BELIEFS AND PRACTICES RELATED TO LABEL READING AND ITS IMPLICATIONS FOR FUNCTIONAL FOODS IN SOUTH AFRICA.

Jane Melissa Badham
B.Sc. Dietetics, RD(SA)

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SUPERVISOR: Prof. J.C. Jerling
CO-SUPERVISOR: Dr. H. van 't Riet

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To my God, who has richly blessed me with the opportunity to further my studies and given me the strength and energy that it required...

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SUMMARY

Motivation

There is international agreement and recognition that the health status of the worlds' population is a cause for concern and that one of the key risk factors for many of the diseases that are increasing at an alarming rate (heart disease, diabetes, cancer) in both developed and developing countries, is diet. Despite many successes (especially in the areas of the eradication and containment of infectious disease and reduced fertility) and the huge advances in scientific research and technology, that have increased both what is known, and what can be done, for prevention and risk management, we still face what many describe as a crisis. Knowledge it seems is not always adequately reflected in public health practice.

The objective of the local (Department of Health, Directorate of Food Control) and international (WHO, Codex Alimentarius) drive towards increased and improved food labelling, is that if consumers have reliable nutrition information available at the point of purchase and if they understand how their diet affects their risk of diseases, they will be able to make risk-reducing food choices. This could ultimately have a significant positive public health impact.

The food industry has also expressed an interest through the concept of functional foods (food similar in appearance to conventional food that is intended to be consumed as part of a normal diet, but has been modified to subserve physiological roles beyond the provision of simple nutrient requirements), that albeit in reality financially motivated, could provide

consumers with the opportunity to reduce their risks of some diseases through readily available, good-tasting diets rather than through the use of curative measures only.

For the success of both these initiatives in public health terms, consumers must:

- accept the link between the food that they eat and their health
- actively look for and trust the messages communicated
- be able to correctly process and integrate the information
- make a purchasing decision.

This highlights the importance of in-depth consumer understanding in order to ensure that regulatory, educational and marketing strategies will affect positive behaviour change and improve health status. Little consumer research has been done in South Africa to assist all those involved (government, industry, researchers, nutrition experts / dietitians, educators) in gaining potentially important insights.

Objectives

Of South Africa's almost 31 million adults, some 11 million live in the metropolitan areas and so have relative exposure to most media and access to the widest range of available food products. This group is also a microcosm of the larger South Africa - being made up of all races, ages and living standards.

The overall objective of this study was to investigate the beliefs and practices of South African metropolitan adults, in relation to the food and health link and the health information contained on food packages in order to consider the implications for functional foods.

The study design was focussed on four key variables, namely, gender, race, age and living standard measure (LSM).

Methods

The study was designed to ensure that the results would be representative of the metropolitan adult (>16 years) population and that they could be weighted and extrapolated. 2000 adults made up of 1000 Blacks, 640 Whites, 240 Coloureds and 120 Indians, with a 50/50 gender split were drawn using a stratified, random (probability) sampling method in order to allow for the legitimate use of the mathematics of probability as well as to avoid interviewer bias. The study group were interviewed, face-to-face, in home, in the preferred language from English, Afrikaans, Xhosa, Zulu, Tswana, North Sotho and South Sotho, by trained field workers. A minimum 20% back-check on each interviewer's work was undertaken to ensure reliability and validity of the data. The field worker used a pre-coded questionnaire that included seventeen food related questions designed by a multi-disciplinary team of marketers, dietitians, nutritionists and research specialists. The food questions used a 5-point Likert scale in order to measure attitude.

The data was captured (3 questionnaire were excluded due to being incorrectly filled in) and the computer software package STATISTICA® Release 6, which was used to perform the statistical analysis. The data was data was weighted to represent the total metropolitan population prior to analysis. Quantitative data was statistically analysed in order to generate relevant descriptive statistics, cross tabulations and statistical tests.

Results

The study considered four variables; gender, race (Black, White, Coloured, Indian), age (16-29, 30-44, 45+) and living standards measure (LSM 2-3, LSM 4-6, LSM 7-10), to explored four statements:

1. I believe food can have an effect on my health
2. I always look for health information contained on the packaging of food products
3. I don't take any notice of health information as it is only marketing hype
4. I buy food that claims to contribute to my health.

The overall response to the belief that food can have an effect on health was positive (54%). There was no practical significant difference between age groups and genders but there were practical significant differences between Blacks and the other race groups (Blacks having the lowest belief in the food and health link) and between the highest LSM group and the other LSM groups (LSM 7-10 had the strongest belief in the link between food and health and this belief decreased with decreasing LSM).

Forty-two percent of respondents always look for health information on the packaging of food, but there was no practical significant difference between all the variables, however women were more likely than men to always look for health information on food packaging.

Over half the respondents (51%) stated that they look for health information and that it is not only marketing hype. There was a small practical significant difference between the top and the bottom LSM group with LSM 7-10 being less sceptical about the health information on food packaging.

67% buy foods that claim to benefit their health and there was a small practical significant difference between Blacks and Whites, with more Blacks agreeing that they buy foods that claim to contribute to health.

CONCLUSION

Findings from this study indicate that adult metropolitan South Africans label reading practices are influenced by a number of factors including attitudes, beliefs and practices and that there are differences based on gender, race, age and LSM which must be considered by regulators in drafting food labelling regulations; the food industry when considering and developing functional foods; and nutrition experts when planning education strategies.

Whilst the labelling of foods with health information and the development of function foods might indeed potentially empower consumers to effectively reduce their risk of many chronic diseases, on its own it is not enough.

Nutrition education is vital and must be planned giving due consideration to the differences in belief and practices that exist within the different gender, race, age and LSM groups found in South Africa.

Food consumption patterns are influenced by consumer attitudes, beliefs, needs, lifestyles and social trends and so more multi-disciplinary research in these fields must be encouraged to find ways to improve nutritional intakes that will lead to improved health for all South Africans.

Key words

Functional food; food labelling; health; consumer; belief; attitude

OPSOMMING

Motivering

Daar is internasionale ooreenstemming en erkenning dat die voedingstatus van die wêreld se bevolking rede tot kommer is en dat dieet een van die sleutel-risikofaktore is vir baie van die siektes wat teen 'n ontstellende tempo toeneem (hartsiektes, diabetes, kanker) in beide ontwikkelde en ontwikkelende lande. Ten spyte van baie suksesse (veral in die areas van die uitwissing en beperking van infektiewe siektes en verlaagde fertiliteit) en die reuse vooruitgang in wetenskaplike navorsing en tegnologie wat kennis en oplossings vir voorkoming en risikobestuur vermeerder het, staar ons steeds, wat baie as 'n krisis beskou, in die gesig. Dit wil voorkom asof kennis nie altyd bevredigend in publieke gesondheidspraktyke gereflekteer word nie.

Die doel van die plaaslike (Departement van Gesondheid, Direktoraat Voedselbeheer) en internasionale (WGO, *Codex Alimentarius*) dryfveer vir vermeerderde en verbeterde voedseletikettering is dat, indien verbruikers betroubare voedingkundige inligting by die punt van aankope het en indien hulle verstaan hoe hulle dieet hul risiko van siektes beïnvloed, hulle in staat sal wees om risikoverlagende voedselkeuses te kan maak. Dit kan uiteindelik 'n betekenisvolle positiewe impak op publieke gesondheid hê.

Die voedselindustrie het ook 'n belangstelling in die konsep van funksionele voedsel aangedui (voedsel soortgelyk in voorkoms aan konvensionele voedsel, bedoel om as deel van 'n normale dieet ingeneem te word, maar wat

gewysig is om fisiologiese rolle benewens die voorsiening van eenvoudige voedingstofvereistes te dien) wat, hoewel in werklikheid finansieel gemotiveer, verbruikers kan voorsien met die geleentheid om hul risiko vir sommige siektes deur maklik bekombare, smaaklike diëte te verlaag, eerder as slegs deur die gebruik van kuratiewe maatreëls.

Vir die sukses van beide hierdie inisiatiewe in publieke gesondheidsterme, moet verbruikers:

- die verband tussen die voedsel wat hulle eet en hul gesondheid aanvaar
- aktief oplet na, en die boodskappe gekommunikeer, vertrou
- in staat wees om in inligting korrek te interpreteer en te integreer
- 'n verkoopsbesluit kan neem.

Dit lig die belang van in-diepte verbruikersverstaanbaarheid uit ten einde te verseker dat wetgewende, opvoedkundige en bemarkingstrategieë positiewe gedragsverandering sal affekteer en gesondheidstatus verbeter. Min verbruikersnavorsing is in Suid-Afrika gedoen om hulp te verleen aan diegene wat betrokke is (regering, nywerheid, navorsers, voedingkundiges, dieetkundiges, opvoeders) in die verwerwing van potensieel belangrike insigte.

Doelwitte

Van Suid-Afrika se bykans 31 miljoen volwassenes bly ongeveer 11 miljoen in die metropolitaanse areas en het dus relatief blootstelling aan die meeste media en toegang tot die wydste reeks van beskikbare voedselprodukte. Hierdie groep is ook 'n mikrokosmos van die groter Suid-Afrika – saamgestel uit alle rasse, ouderdomme en lewenstandaarde. Die oorkoepelende doelwit van hierdie studie was om die menings en gedrag van Suid-Afrikaanse stedelike volwassenes in verband met die verwantskap tussen voedsel en gesondheid en die gesondheidsinligting op voedselverpakkings te ondersoek ten einde die implikasies vir funksionele voedsels te oorweeg.

Die studieontwerp was gefokus op vier sleutelveranderlikes naamlik geslag, ras, ouderdom en lewenstandaard (LSM).

Metodes

Die studie was ontwerp om te verseker dat die resultate verteenwoordigend sou wees van die stedelike volwasse (>16 jaar) populasie en dat dit geweeg en geekstrapoleer kon word. Tweeduisend volwassenes, bestaande uit 1000 Swartes, 640 Blankes, 240 Kleurlinge en 120 Indiërs, met n 50/50 geslagsverspreiding, is getrek deur 'n gestratifiseerde, ewekansige (waarskynlike) steekproefmetode ten einde toe te laat vir die regmatige gebruik van die wiskundige waarskynlikheid asook om onderhoudvoerdervooroordeel te vermy.

Die studiegroep is van aangesig tot aangesit, tuis, in die taal van voorkeur (Engels, Afrikaans, Xhosa, Zoeloe, Tswana, Noord-Sotho en Suid-Sotho) deur opgeleide veldwerkers ondervra. 'n Minimum van 20% van elke onderhoudvoerder se werk is gekontroleer om betroubaarheid en geldigheid van die data te verseker. Die veldwerkers het 'n voorafgekodeerde vraelys gebruik wat sewentien voedselverwante vrae, ontwerp deur 'n multi-dissiplinêre span van bemarkers, dieetkundiges, voedingkundiges en navorsing spesialiste, ingesluit het. Die voedselvrae het 'n 5-punt Likertskaal gebruik om houding te meet.

Die data is ingelees (drie vraelyste is uitgesluit omdat dit foutiewelik ingevul is) en die rekenaarsagtewareprogram STATISTIKA ® is gebruik om die statistiese ontleding te doen. Die data is geweeg om die totale stedelike populasie te verteenwoordig voordat dit geanaliseer is. Kwantitatiewe data is statisties ontleed om relevante beskrywende statistiek, kruistabellering en statistiese toetse te genereer.

Resultate

Die studie het vier veranderlikes oorweeg: geslag, ras (Swart, Blank, Kleurling, Indiër), ouderdom (16-29, 30-44, 45+) en lewenstandaardmaatstawwe (LSM 2-3, LSM 4-6, LSM 7-10), om vier stellings te ondersoek:

1. Ek glo voedsel kan my gesondheid beïnvloed.
2. Ek let altyd op na gesondheidsinligting op die verpakking van voedselprodukte.
3. Ek neem nie kennis van gesondheidsinligting nie omdat dit slegs 'n bemarkingsfoefie is.
4. Ek koop kos wat tot my gesondheid bydra.

Die oorwegende respons tot die stelling dat voedsel gesondheid kan beïnvloed, was positief (54%). Daar was geen prakties betekenisvolle verskil tussen ouderdomsgroepe en geslagte nie, maar daar was wel prakties betekenisvolle verskille tussen Swartes en die ander rassegroepe (Swartes het die minste in die voedsel-gesondheidverband geglo) en tussen die hoogste LSM-groep en die ander LSM-groepe (LSM 7-10 het die sterkste geglo in die verband tussen voedsel en gesondheid en hierdie geloof het verminder met dalende LSM).

Twee-en-veertig present van die respondente het altyd opgelet na voedinginligting op die verpakking van voedsel maar daar was geen prakties betekenisvolle verskil tussen die veranderlikes nie, hoewel vroue meer geneig was as mans om vir voedinginligting op verpakkings te soek.

Meer as die helfte van die respondente (51%) het genoem dat hulle voedinginligting soek en dat dit nie net 'n bemarkingsfoefie is nie.

Daar was 'n klein prakties betekenisvolle verskil tussen die boonste en die onderste LSM-groepe met LSM 7-10 minder skepties oor voedinginligting op voedselverpakking.

