply the targeting policy amongst political pressures;
- The provision of a nutritious menu at the minimum cost;
- To monitor school feeding with limited resources;
- To ensure compliance with tender specifications;
- To ensure quicker payment of suppliers.

4.3.4.3.3 School level

Schools identified the following areas that need to be addressed to improve school feeding:

- Quantities served to the learners should be increased;
- The approved amount per learner per day should be increased;
- Feeding days should be increased and should include Fridays;
- All learners in a school should be fed;
- Menus should be changed to include the learners' preferences and to ensure variety;
- Food should be served earlier;
- Payments made to volunteer workers should be increased and made on a regular basis;
- Food should be provided for learners to take home.

4.3.4.4 Collaboration between health, education and environmental health sectors

4.3.4.4.1 National level

The structure to facilitate co-management of school feeding by the Department of Education and the Department of Health at national level collapsed in recent years. The two main reasons why the Department of Education's active involvement at a national level was ceased revolved around the fact that no budget allocation had been made for activities relating to school feeding and that no career path development opportunities were provided for officials.

The involvement of environmental health in school feeding at a national level was limited to the national Directorate: Food Control's Routine Food Safety Monitoring Programme. Results of the chemical analysis of samples taken nationally, which from time to time included food items intended for school feeding, were made available to the Directorate: Nutrition.

4.3.4.4.2 Provincial level

At a provincial level, the Department of Education was only actively involved in two of the nine provinces even though school feeding was implemented at the schools, which fell under

the jurisdiction of the Department of Education. The roles and responsibilities of the Department of Education were also not formalised in any of the provinces. Several attempts, notably by the Department of Education in the North West Province, were made to formalise the relationship between the departments of health and education with regard to school feeding.

With the exception of the Western Cape, environmental health played a very limited role in school feeding on a provincial level. The roles and responsibilities of environmental health were also not formalised in any of the provinces and no formal programme was in place in any of the provinces to ensure that food was tested on a routinely basis. Quality control of food intended for school feeding was, with the exception of the Western Cape, only done on an ad hoc basis.

4.3.5 Discussion

School feeding was regarded as extremely important on a national, provincial as well as school level. There was, however, a difference in focus on the national and provincial level in terms of the aims future of school feeding.

According to Labadarios (2000), a significant percentage of South Africa's population still lives under adverse socio-economic conditions and only the long-term socio-economic upliftment is likely to ensure the improvement of the nutritional status of the community at large. An in-depth evaluation of development projects and household food security should be conducted before any strategies or policies to phase out school feeding are implemented. Community based projects should be sufficiently developed to cater for school feeding and the continued existence and success of the projects assured to provide household food security. In an evaluation of the development projects in Gauteng, Hlatshwayo-Moleah *et al.* (2000) found that the projects fell short of being effective and that it could not be established that the development projects contributed to the alleviation of poverty, malnutrition or even hunger. It was also found that the relevance of the projects fell short of addressing the causes of the problems.

One of the more popular community based development projects funded are food gardens. According to Del Rosso and Marek (1996) food gardens are not usually intended to provide food directly to programmes. Many constraints must be overcome or bypassed if food

gardens are to be successful. Hlatshwayo-Moleah *et al.* (2000) also stated that gardening was more difficult to sustain.

Although school feeding is delivered through the health sector, there should be co-ordination between the health and education sectors to ensure the successful delivery of school feeding. Del Rosso and Marek (1996) stated that the lack of collaboration between the health and education sectors had been a major stumbling block in Mozambique and Burkino Faso. In Burkino Faso, UNICEF had to step in to provide the necessary co-ordination between health and education. The problem was, however, overcome in Guinea where the school health department was housed in the Ministry of Education but staffed by the health personnel who reported to the Minister of Health.

4.3.6 Conclusion

Based on these results the major conclusions are:

- School feeding should continue but different viewpoints were expressed with regard to the format in which it should continue;
- There is a difference in focus in terms of the aims of school feeding from a national to a provincial level;
- Not one of the provincial business plans provided objectives and measurable deliverables to support the successful achievement of the provincial or national aims of school feeding;
- There is a lack of understanding of the aims of school feeding on a school level;
- Education was not actively involved at a national level and, with the exception of two provinces, not actively involved at a provincial level, even although school feeding was implemented in schools that fell under the jurisdiction of the Department of Education;
- There was very little involvement of environmental health on national, and with the exception of the Western Cape, very little involvement at a provincial level.

4.4 Distribution of funds

4.4.1 Objectives

The objectives of this section were:

- To determine the allocation for school feeding;
- To determine the expenditure for school feeding;
- To determine the number of schools targeted and number of schools reached;
- To determine the number of learners targeted and the number of learners reached.

4.4.2 Introduction

From 1994/95 until 1997/98, RDP funds were made available to the different provinces for school feeding. In 1998/99 the "INP/PSNP Conditional Grant Allocation" replaced the RDP funds. Currently provinces receive Conditional Grants from the national Department of Health to implement the INP. Although the "INP/PSNP Conditional Grant Allocation" is intended mainly to fund primary school nutrition activities, it must also be used to contribute to he process of developing, establishing and maintaining the INP. To access the funds, each province submitted a business plan to the national Department of Health for approval. Each province has the autonomy to decide which portion of the Conditional Grant should be used for school feeding. From 2000/2001 the allocation for school feeding may also be used for recurrent expenditure (equipment, vehicles etc.).

The objective of this section is not only to determine how the funds for school feeding were distributed but also to determine how the funds were utilised.

4.4.3 Methods

4.4.3.1 Allocation, expenditure, number of schools reached and number of learners reached from a global perspective

The allocation and expenditure for the period 1994/95 to 1999/2000 as per the provincial monitoring reports were obtained from the national Department of Health.

4.4.3.2 Allocation, expenditure, number of schools reached and number of learners reached from a provincial perspective

The allocation per province for the period 1997/98 to 2000/2001 was obtained from the national Department of Health. The actual expenditure per province could not be obtained from the national Department of Health as the department only had access to the data pertaining to the INP expenditure, which did not reflect the expenditure on school feeding. Provincial officials were requested by means of the provincial questionnaire to provide the actual expenditure per annum. Gauteng, the Northern Cape and the Western Cape were the only provinces that provided the actual expenditure as requested for the period 1997/98 to 1999/2000 for school feeding in their provinces.

4.4.3.3 Coverage of schools

The total number of schools targeted and reached per province for the period 1997/98 to 1999/2000 was obtained from the national Department of Health as per the monitoring reports.

4.4.3.4 Coverage of learners

The total number of learners targeted and reached per province for the period 1997/98 to 1999/2000 was obtained from the national Department of Health as per the monitoring reports.

4.4.3.5 Relationship between allocation and coverage

The allocation per province and the number of learners reached for the period 1997/98 to 1999/2000, were obtained from the monitoring reports.

4.4.4 Results

4.4.4.1 Summary of results

Table 4.9 provides a summary of the most important aspects of this section.

Table 4.9 Summary of the relationship between poverty gap, allocation, number of schools reached and number of learners reached.

Province	Proportional allocation of "INP/PSNP conditional grant"* %	Proportional allocation apportioned for school feeding** %	Proportional expenditure for school feeding** %	Proportional number of schools reached** %	Proportional number of learners reached** %
Eastern Cape	22.64	21.89	Not available	31.55	21.24
Free State	6.76	5.52	Not available	5.30	5.03
Gauteng	9.39	8.78	8.37	6.39	4.87
KwaZulu-Natal	22.75	21.30	Not available	14.61	21.08
Mpumalanga	6.82	7.73	Not available	7.99	9.23
Northern Cape	1.73	1.93	2.08	1.82	2.39
Northern Province	18.21	19.77	Not available	16.07	23.91
North West	6.76	7.84	Not available	10.24	7.05
Western Cape	4.94	5.24	6.01	6.03	5.20
Total	100	100	100	100	100

* Was done on 60% of poverty gap and 40% of population figures for 1998/99 to 2000/2001

**Average for 1998/99 to 2000/2001

4.4.4.2 Allocation from a global perspective

From 1 September 1994 until 31 March 2001, a total of R3.4 billion has been made available in South Africa for school feeding. From 1994/95 to 1997/98, school feeding was funded by the "RDP Allocation for PSNP." The total amount under this allocation was apportioned for school feeding. From 1998/99, the "RDP Allocation for the PSNP" was replaced with the "INP/PSNP Conditional Grant Allocation" that was between 83% and 89% of the total amount apportioned for school feeding over the three year period. Table 4.10 gives a summary of the funds made available for school feeding.

Table 4.10 Funds made available for school feeding from 1994/95–2000/2001

Financial year	RDP allocation for PSNP	INP/PSNP conditional grant allocation	Amount apportioned for school feeding	% of conditional grant apportioned for school feeding
1994/95	472,840,000		472,840,000	100
1995/96	500,000,000		500,000,000	100
1996/97	500,000,000		500,000,000	100
1997/98	496,000,000		496,000,000	100
1998/99		525,760,000	465,941,132	89
1999/2000		554,677,000	457,945,362	83
2000/2001		582,411,000	489,577,960	84
Total	**1,968,840,000**	**1,662,848,000**	**3,382,304,454**	**93**

The methodology for the distribution of the funds to the nine provinces from 1994/95 to 2000/2001 was based on the projected population (5–14 years of age – the 1991 census/Development Bank of Southern Africa figures) and the aggregate poverty gap figures (Human Sciences Research Council – 1995) as given in Table 4.11.

Table 4.11 Poverty Gap (Human Sciences Research Council – 1995).

Province	Poverty gap	% Poverty gap	Population (5–14 years)	% Population %	Proportional allocation* %
Eastern Cape	3,716,307	24.21	1,674,660	21.06	22.64
Free State	1,158,795	7.55	475,210	5.98	6.76
Gauteng	1,551,284	10.11	689,317	8.67	9.39
KwaZulu-Natal	3,302,859	21.52	1,905,959	23.97	22.75
Mpumalanga	967,686	6.30	583,304	7.34	6.82
Northern Cape	257,375	1.68	142,527	1.79	1.73
Northern Province	2,948,107	19.21	1,367,946	17.20	18.21
North West	916,945	5.97	600,495	7.55	6.76
Western Cape	528,730	3.44	511,963	6.44	4.94
	15,348,088	100	7,951,381	100	100

* 60% of poverty gap and 40% of population

The INP/PSNP Conditional Grant is on the budget of the national Department of Health. In order to access funding, provincial departments of health are required to submit business plans, which have to be approved before funds are released. The INP business plan differed from province to province in terms of the format and the contents thereof. Although 84% of the INP/PSNP Conditional Grant Allocation for 2000/2001 was apportioned for school feeding, some provinces provided less than a page on school feeding in their 2000/2001 business plans while other provinces provided detailed work plans consisting of measurable outputs.

Provincial business plans were approved, irrespective of repeated under-expenditure, compliance with the national nutritional criteria, the national criteria for menu options, the national aims for school feeding, or compliance in terms of the submission of financial and monitoring reports.

4.4.4.3 Expenditure from a global perspective

Table 4.12 gives an indication of the funds expended on school feeding.

Table 4.12 Funds expended on school feeding from 1994/95 – 1999/2000

Financial year	School feeding allocation	Expenditure	Funds not used	% of funds spent
1994/95	472,840,000	134,823,786	338,016,214	29
1995/96	500,000,000	312,478,000	187,522,000	62
1996/97	500,000,000	325,621,177	174,378,823	65
1997/98	496,000,000	399,376,266	96,623,734	81
1998/99	465,941,132	399,909,093	66,032,039	86
1999/2000	457,945,362	356,145,445	101,799,917	78
Total	**2,892,726,494**	**1,928,353,767**	**964,372,727**	**67**
Avg excl	482,121,082	321,392,295	160,728,788	67
Avg Excl. 94/95	483,977,299	358,705,996	125,271,303	74

During this period, in not one single year was the total amount allocated for school feeding expended. An under-expenditure of R 964,372,727 occurred during this period.

Figure 4.4 provides insight into the allocation over the last six years as well as the expenditure according to the monitoring reports:

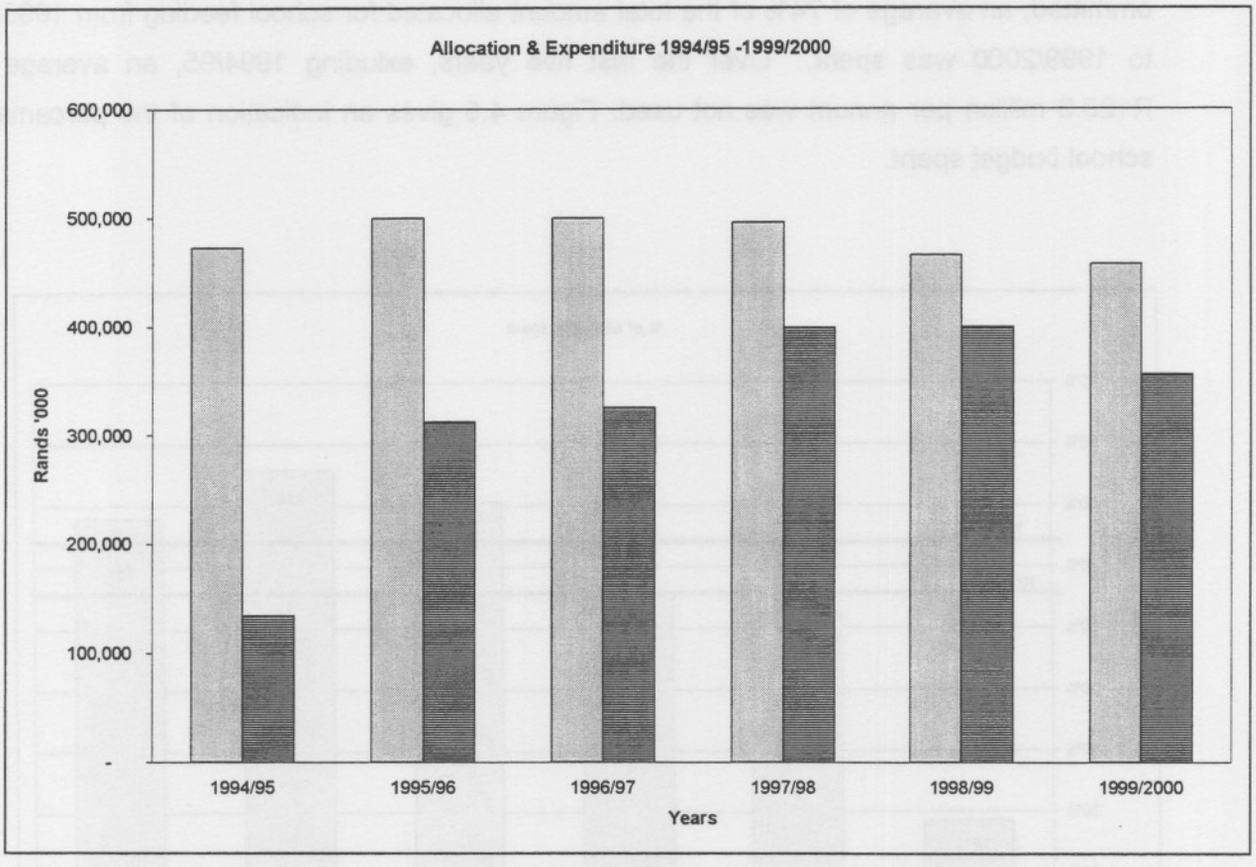


Figure 4.4 Allocation vs. expenditure from a global perspective from 1994/95–1999/2000

An average of 67% of the total amount allocated for school feeding was expended over six years. In 1994/1995 an allocation was made for a year, although the programme was only implemented in the last six months of the financial year. If the expenditure for 1994/95 is ommitted, an average of 74% of the total amount allocated for school feeding from 1995/96 to 1999/2000 was spent. Over the last five years, exluding 1994/95, an average of R125.3 million per annum was not used. Figure 4.5 gives an indication of the percentage school budget spent.

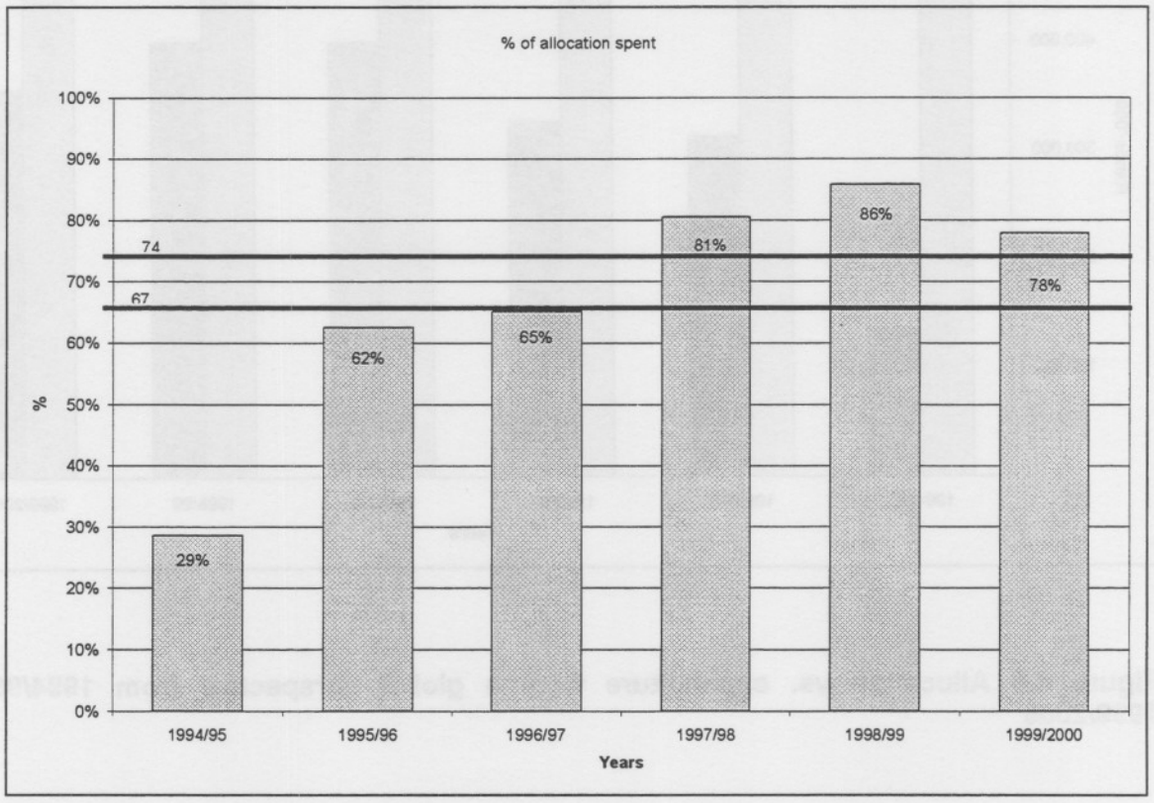


Figure 4.5 Percentage of school feeding budget spent

4.4.4.4 Allocation and expenditure from a provincial perspective

4.4.4.4.1 Allocation for school feeding per province

Table 4.13 gives the allocation for school feeding per province and Table 4.14 the percentage of allocation for school feeding per province per year expressed as a percentage of the total allocation.

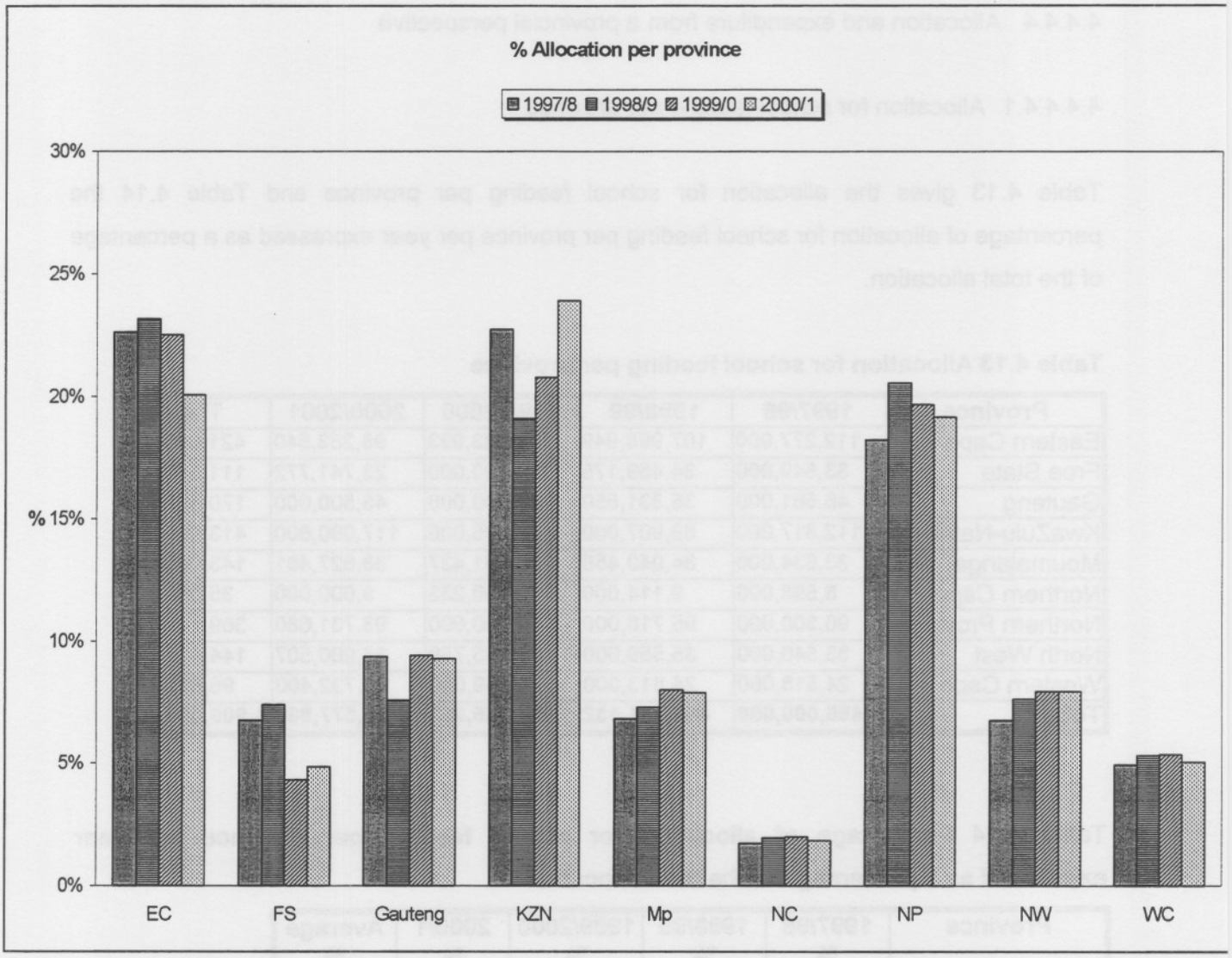
Table 4.13 Allocation for school feeding per province

Province	1997/98	1998/99	1999/2000	2000/2001	Total
Eastern Cape	112,277,000	107,998,949	103,133,933	98,253,540	421,663,422
Free State	33,549,000	34,459,175	19,800,000	23,741,772	111,549,947
Gauteng	46,561,000	35,331,550	43,200,000	45,500,000	170,592,550
KwaZulu-Natal	112,817,000	88,907,000	95,095,000	117,090,600	413,909,600
Mpumalanga	33,834,000	34,040,458	36,601,437	38,627,461	143,103,356
Northern Cape	8,598,000	9,114,000	9,140,233	9,000,000	35,852,233
Northern Province	90,300,000	95,718,000	90,000,000	93,731,680	369,749,680
North West	33,546,000	35,559,000	36,405,759	38,900,507	144,411,266
Western Cape	24,518,000	24,813,000	24,569,000	24,732,400	98,632,400
Total	**496,000,000**	**465,941,132**	**457,945,362**	**489,577,960**	**1,909,464,454**

Table 4.14 Percentage of allocation for school feeding per province per year expressed as a percentage of the total allocation

Province	1997/98 %	1998/99 %	1999/2000 %	2000/1 %	Average %
Eastern Cape	23	23	23	20	22
Free State	7	7	4	5	6
Gauteng	9	8	9	9	9
KwaZulu-Natal	23	19	21	24	22
Mpumalanga	7	7	8	8	7
Northern Cape	2	2	2	2	2
Northern Province	18	21	20	19	19
North West	7	8	8	8	8
Western Cape	5	5	5	5	5
Total	**100**	**100%**	**100%**	**100%**	**100**

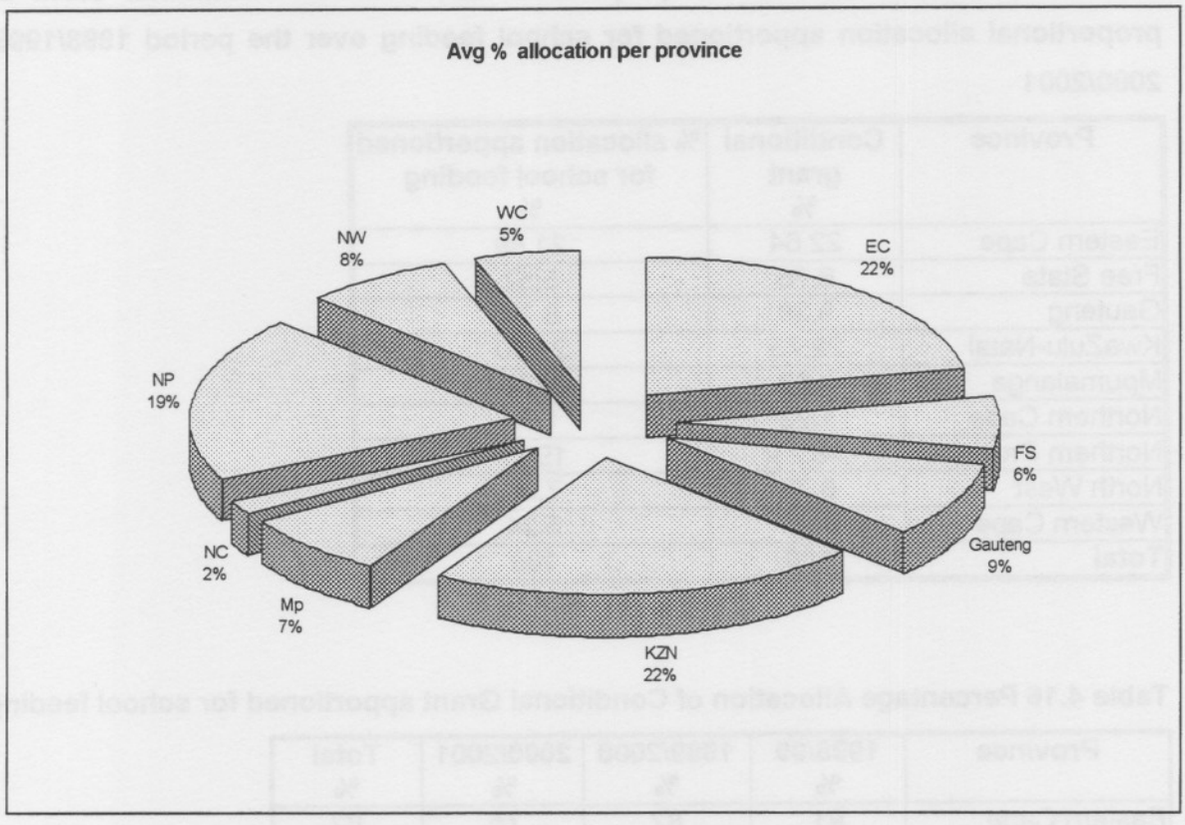
Figure 4.6 illustrates the percentage of allocation per province per year expressed as a percentage of the total allocation.



EC = Eastern Cape; FS = Free State; KZN = KwaZulu-Natal; Mp = Mpumalanga; NC = Northern Cape; NP = Northern Province; NW = North West; WC = Western Cape

Figure 4.6 Allocation per province per year expressed as a percentage of the total allocation

With the exception of KwaZulu-Natal in 1998/99, the annual provincial allocation, expressed as a percentage of the total allocation over the period 1997/98 to 2000/2001, stayed constant with a maximum of 3% variance and an average of 1% difference in the allocation from one year to the next.



C = Eastern Cape; FS = Free State; KZN = KwaZulu-Natal; Mp = Mpumalanga; NC = Northern Cape; NP = Northern Province; NW = North West; WC = Western Cape

Figure 4.7 Allocation per province per year expressed as an average percentage of the total allocation – 1997/98–2000/2001

During the period 1997/98 to 2000/2001 the Eastern Cape and KwaZulu-Natal received the highest share of the total allocation, i.e. 22% each. The Northern Province had the third highest share of total allocation, i.e. 19%. The Northern Cape received the smallest allocation i.e. 2% of the total allocation for school feeding. This is indicated in Figure 4.7.

Provinces had the prerogative to decide what portion of the INP/PSNP Conditional Grant Allocation should be used for school feeding. The percentage over the three years varied from the North West Province that allocated 99% of the Conditional Grant to school feeding to the Free State that allocated 69% of the Conditional Grant to school feeding. In Tables 4.15 and 4.16 the figures are given.

Table 4.15 Relationship between proportional allocation of Conditional Grant and proportional allocation apportioned for school feeding over the period 1998/1999 – 2000/2001

Province	Conditional grant %	% allocation apportioned for school feeding %
Eastern Cape	22.64	21.89
Free State	6.76	5.52
Gauteng	9.39	8.78
KwaZulu-Natal	22.75	21.30
Mpumalanga	6.82	7.73
Northern Cape	1.73	1.93
Northern Province	18.21	19.77
North West	6.76	7.84
Western Cape	4.94	5.24
Total	**100**	**100**

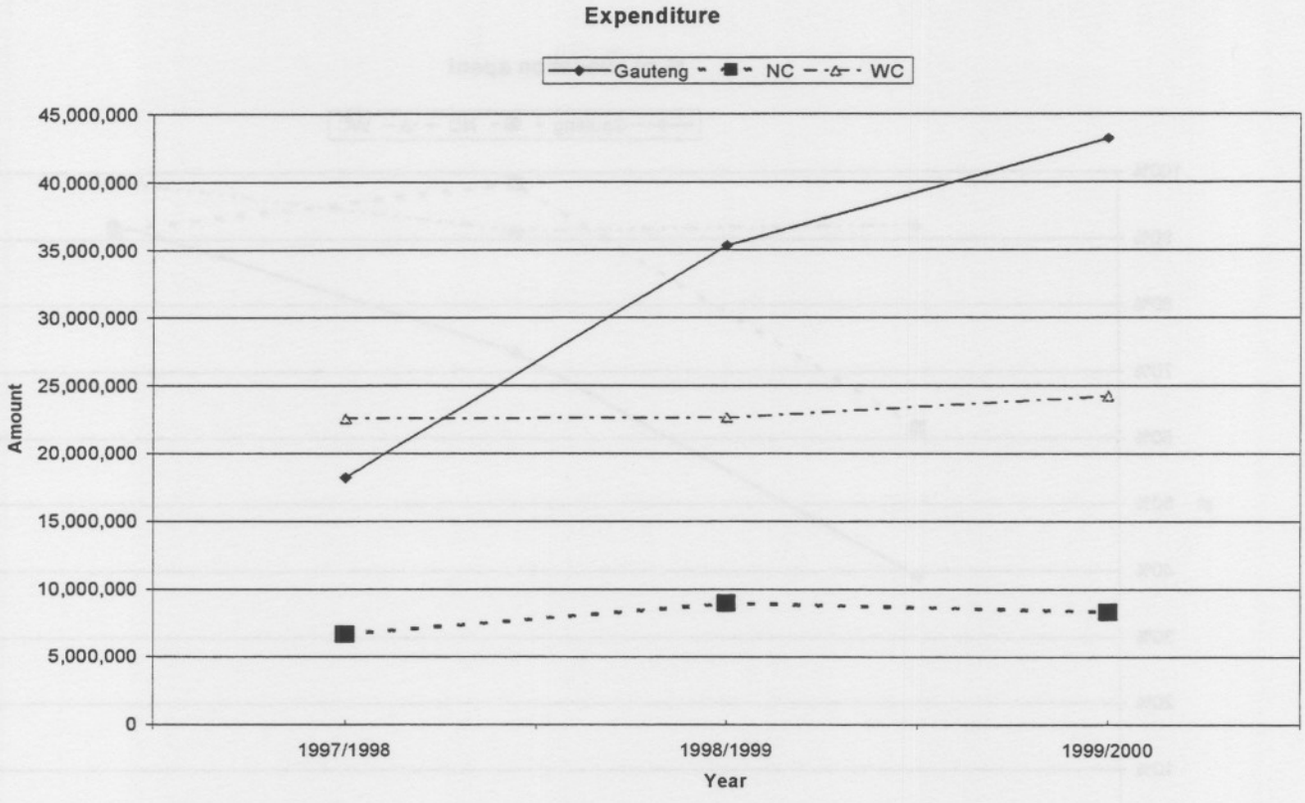
Table 4.16 Percentage Allocation of Conditional Grant apportioned for school feeding

Province	1998/99 %	1999/2000 %	2000/2001 %	Total %
Eastern Cape	91	82	75	82
Free State	97	53	60	69
Gauteng	72	83	83	79
KwaZulu-Natal	74	75	88	80
Mpumalanga	95	97	97	96
Northern Cape	100	95	89	95
Northern Province	100	89	88	92
North West	100	97	99	99
Western Cape	95	90	86	90
Total	**89**	**83**	**84**	**85**

4.4.4.4.2 Expenditure per province

Only three provinces, namely Gauteng, the Northern Cape and the Western Cape, provided the actual expenditure for school feeding in their respective provinces for the period 1997/1998 to 1999/2000. The national Department of Health provided the total annual expenditure, but could not provide the actual expenditure per province for school feeding.

Figure 4.8 illustrates the expenditure per province per year.

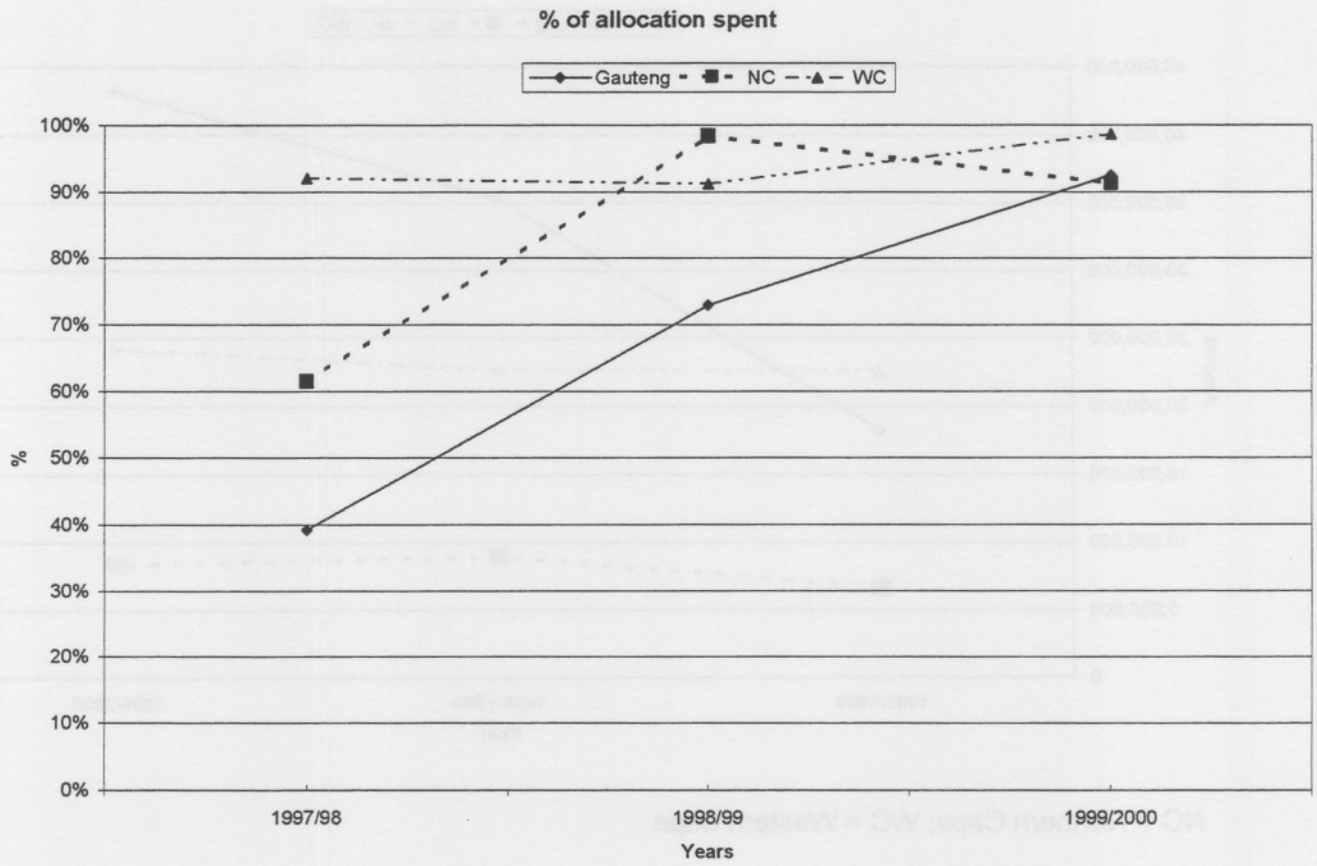


NC = Northern Cape; WC = Western Cape

Figure 4.8 Expenditure per province per financial year

Gauteng's expenditure increased with 94% from 1997/98 to 1998/99 and with 22% from 1998/99 to 1999/2000. The Northern Cape's expenditure increased with 34% between 1997/98 to 1998/99 and decreased with 7% between 1998/99 and 1999/2000. The Western Cape's expenditure stayed consistent between 1997/98 and 1998/99. Between 1998/1999 and 1999/2000 the Western Cape's expenditure increased with 7%.

In 1997/98 the Northern Cape spent only 39% of the total allocation while Gauteng spent 61% and the Western Cape spent 92% of the total allocation. The expenditure increased in the following two years, which indicates an improvement of the utilisation of funds. Explanations for the increase can also be found in programme development, re-engineered processes and therefore improved ability for greater coverage. In 1999/2000 the percentage expended was 91%, 92% and 99% for the Northern Cape, Gauteng and the Western Cape respectively. Over the three years the Western Cape expenditure was the most consistent with 92%, 91% and 99% of their provincial allocation for school feeding expended. This is indicated in Figure 4.9.



NC = Northern Cape; WC = Western Cape

Figure 4.9 Percentage of allocation spent

4.4.4.5 Coverage of schools

Approximately 15 000 schools participated in school feeding annually. In 1999/2000, 15 428 schools, and in 1998/1999, 15 776 schools participated in school feeding. The percentage coverage of schools per province has stayed consistent. The total number of schools per province is given in Table 4.17, the total number of schools targeted in Table 4.18 and the total number of schools reached in Table 4.19.

