

Food label knowledge: a comparison between a developing and developed country context

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Declaration

I, Susara Carolina Havenga, hereby declare that:

FOOD LABEL KNOWLEDGE: A COMPARISON BETWEEN A DEVELOPING AND DEVELOPED COUNTRY CONTEXT

is my own work and that this dissertation submitted for degree purposes at the North-West University has not previously been submitted for degree purposes to any other higher education institution and that, except for sources acknowledged, the work is entirely that of the researcher.

SC Havenga

17 October 2014

Preface

The article format was selected for this dissertation. The study reported on in this dissertation was planned and executed by five researchers, and the contribution of each is acknowledged in the table below. A statement from the co-authors of the article (Chapter 3) is also included, confirming their role in the study and giving their permission for the inclusion of the article in this dissertation. The article is to be submitted to *Cross-Cultural Research*. A copy of the guidelines for authors of *Cross-Cultural Research* is included in Annexure F.

Name	Role in the study
Ms SC Havenga	Responsible for the literature searches, data collection, statistical interpretation, text drafting and writing of dissertation.
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Prof. MJC Bosman	Co-supervisor Critically reviewed the article and dissertation
Prof. M Warnock	Co-supervisor Critically reviewed the article and dissertation Data collection in Fayetteville
Dr SE Ellis	Responsible for statistical analysis

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 this article may be published as part of the M dissertation of Ms SC Havenga.

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Dr SE Ellis

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Opsomming

Die doel van hierdie studie was om die subjektiewe en objektiewe kennis van verbruikers in Potchefstroom (Suid-Afrika) en Fayetteville (Arkansas, VSA) rakende voedseletikette te bepaal en te vergelyk, teen die agtergrond van 'n ontwikkelende en 'n ontwikkelde land. Die vraag is gevra of hulle kennis verskil en of verbruikers se demografie met hulle kennis in verband met voedseletikette verband hou. Geen spesifieke navorsing is tot dusver oor kennis rakende voedseletikette in 'n vergelyking tussen 'n ontwikkelende en 'n ontwikkelde land gedoen nie.

'n Kwantitatiewe studie met doelgerigte steekproefneming is onder die respondente in hierdie verband gedoen deur middel van vraelyste wat tydens 'n onderhoud ingevul is. Beskrywende en inferensiële statistiek is toegepas. Die totale steekproef (N = 713) het respondente van Suid-Afrika ('n ontwikkelende land) en die Verenigde State van Amerika ('n ontwikkelde land) ingesluit, met spesifieke verwysing na respondente van Potchefstroom (n = 400) en Fayetteville (n = 313). Die navorser het daarna gestreef om respondente uit elke etniese, demografiese, geslags- en ouderdomsgroep in te sluit.

Geen verskille is aangetref ten opsigte van die respondente se subjektiewe kennis (SK) van voedseletikette nie. Slegs prakties betekenisvolle verskille ten opsigte van objektiewe kennis (OK) vir die faktore rakende die opspoor van inligting (OK-L), manipulering van inligting (OK-M) met 'n soortgelyke patroon vir simboolinligting (OK-S) is met betrekking tot die respondente van Potchefstroom en Fayetteville bevind, alhoewel respondente van Fayetteville bogemiddelde tellings ten opsigte van OK-L, OK-M en OK-S gehad het. Dit dui daarop dat die respondente van Fayetteville meer kennis gehad het van hierdie faktore as respondente van Potchefstroom. In die studiepopulasie is goeie OK slegs onder goed opgeleide jong respondente van Potchefstroom waargeneem, terwyl respondente uit Fayetteville hoë kennisvlakke getoon het, ongeag hulle demografiese veranderlikes.

Daar is waargeneem dat die respondente van Potchefstroom nie oor soveel kundigheid (OK-L, OK-M en OK-S) beskik het as die respondente van Fayetteville nie. Die resultate van hierdie studie dien as bewys vir die behoefte daaraan om kennis rakende voedseletikette in die Potchefstroom-verband te verbeter, en bring soortgelyke behoeftes in ander ontwikkelende lande ter sprake. Daar kan tot die slotsom gekom word dat opvoedkundige pogings ontwikkel en geïmplementeer moet word met die doel om kennis rakende voedseletikette onder verbruikers van ontwikkelende lande te verhoog, aangesien OK 'n invloed op gesondheid het. Die ontwikkeling van opleidingsprogramme vir verbruikers moet fokus op kwesbaarheid soos geïdentifiseer met betrekking tot die betrokke ouderdomsgroepe en opvoedingspeil sowel as die

probleme wat geïdentifiseer is ten opsigte van die inligting oor etikette en simbole waarvolgens verbruikers optimale kennis omtrent voedsel-etikette kan hê, asook hoe om hierdie etikette vir beter besluitneming en gesondheid te gebruik.

Hierdie navorsing oor kennis insake voedsel-etikette in Suid-Afrika en die Verenigde State van Amerika kan as grondslag dien vir toekomstige studies oor hierdie onderwerp in ontwikkelende en ontwikkelde lande. Dit kan bydra tot beter begrip van die faktore wat tot verbruikers in die ontwikkelende lande se verwarring, wantroue en 'n gebrek aan begrip van die inligting vervat in voedsel-etikette lei. Demografiese eienskappe, die lees van voedsel-etikette en gesondheidsverwante faktore wat tot beter kennis kan bydra kan ook verder ondersoek word tydens die ondersoek van spesifieke behoeftes onder sekere groepe in ontwikkelende lande ten opsigte van hulle kennis van voedsel-etikette.