Sewe-en-sestig persent koop voedsels wat daarop aanspraak maak dat dit gesondheid bevoordeel en daar was 'n klein prakties betekenisvolle verskil tussen Swartes en Blankes, met meer Swartes wat saamstem dat hulle voedsels koop wat bydra tot gesondheid.

Gevolgtrekking

Bevindings van hierdie studie toon dat volwasse stedelike Suid-Afrikaners se praktyke van etiketlesings beïnvloed word deur 'n aantal faktore insluitende houding, menings en gedrag en dat daar verskille is gebaseer op geslag, ras, ouderdom en LSM wat in ag geneem moet word deur wetgewers van voedseletiketregulasies, die voedselnywerheid wanneer funksionele voedsels oorweeg en ontwikkel word en voedingkundiges wanneer onderrigstrategieë beplan word.

Terwyl die etikettering van voedsels met gesondheidinligting en die ontwikkeling van funksionele voedsels inderdaad verbruikers potensieel mag bemagtig om effektief hul risiko vir talle chroniese siektes te verlaag, is dit op sigself nie genoeg nie. Voeding- onderrig is noodsaaklik en moet beplan word met inagneming van die verskille in die menings en gedrag wat bestaan in die verskillende geslag, ras-, ouderdom- en LSM-groepe in Suid-Afrika.

Voedselinnamepatrone word beïnvloed deur verbruikershouding, -menings, verbruikersbehoeftes, lewenstyle en sosiale neigings en meer multi-dissiplinêre navorsing in hierdie veld moet aangemoedig word om maniere te vind om voedingstofinnames te verbeter wat sal lei tot verbeterde gesondheid vir alle Suid-Afrikaners.

Sleutelworde

Funksionele voedsel; voedsel etikettering; gesondheid; verbruiker; mening; houding

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CHAPTER 1

PREFACE

PREFACE

1. TITLE

Beliefs and practices related to label reading and its implications for functional foods in South Africa.

2. HYPOTHESIS

South African adults beliefs and practices regarding the relationship of food to health and the health information contained on food packages are likely to be related to gender, race, age and LSM.

3. AIMS AND OBJECTIVES

To characterise the South African metropolitan adult population (>16 years) and to investigate their beliefs and practices regarding the relationship of food to health and the health information contained on food packages, using four variables (gender, race, age and living standard measure), in order to consider the implications for functional foods.

4. STRUCTURE OF THE DISSERTATION

This dissertation is presented in article format.

The experimental work consisted of a study in the field of consumer science. Four statements (Table 1.1) in a pre-coded questionnaire that included seventeen food related questions designed by a multi-disciplinary team (marketers, dietitians, nutritionists and research specialists) were used to explore consumer beliefs and practices in relation to the link between food and health and the health information contained on food packages of South African adults living in metropolitan areas.

Table 1.1. Statements used to investigate consumers beliefs and practices

1	I believe food can have an effect on my health
2	I always look for health information contained on the packaging of food products
3	I don't take any notice of health information as it is only marketing hype
4	I buy food that claims to contribute to my health.

Chapter 2 consists of a literature review giving an overview of the published, available literature on the issues pertinent to the topic. These include: the reasons for the link between diet / food and health; the associated concerns and action strategies; the concept of functional foods and the core elements of label reading. The references used in this review are listed throughout and the complete references are documented at the end of the Chapter.

Chapter 3 consists of a manuscript on beliefs and practices related to label reading and its implications for functional foods in South Africa that has been prepared for submission to the South African Journal of Clinical Nutrition. The article is fully referenced according to the Vancouver method of referencing required by the publication.

Chapter 4 consists of a summary of the results of the study as well as recommendations to the various interest groups involved in the field of functional foods, namely the regulators, the industry, the researchers and the nutrition experts / dietitians.

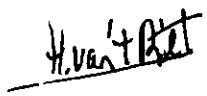
5. AUTHORS CONTRIBUTIONS

The study reported in this dissertation was planned and executed by three researchers and the contribution of each is listed in the table below. A statement from the co-authors is also included, confirming their role in the study and giving their permission for the inclusion of the article in this dissertation.

NAME	ROLE IN THE STUDY
Ms J.M. Badham B.Sc. Diet, Dip Hosp Diet	Responsible for the literature searches, statistical analysis and text drafting
Prof J.C. Jerling PhD. Nutrition	Supervisor. Critically reviewed paper
Dr H van 't Riet PhD. Nutrition	Co-supervisor. Initial statistical planning and critical discussion of the data

I declare that I have approved the above-mentioned article, that my role in the study, as indicated above, is representative of my actual contribution and that I hereby give my consent that it may be published as part of the M.Sc. dissertation of Ms J.M. Badham.

Prof. J.C. Jerling



Dr. H van 't Riet

CHAPTER 2

LITERATURE REVIEW: THE LINK BETWEEN FOOD AND HEALTH; FUNCTIONAL FOODS AND LABEL READING PRACTICES

LITERATURE REVIEW: THE LINK BETWEEN FOOD AND HEALTH; FUNCTIONAL FOODS AND LABEL READING PRACTICES

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1. INTRODUCTION

"Let food be thy medicine and medicine be thy food"
Hippocrates

The relationship between food and health has increasingly come to the fore amongst the researchers, health professionals, the media and the public. Trends in society have an influential effect on consumer choice and demand, and increasingly consumers are being prompted to evaluate their diet and lifestyles, and are expecting health benefits from the foods that they eat.

2. WORLD HEALTH STATUS

The 2002 World Health Report (WHO, 2002), titled 'Reducing Risks, Promoting Healthy Life', acknowledged that while some risks to health have diminished, the very successes of the past few decades in infectious disease control and reduced fertility are generating a "demographic transition". This transition is from traditional societies, where almost everyone is young, to societies with rapidly increasing numbers of middle-aged and elderly people. At the same time, researchers are observing marked changes in patterns of consumption, particularly of food, alcohol and tobacco, around the world. These changing patterns were identified in the report as being of crucial importance to global health and were defined as a "risk transition", which has been shown to cause an alarming increase in risk factors in middle and low income countries. The report states that in 2002 more people than ever before were exposed to products and patterns of living imported or adopted from other countries that pose serious long-term risks to their health.

These include:

- Increasingly tobacco, alcohol and some processed foods are being marketed globally by multinational companies, with low and middle-income countries as their main targets for expansion.

- Changes in food processing and production and in agricultural and trade policies have affected the daily diet of hundreds of millions of people.
- Changes in living and working patterns have led to less physical activity and less physical labour. The television and the computer are two obvious reasons why people spend many more hours of the day seated and relatively inactive than a generation ago.

The consumption of tobacco, alcohol and processed or "fast" foods fits easily into such patterns of life. These changing patterns of consumption and of living, together with global population ageing, are associated with a rise in prominence of diseases such as cancers, heart disease, stroke, mental illness diabetes and other conditions linked to obesity. Already common in industrialized nations, the report states that they now have ominous implications for many low and middle-income countries, which are still dealing with the traditional problems of poverty such as undernutrition and infectious diseases.

This profile is well documented as already occurring in South Africa and there is the co-existence of under- and over-nutrition, not only between populations but also within populations and even within the same households (Vorster *et al.* 1997).

Table 2.1 shows the 10 leading selected risk factors as percentage causes of developing countries' disease burden, as measured in Disease Adjusted Life Years (DALYs).

The statistics contained in the 2002 World Health Report, show that although about one fifth of the global disease burden can be attributed to the joint effects of protein-energy or micronutrient deficiency, almost as much burden can be attributed to risk factors that have substantial dietary determinants – high blood pressure, cholesterol, overweight, and low fruit and vegetable intake.

Mortality, morbidity and disability attributed to the major non-communicable diseases currently account for about 60% of all deaths and 47% of the global burden of disease. These figures are expected to rise to 73% and 60% respectively by 2020 (WHO, 2002).

Table 2.1: Leading 10 selected risk factors as percentage causes of the worlds disease burden measured in DALYs*

DEVELOPING COUNTRIES	
High mortality countries	
Underweight	14.9%
Unsafe sex	10.2%
Unsafe water, sanitation and hygiene	5.5%
Indoor smoke from solid fuels	3.6%
Zinc deficiency	3.2%
Iron deficiency	3.1%
Vitamin A deficiency	3.0%
Blood pressure	2.5%
Tobacco	2.0%
Cholesterol	1.9%
Low mortality countries	
Alcohol	6.2%
Blood pressure	5.0%
Tobacco	4.0%
Underweight	3.1%
Overweight	2.7%
Cholesterol	2.1%
Low fruit and vegetable intake	1.9%
Indoor smoke from solid fuels	1.9%
Iron deficiency	1.8%
Unsafe water, sanitation and hygiene	1.8%
DEVELOPED COUNTRIES	
Tobacco	12.2%
Blood pressure	10.9%
Alcohol	9.2%
Cholesterol	7.6%
Overweight	7.4%
Low fruit and vegetable intake	3.9%
Physical inactivity	3.3%
Illicit drugs	1.8%
Unsafe sex	0.8%
Iron deficiency	0.7%

* WHO (2002)

Looking at disease per se, the figures are also high.

2.1 Blood pressure:

In recent decades it has become increasingly clear that the risks of stroke, ischaemic heart disease, renal failure and other disease are not confined to a subset of the population with hypertension, but rather continue among those with average and even below-average blood pressure (WHO, 2002).

The main modifiable causes of high blood pressure are diet, especially salt intake, levels of exercise, obesity, and excessive alcohol intake. As a result of the cumulative effects of these factors, blood pressure usually rises steadily with age, except in societies in which salt intake is comparatively low, physical activity high and obesity largely absent. Most adults have blood pressure levels that are suboptimal for health. This is true for both economically developing and developed countries.

Globally figures indicate that about 62% of cerebrovascular disease and 49% of ischaemic heart disease are attributable to suboptimal blood pressure, with little variation by sex. Worldwide, high blood pressure is estimated to cause 7.1 million deaths, about 13% of the total. Since most blood pressure related deaths or nonfatal events occur in middle age or the elderly, the loss of life years comprises a smaller proportion of the global total, but is nonetheless substantial (64.3 million DALYs, or 4.4% of the total) (WHO, 2002).

The South African Health Review (HST, 2004) states that 16% of adult women and 13% of men are hypertensive.

2.2 Cholesterol:

A diet high in saturated fat content, heredity, and various metabolic conditions such as diabetes mellitus influence an individual's level of cholesterol. Cholesterol levels usually rise steadily with age, more steeply in women, and stabilize after middle age. Cholesterol is a key component in the development of atherosclerosis.

Mainly as a result of this, cholesterol increases the risks of ischaemic heart disease, ischaemic stroke and other vascular diseases. As with blood pressure, the risks of cholesterol are continuous and extend across almost all levels seen in different populations.

High cholesterol is estimated to cause 18% of global cerebrovascular disease (mostly nonfatal events) and 56% of global ischaemic heart disease. Overall this amounts to about 4.4 million deaths (7.9% of total) and 40.4 million DALYs (2.8% of total) (WHO, 2002).

In South Africa, according to the Heart Foundation, it is estimated that 4.5 million or around 10% of the urbanised (White, Indian and Coloured) population have elevated cholesterol levels (Biesman-Simons, 2004).

2.3 Obesity, overweight and high body mass:

The prevalence of overweight and obesity is commonly assessed using body mass index (BMI), with a strong correlation to body fat content. WHO criteria define overweight as a BMI of at least 25 kg/m^2 and obesity as a BMI of at least 30 kg/m^2. These markers provide common benchmarks for assessment, but the risks of disease in all populations increase progressively from BMI levels of 20–22 kg/m^2 (WHO, 2002).

Increases in the dietary intake of free sugar and saturated fats, combined with reduced physical activity, have according to the WHO (2002) led to obesity rates that have risen three-fold or more since 1980 in some areas of North America, the United Kingdom, Eastern Europe, the Middle East, the Pacific Islands, Australasia and China. In addition, the demographic transition in developing countries is producing rapid increases in BMI, particularly among the young. The affected population has increased to epidemic proportions, with more than one billion adults worldwide overweight and at least 300 million clinically obese.

Overweight and obesity lead to adverse metabolic effects on blood pressure, cholesterol, triglycerides and insulin resistance.

Risks of coronary heart disease, ischaemic stroke and type 2 diabetes (now affecting not only older adults but also children before puberty) increase steadily with increasing BMI, and a raised BMI also increases the risks of cancer of the breast, colon, prostate, endometrium, kidney and gallbladder.

Although mechanisms that trigger these increased cancer risks are not fully understood, they may relate to obesity-induced hormonal changes. Chronic overweight and obesity are shown to contribute significantly to osteoarthritis, a major cause of disability in adults. It is estimated that approximately 58% of diabetes mellitus globally, 21% of ischaemic heart disease and 8–42% of certain cancers were attributable to BMI above 21 kg/m^2. Modest weight reduction reduces blood pressure, abnormal blood cholesterol and substantially lowers risk of type 2 diabetes (WHO, 2002).

According to WHO standards, 29% of men and 56% of women in South Africa are overweight (BMI >25). Almost one in ten men, and three in ten women, are severely obese (BMI 35-39.9) (HST, 2004).