Table 4.17 Total number of schools

Province	1997/98	1998/99	1999/2000	Total
Eastern Cape	5,519	5,529	5,451	16,499
Free State	2,415	2,349	2,032	6,796
Gauteng	1,660	1,660	1,417	4,737
KwaZulu-Natal	3,948	3,948	3,948	11,844
Mpumalanga	2,345	2,345	2,361	7,051
Northern Cape	448	445	286	1,179
Northern Province	2,769	3,214	3,214	9,197
North West	2,077	2,001	1,963	6,041
Western Cape	1,377	1,091	1,217	3,685
Total	**22,558**	**22,582**	**21,889**	**67,029**

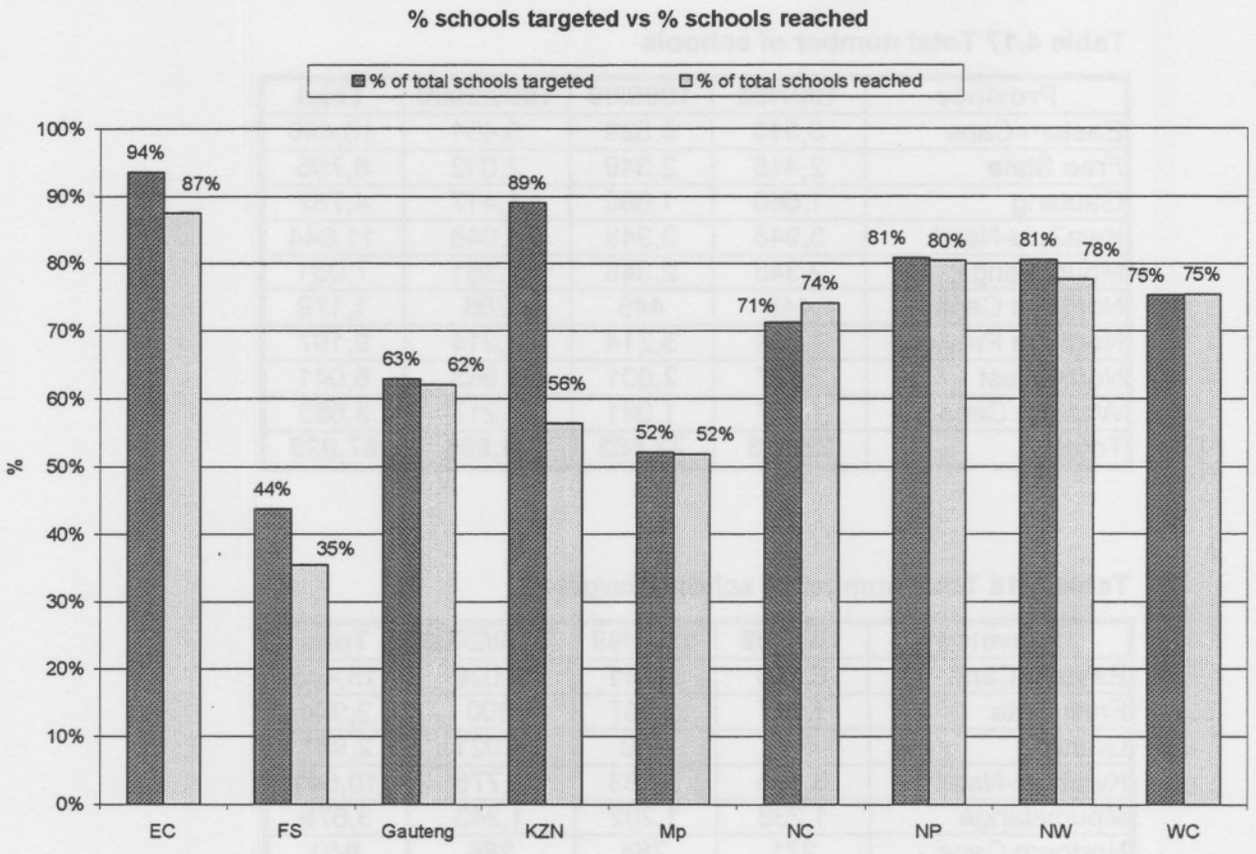
Table 4.18 Total number of schools targeted

Province	1997/98	1998/99	1999/2000	Total
Eastern Cape	5,276	5,141	5,028	15,445
Free State	1,087	1,087	800	2,974
Gauteng	980	980	1,021	2,981
KwaZulu-Natal	3,883	3,883	2,775	10,541
Mpumalanga	1,233	1,202	1,243	3,678
Northern Cape	271	283	286	840
Northern Province	2,522	2,456	2,456	7,434
North West	1,733	1,561	1,571	4,865
Western Cape	960	907	907	2,774
Total	**17,945**	**17,500**	**16,087**	**51,532**

Table 4.19 Total number of schools reached

Province	1997/98	1998/99	1999/2000	Total
Eastern Cape	4,583	4,869	4,981	14,433
Free State	814	1,002	610	2,426
Gauteng	967	967	989	2,923
KwaZulu-Natal	1,714	2,585	2,385	6,684
Mpumalanga	1,210	1,202	1,243	3,655
Northern Cape	271	275	286	8,32
Northern Province	2,483	2,415	2,456	7,354
North West	1,554	1,561	1,571	4,686
Western Cape	953	900	907	2,760
Total	**14,549**	**15,776**	**15,428**	**45,753**

Figure 4.10 illustrates the percentage schools targeted vs.% per school reached out of total school per province.



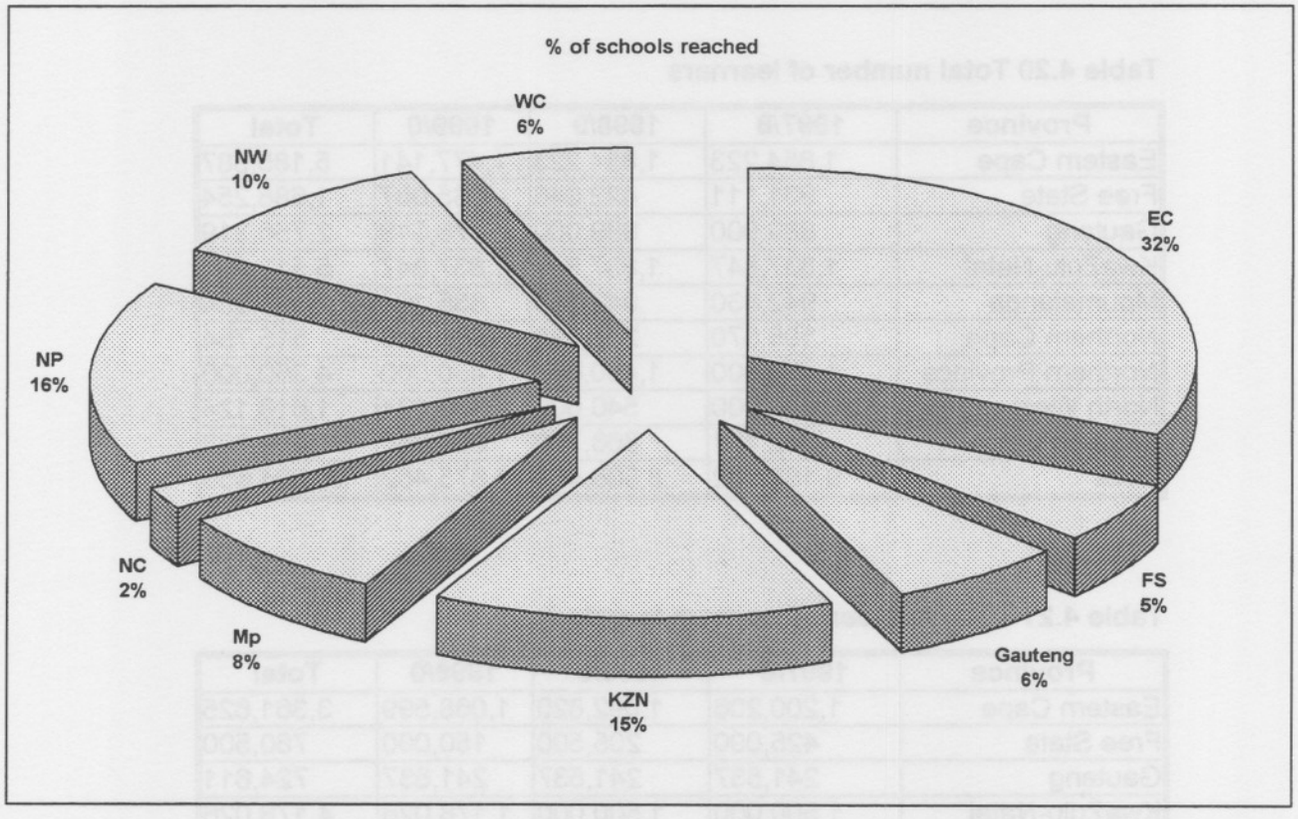
EC = Eastern Cape; FS = Free State; KZN = KwaZulu-Natal; Mp = Mpumalanga; NC = Northern Cape; NP = Northern Province; NW = North West; WC = Western Cape

Figure 4.10 Percentage of schools targeted vs. % per school reached out of total schools per province – average over 3 years

On average, the Eastern Cape targeted 94% of all government primary schools in the province, KwaZulu-Natal 89%, the Northern Province 81% and the North West 81% of the schools in the province. The Free State targeted the least number (44%) of schools. The average percentage of the Northern Cape is questioned as the total number of schools in the province for 1999/2000 differed dramatically from the previous two years. If the trend in the Northern Cape is analysed, it is likely that the average number of schools targeted would only be approximately 60% of the total number of government primary schools in the Northern Cape.

The Eastern Cape reached the largest number (87%) of its government schools. The Free State only reached 35% of the total number of primary schools in its province. The average percentage of schools covered was 67%. The following provinces reached less than the average percentage: Gauteng, KwaZulu-Natal, Mpumalanga and the Free State.

The percentage of schools targeted or reached should not be seen as an indication of whether a province was successful with implementation. The percentage deviation between the schools targeted and schools reached could, however, be an indication of whether provinces were successful as the deviation has budgetary implications. KwaZulu-Natal deviated significantly from its targeted number of schools (33%), the Free State deviated with 9% and the Eastern Cape deviated with 7%.



EC = Eastern Cape; FS = Free State; KZN = KwaZulu-Natal; Mp = Mpumalanga; NC = Northern Cape; NP = Northern Province; NW = North West; WC = Western Cape

Figure 4.11 Provincial representation of total schools reached expressed in percentage

The Eastern Cape accounted for 32% of the total number of schools reached during the period 1997/98 to 1999/2000, while the Northern Province and KwaZulu-Natal accounted for 16% and 15% of the schools reached respectively. The Northern Cape accounted for the lowest, i.e. 2% of the total number of schools reached (Figure 4.11).

4.4.4.6 Coverage of learners

Coverage of learners for the purposes of this section refers to the number of learners that benefited from school feeding. In 1997/98 five (5) million learners participated, in 1998/99 4.8 million and in 1999/2000 4.7 million learners. An average of 4.8 million learners benefited annually over the last three years. Table 4.20 gives the total number of learners per province, Table 4.21 the total number of learners targeted and Table 4.22 the total number of learners reached.

Table 4.20 Total number of learners

Province	1997/8	1998/9	1999/0	Total
Eastern Cape	1,854,223	1,854,223	1,477,141	5,185,587
Free State	931,111	422,046	335,097	1,688,254
Gauteng	889,000	889,000	978,319	2,756,319
KwaZulu-Natal	1,837,847	1,837,847	1,837,847	5,513,541
Mpumalanga	942,830	942,830	535,194	2,420,854
Northern Cape	195,570	203,798	116,386	515,754
Northern Province	1,450,000	1,450,000	1,450,000	4,350,000
North West	540,000	540,000	538,124	1,618,124
Western Cape	542,151	366,718	607,354	1,516,223
Total	9,182,732	8,506,462	7,875,462	25,564,656

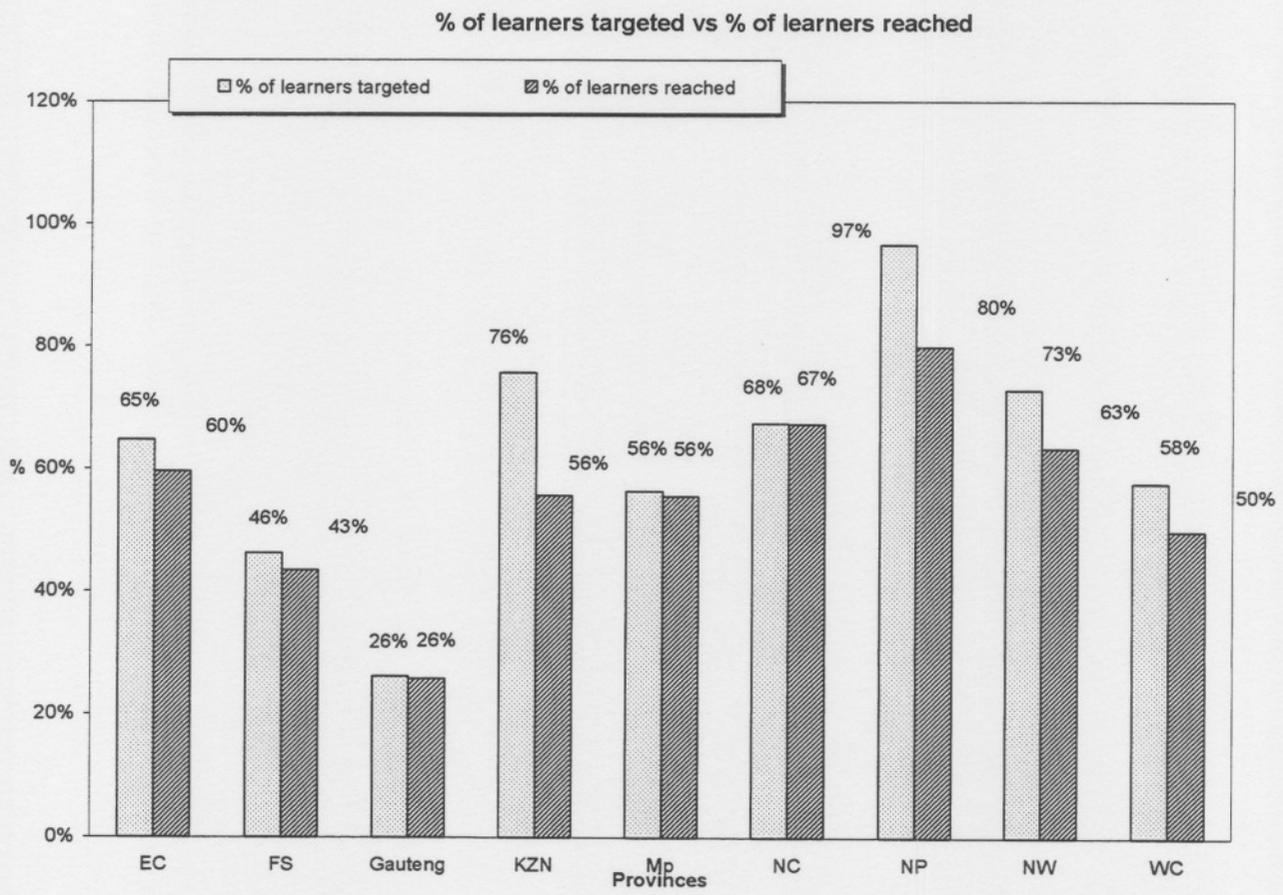
Table 4.21 Total number of learners targeted

Province	1997/8	1998/9	1999/0	Total
Eastern Cape	1,200,206	1,092,820	1,068,599	3,361,625
Free State	425,000	205,500	150,000	780,500
Gauteng	241,537	241,537	241,537	724,611
KwaZulu-Natal	1,500,000	1,500,000	1,178,026	4,178,026
Mpumalanga	496,432	408,165	461,420	1,366,017
Northern Cape	115,247	117,000	116,340	348,587
Northern Province	1,412,656	1,395,489	1,395,489	4,203,634
North West	308,000	338,986	535,985	1,182,971
Western Cape	325,695	274,808	274,808	875,311
Total	6,024,773	5,574,305	5,422,204	17,021,282

Table 4.22 Total number of learners reached

Province	1997/98	1998/99	1999/2000	Total
Eastern Cape	1,056,947	971,979	1,065,527	3,094,453
Free State	398,569	200,242	134,501	733,312
Gauteng	241,537	241,537	227,222	710,296
KwaZulu-Natal	755,206	1,304,211	1,012,465	3,071,882
Mpumalanga	475,433	408,165	461,420	1,345,018
Northern Cape	115,247	116,340	116,340	347,927
Northern Province	1,346,363	1,006,113	1,131,650	3,484,126
North West	308,000	338,986	380,185	1,027,171
Western Cape	324,273	242,525	190,179	756,977
Total	5,021,575	4,830,098	4,719,489	14,571,162

Figure 4.12 illustrates the percentage of learners targeted vs. percentage of learners reached per province.



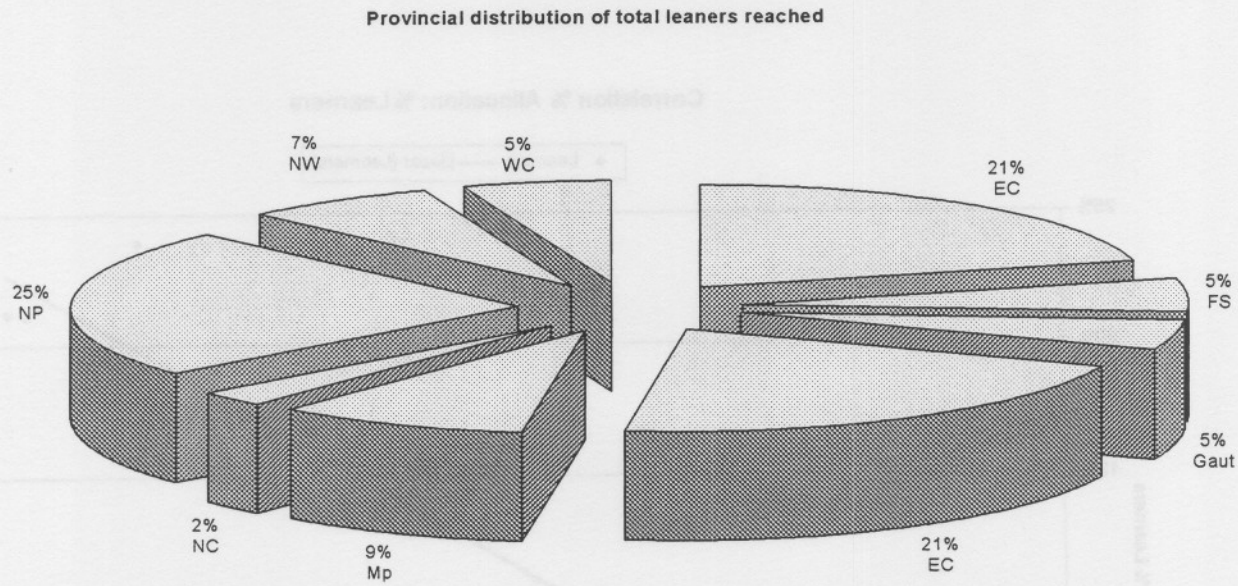
EC = Eastern Cape; FS = Free State; KZN = KwaZulu Natal, Mp = Mpumalanga; NC = Northern Cape; NP = Northern Province; NW = North West; WC = Western Cape

Figure 4.12 Percentage of learners targeted vs. percentage of learners reached

The Northern Province targeted the highest number of learners, namely 97% of its total learners, while Gauteng targeted the lowest number of learners, namely 26% of its total learners. The average number of learners targeted was 67%. Three provinces targeted less than the average i.e. the Eastern Cape, the Western Cape, Mpumalanga, the Free State and Gauteng.

Only Gauteng, Mpumalanga, and the Northern Cape reached the number of learners targeted. Three provinces showed a noticeable deviance from targeted to learners reached, namely the Western Cape with 8% deviation, the North West with 9% deviation, the Northern Province with a 17% deviation and KwaZulu-Natal with 20% deviation.

Figure 4.13 illustrates the provincial representation of total learners reached expressed in percentage.



EC = Eastern Cape; FS = Free State; KZN = KwaZulu Natal, Mp = Mpumalanga; NC = Northern Cape; NP = Northern Province; NW = North West; WC = Western Cape

Figure 4.13 Provincial representation of total learners reached expressed in percentage

Three provinces represented an average 67% of the total learners reached during the period 1997/98 to 1999/2000. The Northern Province represented 25%, the Eastern Cape 21% and KwaZulu-Natal 21% of the total learners. The Northern Cape represented 2% of the total number of learners.

4.4.4.7 Relationship between allocation and coverage

The percentage of learners reached on its own does not provide a true picture of the way funds were applied in a province. An analysis of the expenditure in relation to the percentage of learners reached would have provided a more realistic picture. As the

expenditure for school feeding was not available, the percentage of learners reached and the percentage allocation was analysed. Figure 4.14 illustrates the correlation between percentage allocation and percentage learners reached.

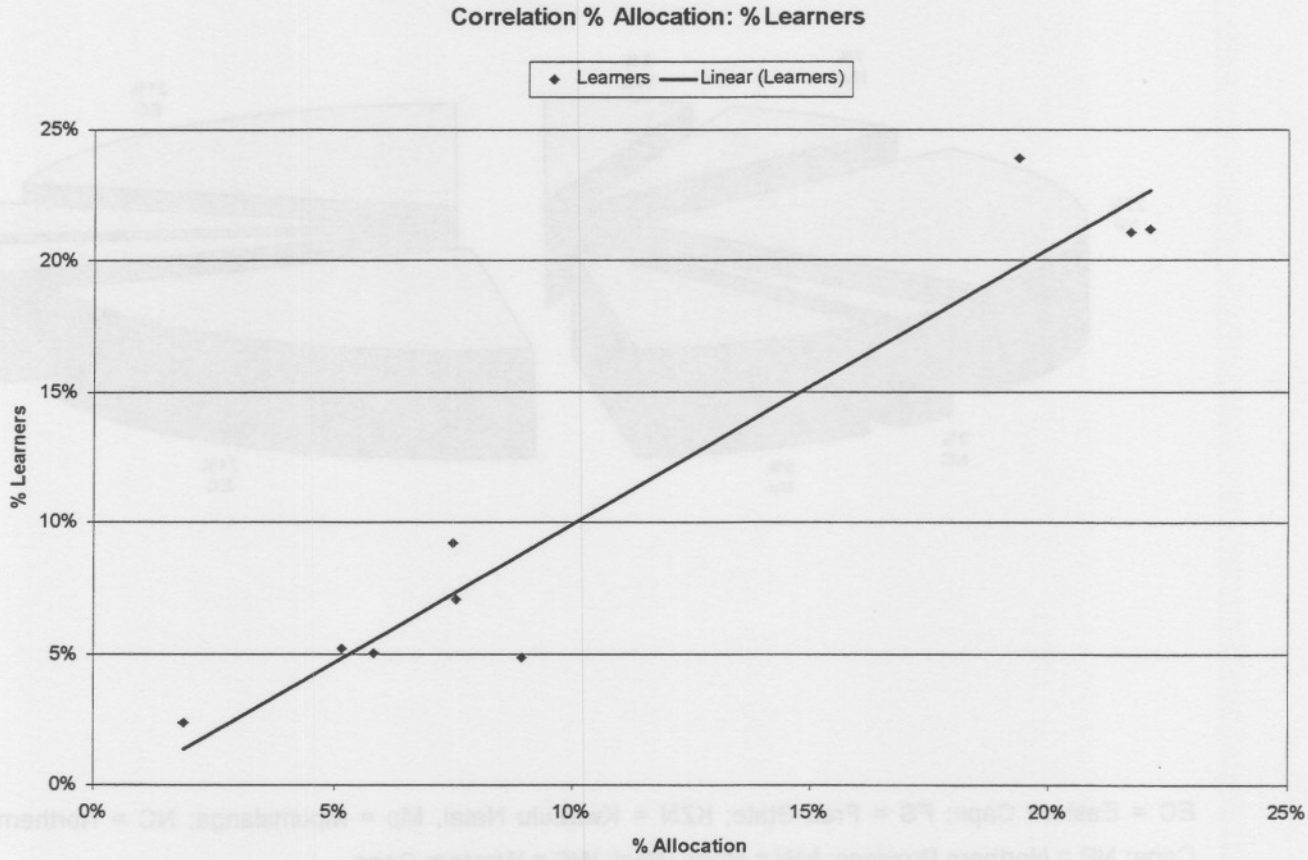
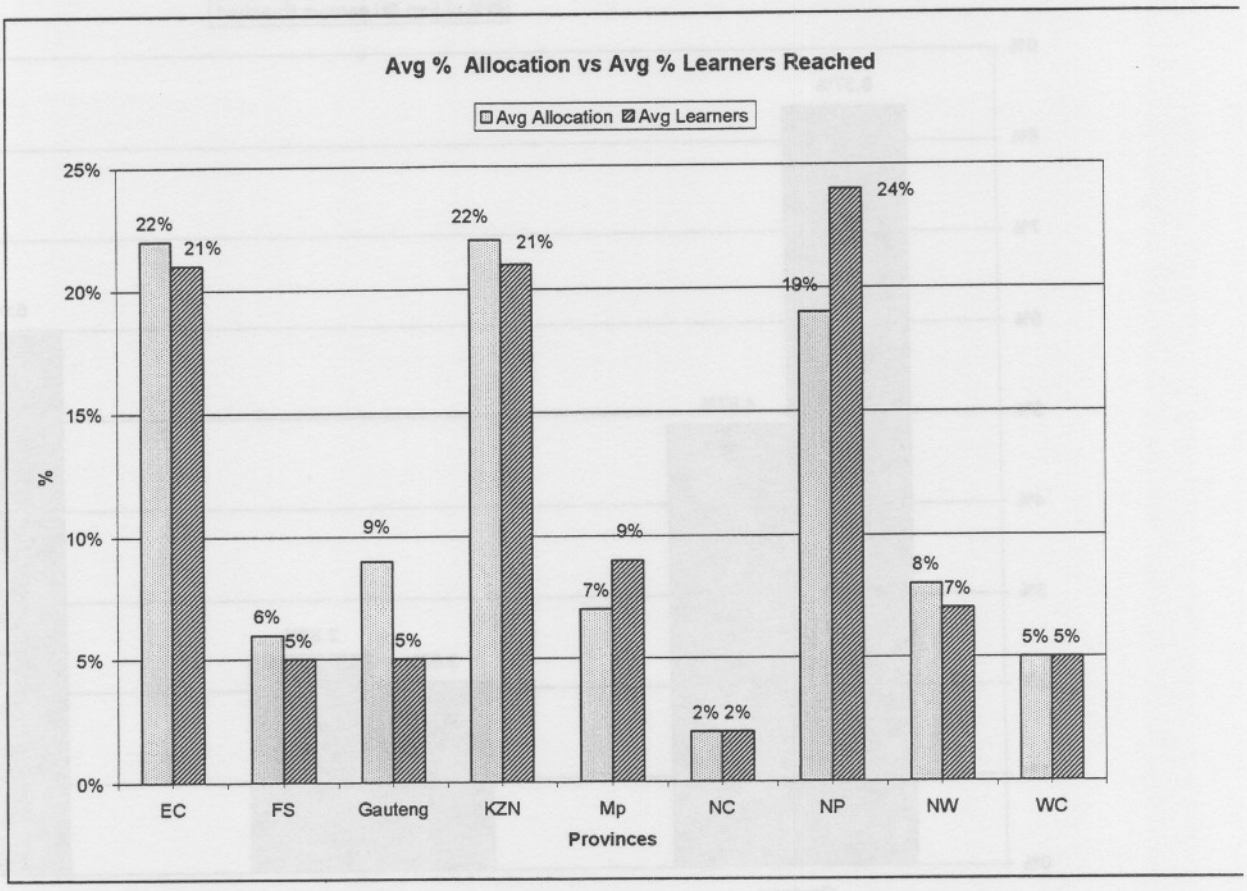


Figure 4.14 Correlation between percentage allocation and percentage learners reached

A positive correlation existed between the percentage learners reached and the percentage allocation. This means that with an increase in allocation, more learners were reached.

Figure 4.15 illustrates the average percentage allocation vs. the average percentage learners reached per province.

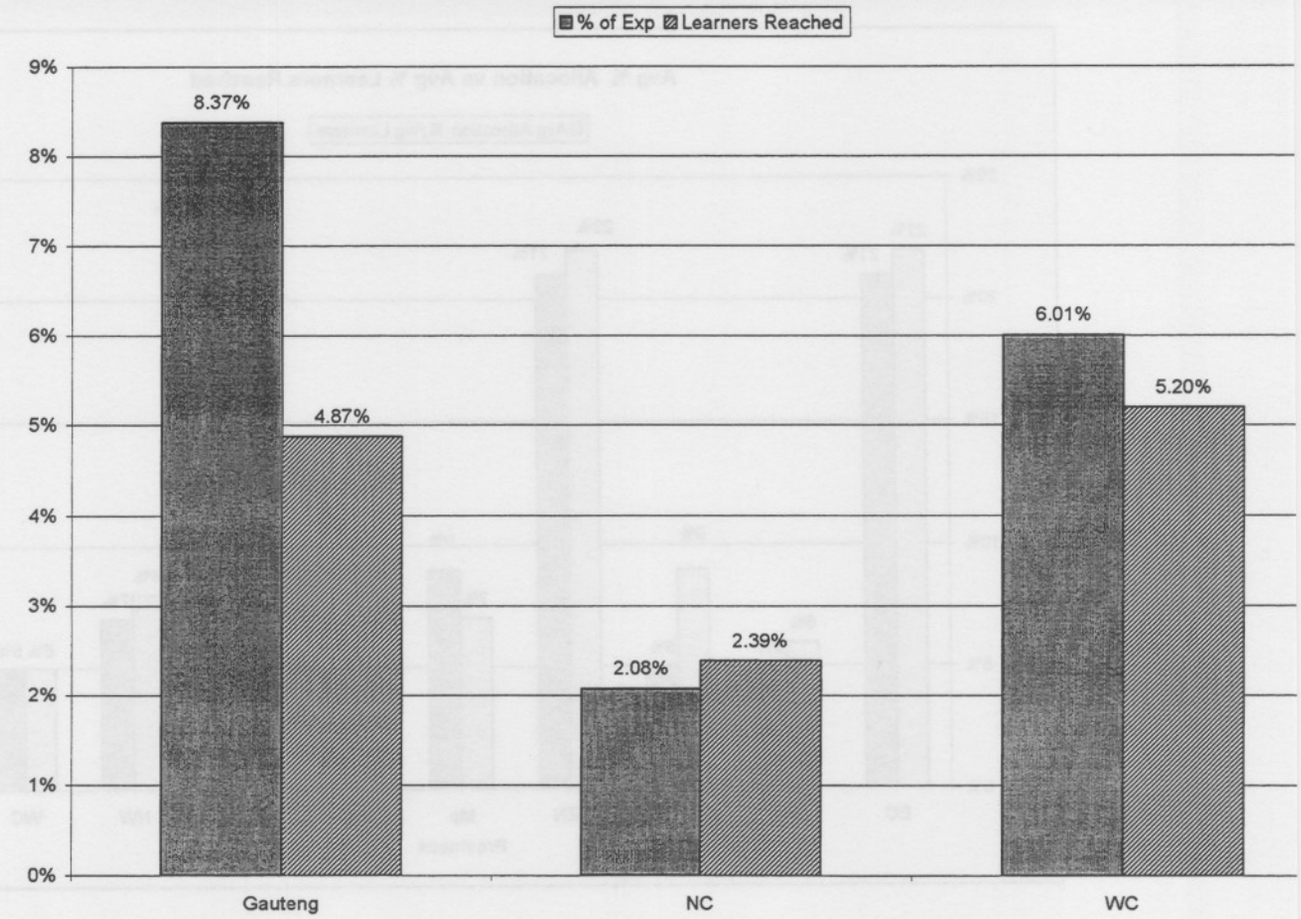


EC = Eastern Cape; FS = Free State; KZN = KwaZulu-Natal; Mp = Mpumalanga; NC = Northern Cape; NP = Northern Province; NW = North West; WC = Western Cape

Figure 4.15 Average percentage allocation vs. average percentage learners reached

During the period 1997/98 to 1999/2000, the Northern Province received an average of 19% of the total allocation for school feeding and reached an average of 24% of the total number of learners. The Eastern Cape, KwaZulu-Natal, the North West, the Western Cape, the Free State and the Northern Cape showed a consistency between the percentage allocation and the percentage learners reached. Mpumalanga only received 7% of the allocation, but reached 9% of the total number of learners. Gauteng received 9% of the allocation, but only reached 5% of total number of learners.

Figure 4.16 illustrates the average percentage expenditure vs. the average percentage learners reached per province



NC = Northern Cape; WC = Western Cape

Figure 4.16 Average percentage expenditure vs. average percentage learners reached

Only three provinces' expenditure on school feeding was available. There was a correlation between the Northern Cape and the Western Cape percentage of total expenditure and percentage of total number of learners reached. Gauteng, however, showed a deviation on expenditure and number of learners reached.

4.4.5 Discussion

The Conditional Grant allocation percentage per province stayed constant over the past four years. Although there was an increase in the total expenditure on school feeding, an average of R125.3 million per year over a period of 5 years (excluding 94/95), and R88 million per year over the last three years, has not been used.

As only three provinces' actual expenditure was available, it was not possible to determine whether under expenditure was a general pattern or whether it referred to a particular province.

Not only is allocation and expenditure important, but attention should also be given to the number of schools participating as well as the number of learners who benefit from school feeding. The total number of schools reached has increased from 1997/98 to 1998/99 with 8% but decreased form 1998/99 to 1999/2000 with 2%. The number of learners reached has decreased in the respective periods with 4% and 2%. It seems that more schools but fewer learners were reached. This could be an indication that individuals were targeted in a school.

4.4.6 Conclusions

Based on these results the major conclusions are:

- Each year huge under expenditure of funding for school feeding took place. Over the last three years an average of R88 million per annum was under-expended;
- The reasons for under-expenditure were not explored as part of this project;
- Annual expenditure per province was not available except in the case of Gauteng, the Northern Cape and the Western Cape;
- Conditional grant allocations still continued each year to the different provinces, irrespective of the previous years' funds being expended;
- Over the last three years, provinces allocated between 69% to 99% of INP/PSNP conditional grant for school feeding;
- The business plans used to secure the INP conditional grant did not have sufficient control to manage and monitor the school feeding progress;
- Discrepancy existed between the percentage allocation for school feeding and the percentage learners reached;
- The different percentage of total learners reached, varied significantly from one province to the other;
- The total number of schools reached increased, while the total number of learners benefiting from school feeding decreased.

4.5 Targeting

4.5.1 Objectives

The objectives of this section were:

- To determine the national policy in terms of targeting;
- To determine the provincial strategies in terms of targeting;
- To determine the attitude of schools towards targeting.

4.5.2 Introduction

McCoy *et al.* (1997) stated that the original objective of reaching 50% of learners at the inception of school feeding in 1994 was replaced by separate provincially determined targeting policies. At the inception, the beneficiaries were identified as the needy learners in primary schools. The term "needy" has been defined differently by the implementing agencies in the different provinces, each using their own criteria to identify needy learners.

To date, targeting has been used as a vehicle to reach the largest number of learners possible within the limited amount allocated for school feeding and not to ensure that the most needy learners are reached.

Targeting will be discussed from a national, provincial and school perspective and attention will be given to:

- Geographic targeting;
- School targeting;
- Age/grade targeting;
- Individual targeting.

4.5.3 Methods

4.5.3.1 National level

The national policy directive with regard to targeting was obtained from and verified by the national Department of Health.

4.5.3.2 Provincial level

Interviews were conducted with provincial officials to determine the provincial targeting policies.

4.5.3.3 School level

At school level, questions were included in the educational and administrative questionnaires to determine both how the different targeting policies were applied in schools and the attitude of schools towards targeting.

4.5.4 Results

4.5.4.1 National level

The following policy directive was developed by all stakeholders and approved by Cabinet: "Targeting should take place at two levels, geographic targeting and then selected schools within the designated geographic areas. Priority should be given to rural and peri-urban areas, including schools serving informal settlements. Targeting should adhere to the criteria of reaching those schools serving the most needy, within the framework of affordability".

4.5.4.2 Provincial Level

Seven of the nine provinces adopted the first level of targeting, namely geographic targeting (the Eastern Cape, Gauteng, KwaZulu-Natal, Mpumalanga, the Northern Cape, the Northern Province, the North West)

Of the 7 provinces:

- 1 Province adopted geographic targeting followed by the next two levels of targeting namely school and grade targeting (the Eastern Cape);
- 3 Provinces adopted geographic targeting followed by school targeting and targeting of individuals (Gauteng, KwaZulu-Natal, Mpumalanga);
- 1 Province complied with the national guidelines of geographic and school targeting (the Northern Province);

- 1 Province adopted geographic targeting followed by individual targeting (North West);
- 1 Province adopted geographic targeting only (the Northern Cape);
- The remaining two provinces (the Free State and the Western Cape) did not adopt geographical targeting:
    - The Free State adopted individual targeting in those schools whose applications were successful;
    - The Western Cape adopted grade and individual targeting.

Provincial targeting strategies are summarised in Table 4.23.

Table 4.23 Provincial targeting strategy

Province	Geographical	School	Grade/age	Individual	Criteria
Eastern Cape	X	X	X		Grade R (Reception year) – Grade 4 All farm schools
Free State				X	Used the following criteria: • Walking distance to school more than 3km • Caregivers that can not provide for learners • Social problems • Availability of running water at school • Availability of sanitation at school • Availability of electricity at school
Gauteng	X	X		X	
KwaZulu-Natal	X	X		X	Rural schools Disadvantaged schools in townships Farm schools
Mpumalanga	X	X		X	Poverty gap Per capita income of communities
Northern Cape	X				All rural and farm schools
Northern Province	X	X			Rural, semi-urban, farm or other informal settlements Only Grades 1–7
North West	X			X	Rural schools – 100% of the learners in the school Urban - 10% of the learners in the school Non-Urban - 80% of the learners in the school
Western Cape			X	X	Grade R–Grade 3

4.5.4.3 School Level

More than two-thirds of the sample schools (68%) targeted all the learners. Of the 68%, 5% of the sample schools were located in areas classified as "within boundaries", 6% in

"adjacent" and 57% in "rural" areas. Only 74% of sample schools in the "rural" areas targeted all learners in the school.

Targeting was done mostly by means of targeting certain grades as specified in provincial guidelines and targeting geographical areas. Some schools indicated that the parents' income and nutritional status of learners were used as criteria where individual targeting was done.

Nearly eighty percent of the sample schools (79%) said that all learners in a school should be fed. 10% of these schools were located in areas classified as "within boundaries", 5% in "adjacent" and 64% in "rural" areas.

The majority of educators interviewed at sample schools were adamant that all learners should be treated equally and that no distinction should be made between learners. The majority of educators expressed the view that if you "feed one, you feed all."

The perception of 77% of the educators interviewed was that targeting within a school would lead to intimidation, 83% that it would lead to victimisation and 82% that it would lead to stigmatisation.

4.5.5 Discussions

4.5.5.1 Geographic Targeting

According to Del Rosso (1999), geographic targeting is the most commonly used mechanism in school feeding. Targeting by geographic area or type of location (e.g. urban) is relatively easy to administrate.

The poverty gap together with other indicators can be used as a guideline to identify those areas where a need for school feeding exists. In a recent study by Labadarios (2000) 74% of the non-urban population and 40.5% of the urban population in South Africa, were classified as poor. Del Rosso and Marek (1996) recommended that the height-for-age census (census that records the height and age of first-grade children), which is widely used in Latin America and Eastern Europe, be used as a tool to identify needy geographic areas.

The current area classification of school locations as provided by the Department of Education, i.e. "within boundaries", "adjacent" and "rural" is not sufficient to be used in geographic targeting.

4.5.5.2 School Targeting

Geographic areas are generally targeted as a first level of targeting followed by either targeting selected schools and/or targeting individuals/grades in a school. In the case of school targeting, schools in geographically selected areas are targeted.

Using the method of school targeting together with geographic targeting is an acceptable way of targeting, provided that the criteria for the classification of schools are appropriate. The current classification of schools is not very helpful in determining the status of a school. The criteria for identifying schools where a need for school feeding exist need to be addressed. Suggested criteria could include:

- Tap water on site;
- Type of toilets;
- Road infrastructure (type, condition of road);
- Distance to the nearest town;
- Distance to nearest shop/spaza shop;
- Register of needs.

4.5.5.3 Individual Targeting

Targeting individuals involves a fair amount of administration on a continued basis. The educator should be familiar with the parents' employment or financial situation as well as their household food security status. As individual targeting could result in learners being stigmatised as poor and could lead to victimisation, intimidation and sharing of food, it is not recommended.

4.5.5.4 Grade/age group targeting

School feeding is intended to benefit all needy primary school learners from Grades 1–7. In order to cover as many schools as possible, some provinces targeted only certain grades. This poses a problem. Normally the younger learners (Grades 1–4) were targeted to receive food. Most of the time, the learners from Grades 1–7 were from the same environment and even the same family. Furthermore, the older learners might intimidate the younger learners and might take away their food. The introduction of the Grade R (reception year) as part of primary school complicates the situation even further. The national policy did not specify the inclusion of learners from Grade R. In some provinces, learners from Grade R were specifically excluded. As they are the youngest and the most vulnerable, it is very difficult to exclude them from school feeding.

Grade or age group targeting is not recommended. All the learners in a school should receive food, including those in Grade R.

4.5.5.5 General

In general, the national directive on targeting was not applied in provinces. In order to cover as many schools as possible within the limited amount available for feeding, some provinces adopted a policy of targeting individuals within a school. One province indicated that they approved all applications regardless of whether there were sufficient funds.

At the implementation level, schools found it difficult to provide food to some and not to others.

In some sample schools where a non-cooked menu was served, food was taken to the respective classes and served to learners in class. The purpose of this arrangement was to prevent the older learners from intimidating the younger ones and to ensure that the older learners did not take the food from the younger learners.