2.4 South Africa

It is clear, that South Africa is not excluded from these dismaying figures. According to the South African Health Review 2003/04 (HST, 2004) chronic disease, with diet playing a key role as a risk factor, was the main cause of death of South Africans in 2000. For Indian and White males one of the leading causes of death is cerebrovascular disease, and this is the leading cause of death among Coloured females, with ischaemic heart disease as the leading cause among Indian and White females.

For the total adult population cardiovascular disease as a whole is the second leading cause of death – with the sub categories of ischaemic heart disease ranking second and stroke fourth.

In total, the chronic diseases accounted for 37% of deaths and 21% of years of life lost due to premature mortality (YLLs). Among women, they account for 40% of deaths and 21% of YLLs; and among men they account for 36% of deaths and 20% of YLLs (HST, 2004).

3. THE FUTURE

It would seem that decades of scientific research into the causes of disease and injury has given the world a vast knowledge base and a huge potential for prevention and risk reduction. However, what is known, and what can be done, is not always reflected adequately in public health practice.

The 2002 WHO report, made it clear that the world was facing global risks to health (either because it has little choice, or because it is making the wrong choices) and yet it is equally clear that dramatic reductions in risk and a healthier future for all can be achieved –

For example: it was estimated that modest population-wide and simultaneous reductions in blood pressure, obesity, cholesterol levels and tobacco use would more than halve cardiovascular disease incidence. It was concluded that what was required was a global response, with strong and committed leadership, supported by all sectors of society concerned with promoting health (WHO, 2002).

In 2004 a Joint WHO/FAO Expert Consultation on Diet, Nutrition and the Prevention of Chronic Diseases (WHO/FAO, 2004) completed a report that aimed to draw on the latest scientific evidence available, so as to update recommendations and implement more effective and sustainable policies and strategies to deal with the increasing public health challenges related to diet.

The report clearly states that it is internationally recognised that the growing epidemic of chronic diseases is related to dietary and lifestyle changes. It states that nutrition is a major modifiable determinant of chronic disease, with scientific evidence increasingly supporting the view that alterations in diet have strong effects, both positive and negative, on health throughout life.

It also states that dietary adjustments may not only influence present health, but may determine whether or not an individual will develop diseases such as cancer, cardiovascular disease and diabetes much later in life (WHO/FAO, 2004).

The consultation acknowledges that although more basic research may be needed on some aspects of the mechanisms that link diet to health, and that diet is just one risk factor, the currently available scientific evidence provides a sufficiently strong and plausible basis to justify taking immediate dietary intervention action.

With regards to the food industry, The World Health Organisation defines the broad parameters for a dialogue: to encourage less saturated fat; more fruits and vegetables; effective food labelling; and incentives for the marketing and production of healthier products.

As a result of the Expert Consultation report, in May 2004 the World Health Assembly passed a document titled 'Global strategy on diet, physical activity and health' (WHO, 2004). This urges all stakeholders - member states (governments), international organisations and the private sector - to play a role in addressing the alarming diet related health trends. The WHO believes that the implementation of the strategy by all those involved will contribute to major and sustained improvements in people's health around the world (WHO, 2004).

The global strategy has four main objectives:

1. to reduce the risk factors for non-communicable diseases that stem from unhealthy diets and physical inactivity, by means of essential public health action and health-promoting and disease-preventative measures;
2. to increase the overall awareness and understanding of the influences of diet and physical activity on health and of the positive impact of preventative interventions;
3. to encourage the development, strengthening and implementation of global, regional, national and community policies and action plans to improve diets and increase physical activity that are sustainable, comprehensive, and actively engage all sectors, including civil society, the private sector and the media;
4. to monitor scientific data and key influences on diet and physical activity; to support research in a broad spectrum of relevant areas, including evaluation of interventions; and to strengthen the human resources needed to enhance and sustain health (WHO, 2004).

With regards to governments, the strategy suggests that they should provide accurate and balanced information for consumers to enable them to easily make healthy choices, and to ensure the availability of appropriate health promotion and education programmes, whilst giving due consideration to their national capabilities and epidemiological profile.

The strategy specifically encourages governments to consider the importance of food labelling and health claims. The report states that:

- consumers require accurate, standardized and comprehensible information on the content of food items in order to make healthy choices.

- as consumers' interest in health grows, and increasing attention is paid to the health aspects of food products, producers increasingly use health-related messages. Such messages must not mislead the public about nutritional benefits or risks.

The strategy also places emphasis on the role of the private sector (food industry, retailers, catering companies, sporting-goods manufacturers, advertising and recreation businesses, insurance and banking groups, pharmaceutical companies and the media) in promoting and acting as advocates for healthy diets and physical activity.

It states that all these groups could become partners with government and nongovernmental organisations in implementing measures to encourage healthy eating and physical activity, sending positive and consistent messages. Furthermore it states that because many companies operate globally, international collaboration is crucial and cooperative relationships with industry have already led to many favourable outcomes. It makes it clear that '*Initiatives by the food industry to reduce the fat, sugar and salt content of processed foods and portion sizes, to increase introduction of innovative, healthy, and nutritious choices; and review of current marketing practices, could accelerate health gains worldwide*'.

Specific recommendations to the food industry include the following:

- promote healthy diets and physical activity in accordance with national guidelines and international standards
- limit the levels of saturated fats, trans-fatty acids, free sugars and salt in existing products
- continue to develop and provide affordable, healthy and nutritious choices to consumers
- consider introducing new products with better nutritional value
- provide consumers with adequate and understandable product and nutrition information
- practise responsible marketing that supports the strategy, particularly with regard to the promotion and marketing of foods high in saturated fats, *trans*-fatty acids, free sugars, or salt, especially to children

- issue simple, clear and consistent food labels and evidence-based health claims that will help consumers to make informed and healthy choices with respect to the nutritional value of foods
- provide information on food composition to national authorities
- assist in developing and implementing physical activity programmes (WHO, 2004).

4. FUNCTIONAL FOODS

Considering the strong position taken by international organisations such as the WHO, combined with advances in various scientific domains, nutrition and food scientists are being charged with the responsibility of clarifying the role that foods play in maintaining and promoting health, and the food industry is provided with a unique opportunity to develop an almost infinite array of new functional food concepts.

What is a functional food? There is a clear discrepancy in the definition used for 'functional foods' which range from the very simple: 'Foods that may provide health benefits beyond basic nutrition' to the more complex: 'Food similar in appearance to conventional food that is intended to be consumed as part of a normal diet, but has been modified to subserve physiological roles beyond the provision of simple nutrient requirements.' This latter definition excludes therapeutic foods and has gained mainstream acceptance as the definition used by the food industry (Bech-Larsen & Grunert, 2003). This means that functional foods are in essence a new category of foods that promise to promote health by producing targeted physiological functions in their users (Saher et al., 2004).

According to Malaspina (1996), the paradigm needs to change from one linking diet with disease to one linking a balanced diet with health and enjoyment. From a public health perspective, the advent of functional foods may allow for the opportunity to achieve a historically significant improvement in public health – people may be able to reduce their

risks of some diseases through readily available, good-tasting diets rather than through the use of curative measures only (Malaspina, 1996).

Some might disagree that functional foods are a new concept, as in China, Japan and other Asian countries; many types of foods have traditionally been associated with specific health benefits. However what is of more recent origin is the development of nutritional science backing functional foods, or new nutritional insights that have allowed for the development of foods and beverages with a claimed health benefit, based on sound scientific evidence (Weststrate *et al.*, 2002). According to Weststrate *et al.* (2002), in general, the functional foods currently found on the market are based on general discoveries in nutritional science rather than on a deliberate research strategy to develop functional foods. For the future, an approach that integrates insights into consumer needs and demand (market pull) and a structured scientific research process (science push), is likely to give the largest chance of real innovations (Weststrate *et al.*, 2002).

One of the biggest problems when discussing functional foods is how to quantify them, due to the different definitions that are widely used.

Weststrate *et al.* (2002) state that if the definition used is, foods that make specific health claims, the market in the USA, Japan and Europe is estimated to be worth 7 billion euros. However functional foods can also be seen as part of a broader health-based market that includes natural and organic foods; 'low and lite' products; fortified foods and weight management products. In this case the global estimate is 95 billion euro for the year 2000. Verbeke (2004) uses a table (Table 2.2) to illustrate the global market size of functional foods, showing the differences in value as a result of different sources and different definitions of the concept.

Table 2.2. Global market size estimates for functional foods*

Market size (million US$ per year)	Year	Definition	References
15,000	1992	Functional, enriched & dietetic foods	Menrad (2000)
6,600	1994	Functional foods	Hilliam (1998)
10,000	1995	Functional foods	Arthus (1999)
11,300	1995	Functional foods	Heller (2001)
21,700	1996	Functional, enriched & dietetic foods	Menrad (2000)
10,000	1997	Foods with specific health benefits	Byrne (1997)
22,000	1998	Foods with specific health benefits	Gilmore (1998)
16,200	1999	Functional foods	Heller (2001)
17,000	2000	Functional foods (forecast from 1998)	Hilliam (1998)
17,000	2000	Functional foods (forecast from 1997)	Hickling (1997)
33,000	2000	Functional foods	Hilliam (2000)
7,000	2000	Foods that make specific health claims	Weststrate, van Poppel & Verschuren (2002)
50,000	2004	Functional foods (forecast from 2000)	Euromonitor (2000)
49,000	2010	Functional foods (forecast from 2000)	Heller (2001)

*Verbeke (2004)

Weststrate *et al.* (2002) indicated in 2002 that the overall growth rate was expected to be 10% per annum for the following five years, which would significantly outperform the overall foods and beverage market's growth of about 2% per annum. Hilliam (1998) warns that although there is agreement that there is vast potential for functional foods, there is little consensus in the food industry about the pace of development.

There are many unresolved issues, with the regulations of health claims being critical, before mainstream market development can really begin. However if this is satisfactorily resolved then, according to Hilliam (1998), it might not be unreasonable for functional foods to take a share of about 5% of total food expenditure in Europe, which, based on 1996 prices, it is predicted, would give a value of about $30 billion.

It is not surprising then that functional foods have been reported as the top trend facing the food industry. This is exemplified by the substantial strategic and operational efforts by leading food, pharmaceutical and biotechnology firms during the 1990s, who see the opportunity of creating niche markets to commercialise innovative products claiming

beneficial physiological effects beyond those ordinarily associated with typical nutrients (de Jong *et al.*, 2003).

So, over the next few decades a range of new functional foods will be introduced, accompanied by media messages and advertising on the need to optimise nutrition, health and quality of life. According to de Jong *et al.* (2003) this will be attractive because there is a powerful psychological appeal, and the WHO push to consumers to improve or maintain health in a proactive way. Milner (2000) also states that it is not only a financial driver that is leading to an increased interest in functional foods, but also increased healthcare costs, new legislation and scientific discoveries. This view is supported by the American Dietetic Association (ADA, 1999). If one considers healthcare costs alone, according to Milner (2000) expenditures associated with health services, as a percentage of national wealth (gross national product or GNP), continue to rise worldwide. Even in the United States health care accounts for about 14% of GNP. And it is well documented that inappropriate dietary habits are viewed by many as contributing to poor health and associated health care costs (Milner, 2000).

Kim *et al.* (2001), state that the diet-related health conditions cost society an estimated $250 billion annually in medical costs and lost productivity, and that the estimated health care savings from improved and better diets could amount to $3.6 to $21 billion. On the other hand, the USDA quoted by Kim *et al.* (2001) estimates that improved dietary patterns could save $43 billion in medical care costs and lost productivity resulting from disability associated with heart disease, cancer, stroke and diabetes each year.

Although functional foods will not be the "magic bullets" against disease, functional foods provide a new way of expressing healthiness in food choices.

According to Saher *et al.* (2004), in the past nutrition experts have recommended the use of certain types and avoidance of other types of foods, without mentioning particular products (for example, 'choose low-fat foods'). However the development of functional foods offers a new kind of health message, by promising specific effects caused by particular food products (for example, 'Flora Pro.activ can lower cholesterol by 10-15%').

Reading of the information on food packaging becomes more important in this category of foods, if the consumer is to understand the benefit offered.

Researchers in the functional food field highlight two important issues that they believe will determine the growth and success or failure of this category:

4.1 The functional food consumer

- Due to the difference in the messages delivered by traditional nutrition education and functional food claims, functional foods may have a different image in the consumers' mind than other health-related products. So far, very little is really known about what kind of associations consumers have with these products.

  Saher *et al.* (2004), in their research undertaken in Helsinki, were able to show that functional food buyers were perceived to be more innovative than buyers of conventional foods – they were seen as having an explorative mind set, to be broad minded and open to new things.

- A study undertaken in the Netherlands amongst 1552 members of the Dutch Health Care Consumer Panel (de Jong *et al.*, 2003), investigated the demographic and lifestyle characteristics of functional food consumers and dietary supplement users. The results showed that 30% used a functional food or supplement at least weekly. Interestingly 61% were in agreement that multivitamin and mineral supplements had proven efficacy, yet in contrast only 15% believed in the sufficiently proven efficacy of sweets and lemonade with extra vitamins and minerals.