In those sample schools where the cooked menu was served, learners lined up to receive the food. Educators remarked that on Mondays the queue was much longer as more learners were hungry after the weekend. Individual targeting is very difficult to apply in such a situation

Quantities delivered to schools were based on the targeted number of learners. Schools, however, that did not apply the individual targeting policy, fed all the learners with the limited quantities available. Field workers also reported that the stock, intended to last for a specific period, was depleted before the intended period in order to feed all the learners. Schools then complained that insufficient quantities were delivered.

The policy of individual targeting in some sample schools led to the dilution of food items as smaller portions were served to the learners. The following case study serves as an example:

Case study (school 008)

The number of loaves delivered (24 loaves) was based on the approved number of learners that should have received food and the approved quantity of bread to be served to each learner (i.e. 80g). The school, however, fed 552 learners. This meant that the 24 loaves were divided between 552 learners, thus each learner only receiving 28.75g of bread. This example is an indication of dilution of food items.

4.5.6 Conclusions

Based on these results the major conclusions are:

- National targeting directives were not applied at provincial level and provincial policies were similarly not applied at school level;
- Targeting was driven from a political and financial perspective. From a political perspective, provinces wanted to cover as many schools as possible. From a financial perspective, provinces could only achieve the political aim if they compromised on the quantity and quality of food items served to learners in order not to exceed the limited funds available for school feeding;
- The term "needy" was not defined;
- The current classification of schools is not very helpful in determining the status of a school;
- Individual targeting in schools led to the dilution of food items as smaller portions were served to learners;
- Educators' perception was that individual targeting led to intimidation, victimisation and stigmatization;
- In practice, targeting does not take place within a school.

4.6 Consistency and coverage

4.6.1 Objectives

The objectives of this section were:

- To determine the total number of school days for the 2000 school calendar year;
- To determine the approved number of feeding days for the 2000 school calendar year;
- To determine the number of schools where feeding did not take place on the day of the visit;
- To determine the number of feeding days missed;
- To determine the actual number of feeding days;
- To determine the arrangements concerning school holidays.

4.6.2 Introduction

Coverage of learners and schools is discussed in the previous section. For the purposes of this section, coverage is an indication of how many days the learners actually received food out of the maximum possible number of days available for feeding. Consistency indicates whether feeding takes place on a regular or on an ad hoc basis.

Consistency and the maximum coverage (school days) are important to achieve the aims of school feeding, i.e. to contribute to the improvement of education quality and general health by:

- Enhancing active learning capacity;
- Alleviating short-term hunger;
- Improving school attendance and punctuality (Kloka, 2000).

4.6.3 Methods

4.6.3.1 Total number of school days

The official public holidays that coincided with the 2000 provincial school terms were deducted to determine the total number of school days per province for the 2000 school calendar year (January to December 2000).

4.6.3.2 Approved number of feeding days

The approved number of feeding days for the 2000 school calendar year was extracted from the provincial business plans and implementation guidelines and verified by the provinces.

4.6.3.3 Schools not feeding on the day of the visit

One hundred and forty nine (149) sample schools were visited by fieldworkers. Reasons for non-feeding were noted by the fieldworkers.

4.6.3.4 The number of feeding days missed

Schools were asked to indicate the number of feeding days missed during the 2000 school calendar year (Administrative questionnaire). The data received from the schools were verified against the provincial feeding day calendars for the 2000 school calendar year. If a sample school included a non-feeding day in the number of feeding days missed, it was corrected. The categories of feeding days used by Saasa-Modise (1997) were used in this section.

4.6.3.5 Actual feeding days

The data received from the schools were verified against the provincial feeding day calendars for the 2000 school calendar year and corrected where non-feeding days were included by sample schools in the number of days missed. The average number of feeding days missed per province was used to determine the number of feeding days missed.

4.6.3.6 Arrangements concerning school holidays

Schools were asked to indicate whether they provided food to learners during school holidays or on non-feeding days.

4.6.4 Results

4.6.4.1 Total number of school days

The total number of school days for the 2000 school calendar year (January to December 2000) in all nine provinces was 197 days. The number of school days per term varied for the different provinces. During the school terms of 2000 there were 7 public holidays

4.6.4.2 Approved number of feeding days

The approved number of feeding days for the 2000 school calendar year per province (January to December 2000) together with the total number of days per school term and percentage coverage of the total number of school days are indicated in Table 4.24.

Table 4.24 Approved number of feeding days and percentage coverage

Province	Approved	% coverage of total number of school days* %
Eastern Cape	143	73
Free State	197	100
Gauteng	186	94
KwaZulu-Natal	152	77
Mpumalanga	116	59
Northern Cape	129	65
Northern Province	196	99
North West	197	100
Western Cape	163	83

* Total number of school days = 197 days

Comments

Only three provinces approved feeding on each of the maximum number of school days. Three of the provinces (the Eastern Cape, Mpumalanga and the Northern Cape) that are the most affected provinces in terms of micronutrient deficiencies and other dietary inadequacies

(Labadarios, 2000), approved feeding on less than 80% of the maximum number of school days.

Each province has the prerogative to decide on the number of feeding days. The number of learners to be fed, the cost per learner per day and the amount allocated per province for school feeding are the factors that determine the number of feeding days per province. Some provinces opted to reduce the number of feeding days in favour of reaching more learners.

4.6.4.3 Schools not feeding on the day of the visit

Table 4.25 gives the number of schools that did not feed on the day the school was visited by the field workers.

Table 4.25 Number of schools not feeding on day of visit

Province	Total sample schools	Not feeding	% of sample schools not feeding
Eastern Cape	50	26	52
Free State	5	1	20
Gauteng	10	0	0
KwaZulu-Natal	22	3	14
Mpumalanga	13	3	23
Northern Cape	3	0	0
Northern Province	15	5	33
North West	22	2	9
Western Cape	9	1	11
Grand Total	149	42	28

Comments

Schools in general indicated that feeding could not take place as suppliers did not deliver sufficient quantities, did not deliver at all, delivered food of unacceptable quality, did not replace food items that were returned or where schools were on the quotation system, that feeding was suspended due to a lack of funds. These reasons given by the schools for non-feeding could not be verified as this would have entailed several verification processes, including verification of delivery notes, stock control and payments made to suppliers, which fell outside the terms of the tender.

The following should, however, not be excluded as possible reasons for the non-feeding:

- Targeting policies were not followed and in order to feed all learners, the stock was depleted before the intended period ended;
- Feeding took place on days that were not approved for feeding resulting in the lack of funds or insufficient quantities in stock;
- Increase of prices on the quotation system depleted funds;
- Poor rotation of stock contributed to the poor quality of food;
- Food items were stolen;
- Late awarding of tenders by the provincial Tender Boards delayed delivery of food items to schools;
- Schools on the quotation system purchased food items not on the list of menu options (meat instead of soya);
- Claims were not submitted for payment.

4.6.4.3.1 The Eastern Cape

At 26 of the sample schools in the Eastern Cape feeding did not take place on the day of visit:

- One sample school did not receive any food during either the second or third term;
- One sample school stopped feeding on 22 August 2000;
- One sample school did not receive any food since September 1999;
- Six sample schools received no food during the third term;
- Six sample schools indicated that they had missed many feeding days;
- Six sample schools did not have any food;
- One sample school stopped feeding one week earlier than scheduled;
- One sample school did not feed for two consecutive days;
- One sample school did not feed on the specific day of the visit;
- One sample school did not feed on Fridays;
- One sample school only fed if funds were available to hire a donkey cart to collect and deliver the food to the school as the supplier did not deliver the food items at the school itself;
- The Eastern Cape Provincial Tender Board extended the 1999/2000 tender until the end of June 2000 as the 2000/2001 tenders were not awarded in time. The new tender was, however, only awarded during the first week of August 2000, which

delayed the start of feeding. It was also indicated that it took some time for new NGOs to start with their deliveries.

4.6.4.3.2 The Free State

One school had not received any food since 1994.

- This school was on the tender system. The principal indicated that he refused to accept the bulk foodstuffs when it was initially delivered, as he requested delivery of a prepared product (sandwich). The School Governing Body on the other hand, claimed that the authorities ignored all requests for participation in the programme.

4.6.4.3.3 KwaZulu-Natal

Three sample schools in KwaZulu-Natal were not feeding on the day of the visit:

- Fieldworkers visited one sample school on a Friday which was not an approved feeding day;
- One sample school stopped feeding due to a lack of funds;
- One supplier prepared and stored the food at his premises. There was therefore no food at the sample school at the time of the visit.

4.6.4.3.4 Mpumalanga

Three sample schools in Mpumalanga were not feeding on the day of the visit:

- At one sample school all the educators and learners were absent for 3 days as educators were attending a meeting;
- At one sample school the helper decided not to cook as she was waiting to switch over from preparing the food on an open fire to using a gas stove;
- At one sample school no cooking took place. Dry ingredients were given to the learners to take home.

4.6.4.3.5 The Northern Province

Five sample schools were not feeding on the day of the visit:

- Two sample schools did not receive any food during the 2000 school calendar year;
- Two sample schools stopped feeding due to lack of funds;
- One sample school did not feed on the day of the visit as the learners were writing exams.

4.6.4.3.6 The North West

Two schools in the North West Province were not feeding on the day of the visit:

- At one sample school the educators had not arrived by 11:00;
- One sample school had construction work being done to the school.

4.6.4.3.7 The Western Cape

One sample school did not have any food due to a lack of funds:

- The school was on the quotation system and therefore responsible for procuring food.

4.6.4.4 The number of feeding days missed

The categories used to classify feeding days missed during the 2000 school calendar year are given in Table 4.26:

Table 4.26 Feeding days missed expressed as a percentage

Province	None %	1-10 days %	11-25 days %	More than 25 days %	No feeding this year %	Total %
Eastern Cape	22.00	8.00	18.00	52.00	0.00	100
Free State	20.00	0.00	20.00	40.00	20.00	100
Gauteng	60.00	30.00	0.00	10.00	0.00	100
KwaZulu-Natal	40.91	22.73	18.18	18.18	0.00	100
Mpumlanga	58.33	33.33	0.00	8.33	0.00	100
Northern Cape	0.00	0.00	66.67	33.33	0.00	100
Northern Province	19.05	4.76	9.52	57.14	9.52	100
North West	21.43	14.29	28.57	35.71	0.00	100
Western Cape	66.67	11.11	22.22	0.00	0.00	100
Average	32.19	13.70	16.44	35.62	2.05	100

Comments

During the 2000 school calendar year, 46% of the sample schools missed less than 10 feeding days, 16% of the sample schools missed between 11 and 25 days, while 36% missed more than 25 days feeding. Two percent of the sample schools did not receive any food during the 2000 school calendar year.

The Eastern Cape, the Free State and the Northern Province had the highest percentage of feeding days missed.

Table 4.27 indicates the number of feeding days missed according to area classification of the school location.

Table 4.27 Feeding days missed according to area classification of school location

Category	None %	1-10 days %	11-25 days %	More than 25 days %	No feeding this year %	Grand total %
Within Boundaries	38.46	23.08	23.08	15.38	0.00	100
Adjacent	33.33	16.67	16.67	33.33	0.00	100
Rural	30.56	11.11	14.81	40.74	2.78	100
Grand Total	32.19	13.70	16.44	35.62	2.05	100

The sample schools located in the areas classified as "rural" represented the highest percentage of schools that missed 25 feeding days or more. This is significant as Labadarios (2000) reported that 74% of the non-urban population was poor.

4.6.4.5 Actual feeding days

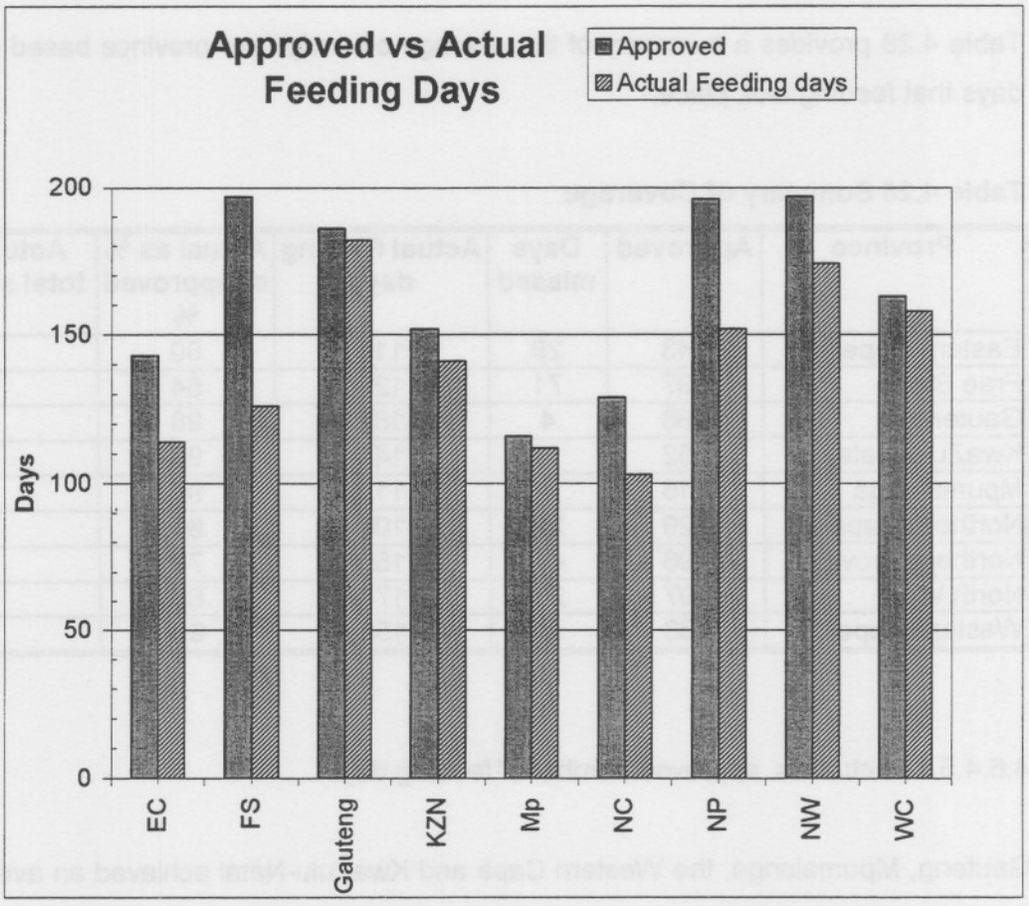
Table 4.28 provides a summary of the average coverage per province based on the actual days that feeding took place.

Table 4.28 Summary of Coverage

Province	Approved	Days missed	Actual feeding days	Actual as % of approved %	Actual as % of total school days %
Eastern Cape	143	29	114	80	58
Free State	197	71	126	64	64
Gauteng	186	4	182	98	92
KwaZulu-Natal	152	11	141	93	72
Mpumalanga	116	4	112	97	57
Northern Cape	129	26	103	80	52
Northern Province	196	44	152	78	77
North West	197	23	174	88	88
Western Cape	163	5	158	97	80

4.6.4.5.1 Actual vs. approved number of feeding days

Gauteng, Mpumalanga, the Western Cape and KwaZulu-Natal achieved an average of 90% or more coverage of their approved number of feeding days. The North West, the Eastern Cape and the Northern Cape achieved an average of between 80% and 89% coverage of the approved number of feeding days. The Northern Province achieved an average of 78% coverage of the approved number of feeding days. The Free State achieved an average of only 64% coverage of its approved number of feeding days. Figure 4.17 illustrates the number of approved vs. the actual number of feeding days per province.



EC = Eastern Cape; FS = Free State; KZN = KwaZulu-Natal, Mp = Mpumalanga; NC = Northern Cape; NP = Northern Province; NW = North West; WC = Western Cape

Figure 4.17 Approved vs. Actual feeding days

4.6.4.5.2 Actual vs. maximum feeding days possible

Gauteng provided the most extensive coverage with an average of 92% of maximum possible feeding days covered. The three provinces most affected in terms of micronutrient deficiencies and other dietary inadequacies, i.e., the Eastern Cape, Mpumalanga and the Northern Cape (Labadarios, 2000), achieved very low coverage ranging from an average of 52% to 58% coverage of the maximum possible feeding days.

4.6.4.6 Arrangements concerning school holidays

Nearly all (99%) of the sample schools indicated that they did not provide food for the learners during the school holidays.

Only 10% of the sample schools provided food to the learners on days not approved for feeding. The food provided to the learners were donated from the community, left over stock or was funded from school fund. One sample school in Mpumalanga used the vegetables from the school's vegetable garden to prepare food for the learners.

4.6.5 Discussions

More than half the sample schools in the Eastern Cape did not feed on the day of the visit. The poor road conditions and the fact that the Eastern Cape Tender Board did not award the 2000/2001 tenders in time may be possible reasons for the high number of schools not feeding on the day of the visit.

According to Saasa-Modise (1997), 79% of the schools in the Eastern Cape missed feeding for 25 days and more in 1997 while 45% of the schools in the Free State missed 25 days or more. The Eastern Cape showed an improvement as only 52% of the sample schools visited during this research period, missed feeding for 25 days and more. The percentage of feeding days missed for 25 days or more in the Free State had risen to 60% during the 2000 school calendar year. The percentage of feeding days missed in the Northern Province increased from 19% in 1997 to an alarming 65% during the 2000 school calendar year. Table 4.29 compares the percentage of schools that missed 25 days and more between the current evaluation and that of Saasa-Modise (1997).

Table 4.29 More than 25 days missed – a comparison with Saasa-Modise (1997)

Province	Saasa-Modise (1997) %	Current study %	Comments
Eastern Cape	79	52	Improvement
Free State	45	60	Deteriorated
Northern Province	19	65	Deteriorated

School feeding aims at improving school attendance. The low coverage could, however, result in a decrease in school attendance.

4.6.6 Conclusion

Based on these results the major conclusions are:

- School feeding should be consistent to achieve the aims of school feeding and to provide the maximum benefit to learners;
- The number of approved feeding days in a year varied significantly from one province to the other;
- Coverage in terms of the maximum number of schools days, was too low;
- Too many schools were not feeding on the day that the visit took place;
- Coverage of approved feeding days in the majority of the provinces was too low;
- Inconsistency of feeding has been identified in some provinces;
- Only 1% of the sample schools provided food for the learners during school holidays.

4.7 Compliance of menu options with criteria

4.7.1 Objectives

The objectives of this section were:

- To use the national guidelines on nutritional criteria as base line to:
    - assess each provincially approved menu option;
    - assess provincial specifications;
- To compare the specifications of food items to the nutritional composition of the food items served at the schools in each province;
- To use the provincial menu options;
- To assess the menu served at school level.

4.7.2 Introduction

The National Department of Health developed nutritional criteria for menus to serve as a guideline for provinces. Provinces are expected to use these guidelines to develop menus and specifications.

Menus served at school level should be measured against provincial guidelines.

4.7.3 Methods

4.7.3.1 National nutritional guidelines

The following national nutritional criteria for menu options exist and were given in the tender specifications:

- The food option or combination of options selected must provide in not less than 25% of the Recommend Dietary Allowance for energy for the 7 and 10–year-old target group and in not less than 20% of the RDA for energy for the 11 to 14–year-old target group:
    - 7–10-year-olds: 2100 kJ (RDA = 8400 kJ)
    - 11–14 year-old-females: 1848 kJ (RDA = 9240 kJ)
    - 11–14 year-old-boys: 2100 kJ (RDA = 10500 kJ);
- For the 11–14-year-old age group, the average for male and female can be used;
- Whereas the provision of a considerable contribution to the recommended energy per day is essential for a child's optimal growth and development, the overall nutrient content of a food option should also be considered. Optimal growth and an enhanced learning ability require a balance of nutrients;
- The use of the following foodstuffs is not recommended for the reasons stated:
    - Non-dairy creamers, blends or any other imitation dairy product, because of its inferior nutritive value;
    - Commercial food products such as cool drinks and biscuits for the following reasons:
        - the message to children via such foods can oppose basic nutrition education messages and undermine household food security;
        - such food products seldom fit in with local eating habits;
        - such food products seldom contribute to community involvement; and

- in some cases, such as enriched cool drinks, tinned meat, tinned fish and soup powder; the energy content is low and the products are expensive;

- If communities want to use formulated fortified commercial food products, reasons for such a choice must be submitted;
- Where resources allow, the basic options should be supplemented with additional nutrient-dense foods;
- The guidelines for a healthy diet should be followed in selecting food options;
- Since school feeding addresses the effects of short-term hunger of marginally malnourished and stunted children who need the immediate extra energy from fat, oil and sugar, these can be added to food in small quantities to increase the energy content of the food;
- In terms of social criteria, menu options should make use of already avaialble food products, that are culturally acceptable, commonly consumed and that fit in with the local eating habits.

4.7.3.2 Analysis at provincial level

The menus and menu items of the provinces as provided by provincial and/or used in the provincial specifications were used. Additional information was obtained from the Business Plans of the nine provinces.

Menu compliance of the provincially approved menus was compared to the national nutritional criteria.

Tender documents or quotation documentation of the nine provinces were used to obtain the specifications of menu items.

4.7.3.3 Analysis at school level

The menu and menu items served at the sample school were recorded and compared with the menu as stated by the respective provinces.

Three learners at each of the sample schools visited were interviewed. This questionnaire included questions on the food likes and dislikes of the learners. All these learners participated in the school feeding.

4.7.4 Results

4.7.4.1 Summary of results

The compliance of provincially approved menu options to national criteria is given in Table 4.30. In Table 4.31 the compliance of menu served at schools on day of visit with provincial criteria is given and in Table 4.32 the compliance of weight of bread delivered at schools with provincial specifications.

The results of each province are then discussed in detail.

Table 4.30 Compliance of provincial approved menu options with national criteria

Province	Policy guideline for energy	Energy provided by the provincial approved menus as % of the RDA for 7–10-year-olds (as given by the provinces)	Commercial products stated as unsuitable in the national criteria on provincially approved menu	Nutrient(s) specified for provincial approved menus	Specifications adequate
National Guidelines	7–10-year-old: 25% RDA 11–14-year-old: 20% RDA		No commercial products should be used	None	No details given
Eastern Cape	7–10-year-old: 25% RDA 11–14-year-old: 20% RDA	19%	Fortified Biscuits Vitamin enriched Cool Drink	Protein	No
Free State	20% RDA	24%	Fortified Biscuits	None	No
Gauteng	20% RDA	No energy values were given on menus	Fortified Biscuits Vitamin enriched Cool Drink Tinned fish	None	No
KwaZulu-Natal	20% RDA	No energy values were given on menus	Soup powder Fortified Biscuits Cocoa	None	No
Mpumalanga	No	Bread: 19% Cooked: 21%	None	Protein, fat, CHO	No
Northern Cape	20% RDA	No energy values were given on menus	Fortified Biscuits Vitamin enriched Cool Drink Tinned fish	None	Only for some food items
Northern Province	No	28%	Vitamin enriched Cool Drink	None	No
North West	25% RDA	Incomplete information	Fortified Biscuits Vitamin enriched Cool Drink	None	No Peanut butter mixture specifications were incorrect
Western Cape	20% RDA	20%	None	None	No

RDA = Recommended Dietary Allowance
CHO = carbohydrate

Table 4.31 Compliance of menu served at schools on day of visit with provincial criteria

Province	Only items on provincial approved menu served	Unsuitable commercial products according to national criteria served at schools
Eastern Cape	Yes	Fortified Biscuits Vitamin enriched Cool Drink
Free State	Yes	None served
Gauteng	Yes	Vitamin enriched Cool Drink Tinned fish
KwaZulu-Natal	No 8 Schools served food items not on menus	Cocoa Hard animal cooking fat Soup powder Tinned fish
Mpumalanga	Yes	None
Northern Cape	No, fruit were served once a week	None
Northern Province	No, sugar beans was served at 2 schools	Vitamin enriched Cool Drink
North West	Yes	Fortified Biscuits Vitamin enriched Cool Drink
Western Cape	No, soup power and cool drink served at 1 school	Cool Drink

Table 4.32 Compliance of weight of bread delivered at schools with provincial specifications

Province	Weight of one bread as specified by the province	Weight of one bread delivered at schools
Eastern Cape	800 gram	500–650 gram
Free State	800–850 gram	588–760 gram
Gauteng	800–850 gram	500–700 gram
KwaZulu-Natal	800 gram (average)	Not possible to weigh bread (was already prepared)
Mpumalanga	800–850 gram	510–550 gram
Northern Cape	Not specified	590–690 gram
Northern Province	Not specified	600–700 gram
North West		580–670 gram
Western Cape	800–850 gram	700 gram

4.7.4.2 The Eastern Cape

4.7.4.2.1 Provincially approved menu

Table 4.33 gives the menus for the Eastern Cape.

Table 4.33 The Eastern Cape menu as obtained from the tender specifications 1999/2000

Menu number	Menu item	Quantity	Energy (kJ)	Protein (g)
1	Brown bread	80 gram	744	6.88
	Peanut butter	20 gram	492	4.92
	Soup	Depends on dilution ratio for given energy & protein	220	3.2
2	Brown bread	80 gram	744	6.88
	Peanut butter	20 gram	492	4.92
	Cool drink	Depends on dilution ratio for given energy & protein	220	-
3	Fortified biscuits	Depends on energy value per 100 gram serving	1046	4.1
	Peanut butter	20 gram	492	4.92
	Soup	Depends on dilution ratio for given energy & protein	220	3.2
4	Fortified biscuits	Depends on energy value per 100 gram serving	1046	4.1
	Peanut butter	20 gram	492	4.92
	Cool drink	Depends on dilution ratio for given energy & protein	220	-

The average energy value over the four menus: 1607 kJ = 19% of the RDA for children 7–10 years of age.

Table 4.34 gives the percentage energy and protein contribution.

Table 4.34 The percentage energy and protein contribution of the approved menu as obtained from the tender specifications 1999/2000

Option	7–10 year		11–14 year	
	Energy % RDA	Protein % RDA	Energy % RDA	Protein % RDA
1	18	60	14	33
2	18	47	14	26
3	21	52	17	30
4	21	39	17	23

RDA = Recommended Dietary Allowance

Comments

- Commercial products such as fortified biscuits and enriched cool drink were used;
- A protein value was given for the cool drink. Usually cool drink does not contain protein;
- The options did not supply enough energy when compared to the guideline of the Province;

- The menu was high in protein and provided between 39% and 60% of the RDA for protein for the 7–10-year-old age group and between 23% and 33% for the 11–14-year-old age group.

4.7.4.2.2 Provincial Specifications

Specifications were given for:

- Peanut butter - total aflatoxin shall be less than 10 µg / kg and the B1 aflatoxin not more than 5 µg / kg. No nutritional composition was given;
- Fortified biscuit - a Vitamin A and iron fortified biscuit at 50% of the RDA for a child in the 7–10-year-old category;
- No specifications were given for the enriched cool drink or enriched soup.

Comments

- Specifications were not complete in terms of nutritional value.

4.7.4.2.3 Food served at schools

Twenty-four of the 50 schools served food to the learners on the day the schools were visited. Table 4.35 summarises the type of food served at the schools.

Table 4.35 Food served at Eastern Cape schools

Approved menu items	Food items offered at schools on day of the visit
Brown bread	Brown bread at 15 schools
Peanut butter	Peanut butter at 20 schools
Soup	Not served
Cool drink	Vitamin C cool drink at 20 schools
Fortified biscuits	Fortified biscuits at 7 schools

Comments

- Commercial products such as fortified biscuits and vitamin enriched cool drink were used;
- Only food items on the menu were served at the schools;
- Only peanut butter and cool drink were served at one school with no bread or fortified biscuits;

- Only bread (70g) with nothing else was served at one school;
- Bread was more often served than the fortified biscuits;
- Peanut butter and cool drink were served often;
- The weight of the bread delivered at the schools varied from 500 - 650 gram;
- The food item most liked by the learners was bread;
- The food items least liked by the learners were peanut butter (43%), followed by cool drink (33%), bread (16%) and biscuits (7%);
- The learners did not like the peanut butter because it tasted bad (60%). Ten percent reported that it made them sick.

Table 4.36 gives the nutritional comparison between the specifications for fortified biscuits and the biscuits served at the schools.

Table 4.36 Nutritional comparison between specifications for fortified biscuits and the biscuits served at the schools

Energy/nutrient	Specifications of fortified biscuits per 100 gram	Biscuits used at schools as provided by the manufacturer per 100 gram
Energy: Protein ratio	1046 kJ : 4.1 gram	1046 kJ : 5.25 gram
Vitamin A (mg RE)	350 (50% RDA)	215 (31% RDA)
Iron (mg)	5 (50% RDA)	14.3 (143% RDA)

Comments

- The vitamin A content of the biscuits served at the schools was lower than the specification;
- The iron content of the biscuits served at the schools was nearly three times higher than the specifications.

4.7.4.3 The Free State

4.7.4.3.1 Provincially approved menu

The following menus for the Free State were provided (Table 4.37):

Table 4.37 The Free State menu as obtained from the tender specifications 1999/2000

Menu number	Menu item	Quantity	Energy (kJ)
1	Maize meal (raw)	100 gram	1306
	Sunflower oil	12.5 ml	462
	Full cream milk powder	150 ml	311
2	Brown bread	105 gram (3 slices)	1371
	Peanut butter	15 gram	248
	Full cream milk	150	311
3	Maize meal (raw)	100 gram	1306
	Soy mince	50 gram	600
	Sunflower oil	5 ml	185
4	Brown bread	70 gram (2 slices)	914
	Peanut butter	10 gram	248
	Fortified Biscuits	34 gram (3)	633
	Full cream milk	150 ml	219
5	Brown bread	70 gram (2 slices)	914
	Peanut butter	10 gram	248
	Fortified Biscuits	45 gram (4)	844
6	Maize meal (raw)	100 gram	1306
	Milk powder	150 ml	311
	Peanut butter	15 gram	248
	Sunflower oil	10 ml	185
7	Brown bread	70 gram (2 slices)	914
	Soy mince	50 gram	600
	Milk powder	150 ml	311
	Sunflower oil	5 ml	185

The average energy value over the seven menus: 2026 kJ = 24% of the RDA for children 7–10 years of age.

Comments

- A bread and cooked menu were offered;
- A commercial product, fortified biscuits, was included on the menu.

4.7.4.3.2 Provincial Specifications

Specifications were given for:

- Brown bread - weight 800–850 gram;
- Milk products - full cream milk and full cream milk powder. Only real dairy products may be used;
- Peanut butter - total aflatoxin should be less than 10 µg / kg and the B1 aflatoxin not more than 5 µg / kg. No nutritional composition was given;
- Enriched soup - must contain 350 kJ and 4 gram protein per 200 ml serving;

- Soy mince and soup - per 100 gram dry mass: protein > 18 gram; energy 1200 kJ; sodium < 3 gram.

Comments

- No information was available on the total aflatoxin and B1 aflatoxin levels of the peanut butter used;
- The vitamins and mineral content of fortified biscuits and enriched maize meal were specified, but no guidelines were given in the specifications on the level of micronutrient supplementation;
- No values on the nutritional analysis on the fortified biscuits and enriched maize meal used in the Free State were available from the manufacturers.

4.7.4.3.3 Food served at schools

Four of the 5 schools served food to the learners on the day the schools were visited. Table 4.38 gives the types of food served.

Table 4.38 Food served at the Free State schools

Approved menu items	Food items offered at schools on day of the visited
Maize meal	
Brown bread	Brown bread at 4 schools
Sunflower oil	
Milk, fresh and full cream milk powder (real dairy)	Fresh milk at 2 schools
Peanut butter	Peanut butter at 2 schools
Salt	
Fortified biscuits	
Soy mince and soup	

Comments

- The bread menu was usually offered;
- Fresh milk was used at the schools visited;
- Either peanut butter or milk was served with the bread;
- The fortified biscuits and enriched maize meal were not used;
- The weight of the bread delivered varied from 588–760 gram;
- The food item most liked by the learners was bread (83%);
- Learners interviewed appeared to enjoy all food items served to them.

4.7.4.4 Gauteng

4.7.4.4.1 Provincially approved menu

The menus provided in Gauteng are given in Table 4.39.

Table 4.39 Gauteng menu as obtained from tender specification 1999/2000

Menu number	Menu item	Quantity
Cooked Monday	Sorghum porridge	80 gram
	Sugar	15 gram
	Oil	10 ml
	Full cream milk	100 ml
Cooked Tuesday	Brown bread	80 gram
	Peanut butter	30 gram
	Jam	20 gram
	Vitamin C cool drink	200 ml
Cooked Wednesday	Maize meal porridge	100 gram
	Dried legumes	40 gram
	Oil	10 ml
Cooked Thursday	Brown bread	80 gram
	Margarine	20 gram
	Full cream milk powder	20 gram
Cooked Friday	Maize meal porridge	100 gram
	Soya mince	40 gram
	Oil	10 ml
Bread Monday	Fortified biscuits	100 gram (4)
	Vitamin C cool drink	200 ml
Bread Tuesday	Brown bread	80 gram
	Peanut butter	30 gram
	Jam	20 gram
	Vitamin C cool drink	200 ml
Bread Wednesday	Brown bread	80 gram
	Jam	20 gram
	Margarine	20 gram
	Full cream milk	200 ml
Bread Thursday	Brown bread	80 gram
	Fish	30 gram
	Margarine	20 gram
	Vitamin C cool drink	200 ml
Bread Friday	Brown bread	80 gram
	Margarine	20 gram
	Full cream milk powder	20 gram

No energy values were given.

Comments

- Two menus were offered in Gauteng, i.e. a cooked menu and a bread menu;
- Commercial products such as fortified biscuits and a vitamin enriched cool drink were used;
- A full cream real dairy blend powder was mostly used at the schools and not fresh milk.

4.7.4.4.2 Provincial Specifications

Specifications were given for:

- Peanut butter - total aflatoxin should be less than 10 µg / kg and the B1 aflatoxin not more than 5 µg / kg. No nutritional composition was given
- Milk - non-dairy creamers, blends or any other imitation dairy products should not be used. No nutritional composition was given
- Fortified biscuits – some nutritional values were given
- Edible oils
- Soya based foodstuffs - energy value in kJ must be given on the package
- Enriched maize meal - should contain not less than 10 mg nicotinamide and 1 mg of riboflavin per 400 g of maize meal
- Brown bread - weight 800–850 gram.

Comments

- Specifications were not complete in terms of nutritional value.

4.7.4.4.3 Food served at schools

All 10 of the schools served food to the learners on the day the schools were visited and Table 4.40 gives an indication of the foods served at the schools.

Table 4.40 Food served at Gauteng schools

Approved menu items	Food items offered at schools on day of the visit
Bread	Brown bread at 8 schools
Fortified biscuits	
Peanut butter	Peanut butter at 3 schools
Jam	Jam at 3 schools
Margarine	Margarine at 6 schools
Vitamin C cool drink	Vitamin C cool drink at 3 schools
Tinned fish	Tinned fish in tomato sauce at 4 schools
Full cream milk	Milk powder at 1 school Fresh milk at 1 school
Maas	
Grain sorghum	Maltabella at 1 school
Maize meal	Maize meal at 1 school
Dried legumes	
Soya mince	Soya soup at 1 school
Oil	
Sugar	

Comments

- Only food items on the menu were served at the schools;
- 8 out of 10 schools served bread, while only 2 schools served a cooked menu;
- It seems that the bread menu was more often served than the cooked menu;
- A dairy blend milk powder was served at schools;
- The maize meal used was not enriched;
- The weight of the bread delivered in Gauteng varied between 500 and 700 gram;
- The food item most liked by the learners was bread (33%);
- The food items most disliked by the learners were fish (40%), followed by milk (25%), margarine (10%), biscuits, porridge and soya (5% each);
- The learners complained that the fish tasted bad (50%), that they did not like it (37.5%) and that it made them sick (12.5%).

A comparison was done to evaluate the nutritional composition of the full cream dairy blend powder with a "standard" or "normal" full cream milk powder (Table 4.41).

Table 4.41 Nutritional comparison of full cream milk powder and dairy blend milk powder served at the schools

Energy/Nutrient	Specifcation of full cream milk powder Per 100 gram	Dairy blend powder as supplied by manufacturer* Per 100 gram
Energy (kJ)	1676	2109
Protein (g)	26.4	25.7
Fat (g)	12 – 15	28
Carbohydrate (g)	46	37.4
Calcium (mg)	1003	930
Iron (mg)	0.4	6
Magnesium (mg)	103	85
Phosphorus (mg)	843	750
Potassium (mg)	1558	1200
Sodium (mg)	509	350
Zinc (mg)	3.4	3.34
Copper (mg)	0.14	0.08
Vitamin A (RE)	123	450
Thiamin (mg)	0.4	0.23
Riboflavin (mg)	1.4	1.4
Niacin (mg)	0.8	0.6
Vitamin B6 (mg)	0.35	0.302
Folic acid (ug)	?	37
Vitamin B12 (ug)	?	1.8
Vitamin C (mg)	7	9
Vitamin E (mg)	0	1.08
Vitamin D (mg)	3.2	10

* Vitamin A, D and iron added

Comments

- The fatty acid composition of dairy blend milk powder was not available. The word "blend" in the name is of some concern, but the manufacturers stated that butterfat is used. The word "blend" usually referred to the addition of fat of unsuitable fatty acid composition;
- The fat and therefore energy content of dairy blend powder was lower than that of "normal" full cream milk powder;
- The calcium, magnesium, phosphorus, potassium, copper, thiamin and niacin content of dairy blend powder were slightly higher than that of "normal" full cream milk powder;
- Because of the added vitamin A and D and iron to full cream milk powder, the content of these nutrients were higher;
- The values received from the manufacturer for folic acid (incorrect unit), niacin and vitamin B12 were unacceptable.

4.7.4.5 KwaZulu-Natal

4.7.4.5.1 Provincially approved menu

Two menus were received for KwaZulu-Natal and are given in Tables 4.42 and 4.43.

Table 4.42 KwaZulu-Natal menu as provided by national

Menu number	Menu item	Quantity
1	Brown bread	2 slices
	Margarine	10 gram
	Peanut butter	25 gram
	Milk	200 ml
2	Brown bread	2 slices
	Margarine	10 gram
	Jam	15 gram
	Milk	200 ml
3	Rice (raw)	100 gram/125 ml **OR**
	Rice (cooked)	200 gram/250 ml
	Beans (raw)	80 gram **OR**
	Beans (cooked)	160 gram
	Soya mince	
4	Brown bread	2 slices
	Soup	200 ml
5	Samp (raw)	40 gram **OR**
	Samp (cooked)	200 gram
	Beans (raw)	80 gram **OR**
	Beans (cooked)	160 gram
	Soup	100 ml / 2 cups

The following menus for KwaZulu-Natal were received in December 2000 from the province.

Table 4.43 KwaZulu-Natal menu – New Menu received from the province

Menu number	Menu item	Quantity
1	Sandwich: Brown bread	2 slices
	Margarine	10 gram
	Peanut butter OR	25 gram
	Jam	15 gram
	Milk	200 ml
2	Sandwich: Brown bread	2 slices
	Soya mince OR	
	Meat OR	
	Beans	
	Raw	80 gram (2 cups)
	Cooked	160 gram (1 cup)
3	Rice: Raw	100 gram/125 ml (2 cup)
	Cooked	200 gram/250 ml (1 cup)
	Beans: Raw	80 gram (1/2 cup)
	Cooked OR	160 gram (1 cup)
	Soya mince	
4	Bread	2 slices
	Soup with vegetables	200 ml (1 cup)
5	Samp: Raw	40 gram
	Cooked	200 gram (1 cup)
	Beans: Raw	80 gram (1/2 cup)
	Cooked	160 gram (1 cup)
	Soup	100 ml (1/2 cup)
6	Phutu	200 gram
	Maas/	200 ml (1 teacup)
	Meat/	
	Soya mince or	
	Soup	200 ml (1 cup)
7	Fruit	Once a week
8	Fortified biscuits	3 biscuits
	Cocoa/milk	200 ml

It was not possible to complete the nutritional analysis of this menu due to lack of clear indication of the quantities for each of the food items.

Comments

- No commercial products were given as part of the first menus received;
- The new menu included "meat" (no quantities given), fortified biscuits and a cocoa drink;
- Fruit may be served once a week.

4.7.4.5.2 Provincial Specifications

Specifications were given for different food items in terms of the quantity to be used.

- Milk – only real dairy full cream milk, fresh and long life may be used;
- Bread – weight of an average loaf of bread is 800 gram. Fillings for the bread included lentils, split peas, soya products, beans;
- Margarine of a vegetable source should be used. It must be soft (poly-unsaturated fat composition not specified), good quality and easy to spread. No animal fats are to be used, e.g. lard or holsum;
- Peanut butter must be of good quality;
- Jam must be of a good quality grade and easy to spread;
- Lentils, split peas, beans, soya products – details on the quantity to be used;
- Samp – details on the quantity to be used;
- Soup – details on preparation and quantities to be used;
- Sugar – white or brown sugar may be used;
- Details on serving size.