These results, despite 52% believing that the development of functional foods was a positive development. The message seems clear: communication about functional foods is critical for their success and for consumer confidence in this new category of foods.

- In the past, the finding that only women are judged based on their eating behaviour, has resulted in the omission of males from food based impression studies. However, Saher *et al.* (2004) states that functional foods offering a new, targeted technique for improving one's health, may also appeal to men and influence the impressions formed of male users of functional foods. This indicates that, in functional food and consumer attitude and behaviour research, it is important not to exclude men.

- Research has also shown that age can mediate impressions of functional foods. General health interest in food related matters increases with age. As people get older they tend not only to place more value on the healthiness of food, but also become more reluctant to try unfamiliar foods.

  This means that while appreciation of food healthiness would predispose older people to favour functional foods, a hesitant attitude towards unfamiliar foods might have entirely the opposite effect. It would seem that it is difficult to predict how the elderly will react to functional food products (Saher *et al.*, 2004).

According to Verbeke (2004), within the food industry the need for further research into consumer behaviour was identified in 1997 as being a top priority, as acceptance failure rates from recent food cases have shown that consumer acceptance is often neglected or at least far from being understood. One of the issues is the consumers' label reading behaviour and acceptance of the communicated messages.

4.2 Label information and health claims

- Urala and Lähteenmäki (2004) state that, amongst the important issues that will determine the success of the future of functional foods, consumers have to trust the information concerning the functional effect. They state that manufacturers have to offer the right information in a credible way to the right consumers. This in essence relies on consumers looking for, reading and believing the information contained on food packaging. Studies in Finland have showed consumers to be rather positive towards functional foods. Urala and Lähteenmäki (2004) refer to a study of theirs that showed all health-related claims as being advantageous when attached to a product used daily. Respondents were very confident with the health-related information coming from authorities and quite confident even with that coming from food manufacturers. Weststrate *et al.* (2002) states that it is now recognised that although there is a place for products specifically aimed at disease reduction, there is also a trend towards products providing 'daily health benefits' such as healthy, attractive skin, which might not be important from a public health perspective, but are very relevant for the consumer and could contribute to longer-term health objectives. These need to be considered in any regulatory framework.

- Consumers' perceptions of the healthiness of the processes and enrichments involved in the production of functional foods may be altered by the use of health claims. In the United States, the deregulation of the USA health claim legislation in 1985 gave impetus to the creation of the functional foods market. According to Bech-Larsen and Grunert (2003), in the following years this market experienced growth rates of up to 20% compared to the general USA food market with a growth of below or around 1%. Following a number of examples of deceptive marketing practices, the USA health claim legislation was made more restrictive again in 1995. The international debate on health claims continues to rage.

Bech-Larsen and Grunert (2003) describe that in general, current international health claim legislation distinguishes between physiological and preventative claims. Physiological claims describe how a functional enrichment affects the body, whereas prevention claims explicate the disease, which is prevented by enrichment. In the USA physiological claims for certain enrichment components are allowed whereas in the EU both types of claims are generally forbidden.

In South Africa, the draft regulations relating to labelling and advertising of foodstuffs (SA, 2002) allow for certain health claims, namely nutrient function claims, enhanced function claims and 13 reduction of disease risk claims.

The use of any of these claims will however trigger the need for mandatory nutrition information being contained on pack in a specific format and, in general, using specific wording. This implies that consumers will or should read the on pack information, in order to gain further information about the nature of the claim and the nutrition provided to meet the claim requirements.

Codex Alimentarius is, in an attempt to gain world harmonization, discussing the issue of nutrition and health claims and is also looking at nutrient function claims, other function claims and reduction of disease risk claims (CCFL, 2003). There is however much debate over the definitions. Key to the guidelines under discussion will be the provision of accurate nutrition information on pack with the specific aim of informing consumers and preventing misinformation.

Both of these issues highlight the importance of in-depth consumer understanding; consumer need and awareness; consumer acceptance of a food solution; powerful communication of the health benefits to the consumer; uncompromised taste; optimal convenience; adequate retail or out-of-home availability; proven safety and efficacy; acceptable price level;

assurance and support from different sources including scientific opinion leaders and clear regulatory frameworks for making claims. It is clear that nutritional research will only pay off if it is closely integrated with the other prerequisites for success for a functional food (Weststrate *et al.*, 2002).

The field of functional foods is not the ground of nutrition scientists alone. The research process according to Weststrate *et al.* (2002) will be powered by technology and insights available from other disciplines, such as informatics, pharmacology, engineering, proteomics and genomics.

The research funnel will however most likely start with consumer needs and narrow down to the final functional food through a stepwise approach:

1. Consumer understanding: what kind of health benefits in foods or technology solutions do consumers really want?
2. Bio-informatics: what molecules could do the job?
3. *In vitro* screening and *in vivo* testing: which molecules work best in model systems?
4. Bioavailability: is the bioactive compound digested and absorbed?
5. Functional food technology: can we source the ingredient and make an attractive food?
6. Biomarkers: can we measure relevant effects in man?
7. Human intervention studies: does it really work?
8. Communication: how do we explain the benefits? (Weststrate *et al.*, 2002)

5. LABEL READING

The world trend of increasing emphasis on nutrition, and its impact on health and disease development, has drawn the consumers' attention to the acquisition of nutrition information about the foods that they include in their eating plan.

Byrd-Bredbenner *et al.* (2000) state that if we are to make inroads into the reduction of diet-related diseases, consumers must have ready access to the nutrient content of food and believe that whilst the cost of conducting the necessary analysis to provide this information is not trivial, it is far less costly than the monetary and human costs associated with diet-related diseases. They state that in the US, the food industry spent $2 billion to implement the food regulations. In contrast, the benefits of the new regulations, which include health-care cost savings and related improvements in productivity, are estimated to range from $4 billion to $100 billion over the next two decades.

It is proposed, by Shine *et al.* (1997b), that food companies can satisfy increasing consumer interest in health by including nutrition information on labels. This however comes with the prerequisite that consumers look for, trust and take cognisance of this information.

Shepard (1999) looks at the social determinants of food choice and makes it clear that, like any complex human behaviour, food choice will be influenced by many interrelating factors. It is not determined entirely by physiological or nutritional need, but is also influenced by social and cultural factors.

5.1 Frequency of label reading

It would seem from studies that label reading practices are on the increase – certainly in North America. Since implementing the mandatory Nutrition Facts label in the USA, the percentage of US consumers reporting that they almost always read nutrition labels when purchasing food for the first time has steadily increased to almost meet the US goal of 85% (Bryd-Bredbenner *et al.*, 2000).

The Canadian National Institute of Nutrition (NIN) undertook a study that investigated the nutrition labelling perceptions and preferences of Canadians (NIN, 1999). The study found that in 1997, 71% of Canadians reported using product labels as a source of nutrition information, compared to 61% in 1989, and 70% claim to refer to the nutrition information panel often or sometimes.

5.2 Profile of non- label readers

Despite any growth in label reading practices, there will always be those that do not read labels. The Canadian National Institute of Nutrition (NIN, 1999) study found that 30% of Canadians claimed to rarely or never use the nutrition information panel - 40% of these stating that they were familiar with the foods they eat; 22% having a general lack of interest in the information provided and 23% indicating that it takes too much time to read.

A Scottish study by Tessier *et al.* (2000) showed a similar figure of non-readers, with 22% of the sample claiming to never read them; and an Irish study (Shine *et al.*, 1997b) found that not being interested in nutrition was the reason given by 22% of those who did not read labels.

5.3 Profile of label readers

Researchers around the world have however investigated the label reading practices of consumers and the specific characteristics of those consumers that do read label information. Table 2.3 is a summary of a number of the studies undertaken.

Table 2.3: Summary of label reading habits and typical label reader demographics in several countries

COUNTRY	POSITIVE LABEL READING	POSITIVE LABEL READING DEMOGRAPHICS	RESEARCHERS
Ireland	58% read	Female Completed tertiary education	Shine, O'Reilly & O'Sullivan (1997)
Australia/New Zealand	25-50% read (depending on type of food)	Female >35 years Higher education	Irwin (2002)
Scotland	78% occasionally 11.4% always	Female	Tessier, Edwards & Morris (2000)
United Kingdom	22-59% look for	Not given	Higginson, Rayner, Draper & Kirk (2002)
United Kingdom	25% women aged 25-45 years	N/A	Byrd-Bredbenner, Wong & Cottee (2000)
Norway	79% often	Female Highly educated On a special diet	Wandel (1997)
Canada	70% often or sometimes	Female <55 years Higher education Higher income	Canadian National Institute of Nutrition (1999)
United States	52% on first purchase	Baby Boomers (40-58 years) Matures (>58 years)	American Food Marketing Institute (2000)
China (Hong Kong)	-	Frequent users = nutrition seekers Aged 35-54 years Use English & Chinese	Siu & Tsoi (1998)

It is evident from Table 2.3 that internationally there is a general trend towards more women than men and more highly educated individuals reading labels. With regard to age it is generally considered to be individuals older than 35 years that read labels, but with some differences as to the upper cut-off age.

5.4 Additional factors impacting on label reading

It would appear that apart from gender, age and educational demographics, there are a number of other factors that impact on the choice to read label information. Those that will be discussed include the perception of the importance of nutrition against other food qualities; first purchase practices; belief in what one reads and the concept that sufficient information is provided to allow for informed choice.

According to research done by Shine *et al.* (1997a) in Ireland (n=200) - quality, taste and nutritional content are of similar importance to consumers and are of higher importance than brand and convenience. In the United States, although nutrition has gained more importance, it still takes second place behind taste (FMI, 2001).

In South Africa, a study (n=388) amongst women showed that these consumers regarded price and habit as important factors in food purchasing, but felt that nutritional information for a healthy choice could under certain circumstances rival price (Anderson & Coertze, 2001). In a study carried out amongst Black South African secondary school and university students (n=412) it was found that the three highest food choice factors included health, sensory appeal and mood (Peltzer, 2001).

According to Irwin (2002), The Australian and New Zealand Food Authority (ANZFA) national consumer survey on food labelling found that depending on the type of food, one-quarter to one-half of people read nutrition information panels. Australians rank health claims as the second most important item of health information for a food label, after additives.

Research was undertaken in China by Siu and Tsoi (1998). They note that countries such as China and other ASEAN countries will soon constitute an economic power comparable to that of North America and Europe and yet there was little information on nutrition label usage in a Chinese socio-context. Their study looked at the use of nutrition information on labels by Chinese in Hong Kong.

The results found that the 'frequent users' are the 'nutrition seekers' who believe that nutrition is more important than taste, and they were predominantly in the 35-54 age group, and use both English and Chinese.

In this context, the researchers suggested that new market entrants with unfamiliar brands could consider using nutrition information labels as a means of achieving a competitive edge over the well-know brands that are less likely to provide this information.

5.5 Label reading impact on purchasing decisions

In a recent survey, it was shown that 52% of American shoppers 'almost always' check the nutrition facts label on their first purchase and another 25% sometimes do so (FMI, 2001). Interestingly considering the generation theory, the American research shows that Baby Boomers (born between 1946 and 1964) and Matures (born before 1946), are more interested than younger shoppers in living healthily, with more than half in each group always looking at the labels before they first-time buy.

A South African study by Anderson and Coertze (2001) amongst women showed that 79% indicate that they read labels when they purchase a new product and that they make use of the nutritional information to assist them in making food purchases.

A study carried out in the UK by Byrd-Bredbenner *et al.* (2000) (n=50), amongst women aged between 25 and 45 years, showed that one-fourth of those surveyed reported that they always read nutrition labels on food packages. This study showed that 80% however reported reading labels the first time they purchased a food, and they postulate that the gap may be because people tend to repeat meal patterns and thus theoretically only feel the need to read a label once. The study also showed that nutrition labels had a strong impact on food purchasing decisions – 92% stated that nutrition labels always or sometimes affected their food purchasing decisions.

In addition, a third of those reading the labels indicated that they stopped purchasing a food product because of information they gained from the label, and approximately one-fourth started buying an item after reading the label.

Twenty-six percent of American shoppers decided to start buying a food product in the past six months because of something they read on the nutrition facts label, and 34% stopped buying products for this same reason (FMI, 2001). An indication that the nutritional content of food products is often an important determinant in buying behaviour and more people are looking at the information, as they become more health conscious.

Using the generation theory, it appears that Baby Boomers (aged 40-58 years) are more likely than Matures (>58 years) to stop buying food products due to the information on nutrition labels.

Eighty-nine percent of the sample that read the food labels, in a study conducted in Ireland by Shine *et al.* (1997b), claimed that sometimes they change their mind, deciding not to purchase the food product. Furthermore 73% claim to use nutrition labels to assist them in product comparisons. It is therefore clear that nutrition labelling does have an impact on consumer purchase decisions.

On the other hand, in the UK, Higginson *et al.* (2002) undertook a verbal protocol analysis study (n=14) to monitor nutrition label use amongst British subjects. Although the researchers acknowledge the limitations of the study due to the small sample size, the study showed that nutrition information was in reality used during the choice of only 4.2% of the products purchased and by only four out of ten subjects. This, despite studies showing that 62% of British adults are aware of nutrition information and between 22% and 59% claim in self-report surveys to look particularly for nutrition information.