Comments

- The specifications did not include any detail on the nutritional composition of the food items;
- No information was available on the total aflatoxin and B1 aflatoxin levels of the peanut butter used.

4.7.4.5.3 Food served at schools

Twenty of the 21 schools served food to the learners on the day the schools were visited. Table 4.44 gives an indication of the food served at the schools on the day of the visit.

Table 4.44 Food served at KwaZulu-Natal

Approved menu items	Food items offered at schools on day of the visit
Brown bread	Brown bread at 2 schools
Margarine	
Peanut butter	
Milk	
Jam	
Rice	Rice at 9 schools
Dried beans	Sugar beans at 8 schools
Soya mince	
Soup	Powder based soup at 4 schools Enriched powder base at 1 school
Samp	Samp at 5 schools
Maize meal (new menu)	Maize meal at 3 schools
Meat (new menu)	Beef (mince & stewing meat) at 4 schools
	Chicken at 1 school
	Fish in tomato sauce at 1 school
	Potato at 1 school
	Cabbage at 3 schools
	Onion at 2 schools
Fruit (new menu)	Fruit at 1 school
	Vegetable oil at 1 school
	White animal cooking fat at 3 schools
Cocoa (new menu)	Cocoa (drinking chocolate ?) at 1 school

Comments

- Rice and sugar beans were most often served at the schools;
- Eight of the schools served food items that were not on the menu (old or new menu);
- Fresh meat and chicken were used at 5 schools;
- White animal cooking fat, which is high in saturated fat, was used at some of the schools. This is not in line with the prudent dietary guidelines and does not comply with the provincial specifications;
- Cocoa was served at one school which is not in line with the prudent dietary guidelines;
- 40% of the learners liked all the food served at the schools;
- The food items most disliked by the learners were samp (46%), followed by fish (15%), porridge, soup and beans (8% each);
- Most of the learners complained that the samp made them sick (60%), 20% said that they did not like it and 10% said that it was not cooked properly.

4.7.4.6 Mpumalanga

4.7.4.6.1 Provincially approved menu

The provincially approved menus for Mpumulanga are given in Table 4.45.

Table 4.45 Mpumalanga menu as obtained from tender specification 1999/2000

Menu number	Menu item	Quantity	Composition
Bread menu	Brown bread	80 gram	Energy: 1573 kJ Protein: 14.5 gram Fat: 13% CHO: 50 gram
	Full cream milk / powder	200 ml / 20 gram	
	Peanut butter	15 gram	
Alternative menu			
2 (Monday)	Maize meal / Maize rice (raw)	60 gram	Energy: 1760 kJ Protein: 12.5 gram Fat: 8 gram CHO: 68.5 gram
	Soya mince (raw)	25 gram (20% prot)	
	Oil	5 ml	
	Dried / Fresh vegetables	10 / 100 gram	
3 (Tuesday)	Maize meal / Maize rice (raw)	60 gram	
	Dried beans (raw)	30 gram	
	Oil	5 ml	
	Dried / Fresh vegetables	10 / 100 gram	
4 (Wednesday)	Maize meal / Maize rice (raw)	60 gram	
	Soya mince (raw)	25 gram (20% prot)	
	Oil	5 ml	
	Dried / Fresh vegetables	10 / 100 gram	
5 (Thursday)	Maize meal / Maize rice (raw)	60 gram	
	Dried beans (raw)	30 gram	
	Oil	5 ml	
	Dried / Fresh vegetables	10 / 100 gram	
6 (Friday)	Maize meal / Maize rice (raw)	60 gram	
	Soya mince (raw)	25 gram (20% prot)	
	Oil	5 ml	
	Dried / Fresh vegetables	10 / 100 gram	

Comments

- Energy content of bread menu = 1573 kJ = 19% of the RDA for children 7–10 years of age;
- Energy content of the alternative menu = 1760 kJ = 21% of the RDA for children 7–10 years of age;
- Mpumalanga offered a bread menu and an alternative (cooked) menu;
- No commercial products such as biscuits or cool drink were included on the menu;
- The cooked menu included food usually eaten by the community;
- Milk powder was more regularly used than fresh milk.

4.7.4.6.2 Provincial Specifications

Specifications were given for:

- Peanut butter - the total aflatoxin should be less than 10 µg / kg and the B1 aflatoxin not more than 5 µg / kg;
- Milk - non-dairy creamers, blends or any other imitation dairy products should not be used;
- Edible oils;
- Soya based foodstuffs - the energy value must be given;
- Enriched maize meal - should contain not less than 10 mg nicotinamide and 1 mg of riboflavin per 400 g of maize meal;
- Brown bread - weight 800–850 gram;
- Fresh products.

Comments

- Specifications were not complete in terms of nutritional value.

4.7.4.6.3 Food served at schools

Ten of the 13 schools served food to the learners on the day the schools were visited. Table 4.46 gives the foods served at the schools.

Table 4.46 Food served at Mpumalanga

Approved menu items	Food items offered at schools on day of the visit
Brown bread	Brown bread at 3 schools
Full cream milk / powder	Dairy blend dry powder at 3 schools
Peanut butter	Peanut butter at 3 schools
Maize meal / Maize rice (raw)	Maize meal at 7 schools
Soya mince (dried)	Soya mince at 7 schools
Oil	Oil at 3 schools
Dried / Fresh vegetables	
Dried beans (raw)	

Comments

- Maize meal and soya mince were most often used at the schools;
- The soya mince was usually used to prepare a soup;
- A milk powder used was a real dairy milk blend;
- The maize meal used was not enriched;

- The weight of the bread delivered varied between 510 and 550 gram;
- The food item most liked by the learners was dried beans (47%);
- The food items least liked by the learners were soya (42%), followed by beans (19%), milk (19%), peas (10%) and cabbage (6%);
- The learners reported that the soya had a bad taste (42%) and that it made them sick (33%).

4.7.4.7 The Northern Cape

4.7.4.7.1 Provincially approved menu

The menus for the Northern Cape are given in Table 4.47.

Table 4.47 The Northern Cape menu provided by national Department of Health

Menu number	Menu item	Quantity
1	Brown bread	2 slices
	Peanut butter	15 gram
	Jam	15 gram
	Vitamin C cool drink	200 ml
2	Soya mince	40 gram
	Rice / Mealie rice, cooked	150 gram
	Vitamin C cool drink	200 ml
3	Fish (canned in tomato)	40 gram
	Rice / Mealie rice, cooked	150 gram
	Vitamin C cool drink	200 ml
4	Soya mince	40 gram
	Rice / Mealie rice, cooked	150 gram
	Vitamin C cool drink	200 ml
5	Fortified biscuits	75 gram (3)
	Vitamin C cool drink	200 ml

Comments

- The energy content of menu was not given;
- Other food items were also approved, but not included in the approved menu combinations;
- A bread menu or cooked menu may be used;
- Commercial products such as fortified biscuits, a vitamin enriched cool drink and tinned fish were used;
- The weight of the bread per serving was not given.

4.7.4.7.2 Provincial Specifications

The following guidelines were given for:

- Milk - no blends or creamers should be used. Only real dairy may be used;
- No specifications were given for the fortified biscuits and vitamin enriched cool drink;
- The weight of the bread was specified as 800–850 gram;
- Maize meal – 100 gram of the maize meal must supply more than 33% of the total daily recommended dietary allowances (RDA) of a child 7–10 years, with regard to essential amino acids, essential fatty acids, proteins, minerals, vitamins and more than 20% of the energy. The protein must be of a very high biological quality.

Comments

- The specifications were incomplete and did not give any details on the nutritional content for some of the food items;
- The specifications for bread did not include enrichment with vitamins and/or minerals;
- The weight of the bread delivered at the schools varied between 590 and 690 gram;
- Maize meal – amino acid requirements are based on estimates and are not given as a RDA. As yet, no RDA has been established for essential fatty acids. The specification that the protein must be of very high biological value means that some kind of animal protein (maybe milk) must be added to the maize meal.

4.7.4.7.3 Food served at schools

All three sample schools served food to the learners on the day the schools were visited and the type of food served at the schools is given in Table 4.48.

Table 4.48 Food served at the Northern Cape schools

Approved menu items	Food items offered at schools on day of the visit
Brown bread	Brown bread at 3 schools
Peanut butter	Peanut butter at 2 schools
Jam	Jam at 3 schools
Vitamin C cool drink	
Soya mince	
Rice / Mealie rice, cooked	
Fish (canned in tomato)	
Fortified biscuits	
Full cream milk *	
Full cream milk powder *	
Fortified maize meal porridge *	
Grain sorghum porridge *	
Oil *	
Sugar *	
Dried beans *	
Soya-based milk products *	

* Food items not on the approved menu combinations, but on the approved list of food items.

Comments

- Only the bread menu was served at the schools;
- Some schools served fruit once a week;
- The food item most liked by the learners was bread (89%);
- One school served a vitamin and mineral enriched bread;
- Only three of the 16 approved food items were served at the schools visited.

4.7.4.8 The Northern Province

4.7.4.8.1 Provincially approved menu

The menus for Northern Province are given in Table 4.49.

Table 4.49 Northern Province Menu as provided by national Department of Health

Menu number	Menu item	Quantity	Energy (kJ)
1	Brown bread	105 gram	977
	Peanut butter	30 gram	738
	Vitamin C cool drink	250 ml	390
2	Sorghum/Mealie meal	100 gram	1550
	Soya mince	50 gram	675
	Dehydrated/fresh vegetables	10/100 gram	0
	Oil	5 ml	185
3	High energy Sorghum/Soya	150 gram	2475
	Vitamin C cool drink / Fruit	250 ml / 100 gram	390
4	Sorghum/Maize meal	100 gram	1550
	Spinach/Pumpkin leaves	200 gram	0
	Ground peanuts	50 gram	1230
5	Sorghum/Maize meal	100 gram	1550
	Lentils	50 gram	690
	Dehydrated/Fresh vegetables	10 / 100 gram	0
	Oil	5 ml	185
6	Instant samp	100 gram	1550
	Lentils	50 gram	690
	Dehydrated/Fresh vegetables	10 / 100 gram	0
	Oil	5 ml	185
7	Sorghum/Maize meal	100 gram	1550
	Split peas	50 gram	675
	Dehydrated/Fresh vegetables	10 / 100 gram	0
	Oil	5 ml	185
8	Instant samp	100 gram	168
	Ground peanuts	50 gram	1100
9	Maize meal	100 gram	1550
	Pumpkin/Ground peanuts	100 gram	1000

The average energy content of the menu over 9 days = 2360 kJ = 28% of the RDA for children 7–10 years of age

Comments

- Most of the menu items were in accordance with the local eating habits of the community;
- A commercial product like vitamin enriched cool drink was used.

4.7.4.8.2 Provincial Specifications

No specifications were given for any of the food items and no specifications were given for the vitamin C enriched cool drink and high-energy sorghum.

Comments

- No specifications were available
- Although a high energy sorghum product was on the provincial approved menu, no nutritional specifications were given
- The weight of the bread delivered varied between 600 - 700 gram.

4.7.4.8.3 Food served at schools

Seventeen of the 22 schools served food to the learners on the day the schools were visited. The types of food served are given in Table 4.50.

Table 4.50 Food served at the Northern Province schools

Approved menu items	Food items offered at schools on day of the visit
Brown bread	Brown bread at 13 schools
Peanut butter	Peanut butter at 9 schools
Vitamin C cool drink	Vitamin C cool drink at 8 schools
Sorghum	
Maize meal	Maize meal at 3 schools
Soya mince	Soya mince at 2 schools
Dehydrated / Fresh vegetables	
Cooking oil	
High energy sorghum	
Fruit	
Spinach / Pumpkin leaves	
Peanuts	
Lentils	
Instant samp	Samp at 1 school
Split peas	
	Sugar beans at 2 schools

Comments

- With the exception of the sugar beans, only food items on the menu were served at the schools;
- The bread menu was more often served at the schools than the cooked menu;
- The commercially enriched cool drinks were served at 8 of the 17 (47%) schools;
- The food item most liked by the learners was bread (31%);
- The food items most disliked by the learners were porridge (34%), followed by soya (22%), peanut butter (13%), bread, cabbage, samp (9% each) and the cool drink;

- The learners reported that the porridge tasted bad (56%) and that it made them sick (44%);
- Fruit and vegetables were not served at any of the schools visited.

4.7.4.9 The North West

4.7.4.9.1 Provincially approved menu

The menus for Northern West are given in Table 4.51.

Table 4.51 North West menu obtained from tender specification 1999/2000

Menu	Menu item	Quantity	Energy (kJ)
	Enriched bread (1 day/w)	3 slices (120 g)	
	Peanut butter (1 day/w)	23 gram	
	Fortified porridge (2 days/w)	70 gram	
	Fortified biscuits (2 days/w)	100 gram	1962
	Vitamin C cool drink (5 days/w)	11 gram	160

Comments

- Commercial products such as fortified biscuits and a vitamin enriched cool drink were used;
- All the food items, with the exception of the peanut butter, were enriched with vitamins and minerals, but no provincial guidelines were given on the level of fortification;
- The peanut butter was a 1:1 mix with hard margarine.

4.7.4.9.2 Specifications

Detailed specifications were given for:

- Bread;
- Peanut butter and margarine mix;
- Fortified biscuits;
- Fortified instant sorghum porridge;
- Vitamin enriched cool drink.

Comments

- Although detailed nutritional analysis in the specifications are to be commended, it must be correct, practical and in line with industry availability. If not, product development comes into play that is both costly and requires special knowledge and expertise. For example the peanut butter and margarine mix might be practical, but the nutritional analysis given in the specification was that of medium fat margarine and thus incorrect. If a fortified biscuit with special features are to be developed, it could be very expensive.

A comparison of the nutrient composition of the fortified bread as given in the specifications were made with the actual analysis and the following comments can be made:

- The nutrient composition of the fortified bread met the specifications except for folic acid, iron and calcium that were higher than the specifications;
- The iron content of the bread was 4 mg per 100 gram higher than the specifications;
- This contributed an extra 5.6g to the average iron provided by the menu, representing 56% of the RDA.

A nutritional comparison of the peanut butter and margarine mix specifications and the laboratory analysis as provided by the supplier of the peanut butter mix was made.

Comments

- The specification given for the peanut butter mixture with margarine was incorrectly given as the same as for medium fat margarine. This is totally unacceptable since the protein content of margarine is usually below 0.5% and that of peanut butter in the order of 25% (Langenhoven *et al.,* 1991). If the mixture was 50:50 then the protein specification should have been 12.5%. The specification for protein was 0.2% protein and the laboratory value was 26.9%. The same line of argument applies to the rest of the nutrients. The energy value according to the laboratory analysis was much higher than the specification, 2913 kJ vs. 1880 kJ. In the specifications, under chemical requirements, the energy value was given as 2500 kJ. This is very confusing, but the value of 2500 kJ is probably more correct. All the macronutrients were higher according to the laboratory analysis in comparison with the specification. No specification was given for any of the vitamins or minerals.

A nutritional comparison of the fortified biscuits specifications and the laboratory analysis as provided by the supplier of the biscuits was made.

Comments

- Although thiamin and vitamin B1 is the same vitamin, two different values for this vitamin were given in the specification. This must be very confusing for the manufacturer to decide on the fortification level of the product;
- The same applies to the nutrient riboflavin/vitamin B2;
- Two completely different values are given for niacin;
- The correct unit for folic acid is μg and not mg - a difference of 1000!
- The energy and carbohydrate content of the biscuits complied with the specifications. The protein, fat and fibre content were higher than the specifications;
- Although no specification was given for the vitamin A content of the fortified biscuits it contained 1760IU per 100 gram. The same applied to iron, calcium, phosphorus, magnesium and zinc. The learners received 100 gram of the biscuits per day. This will contribute an extra 5.3 gram of iron and 1760 IU of vitamin A per day, representing 53% of the RDA for iron and 53% of the RDA for vitamin A. The biscuits will contribute an extra 28% of the RDA for calcium per day;
- The reason for the higher than specified nutrient content of the biscuits should be investigated, because it could contribute to an imbalance in the nutrients offered daily to the learners and could also increase the costs of the product.

A nutritional comparison of the fortified instant sorghum porridge specifications and the laboratory analysis as provided by the supplier and on the packaging of the fortified instant sorghum porridge was made.

Comments

- The unit of vitamin B12 was given in mg in stead of μg in the specifications;
- The nutrient analysis of one of the sorghum based instant porridges was obtained from the manufacturer. The nutrient analysis of the other one was taken directly from the packaging;
- Regarding the nutrient composition of the porridge as obtained from the manufacturer –
    - The energy and macronutrients were in line with the specifications;
    - The values of all the vitamins and minerals were higher than the specifications, for some nutrients more than double;
    - The zinc content was four times higher than the specifications;
- Regarding the nutrient composition of the porridge as obtained from the packaging –

- The energy, protein, and fat content of the porridge is lower than the specifications;
- The carbohydrate content is higher than the recommendations;
- With the exception of vitamin C, all the vitamin and mineral values were lower than the specifications.

A nutritional comparison of the vitamin enriched cool drink specifications and the laboratory analysis as provided by the supplier of the cool drink was made.

Comments

- The energy, carbohydrate, thiamin, riboflavin, niacin and phosphorus content of the powder used in the province were in line with the specifications;
- The vitamin C content of the cool drink used was more than double the specifications;
- The units for vitamin A differ from the specifications and product used and could therefore not be compared.

4.7.4.9.3 Food served at schools

Thirteen of the 15 schools served food to the learners on the day the schools were visited and the types of food are given in Table 4.52.

Table 4.52 Food served at the North West schools

Approved menu items	Food items offered at schools on day of the visit
Enriched bread	Brown bread at 2 schools
Peanut butter	Peanut butter at 2 schools
Fortified porridge	Instant porridge at 4 schools
Fortified biscuits	Fortified biscuits at 8 schools
Vitamin C cool drink	Vitamin enriched cool drink at 9 schools

Comments

- Only food items on the menu were served at the schools;
- The vitamin C enriched cool drink and fortified biscuits were most often used at the schools;
- Although the bread delivered at some schools were marked 700g it weighed between 580 and 670 gram;
- The food item most liked by the learners was the biscuits (43%);

- The food items least liked by the learners were fortified sorghum instant porridge (74%), followed by the cool drink (10%);
- 52% of the learners reported that the porridge made them sick;
- Two thirds of the learners (67%) complained that the cool drink was too sweet.

4.7.4.10 The Western Cape

4.7.4.10.1 Provincially approved menu

The menu of the Western Cape is given in Table 4.53.

Table 4.53 Western Cape menu as obtained from tender specifications 1999/2000

Menu number	Menu item	Quantity	Energy (kJ)
1	Brown bread	2 slices (80 gram)	651
	Peanut butter	20 gram	496
	Jam	10 gram	109
	Full cream milk **OR**	20 gram / 200 ml	420
	Lactose free milk	20 gram / 200 ml	

Comments

- Energy content of menu = 1676 kJ = 20% of the RDA for children 7–10 years of age;
- Only a bread menu was offered.

4.7.4.10.2 Provincial Specifications

Specifications are given for:

- Brown bread - weight 800–850 gram;
- Milk products - full cream milk and full cream milk powder. Only real dairy products may be used;
- High-energy drink - contains soya, vegetable fat, sugar & whey. The approximate analysis is as follows:
    - protein 10% - 15 %;
    - fat 20 %;
    - carbohydrates 50 %;
    - energy 3000 kJ/100 gram;
    - providing 30% of the RDA for all vitamins and minerals;

- Peanut butter - total aflatoxin shall be less than 10 µg / kg and the B1 aflatoxin not more than 5 µg / kg;
- Jam;
- Lactose free milk - must provide 100% of the RDA for a child 6–14 years of age for all vitamins and minerals per 100 gram. Protein must be of high biological value. The approximate analysis is as follows:
    - protein > 17 %;
    - fat > 17 %;
    - carbohydrate > 50% (only glucose);
    - energy > 1800 kJ/100 gram.

Comments

- Specifications were complete in terms of nutritional value for most of the food items.

4.7.4.10.3 Food served at schools

Eight of the 9 schools served food to the learners on the day the schools were visited. The type of food served at the schools is given in Table 4.54.

Table 4.54 Food served at the Western Cape schools

Approved menu items	Food items offered at schools on day of the visit
Brown bread	Brown bread in 8 schools
Peanut butter	Peanut butter in 7 schools
Jam	Jam in 5 schools
Full cream milk	Powder food supplement in 4 schools
	Soup powder in 1 school
	Cool drink in 1 school

Comments

- The weight of the bread delivered is 700 gram;
- Two food items served at the schools were not on the approved menu;
- The food item most liked was bread;
- The food items least liked were peanut butter and milk (31% each), followed by cool drink, samp (12% each), bread, soup and potatoes (6% each).

A nutritional comparison of the specifications of a high energy drink and with drink served at the schools as supplied by the manufacturer was made.

Comments

- The product used provides 1000 kJ/100 gram less than the specifications. This is a big difference;
- In general, the product used provides far more vitamins and minerals than specified.

4.7.5 Discussion

The national nutritional criteria recommend that food options or combination of options must provide different percentage RDA for energy for the 7–10-year-old age groups, 11–14-year-old age group (females) and 11–14-year-old age group (males). The implementation of these guidelines is, however, impractical because it means that older learners should receive a bigger portion. In many of the schools we found that learners of different ages were in one class. An already overloaded education staff will not have the time to serve different portion sizes to different age groups. It could also contribute to victimization. The percentage of RDA for energy should be based on the most vulnerable younger age group i.e. the 7–10-year-old age group.

The national nutritional criteria are in some cases vague and not enough detail is given. For example, it is stated that "a balance of nutrients" is required, but no details are given in terms of the quantity of vitamins and minerals. No definitions are given for example "commercial foods".

The menus of only two of the provinces met all the criteria of the national nutritional guidelines. The inclusion of commercial products on the menu was the main reason why the menus did not comply with the guidelines. The reasons for this non-compliance are debatable. It could be that financial constraints "forced" the provinces to include these commercial products, or it could be that it was logistically the most suitable menu options, or it could be that the provinces thought it suitable food items to use. Although the national nutritional criteria state "if communities want to use formulated fortified commercial food products, reasons for such choice must be submitted", it is unclear who the community is and whether such submitted document must be approved and by whom. According to the Directorate: Nutrition, national Department of Health, they did not receive any request for the inclusion of commercial products by any province or community.

Commercial products such as biscuits and cool drinks were used in most of the provinces. The use of these products is not recommended because it could lead to household food

insecurity and the message communicated to children when advocating such foods can oppose basic nutrition education messages as described in the National criteria for food items to be included. Wentzel-Viljoen *et al.* (2000) reported in their study on more than 750 primary school learners that 62% of the learners thought that all biscuits are healthy and 48.2% said that all cool drinks are healthy. This is a clear message to health professionals that food items served as part of a school feeding programme are accepted as "healthy" by the learners and great care should be taken when deciding on the inclusion of such commercial products.

The food items most liked by the learners were bread, biscuits and dried beans. In the study by Steyn *et al.* (1996) it was also reported that bread was popular in the four provinces that they studied. In this study it was, however, found that peanut butter was also ranked high in popularity. Wolmarans *et al.* (1995) reported on the breakfast patterns of primary school children in low socio-economic areas. They found that black children most frequently consumed bread (73%) before school, followed by cooked porridge (16%).

In the present study, the food items least liked were peanut butter, instant sorghum based porridge, tinned fish, samp and soya. Wentzel-Viljoen *et al.* (2000) also reported that an instant sorghum based porridge was not liked by the learners. The learners who participated in the study undertaken by Steyn *et al.* (1996) said that they did not like the cool drink, because it did not "taste nice" and made them sick.

According to the National Food Consumption Survey (NFCS), the food items most frequently eaten by children (1–9 years of age) in SA as determined by the 24-hour recall are maize, white sugar, tea, bread and whole milk (Labadarios, 2000). Maize meal was served in only three Provinces as part of the school feeding programme. It is thus clear that not all the food items presently on the provincialy approved menus fit in with local eating habits. Only 12.8% of the schools visited (4 provinces) served mealie meal porridge, which is the food most frequently eaten according to the NFCS. Bread was served to the learners in all nine provinces. Approximately 50% of the schools served bread on the day the schools were visited. More schools (13.8%) (2 provinces) served fortified biscuits than maize meal on the day of the visit. There are a number of reasons for the low percentage of schools serving maize meal, for example it is not given as an option on the provincially approved menu, cooking facilities were not available, water was not available on the school ground or no helpers were available for the preparation. Five of the provinces served vitamin enriched cool drink in 37.8% of the schools visited.

Only one of the Provinces did not have any specifications for food items to be used. The specifications unfortunately were not adequate, complete and completely correct for any of the provinces and therefore no standard for quality was set. This could lead to the provision of food items of lower quality as intended by the Provinces. The specifications of the different foodstuffs in some Provinces need urgent discussions to rectify and clarify incorrect specifications. A good example of this is the weight of the bread delivered to the schools. Although the weight is specified as between 800–850 gram, the weight of some bread delivered was as low as 500 gram.

Independent nutritional analyses of food products used (and sometimes specifically developed for the school feeding programme) were not available. Nutritional analyses of food items were available in the North West only. In the North West the nutritional content of the food products provided to the schools did not always meet the tender specifications. If nutritional analyses of food items are not done by an independent laboratory, it is impossible to assess whether the nutrient content of the food items actually meet the criteria as set in the specifications. Although it was specified for example that the maize meal must be fortified with certain nutrients, ordinary maize meal was used. The value of specifications is then questioned.

In some provinces food items not on the menu options or list of food items approved, were served to the learners. Questions that could be asked about this practice include, who supplied the food, who paid for the food, was the food acceptable to the Nutrition Directorate, and was the food acceptable to the learners?

The business plans of the provinces, which includes the provincially approved menus and specifications, must be approved by the National Department of Health, Directorate: Nutrition before the funds for the school feeding scheme is released to that province. It is suggested that the Directorate: Nutrition uses this opportunity to make sure that the provincially approved menus and specifications comply with the national nutritional criteria.

4.7.6 Conclusions

Based on these results, the major conclusions are:

- Some of the guidelines of the national nutritional criteria are unclear;
- Only two of the provincially approved menus met all the criteria of the national nutritional guidelines;

- Commercial foods such as fortified biscuits and vitamin enriched cool drink were included on the menus of seven provinces;
- Commercial foods such as fortified biscuits and vitamin enriched cool drink were served at the schools visited;
- The bread menu seemed to be served most often. It was served in all nine provinces and in 53% of the schools visited;
- The food items most liked by the learners were bread, biscuits and dried beans;
- The food items least liked by the learners were peanut butter, instant sorghum based porridge, tinned fish, samp and soya;
- Not all the food items served at the schools were in accordance with the local eating habits;
- Food items that were not on the approved menu were served to the learners;
- The number of menu options in some provinces were limited which could be very boring to the learners;
- Specifications of food items were inadequate especially in terms of nutritional composition;
- The bread delivered at the schools did not meet the weight specifications of the provinces;
- The Directorate: Nutrition at the national Department of Health should be responsible for the final approval of the menus and specifications of the provinces before the funds for the school feeding scheme is released to the provinces.

4.8 Food Quantity

4.8.1 Objectives

The objective of this section was to determine to what extent the actual portions served complied with the menu specifications, regarding:

- Amounts, volumes and weights;
- % RDA for energy;
- Nutrients as specified.

The nutrient composition of the provincially approved menus and the menus served at the schools visited will be assessed in terms of the national nutritional criteria, the Recommended Dietary Allowances and the prudent dietary guidelines.

4.8.2 Introduction

The menu as a whole served to the learners at the sample schools was investigated. The dietary intake of individual learners was not assessed.

4.8.3 Methods

4.8.3.1 Nutritional analysis of the approved menus in each province

The menu(s) of each of the nine provinces were analysed according to the quantities and type of food specified in the Business Plans and specifications of each province. The MRC *FoodFinder2* programme was used to analyse the menus for energy and nutrient composition. This computer programme is based on the South African Food Composition Tables (Langenhoven *et al.*, 1991). If the nutrient composition of a food item on the menu was available (as described in the specifications), it was added to the food database and used for the analysis.

The average energy and nutrient content of the approved menus were compared to the Recommended Dietary Allowances for a child 7–10 years of age. Only this one age group was used. It was felt that comparison with the older age group (for girls and boys separately) would only increase the number of tables without adding additional information on the quality of the nutritional composition of the menus.

4.8.3.2 Nutritional analysis of the food items served at the schools

The food items served at the sample schools were weighed on the day of the visit to the school. More than one sample of the food served to the learners at the schools was weighed. The average portion size was calculated and used for the analysis. When it was not possible to weigh the food, it was measured in household quantities. The household quantities were converted to weight in gram using the MRC Food Quantities Manual (Langenhoven *et al.*, 1991).

The food items served at the sample schools on the day of the visit to the school were analysed for energy and nutrients using the MRC *FoodFinder2* programme (Langenhoven *et al.*, 1991). If the nutrient composition of a food item on the menu was available from the

supplier or manufacturer, it was added to the food database and used for the analysis. For example, the fortified biscuits used in the North West differ from the fortified biscuits used in Gauteng. The nutrient composition of both types of biscuits was added to the programme and used for the analysis.

The average energy and nutrient content of the food served at the sample schools were calculated for each of the nine provinces.

If food was not served at the school on the day of the visit, but it was supposed to be a feeding day, the school was included in the analysis. If it was not a feeding day at the school according to the approved feeding day calendar, that school was not included in the calculations. It is statistically correct to include these schools where no food was served to the learners, because it actually means that the portion size of the food items was zero. The tender specifications clearly stated that the objective of this section is to determine to what extent the *actual portions served* complied with the menu specifications regarding the amounts, volumes and weights of portions, % RDA for energy and nutrients as specified.

The average energy and nutrient content of the food served at the sample schools were also calculated, *excluding the schools where no feeding took place*. This has been included on request of the provinces and gives an indication of the nutrient composition of the food served at the schools. These results will, however, not be included in the comments, discussions or conclusion.

The average energy and nutrient content of the food served at the schools were compared to the Recommended Dietary Allowances for a child 7–10 years of age.

The average energy and nutrient content of the provincially approved menu(s) and the menu served at the schools were compared to the national nutritional criteria and that of the specific province as specified in the Business Plan of the province.

4.8.3.3 Analysis of portions served at schools per provincially approved menu

The portions of the food items served at the schools were compared to portions given in the provincially approved menus.

4.8.4 Results

4.8.4.1 Summary

A summary of some of the results is firstly presented in Table 4.55 followed by detailed results of each province. Table 4.56 summarises the compliance of the provincially approved menu(s) and the food served to the learners at the schools on the day of the visit with national and provincial criteria.

Table 4.55 Number of schools visited in each province and the number of schools that served food on the day of the visit

Province	Number of schools visited	Number of schools that served food on the day of the visit	Percentage of schools that served food on the day of the visit
Eastern Cape	50	24	48
Free State	5	4	80
Gauteng	10	10	100
KwaZulu-Natal	20	21	95
Mpumalanga	10	13	77
Northern Cape	3	3	100
Northern Province	22	17	77
North West	15	13	87
Western Cape	9	8	89
Total	**144**	**113**	**78.5**

Table 4.56 Compliance of the provincial approved menu(s) and the food served to the learners at the schools on the day of the visit with national and provincial criteria

Province	Does the energy provided by the menu comply with the national criteria?	Does the energy provided by the menu comply with provincial criteria?	Does the energy distribution of the menu comply with the prudent dietary guidelines?
Eastern Cape			
Menu Approved	No	No	No
Menu Served	No	No	No
Free State			
Menu Approved (Bread)	No	Yes	Yes
Menu Approved (All)	Yes	Yes	Yes
Menu Served	No	No	Yes
Gauteng			
Menu Approved (Bread)	No	Yes	No
Menu Approved (All)	Yes	Yes	Yes
Menu Served	No	No	No
KwaZulu-Natal			
Menu Approved	No	Yes	Yes
Menu Served	No	No	Yes
Mpumalanga			
Menu Approved (Bread)	No	No provincial criteria	No
Menu Approved (Cooked)	No		Yes
Menu Served	No		Yes
Northern Cape			
Menu Approved (Bread)	No	No	Yes
Menu Approved (All)	No	No	Yes
Menu Served	No	No	Yes
Northern Province			
Menu Approved (Bread)	Yes	No provincial criteria	Yes
Menu Approved (All)	Yes		Yes
Menu Served	No		Yes
North West			
Menu Approved (All)	No	No	Yes
Menu Served	No	No	Yes
Western Cape			
Menu Approved (All)	No	Yes	No
Menu Served	No	No	No

4.8.4.2 The Eastern Cape

4.8.4.2.1 Analysis of approved menu vs. menu served

Twenty-four of the 50 sample schools served food to the learners on the day the schools were visited. This means that the portion of the food items served at 26 schools were zero. Table 4.57 gives the nutritional composition of the approved menu and menu served at the schools.

Table 4.57 Energy and nutrient composition of the approved menu and the menu served at the schools

Energy and nutrients	Energy and nutrient content of the approved menu		Energy and nutrient content of food served at schools (n = 50)		Energy and nutrient content of food served at schools (n = 24)	
	Mean	% RDA	Mean	% RDA	Mean	% RDA
Energy (kJ)	1714	20.5	652	7.8	1358	16.2
Protein (g)	12.6	45.1	4.5	16.1	9.4	33.4
Total fat (g)*	15.4		5.6		11.6	
Total CHO (g)*	52.2		20.4		42.5	
Dietary fibre (g)*	4.9		2.0		4.2	
Calcium (mg)	51	6.4	25	3.2	53	6.6
Iron (mg)	5.2	52.4	1.3	13.5	2.8	28.1
Magnesium (mg)	69	40.7	31	18.0	64	37.5
Phosphorus (mg)	19	24.0	74	9.3	154	19.3
Zinc (mg)	1.34	13.4	0.57	5.7	1.18	11.8
Copper (mg)	0.19	12.5	0.09	5.8		
Vitamin A (RE)	157	22.4	51	7.3	106	15.1
Thiamin (mg)	0.85	84.7	.029	29.1	0.61	60.7
Riboflavin (mg)	0.84	70.3	0.4	33.4	0.84	69.6
Niacin (mg)	11.5	88.6	4.6	35.1	9.5	73.1
Vitamin B6 (mg)	0.35	25.0	0.11	7.8	0.229	16.3
Folic acid (µg)	115	114.9	34	34.0	71	70.8
Vitamin B12 (µg)	0.9	60.9	0.2	13.7	0.4	28.6
Vitamin C (mg)	47	105.5	28	61.4	58	127.9
Vitamin E (mg)	2048	35.4	0.74	10.5	1.53	21.9

* no RDAs

Comments on the energy and nutrient composition

- The energy content of the approved menu did not comply with the national criterion that the menu must supply 25% of the RDA for energy, neither with the provincial criterion of 25% of the RDA for energy for 7–10 year olds;
- The energy content of the menus served at the schools did not comply with the national criterion that the menu must supply 25% of the RDA for energy, neither with the provincial criterion of 25% of the RDA for energy for 7–10 year olds;

- The food served to the learners provided only 8% of the RDA for energy;
- The protein content of the approved menu was high, but the protein content of the menu served to the learners was lower;
- The micronutrient content of the approved menu as well as the menus served to the learners varied largely, with no clear pattern of percentage contribution.

4.8.4.2.2 Analysis of energy distribution approved menu vs. menu served

Table 4.58 provides the percentage energy distribution of the approved menu and the menu served at the schools.

Table 4.58 Percentage energy distribution of the approved menu and the menu served at the schools

% energy distribution	Approved menu	Food served at schools (n = 50)	Food served at schools (n = 24)
Protein (%)	12.5	11.7	11.7
Fat (%)	33.3	31.7	31.7
Carbohydrate (%)	56.6	58.6	58.6

Comments on the energy distribution

- The fat content of the approved menu and the menu served at the schools was higher than the recommendations of the prudent dietary guidelines (ADSA, 2000).

4.8.4.2.3 Analysis of portions served at schools per provincially approved menu

Table 4.60 gives the minimum and maximum portions that were served at the sample schools during the visits. The actual minimum portion served was zero for those schools where no food was served on the day of the visit.

Table 4.59 Minimum and maximum portions served at schools visited in comparison with quantities as per the provincially approved menu

Menu item	Quantity as per provincially approved menu	Minimum portion served at schools	Maximum portion served at schools
Brown bread	80 gram	40 gram	100 gram
Peanut butter	20 gram	11 gram	50 gram
Cool drink	Depends on dilution ratio for given energy & protein	150 ml	500 ml
Fortified biscuits	Depends on energy value per 100 gram serving	30 gram	100 gram
Peanut butter	20 gram	11 gram	50 gram
Soup	Depends on dilution ratio for given energy and protein	Not served at schools visited	

Comments on food quantity served

- The portion size of the different food items served at the schools deviated from the provincially approved menu;
- There was a big difference between the minimum and maximum portion sizes of the food items served at the schools. For example the peanut butter portion ranged from 11 to 50 grams. This equals a energy contribution by the peanut butter of 271 to 1230 kJ (a 4.5 fold difference);
- It is clear that no portion control was exercised at any of the schools.

4.8.4.3 The Free State

4.8.4.3.1 Analysis of approved menu vs. menu served

Four of the 5 sample schools served food to the learners on the day the schools were visited. This means that the portion of the food items served at one school was zero.

See Table 4.60 for the nutritional analysis of the approved menus and the menus served at the schools.

Comments on the energy and nutrient composition

- The energy content of the approved bread menu did not comply with the national criterion that the menu must supply 25% of the RDA for energy, but complied with the provincial criterion of 20% of the RDA for energy;
- The energy content of the approved "all options" menu complied with the national criterion that the menu must supply 25% of the RDA for energy and the provincial criterion of 20% of the RDA for energy;
- The energy content of the approved bread menu was lower than that of the approved "all options" menu;
- The energy content of the menu served at the schools did not comply with the national criterion that the menu must supply 25% of the RDA for energy or with the provincial criterion of 20% of the RDA for energy;
- The approved bread and "all options" menu supplied more than 60% of the RDA for protein;
- The menu served at the schools was also high in protein;
- The micronutrient content of the approved menus as well as the menus served to the learners varied largely, with no clear pattern of percentage contribution.

Table 4.60 Energy and nutrient composition of the approved menus and the menu served at the schools

Energy and nutrients	Energy and nutrient content of the approved bread only menu		Energy and nutrient content of the approved "all options" menu		Energy and nutrient content of food served at schools (n = 5)		Energy and nutrient content of food served at schools (n = 4)	
	Mean	% RDA	Mean	% RDA	Mean	% RDA	Mean	% RDA
Energy (kJ)	1922	23.0	2290	27.4	1218	14.6	1522	18.2
Protein (g)	17.5	62.6	18.7	66.8	11.4	40.6	14.2	50.8
Total fat (g)*	14.7		14.8		9.2		11.5	
Total CHO (g)*	55.7		68.5		37.0		46.2	
Dietary fibre (g)*	7.8		6.1		5.6		7.0	
Calcium (mg)	243	30.4	532	66.5	159	19.9	198	24.8
Iron (mg)	2.0	19.8	11.2	111.8	1.4	14.4	1.8	18.1
Magnesium (mg)	119	70.2	124	73.1	56	32.8	70	41.0
Phosphorus (mg)	366	45.8	604	75.5	171	21.3	213	26.7
Zinc (mg)	2.42	24.2	6.03	60.3	1.73	17.3	2.16	21.6
Copper (mg)	0.3	19.9	0.33	22.3	0.14	9.7	0.18	12.1
Vitamin A (RE)	71	10.1	137	19.6	67	9.5	83	11.9
Thiamin (mg)	0.22	21.9	0.68	67.9	0.15	15.4	0.19	19.3
Riboflavin (mg)	0.32	26.5	0.69	57.8	0.22	18.0	0.27	22.5
Niacin (mg)	4.8	37.3	8.0	61.5	3.9	29.6	4.8	37.1
Vitamin B6 (mg)	0.252	18	0.712	50.8	0.269	19.2	0.336	24.0
Folic acid (µg)	63	63.3	51	51.3	42	42.3	53	52.9
Vitamin B12 (µg)	0.6	42.9	0.9	65.3	0.3	20.6	0.4	25.7
Vitamin C (mg)	2	3.3	24	53.5	1	1.6	1	2.0
Vitamin E (mg)	0.87	12.4	0.03	0.3	0.58	8.3	0.72	13.3

* no RDAs

4.8.4.3.2 Analysis of the energy distribution of the approved menu vs. menu served

Table 4.61 provides the percentage energy distribution of the approved menu and the menu served at the schools.

Table 4.61 Percentage energy distribution of the approved menu and the menu served at the schools

% energy distribution	Approved bread only menu	Approved "all options" menu	Food served at schools (n = 5)	Food served at schools (n = 4)
Protein (%)	15.5	13.9	15.9	15.9
Fat (%)	28.3	23.9	27.8	27.8
Carbohydrate (%)	56.2	55.4	59.4	59.4

Comments on the energy distribution

- The energy distribution of the approved menus and the menus served at the schools complied with the recommendations of the prudent dietary guidelines (ADSA, 2000).

4.8.4.3.3 Analysis of portions served at schools per provincially approved menu

Table 4.62 gives the minimum and maximum portions that were served at the sample schools during the visits. The actual minimum portion served was zero for those schools where no food was served on the day of the visit.

Table 4.62 Minimum and maximum portions served at schools visited in comparison with quantities as per the provincially approved menu

Menu item	Quantity as per provincially approved menu	Minimum portion served at schools	Maximum portion served at schools
Brown bread	105 gram (3 slices)	60 gram	110 gram
Peanut butter	15 gram	14 gram	39 gram
Full cream milk	150	140 gram	220 gram
Maize meal (raw)	100 gram	Not served at schools visited	
Sunflower oil	12.5 ml		
Full cream milk powder	150 ml		
Maize meal (raw)	100 gram	Not served at schools visited	
Soy mince	50 gram		
Sunflower oil	5 ml		
Brown bread	70 gram	Not served at schools visited	
Peanut butter	10 gram		
Biscuits	34 gram		
Full cream milk	150 ml		
Brown bread	70 gram	Not served at schools visited	
Peanut butter	10 gram		
Biscuits	45 gram		
Maize meal (raw)	100 gram	Not served at schools visited	
Milk powder	150 ml		
Peanut butter	15 gram		
Sunflower oil	10 ml		
Brown bread	70 gram	Not served at schools visited	
Soy mince	50 gram		
Milk powder	150 ml		
Sunflower oil	5 ml		

Comments on food quantity served

- Only one school served the correct portion size for all the food items, namely bread;
- The weight of the bread varied from 60 gram to 110 gram – nearly double;
- It is clear that portion control was not exercised at all the schools.

4.8.4.4 Gauteng

4.8.4.4.1 Analysis of approved menu vs. menu served

All 10 of the sample schools served food to the learners on the day the schools were visited. The nutritional composition of the approved menu and menu served at the schools is given in Table 4.63.

Table 4.63 Energy and nutrient composition of the approved menus and the menu served at the schools

Energy and nutrients	Energy and nutrient content of the approved cooked menu		Energy and nutrient content of the approved bread menu		Energy and nutrient content of food served at schools (n = 10)	
	Mean	% RDA	Mean	% RDA	Mean	% RDA
Energy (kJ)	2259	27.0	1965	23.5	1575	18.8
Protein (g)	14.3	51.0	12.4	44.2	11.7	41.7
Total fat (g)*	16.1		19.2		16.7	
Total CHO (g)*	77.3		58.0		40.7	
Dietary fibre (g)*	6.4		5.1		4.0	
Calcium (mg)	114	14.3	152	19.0	141	17.6
Iron (mg)	3.4	34.0	4.4	43.9	1.8	17.9
Magnesium (mg)	141	82.8	152	89.1	113	66.6
Phosphorus (mg)	291	36.4	238	29.7	235	29.4
Zinc (mg)	2.1	21.0	1.65	16.5	1.83	18.3
Copper (mg)	0.4	26.6	0.19	12.8	0.23	15.6
Vitamin A (RE)	42	6.0	193	27.6	95	13.7
Thiamin (mg)	0.4	39.6	0.3	29.8	0.16	16.3
Riboflavin (mg)	0.3	24.7	0.35	29.0	0.19	15.5
Niacin (mg)	4.0	30.7	4.3	33.0	3.8	28.9
Vitamin B6 (mg)	0.259	18.5	0.299	21.3	0.124	8.9
Folic acid (µg)	57	56.8	95	95.4	31	30.9
Vitamin B12 (µg)	0.1	8.3	1.5	108.0	1.6	115.2
Vitamin C (mg)	5	11.8	12	27.4	2	5.4
Vitamin E (mg)	4.24	60.6	2.09	29.8	1.12	16.1

* no RDAs

Comments on the energy and nutrient composition

- The energy content of the approved cooked menu complied with the national criterion that the menu must supply 25% of the RDA for energy and with the provincial criterion of 20% of the RDA for energy;
- The energy content of the approved bread menu did not comply with the national criterion that the menu must supply 25% of the RDA for energy, but complied with the provincial criterion of 20% of the RDA for energy;
- The energy content of the approved bread menu was lower than that of the approved cooked menu;
- The menu as served to the learners did not comply with the national criterion that the menu must supply 25% of the RDA for energy, neither with the provincial criterion of 20% of the RDA for energy;
- The protein content of the approved cooked and bread menus was more than 40% of the RDA;
- The menu as served to the learners was also high in protein (42% of the RDA);

- The micronutrient content of the approved menus varied largely, with no pattern regarding the percentage contribution;
- The micronutrient content of the menu served at the schools ranged from 5% to 115% of the RDA for vitamin C and vitamin B12 respectively.

4.8.4.4.2 Analysis of energy distribution of the approved menu vs. menu served

Table 4.64 provides the percentage energy distribution of the approved menu and the menu served at the schools.

Table 4.64 Percentage energy distribution of the approved menus and the menu served at the schools

% energy distribution	Approved cooked menu	Approved bread menu	Food served at schools (n = 10)
Protein (%)	10.8	10.7	12.6
Fat (%)	26.4	36.2	39.2
Carbohydrate (%)	63.0	54.5	48.3

Comments on the energy distribution

- The approved cooked menu complied with the general prudent dietary guidelines (ADSA, 2000);
- The approved bread menu was too high in fat when compared to the prudent dietary guidelines;
- The menu served at the schools was too high in fat and too low in carbohydrate when compared to the prudent dietary guidelines.

4.8.4.4.3 Analysis of portions served at schools per provincially approved menu

Table 4.65 gives the minimum and maximum portions that were served at the sample schools during the visits.

Table 4.65 Minimum and maximum portions served at schools visited in comparison with quantities as per the provincially approved menu

Menu item	Quantity as per provincially approved menu	Minimum portion served at schools	Maximum portion served at schools
Sorghum porridge	80 gram	80 gram	80 gram
Brown bread	80 gram	35 gram	80 gram
Peanut butter	30 gram	30 gram	30 gram
Jam	20 gram	8 gram	20 gram
Vitamin C cool drink	200 ml	200 ml	200 ml
Maize meal porridge	100 gram	40 gram	40 gram
Dried legumes	40 gram	10 gram	10 gram
Full cream milk	200 ml	20 gram powder	400 ml
Tinned fish	30 gram	30 gram	30 gram
Margarine	20 gram	7 gram	20 gram
Sugar	15 gram	Not served at schools visited	
Oil	10 ml	Not served at schools visited	
Soya mince	40 gram	Not served at schools visited	
Fortified biscuits	100 gram	Not served at schools visited	

Comments on food quantity served

- The sorghum porridge was served without any sugar, oil or milk added;
- Menus were not served as on the provincially approved menu;
- There were deviations from the provincially approved portion sizes for the bread, jam, milk and margarine;
- The smaller portions served to the learners caused a decrease in the energy supplied to the learners;
- Portion control was not exercised in all the schools.

4.8.4.5 KwaZulu-Natal

4.8.4.5.1 Analysis of approved menu vs. menu served

Twenty of the 21 sample schools served food to the learners on the day the schools were visited. The one school where feeding did not take place, was excluded from the calculations since it was not a feeding day according to the calendar on the day the school was visited. The portion of the food items served at the other one school that was supposed to feed was zero. Table 4.66 gives the nutritional composition of the approved and served menus.

A new menu was received from KwaZulu-Natal on 12 December 2000. This menu could, however, not be analysed for nutritional composition due to the lack of clear indications of portion sizes and raw/cooked weight of the food items.

Table 4.66 Energy and nutrient composition of the approved menu and the menu served at the schools

Energy and nutrients	Energy and nutrient content of the approved menu		Energy and nutrient content of food served at schools (n = 21)		Energy and nutrient content of food served at schools (n = 20)	
	Mean	% RDA	Mean	% RDA	Mean	% RDA
Energy (kJ)	1842	22.0	1206	14.4	1266	15.1
Protein (g)	15.3	54.8	9.3	33.1	9.7	34.8
Total fat (g)*	10.5		3.7		3.9	
Total CHO (g)*	60		47.5		49.9	
Dietary fibre (g)*	10.1		6.2		6.5	
Calcium (mg)	158	19.8	42	5.3	44	5.5
Iron (mg)	3.1	31.4	2.2	21.5	2.3	22.6
Magnesium (mg)	110	64.6	65	38.5	69	40.5
Phosphorus (mg)	298	37.2	152	19.0	159	19.9
Zinc (mg)	2.44	24.4	1.55	15.5	1.63	16.3
Copper (mg)	0.48	32.0	0.34	22.7	0.36	23.8
Vitamin A (RE)	89	12.8	14	2.0	15	2.1
Thiamin (mg)	0.27	26.5	0.18	17.7	0.19	18.5
Riboflavin (mg)	0.22	18.2	0.08	6.7	0.08	7.0
Niacin (mg)	3.1	23.6	1.7	12.9	1.8	13.6
Vitamin B6 (mg)	0.302	21.6	0.184	13.1	0.193	13.8
Folic acid (µg)	148	148.4	83	83.0	87	87.2
Vitamin B12 (µg)	0.4	27.4	0.4	25.9	0.4	27.1
Vitamin C (mg)	2	4.4	5	10.6	5	11.1
Vitamin E (mg)	0.66	9.5	0.28	4.1	0.3	4.3

* no RDAs

Comments on the energy and nutrient composition

- The energy content of the approved menu did not comply with the national criterion that the menu must supply 25% of the RDA for energy, but complied with the provincial criterion of 20% of the RDA for energy;
- The menu as served to the learners did not comply with the national criterion that the menu must supply 25% of the RDA for energy, neither with the provincial criterion of 20% of the RDA for energy;
- The protein content of the approved menu and the menu served to the learners was more than 33% of the RDA;
- The micronutrient content of the approved menus as well as the menus served to the learners varied largely, with no pattern of percentage contribution.

4.8.4.5.2 Analysis of the energy distribution of the approved menu vs. menu served

Table 4.67 provides the percentage energy distribution of the approved menu and the menu served at the schools.

Table 4.67 Percentage energy distribution of the approved menu and the menu served at the schools

% energy distribution	Approved menu	Food served at schools (n = 21)	Food served at schools (n = 20)
Protein (%)	14.2	13.1	13.1
Fat (%)	21.1	11.3	11.3
Carbohydrate (%)	64.7	75.7	75.7

Comments on the energy distribution

- The percentage energy distribution of the approved menu complied with the criteria of the prudent dietary guidelines (ADSA, 2000);
- The percentage energy distribution of the menu served at the schools complied with the criteria of the prudent dietary guidelines.

4.8.4.5.3 Analysis of portions served at schools per provincially approved menu

The following minimum and maximum portions were served at the sample schools during the visits. The actual minimum portion served was zero for the one school where no food was served on the day of the visit.

Table 4.68 Minimum and maximum portions served at schools visited in comparison with quantities as per the provincially approved menu (old and new menu)

Menu item	Quantity as per provincially approved menu	Minimum portion served at schools	Maximum portion served at schools
Brown bread	2 slices	105 gram	110 gram
Margarine	10 gram	Not served at schools visited	
Peanut butter	25 gram	Not served at schools visited	
Milk	200 ml	Not served at schools visited	
Jam	15 gram	Not served at schools visited	
Rice	100 gram/125 ml raw OR 200 gram/250 ml cooked	40 gram cooked	100 gram cooked
Beans	80 gram raw OR 160 gram cooked	25 gram raw	100 gram raw
Soya mince	No quantity given	Not served at schools visited	
Soup	100 - 200 ml	150 ml	200 ml
Samp	40 gram raw OR 200 gram cooked	30 gram	40 gram
Meat for sandwich	No quantity given	Not served at schools visited	
Phutu	200 gram	40 gram raw	60 gram
Maas	200 ml	Not served at schools visited	
Meat	No quantity given	5 gram	100 gram
Fruit	No quantiy given	90 gram	90 gram
Cocoa	200 ml	200 ml	200 ml
Menu items not on provincial approved menu			
Holsum		1 gram	5 gram
Cabbage		30 gram	40 gram
Potatoes		80 gram	80 gram
Tinned fish in tomato sauce		36 gram	36 gram

Comments on food quantity served

- The provincially approved menus were not served as such at the schools;
- Quantities were not given for all the menu items on the approved provincial menus;
- The majority of quantities served to the learners did not meet the standard as approved by the province;
- The quantity of dried beans served to the learners varied from 25 to 100 gram raw beans, representing 346 kJ to 1384 kJ respectively. This is equal to 4% and 16% of the RDA for energy for children 7–10 years old;
- It is clear that no portion control was exercised at any of the schools.

4.8.4.6 Mpumalanga

4.8.4.6.1 Analysis of approved menu vs. menu served

Ten of the 13 sample schools served food to the learners on the day the schools were visited. This means that the portion of the food items served at three schools was zero.

See Table 4.69 on next page for the nutritional analysis of the approved menus and the menus served at the schools.

Table 4.69 Energy and nutrient composition of the approved menu and the menu served at the schools

Energy and nutrients	Energy and nutrient content of the approved bread menu		Energy and nutrient content of the approved alternative menu		Energy and nutrient content of food served at schools (n = 13)		Energy and nutrient content of food served at schools (n = 10)	
	Mean	% RDA	Mean	% RDA	Mean	% RDA	Mean	% RDA
Energy (kJ)	1783	21.3	1556	18.6	738	8.8	960	11.5
Protein (g)	17	60.6	9.2	32.8	5.6	20.1	7.3	26.2
Total fat (g)*	15.9		7.6		4.9		6.3	
Total CHO (g)*	47.1		61.2		25.9		33.7	
Dietary fibre (g)*	6.2		4.7		1.8		2.4	
Calcium (mg)	289	36.1	32	4.0	44	5.5	57	7.1
Iron (mg)	1.7	16.6	1.5	14.9	0.7	7.1	0.9	9.3
Magnesium (mg)	107	62.8	65	38.5	38	22.3	49	28.9
Phosphorus (mg)	368	46.0	144	18.1	78	9.8	102	12.7
Zinc (mg)	2.26	22.6	4.66	46.6	2.11	21.1	2.74	27.4
Copper (mg)	0.26	17.1	0.37	24.8	0.16	10.4	0.2	13.5
Vitamin A (RE)	94	13.4	0	0	22	3.1	28	4.0
Thiamin (mg)	0.19	18.9	0.27	26.8	0.13	12.7	0.16	16.5
Riboflavin (mg)	0.38	31.9	0.07	5.8	0.08	7.1	0.11	9.17
Niacin (mg)	4.2	32.7	0.8	6.1	1.0	7.6	1.3	9.9
Vitamin B6 (mg)	0.236	16.8	0.086	6.2	0.046	3.3	0.059	4.2
Folic acid (µg)	55	55.0	55	55.0	16	15.8	21	20.5
Vitamin B12 (µg)	0.8	57.1	0	0	0.1	5.0	0.1	6.5
Vitamin C (mg)	2	4.4	0	0	0	0	0	0
Vitamin E (mg)	0.93	13.2	3.37	48.2	0.93	13.3	1.21	17.3

no RDAs

Comments on the energy and nutrient composition

- The energy content of the approved bread and alternative menus did not comply with the national criterion that the menu must supply 25% of the RDA for energy;
- The energy content of the approved menu was higher than that of the approved alternative menu;
- The energy content of the menu served at the school did not comply with the national criterion that the menu must supply 25% of the RDA for energy;
- The energy content of the menu served at the school was very low and provided only 9% of the RDA for energy;
- The protein content of both the approved menus was at least 33% of the RDA;
- The protein content of the approved bread menu was nearly double that of the approved alternative menu;
- The protein content of the menu served to the learners was 20% of the RDA;
- The micronutrient content of the approved menus as well as the menus served to the learners varied largely, with no pattern of percentage contribution.

4.8.4.6.2 Analysis of the energy distribution approved menu vs. menu served

Table 4.70 provides the percentage energy distribution of the approved menu and the menu served at the schools.

Table 4.70 Percentage energy distribution of the approved menu and the menus served at the schools

% Energy distribution	Approved bread menu	Approved alternative menu	Food served at schools (n = 13)	Food served a schools (n = 1(
Protein (%)	16.2	10.0	13.0	13.0
Fat (%)	33.0	18.0	24.3	24.3
Carbohydrate (%)	50.8	**72.0**	63.9	63.9

Comments on the energy distribution

- The fat content of the approved bread menu was higher than the guidelines of the prudent dietary guidelines (ADSA, 2000);
- All the other menus complied with the criteria of the prudent dietary guidelines in terms of energy distribution.

4.8.4.6.3 Analysis of portions served at schools per provincially approved menu

Table 4.71 gives the minimum and maximum portions that were served at the sample schools during the visits. The actual minimum portion served was zero for the three schools where no food was served on the day of the visit.

Table 4.71 Minimum and maximum portions served at schools visited in comparison with quantities as per the provincially approved menu

Menu item	Quantity as per provincially approved menu	Minimum portion served at schools	Maximum portion served at schools
Brown bread	80 gram	25 gram	48 gram
Full cream milk / powder	200 ml / 20 gram	20 gram powder	20 gram powder
Peanut butter	15 gram	10 gram	30 gram
Maize meal / Maize rice (raw)	60 gram	20 gram	60 gram
Soya mince (raw)	25 gram (20% prot)	5 gram	13 gram
Oil	5 ml	2 gram	5 gram
Dried / Fresh vegetables	10 / 100 gram	10 gram	10 gram
Dried beans (raw)	30 gram	15 gram	15 gram

Comments on food quantity served

- The quantity of bread served to the learners was far less than that approved by the province, ranging from 31% to 60 % of the approved quantity;
- The quantity of maize meal (raw) served to the learners ranged from 20 to 60 gram, representing 310 kJ and 929 kJ respectively. This is equal to 4% and 11% of the RDA for energy for children 7–10 years of age;
- It is clear that portion control was not exercised at any of the schools.

4.8.4.7 The Northern Cape

4.8.4.7.1 Analysis of the approved menu vs. menu served

All 3 sample schools served food to the learners on the day the schools were visited. Table 4.72 gives the nutritional composition of the approved and served menu.

Table 4.72 Energy and nutrient composition of the the approved menu and the menu served at schools

Energy and nutrients	Energy and nutrient content of the approved bread menu only		Energy and nutrient content of the approved "all options" menu		Energy and nutrient content of food served at schools (n = 3)	
	Mean	% RDA	Mean	% RDA	Mean	% RDA
Energy (kJ)	1469	17.6	1491	17.8	1133	13.5
Protein (g)	9.8	**34.9**	11.9	42.4	7.8	28.0
Total fat (g)*	8.9		6.5		7.1	
Total CHO (g)*	51.7		59.5		39.9	
Dietary fibre (g)*	5.6		5.2		4.6	
Calcium (mg)	54	6.8	117	14.6	53	6.6
Iron (mg)	1.7	17.5	4.2	41.9	1.3	12.8
Magnesium (mg)	204	120.2	187	109.7	49	28.9
Phosphorus (mg)	174	21.8	182	22.7	110	13.8
Zinc (mg)	1.39	13.9	1.65	16.6	1.19	11.9
Copper (mg)	0.25	16.4	0.34	23.0	0.17	11.6
Vitamin A (RE)	0	0	154	22.0	17	2.4
Thiamin (mg)	0.13	13.4	0.32	32.2	0.11	10.9
Riboflavin (mg)	0.06	5.0	0.24	20.3	0.07	5.6
Niacin (mg)	3.8	29.5	3.0	22.7	3.2	24.9
Vitamin B6 (mg)	0.152	10.9	0.47	33.6	0.171	12.2
Folic acid (µg)	41	41.4	42	41.9	33	32.7
Vitamin B12 (µg)	0	0	1.5	110.2	0	0
Vitamin C (mg)	6	13.7	18	40.5	1	3.2
Vitamin E (mg)	0.71	10.1	1.05	15.0	0.56	8.1

* no RDAs

Comments on the energy and nutrient composition

- The energy content of the approved menu did not comply with the national criterion that the menu must supply 25% of the RDA for energy, neither with the provincial criterion of 20% of the RDA for energy;
- The energy content of the approved bread menu and approved "all options" menu was the same;
- The energy content of the menu served at schools did not comply with the national criterion that the menu must supply 25% of the RDA for energy, neither with the provincial criterion of the province of 20% of the RDA for energy;
- The approved menu supplied more than 33% of the RDA for protein;
- The menu served at the schools supplied 28% of the RDA for protein.

4.8.4.7.2 Analysis of the energy distribution of the approved menu vs. menu served

Table 4.73 provides the percentage energy distribution of the approved menu and the menu served at the schools.

Table 4.73 Percentage energy distribution of the approved menu and the menu served at the schools

% energy distribution	Approved bread only menu	Approved "all options" menu	Food served at school
Protein (%)	11.3	13.5	11.8
Fat (%)	22.4	16.1	23.1
Carbohydrate (%)	66.4	73.7	66.8

Comments on the energy distribution

- The energy distribution of the approved and menus served at the schools complied with the recommendations of the prudent dietary guidelines (ADSA, 2000).

4.8.4.7.3 Analysis of portions served at schools per provincially approved menu

Table 4.74 gives the minimum and maximum portions that were served at the sample schools during the visits.

Table 4.74 Minimum and maximum portions served at schools visited in comparison with quantities as per the provincially approved menu

Menu item	Quantity as per provincially approved menu	Minimum portion served at schools	Maximum portion served at schools
Brown bread	2 slices	48 gram	60 gram
Peanut butter	15 gram	18 gram	18 gram
Jam	15 gram	18 gram	25 gram
Vitamin C cool drink	200 ml	Not served in the schools visited	
Soya mince	40 gram	Not served in the schools visited	
Rice / Mealie rice, cooked	150 gram	Not served in the schools visited	
Vitamin C cool drink	200 ml	Not served in the schools visited	
Fish (canned in tomato)	40 gram	Not served in the schools visited	
Rice / Mealie rice, cooked	150 gram	Not served in the schools visited	
Vitamin C cool drink	200 ml	Not served in the schools visited	
Soya mince	40 gram	Not served in the schools visited	
Rice / Mealie rice, cooked	40 gram	Not served in the schools visited	
Vitamin C cool drink	200 ml	Not served in the schools visited	
Fortified biscuits	75 gram (3)	Not served in the schools visited	
Vitamin C cool drink	200 ml	Not served in the schools visited	

Comments on food quantity served

- No weight is given of the two slices of bread as approved by the province. Although all the schools visited served two slices of bread, the weight of the bread ranged from 48 to 60 gram;
- The portion size of the jam varied from 18 to 25 gram which is more than the weight approved by the province;
- The peanut butter served to the learners was more than the quantity as approved by the province;
- It seems that quantity control was not exercised at any of the schools visited.

4.8.4.8 The Northern Province

4.8.4.8.1 Analysis of the approved menu vs. menu served

Seventeen of the 22 sample schools served food to the learners on the day the schools were visited. This means that the portion of the food items served at 5 schools was zero.

See next page, Table 4.75, for the nutritional analysis of the menus

Table 4.75 Energy and nutrient composition of the approved menu and the menus served at the schools

Energy and nutrients	Energy and nutrient content of the approved bread menu		Energy and nutrient content of the "all options" menu		Energy and nutrient content of the food served at schools (n = 22)		Energy and nutrient content of the food served at schools (n = 17)	
	Mean	% RDA	Mean	% RDA	Mean	% RDA	Mean	% RDA
Energy (kJ)	2092	25.0	2627	31.4	933	11.2	1207	14.4
Protein (g)	16.4	58.6	22	78.5	7.3	26.0	9.4	33.7
Total fat (g)*	17.1		15.3		4.3		5.5	
Total CHO (g)*	60.8		90.3		34.1		44.1	
Dietary fibre (g)*	8.7		10.7		4.2		5.5	
Calcium (mg)	77	9.6	100	12.5	40	5	52	6.5
Iron (mg)	2.4	24.4	5.6	56.1	1.7	17.0	2.2	22.1
Magnesium (mg)	281	165.6	189	111.1	114	66.9	147	86.5
Phosphorus (mg)	282	35.2	374	46.7	131	16.4	169	21.2
Zinc (mg)	2.22	22.2	3.07	30.7	1.03	10.3	1.34	13.4
Copper (mg)	0.37	24.9	0.69	46.2	0.2	13.3	0.26	17.3
Vitamin A (RE)	0	0	100	14.2	0	0	0	0
Thiamin (mg)	0.21	21.2	0.54	53.9	0.15	15.1	0.2	19.5
Riboflavin (mg)	0.1	8.0	0.18	15.1	0.05	4.5	0.07	5.9
Niacin (mg)	6.7	51.4	4.9	37.6	2.1	16.1	2.7	20.9
Vitamin B6 (mg)	0.256	18.3	0.361	25.8	0.155	11.1	0.2	14.3
Folic acid (µg)	68	67.5	59	58.6	29	29.4	38	38.1
Vitamin B12 (µg)	0	0	0.1	4.8	0	0	0	0
Vitamin C (mg)	6	13.9	10	22.9	4	9.2	5	11.9
Vitamin E (mg)	1.41	20.1	3.16	45.1	0.32	4.6	0.42	5.9

* no RDAs

Comments on the energy and nutrient composition

- The energy content of both the approved menus complied with the national criterion that the menu must supply 25% of the RDA for energy;
- The energy content of the approved bread menu was lower than that of the approved "all options" menu;
- The menu as served to the learners did not comply with the national criterion that the menu must supply 25% of the RDA for energy;
- The protein content of the approved menus was more than 50% of the RDA, with that of the "all options" menu higher than the bread menu;
- The protein content of the menu served to the learners was half the protein content of the approved menus at 26% of the RDA;
- The micronutrient content of the approved menus as well as the menus served to the learners varied largely, with no clear pattern of percentage contribution.

4.8.4.8.2 Analysis of energy distribution approved menu vs. menu served

Table 4.76 provides the percentage energy distribution of the approved menu and the menu served at the schools.

Table 4.76 Percentage energy distribution of the approved menu and the menu served at the schools

% energy distribution	Approved menu	Food served at schools (n = 22)	Food served at schools (n = 17)
Protein (%)	14.2	13.3	13.3
Fat (%)	21.5	17.0	17.0
Carbohydrate (%)	65.4	69.8	69.8

Comments on the energy distribution

- The percentage energy distribution of the approved menu complied with the criteria of the prudent dietary guidelines (ADSA, 2000);
- The percentage energy distribution of the menu served at the schools complied with the prudent dietary guidelines.

4.8.4.8.3 Analysis of portions served at schools per provincially approved menu

Table 4.77 gives the minimum and maximum portions that were served at the sample schools during the visits. The actual minimum portion served was zero for the five schools where no food was served on the day of the visit.

Table 4.77 Minimum and maximum portions served at schools visited in comparison with quantities as per the provincially approved menu

Menu item	Quantity as per provincially approved menu	Minimum portion size served at schools	Maximum portion size served at schools
Brown bread	105 gram	40	154
Peanut butter	30 gram	12	25
Vitamin C cool drink	250 ml	200	250
Sorghum/Mealie meal	100 gram	Not served at schools visited	
Soya mince	50 gram	200 ml cooked	200 ml cooked
Dehydrated/fresh vegetables	10/100 gram	Not served at schools visited	
Oil	5 ml	Not served at schools visited	
High energy Sorghum/Soya	150 gram	Not served at schools visited	
Vitamin C cool drink / Fruit	250 ml / 100 gram	Not served at schools visited	
Spinach/Pumpkin leaves	200 gram	Not served at schools visited	
Ground peanuts	50 gram	Not served at schools visited	
Lentils	50 gram	15 gram dried beans	15 gram dried beans
Instant samp	100 gram	65 gram	65 gram
Split peas	50 gram	Not served at schools visited	
Maize meal	100 gram	30 gram	60 gram
Pumpkin/Ground peanuts	100 gram	Not served at schools visited	

Comments on food quantity served

- The quantity of bread, peanut butter, dried beans, samp and maize meal served to the learners was less than the quantities of the provincialy approved menu;
- The weight of the bread ranged from 40 to 154 gram, representing 38% and 147% of the provincially approved weight of the bread;
- The weight of the maize meal served to the learners ranged from 30% to 60% of the provincially approved menu;
- It is clear that, with the exception of the cool drink, quantity control was not exercised at any of the schools visited.

4.8.4.9 The North West

4.8.4.9.1 Analysis of the approved menu vs. menu served

Thirteen of the 15 sample schools served food to the learners on the day the schools were visited. This means that the portion of the food items served at two schools was zero. The nutritional composition of the approved and served menu is given in Table 4.78.

Table 4.78 Energy and nutrient composition of the approved menu and the menu served at the schools

Energy and nutrients	Energy and nutrient content of the approved menu		Energy and nutrient content of the food served at schools (n = 15)		Energy and nutrient content of the food served at schools (n = 13)	
	Mean	% RDA	Mean	% RDA	Mean	% RDA
Energy (kJ)	1795	21.5	1617	19.3	1865	22.3
Protein (g)	11.2	39.8	10.9	38.8	12.5	44.8
Total fat (g)*	11.3		12.8		14.8	
Total CHO (g)*	74.2		59.9		69.1	
Dietary fibre (g)*	6.5		8.9		10.3	
Calcium (mg)	199	24.8	185	23.2	214	26.7
Iron (mg)	6.8	67.7	5.2	52.1	6.0	60.1
Magnesium (mg)	14	8.2	10	5.8	11	6.7
Phosphorus (mg)	58	7.2	52	6.5	60	7.5
Zinc (mg)	0.96	9.9	1.07	10.7	1.23	12.35
Copper (mg)	0.3	198.5	0.12	7.8	0.13	9.0
Vitamin A (RE)	1018	145.5	864	123.5	997	142.5
Thiamin (mg)	1.01	101.3	0.84	83.8	0.97	96.7
Riboflavin (mg)	1.37	114.1	1.09	91.0	1.26	105.0
Niacin (mg)	11.0	84.8	8.4	64.3	9.6	74.2
Vitamin B6 (mg)	0.600	42.9	0.627	44.8	0.723	51.7
Folic acid (µg)	132	132.2	142	142.3	164	164.2
Vitamin B12 (µg)	1.7	118.9	2.1	152.6	2.5	176.1
Vitamin C (mg)	81	180.2	61	136.5	71	157.4
Vitamin E (mg)	3.02	43.1	3.53	50.5	4.08	58.2

* no RDAs

Comments on the energy and nutrient composition

- The energy content of the approved menu did not comply with the national criterion that the menu must supply 25% of the RDA for energy or with the provincial criterion of 25% of the RDA for energy;
- The energy content of the menu served at the schools did not comply with the national criterion that the menu must supply 25% of the RDA for energy or with the provincial criterion of 25% of the RDA for energy;
- The energy content of the menu served to the learners (excluding the schools where feeding did not take place) was higher than the approved menu. This was

due to the fact that the learners received more biscuits than prescribed on the approved menu;

- The protein content of the approved menu and the menu served at the schools was more than 33% of the RDA;
- The micronutrient content of the approved menu ranged from 8% for magnesium to 199% of the RDA for copper, indicating an imbalance of micronutrients;
- No guidelines were given for the level of fortification of the approved food items with micronutrients;
- The micronutrient content of the menu served at the schools also varied from very low to extremely high values, indicating an imbalance.

4.8.4.9.2 Analysis of energy distribution approved menu vs. menu served

Table 4.79 provides the percentage energy distribution of the approved menu and the menu served at the schools.

Table 4.79 Percentage energy distribution of the approved menu and the menu served at schools

% energy distribution	Approved menu	Food served at schools (n = 15)	Food served at schools (n = 13)
Protein (%)	10.6	11.4	11.4
Fat (%)	23.4	29.3	29.3
Carbohydrate (%)	76.4	72.4	72.4

Comments on the energy distribution of the menus

- The energy distribution of the approved menu and the menu served at the schools complied with the recommendations of the prudent dietary guidelines (ADSA, 2000).

4.8.4.9.3 Analysis of portions served at schools per provincially approved menu

Table 4.80 gives the minimum and maximum portions that were served at the sample schools during the visits. The actual minimum portion served was zero for the three schools where no food was served on the day of the visit.

Table 4.80 Minimum and maximum portions served at schools visited in comparison with quantities as per the provincially approved menu

Menu item	Quantity as per provincially approved menu	Minimum portion served at schools	Maximum portion served at schools
Enriched bread (1 day/w)	3 slices (120 g)	68	125
Peanut butter (1 day/w)	23 gram	10	18
Fortified porridge (2 days/w)	70 gram	16	71
Fortified biscuits (2 days/w)	100 gram	100	125
Vitamin C cool drink (5 days/w)	11 gram	8	17

Comments on food quantity served

- The weight of the bread varied from 68 gram to 125 gram;
- The peanut butter did not meet the quantity of the provincially approved menu;
- The weight of the fortified porridge ranged from 16 gram to 71 gram;
- It seems that some quantity control regarding the fortified biscuits was possible.

4.8.4.10 The Western Cape

4.8.4.10.1 Analysis of the approved menu vs. menu served

Eight of the 9 sample schools served food to the learners on the day the schools were visited. This means that the portion of the food items served at one school was zero. Table 4.81 gives the nutritional composition of the approved and served menus.

Table 4.81 Energy and nutrient composition of the approved menu and the menu served at the schools

Energy and nutrients	Energy and nutrient content of the approved menu		Energy and nutrient content of food served at schools (n = 9)		Energy and nutrient content of food served at schools (n = 8)	
	Mean	% RDA	Mean	% RDA	Mean	% RDA
Energy (kJ)	1909	22.8	1436	17.2	1616	19.3
Protein (g)	14.6	52.3	11.0	39.1	12.3	44.0
Total fat (g)*	15.7		12.6		14.2	
Total CHO (g)*	56.9		41.5		46.7	
Dietary fibre (g)*	6.6		4.7		5.3	
Calcium (mg)	301	37.6	203	25.3	228	28.5
Iron (mg)	5.2	52.4	3.6	36.0	4.1	40.5
Magnesium (mg)	128	75.4	109	64.1	123	72.1
Phosphorus (mg)	423	52.9	295	36.9	332	41.5
Zinc (mg)	4.04	40.4	2.79	28.0	3.1	31.4
Copper (mg)	0.68	45.3	0.48	31.8	0.54	35.8
Vitamin A (RE)	199	28.5	133	19.0	150	21.4
Thiamin (mg)	0.36	35.6	0.24	24.2	0.27	27.2
Riboflavin (mg)	0.31	25.7	0.21	17.5	0.24	19.6
Niacin (mg)	7.4	57.2	5.5	42.2	6.2	47.5
Vitamin B6 (mg)	0.444	31.7	0.311	22.2	0.350	25.0
Folic acid (µg)	95	95.4	67	66.6	75	74.9
Vitamin B12 (µg)	0.3	21.4	0.2	14.3	0.2	16.1
Vitamin C (mg)	9	19.3	7	14.6	7	16.4
Vitamin E (mg)	2.32	33.1	1.74	24.9	1.96	28.0

* no RDAs

Comments on the energy and nutrient composition

- The energy content of the approved menu did not comply with the national criterion that the menu must supply 25% of the RDA for energy, but complied with the provincial criterion of 20% of the RDA for energy;
- The energy content of the menu served at the schools did not comply with the national criterion that the menu must supply 25% of the RDA for energy nor with the provincial criterion of 20% of the RDA for energy;
- The protein content of the approved menu was more than 50% of the RDA;
- The protein content of the menus served to the learners was also high and provided more than 33% of the RDA;
- The micronutrient content of the approved menus was, with the exception of vitamin B12 and vitamin C, more than 25% of the RDA. This was probably due to the fact that micronutrient enriched food items were included in the menus
- The micronutrient content of the menu served at the schools was, with the exception of vitamin B12 and vitamin C, 20% and more of the RDA.

4.8.4.10.2 Analysis of energy distribution of the approved menu vs. menu served

Table 4.82 provides the percentage energy distribution of the approved menu and the menu served at the schools.

Table 4.82 Percentage energy distribution of the approved menu and the menus served at the schools

% energy distribution	Approved menu	Food served at schools (n = 9)	Food served at schools (n = 8)
Protein (%)	13.0	13.0	13.0
Fat (%)	30.4	32.6	32.6
Carbohydrate (%)	56.5	54.6	54.6

Comments on the energy distribution

- The fat content of the approved menu and the menu served at the schools was marginally higher than the recommendations of the prudent dietary guidelines (ADSA, 2000).

4.8.4.10.3 Analysis of portions served at schools per provincially approved menu

Table 4.83 gives the minimum and maximum portions that were served at the sample schools during the visits:

The actual minimum portion served was zero for the one school where no food was served on the day of the visit.

Table 4.83 Minimum and maximum portions served at schools visited in comparison with quantities as per the provincially approved menu

Menu item	Quantity as per provincially approved menu	Minimum portion served at schools	Maximum portion served at schools
Brown bread	2 slices (80 gram)	30 gram	80 gram
Peanut butter	20 gram	12 gram	30 gram
Jam	10 gram	10 gram	15 gram
Full cream milk **OR**	20 gram / 200 ml	30 gram powder	30 gram powder
Lactose free milk	20 gram / 200 ml		
Food items not on the approved menu			
Cool drink		200 ml	200 ml
Soup (enriched)		200 ml	200 ml

Comments on food quantity served

- The weight of the bread ranged from 30 to 80 gram, representing 37.5% to 100% of the quantity of the provincially approved menu;
- The weight of the peanut butter ranged from 12 gram to 30 gram, which is 60% to 150% of the quantity of the provincially approved menu;
- The weight of the jam was either equal or more than the weight of the provincially approved menu;
- It seems that quantity control was not exercised at the schools.

4.8.5 Discussion

4.8.5.1 Energy content of the provincially approved menus

The energy content of the provincially approved menus ranged from 17.6% to 27.4 % of the RDA for children 7–10 years of age. Some provinces had more than one approved menu. The energy content of 10 of the 14 approved menus in the nine provinces complied with the national criterion that the menu should supply 25% of the RDA for energy. Powell *et al.* (1998) evaluated the effects of breakfast in rural primary school children. A breakfast was provided to the children (ages 7–10 years) that consisted of a cheese sandwich or spiced bun and cheese with flavoured milk. The breakfast provided 2419 kJ to 2953 kJ (29%–35% of the RDA) and 27.1 gram protein (97% of the RDA). They found small benefits in the children's nutritional status, school attendance, and achievements. In order to meet one of the objectives of the school feeding programme, namely to contribute to the improvement of education quality and general health, the energy and nutrient content of the approved menus should at least meet the national nutritional criteria.

4.8.5.2 Energy content of the menus served

The energy content of the menus served at the schools to the learners ranged from 11.5% to 19.3% of the RDA for energy for 7–10 year olds. In one province the average % energy supplied was as low as 7.8% of the RDA when taking into account that only 24 out of the 50 schools visited served food to the learners on the day of the visit to the schools. Not one of the menus served to the learners in any of the provinces complied with the national criteria that the menu should supply 25% of the RDA for energy. The Health

Systems Trust (1997) reported on the nutritional content of actual PSNP meals in the Western Cape (3 schools) and the Free State (3 schools). They found that the energy content, as a percentage of the RDA, of the meals served at the schools was between 20% and 26% for the Western Cape schools and between 12% and 18% for the Free State. The National Progressive Primary Health Care Network (NPPHCN) conducted a rapid appraisal of the PSNP in 1995 (NPPHCN, 1995). Thirty schools of the Western Cape and the Eastern Cape were included in the study. The researchers reported that the PSNP was contributing approximately 20% of the RDA for energy and 50% for protein. In the Eastern Cape meals provided less than 20% of the RDA for energy and less than 50% for protein. In their study Walker *et al.* (1998) reported similar values on the food consumption during the school day of rural Jamaican children. The children participated in two government school feeding programmes. The one type of school feeding programme was a cooked meal and the other a bun and milk. The mean energy intake was 17%–20% of the daily energy requirement for the children 7–10 years of age. The findings of this research supports previous findings of similar school feeding programmes.

4.8.5.3 Protein content

The inclusion of peanut butter, milk, fish and dried legumes (including soya) in the menus contributed to the high protein content of the approved menus. The protein content of the approved menus varied between 32.8% and 78.5% of the RDA. The menu that provided 78.5% of the RDA for protein included food items such as soya, dried beans, lentils and maize on the menu but no meat, fish or milk. Unfortunately these approved menus were never served as planned at the schools. Some of the menus served at the schools were also high in protein, ranging from 14.4% to 50.8% of the RDA.