A Canadian study amongst university students showed that they appear to place less importance on nutrition information on food labels believing, on average, that nutrition information plays a small but significant role in influencing food purchasing decisions (Smith *et al.* 2000).

5.6 Belief in label information

Another aspect, that some of the research highlights, is the consumers' belief in the information contained on the packaging of food.

Research on trends in the United States (FMI, 2001) found that shoppers do not automatically believe package claims and 86% 'always' or 'sometimes' check the nutrition facts label to verify the claim. Thirty six percent 'always' verify. In addition, the research showed that older shoppers and those who put a great deal of interest into healthy eating are more likely to verify claims by checking the nutrition facts label.

Considering the issue of the amount of information provided on the label, a Norwegian study undertaken by Wandel (1997) showed that although 79% claim to read labels 'often', 'sometimes' or 'always', there is still a feeling of lack of information.

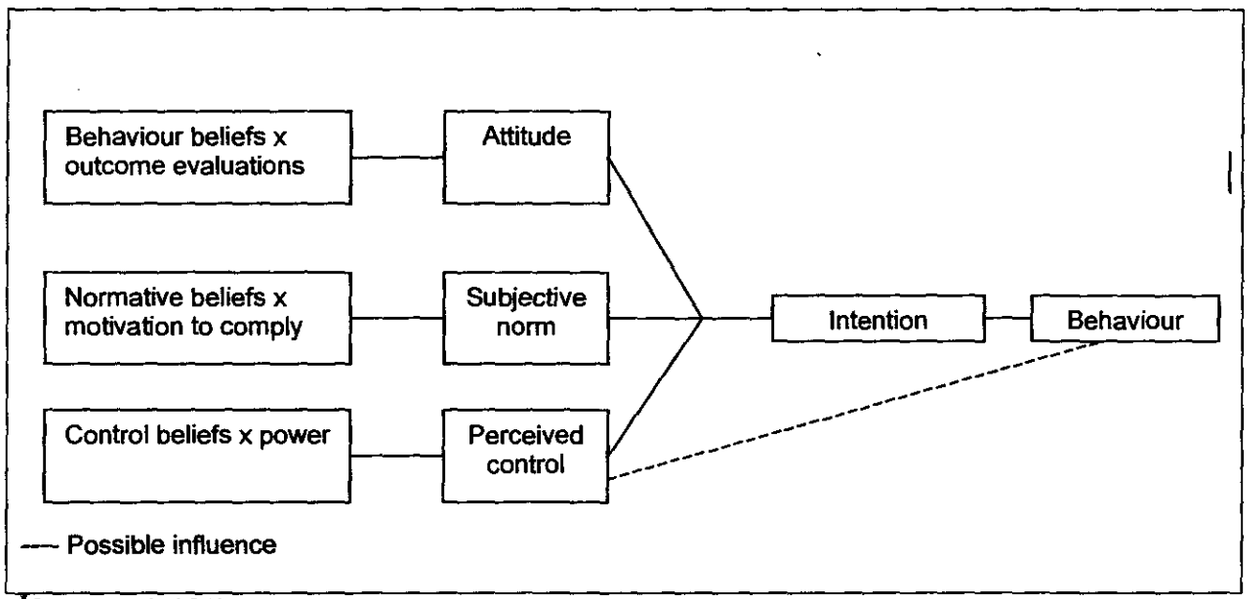
The Canadian National Institute of Nutrition (NIN, 1999) study also found that one of the main issues around nutrition information related to the impression that the information supplied is insufficient or sometimes misleading. Smith *et al.* (2000) found that, amongst Canadian university students, there was greater distrust of the nutrition information panel amongst young men than young women. They also found that the belief in the truthfulness of nutrient claims is not significantly associated with food label use in either gender – food labels are used regardless of the perceived credibility of nutrient claims (Smith *et al.* 2000).

5.7 Effect of attitude on label reading

Attitude is an important factor in label reading practice that must not be underestimated. According to Sheperd (1999), beliefs about the nutritional quality and health effects of a food may be more important than the actual nutritional quality and health consequences in determining an individual's choice.

Likewise various marketing, economic, social, cultural, religious or demographic factors may act through the attitudes and belief held by the individual. It seems therefore that the study of relationships between choice and the beliefs and attitudes held by a person, offers a possible route towards the better understanding of the influence of different factors on food choice. He suggests that the Theory of Planned Behaviour (Figure 2.1) is a valuable model, as it seeks to explain behaviour which is under control of the individual as well as non-volitional behaviours, goals and outcomes and includes a component of perceived control.

Figure 2.1: Schematic representation of the components of the Theory of Planned Behaviour*.



*Sheperd (1999)

Bagozzi *et al.* (2002) write that one of the most important aspects of attitudes is their presumed influence on subsequent behaviour. Attitudes have been conceptualized as an important mediator of behaviour. For example if you have a positive attitude towards the practice of safe sex, you are more likely to behave in a manner consistent with safe sex practices. Given this, attitudes have been viewed as an important means by which to modify or change behaviour. This gives rise to two fundamental issues. First, when do attitudes actually guide behaviour? Secondly, how does one go about changing a person's attitude?

The Elaboration Likelihood Model of persuasion (ELM)(Du Plessis and Rousseau, 2003) predicts that a person's motivation and ability influence which process is most likely to guide persuasion. When individuals possess both motivation and ability, they are more likely to be persuaded by thoughtful elaboration of the issue-relevant persuasive information. Du Plessis and Rousseau (2003), stress that attitude is a learned experience, which therefore implies that a person is not born with attitudes and that attitudes are actually formed during the learning process.

Galef (1996) states that, due to the complicated nature of food choice, he believes that our understanding of the topic will never be as complete as our understanding of the physiological processes that support initiation and termination of feeding bouts. However, he feels that regardless of the difficulties, investigations into food selection must be undertaken as ultimately practical problems associated with feeding behaviour are as a result not only of eating inappropriate amounts, but also of inappropriate food choices.

5.8 Impact of label reading on health status

The key reason, from a public health perspective, for the development of nutrition information on the packaging of food, is to educate and inform the consumer of nutrition related issues pertaining to the particular food, and to provide them with information that empowers them to make healthy choices based on that information.

A study in Ireland, showed that 58% of those interviewed (n= 200) claimed to read nutrition information, and almost two-thirds of those strongly agreed that diet is an important part of their lifestyle, and the majority perceived nutritional content as an important attribute of a food product. Furthermore, a significant association was found between attitudes to the diet-disease relationship and the use of nutrition labelling, with half of those who read the labels strongly agreeing that there is a relationship between diet and disease.

It is interesting to note that the same study found that only 24% of those who use nutrition labels are aware of what constitutes a balanced diet (Shine *et al.*, 1997b).

A Scottish study, by Tessier *et al.* (2000) showed similar trends. They found that 78% of the sample (n= 132) claimed to read labels at least occasionally but that only 11.4% always read them and that even when food labels are read, people do not appear to fully understand them.

Further support for this lack of understanding of labels comes from the Canadian National Institute of Nutrition (NIN, 1999) study that found that the main issue pertaining to nutrition information relates to the overall difficulty understanding or reading the information.

This finding is cause for concern, as the effectiveness of food labels is greatly reduced if consumers are unable to evaluate the nutrition information of food labels in the context of their overall diet.

The researchers conclude with the salient comment that food labels will not have any impact on food choice unless beliefs and the behaviour of consumers regarding food labelling as well as the 'lay perspectives' on health and nutrition, are modified.

Neuhouser *et al.* (1999) also investigated the issue of whether label reading influences the overall diet. They found a significant association between reading of labels and lower fat intakes, and that the key predictor was the belief in the importance of having a low fat diet and the relationship between diet and cancer (Neuhouser *et al.*, 1999).

This concept is supported by Davies (1994), who states that motivation may be affected by ability in so far as those who are more familiar with a subject (possessing greater knowledge) are perhaps in a better position to grasp the personal relevance.

He states that as a population becomes more educated on the importance of healthy eating and living through mass media broadcasts, journals and the popular press, labelling is likely to become an increasingly important issue.

Much research and commentary and even education efforts in the United States, encourages consumers to use the new American food label and demonstrate the variety of ways in which food labels can be used – to compare similar products or different product categories; to evaluate claims; to determine whether a specific nutrient in a product is high or low; to decide how to adjust the diet when adding a specific food or to track the quantitative contribution made by a food to an overall diet. Studies have found that product selection tasks, such as determining the level of specific nutrients in a product and comparing products, are the most frequently reported purposes (Levy & Fein, 1998).

In a series of Food and Drug Administration (FDA) studies (Levy & Fein, 1998), they evaluated the performance characteristics of several proposed nutrition label formats using mock-ups of product labels and asking respondents to perform set tasks. Subjects found about 80% of the nutrient level differences when they compared two products, but when they calculated the quantitative contribution of a product's nutrient level to a dietary recommendation, they were successful only 20% of the time. Overall, performance on the tasks that required making nutrition and dietary judgments was intermediate, and the scores for these tasks were strongly affected by prior knowledge and beliefs. Gender had no statistically significant effects on ability to perform any of the label tasks undertaken.

Anderson and Coertze (2001) also found that in South Africa, comparisons using numerical methods and calculations involving conversion were poorly executed. Peltzer (2001) found that amongst Black secondary school and university students, nutrition knowledge (diet recommendations, sources of nutrients, and diet-disease based relationships) does not influence the choice of everyday foods.

The researchers conclude that food labels appear to be a good tool for making product selections and confirming (i.e. reminding people of) popular nutrition beliefs. However the food label is an inadequate tool for helping people to plan diets, and is unlikely to contribute by itself to a better or more critical understanding of nutrition principles.

These issues are important for educational strategies and seem to show that consumers have difficulty in moving between product level and total diet levels of analysis, therefore consumer nutrition guidance will be more effective if it instructs people how to balance their diets in ways that do not require quantitative tasks (Levy & Fein, 1998).

5.9 Role of education on label reading

A study undertaken by Kessler and Wunderlich (1999) to determine the relationship between use of food labels and nutrition knowledge in people with diabetes, showed that although in comparison to the general consumer, people with diabetes were greater users of food labels, the use of nutrition labels alone without appropriate individualized nutrition modification/goals appeared to have limited influence on increasing nutrition knowledge. This suggests that receiving nutrition education from a healthcare professional in reading food labels leads to a better level of nutrition knowledge and obtaining appropriate nutrients and incorporating a variety of foods into daily meals. It could perhaps be hypothesized that the same would be true for the general public.

The Dietetics Association of Australia emphasizes in its perspective on nutrition labelling (Irwin, 2002) that information on labels is not enough and using nutrition information is only a reality when accompanied by nutrition education. Knowledge of a 'healthy diet' needs to be translated into food choices, and that this requires significantly more resources directed to nutrition education that should include the interpretation of label information and health claims.

They state that for health professionals the main challenges (and opportunities) are to educate consumers on interpretation and use of labels in choosing a healthy diet; and to work with manufacturers to ensure label information is as accurate and meaningful as possible.

Byrd-Bredbenner *et al.* (2000) believe that in order for the label to provide consumers with information of healthy choices, they need to:

- be mandatory for all foods
- include the content of all nutrients of concern
- be in an easy to use and understand format
- place a foods nutrient content in the context of an overall healthful diet
- be based on standardized serving sizes
- clearly define nutrient content claims.

While there is little doubt that the information on food labels can help consumers make sound dietary choices in accordance with recommendations from health authorities, nutrition labels cannot stand-alone. Effective educational initiatives are vital, as consumers need to know how to use the information skillfully (Bryd-Bredbenner *et al.*, 2000).

5.10 Public health outcomes of label reading

Balasubramanian and Cole (2002) state that the underlying hope of the American Nutrition Labelling and Education Act (NLEA) is that if consumers have reliable nutrition information available at the point of purchase, and if they understand how their diet affects their risk of diseases, they will be able to make risk-reducing food choices.

Ultimately, this change in behaviour could reduce the costs to society of treating many medical conditions. This hope reflects the reason for much of the nutrition labelling legislation around the world.

In their extensive study, Balasubramanian and Cole (2002) did not detect any general effect of the new labelling legislation on either consumers search for information or their efficiency in processing the information.

They did however find that there has been an increase in consumer sensitivity of search, recall and choice activities to negative nutrients compared with positive nutrients. They also found that the low motivation, low-knowledge consumers benefited in socially desirable ways.

The researchers make some important points regarding public health and public policy challenges. On the one hand, consumers' failure to use the nutrition facts panel information as intended undermines the benefits of label reading and promoting health; but on the other hand, consumers' willingness to increase the purchase of foods without undesirable nutritional characteristics has positive welfare benefits. The challenge will be to build greater consumer sensitivity for health benefits that stem from positive nutrients, so education initiatives need to emphasise the dysfunctional consequences of consumers not focusing on all foods consumed when reading labels, and they should be encouraged to direct their attention to all nutrients and not just those with a negative link to health (Cole & Balasubramanian, 2002).

This emphasises the fact that nutrition labelling can reinforce healthy eating patterns by providing consumers with information to make knowledgeable choices, however, ideally, nutrition information on the label should be relevant to current dietary guidelines based on nutrition recommendations and health promotion goals. This means addressing the challenge of integrating a quantitative nutrition labelling system with a dietary guidance system composed largely of qualitative messages (NIN, 1999). It must not be forgotten that healthy eating is the sum of the total of all food choices made over time – no one food, meal or even day's meals determines if an eating pattern is healthy.

As much as food labelling is being discussed internationally and Codex Alimentarius is working on setting guidelines, so too is there a groundswell towards the development of food-based dietary guidelines (FBDG's) (Love *et al.* 2001).

FBDGs are seen to possibly offer a more effective public health solution to addressing the massive global burden of diet-related diseases and there is, according to Gibney and Vorster (2001), a growing perception that nutrient-based dietary guidelines are not effective in promoting appropriate diets and healthy lifestyles. This might indeed be because the man in the street thinks in terms of food and not in terms of nutrients (Love *et al.,* 2001).

This must not be forgotten especially as South Africa has recently launched its own unique set of FBDG's (Table 2.4), having followed the process recommended by a joint FAO/WHO expert consultation. These guidelines represent expert agreement on how diet-related public health problems should be addressed by dietary recommendations to consumers, and can and will now be used as a consistent communication tool (Gibney & Vorster, 2001).

The challenge for the regulators and nutrition experts in South Africa, especially considering that we are a society in transition (both in education level and health status), will be to ensure that the draft food labelling legislation and the FBDG's work together to enhance health and promote healthy choices amongst all South Africans, rather than giving further conflicting and confusing information and messages.

Table 2.4: The food-based dietary guidelines for South Africans older than 7 years of age*

❑ Enjoy a variety of foods
❑ Be active
❑ Drink lots of clean, safe water
❑ Make starchy foods the basis of most meals
❑ Eat plenty of vegetables and fruits every day
❑ Eat dry beans, peas, lentils & soya regularly
❑ Chicken, fish, meat, milk or eggs can be eaten daily
❑ Eat fats sparingly
❑ Use salt sparingly
❑ Use food & drinks containing sugar sparingly & not between meals
❑ If you drink alcohol, drink sensibly

* DOH (2004)

CONCLUSION

Health professionals and international health organisations worldwide recommend that people eat a nutritious diet to promote and preserve health. At the same time the development of functional foods is a genuine, albeit if successful, financially rewarding drive from within the food industry. From the international research, it is evident that consumers' attitudes to nutrition are generally positive and they are concerned with nutrition and the impact the foods that they choose can have on their health. Unfortunately, consumers appear to have obtained an incomplete picture of nutrition through nutritional messages that have been received.

A wealth of information exists on the impact of various sources of information, including the "popular" media and food company advertising. In the context of the nutrition labelling, research findings highlight a number of factors which need to be considered:

- Is the message communicated through nutrition labelling clear and not misleading?
- Is nutrition labelling a useful and efficient means of communicating information?
- Is the nutrition labelling format understood by the consumer?
- Does the information result in a positive behaviour change?
- Does the nutrition label information meet the needs of the specific demographics of the population?
- Does the information support the dietary guidelines?

It cannot be disputed that consumer attitudes, beliefs, needs, lifestyles and social trends are reflected in food consumption patterns and so more multi-disciplinary research in these fields should be encouraged, in order to assist in finding answers that will hopefully ultimately lead to improved health for all.

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CHAPTER 3

ARTICLE:
LABEL READING BEHAVIOUR AND ITS IMPLICATIONS FOR FUNCTIONAL FOOD IN SOUTH AFRICA

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LABEL READING BEHAVIOUR AND ITS IMPLICATIONS FOR FUNCTIONAL FOOD IN SOUTH AFRICA

J Badham, JC Jerling, H van 't Riet

School for Physiology, Nutrition and Consumer Science, North-West University, Potchefstroom

Objectives. The objective of this study was to investigate the beliefs and practices of metropolitan South African adults regarding the relationship of food and health and the health information contained on food packaging, focusing on gender, race, age and living standards measure (LSM) differences, in order to consider the implications for functional food in South Africa.

Design. Two thousand South African adults living in metropolitan areas were part of a stratified, random sample that participated in a quantitative questionnaire study administered by trained field workers as a face-to-face interview from amongst seven languages. Before data analysis, the sample was weighted to the 2000 census data. Statements related to beliefs and label-reading practices were investigated using gender, race, age and socio-economic indicator variables. The statements were: I believe food can have an effect on my health; I always look for health information contained on the packaging of food products; I don't take any notice of health information as it is only marketing hype and I buy food that claims to contribute to my health.

Results. The overall response to the belief that food can have an effect on health was positive (54%). There was no practical significant difference between age groups and genders but there were practical significant differences between Blacks, who hold the lowest belief in the food and health link, and the other race groups and between the highest LSM group and the other LSM

groups, with the highest LSM group most likely to believe in the food and health link. Forty two percent of respondents always look for health information on the packaging of food, but there was no practical significant difference between any of the groups. Over half the respondents (51%) take notice of health information on food packaging and do not think it is only marketing hype. There was a significant difference between the genders and Blacks and the other races. A small practical significant difference was found between LSM 7-10 and LSM 2-3, with LSM 7-10 being less sceptical about the health information. Sixty seven percent buy foods that claim to benefit their health and there was a small practical significant difference between Blacks and Whites.

Conclusion. There are differences in beliefs and label reading practices amongst metropolitan South African adults specifically amongst the races and socio economic groups (LSM's). These could have a public health impact and should be considered by the regulators, food industry and nutrition experts in the light of the trend towards encouraging healthier food choices, more comprehensive food labelling and the development of functional foods. Further detailed and multi-disciplinary research should be encouraged in order to assist in finding ways to improve nutritional intake to lead to improved health for all South Africans.

The relationship between food and health has increasingly come to the fore amongst the researchers, health professionals, the media and even the public.

The 2002 World Health Report[1] acknowledged that while some risks to health have diminished, researchers are observing marked changes in patterns of consumption and of living that are leading to the well-accepted concept of 'risk transition', known to impact on global health. These changing patterns are associated with a rise in prominence of diseases such as cancers, heart disease, stroke, diabetes and other conditions linked to obesity.

Already common in industrialized nations, they now have ominous implications for many low and middle-income countries, including South Africa, which are still dealing with the problems of poverty including undernutrition and infectious diseases.[1]

The report shows that although about one fifth of the global disease burden can be attributed to the effects of protein-energy and micronutrient deficiency, almost as much burden can be attributed to risk factors that have substantial dietary determinants – high blood pressure, cholesterol, overweight, and low fruit and vegetable intake.

In 2004 a joint WHO/FAO Expert Consultation on Diet, Nutrition and the Prevention of Chronic Diseases updated recommendations to implement more effective and sustainable policies and strategies regarding the public health challenges related to diet.[2]

In May 2004, the World Health Assembly passed a Global strategy on diet, physical activity and health that urges all stakeholders - governments, international organisations and the private sector - to play a role in addressing the alarming diet related health trends and thereby contribute to major and sustained improvements in people's health around the world.[3]

Many of the recommendations in the strategy suggest providing accurate and balanced information for consumers in order to enable them to easily make healthy choices. This includes food labelling and health claims as well as introducing new products with better nutritional value.[3] By implication, this encourages the development of functional foods and the increased use of on pack nutrition information.

The definition of functional foods that has gained mainstream acceptance is, 'Food similar in appearance to conventional food that is intended to be consumed as part of a normal diet, but has been modified to subserve physiological roles beyond the provision of simple nutrient requirements.'[4] From a public health perspective, the advent of functional foods may allow for the opportunity to achieve a significant improvement in public health as people may be able to reduce their risks of some diseases through the food that they choose to incorporate into their diets. Not surprisingly, functional foods have been reported as the top trend facing the food industry.[5]

Although functional foods will not be the 'magic bullets' against disease, they do provide a new way of expressing healthiness in food choices. Key in understanding the role and value of functional foods, is the consumers reading of the health information on the packaging of the food.

As a result food labelling regulations are being discussed and drafted worldwide. In South Africa, the first draft of the Regulations relating to labelling and advertising of foodstuffs, allows for certain health claims, namely nutrient function claims; enhanced function claims and 13 reduction of disease risk claims.[6] The use of any of these claims will however trigger the need for mandatory nutrition information in a specific format and in general using specific wording. This implies that consumers should read the on pack information, in order to gain information about the claim.

Codex Alimentarius is also discussing the issue of nutrition and health claims and the provision of accurate nutrition information with the specific aim of preventing misinformation.[7]

Internationally studies show that label reading practices are on the increase.[8,9] There appear however to be specific demographic trends and in addition there are a number of other factors that impact on label reading habits. These include, the perception of the importance of nutrition impacting on health; belief in what one reads; attitudes and ultimately buying behaviour.[8-16]

This study examined the label reading behaviour of South African adults based on four statements - I believe food can have an effect on my health; I always look for health information contained on the packaging of food products; I take notice of health information as it is not only a marketing hype and I buy food that claims to contribute to my health - in order to consider the implications for functional food in South Africa. Comparisons were made between the subgroups of gender, race, age and living standards measure (LSM).

METHODS

Subjects

The collection of the data was part of a structured quantitative syndicated questionnaire of South African adults living in metropolitan areas. The study population consisted of South Africans 16 years and older living in the metropolitan areas (Gauteng, Pretoria, Durban/Pietermaritzburg, Port Elizabeth/East London, Bloemfontein, Cape Town). The survey comprised Black, White, Coloured and Indian people and both men and women. It included squatters but excluded live-in domestic workers and hostel dwellers. The sample was comprised of 2000 individuals with a 50/50 gender split of the total sample and was made up of 1000 Blacks, 640 Whites, 240 Coloureds and 120 Indians. The racial composition of the sample is an accepted sampling ratio that allows for both analysis and an acceptable sample error. Before data analysis, the sample was weighted to the 2000 census data of Statistics South Africa[17], thereby ensuring that the results are representative and can be extrapolated.

The sample was a stratified, random sample. Stratified by province and within province, by community size, city, township and suburb. Within each stratum, sampling points were determined by a systematic random selection, based on cumulative population figures per stratum. A starting point per sample point was selected at random. A low integer was randomly selected and the first interview took place at the house with the lowest number ending in the low interger. From this starting point every third household was chosen until a cluster of 5 was completed: Within a household all qualifying members of the household were listed and the qualifying respondent determined by a random selection grid. Only if interviewing the selected respondent was impossible after three calls or if the person refused to participate, were they substituted by someone of the same gender, age and working status, living in the same street.

Interview

Interviews were administered face-to-face at home, in the preferred language of the respondent from English, Afrikaans, Xhosa, Zulu, Tswana, North Sotho or South Sotho. The base language of the questionnaire was English but it was back translated to the other six languages. The interview was carried out by contracted trained field workers, with at least a matric education. A minimum 20% back-check on each interviewer's work, either by personal visit or telephone, was made by the team supervisor to ensure reliability and validity of the data.

Questionnaires

Seventeen food related questions included in the pre-coded questionnaire were designed by a multi-disciplinary team made up of marketers, dietitians, nutritionists and research specialists. The food questions used a 5-point Likert scale that required the respondent to indicate a degree of agreement or disagreement with the proposed statement. Verbal anchor points on the scale ranged from 'strongly agree' or 'very likely' to 'strongly disagree' or 'very unlikely'.

Although statistical analyses were performed on a 5-point Likert scale, for practical purposes, results given as percentages will be reported using a 3-point scale, namely 'agree/likely', 'neither agree nor disagree/neither likely nor unlikely' and 'disagree/unlikely'. These were obtained by combining 'strongly agree/very likely' with 'agree/likely' and 'strongly disagree/very unlikely' with 'disagree/unlikely'.

The statements used in this study were:

1. I believe food can have an effect on my health
2. I always look for health information contained on the packaging of food products
3. I don't take any notice of health information as it is only marketing hype
4. I buy food that claims to contribute to my health.

The variables that were statistically explored for each of the statements were gender, race, age and living standards measure (LSM).[18]

The age variable was divided into three categories, namely 16-29 years, 30-44 years and 45+. The basis for this division was that the researcher believes that generally individuals between 16-29 years are perceived to be less worried about their health and are more likely to be single; individuals between 30-44 years are perceived to be more responsible in their actions and are more likely to have their own families; individuals 45+ years are perceived as likely to have started to feel the impact of the chronic diseases or at least be more concerned about health issues.

The South African Research Foundation (SAARF) universal LSM[18] is a non-racial measurement that distinguishes between living standards or social classes and is widely accepted as a target marketing tool.

Twenty-nine variables are used to yield a composite measure of social class and there are ten LSM groups, ranging from group ten which has the highest living standard to group one, which has the lowest. For the purposes of this study, the LSM groups have been categorized into three broader groups based on common food industry research practice in metropolitan areas, namely LSM 2-3; LSM 4-6; LSM 7-10. LSM 1 is excluded, as it does not occur in metropolitan areas.

Statistical analysis

The data collected by the field workers, was recorded manually and this information was checked by a supervisor and subsequently transferred into a computer database using the package QUANVERT®. STATISTICA® Release 6 was used for statistical analysis. Three questionnaires were excluded from the study due to being incomplete, thus making the total study number used in analysis 1997. Before analysis, the data was weighted to represent the total AMPS® universe.