4.8.5.4 Fat content

Most of the approved menus and the menus served at the schools complied with the guidelines of the prudent diet (ADSA, 2000). It is important that the food served to the learners complies with these guidelines to prevent the development of degenerative diseases and for the establishment of healthy food choices.

4.8.5.5 Micronutrients

Neither the national nutritional criteria nor the provinces gave any guidelines for the level of fortification of food items for micronutrients. The national nutritional criteria, however, stated "optimal growth and an enhanced learning ability requires a balance of nutrients". This balance of nutrients was not addressed by any of the provinces.

4.8.5.6 Contribution of food served to learners to the total intake

These results suggest that the food served to the learners at schools could make a considerable contribution to the daily energy and protein intake of the learners if given as planned by the provinces. Unfortunately, data on the contribution of the food served at the schools to the total dietary intake was not collected in this study. Swart (1998) evaluated the contribution of the PSNP to the dietary intake of primary school children in urban, rural and informal settlements in the Western Cape Province. She concluded that although the PSNP made a considerable contribution to the daily energy intake of the learners, it was not adequate and would therefore adversely effect the growth and development of the learners. Wentzel-Viljoen *et al.* (2000) reported the nutrient intake and the contribution of the school feeding to the total dietary intake in their study on the evaluation of the PSNP in the North West. Using the 24-hour recall method, they found that 79% of the boys and 80% of the girls had a total energy intake of less than 100% of the RDA for energy. The energy contribution of the school feeding to the total energy intake was 22% for boys and 21% for girls.

The National Food Consumption Survey (NFCS) (Labadarios, 2000) reported on the total energy and nutrient intake of children between 1 and 9 years of age. Although questions were asked whether food was eaten at school as part of the school feeding programme, no data was reported on the contribution of the school feeding programme to total intake. It is, from a scientific point of view, not advisable to use the NFCS data to calculate the energy and nutrient contribution of the school feeding programme to total intake. The different methodologies used to obtain dietary data and the different study populations prevent meaningful calculations.

On the other hand, care should be taken that the food served at school does not displace food consumed by the child at home. Sanghvi and Moore (1996, as stated in McCoy *et al.*, 1997) described this problem and stated that the school meal might displace food

consumed by the child at home, thereby not providing any net gain in nutritional intake, and possibly even resulting in an overall reduction in the nutritional intake. This is particularly of concern when the school meal is small in terms of its nutrient value.

4.8.5.7 Food quantities served at schools

The quantities of food served to the learners were less than indicated on the menus approved by the different provinces. The effect of these smaller portions served are reflected, as discussed above, on the energy and nutrient content of the provincially approved menus versus served menus. One of the reasons for the smaller portions served could be poor or no portion control at the schools, not by the educational staff or by the helpers at the school. Another reason could be that more learners were fed than were supposed to be feed, in other words no targeting took place. It could also be that not enough food was delivered, and the food available was shared between the learners. Whatever the reason for the smaller portions served, it resulted in less energy, protein and micronutrients being supplied by the feeding scheme to the learners as was planned by the provinces.

It was unfortunately not possible to quantify the effect of the school feeding programme on the educational quality (school attendance, punctuality, etc.), and therefore the impact of the energy and nutrients supplied by the school feeding programme could not truly be assessed and quantified.

4.8.6 Conclusion

Based on these results, the major conclusions are:

- Food was served in 78.5% of the schools visited. With the exception of one school, all the schools visited were supposed to serve food on the day of the visit;
- Only two provinces served food in all the sample schools on the days the schools were visited;
- The energy content of the majority of provincially approved menus did not comply with the national criterion that the menu should supply 25% of the RDA for energy for the 7–10-year-old age group;
- The different % RDA for energy provided by the actual menus served, varied significantly from one province to the other;

- In most of the cases the energy content of the bread menu was lower than that of the cooked/alternative/"all options" menus;
- The energy content of all the menus served to the learners did not comply with the national criteria that the menu should supply 25% of the RDA for energy for the 7–10-year-old age group;
- The protein content of the approved menus was high;
- The protein content of the menus served to the learners ranged from 14% to 51% of the RDA;
- The balance of nutrients was not addressed by national or provincial guidelines;
- No guidelines were given on the level of fortification of food items with micronutrients;
- Some provinces specified the use of food items fortified with vitamins and minerals;
- Quantities of the food items, as specified in the provincially approved menus, were not served at all the schools;
- Portion control was not exercised at most of the schools;
- The weight of the bread delivered to the schools and therefore the weight of the portion of bread served to the learners, in most cases was lower than the given weight in the provincially approved menus;
- The impact of the school feeding programme on educational quality (school attendance, punctuality, etc.) could not be assessed and quantified.

Subsequently a cost-benefit and cost-effectiveness analysis of the school feeding will be done.

4.9 Cost-benefit and cost-effectiveness analysis

4.9.1 Objectives

The objectives of this section were:

- To provide an economic evaluation of school feeding;
- To indicate the cost-effectiveness from a national perspective in terms of procurement systems and menu types;
- To determine the most cost-effective menu served;
- To provide a case study on the non-cooked menu;

- To provide a case study on the cooked menu;

It should be noted that Levinson *et al.* (1999b) said that the term "cost-effectiveness" is used erroneously in assessing the cost of achieving outputs rather than impacts. They suggested that these calculations should rather be referred to as "cost-delivery" ratios.

4.9.2 Introduction

Since 1994/95, approximately R500 million has been made available annually for school feeding. Over a six-year period (1994/95 – 1999/2000), R2.9 billion was allocated of which R1.9 billion was expended.

A cost-benefit analysis (CBA) is a quantitative analytical tool to aid decision-makers in allocating resources efficiently. It identifies, and attempts to quantify the costs and benefits of a program or activity (Department of Finance, 1995).

Three types of CBAs exist, namely the economic evaluation, the financial evaluation and cost-effectiveness studies. The economic evaluation refers to a methodology of assessing the net benefits accruing to the economy or society as a whole as a result of an investment. A financial evaluation is used to assess whether a proposal offers an acceptable financial return from an investment perspective. A cost-effectiveness study may be undertaken from either a national or local perspective. Cost-effectiveness studies differ from CBA in that benefits are not expressed in money units, but in physical units (Department of Finance, 1995).

For the purpose of this part of the evaluation, an economic evaluation as well as a cost-effectiveness study has been conducted.

4.9.3 Methods

4.9.3.1 Economic evaluation of school feeding

International publications were used to provide a brief overview of the net benefits of school feeding. Data from monitoring reports received from the national Department of

Health were used to determine the average amount invested by the government in learners participating in the programme.

4.9.3.2 Cost-effectiveness of procurement systems

Interviews were conducted with officials in the financial section of the national Department of Health, Directorate: Nutrition. Data on the budget for school feeding as per monitoring reports as well as expenditure as per the Financial Management System (FMS) reports were obtained.

Information regarding the different procurement systems used in the provinces was obtained from provinces by means of the provincial questionnaires as well as the tender specifications and/or business plans.

4.9.3.3 The most cost-effective menu served

The provincially approved menus were obtained from the provinces. The energy as a percentage of the RDA of each of these menus was calculated. The menus served at the schools were analysed to determine the energy and then expressed as a percentage of the RDA.

The allocation per learner per day was obtained from the provincial business plans and by means of interviews with the respective provinces.

The cost per 2100kJ was used as the standard to compare the costs. To comply with international standards, the cost per 1000 calories (4200kJ) was also calculated.

4.9.3.4 The non-cooked menu: case study

The menus as well as the costing per learner per day were obtained from the provincial business plans and tender specifications. The data used was verified by the provinces and used to compile the case study. Wholesale prices were obtained and used in the case study.

4.9.3.5 The cooked menu: case study

The menus and different costing per learner per day together with the wholesale prices were used in the case study.

4.9.4 Results

The first objective of this section of the study, namely to provide and economic evaluation of the school feeding programme subsequently comes under discussion.

4.9.4.1 Economic evaluation of school feeding

4.9.4.1.1 Costs of school feeding

A total of R2.9 billion has been available for school feeding from 1994/95-2000/2001. From 1997/98 until 1999/2000 an average 4,9 million learners benefited annually from school feeding at an average annual cost of R385 million. If expressed in terms of the cost for the government to feed one learner per year, it means that **R79 has been invested per learner per year** over the three-year period. Table 4.84 gives the total budget and expenditure of school feeding.

Table 4.84 Total budget and expenditure of school feeding:

Financial year	Budget Rand	Expenditure Rand	Learners	Allocation/ learner Rand	Expenditure/ learner Rand
1994/95	472,840,000	134,823,786			
1995/96	500,000,000	312,478,000			
1996/97	500,000,000	325,621,177			
1997/98	496,000,000	399,376,266	5,021,575	98.77	79.53
1998/99	465,941,132	399,909,093	4,830,098	96.47	82.80
1999/2000	457,945,362	356,145,445	4,719,489	97.03	75.46
Total	2,434,781,132	1,928,353,767	14,571,162		
2000/1	489,577,960	In progress	In progress		
Total	2,924,359,092	1,928,353,767	14,571,162		
Avg1997/98 -1999/2000	R473,295,498	R385,143,601	4,857,054	R97.42	R79.26

The above expenditure per learner includes food, transport, administration and helper cost, but excludes any staff costs. As the data relating to the number of learners that

benefited from school feeding from 1994/95 until 1996/97 was not available, the averages of budget, expenditure, learners and allocation per learner were calculated for the period 1997/1998 until 1999/2000.

4.9.4.1.2 Benefits of school feeding

It is extremely difficult to quantify the benefits and impact of school feeding. When assessing benefits, the short-term as well as the long-term benefits should be taken into consideration. The lack of optimal nutrition during childhood can have a tremendous negative effect on the person as an adult.

Very little research on the social and economic benefits of school feeding has been done in South Africa. A vast amount of information is, however, available on the numerous studies and research projects conducted in those countries where school feeding programmes were implemented. Results of a few of these studies are given:

As a result of the substantial reduction in child death rates, a higher proportion of children is attending school than ever before. Despite the improvement in the survival rate of the school going age group, there is still a major burden of disease and ill health amongst this group. This holds true particularly in areas such as poor nutrition and intestinal parasitic diseases. This burden of ill health compromises the children's development, school attendance and ability to take advantage of what might be their only opportunity to obtain a formal education (Maier, 2000).

Jamison *et al.* (1993) indicated that an estimated 60 million children of school going age suffer from iodine deficiency disorders. Furthermore, another 85 million are at risk of acute respiratory disease and other infections because they are deficient in vitamin A. The number of children suffering from iron deficiency anemia is greater still – 210 million.

A learner's nutritional and health status plays a very important role in school performance. Poor nutrition and health diminish learners' cognitive development by reducing their active learning capacity. Learners who lack certain nutrients in their diet, or who suffer from protein-energy malnutrition, hunger, parasitic infections or other diseases, do not have the same potential for learning as healthy and well-nourished children. The need for energy is also much greater than that of younger children (Jamison *et al.*, 1993).

Studies in Tamil Nadu, India found that school feeding encouraged school enrolment while studies in Jamaica and Indonesia found that school feeding significantly increased school attendance (McCoy *et al.*, 1997).

Dolan *et al.* (2000) indicated that children, who did not attend schools where they could be included in school health programmes, were more likely to be sick and had higher levels of malnutrition (stunting was particularly high) than those who attended school where they were included in school health programmes.

School feeding programmes can, if effectively implemented, increase community involvement in the school, especially where the programmes depend on the community to prepare and serve the food to the learners. Schools with their communities behind them are far more effective than schools without community involvement (Del Rosso, 1999).

If properly designed and effectively implemented, school feeding can benefit, directly or indirectly, not only the learner but also the community and government:

Benefits of school feeding for the learners are as follows:

Learners

Learners benefit from school feeding as it encourages school attendance and increases potential for learning. The majority of principals and/or educators interviewed indicated that learners benefited from school feeding as it improved their concentration, school attendance, punctuality, discipline, average scores, alertness, physical well-being and behaviour, and alleviated their temporary hunger. Table 4.85 gives information on the percentage of principals and/or educators that indicated an improvement due to school feeding in terms of the above-mentioned areas.

Table 4.85 Percentage of principals and/or educators that indicated an improvement due to school feeding in the following areas

Areas	Improvement %
Concentration/attention in class	86.58
School attendance	86.58
Punctuality	67.11
Discipline	71.81
School performance (Average scores)	74.50
Behaviour	72.48
Physical well-being of learners	82.55
Alleviation of temporary hunger	91.28
Alertness/participation in learning activities	87.92

Benefits of school feeding for the community are as follows:

Community

The community benefits in the broader sense where community members are compensated for their participation and thus generate an additional income. Learners receiving food regularly, have a lower risk of illness, which means less medical care cost for the family. It has been shown that, involving parents in nutrition intervention at an elementary level enhance the eating behaviour of both students and parents (WHO, 1998).

Benefits of school feeding for the government are as follows:

Government

The government benefits in the long run from school feeding as educated adults can enhance the country's economic growth. The probability of being employed increases with education, which means less unemployment cost for the government. A potential decrease in risk of illness and mortality will also lower the economic burden to the country.

With regard to an economic evaluation of school feeding, it can be stated that the long-term benefits far outweigh the investment of R79 per learner per year.

Regarding the second objective of this section of the study, namely to indicate the cost-effectiveness from a national perspective, the following:

4.9.4.2 Cost-effectiveness from a national perspective

In terms of the tender specifications, the following aspects will be discussed:

- Procurement systems;
- Menu types.

4.9.4.2.1 Different procurement systems

The nine provinces used different procurement systems in school feeding. The two main procurement systems were the tender system and the quotation system. Table 4.86 gives a summary of the provincial procurement systems.

Table 4.86 Summary of provincial procurement systems

Province	Main type	Remarks
Eastern Cape	Tender	Use NGOs with subcontractors
Free State	Tender/Quotation	Phasing out quotation system in favour of tender system
Gauteng	Tender	17 suppliers
KwaZulu-Natal	Quotation	Do not provide advance payments. Supplier delivers on credit and is reimbursed
Mpumalanga	Tender	26 suppliers
Northern Cape	Quotation	Provide advance payments of up to 30% of total allocation to schools. Do not feed during Dec – March in order to close the books
Northern Province	Quotation	Provide advance payments of up to 50% of total allocation to schools
North West	Tender	Tenders are allocated per food item and for transport of food items to schools
Western Cape	Tender/Quotation	5 NGO's

NGO = Non government organization

A discussion on the two procurement systems follows, with that on the tender system first in line.

4.9.4.2.2 Tender system

Provincial departments of health followed standard tender procedures to call for tenders in terms of specifications drawn up by them. Tenders were published by the provincial Tender Boards, inviting suppliers and/or NGO's to tender for the delivery of specified menu items and quantities to specified schools in a specific area. These tenders, at a fixed price, were awarded to the successful organisation/s for a specified period. Contracts were entered into between the provincial departments of health and the money flowed from the provincial departments of health to the suppliers and/or NGO's upon receipt of specific documentation e.g. proof of delivery.

Variations existed within the tender system. The reason for this was that provinces aspired to adhere to RDP principles by empowering more suppliers.

Sub-contracting

A second level of the tender procurement system was used in South Africa, namely subcontracting. This system is a hybrid between the tender and quotation system, but was referred to as the tender system.

Tenders were advertised and awarded to NGOs by the provincial Tender Board. The NGOs in turn appointed sub-contractors to render the required services at school level. NGOs did not procure or deliver the food items to the schools. This means that the procurement was done by small organisations, which did not have buying power and who were subjected to very little control with regard to the quality of the food items delivered to schools.

As part of their contractual agreements, NGOs were required to engage in monitoring. It is, however, not acceptable that the same body responsible for implementation exercises quality control. An impartial body should be responsible for exercising quality control.

Tender per food item

One of the provinces allocated tenders per food item per region. Food items were delivered to a central depot and in some areas to sub-stores. A second contract was awarded to transport the food items to the respective schools.

The second part of the two procurement systems that will subsequently be discussed, is the quotation system.

4.9.4.2.3 Quotation system

Schools approached different suppliers to provide food for the school. Money flowed from the schools to the suppliers upon receipt of certain documentation e.g. proof of delivery. Schools, in turn, claimed reimbursement of expenditure from the provincial Department of Health with whom it had a contract. To start the process, schools received advances of approximately 25% to 50% of the total amount allocated to schools to feed learners for a year.

A comparison between the tender and the quotation system will follow.

4.9.4.2.4 Comparison between the tender system and the quotation system

Table 4.87 provides a comparison between the two systems.

Table 4.87 Comparison between Tender (without variations) and Quotation System

Factors	Tender	Quotation
Awarded by	Province	School
Procurement time frame	Long process Takes 3-4 months	Short Between 1 month and 1 year – depending if school file has been cleared in terms of advances given in the previous financial year
Contract	The tender document serves as a binding contract between suppliers and/or NGO and the provincial departments of health	The school signs "a letter" with provincial government School only has a quote from suppliers, no contract is signed
Number of suppliers	Few	Many
Adhere to RDP principles	Yes when contract is awarded to SMME or when local contractors from community are subcontracted	Yes SMMEs and local suppliers
Accountability	The supplier is accountable to perform according to the tender	The school is accountable for the funds paid to them
Menu control	Province decides on the menu	School, together with supplier decide on the menu
Purchasing power	Buy in bulk	Buy small quantities
Acquiring Price	Lower due to huge quantities	Higher due to small quantities. No bulk buying takes place.
Food procured from	Any source	Local
Responsibility for buying and distributing	Supplier	School
Administrative burden on schools	Very little	Very time consuming
Testing the quality of products	Easier – only a few points of sampling necessary	More difficult due to the large number of suppliers. All participating schools should be included as all have different supplies
Administration burden for completing and submitting claims	Supplier must submit claims to provinces	School must prepare and submit claims to province/regions/districts
Administrative infrastructure required	Little	Extensive
Advance payments	Do not take place	Most schools receive advances except KwaZulu-Natal
Payment	Department pays supplier directly	Department pays the school, who in turn pays the supplier
Financial Control	Paid per item delivered on proof of delivery (Delivery Note)	Paid on invoice as long as the invoice amount is less than the school's monthly allocation. Some provinces say that they do control items to be delivered
Financial Strength	Supplier must be financially sound and carry costs for at least 3 months	Schools receive advance and thus are not required to have other financial backing
Time period to close the books	Within a month after financial year end	At least 4 months after financial year end – up to a few years
Distances to deliver	Long	Shorter
Responsibility for deliveries	Supplier	Supplier
Product Specifications	Exists	Very little information exists
Fixed price for period	Tender period – normally 1 year	Not fixed, prices can be increased

Factors	Tender	Quotation
Training	Little effort Limited number of suppliers need to be trained	A huge effort As both the suppliers and participating schools need to be trained
Government staff required to manage procurement	Few	Many

4.9.4.2.5 Advantages and disadvantages of the different procurement systems

Both systems have advantages as well as disadvantages. Apart from the financial implications of the two different systems, the resources required to manage the systems can influence the overall effectiveness of the programme:

Following is a brief discussion of the advantages and disadvantages of the tender system and quotation system. Firstly the tender system:

Tender system

Main advantages of tender system

- Economics of scale applies;
    - Suppliers can offer better prices as a result of bulk buying;
- Less government resources are required to
    - Manage the suppliers;
    - Administer the claims;
    - Test products;
- The menu is determined by the province and the quality of menu contents is controlled by specifications;
- Tender price is fixed for a year.

Main disadvantages of tender system

- Awarding of tenders takes long;
- Only a few suppliers will receive economic benefit;
- Suppliers are not necessarily from the local community;
- Supplier should have bridging funds.

Subcontracting

Main advantages of subcontracting

- Adhere to RDP principals;

- More suppliers are involved;
- Local people are involved.

Main disadvantages of subcontracting

- The delivery chain is lengthened;
- The same problems occur as with the quotation system;
- Less control over quality of food items.

Tender per food item

Main advantages of the tender per food item

- More people benefit through their participation;
- Make use of local suppliers.

Main disadvantages of the tender per food item

- Food items are not necessarily simultaneously available for distribution;
- Some food items might be stored for long periods before final distribution;
- Food items might never reach the schools (delivered at the central depot) but must be paid for;
- Schools might not receive all food items at the same time which could influence the energy provided by the menus served;
- Stock at central depot is at risk of spoilage, pilferage, fire etc.

Subsequently the advantages and disadvantages of the quotation system are discussed briefly:

Quotation system

Main advantages of quotation system

- Numerous suppliers receive economic benefit;
- Suppliers are from the local community.

Main disadvantages of quotation system

- The risk of fraud is very high due to advance being paid out as well as the time it takes to close books;
- Less control is exercised with regard to the menu and menu contents;
- Selective representation testing of products is very difficult or not possible at all ;
- Prices can increase at any time;

- More government resources are necessary to
  - Manage the suppliers;
  - Administrate the claims;
  - Test products.

4.9.4.2.6 Menu types

Provinces have the prerogative to decide on the type of menus that they would like to serve in their provinces. Normally the local eating habits of the community were taken into consideration when menus were compiled.

The Eastern Cape and the North West Province were the only two provinces that did not have a cooked menu. The Western Cape had a few schools on the quotation system that served the cooked menu. Table 4.88 gives a comparison between a cooked and a non-cooked menu.

Table 4.88 Comparison between a cooked and a non-cooked menu

Factors	Cooked	Non-cooked
Menu example	Maize meal 60 g Soya mince 25 g Oil 5 ml Dried/Fresh vegetables (10/100g)	Bread 80 g Peanut Butter 15 g Full cream milk/ powder = 200 ml/20 g
Perception according to type of food items served	Meal	Snack
Preparation time	2 hours	15 minutes
Preparation utensils	Pots Fire wood / gas Spoons	Knife Spoons Mixing buckets
Number of helpers needed	2 per school	1 per school
Serving	Pots are very heavy to move Served outside	Can take container with food to class to distribute food to learners
Budget food cost per learner per day	R0.56	R0.73
Budget helper costs (allowance)/day	R0.05 X 100 = R5	R0.05 X 100 = R5
Delivery	Bulk Monthly	Some items in bulk, bread on daily basis Daily and monthly
Delivery notes	One	Many
Store room	Big	Small
Risk of food in stock disappearing	High	Low (regular deliveries)
Risk of prepared food being taken home	Low	Very High
Energy (kJ)	1760	1573
Protein	12.5 g	14.5 g
Preference	Difficult to determine	Difficult to determine

The above example is based on a school with 100 targeted learners.

Main advantages of following a cooked menu

- More cost effective in terms of energy provided;
- Delivery and food costs are less than the non-cooked menu.

Main disadvantages of following a cooked menu

- Volunteer workers take longer to prepare food;
- Based on type of food, the perception existed that a meal was served;
- Stock is delivered in bulk which increases the risk of loss – lack of sufficient storage facilities, food goes missing, quality of food deteriorates, larger quantities of food are served resulting in the stock being depleted before the intended period ends;
- An infrastructure is required.

Main advantages of following a non-cooked menu

- Easy to prepare and does not take up to much time;
- Less infrastructure is required;
- Based on type of food, the perception exists that a snack is served;
- Deliveries are more frequent (bread is delivered daily).

Main disadvantages of following a non-cooked menu

- The large number of delivery notes increases administration;
- Delivery and food costs are higher than the cooked menu.

Comments

The food cost of a cooked menu was less than the food cost for a non-cooked menu, but required more volunteer workers to prepare the food. It is not recommended that the cooked menu be served in small remote schools where there are no volunteer workers as either the educator (only educator) or learners will be required to prepare the food.

These problems taken into consideration, it seems necessary to decide on the most cost-effective menu.

4.9.4.3 The most cost-effective menu served

4.9.4.3.1 Introduction

The national guidelines stated that school feeding should provide the maximum energy at the lowest cost.

In determining the most cost-effective approved menu, the following will be addressed:

- The components of costing;
- Cost of menu options will be standardized;
- The energy value per menu will be determined;
- The most cost effective menu will be determined.

4.9.4.3.2 Components of costing

Each province had the prerogative to decide on the menu as well as the price per menu per learner per day, provided that the national criteria were met in terms of nutritional, social and logistical guidelines. The method to calculate the price per learner per day, varied from province to province.

The following components of costing have been identified:

- Food costs;
- Administration costs;
- Transport costs;
- Helper costs.

On the quotation system, the price per learner per day normally consisted of food costs and administration costs. The administration costs, which included transport costs and helper costs (payments of volunteer workers), were 10% of the total food cost per learner per day.

On the tender system, the price per child per day normally consisted of two specific amounts, one for food costs and one for helpers. In the Western Cape and the Eastern Cape, however, an allocation was also made for administration. The North West province

was unique in that it had two separate tenders for the provision of food items and for the transport of food items.

The importance of separating the food costs and helper costs and treating these costs as two separate issues, relates to the VAT levied on food products. If a supplier delivers bulk foodstuffs to schools, the zero rate to these supplies can be applied. The supplier will therefore only pay 14% VAT on those items that are not zero rated. If a supplier on the other hand is required to deliver a prepared product, the total amount payable to the supplier per child per day is regarded as being inclusive of VAT.

If the helper costs are included in the amount per child per day the impression is created that the supplier is providing a prepared product and will therefore be liable to pay VAT on the total amount per child per day. This means that 14% of the price per child per day will have to be paid over to SARS. The tender specifications or agreement with the supplier should also state clearly that the supplier is required to deliver bulk foodstuffs to schools. Helpers are paid an honorarium on behalf of the department and are not in any way employed by the supplier.

There was no uniform honorarium amount or method to calculate the helpers' compensation. In some provinces volunteer workers received monthly food parcels valued at a fixed price, while volunteer workers in other provinces received a fixed amount per day, or per learner per day. Another province did not make use of volunteer workers as the educators and learners were responsible to mix the food.

Where the helper costs were calculated based on the number of targeted learners, the budget for schools with less than 100 learners was very small. Those schools would find it difficult to compensate volunteer workers.

The frequency of deliveries and distances travelled to schools influence transport costs. In the event that bulk foodstuffs are delivered (cooked menu), the transport costs will be less, while transport costs for bread deliveries will be higher as deliveries are more frequent.

The type of menu served also influence the food cost. The food cost of the cooked menu was at least 15–20 cents per learner cheaper than the non-cooked menu. However, the volunteer workers assisting with the cooked menu should be compensated more as they

spend longer hours preparing and serving the food. Delivery costs for the supplier will be much higher on the non-cooked menu if bread has to be delivered every day.

4.9.4.3.3 Standardise costing of menu options

The following costing per learner per day was obtained from the provincial business plans and/or from discussions with the respective provincial nutrition coordinators (Table 4.89).

Table 4.89 Budget per learner per day as provided by the respective provinces

Province	Food (range) Rand	Admin Rand	Transport Rand	Helper Rand
Eastern Cape (Bread)	0.39	0.1	0.12	0.05
Eastern Cape (Biscuits)	0.42	0.1	0.08	0.05
Free State	0.99 –1.32			
Gauteng (Bread)	0.88-95			Sliding Scale
Gauteng (Cooked)	0.80 – 0.85			Sliding Scale
KwaZulu-Natal	0.60	Sliding scale		
Mpumalanga (Bread)	0.73			R9/day
Mpumalanga (Cooked)	0.56			R9/day
Northern Cape	0.5	Sliding scale		
Northern Province	0.73	Sliding scale		
North West	0.656		0.044	
Western Cape	0.7	Sliding scale		

Table 4.90 gives the costing after adaptation.

Table 4.90 Adapted costing – standardised cost per learner per day

Province	Food (range) Rand	Admin Rand	Transport Rand	Helper Rand	Total allocation per learner/day Rand
Eastern Cape (Bread)	0.39	0.1	0.12	0.05	0.66
Eastern Cape (Biscuits)	0.45	0.1	0.06	0.05	0.66
Free State	1.10*				1.10
Gauteng (Bread)	0.93*			0.07***	1.00
Gauteng (Cooked)	0.83*			0.07***	0.90
KwaZulu-Natal	0.6	0.06****			0.66
Mpumalanga (Bread)	0.73			0.05***	0.78
Mpumalanga (Cooked)	0.56			0.05***	0.61
Northern Cape	0.5	0.1*			0.60
Northern Province	0.73	0.073**			0.80
North West	0.656		0.044		0.70
Western Cape	0.7	0.07**			0.77

* Use the mean as basis
** Use 10% administration rule
*** Convert helper costs to a per learner rate
**** Confirmed with financial official

From the table above, provinces can be ranked from high to low in terms of their respective allocation per learner per day. This in itself is not an indication of the cost-effectiveness of school feeding. To understand which province was the most cost-effective, the cost per energy provided should be expressed.

4.9.4.3.4 The energy value per menu

The following with results will be given:

- Summary of % RDA for energy;
- Correlation between % RDA for energy and cost of approved menu;
- Correlation between % RDA for energy and cost of menu served;
- Total allocation per learner
    - Funds required to obtain 2100Kj (25% RDA) on approved menu;
    - Funds lost per day per learner on menu served;
    - Funds required to serve 2100Kj on current quantities served;
- Food allocation per learner
    - Funds required to obtain 2100Kj (25% RDA) on approved menu;
    - Funds lost per day per learner on quantities served;
    - Funds required to serve 2100Kj on current quantities served;
- International comparison.

4.9.4.3.4.1 Summary of % RDA for energy

Table 4.91 gives a summary of the average energy provided by the provincially approved menus and menus served on the day of visit.

Table 4.91 The average energy provided by the provincially approved menus and menus served on the day of visit

Province	Total allocation/ learner/day on menu as provided	Menu as provided by the different provinces	Approved menu calculated energy (kJ)	Menu served * calculated energy (kJ)
	Rand	Energy expressed as a % of RDA**	Energy expressed as a % of RDA**	Energy expressed as a % of RDA**
Eastern Cape (Bread)	0.66	19%	19%	16%
Eastern Cape (Biscuits)	0.66	19%	21%	
Free State (Bread)	1.10	24%	23%	18%
Free State (All)	1.10	24%	27%	
Gauteng (Bread)	1.00	Not indicated on menu	23%	19%
Gauteng (Cooked)	0.90	Not indicated on menu	27%	
KwaZulu-Natal (All)	0.66	Not indicated on menu	22%	15%
KwaZulu-Natal (Bread)	0.66	Not indicated on menu	22%	
Mpumalanga (Bread)	0.78	19%	21%	12%
Mpumalanga (Cooked)	0.61		19%	
Northern Cape (Bread)	0.60	Not indicated on menu	18%	14%
Northern Cape (All)	0.60	Not indicated on menu	18%	
Northern Province (Bread)	0.80	28%	25%	14%
Northern Province (All)	0.80	28%	31%	
North West	0.70	Incomplete on menu	22%	22%
Western Cape	0.77	20%	23%	19%

MRC = Medical Research Council
RDA = Recommended Dietary Allowance
* Schools where no feeding took place on the day of the visit were excluded
**RDA for children 7–10 years of age

Provincially approved menu

Only five of the nine provinces indicated the % RDA for energy on their menus. Of the five provinces, only one province, the Northern Province, adhered to the national criteria of 25% of the RDA for energy.

Calculated % RDA

From the above table, only the provincially approved menus in the Free State (all), Gauteng (cooked), and the Northern Province (all) met the national nutritional criterion of providing 25% of the RDA for energy.

Menu served

Not one of the provinces met the national nutritional criterion of providing 25% of the RDA for energy of the menus served at the schools.

4.9.4.3.4.2 Correlation between % RDA for energy and cost of provincially approved menus

Figure 4.18 illustrates the correlation between the energy as a % of the RDA and cost of approved menus

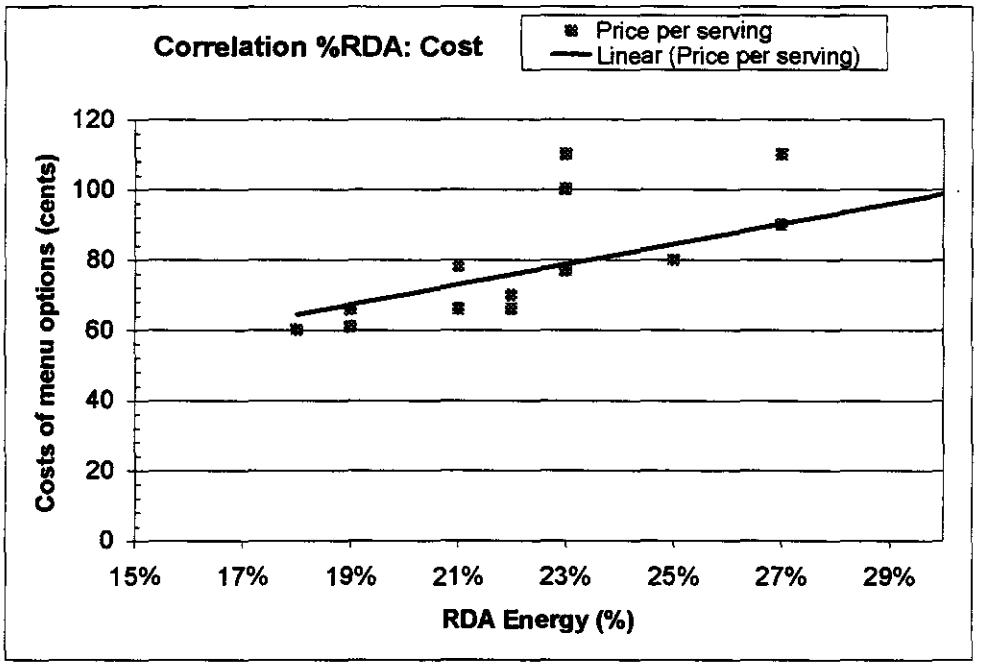


Figure 4.18 Correlation between the energy as a % of the RDA and cost of approved menus

All 16 menu options (of the nine provinces) were used in the correlation between % RDA for energy and cost. A positive correlation existed between energy as a % of RDA and

the cost of the menu option of the approved menus. On average, an energy content of 25% of the RDA was accomplished at a total cost of R0.84.

4.9.4.3.4.3 Correlation between % RDA for energy and cost of menus served

Figure 4.19 illustrates the correlation between the % RDA for energy and the cost of the menus served.

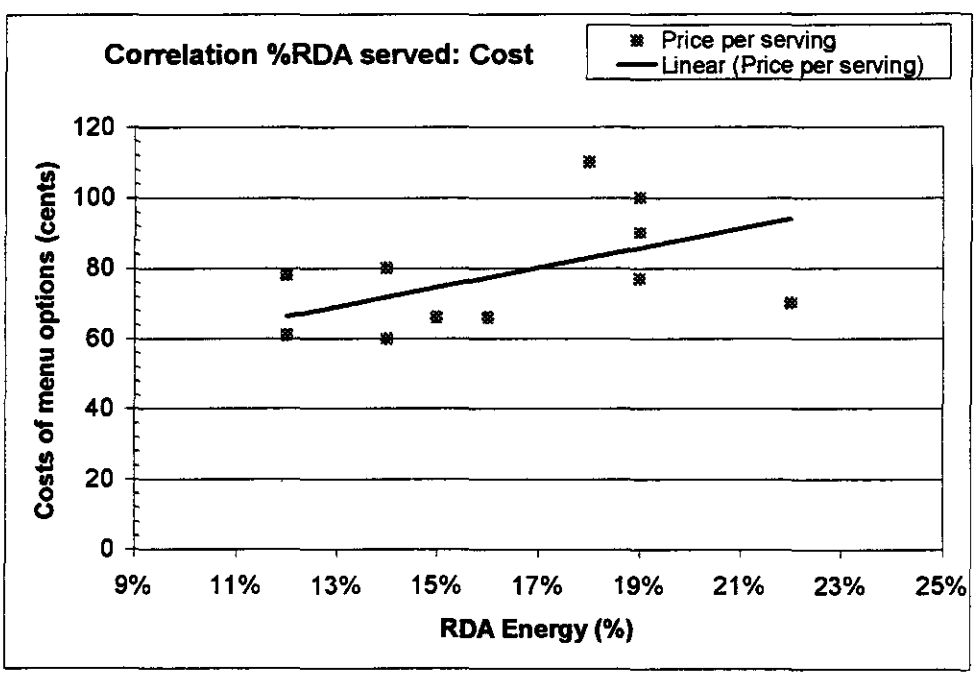


Figure 4.19Correlation between the energy as a % of the RDA and cost of menus served

All 16 menu options (of the nine provinces) were used in the correlation between % RDA for energy served and cost of the menu. A positive correlation existed between energy as a % of RDA served and the cost of the menu option of the menu served. No menu met the national criterion of 25% of the RDA for energy. If the trend is extrapolated further, it seems that 25% RDA for energy would have been reached at R1.15.

4.9.4.3.4.4 Total allocation per learner

Table 4.92 indicates the funds required to obtain 2100kJ (25% RDA) on the approved menus.

Table 4.92 Funds required to provide 2100kJ (25% RDA for energy) on approved menu

Province	Total allocation/ learner/day on menu provided	Approved menu calculated energy (kJ)	Funds required to obtain 2100 (kJ) (25% RDA)
	Rand	Energy (kJ)	Rand
Eastern Cape (Bread)	0.66	1627	0.85
Eastern Cape (Biscuits)	0.66	1795	0.77
Free State (Bread)	1.10	1922	1.20
Free State (All)	1.10	2290	1.01
Gauteng (Bread)	1.00	1965	1.07
Gauteng (Cooked)	0.90	2259	0.84
KwaZulu-Natal (All)	0.66	1842	0.75
KwaZulu-Natal (Bread)	0.66	1887	0.73
Mpumalanga (Bread)	0.78	1783	0.92
Mpumalanga (Cooked)	0.61	1556	0.82
Northern Cape (Bread)	0.60	1469	0.86
Northern Cape (All)	0.60	1491	0.85
Northern Province (Bread)	0.80	2092	0.80
Northern Province (All)	0.80	2627	0.64
North West	0.70	1795	0.82
Western Cape	0.77	1909	0.85

In the above table, the allocation per learner per day is provided and the energy calculated by the MRC *Foodfinder2*. This computer programme is based on the South African Food Composition Tables (Langenhoven *et al.*, 1991). As the national standard specified that 25% RDA or 2100 kJ should be provided, a calculation was done to determine the funds required if the different provinces had to comply with the 25% RDA for energy.

For example: The North West's total allocation per learner per day was R0.70. For R0.70, the North West approved a menu with 1795 kJ or 22% of the RDA for energy. For the North West to keep on serving its approved menu and meet the national criteria of 25% of the RDA for energy, an allocation of R0.82 is required.

From the table above, only the Free State (all), Gauteng (cooked), the Northern Province (bread) and the Northern Province (all) would be able to afford to provide 25% of the RDA for energy on their respective approved menus.

4.9.4.3.4.5 Funds lost per day per learner on the menu served at schools

Table 4.93 gives the funds lost per learner per day due to incorrect quantity served at schools.

Table 4.93 Funds lost per learner per day due to incorrect quantity served at schools

Province	Energy (kJ) of the approved menu calculated energy	Allocation / learner/day Rand	Energy (kJ) of menu served* calculated energy	Total costs menu served Rand	Funds lost per learner/day Rand
Eastern Cape (Bread)	1627	0.66	1358	0.55	0.11
Eastern Cape (Biscuits)	1795	0.66	1358	0.50	0.16
Free State (Bread)	1922	1.10	1522	0.87	0.23
Free State(All)	2290	1.10	1522	0.73	0.37
Gauteng (Bread)	1965	1.00	1575	0.80	0.20
Gauteng (Cooked)	2259	0.90	1575	0.63	0.27
KwaZulu-Natal (All)	1842	0.66	1266	0.45	0.21
KwaZulu-Natal (Bread)	1887	0.66	1266	0.44	0.22
Mpumalanga (Bread)	1783	0.78	960	0.42	0.36
Mpumalanga (Cooked)	1556	0.61	960	0.38	0.23
Northern Cape (Bread)	1469	0.60	1133	0.46	0.14
Northern Cape (All)	1491	0.60	1133	0.46	0.14
Northern Province (Bread)	2092	0.80	1207	0.46	0.34
Northern Province (All)	2627	0.80	1207	0.37	0.43
North West	1795	0.70	1865	0.73	-0.03
Western Cape	1909	0.77	1616	0.65	0.12
Average	**1865**	**0.74**	**1312**	**0.48**	**0.21**

* Schools where no feeding took place on the day of the visit were excluded

The total cost of the menu served was calculated. The difference between the total allocation per learner per day and the cost per learner per day indicates the amount lost by the government per learner per day due to incorrect quantities served.