Frequency tables were drawn up for race, gender, age group and living standard measure (LSM) group and for each of the questions being analysed. Cross tabulations were carried out for each of the questions against race, gender, age group and LSM to identify relationships between the variables. Subsequently means and standard deviations (SD) of variables and subgroups were calculated for each statement. This was followed by performing a one-way analysis of variance (ANOVA) and the unequal N HSD post hoc test. Finally, to determine if statistically significant differences were also of practical significance, a procedure as prescribed by Steyn[19] was used which determines the effect size (d), independent of units and sample size, but related to the spread of the data. Further calculations were made to determine between which groups the practically significant difference existed and a d-value was used to determine effect size as a small effect (d=0.3-0.49), medium effect (d=0.5-0.79) or large effect (d=≥0.8).

RESULTS

Of the total South African population of almost 47 million people, the adult metropolitan population comprises of 10.65 million people. Table 3.1 shows the demographic profile of the South African adult metropolitan population.

Table 3.1: Demographic profile of metropolitan adult (>16 years) South Africans

TOTAL GROUP			GENDER		RACE			
Variables	**Number**	**%**	**Men**	**Women**	**Black**	**White**	**Coloured**	**Indian**
GENDER								
Men	5 352 000	50.3						
Women	5 296 000	49.7						
RACE								
Black	6 127 000	57.5	52%	48%				
White	2 680 000	25.2	50%	50%				
Coloured	1 271 000	11.9	47%	53%				
Indian	570 000	5.4	47%	53%				
AGE GROUP								
16-29 years	4 253 000	39.9	52%	48%	64%	19%	12%	5%
30-44 years	3 430 000	32.2	50%	50%	60%	22%	13%	5%
45+ years	2 965 000	28.0	47%	53%	45%	38%	11%	6%
LSM GROUP								
LSM 2-3	1 095 000	10.3	51%	49%	99%	0.4%	0.5%	0%
LSM 4-6	5 533 000	52.0	52%	48%	83%	2%	12%	3%
LSM 7-10	4 020 000	37.7	47%	53%	11%	63%	15%	11%

Figure 3.1, represents the response of the total study group to each of the statements. Table 3.2 presents the mean responses and weighted sample numbers of the subgroups for each statement.

Table 3.2: Mean response and weighted sample numbers for each statement by demographic subgroup

DEMOGRAPHIC		STATEMENT							
		I believe food can have an effect on my health		I always look for health information		I don't take any notice of health information as it is only marketing hype		I buy foods that claim to contribute to my health	
	Total number of respondents [1]	Mean value[2]	Number of respondents[1]	Mean value[2]	Number of respondents[1]	Mean value[2]	Number of respondents[1]	Mean value[2]	Number of respondents[1]
GENDER									
Male	5352	3.39 *	5288	3.04 *	5304	2.76 *	5239	3.72 *	5301
Female	5296	3.31 *	5232	3.23 *	5251	2.59 *	5163	3.81 *	5227
RACE									
White	2680	3.7 a	2664	2.99 #	2651	2.57 #	2643	3.51 a * #	2651
Black	6127	3.12 □ a b c	6025	3.23 # ♦ ▽	6063	2.78 # ♦ *	5978	3.89 a ♦ □	6036
Coloured	1271	3.59 b	1265	3.07 ♦	1271	2.46 ♦	1220	3.74 * ♦	1271
Indian	570	3.75 □ c	565	2.95 ▽	570	2.56 *	561	3.68 # □	570
AGE									
16-29	4253	3.28 * ♦	4025	3.19 #	4217	2.67	4173	3.73 *	4183
30-44	3430	3.38 * #	3409	3.16 *	3406	2.65	3353	3.81 *	3413
45+	2965	3.46 ♦ #	2906	3.08 * #	2932	2.69	2876	3.76 *	2932
LSM									
2 to 3	1095	3.07 ▽ a	1073	3.18 *	1078	2.98 a *	1048	3.82 *	1087
4 to 6	5533	3.18 ○ b	5444	3.19 ♦	5482	2.74 * #	5382	3.82 #	5450
7 to 10	4020	3.67 ▽ ○ a b	4003	3.06 * ♦	3995	2.5 a #	3972	3.67 * #	3991

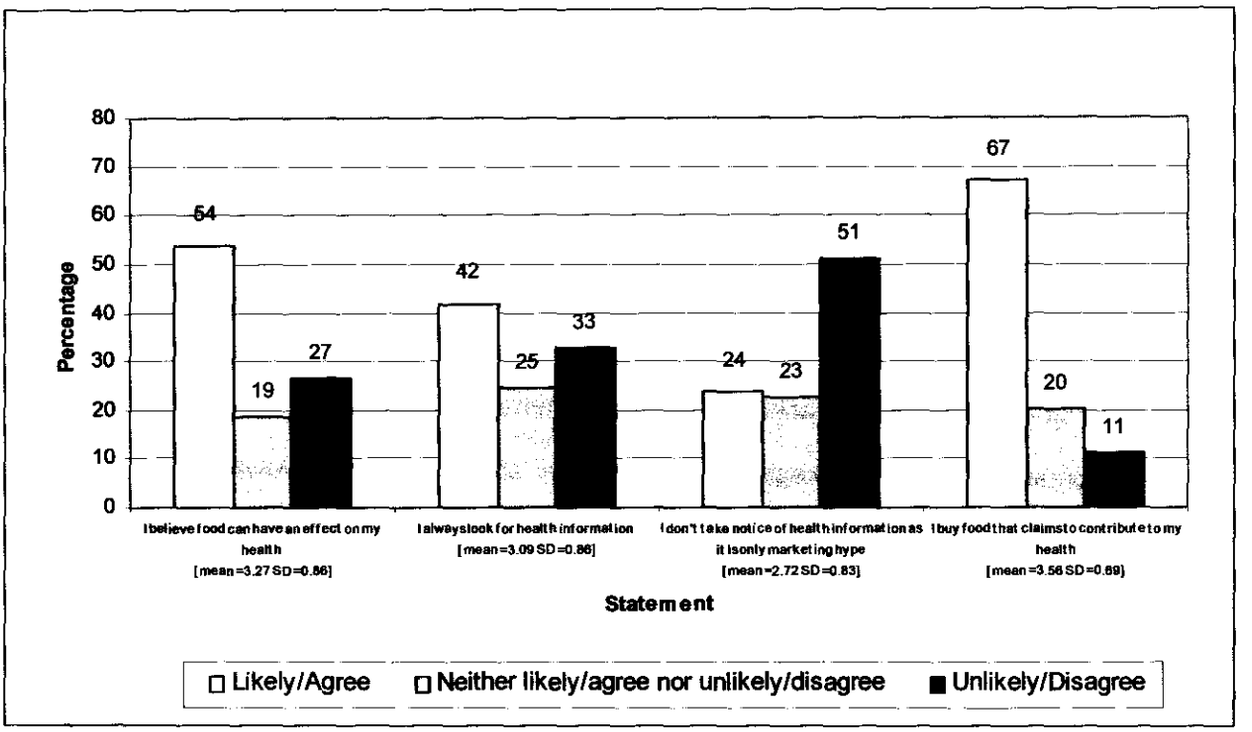
LEGEND

[1]Number of respondents (n) in '000.

Note: The discrepancies between the total number of respondents under the demographics and the number of respondents for each statement is due to the fact that respondents who answered 'Don't know' to the statement were not included in the data analysis

Mean value[2]	Mean value on a 5 point response scale for each separate statement, where: 1 = Very unlikely; 2 = Unlikely; 3 = Neither likely nor unlikely; 4 = Likely; 5 = Very likely	
* ♦ # ▽ □ ○	Means from groups for a particular statement with a symbol in common differ statistically from one another ($p < 0.05$)	
Alphabetical letter	Indicates that the difference between the two groups with the same letter was both statistically significant and practically significant	
Letters a and b	Indicates a small practical significance	d= 0.3 to 0.49
Letter c	Indicates a medium practical significance	d= 0.5 to 0.79

Figure 3.1: South African metropolitan adults response to statements related to label reading behaviour



The belief as to whether South African adults actually believe that food can have an effect on health was explored. Over half the study group (54%) do believe that food can have an effect on health (mean = 3.27), with 27% stating that they do not believe this (Figure 3.1). Table 3.2 shows that there was no practical significant difference between the genders and age groups, indicating that, this view is shared by men and women of all ages. If one converts the results to numbers of South Africans living in metropolitan areas, almost 6 million people believe in the link between food and health and almost 3 million do not.

Of the race groups, the Blacks hold the lowest belief in the food and health link (mean=3.12). The difference between the Blacks and Indians was of medium practical significant difference (d=0.52), and there was also a small practical significant difference in the response between Whites and Blacks (d=0.48), with Whites expressing a stronger belief in the food and health link; and between Blacks and Coloureds (d=0.39) (Table 3.2).

Table 3.2 also shows that LSM 7 to 10 (4 020 000 people) were the most likely to believe in the link between food and health (mean = 3.67), and a small practical significant difference (d= 0.4) was found between this group and LSM 4 to 6 that account for 5 533 000 people (mean = 3.18). A small practical significant difference (d=0.49) was also found between LSM 7 to 10 (mean = 3.67) and LSM 1 to 3 (mean = 3.07). Thus, the highest LSM group had the strongest belief in the link between food and health and this belief decreased with decreasing LSM status.

According to Figure 3.1, when one asks South African metropolitan adults if they look for health information contained on the packaging of foods, 42% state that they always look for this information (4 472 160 individuals). The data presented in Table 3.2 shows statistically significant differences but not practically significant difference in the response between the genders, races, age groups and LSM's. Considering only the gender variable, Table 3.2 shows that women (mean=3.23) are more likely than men (mean=3.04) to always look for health information.

In response to whether or not people take notice of health information on food packaging, just over half (51%) of the study sample, 5 430 480 people felt that the information was not only marketing hype (mean = 2.72) (Figure 3.1). The data in Table 3.2 shows that amongst the age groups there was no significant difference but that a significant difference was found between the genders and between the Blacks and the other three races. As with the belief that food can have an effect on health, a small practical significant difference (d=0.43) was found between LSM 7 to 10 (mean = 2.5) and LSM 2 to 3 (mean = 2.98), with LSM 7 to 10 being less sceptical about the health information . The lower LSM's were associated with a lower frequency of taking notice of the health information on the labels.

Figure 3.1 illustrates that with regard to buying foods that claim to contribute to an individuals health, just over two-thirds (67% or 7 134 160) of South African metropolitan adults responded that they were likely to buy these foods, whilst 20% (2 129 600) were undecided (mean = 3.56). There was a small practical significant difference (d=0.38) in the response between Blacks (mean = 3.9) and Whites (mean = 3.5), with more Blacks agreeing that they buy foods that claim to contribute to health (4 337 000 Blacks versus 1 522 000 Whites).

DISCUSSION

The present study used a questionnaire to investigate metropolitan South African adults responses to four statements pertaining to the belief in the link between food and health, together with label reading practice and impact on purchasing, to consider the implications for functional food in South Africa and possible public health outcomes.

In the light of the report by the WHO/FAO[2] and the subsequent World Health Assembly strategy[3], it can be interpreted as having a positive public health impact that, 54% of adult South Africans living in metropolitan areas, regardless of age and gender believe that food can have an effect (positive or negative) on health. This fact should be taken into consideration when planning any public health strategy.

The South African Health Review 2003/04[20] clearly shows that all race groups are predisposed to chronic diseases. Communication and educational strategies must not overlook the fact that despite the statistical data, almost 3 million South African adults state that they do not believe that food can have an effect on health. Although the difference with the other races was small, less Blacks believe that food can have an effect on health, and as they make up 57.5% of the metropolitan adult population, special attention should be given to them.

This concern is further highlighted by research that shows, that although Americans are concerned with nutrition, the number who are 'very concerned' fell to 46% in 2000. This reflects a steady decline since concern regarding nutrition peaked at 62% in 1994.[14,15]

The majority of the South African population defined as undernourished, are Black children aged between 0-12 years.[22] It can therefore be considered a public health concern that Blacks held the lowest belief in the link between food and health This fact needs to be considered when any diet/nutrition related communication campaign is designed.

In South Africa, LSM[18] is used to distinguish between the socio-economic groups. With regard to the belief in the link between food and its effect on health, it was those adults with the highest living standard that held the strongest belief in the link between food and health. According to Davies[22] motivation may be affected by ability in so far as those who are more familiar with a subject are better positioned to grasp the personal relevance. In South Africa LSM 7-10 has the greatest access to education, satellite television, the internet, and the print media. It may therefore be hypothesised that they are more familiar with the proven link between food and health and attach personal relevance to this knowledge and therefore more strongly link food to affecting their health.

It would seem from studies that the practice of label reading appears to be increasing.[8,9] Since implementing the mandatory Nutrition Facts label in the United States, the percentage of consumers reporting that they almost always read nutrition labels when purchasing food for the first time has steadily increased to almost meet the goal of 85%.[8]

The practice of reading the label is widespread but the extend varies between countries. The Canadian National Institute of Nutrition[9] showed that 70% of Canadians claim to refer to the nutrition information panel 'often or sometimes', while it is reported that 79% of Norwegians 'often' read labels[8].