For example: Gauteng (cooked) paid suppliers R0.90 per learner per day to provide 2259 kJ per learner. The average quantities served on the day of visit only accounted for 1575 kJ per learner. This means that the cost of the menu on the day was only R0.63 per learner per day. The Gauteng Province lost R0.27 per learner per day due to incorrect quantities served.

From the table above, only the North West served a menu on the day of visit, which provided more energy than the approved menu. The province effectively gained R0.03 per learner per day.

On average, the government lost R0.21 on the total allocation per learner per day due to incorrect quantities being served at schools.

4.9.4.3.4.6 Funds required to serve a 2100kJ menu on current quantities served

Table 4.94 indicates the funds required to serve 2100kJ to the learners on the current quantities served.

Table 4.94 Funds required to serve a 2100kJ menu on the current quantities served

Province	Allocation / learner/day	Energy (kJ) Menu served*	Funds required to serve 2100 kJ on menu served Rand
Eastern Cape (Bread)	0.66	1358	1.02
Eastern Cape (Biscuits)	0.66	1358	1.02
Free State (Bread)	1.10	1522	1.52
Free State(All)	1.10	1522	1.52
Gauteng (Bread)	1.00	1575	1.33
Gauteng (Cooked)	0.90	1575	1.20
KwaZulu-Natal (All)	0.66	1266	1.09
KwaZulu-Natal (Bread)	0.66	1266	1.09
Mpumalanga (Bread)	0.78	960	1.71
Mpumalanga (Cooked)	0.61	960	1.33
Northern Cape (Bread)	0.60	1133	1.11
Northern Cape (All)	0.60	1133	1.11
Northern Province (Bread)	0.80	1207	1.39
Northern Province (All)	0.80	1207	1.39
North West	0.70	1865	0.79
Western Cape	0.77	1616	1.00

* Schools where no feeding took place on the day of the visit were excluded.

In the above table, the allocation per learner per day is provided and the energy served calculated by the MRC *Foodfinder2* computer programme (Langenhoven *et al.*. 1991). The funds required to serve 2100kJ on the menu served was then calculated.

For example: The Western Cape paid R0.77 per learner per day for 1616 kJ served. If the correct quantity (kJ) was served, i.e.2100 kJ, it would have cost R1.00.

From the table above, none of the provinces could serve the 2100kJ within the current allocation and the current approved menus.

4.9.4.3.4.7 Food allocation per learner

Table 4.95 indicates the funds required to obtain 2100kJ (25% RDA) on the approved menu.

Table 4.95 Funds required to obtain 2100kJ (25% RDA) on approved menu

Province	Allocation for food cost/ learner/day Rand	Energy (kJ) approved menu	Food cost required for 2100 kJ – approved menu Rand
Eastern Cape (Bread)	0.39	1627	0.50
Eastern Cape (Biscuits)	0.42	1795	0.49
Free State (Bread)	1.00	1922	1.09
Free State(All)	1.00	2290	0.92
Gauteng (Bread)	0.93	1965	0.99
Gauteng (Cooked)	0.83	2259	0.77
KwaZulu-Natal (All)	0.60	1842	0.68
KwaZulu-Natal (Bread)	0.60	1887	0.67
Mpumalanga (Bread)	0.73	1783	0.86
Mpumalanga (Cooked)	0.56	1556	0.76
Northern Cape (Bread)	0.50	1469	0.71
Northern Cape (All)	0.50	1491	0.70
Northern Province (Bread)	0.73	2092	0.73
Northern Province (All)	0.73	2627	0.58
North West	0.66	1795	0.77
Western Cape	0.70	1909	0.77

As national criteria specified that 25% of the RDA for energy or 2100 kJ should be provided, a calculation was done to determine what the allocation should have been if the different provinces complied with the 25% RDA for energy.

For example: The Northern Cape (bread) food allocation per learner per day was R0.50. For R0.50, the Northern Cape provided a menu with 1469 kJ or 18% RDA for energy. For the Northern Cape to keep on serving its approved menu and meet the national criteria of 25% RDA for energy, an allocation of R0.71 is needed.

From the table above, only the Free State (all), Gauteng (cooked), the Northern Province (bread) and the Northern Province (all) would be able to afford to meet the 25% RDA for energy on their respective approved menus.
The funds lost per day per learner on quantities served are given in Table 4.96.

Table 4.96 Funds lost per learner per day due to incorrect quantities served at schools

Province	Energy (kJ) approved menu	Allocation for food cost/ learner/day Rand	Energy (kJ) menu served*	Food cost for menu served Rand	Funds lost per learner/day Rand
Eastern Cape (Bread)	1627	0.39	1358	0.33	0.06
Eastern Cape (Biscuits)	1795	0.42	1358	0.32	0.10
Free State (Bread)	1922	1.00	1522	0.79	0.21
Free State(All)	2290	1.00	1522	0.66	0.34
Gauteng (Bread)	1965	0.93	1575	0.75	0.18
Gauteng (Cooked)	2259	0.83	1575	0.58	0.25
KwaZulu-Natal (All)	1842	0.60	1266	0.41	0.19
KwaZulu-Natal (Bread)	1887	0.60	1266	0.40	0.20
Mpumalanga (Bread)	1783	0.73	960	0.39	0.34
Mpumalanga (Cooked)	1556	0.56	960	0.35	0.21
Northern Cape (Bread)	1469	0.50	1133	0.39	0.11
Northern Cape (All)	1491	0.50	1133	0.38	0.12
Northern Province (Bread)	2092	0.73	1207	0.42	0.31
Northern Province (All)	2627	0.73	1207	0.34	0.39
North West	1795	0.66	1865	0.69	-0.03
Western Cape	1909	0.70	1616	0.59	0.11
Average	1865	0.68	1312	0.41	0.19

* Schools where no feeding took place on the day of the visit were excluded.

The total food cost of the menu served was calculated. The difference between the total food allocation per learner per day and the food cost per learner per day indicates the amount lost by the government per learner per day due to incorrect quantities served.

For example: Mpumalanga (cooked) paid suppliers R0.56 food cost per learner per day to provide 1556 kJ per learner per day. The average menu served on the day of visit only accounted for 960 kJ. This means that the cost of the menu at the day was only R0.35 per learner per day. Mpumalanga Province lost R0.21 per learner per day on food costs due to incorrect food quantity served.

From the table above, only the North West's menu served on the days of visit provided more kJ than the approved menu. The province gained R0.03 per learner per day. On

average the government lost R0.19 on food cost per learner per day due to incorrect quantities being served at the school.

In Table 4.97 the funds required to serve 2100kJ on current quantities served is given.

Table 4.97 Funds required to serve 2100kJ on indication of the food allocation per learner per day needed to meet the energy criteria:

Province	Allocation for food cost/ learner/day Rand	Energy (kJ) menu served*	Funds required to serve 2100 kJ on menu served Rand
Eastern Cape (Bread)	0.39	1358	0.60
Eastern Cape (Biscuits)	0.42	1358	0.65
Free State (Bread)	1.00	1522	1.38
Free State(All)	1.00	1522	1.38
Gauteng (Bread)	0.93	1575	1.24
Gauteng (Cooked)	0.83	1575	1.11
KwaZulu-Natal (All)	0.60	1266	1.00
KwaZulu-Natal (Bread)	0.60	1266	1.00
Mpumalanga (Bread)	0.73	960	1.60
Mpumalanga (Cooked)	0.56	960	1.23
Northern Cape (Bread)	0.50	1133	0.93
Northern Cape (All)	0.50	1133	0.93
Northern Province (Bread)	0.73	1207	1.27
Northern Province (All)	0.73	1207	1.27
North West	0.66	1865	0.74
Western Cape	0.70	1616	0.91

* Schools where no feeding took place on the day of the visit were excluded.

The funds required to serve 2100 kJ, based on the menu served, was then calculated.

For example: Western Cape paid R0.70 food cost per learner per day for 1616 kJ served. If the correct quantity was served, i.e. 2100 kJ it would have cost R0.91.

From the table above, none of the provinces can serve the 2100 kJ within the current allocation and current approved menus.

4.9.4.3.4.8 International comparison to 4200 kJ (1000 calories)

Table 4.98 gives the cost per 4200 kJ (1000 calories) of the approved and served menus in all nine provinces.

Table 4.98 The cost per 4200 kJ (1000 calories)

Province	Total allocation/ leaner/day Rand	Energy (kJ) of approved menu	Energy (kJ) of menu served	Cost for 4200 kJ (1000 cal) of approved menu Rand	Cost for 4200 kJ of menu served Rand
Eastern Cape (Bread)	0.66	1627	1358	1.70	2.04
Eastern Cape (Biscuits)	0.66	1795	1358	1.54	2.04
Free State (Bread)	1.10	1922	1522	2.40	3.04
Free State(All)	1.10	2290	1522	2.02	3.04
Gauteng (Bread)	1.00	1965	1575	2.14	2.67
Gauteng (Cooked)	0.90	2259	1575	1.67	2.40
KwaZulu-Natal (All)	0.66	1842	1266	1.50	2.19
KwaZulu-Natal (Bread)	0.66	1887	1266	1.47	2.19
Mpumalanga (Bread)	0.78	1783	960	1.84	3.41
Mpumalanga (Cooked)	0.61	1556	960	1.65	2.67
Northern Cape (Bread)	0.60	1469	1133	1.72	2.22
Northern Cape (All)	0.60	1491	1133	1.69	2.22
Northern Province (Bread)	0.80	2092	1207	1.61	2.78
Northern Province (All)	0.80	2627	1207	1.28	2.78
North West	0.70	1795	1865	1.64	1.58
Western Cape	0.77	1909	1616	1.69	2.00

On the approved menus, at the same energy (4200 kJ), the Northern Province (all), followed by the menus in KwaZulu-Natal (bread), KwaZulu-Natal (all) and the Eastern Cape (biscuits) had the most cost effective menu. From the above table, it would appear that the menus of the Free State (bread),the Free State (all) and Gauteng (bread) were the most expensive.

If the menus served at schools are standardised at the same energy (4200kJ), the menu in the North West, followed by the menus in the Western Cape and the Eastern Cape were the most cost-effective. The Free State (bread), the Free State (all) and Gauteng (bread) were still the most expensive menus served per 4200 kJ (1000 calories).

4.9.4.3.4.9 The most cost-effective menu

Table 4.99 gives the ratings of the most cost-effective menu.

Table 4.99 Ratings of the most cost effective menu

Province	Energy (kJ) of approved menu	Energy (kJ) of menu served	Total alloca-tion/learner per day Rand	Cost/ kJ of approved menu Rand	Cost/ kJ of menu served Rand
Northern Province (all)	2627	1207	0.80	0.00030	0.0007
Free State (all)	2290	1522	1.10	0.00048	0.0007
Gauteng (cooked)	2259	1575	0.90	0.00040	0.0006
North West	1795	1865	0.70	0.00039	0.0004
Western Cape	1909	1616	0.77	0.00040	0.0005
Gauteng (bread)	1965	1575	1.00	0.00051	0.0006

The following 6 menus of the 5 provinces were selected to identify the most cost-effective menus:

- The Free State (all);
- Gauteng (cooked);
- The Northern Province (all);
- The North West;
- The Western Cape (bread);
- Gauteng (bread).

The approved menus in the Free State (all), Gauteng (cooked) and the Northern Province (all) were the only menus that met the national criterion for the % RDA for energy. The menus served in the North West, the Western Cape and Gauteng (bread) provided the highest % RDA for energy.

The menus served in the following provinces, in ranking order on cost/kJ on the menu served, from highest to lowest, are:

- The North West;
- The Western Cape;
- Gauteng (cooked);
- Gauteng (bread);
- The Northern Province (all);
- The Free State (all).

Costing can, however, not be viewed from a financial perspective only. The menu items served should also be considered. The North West served commercial products (fortified biscuits, fortified sorghum based porridge and Vit C enriched cool drink), which were not

recommended in terms of the national nutritional criteria. The Western Cape, therefore, served the most cost-effective menu.

Discussion on the economic evaluation of some case studies of the non-cooked and cooked menus will now follow:

4.9.4.3.4.10 Case study on the non-cooked menu

Introduction

A case study was done in order to determine the actual cost (wholesale price) to the supplier to feed a learner per day. The actual cost was compared to the allocation per learner per day. The different approved bread menus of all the provinces were considered and the different quantities as specified in the respective menus were used. Two actual costs are indicated – a low cost for items bought in bulk and a high actual cost for items bought in small quantities.

Results: Bread menu

Table 4.100 gives the actual costs of the food items only.

Table 4.100 Actual cost of food items only

Menu item	Quantity	High actual cost Rand	Low actual cost Rand
Bread	800 g*	2.40	1.90
Peanut butter	1 kg	5.76	4.85
Cool drink	1 kg	6.73	5.20
Milk	1 kg	12.19	12.00
Jam	1 kg	5.00	4.40
Margarine	1 kg	4.78	4.50

* The price for a 800 gram loaf of bread has been quoted. It should be noted that 800 gram loaves of bread in school feeding was nearly non-existing. The actual weight of a loaf delivered varied from 500 gram to 700 gram.

Table 4.101 gives the quantities per learner per day according to the menus in grams.

Table 4.101 Quantities per learner per day according to the menus in kilogram

Province	Bread Kilogram	Peanut Butter Kilogram	Cool Drink Kilogram	Jam Kilo-gram	Margarine Kilogram	Milk Kilo-gram
Eastern Cape	0.080	0.020	0.008*			
Free State	0.105	0.015				0.015
Gauteng	0.080	0.030	0.008*	0.020		
KwaZulu-Natal	0.080	0.025			0.010	0.020
Mpumalanga	0.080	0.015				0.020
Northern Cape	0.080	0.015	0.008*	0.015		
Northen Province	0.105	0.030	0.010			
North West	0.105	0.023	0.011			
Western Cape	0.080	0.020		0.010		0.020

* Cool drink powder 8 g = 200 ml
2 slices of brown bread was quantified as 80 g (40 g each)
The milk was converted to milk powder

Table 4.102 gives the cost range for food costs for the menu given in Table 4.101.

Table 4.102 Cost range for food costs for above menu quantities

Province	Actual cost (bulk buying) Rand	Actual cost (small quantities) Rand	Cost range for food cost Rand
Eastern Cape	0.33	0.41	0.33–0.41
Free State	0.50	0.58	0.50–0.58
Gauteng	0.47	0.57	0.47–0.57
KwaZulu-Natal	0.60	0.68	0.60–0.68
Mpumalanga	0.50	0.57	0.50–0.57
Northern Cape	0.37	0.46	0.37–0.46
Northern Province	0.45	0.56	0.45–0.56
North West	0.42	0.52	0.42–0.52
Western Cape	0.57	0.65	0.57–0.65

Table 4.103 compares the allocation of funds with the actual food costs.

Table 4.103 Comparing allocation with actual food cost

Province	Actual range for food cost Rand	Allocated food / learner / day Rand	Profit margin per learner per day on the upper limit Rand
Eastern Cape	0.33–0.41	0.39	-0.02
Free State	0.50–0.58	1.00*	0.42
Gauteng	0.47–0.57	0.93	0.36
KwaZulu-Natal	0.60–0.68	0.60	-0.08
Mpumalanga	0.50–0.57	0.73	0.16
Northern Cape	0.37–0.46	0.50	0.04
Northern Province	0.45–0.56	0.73	0.17
North West	0.42–0.52	0.66	0.14
Western Cape	0.57–0.65	0.70	0.05

* The food cost was reduced by 10c in order to exclude administration costs

The suppliers in the following provinces would find it difficult to provide quality food within the allocated price per child per day:

- The Eastern Cape;
- KwaZulu-Natal;
- The Northern Cape (the province was on the quotation system and food items were bought in small quantities).

The Western Cape would be able to manage on 0.70c as the majority of schools were on the tender system and bulk buying could take place. The suppliers in the Free State and Gauteng made the most profit per learner per day.

Results: Fortified biscuit menu

Table 4.104 gives the actual cost of food items only.

Table 4.104 Actual cost of food items only

Menu item	Quantity	High actual cost Rand	Low actual cost Rand
Fortified biscuits	1 kg	4.80	4.80
Peanut butter	1 kg	5.76	4.85
Cool drink	1 kg	6.73	5.20

Table 4.105 gives the quantities per learner per day according to menus in gram.

Table 4.105 Quantities per learner per day according to menus in gram

Province	Fortified biscuit Kilogram	Peanut butter Kilogram	Cool drink Kilogram
Free State	0.100	0.020	0.008*
Gauteng	0.100		0.008*
Northern Cape	0.075		0.008*
North West	0.100		0.011

*Cool drink powder 8 g = 200 ml

Only the provinces that served fortified biscuits were included in this study.

Table 4.106 gives the cost range for food costs for the menu quantities.

Table 4.106 Cost range for food costs for menu quantities

Province	Actual cost (bulk buying) Rand	Actual cost (small quantities) Rand	Cost range for food cost Rand
Eastern Cape	0.62	0.65	0.62–0.65
Gauteng	0.52	0.53	0.52–0.53
Northern Cape	0.40	0.41	0.40–0.41
North West	0.54	0.55	0.54–0.55

Table 4.107 compares the allocation with the actual food costs.

Table 4.107 Comparing allocation with actual food cost

Province	Actual range for food cost Rand	Allocated food / learner / day Rand	Profit margin per learner / day on upper limit Rand
Eastern Cape	0.62– 0.65	0.39	-0.23
Gauteng	0.52 – 0.53	0.93	0.40
Northern Cape	0.40 – 0.41	0.50	0.09
North West	0.54 – 0.55	0.66	0.10

The suppliers in the Eastern Cape would not be able to deliver quality food items at the current price. The suppliers in Gauteng made the most profit per learner per day.

The discussion of the economic evaluation of the cooked menu will now follow:

4.9.4.3.4.11 Case study on the cooked menu

Introduction

A case study was done to determine the **actual cost (wholesale price)** to the supplier to feed a learner per day. The actual cost was compared to the allocation per learner per day. The different approved cooked menus of all provinces were considered and the different quantities as indicated by the respective menus, were used. Two actual costs are indicated – a low cost for items bought in bulk and a high actual cost for items bought in small quantities.

Results

Table 4.108 gives the actual cost of the food items.

Table 4.108 Actual cost of food items only

Menu item	Quantity	High actual cost (small quantities) Rand	Low actual cost (bulk buying) Rand
Maize Meal	1 kg	1	1.5
Maize Rice	1 kg	1.8	1.2
Soya Mince	1 kg	6.2	5.8
Oil	1 litre	5.73	4.3
Vegetables	1 kg	5.5	4.5
Cool Drink	1 kg	5.2	6.73

Table 4.109 gives the quantities in gram per learner per day according to the menus.

Table 4.109 Quantities per learner per day according to the menus in gram

Province	Maize meal Kilogram	Soya mince Kilogram	Oil Litre	Vegetables dried Kilogram	Maize rice Kilogram	Cool drink Kilogram
Free State	0.100	0.050	0.005			
Gauteng	0.100	0.040	0.010			
Mpumalanga	0.060	0.025	0.005	0.010		
Northern Cape		0.040			0.150	0.008
Northen Province	0.100	0.050	0.005	0.010		

*Cool drink powder 8 g = 200 ml

The Eastern Cape, the North West and the Western Cape were omitted from this study as they followed the non-cooked menus. KwaZulu-Natal was omitted from the case study as the menus varied form the above. A separate case study should be done.

Table 4.110 gives the cost range of food costs for the menu quantities.

Table 4.110 Cost range for food costs for menu quantities

Province	Actual cost (bulk buying) Rand	Actual cost (small quantities) Rand	Cost range for food cost Rand
Free State	0.41	0.49	0.41–0.49
Gauteng	0.38	0.45	0.38–0.45
Mpumalanga	0.27	0.30	0.27–0.30
Northern Cape	0.47	0.56	0.47–0.56
Northern Province	0.46	0.52	0.46–0.52

Table 4.111 compares the allocation with the actual food cost of the non-cooked menus.

Table 4.111 Comparing allocation with actual food cost

Province	Actual range for food cost Rand	Allocated food / learner / day Rand	Profit margin per learner per day on upper limit Rand
Free State	0.41–0.49	1.00*	0.51
Gauteng	0.38–0.45	0.83	0.38
Mpumalanga	0.27–0.30	0.56	0.26
Northern Cape	0.47–0.56	0.50	-0.06
Northern Province	0.46–0.52	0.73	0.22

* The food cost was reduced by 10c in order to exclude administration costs

The Northern Cape was the only province that could not deliver a cooked menu at the allocated R0.50 per learner per day. The suppliers in the Free State and Gauteng made the most profit per learner per day.

Table 4.112 compares the profit margins of the different provinces.

Table 4.112 Comparison on profit margins

	Bread	Biscuit	Cooked
Province	Profit margin per learner /day on upper limit Rand	Profit margin per learner /day on upper limit Rand	Profit margin per learner /day on upper limit Rand
Eastern Cape	-0.02	-0.23	
Free State*	0.42		0.51
Gauteng*	0.36	0.40	0.38
KwaZulu-Natal	-0.08		
Mpumalanga*	0.16		0.26
Northern Cape	0.04	0.09	0.14
Northern Province	0.17		0.22
North West	0.14	0.10	
Western Cape	0.05		

* The cost per child per day, therefore the profit margin, is inclusive of administrative and transport costs.

Based on the economic evaluation done, it appears that the profit margin on the cooked menu is the highest.

4.9.5 Discussions

4.9.5.1 Economic evaluation of school feeding

Based on international literature on the subject of school feeding, it is evident that school feeding is regarded as extremely important throughout the world. The challenges of school feeding are not unique to South Africa.

The use of cost-benefit analysis and its application in the field of health promotion is not new. However, complaints about the insistence on cost-benefit or cost-effectiveness analysis among heath promotion programme managers are common. In order to assess whether programmes are "worth it", some kind of cost-benefit or cost-effectiveness analysis must be included as part of programme evaluation. There is, however, much controversy surrounding the use of cost-benefit and cost-effectiveness techniques in making important policy decisions in the health sector (Barry & DeFriese, 1990).

4.9.5.2 Cost-effectiveness from a national perspective

Each province should take into account its own unique circumstances, infrastructure and resources to implement and manage the programme, when deciding on the procurement system to use.

Factors that should be considered in determining the choice of menu to be served at schools include the availability of cooking utensils, how difficult it is to obtain fuel for cooking and whether volunteer workers are available to prepare the food. The feeding time of before 09:00 is also an important consideration.

4.9.5.3 Most cost-effective menu served

The most cost-effective menu should not only be viewed from a financial perspective, but also from a perspective of meeting the national nutritional criteria. Not one of the menus served in any of the provinces complied with the national nutritional criteria regarding the energy to be provided.

4.9.6 Conclusions

Based on these results, the major conclusions are:

- The long-term benefits of school feeding far outweigh the investment of R79 per learner per year;
- The tender system is preferred to the quotation system as the tender system requires fewer resources (to manage suppliers, process claims and test products) and decreases the opportunity of fraud as more control can be exercised;
- Sub-contracting, without control over subcontractors, is not preferred;
- Tender per food items is not preferred;
- The different costing structures varied significantly from one province to the other;
- The food cost and delivery cost of a cooked menu were less than the food cost and delivery cost of the non-cooked menu;
- The different %RDA for energy provided by the approved menus varied significantly from one province to the other, from 18% to 27%;

- Only the approved menus of the Free State, Gauteng (cooked) and the Northern Province complied with the national nutritional criteria of 25% of the RDA for energy;
- Not a single province succeeded in serving a menu that complied with the national criteria of 25% of RDA for energy;
- Taking menu items into consideration, the Western Cape served the most cost effective menu providing 19% RDA for energy (1616 kJ) at R0.77;
- The Eastern Cape, KwaZulu-Natal and the Northern Cape would not be able to provide the required quantities and quality of the bread menu at the allocated amount per learner per day;
- The Eastern Cape would not be able to provide the required quantities and quality of biscuits at the allocated amount per learner per day;
- Suppliers in the Free State, Gauteng, Mpumalanga, the Northern Cape and the Northern Province would be able to provide the cooked menu at the allocated amount per learner per day;
- The different profit margins of food cost varied significantly from province to province and menu to menu. On the biscuit menu the Eastern Cape suppliers would make a loss of 0.23 per learner per day, while Gauteng suppliers will make a profit of 0.40 per learner per day;
- The profit margins on the menus in the Free State and Gauteng were more than double that of the province with the second highest profit i.e. the Free State profit margin on the cooked menu was R0.51 and on the bread menu R0.42. Gauteng's profit margin on the bread menu was R0.36, R0.40 on the biscuit menu and R0.38 on the cooked menu;
- Allocation per learner per day varied significantly from province to province from 0.60 per learner per day to R1.10 per learner per day;
- Profit margin per learner per day varied significantly from province to province from a loss of R0.08 to a profit of R0.51 per learner per day.

4.9.7 Recommendations

4.9.7.1 Introduction

The recommendations that follow are in line with international solutions to similar challenges facing school feeding all over the world.

Del Rosso (1999) developed a guide for improving the effectiveness of school feeding and increasing the benefit to education. The seven steps are:

- Define school feeding programme policy and objectives;
- Develop targeting and coverage strategies;
- Optimise menu ratios and time of meals;
- Optimise cost/benefit;
- Simplify programme implementation;
- Ensure useful monitoring of process and evaluation outcomes;
- Seek opportunities for integrated interventions.

Del Rosso's seven step approach to improve school feeding has been used as a guideline in the proposed recommendations.

4.9.7.2 The future of school feeding

School feeding should continue

Two high-level policy decisions need to be made with regard to the format in which school feeding should continue as well as which department should be the primary implementation agency for school feeding. The two questions to be answered are:

- Is school feeding a nutritional programme or social relief programme?
- Should school feeding remain the responsibility of the Department of Health or should it be moved to the Department of Education or Department of Social Development?

If school feeding is implemented as a nutritional programme, the national nutritional criteria should be correctly applied in all nine provinces. Menu compositions, the provision of energy and micronutrients in the menu options and the time of feeding should be strictly adhered to.

If, however, it is decided that school feeding should be a social relief programme, learners, irrespective of their individual needs, could benefit from the programme. The composition of menus, time of feeding and targeting will then play a far less important role. The programme could also be moved to the Department of Education or the Department of Social Development with limited input from the Department of Health.

The evaluators recommend that school feeding in South Africa should be a nutritional programme.

Exit strategy to phase out school feeding

An exit strategy to scale down school feeding in favour of sustainable development projects has been adopted by the national Department of Health. An in-depth evaluation of the continued existence and success of community based development projects to provide household food security should, however, be done before any strategies or policies to phase out school feeding are implemented.

4.9.7.3 Implementation guideline

It is recommended that the policy document be revised, updated and distributed to the provinces. "The role of the national directorate is pivotal in coordinating the INP. They must maintain responsibility for policy formulation, development and implementation of guidelines, national budgeting and overall coordination (KPMG, 2000)." A policy document for school feeding exists at national level. Changes to the policy have been made over the last few years, but the policy document was not updated and distributed to the provinces. It is further recommended that the national Department of Health develops a comprehensive implementation guideline for use in the provinces. The existing policy guidelines should be used as a basis to develop the comprehensive implementation guideline. Provinces should be consulted and their inputs on the implementation guidelines should be obtained.

The following approach is recommended:

- Develop objectives and measurable deliverables;
- Develop criteria for implementation.

The aims of school feeding should be re-visited and the objectives and measurable deliverables developed to support the successful achievement of the aims. The outcome of the high-level policy decision on the future of school feeding will, to a large extent, determine whether the present aims of school feeding in South Africa are still applicable.

Whereas the aims are broad in nature, objectives are more specific. Objectives and deliverables should be developed for each and every aim to provide a way to measure

whether the objectives have been reached. The national objectives should be broken down into provincial objectives and outcomes. The provincial objectives and deliverables should in turn be broken down into regional and/or district objectives and deliverables.

Tools should be developed to measure the deliverables. Implementing agencies, schools as well as officials responsible for monitoring, should receive the necessary training to be able to effectively use these monitoring tools. To measure the objectives and provide information on the deliverables at school level, each school should keep a daily record of the following:

- Number of learners fed;
- Actual days fed;
- School attendance of learners;
- Serving time of the food;
- Quantities prepared and served to the learners;
- When, what, to whom and how many contact hours for nutrition education;
- Stock control.

Criteria for implementing school feeding should be developed. The national nutritional criteria as described in the document "Primary School Nutrition Programme" forms the basis for school feeding. It is recommended that this document be used to develop a comprehensive implementation guideline. The guideline should be clear on the following:

- Menu items that are recommended;
- Menu items that are not recommended;
- Detailed specifications for individual menu items;
- Energy value of menus;
- Micronutrients content of menus;
- Fortification criteria for menu items;
- Standard costing for menus – updated annually;
- Food safety issues;
- Transport and delivery of food items;
- Labelling and packaging;
- Shelf life of food items;
- Storage of food items at schools;
- Food preparation of food items at schools;
- Food serving;
- Stock control at schools.

4.9.7.4 Service level agreements

The national Department of Health should develop service level agreements between Department of Health and:

- Department of Education;
- Environmental Health;
- The finance sections responsible for the processing of school feeding claims.

It is suggested that standardised service level agreements be developed by the national Department of Health for use at both national and provincial level. Agreement on the use of service level agreements should take place on a national level. With a service level agreement, the Department of Health agrees to make funds available for service rendered. The service level agreement should include:

- A budget;
- A work plan / action plan;
- Deliverables;
- Reporting mechanisms;
- Feed back mechanisms.

Education

The Department of Education's active participation is crucial for the successful implementation of school feeding. Currently the Department of Health is implementing school feeding at schools over which it has no jurisdiction. Obtaining shared ownership by means of service level agreements with the Department of Education should be a priority. From a national perspective the following should be addressed:

- Career path development of officials that will be responsible for school feeding;
- Budgets for the officials that should include travelling, telephone and photocopying costs;
- Feeding time to take place before 9:00 (possible by means of a school feeding period of 30 minutes).

Environmental Health

The services to be rendered in terms of the service level agreement should include the routine testing of food items for safety as well as assistance to the Department of Health

with regard to the tender process. The costs pertaining to the testing of food items should be covered in the budget for services rendered in terms of the agreement.

Finance sections

The aim of the service level agreement with the respective finance sections responsible for the processing of school feeding claims should be to ensure that payments to service providers are made within a given time. Each province, in collaboration with the finance section, should develop a claim submission procedure. The submission procedures should be managed monitored. The reasons for the delays should be identified and addressed.

Service level agreement between the national Department of Health and the provincial departments of health should be developed and implemented. Currently provinces are required to submit INP business plans each year to secure Conditional Grants. The INP business plan, in its present format can, however, not be used as a management tool to manage and monitor the successful implementation of school feeding.

It is suggested that a standardised service level agreement be developed that will replace the current format of the business plan. The service level agreement should at least include the following:

- Objectives;
- A budget;
- A work plan / action plan;
- Deliverables;
- Reporting mechanisms;
- Feed back mechanisms;
- Conditions to which provinces should adhere to before funds are transferred to the respective provinces.

The present conditions for the approval of funds should be extended to include compliance with national nutritional criteria.

Service level agreement in the form of a contract between the province and the supplier should be signed and the supplier should be managed accordingly. A service level agreement that will serve as a management tool to ensure that food of an acceptable quality is delivered at schools should be developed and implemented. It is recommended that the document includes at least the following:

- Delivery times;
- Delivery conditions;
- Product specification;
- Food quality and safety;
- Clause on testing and the cost of testing;
- Remedial actions that will be taken if the supplier does not perform according to the contract.

Each province's legal section should approve these contracts.

The supplier has obligations towards the school in terms of the delivery of food items and it should be managed accordingly. At the start of the contract, participating schools should be provided with:

- Delivery schedule;
- Delivery quantities;
- Mixing instructions on all products.

Service level agreement between the province/region/district and the school should be signed and managed. Each participating school should on an annual basis sign a service level agreement with the province/region/district. This agreement could include the following undertakings from the schools:

- Accepting responsibility for implementing the school feeding;
- Accepting responsibility for infrastructure provided;
- Commitment towards putting learners first;
- Commitment to work against any stealing of food items;
- Accepting to keep record of delivery of food items, feeding of the learners, absenteeism of learners and complaints received.

From the province/region/district side they should provide the schools with the following:

- A letter indicating number of learners that should be fed;
- Feeding schedule;
- Menu to be prepared each day;
- Menu quantities to be prepared;
- Stock control schedule;
- Contact person, in case of no delivery or of substandard products delivered;
- Training for volunteer workers;

- Frequency and quantity.

4.9.7.5 Standardisation

To ensure that the learners throughout South Africa are given an equal opportunity to benefit optimally from school feeding and that suppliers in all provinces receive the same economic benefit, it is recommended that school feeding be standardised in all nine provinces.

It is recommended that the following be standardised:

- Coverage;
- Targeting;
- Menu options;
- Different menus costs.

Coverage

The aims of school feeding cannot be achieved if feeding does not take place on a regular basis. It is recommended that learners receive food on a minimum of 156 feeding days per year (about 80% of the maximum number of school days in a school calendar year). The minimum number of feeding days should be implemented in all nine provinces. Taking into consideration the minimum number of feeding days (156 days), each province should develop its own feeding day calendar. The number of feeding days can be increased, providing the provincial budgets are not exceeded.

The following could be considered:

- Feeding every weekday, excluding public holidays;
- All grades should be targeted including the reception grade;
- School holidays should be excluded;
- Feeding should take place during the first week of each term;
- Feeding should take place during examination;
- January and December could be excluded;
- The first day of each school term could be excluded;
- The last week of the school term could be excluded.

Targeting

Individual targeting in a school is not recommended. Geographic targeting followed by school targeting should be applied. This means that all the learners in a specific school, including learners from the Grade R should benefit from school feeding. The height-for-age census, which is widely used in Latin America and Eastern Europe, could be used as a tool to identify needy geographic areas.

The current classification of schools is not very helpful in determining the status of a school. It is recommended that national school classification criteria be developed to assist provinces in identifying those schools where a need for feeding exists.

Recommended menu options

The percentage of RDA for energy should, for practical purposes, be based on the most vulnerable younger age group i.e. the 7–10-year-old age group. It is therefore recommended that the percentage of the RDA for energy for all learners be 25% or 2100kJ.

Table 4.113 provides menu options that meet the 2100kJ criterion. It is recommended that schools should have a choice of menu options and not of individual menu items to be selected from the different menu options.

Table 4.113 Menu options

Option 1	Option 2	Option 3	Option 4
25 g milk powder* 100 g bread** 25 g peanut butter	20 g milk powder* 100 g bread** 25 g peanut butter 10 g jam	10 g milk powder* 100 g fortified biscuit$	15 g milk powder* 100 g maize meal# 6 g sunflower oil

Table 4.113 Menu options (continued)

Option 5	Option 6	Option 7
120 g bread** 30 g peanut butter 20 g jam	150 g cooked rice 70 g dried beans 20 g soya	24 g (200 ml) lactose free nutri drink 100 g bread 25 g peanut butter 10 g jam

*Values for full cream milk powder (vitamin A, vitamin D and iron added)

** Values of enriched bread that is already available on the market, have been used. Bread should be brown bread.

$ Values used of a fortified biscuit already on the market and nationally available

Values of vitamins and minerals based on the proposal of the National Fortification Task Team

Weight for beans, soya and maize meal is raw values

Weight of raw rice to give 150 g cooked = 58 g

Comments on menu options

- The menu options are based on the food items most often eaten in the provinces as established by the NFCS on 1–9-year-old children (Labadarios, 2000). These food items are maize, bread, whole milk, white sugar and white rice;
- It is presently proposed by the National Fortification Task Team of the Department of Health that maize and wheat flour be used as vehicles for food fortification on a mandatory basis in South Africa. Once this has been finalized, the need for further fortification of the food items used in the school feeding should be investigated. Labadarios (2000) also recommended that any fortified product currently used in the PSNP and PEM schemes should be re-evaluated;
- The options are for a nutritious snack rather than a complete meal;
- The options require the minimum preparation and serving time;
- Milk was listed as one of the five most often consumed products by children 1–9 years of age (Labadarios, 2000). Milk is suggested in the options instead of cool drink to provide a liquid. The milk provides more nutrients than a cool drink, but could be more expensive. Although the use of milk as part of the school feeding

programme has been questioned (Kloka, 1998), it is used internationally (Powell *et al.*, 1998) as part of school feeding programmes. Vorster and Venter (1992) also argued in their article on strategies for school feeding programmes that a milk supplement should be considered. Based on the results of the NFCS, the researchers recommended "the inclusion of milk in menus of the Primary School Nutrition Programme and in crèches should be seriously considered and implemented" (Labadarios, 2000);

- Where clean safe water is not available, the equivalent of the milk powder could be given in the form of fresh milk (to be obtained from local community) or ultra high temperature (UHT) milk. Although UHT milk is more expensive, not too many schools should be without clean safe water;
- The lactose-free nutri-drink is already available in different flavours;
- Cool drink was not included. Further research is recommended based on the findings of Wentzel-Viljoen *et al.* (2000) in the North West Province;
- Commercial products such as biscuits are not recommended. Menu option 3, which includes fortified biscuits, should only be used in remote schools where the delivery of bread would not be possible or where no volunteer workers would be able to prepare the food products specified in the menu options;
- The number of menu options provides a variety of menus to choose from;
- A fortified instant maize meal porridge is already available on the market, but could be too expensive to include at all the schools. It could however be used under special circumstances, for example in very remote schools where other products such as fortified biscuits do not fit in with the local eating habits.

Table 4.114 gives the nutritional analysis of the menu options.

Table 4.114 Nutritional analysis of snack options

Energy and nutrients*	Option 1 %RDA	Option 2 %RDA	Option 3 %RDA	Option 4 %RDA	Option 5 %RDA	Option 6 %RDA	Option 7 %RDA
Energy	25.3 (2114kJ)	25.4 (2129kJ)	25 (2091kJ)	25.1 (2104kJ)	25.6 (2144kJ)	24.6 (2057kJ)	24.9 (2091kJ)
Protein	76.7	72.3	42.9	45.9	64.8	65.5	80.0
Calcium	47.6	42.1	12.9	17.9	22.9	12.7	24.4
Iron	36.8	34.8	149	32.1	28.1	49.4	161.1
Magnesium	35.6	33.4	22.7	60.4	28.4	88.4	56.9
Phosphorus	33.5	29	18.1	39.1	12.5	41.6	21.3
Zinc	33.3	31.9	13.3	29.8	30.4	76.9	90.8
Copper	10.7	11.5	0.5	9.5	13.3	66.4	-
Vitamin A	30.4	27.2	67.9	26.2	17.2	0.02	14.3
Thiamine	27.3	26.1	82.3	26.6	25.8	43.5	24.8
Riboflavin	47.9	42.1	78.3	39.2	22.5	13.0	19.1
Niacin	57.4	57.1	50.5	23.8	67.4	18.5	56.3
Vitamin B6	44.3	43.2	59.3	26.8	46.7	32.4	38.9
Folate	68.8	67.1	303.7	71.6	71.8	266.7	59.7
Vitamin B12	32.1	25.7	234.3	19.3	0	2.3	0
Vitamin C	5.0	5.6	90.9	3	3.1	4.7	1.6
Vitamin E	20.6	19.9	81.5	64.5	20.1	7.7	16.8
Vitamin D	25	20	50	15	0	0	0

* Energy and nutrients expressed as a percentage of the Recommended Dietary Allowance

Additional food items that could be considered for inclusion, depending on the availability of funds and facilities at schools, are:

- Sugar;
- Fruit;
- Soup (soya based) in winter;
- Cabbage group vegetables.

The additional food items are based on the results of the NFCS (Labadarios, 2000).

It is further recommended that:

- Suppliers/manufacturers submit, on an annual basis, a standardised laboratory nutritional analysis for approval of their product;
- Random sampling done on school level;
- Testing be done at least once a year for aflatoxin levels in peanut butter;
- Random sampling of bread sizes done at least once a year;
- Information regarding the purification of water should be provided to schools.

Menu cost

The cost of the recommended menu options should be standardised throughout all the provinces to ensure:

- That the correct quantities can be provided;
- The prescribed energy and nutrient as a percentage of the RDA can be provided;
- Suppliers can deliver the required quality of food items.

It is also recommended that:

- A standardised percentage be added to the cost of the different menu options to provide for administrative costs, including transport and helper payment. This standard percentage is recommended at 10%;
- Helper payment be standardised.

The following section provides information on the costing of the menu options.

Standardised costing was done using the following method. The prices for food items were researched to obtain wholesale prices. Two cost structures were used - high cost refers to the price when buying in small quantities and low cost refers to the price when buying in large quantities. The costs of the menu options were calculated with the wholesale price as the standard price. Table 4.115 provides the costs of food items as in January 2001.