In the United Kingdom the figures from studies investigating adults particularly looking for nutrition information, range between 22-29%.[23] In contrast only 11% of people in a Scottish study[12] 'always' read the label.

There are more areas of commonality in the demographics of the individuals that read labels. Internationally more women than men[9-13] and more highly educated individuals[9-13] read labels. With regard to age, it is generally considered to be individuals older than 35 years that read labels but with some differences as to the upper cut-off age. [9,11,15]

A survey amongst middle-income White women in Kloof in South Africa by Anderson and Coertze[16] reported that 65% indicated that they read the food label when purchasing food items. This present study found that 45% of adult metropolitan South African women state that they always look for health information of the packaging of foods. Although the difference was not of practical significance, the international trend was followed, with more women than men saying they look for information.

Of interest is that although 54% of adult South Africans believe that food can have an effect on their health, only 42% claim to look for health information on the packaging of foods. This indicates some interest in the food and health relationship, however also shows a gap between belief and practice.

In terms of the draft regulations[6] and the functional food market, that rely on consumers reading labels, there is some cause for concern as over 4 million adult South Africans do not look for health information and so may not be exposed to health messages contained on pack that could positively affect their health.

This concern could be tempered by international research that shows that label reading practice and improved health outcomes are not synonymous. Shine *et al.*[10] reported that in an Irish study only 24% of those who use nutrition labels are aware of what constitutes a balanced diet, while Tessier *et al.*[12] found that even when food labels are read, people do not appear to fully understand them.

These findings imply that the food industry and nutrition experts cannot rely on consumers reading labels in order to make informed judgments as to the foods that they consume. This has a possible public health impact, as the key reason for the development of nutrition information on the packaging of food, is to educate and inform the consumer so that they can make choices based on the information.

If consumers are unable to evaluate the nutrition information on food labels in the context of their overall diet, the effectiveness of food labels is greatly reduced.

It must also be noted that it has been reported in the literature, that people have difficulty in composing healthy daily diets and this is strongly affected by prior knowledge and beliefs. In addition, comparisons that require using numerical methods are not well received and calculations involving conversions are poorly executed.[16,24]

This suggests that food labels appear to be a good tool for making product selections and confirming popular nutrition beliefs, however the food label alone is an inadequate tool for helping people to plan diets, and is unlikely to contribute by itself to a better or more critical understanding of nutrition principles.

In the United States shoppers do not automatically believe package claims and 36% 'always' and 86% 'always or sometimes' check the nutrition facts label to verify the claim. In addition, older shoppers and those who put a great deal of interest into healthful eating are more likely to verify claims by checking the nutrition facts label.[15]

It appears, although more detailed research is necessary, that South African adults, regardless of age believe that the information on food packaging is not only marketing hype. This finding places a great responsibility on the food industry to ensure that the information included on pack is not false and supports the need for regulations[6] to provide evidence-based guidelines and definitions.

An interesting finding of this study was that the lower LSM groups took less notice of health information on pack. Once again, considering Davies' theory[22], one might hypothesise that the lower LSM's having less access to information and knowledge, are less able to see the personal relevance of the information and so are less likely to believe the information. Based on the research pertaining to attitude and its impact on buying behaviour[25] another hypothesis could be that as attitude determines behaviour and is understood to be a learned experience, and the lower LSM's have less access to education; their attitude to on pack information is more skeptical. These are however only hypothesis and there could be other reasons for this result. More detailed research into the differences in beliefs and perceptions between the LSM groups would be valuable.

The results of the present study showed that just over two-thirds (67%) of the metropolitan adults responded that they are likely to buy foods that claim to contribute to their health and more Blacks than Whites stated that they purchased foods making a health claim. This is of particular interest considering that Blacks were the least likely to believe that food could have an effect on health. This indicates some conflict, however the study did not explore the statements and more research into when and why claims lead to purchasing decisions should be undertaken to give greater insight.

Of interest is the finding that 20% of adult South Africans are undecided as to whether or not they buy foods claiming to contribute to their health. From a public health perspective, this indicates that there are not only a large number of South Africans (6 million) that do not currently read labels, but there are also many (2 million) that need to be persuaded to consider foods that contain a health claim in order to encourage food choice decisions that could potentially positively impact on health.

According to research done by Shine *et al.*[14] in Ireland - quality, taste and nutritional value are of similar importance to consumers and are of higher importance than brand and convenience. In the United States, although the interest in the nutrition value of foods is up, it still takes second place behind taste.[15]

Anderson and Coertze's South African study[16] showed that women regarded price and habit as important factors in food purchasing, but felt that nutritional information could under certain circumstances rival price. The research showed that greater use is made of the nutrition information on the labels when purchasing a new product, as against regular purchasing.

This finding is supported by the research of Byrd-Bredbenner *et al.*[8], amongst women aged between 25 and 45 years, that found 80% reported reading labels the first time they purchased a food. Both groups of researchers postulate that this may be because people tend to repeat meal patterns and thus theoretically only need to read a label once.

The Byrd-Bredbenner *et al.*[8] study also showed that nutrition labels had a strong impact on food purchasing decisions with 92% of the sample stating that nutrition labels always or sometimes affected their food purchasing decisions. Another study found that approximately 26% of shoppers decided to start buying a food product in the past six months because of something they read on the nutrition facts label and 34% stopped buying products for this same reason.[15]

CONCLUSION

Findings from this study indicate that adult metropolitan South Africans label reading practices are influenced by a number of factors including attitudes and beliefs and that there are differences based most specifically on race and LSM. In addition, the results together with the literature, suggest that using nutrition information on the packaging of food to improve health outcomes is probably only a reality when accompanied by nutrition education that gives due consideration to the factors influencing the individuals practices. These influencing factors must be considered by regulators, the food industry and nutrition experts, if the recommendations made in the WHO Global strategy on diet, physical activity and health are to positively impact on public health.

Food consumption patterns are influenced by consumer attitudes, beliefs, needs, lifestyles and social trends and so more multi-disciplinary research in these fields must be encouraged to find ways to improve nutritional intakes that will lead to improved health for all South Africans.

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CHAPTER 4

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS AND RECOMMENDATIONS

INTRODUCTION

The main findings of the study reported in this dissertation will be summarised in this final chapter, together with some general conclusions and recommendations to those involved (government, industry, researchers, nutrition experts / dietitians) in the field of functional foods.

Only general discussion and conclusions will be made in this chapter, as each of the results of the study are presented, discussed and interpreted in comparison to the available published literature in the preceding chapters.

SUMMARY OF MAIN FINDINGS

The effect of food on health

- Over half the study group (almost 6 million people) believed that food can have an effect on health. There was no practical significant difference between the genders and age groups.
- Of the race groups, the Blacks hold the lowest belief in the food and health link. The difference between the Blacks and Indians was of medium practical significant difference and there was also a small practical significant difference in the response between Whites and Blacks, with Whites expressing a stronger belief in the food and health link; and between Blacks and Coloureds.
- The highest LSM group (LSM 7-10) had the strongest belief in the link between food and health and this belief decreased with decreasing LSM status.

Label reading

- 42% of metropolitan adults (almost 4½ million individuals) state that they always look for health information on the packaging of food and there was no practical significant difference between the genders, races, age groups and LSM's.
- Although the difference was not of practical significance, women were more likely than men to always look for health information.

Taking notice of label information

- Just over half (51%) of metropolitan adults, 5 430 480 people, regardless of age, felt that the information on the packaging of foods was not only marketing.
- LSM 7-10 was less sceptical about the health information on food packaging than LSM 2-3. The lower LSM's were associated with a lower frequency of taking notice of the health information on the labels.

Purchasing

- Just over two-thirds of South African metropolitan adults (some 7 million) say they are likely to buy foods that claim to contribute to their health.
- Just over 2 million people are uncertain as to whether they would buy foods that claim to contribute to their health.
- More Blacks agree that they buy foods that claim to contribute to health than Whites. In actual numbers, almost 4½ million Blacks state that they buy foods with health claims as against 1½ million Whites.

CONCLUSIONS

From the available literature it is evident that there is justifiable concern over the health status of the worlds' population and the negative impact that diet and lifestyle changes are having on many disease profiles. Special concern is cited for low and middle-income countries, including South Africa, which are still dealing with the problems of poverty such as undernutrition and infectious diseases.

These together with the 'risk transition' associated rise in prominence of diseases such as cancers, heart disease, stroke, mental illness, diabetes and other conditions linked to obesity creates an even more concerning problem.

In response to these concerns, the World Health Organisation (WHO) have developed recommendations for governments and the private sector to encourage more effective and sustainable policies and strategies to deal with the increasing public health challenges related to diet.

Many of these strategies include reference to comprehensive food labelling and the development of functional foods. However the research in these fields, shows that neither, on their own will solve the problems and each come with inherent drawbacks and limitations. Many of the problems experienced globally, are related to consumer beliefs and attitudes and the challenges of behaviour change.

The findings from this study indicate that South Africa is no different, and although there is an acceptance of the diet and health link, this is not enough to result in diligent label reading and ultimately the selection of foods offering health benefits.

Adult metropolitan South Africans label reading practices are influenced by a number of belief factors and there are differences based most specifically on race and living standards measure (LSM). These must be considered by all the stakeholders (regulators, the food industry, nutrition experts / dietitians and possibly even educators) if we are going, through regulations and functional foods, to empower people to effectively reduce their risk of many chronic diseases through readily available, good-tasting diets rather than through the use of curative measures only - thereby positively impacting on public health.

RECOMMENDATIONS

The development of the category, functional foods and the trend towards the allowance of certain health claims and more comprehensive food labelling, all with a real potential to positively impact on public health, is exciting and should be embraced. However as with any new developments, there should be some caution. Each of the role players involved carry a certain responsibility and face potential challenges that need to be addressed so that ultimately these developments will lead to improved health for all.

Regulators

- Although international food labelling harmonisation is a laudable concept and will indeed assist in issues of world trade, it is important to remember that each country has it's own set of public health issues and unique consumers. It is not without purpose that many Codex documents refer to the need 'to be consistent with national nutrition policy'. This must continue to be the case.
- Consumer research should become a more prominent part in the drafting of regulations in order to assess the beliefs and attitudes towards many of the components that nutrition experts take for granted. For example, what are consumers key food label concerns? Do consumers understand the draft format for the provision of nutrition information? Apart from being considered at the drafting stage, the results of such studies should be incorporated into well-planned and targeted education programmes that must run parallel to the launching of regulations.
- As consumers do take notice of health information on food packaging and do not consider it to be only marketing hype, it is critical that regulations ensure that the information allowed is firmly based in the best available scientific evidence and that there are sufficient powers for enforcement of the regulations.

- Within the Department of Health, there are numerous different directorates, but all with the same ultimate vision – affordable, good quality health care for all South Africans - it is important that there is an open line of communication between these groups in order to ensure that activities support one another. For example, consideration needs to be given as to how the food-based dietary guidelines can be incorporated into health claims.

Food industry

- Two-thirds of adult South Africans in metropolitan areas claim to buy foods that offer a health benefit. This is an indication that there are opportunities for functional foods in South Africa. The caveat is that only 42% always look for health information on pack. More than the product label has to be used to communicate health messages.
- The research did not explore consumers understanding of 'foods that claim to contribute' to health. The literature shows that functional foods may have a different image in the consumers' mind than other health-related products. It is thus imperative to carry out research into the kind of associations consumers have with these products.
- Over half of the consumers take notice of health information of food packaging and do not see it as only marketing hype. Although the research did not investigate what consumers notice or what they associate it with, from a public health perspective, it indicates that a great deal of responsibility might be placed on food manufacturers to ensure that the information that is given, is indeed based on the latest available scientific evidence.
- From the beginning of the functional food development process, partnerships with scientists, public health nutrition experts, consumer scientists and communication specialists are essential. The development of functional foods is not the domain of only the food technologists and marketers.

- Nutritional research will only pay off if it is closely integrated with an in-depth understanding of the consumer. The research funnel should start with consumer beliefs, attitudes, perceptions and needs and then narrow down to the final functional food.

Nutrition experts / dietitians

- Considering the magnitude of the health problems directly related to diet that the worlds' population is experiencing, nutrition experts and dietitians need to play a more active role in affecting positive behaviour change. They have many of the unique skills needed to educate consumers regarding – the food and health link; understanding functional foods; authenticity of health claims; reading and interpreting food labels and integrating quantitative and qualitative health messages.
- In the past nutrition experts have recommended the use of certain types and avoidance of other types of foods, without mentioning particular products (for example, 'choose low-fat foods'). However with the development of functional foods there needs to be an openness to accepting the specific positive effects caused by particular food products (for example, 'Flora Pro.activ can lower cholesterol by 10-15%').
- The development of the functional food category and the trend towards food labelling that allows for health claims means that evidence based practice will become even more essential.
- More than ever before there is the need to stay up-to-date with the latest developments in science and food technology and to accept that nutrition developments will be powered by technology and insights available from other disciplines, such as informatics, pharmacology, engineering and genomics.