Table 4.115 Wholesale prices for menu items

Food item	Quantity	High cost Rand	Low cost Rand
Biscuits	1 kg	4.80	4.80
Bread	0.8 kg	2.40	1.90
Dried Beans	1 kg	4.92	4.40
Lactose-free nutri-drink	1 kg	12.00	11.30
Jam	1 kg	5.00	4.40
Maize	1 kg	1.50	1.00
Milk powder	1 kg	12.19	12.00
Oil	1 litre	5.73	4.30
Peanut Butter	1 kg	5.76	4.85
Rice	1 kg	3.60	2.00
Soya	1 kg	6.20	5.80

* The price of milk powder used was that of real dairy blend - the blend consisted of all products of milk e.g. milk powder, whey powder, butter milk powder etc.

Table 4.116 gives the costing of the different menu options based on the costs given in Table 4.115.

Table 4.116 Costing of Option 1 and Option 2 in Rand

Option 1	Gram	High	Low	Option 2	Gram	High	Low
Bread	0.1	0.30	0.24	Bread	0.1	0.30	0.24
Milk	0.025	0.31	0.30	Jam	0.01	0.05	0.05
Peanut Butter	0.025	0.14	0.12	Milk	0.02	0.24	0.24
				Peanut Butter	0.025	0.15	0.12
Total		0.75	0.66			0.74	0.65

Table 4.116 Costing of Option 3 & Option 4 in Rand (continued)

Option 3	Gram	High	Low	Option 4	Gram	High	Low
Biscuits	0.1	0.48	0.48	Maize Meal	0.1	0.15	0.10
Milk	0.01	0.12	0.12	Milk	0.015	0.18	0.18
				Oil	0.006	0.04	0.03
Total		0.60	0.60			0.37	0.31

Commercial products such as biscuits are not recommended. Menu option 3, which includes fortified biscuits, should only be used in remote schools where the delivery of bread would not be possible or where no volunteer workers would be able to prepare the food products specified in the menu options

Table 4.116 Costing of Option 5 & Option 6 in Rand (continued)

Option 5	Gram	High	Low	Option 6	Gram	High	Low
Bread	0.12	0.36	0.29	Dried Beans	0.07	0.35	0.31
Jam	0.02	0.10	0.09	Rice	0.058	0.21	0.11
Peanut Butter	0.025	0.14	0.12	Soya	0.02	0.12	0.12
Total		0.60	0.50			0.68	0.54

Table 4.116 Costing of Option 7 in Rand (continued)

Option 7	Gram	High	Low
Lactose free nutri drink	0.024	0.29	0.27
Bread	0.10	0.30	0.24
Peanut Butter	0.025	0.14	0.12
Jam	0.010	0.05	0.04
Total		0.78	0.67

Table 4.117 provides a summary of the costing of the menu options.

Table 4.117 Summary of menu costs and energy value

Menu option	Menu costs	kJ	% RDA
1	0.75	2114	25.3
2	0.74	2129	25.4
3	0.60	2091	25.0
4	0.37	2104	25.1
5	0.60	2144	25.6
6	0.68	2057	24.6
7	0.78	2139	25.5

RDA = Recommended Dietary Allowance

In the case where fresh milk will be used, the menus will be more expensive.

4.9.7.6 Simplify Program Implementation

To simplify the implementation of the programme the following recommendations are made:

- Feeding should take place before 09:00;
- The tender system is recommended as it requires less resources to administer and monitor the programme;
- A non-cooked menu or cooked menu may be served as long as it takes place before 09:00;
- In the case were a cooking menu is served at schools, the necessary utensils should be made available.

4.9.7.7 Commission research

Ongoing research is a key issue in measuring progress and ensuring the successful implementation of school feeding. Following this research it is recommended that:

- Research be done on the effect of food items served to learners, especially cool drink, fortified biscuit and fortified porridge and instant maize, on the blood glucose levels of learners;
- Research be done on the provincial allocations for school feeding;
- Ongoing research on the impact of school feeding;

- Research be done on the sustainability of community based development projects;
- Research be done on a standardised school feeding food parcel for learners and the possible exemption of value added tax (VAT);
- Research be done on the cost of providing infrastructure at schools;
    - Building of a room or changing an existing room that can be used as preparation/storage area;
    - In the case were the school serves a cooked menu, install a gas burner(s);
    - Supply the necessary utensils;
- Research be done on the trends in under expenditure of the allocated budgets.

4.9.7.8 Monitoring of processes and evaluation of outcomes

The successful implementation depends on the monitoring of the processes and the evaluation of the deliverables. Standardised monitoring tools and processes should be developed and provinces, schools and suppliers should be evaluated on the same basis.

It is recommended that:

- A standard be developed on the number of visits per school per year;
- A standard be developed on the number of visits one monitor can do per year;
- A standard monitoring system be designed;
- Feedback on a monthly basis be given to provinces and national on monitoring;
- Corrective action be taken in the event where school feeding is not taking place according to national and provincial guidelines;
- Standards be developed to evaluate the performances of suppliers, schools and provinces.

KPMG (2000) indicated that the lack of resources to plan, implement, manage and measure the initiates was one of the key weaknesses of the INP. It is therefore recommended that consideration be given to the outsourcing of the monitoring aspects of school feeding. The evaluation of the outcomes and the impact of school feeding on the learner should be included in the tender for monitoring.

4.9.7.9 Develop a framework for a primary school data base for school feeding

During the research project, it became clear that there was a lack of sufficient information with regard to the:

- Exact location of the schools;
- Correct contact numbers;
- Profiles on participating schools (availability of safe water, storage facilities, whether feeding was taking place, etc.).

It is recommended that a national primary school database be developed for school feeding. The database should be updated on a provincial level at least once a year. The following should be included in the database:

- Name of the school;
- Physical address of the school;
- Postal address of the school;
- Location of and directions to the school;
- Targeted number, budget, and expenditure per annum;
- Region and or district;
- Name of supplier;
- Name of principal of the school;
- Contact number of the principal and/or the school;
- School profile;
    - Availability of safe water;
    - Toilet facilities at the school;
    - Number of classrooms at the school;
    - Existence of a vegetable garden at the school;
    - Distance to nearest shops from the school;
    - Type of road and condition of road to the school;
    - Availability of storage facilities at the school;
- Availability of monitoring data;
- Progress reports (records kept at school level).

The database should serve as a source to determine the number of schools as well as the number of learners that benefit from school feeding on an annual basis.

4.9.7.10 Develop national information, educational and communication campaign

It is recommended that standardised communication strategies be developed for the following target groups:

- General community, including parents and learners;
- Suppliers;
- Schools (beneficiaries).

The following aspects could be included in the communication to the general community:

- The purpose of school feeding;
- The aims of school feeding;
- The role and responsibilities of parents;
- The role and responsibilities of learners;
- Community involvement at schools;
- Lunch box campaigns;

Suggested aspects to be included in the communication to suppliers:

- The purpose of school feeding;
- The aims of school feeding;
- The role and responsibilities of the supplier;
- Menus including specifications;
- Procurement and delivery conditions;
- Claims procedure;
- Complaints procedure;
- Contracts;
- Feeding days;
- Information on schools, contact persons, etc.

Suggested aspects to be included in the communication to schools:

- The purpose of school feeding;
- The aims of school feeding;
- The role and responsibilities of the school;
- The role and responsibilities of the province;
- The role and responsibilities of the national Department of Health;
- The role and responsibilities of the supplier;
- The role and responsibilities of voluntary workers;

- The role and responsibilities of School Governing Bodies;
- Implementation issues;
- Menu, feeding days, feeding times, monthly quantities, preparation quantities, hygiene, storage, stock control, delivery control;
- Complaints procedure;
- Nutritional education; theme for the year, number of contact hours for the year;
- Information on linking-up with agriculture and commercial farms.

4.9.7.11 Funds Allocation

Expenditure data shows a trend of under-expenditure of funds intended for school feeding. Of the 2.9 billion that was made available from 1994/95 to 1999/2000, only R1.9 billion was expended. A total amount of R 964 372 727 has not been utilised over this period.

It is recommended that the total amount of the INP/PSNP Conditional Grant apportioned for school feeding be utilised as follows:

Food procurement	80%
Programme development	20%

Reason for suggested allocation

From 1995/96 to 1999/2000 only 75% of the allocated amount for school feeding was used. In 1999/2000 the percentage increased to 78%. It is therefore recommended that the total conditional grant be split – 80% for food procurement and 20% for development.

Food procurement

The funds for food procurement should be distributed to the provinces. Until research has been done on the criteria for the distribution of funds, the current methodology for distribution should be used. It is, however, recommended that the latest census figures available (1996), poverty gap data (1996) and anthropometric indicators (Labadarios, 2000) be used.

It is further recommended that the provinces that utilise their funds optimally should be awarded and the provinces that do not utilise their funds, should have to explain their deviation form the plan, and appropriate action should be taken against them.

Developmental funds

It is recommended that the 20% of the amount apportioned for school feeding be kept at national Department of Health and be utilised for programme development that could include the following:

- Develop service level agreements;
- Develop national criteria for implementation;
- Develop food testing programme for food safety;
- Develop information, education and communication campaigns;
- Develop training material;
- Provide infrastructure at schools;
- Commission research;
- Support for the education budget;
- Support for the environmental health budget.

Once the necessary infrastructures have been developed and are in place, the percentage can be reduced and more funds made available to the provinces. The additional funds could then be used to:

- Increase food procurement (feeding days, menu costs or number of learners);
- Budget for the Department of Education;
- Budget for Environmental Health.

It is, however, recommended that the national Department of Health keep at least a minimum of 1% of the amount set aside for programme development and for ongoing research projects including that on the evaluation of the programme.

4.9.8 Critical appraisal of some aspects of the evaluation of the national PSNP

The aspects discussed in Chapter 3 are also applicable to this evaluation. These aspects included the timing and time-frame of the evaluation, lack of a conceptual framework, lack of clear goals and objectives, multi-level and multi-site evaluation.

CHAPTER 5

5 SUGGESTED FRAMEWORK FOR THE MONITORING AND EVALUATION OF NUTRITION AND NUTRITION–RELATED PROGRAMMES IN SOUTH AFRICA

5.1 Introduction

The framework was developed based on the theory of and different approaches to evaluation research in social sciences as well as the applications of monitoring and evaluation in public health programmes. The experience gained with the evaluation of the PSNP in the North West Province and on National level was also incorporated.

An evaluation must match the objectives of the programme being evaluated. Without a conceptual framework or programme model, evaluation becomes even more difficult. The framework defines what is to be evaluated and what independent and dependent variables or indicators are to be measured.

Any evaluation undertaken should meet recognised ethical standards. It should be conducted with regard for the rights and interests of those involved and affected (Anon, 1999).

In this chapter the suggested framework for the process of evaluation of nutrition and nutrition-related programmes in South Africa will be discussed. The aim is also that this framework could serve as a practical guideline for future evaluations.

5.2 Suggested framework

As for social intervention programmes, nutrition intervention programmes differ depending on the scope of the intervention (degree of coverage), complexity (levels of delivery), domain of application (mulit-site or single site), and time frame (short-term and long-term interventions) (Babbie & Mouton, 2001). These authors identified certain core dimensions

or features that characterize all interventions and which are also applicable to nutrition intervention programmes, namely:

- Clearly defined goals and objectives;
- The target group (intended beneficiaries);
- Programme components (the means to achieve the goals);
- The management and implementation system (programme infrastructure);
- The human resource base (who drives the programme);
- The stakeholders who have a direct or indirect interest in the programme;
- The context (or setting) of the programme.

The conceptual framework is based on programme theory that guides an evaluation by identifying key programme elements and articulating how these elements are expected to relate to each other. A conceptual framework is necessary to bring all the different components of evaluation together in a meaningful way.

Table 5.1 gives the outline of the suggested framework for the evaluation of nutrition and nutrition-related programmes in South Africa.

In the framework the different types of evaluation are linked to the development stages of the programme in an effort to provide a complete overview of the total process. In this chapter, however, only the issues pertaining directly to evaluation will be discussed.

Parts of this framework (as will be indicated in the subsequent discussion) resemble published frameworks as discussed in Chapter 2. However, it is unique and new because of the linkage between different evaluation actions and the programme development steps.

Table 5.1 Framework for the evaluation of nutrition and nutrition-related programmes

	Stage of the programme							
Description	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**
	Initiation of the programme	**Planning of the programme**	**Programme inputs**	**Programme outputs**	**Primary programme outcomes**	**Secondary programme outcomes**	**Impact**	**Broader long-term benefits**
						Programme impact		
What happens with the programme	Identification of the programme: * Political decision * Evidence-based research decision	Development of the programme: * Conceptualisation *Logic model (cause-effect) including impact * Goals and objectives * Study design * Methodology *Target group * Coverage * Deliverables * Logistics * Resources *Pilot study, etc.	The delivery of goods and services to the target group as planned	Target group receive goods and services as planned	Direct effect of delivery of goods and services on the target group as planned	Secondary effect of goods and services delivered on the target group	Impacts of the goods and services delivered to the target group and generally reflect the primary objective of the programme	
Evaluation type	Need evaluation and programme theory evaluation #		Implementation or process evaluation (Also named Monitoring) #		Outcome / impact evaluation #	Impact evaluation Efficiency evaluation #		Long-term impact evaluation #
What happens with the evaluation	A systematic approach of evaluation of the following: * Need for the programme * Basis for problem identification * Conceptual framework * Goals and objectives * Target population identification * Intended/planned coverage * Deliverables * Logistics, etc. * Feedback to the programme managers		A systematic approach to answer the following questions (only examples): * Is the programme implemented as planned * Are the right goods and services delivered * Are the goods and services delivered to the correct target group * Coverage Should be part of the programme management * Regular monitoring is essential * Feedback to the programme managers		Measures changes in behaviours and/or practices Links provision of goods and services to outcome	Impact evaluation: Measures whether interventions (goods and services delivered) actually produced the intended effects Efficiency evaluation (cost-benefit and cost-effectiveness): Provides a frame of reference for relating costs to programme results and is a means of judging the efficiency of the programme		Sustained effects resulting from the achievements of impacts, usually in combination with other factors. Might only be seen many years later

Steps (key elements) that should be included for the evaluation of each phase of the programme:

1. Identify and engage the stakeholders
2. Focus on the evaluation question
3. Develop the evaluation framework, indicators and measuring instruments
4. Gather high quality data and information
5. Justify the conclusion
6. Use and implement the evaluation

5.3 Deciding on the evaluation as part of the intervention programme

It should be one of the first tasks of the programme manager (the person responsible for the development of the nutrition or nutrition-related programme) to decide whether evaluation of the programme will be part of the programme or not.

Once it has been decided that evaluation of the programme will be included as part of the programme, it is of the utmost importance to involve the evaluator from the very beginning of the project. The evaluator should be part of early discussions regarding the need of the programme, implementation, intended outcomes and impact of the programme.

A partnership should be established between the programme manager and the evaluator.

The evaluation of an intervention programme, both implementation and impact evaluation, should no longer be questioned. The amount of funds spent on an intervention programme justifies and necessitates the evaluation of the programme.

The majority of evaluation researchers agree that the evaluator or evaluation team should become part of the programme development at a very early stage (Habicht *et al.*, 1999; Levinson *et al.*, 1999b; Guzman & Feria, 2002).

Guzman and Feria (2002) discussed the negotiation process of programme evaluation. They stated: "... we believe that having the evaluation team participating in programming creates evaluation plans that are highly congruent with both short- and long-term goals of the interventions that we conduct". One of the main advantages of incorporating the evaluation early on in the project is that a valid baseline survey can be conducted and control groups established (Levinson *et al.*, 1999a).

5.4 Deciding on the evaluator or evaluation team

Careful consideration should be given to deciding on the appropriate evaluator or evaluation team. The person or persons should not only have evaluation knowledge, skills and experience, but also an understanding of nutrition, the community where the programme will be implemented and the culture of the population to receive goods and/or

services from the programme. The evaluator could be an internal or external evaluator or a mix of the two for different parts of the evaluation.

An evaluation team should be established comprising of at least the evaluator, the manager of the programme, a statistician and epidemiologist, the end-users of the evaluation results and representatives of the participating community. Other appropriate persons should also be considered for the evaluation team.

Brazil (1999) suggested that the evaluator's role should be embedded in the organisation's decision-making process to be effective. The evaluator should be at a senior level and also assume an advocacy role in implementing changes that are decided on as the result of an evaluation.

5.5 Deciding on the purpose of the evaluation

The programme manager with the evaluation team should establish the purpose and focus of the evaluation. The purpose of the evaluation could be judgement-orientated, improvement-orientated or knowledge-orientated (Patton, 1997). A decision should be reached regarding the extent of the evaluation, for example: will the evaluation focuses on the implementation of the programme (monitoring), and/or the evaluation of the outcomes of the programme, and/or the impact of the programme and/or the efficiency of the programme? Based on these answers the appropriate evaluation framework can then be developed.

5.6 Resources for the evaluation

Once it has been decided to do an evaluation of the programme the resources to do it should be considered. Evaluation of a programme is expensive and it gets more expensive depending on a number of factors, including the following:

- External or internal evaluator;
- Extent of the evaluation or the evaluation questions to be answered;
- Monitoring of the implementation;
- Multi-sectorial evaluation;
- Multi-level evaluation;
- Multi-site evaluation.

The costs of the evaluation should be included as part of the total budget of the programme. Lack of adequate funding has been a persistent obstacle to the growth of evaluation practice. Programme staff were then tasked to do the evaluation and often lack the skills to design and implement evaluation plans resulting in superficial data or *post-hoc* designs, instead of evaluation plans that are an integral component of programme development (Brazil, 1999).

Levinson *et al.* (1999b) suggested that monitoring and evaluation costs should total 3%–5% of total project costs. If the costs are much higher, less expensive evaluation options should be considered.

5.7 Type of evaluation to be conducted

5.7.1 Introduction

A decision should be taken on what type of evaluation is required for the programme. Babbie and Mouton (2001) stated that an evaluation that covers the objectives of all four types of evaluation, namely evaluation of need, the evaluation of programme (monitoring), the evaluation of outcome or impact evaluation and the evaluation of efficiency, is a "comprehensive evaluation". For a comprehensive evaluation it is necessary to assess the need for the programme, programme conceptualisation and design, programme coverage and delivery, intended as well as unintended impacts and programme cost-effectiveness.

The ideal is to conduct a comprehensive evaluation of the nutrition or nutrition-related programme.

A very brief discussion of each type of evaluation will subsequently follow. In Chapter 2 each type of evaluation was discussed in detail with applications of use in the field of health.

5.7.2 Need evaluation

Evaluation of need should be a systematic approach to identifying a problem, determining the extent of the problem, and accurately defining the target population to be served and the nature of the services needed. Needs assessments may also be used to determine

whether there is a need for a new programme and to compare or prioritise needs within and across programme areas (Rossi *et al.*, 1999).

This is an important tool in the planning process when the principal concern is whether or not a health problem should become a concern of the community or organisation (Brazil, 1999).

5.7.3 Implementation or process evaluation

Implementation evaluation or monitoring is such an important part of the evaluation of nutrition and nutrition-related intervention programmes that it justifies a more detailed discussion as part of this chapter. Implementation evaluation is of crucial importance to be able to explain programme outcomes. When outcomes are evaluated without knowledge on implementation, the results seldom provide a direction or action because the decision maker lacks information on what produced the observed outcomes (or lack of outcomes). Pure pre-post outcomes evaluation is a "black-box" approach to evaluation and gives no insights into reasons why a programme reached the intended outcomes or not.

Monitoring refers to the periodic and routine collection of information throughout the life of the programme to determine whether the programme delivery is proceeding as planned. It answers the question: "Does the actual implementation coincide with the implementation plan of the programme?" It also provides essential information to understand and explain the results and outcomes of the programme evaluation. When planning the monitoring system of a programme the following steps should be considered:

- Develop a user-friendly simplistic monitoring system;
- Include a system for the feedback of the information gathered;
- Develop a system for acting on information gathered to improve the delivery of the goods and/or services of the programme;
- Analyse the information received;
- Develop a system for improvement of and changes to the programme based on the information analysed.

The questions that should be answered with the monitoring include the following:

- Do the goods and/or services to be delivered meet the criteria as planned?
  For example: The general conclusion of the North West evaluation was that the delivery of food to the schools did not meet the criteria as planned. The evaluators reported that food disappeared between the manufacturer and the school (Wentzel-Viljoen *et al,* 2000)

- Are programme goods and/or services delivered on time?
  For example: In the North West evaluation 57.3% of the schools reported non-delivery of food, 71.5% reported irregular delivery of food and 59.9% reported late delivery of food (Wentzel-Viljoen *et al,* 2000)

- Are programme goods and/or services delivered to the intended target group?
  For example: It was observed that food intended for learners as part of the PSNP in the North West was for sale at taxi ranks. In the same study, more than fifty percent of the learners reported that they took food home to share with younger children at home. Nearly fifty percent of the learners also indicated that they have seen an educator eating some of the food and nearly a quarter reported that they have seen an educator taking food away from school (Wentzel-Viljoen *et al,* 2000)

- Are programme goods and/or services delivered in the intended manner?
  For example: Nearly a quarter of the schools that participated in the North West evaluation reported that they received food after the expiry date on the food. (Wentzel-Viljoen *et al,* 2000)

- Are programme goods and/or services delivered acceptable to the community?
  For example: The parents of learners, who received food as part of the PSNP, suggested that fresh fruit/vegetables be included on the menu (Wentzel-Viljoen *et al,* 2000)

- Is the coverage of intended programme participants good?
  For example: In the North West evaluation it was reported that the average number of feeding days (125) represented 65.8% of the possible 190 feeding days (Wentzel-Viljoen *et al,* 2000)

- Is community participation proceeding on schedule as planned?
  For example: Community involvement is an important aspect of the PSNP. In the North West evaluation only 30% of the parents interviewed indicated that they were involved with the PSNP while more than half of them indicated that they would like to become involved with the feedind scheme (Wentzel-Viljoen *et al,* 2000)

5.7.4 Impact or outcome evaluation

Impact evaluation, also called impact assessment or an outcome evaluation, gauges the extent to which a programme produced the intended improvements in the social conditions it addressed. Impact evaluation has the basic aim of producing an estimate of the net effects of an intervention – that is, an estimate of the impact of the intervention uncontaminated by the influence of the other processes and events that also affect the conditions the programme attempts to change. Impact evaluation is most appropriate for mature, stable programmes with a well-structured and well-documented programme model (Rossi *et al.*, 1999). The design of the evaluation is very important. Impact evaluation requires at least a quasi-experimental design. Intended and unintended impact should be evaluated.

5.7.5 Efficiency evaluation

Efficiency evaluation, including cost-benefit and cost-effectiveness analyses, provides a frame of reference for relating costs to programme results. In cost-benefit analyses, the outcomes of programmes are expressed in monetary terms, and in cost-effectiveness analyses, outcomes are expressed in substantive terms (Rossi *et al.*, 1999). Cost-benefit analysis is a method for determining whether or not a programme is "worth it" (Barry & DeFriese, 1990). The monetary costs of a programme are compared with the expected benefits, also expressed in monetary terms. Cost-benefit analysis is useful if the costs and benefits can be expressed in monetary terms. For example, if such information is available for two programmes, a comparison may be made through the use of the benefit/cost ratio to decide which one of the programmes are "better". The more tangible the programme benefits, the easier it is to translate them into monetary terms. But it is impossible to decide on the monetary value of a life saved by a programme. It is therefore not always possible to calculate the cost-benefit of a programme.

Very few cost-benefit analysis studies in the field of health have been done and in nutrition-related intervention studies even less.

5.8 Discussion of the key elements of the framework

These elements should be considered for each step of the evaluation to ensure that an appropriate evaluation of high quality is done.

5.8.1 Identify and engage the stakeholders

The evaluation team should know who all the stakeholders are. This is only possible if the evaluator is part of the programme development from the initiation of the programme. The building of a trusted relationship between the evaluation team and all the stakeholders is of the utmost importance to prevent misunderstanding and mutual respect. Role clarification of stakeholders assists in preventing role confusion and the duplication of efforts that can typically disrupt collaborative efforts. The specific needs of the stakeholders should be valued by the evaluation team and included in the development of the evaluation. The environment (community) must be researched to ensure a comprehensive understanding of the people and the culture of the community.

Different stakeholders might have varying levels of involvement depending on their own interest and involvement in the programme, perspectives, skills and concerns.

Wong *et al.* (2002), for example, involved communities per se in the planning and conducting of research in their conceptual model for a culturally responsive community-based diabetes prevention programme. Such involvement ensured that cultural beliefs, practices and concerns of black communities were incorporated in all stages of the programme intervention. In their evaluation of the implementation of an integrated nutrition programme on the nutritional status, morbidity, and diet of and care for children 5 to 25 months of age at baseline in rural Viet Nam, Marsh *et al.* (2002) trained community members to collect data.

Many evaluators stressed the importance of engaging the stakeholders in developing the evaluation plan as well as the execution of the evaluation (Anon, 1999; Brazil, 1999; Fetterman, 1997; Patton, 1987; 1997; 2001; Gregory, 2000). The more involved the

stakeholders and end-users become with the evaluation, the more targeted the evaluation will be and the more likely that the recommendations will be used in the decision-making process regarding the programme.

5.8.2 Focus on the evaluation design

Once the evaluation question has been clarified and the stakeholders identified, the evaluation design can be decided on.

Statistical and epidemiological advice should be sought on the design of the evaluation process. The designs that could be considered include: an experimental design (pretest-post test control group, post test-only control group); a non-experimental design (post test-only, pretest-post test, static-group comparison) or a quasi-experimental design (time series design, non-equivalent group, separate sample pretest-post test) (Levinson *et al.*, 1999b; Omwega, 1999).

The advantages and disadvantages of each of the designs should be considered to establish which one would best answer the evaluation question and be practical to execute.

Levinson *et al.* (1999a) suggested that following an initial baseline survey, one or two midterm evaluations should be done in the mid to late stages of a project. An endpoint evaluation should be done upon project completion or at the end of a funding cycle. An efficient ongoing monitoring system should be in place from the start of the project.

5.8.3 Development of the evaluation specific framework, indicators and measuring instruments

5.8.3.1 Evaluation specific framework

This framework should be developed with the specific evaluation question to be answered as well as the evaluation design in mind. Ahmad(1995) also indicated that a model or framework should be developed for each programme.

Based on the literature studied and the experience gained by the two evaluation studies conducted on the PSNP it is suggested that the *theory-based evaluation* approach is followed for the evaluation of nutrition and nutrition-related programmes. Weiss (1972; 1988; 1997) described theory-based evaluation as follows: "TBE aims to surface the theoretical underpinnings of the programme in advance and use the theories to help structure the evaluation. It aims to describe the actual mechanisms that are related to good outcomes". The evaluation is expected to collect data to see how well each step of the sequence in facts come out. Other researchers also suggested the use of a theory based evaluation approach (Chen & Rossi, 1980; Caracelli & Green, 1997; Reynolds, 1998; Wimbush & Watson, 2000; Bickman, 2001; Donaldson & Gooler, 2002;).

The use of a *theory-based evaluation* approach for the evaluation of the PSNP in the North West Province was illustrated in Chapter 3. The framework described the project inputs, project outputs, primary outcomes, secondary outcomes, key outcomes and impact. It was shown by the evaluators that this approach is suitable for the evaluation of nutrition programmes. The theory-based evaluation approach was not originally used in the national evaluation of the PSNP because the evaluation called only for certain aspects of the PSNP (as per tender). But, as illustrated in Chapter 4, a theory-based evaluation framework could be developed.

The conceptual framework of the evaluation should include at least the following four principal components, namely: inputs, outputs, outcomes and impacts as indicated in Table 5.1. The outcomes could be divided in primary and secondary outcomes. Figure 5.1 illustrates the different components.

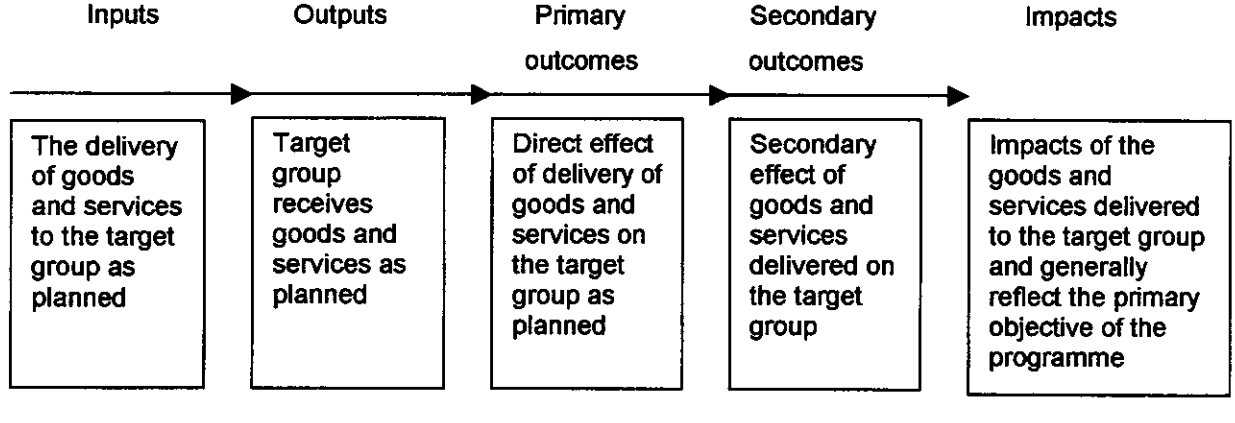


Figure 5.1 Evaluation specific framework

This framework offers the development of logical links or connections between the input activities, outputs, outcomes and impacts. The long-term benefits, that is the effects resulting from the achievements of impacts, usually in combination with other factors, could also be added to the framework. The framework can be defined generally as a flow chart that displays a sequence of logical steps in programme implementation and the achievement of desired outcomes. It is unique in communicating the relationship of programme resources and operations to outcomes in a simple picture. The evaluator can use the framework to initiate dialogue with the programme manager and stakeholders to clarify the programme's processes and goals. Once the assumptions underlying the programme seem logical, the evaluation can be further developed and refined.

Other factors that could have an effect on the evaluation should also be included in the framework, for example: is the evaluation done at more than one level (multi-level) or at more than one site (multi-site). Multi-level and multi-site evaluations add another dimension to the practical execution of the evaluation and can become a logistical nightmare if not planned with insight.

5.8.3.2 Instruments

Once the evaluation specific framework has been developed and accepted by all involved in the evaluation, appropriate indicators should be identified. The indicators define the programme attributes that pertain to the focus and questions of the evaluation. Indicators address criteria that will be used to judge the programme, therefore indicators reflect aspects of the programme that are meaningful to measure programme activities (monitoring) and programme effects (outcomes and impact) and efficiency of the programme (cost-effectiveness and cost-benefits). The conceptual framework, developed specifically for the programme, could be used to define a spectrum of indicators leading from programme activities to expected effects. Relating indicators to the conceptual framework allows the detection of small changes in performance faster than if a single outcome were the only measure used. This approach results in a set of broad-based measures that reveal how outcomes are the consequence of intermediate effects of the programme (Anon, 1999).

5.8.3.3.. Measuring methods

When the indicators have been identified and agreed upon, the methods to measure each indicator must be developed. The development of suitable and appropriate measuring methods is a vital component of the evaluation process. Multiple sources of evidence should be used, for example persons, documents, observations, etc. to provide an opportunity to include different perspectives regarding the programme and thus enhances the credibility of the evaluation.

Although all types of data have limitations, the overall credibility can be improved by using multiple methods and procedures for collecting, analysing and interpreting data. The use of triangulation offers the evaluator a method to solve the problem of rival explanations using a three-way comparison. Triangulation is an ideal method for evaluation research, but it can be very expensive (Patton, 1999).

It is recommended that both qualitative and quantitative methods are used to optimize the strength of the data. Qualitative methods (perceptions, behaviour, etc.) and quantitative methods (height, weight, dietary intake, biochemical indicators, etc.) are suitable for the evaluation of nutrition and nutrition-related intervention programmes.

Mark *et al.* (1999) reviewed the possibility of an integrative framework for evaluation practice. He remarked that the "last two decades, much of the energy and intellectual capital in the field of evaluation has been spent in skirmishers and peace talks between advocates of qualitative and quantitative paradigms. The paradigm war has been the subject of numerous plenary sessions, presidential addresses, papers, chapters, volumes, and hallway conversations. Sometimes the combatants in this war have argued that there can be no accommodation between the sides". They noted that Lincoln said in 1990: "Accommodation between the paradigms is not possible. The rules for action, for process, for discourse, for what is considered knowledge and truth, are so vastly different, that although procedurally we may appear to be undertaking the same search, in fact, we lead to vastly diverse, disparate, distinctive, and totally antithetical ends". Fortunately, Mark *et al.* (1999) did also mention that other evaluators called for integration across the two paradigms.

An integrative framework for a multi-method evaluation, as suggested in the conceptual framework, offers two ways of looking at the data. Firstly, evidence from different data sources are organised by programme element rather than by source or method.

Secondly, it integrates data collection and analysis by defining each programme element in relation to its antecedents and consequences (Cooksy *et al.*, 2001).

Suitable indicators and applicable measurement methods can only be identified and developed if the aims and objectives of the programme are clearly stated in measurable terms.

See also Figure 3.2 and Table 3.1 for an example of the conceptual framework with indicators and method of measurement.

5.8.4 Gather high quality data and information

Data and information should be gathered in such a way that the quality and credibility of the results cannot be questioned. Quality refers to the appropriateness and integrity of information used in the evaluation. High-quality data are reliable, valid and informative for their intended users (Anon, 1999). The stakeholders should perceive the evidence as believable and relevant for answering their questions. This will be true if enough attention was given to detail when developing the measuring instruments used for gathering the data.

To ensure that the data are credible, reliable and valid the following should be addressed:

- Develop the measuring instruments with care and use persons with expertise, for example for developing questionnaires;
- Test and pilot all the measuring instruments;
- Standardise the field workers in using the measuring instruments, both qualitative and quantitative;
- Use only standardised measuring equipment, for example scales to measure weight;
- Have a monitoring system in place to control the actual field work and collection of data;
- Encourage participation by the stakeholders to improve later acceptance of results;
- Develop a suitable and appropriate coding system;
- Ensure proper data management (capturing of data, cleaning of data, etc.).

The Evaluation Working Group of the CDC (Anon, 1999) recommended that "... the intent of a practical evaluation is to strive for a level of quality that meets the stakeholders' threshold for credibility".

Detailed attention must be given to the logistical planning of the fieldwork. The procedures for gathering evidence in evaluation must be aligned with the cultural conditions in each setting of the programme and scrutinized to ensure that the privacy and confidentiality of the information and sources are protected (Anon, 1999).

5.8.5 Justify the conclusions

The evaluation conclusions are justified when they are linked to the evidence gathered and judged against agreed-upon values or standards set by the stakeholders. Stakeholders must agree that conclusions are justified before they will use the evaluation results with confidence. Justifying conclusions on the basis of evidence includes standards, analysis and synthesis, interpretation, judgment and recommendations (Anon, 1999).

Standards reflect the values held by the stakeholders. Using explicit standards distinguishes evaluation form other approaches to strategic management in which priorities are set without reference to explicit values (Anon, 1999).

Analysis and synthesis of the findings of the evaluation might detect patterns in evidence, either by isolating important findings (analysis) or by combining sources of information to reach a larger understanding (synthesis) (Anon, 1999).

Interpretation is the effort of figuring out what the findings mean and is part of the overall effort in understanding the evidence gathered in an evaluation (Anon, 1999).

Judgments are statements concerning the merit, worth, or significance of the programme and are formed by comparing the findings and interpretations regarding the programme against one or more selected standards (Anon, 1999).

Recommendations are actions for consideration resulting from the evaluation. Forming recommendations is a distinct element of programme evaluation that requires information beyond what is necessary to form judgments regarding programme performance. It is

acknowledged that an evaluation can be strengthened by recommendations that anticipate the political sensitivities of intended users (Anon, 1999).

Analysis, synthesis and interpretation of the data and information should always be done in collaboration with a statistical expert.

5.8.6 Use and implement the evaluation

The report on the evaluation should meet the expectations of the stakeholders. Lessons learned in the course of an evaluation do not automatically translate into informed decision-making and appropriate action. Deliberate effort is needed to ensure that the evaluation processes and findings are used and disseminated appropriately (Anon, 1999; Brazil, 1999). The Evaluation Working Group (Anon, 1999) identified five elements that are critical for ensuring the use of an evaluation, namely design, preparation, feedback, follow-up, and dissemination. Each of these elements will be discussed briefly.

5.8.6.1 Design

In the design of the evaluation, as already discussed, the intended uses by primary users should be acknowledged. This justifies the involvement of all the stakeholders in the evaluation process from the very beginning.

5.8.6.2 Preparation

Preparation refers to the steps taken to rehearse eventual use of the evaluation findings. The stakeholders must have the ability to translate new knowledge into appropriate action. Rehearsing how potential findings might affect decision-making will prepare the stakeholders for eventually using the evidence.

5.8.6.3 Feedback

Continuous giving and receiving feedback creates an atmosphere of trust among stakeholders. It helps to keep an evaluation on track by letting those involved stay

informed regarding how the evaluation is proceeding. Stakeholder feedback is an integral part of evaluation, particularly for ensuring use. Feedback can be given in various forms, for example regular meetings to discuss progress and share interim findings and draft reports.

5.8.6.4 Follow-up

Follow-up refers to the technical and emotional support that users need during the evaluation and after they have received the evaluation findings. Follow-up is important for various reasons, for example to remind intended users of their planned use of the findings and to prevent lessons learned from becoming lost or ignored in the process of making complex or politically sensitive decisions. To prevent this, someone in the evaluation team should serve as an advocate findings of the evaluation during the decision-making phase. This person should also have the responsibility of preventing the misuse of evaluation findings. Evaluation results are always bound by the context in which the evaluation was conducted and should be used in such a context only.

5.8.6.5 Dissemination

Dissemination is the process of communicating either the procedures or the lessons learned from an evaluation to relevant audiences in a timely, unbiased, and consistent fashion. The goal of dissemination is to achieve full disclosure and impartial reporting.

5.9 Conclusions

The suggested framework could be used as the basis for the development of an evaluation plan. In dietary intake studies, the question to be answered guides the methodology to be used. The same applies to evaluation. For each programme to be evaluated the evaluation plan should be tailor-made.

Ahmad (1995) said that the evaluation methods and techniques suited to the intervention of a single programme could differ considerably, leading to diversified methodologies and sometimes seemingly contradictory results. For the Texas nutrition education and training programme a model was developed to meet the specific needs of the programme. The

structure of the model was applicable to varied programme interventions and used throughout the evaluation process to select variables to be measured and to conduct systematic evaluation activities in spite of the diversity of programme interventions.

In their study on the evaluation of CBP, Telfair and Leviton (1999) interviewed CBP leaders who have worked in CB settings for at least two decades. The leaders were asked: "Is there an ideal evaluation model or approach for CB health programmes?" The leaders responded as follows: "When a programme is germinated in a community, the funders should include an evaluator in their initial plans. If the evaluators are brought in after the project was begun, they seem like an alien part of the process. It needs to be clear whom the evaluators work for and to whom they feel accountable. It should be the community first". Many of those interviewed were less interested in any particular evaluation model and more interested in the substantial questions that relate to the evaluator's approach. This underscores the feeling that "no one model is perfectly applicable to evaluation".

5.10 Recommendations

Monitoring and evaluation should form an integral part of any nutrition- and nutrition-related intervention programme.

Although it is recognised that monitoring and evaluation is an essential component of good programme design, unfortunately few programmes make provision for adequate monitoring and evaluation (Ismail *et al.*, 2002).

The following statement of the Evaluation working group of the CDC (Anon, 1999) is supported. The Group stated that the time has come that public health professionals can no longer question whether to evaluate their programmes; instead, the appropriate questions are:

- What is the best way to evaluate?
- What is being learned from the evaluation?
- How will lessons learnt from the evaluations be used to make public health efforts more effective and accountable?

It is the responsibility of each programme manager to include, not only the principle of evaluation of the programme from the very beginning, but also the evaluator per se to ensure the most appropriate evaluation possible.

South Africa has serious malnutrition and HIV/AIDS problems that are addressed by multi-sectorial, mutli-level and multi-site intervention programmes. Evaluation of these programmes should be included as part of the development of these programmes. Billions of Rands are spend on these programmes and the funders, whether it is the South African government or other agencies should demand responsibility and accountability from the programme developers and implementers through appropriate evaluations.

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