Abstract

The aim of this study was to determine and compare the subjective and objective food label knowledge of consumers from Potchefstroom (South Africa) and Fayetteville (Arkansas, USA), therefore in a developing and developed country context. The question was asked whether the knowledge of consumers in such contexts differed and whether consumers' demographics are associated with their food label knowledge. No specific research on food label knowledge has been done in a comparative context between a developing and developed country previously.

A quantitative study using purposive sampling was conducted among respondents in these contexts by means of interviewer-administered questionnaires. Descriptive and inferential statistics were applied. The total study sample (N = 713) included respondents from South Africa (a developing country) and the United States of America (a developed country) with specific reference to respondents from Potchefstroom (n = 400) and Fayetteville (n = 313). The researcher strived to include respondents from each ethnic, demographic, gender and age group.

No differences were found regarding respondents' subjective knowledge (SK) of food labels. With respect to respondents from Potchefstroom and Fayetteville, practically significant differences regarding objective knowledge (OK) were found only within the factors of locating information (OK-L) and manipulating information (OK-M) with a similar pattern for symbol information (OK-S), although respondents from Fayetteville had higher mean scores for OK-L, OK-M and OK-S, which indicates that respondents from Fayetteville were more knowledgeable on these factors than respondents from Potchefstroom. Within the study populations, better OK was only observed among respondents from Potchefstroom who were young and well educated, whereas respondents from Fayetteville had high levels of knowledge regardless of demographic variables.

It was observed that respondents from Potchefstroom were not as knowledgeable (OK-L, OK-M and OK-S) as respondents from Fayetteville. The results from this study serve as evidence for a need to improve food label knowledge in the Potchefstroom context, and raise the question about similar needs in other developing countries. It can be concluded that educational efforts should be developed and implemented to increase objective food label knowledge among consumers from developing country contexts, as OK may have an impact on health. Development of consumer education programmes should focus on the vulnerabilities identified with regard to age and education groups as well as the problems identified regarding label and

symbol information provided, whereby consumers might acquire optimal food label knowledge to use these labels for improved decision-making and health.

This research about food label knowledge in South Africa and the United States of America, may serve as a foundation for future studies to be conducted in developing and developed country contexts. This might result in a better understanding about factors that contribute to consumers' confusion, distrust and lack of understanding of food label information, which may hinder food label knowledge in developing country contexts. Demographic, label-reading and health-related factors that may contribute to increased knowledge could also be further explored in addressing specific needs among particular groups in developing country contexts regarding their food label knowledge.

Keywords

Consumer

Demographics

Food labeling

Food label knowledge

South Africa

United States of America

List of Acronyms

AHA	American Heart Association
AIDS	Acquired immunodeficiency syndrome
CHD	Coronary Heart Disease
DOH	Department of Health
DV	Daily Value
EC	European Community
EU	European Union
EUFIC	European Union Food Information Council
FDA	Food and Drug Administration
g	Gram
GED	General Education Diploma
GMA	Grocery Manufacturer's Association
HIV	Human immunodeficiency virus infection
kJ	KiloJoule
KCAL	KiloCalorie
KMO	Kaiser-Meyer-Olkin
MG	Milligram
MSG	Monosodium glutamate
NLEA	Nutrition Labelling and Education Act
OK	Objective knowledge
OK-H	Objective knowledge health claims
OK-L	Objective knowledge locating information
OK-M	Objective knowledge manipulating information
OK-N	Objective knowledge nutrient claims
OK-S	Objective knowledge symbols
SA	South Africa
SK	Subjective knowledge
SK-F	Subjective knowledge food label information
SK-G	Subjective knowledge general information
UK	United Kingdom
USA	United States of America
USDA	United States Department of Agriculture
WHO	World Health Organisation

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Chapter 1: Introduction

1.1 Background and motivation

Food contributes significantly to consumers' lifestyle, in providing pleasure and in fulfilling consumers' energy and nutritional requirements (Drichoutis *et al.*, 2008:141) through appropriate food choices. In order for consumers to make informed dietary decisions, they need nutrition information on food labels (Borra, 2006:1235S; Byrd-Bredbenner *et al.*, 2000:615), as well as thorough food label knowledge, since these might influence their consumption patterns (Marietta *et al.*, 1999:445) and overall health (Fusaro & Toops, 2012; Houston & Venkatesh, 1996).

Consumers' understanding of food and food production and their attitudes towards health and diet form part of a multi-disciplinary and increasingly important research area in consumer science (Patermann, 2007 in EC, 2007). There is little literature regarding consumers' food label knowledge in general and within the South African and United States of America consumer context in particular. Previous research (Block & Peracchio, 2006:188; Cowburn & Stockley, 2005:21; Drichoutis *et al.*, 2006:1; Gorton *et al.*, 2008:1359; Marietta *et al.*, 1999:445) centred on consumers' knowledge regarding nutritional information on labels, and not the overall knowledge of food labels. This lack in literature, the need in consumer science for information on consumers' food behaviour (Patermann 2007, in EC, 2007) and the paucity of knowledge regarding food labels motivated this study. The only study on food label knowledge in the South African context was done by Van der Merwe *et al.* (2012). Anderson and Coertze (2001:28) did a similar study in the South African context; however, that was aimed at nutrition label knowledge.

1.1.1 Food labels as an information source

Consumers live in a world where communication options and their preferences of communication are expanding rapidly (Schiffman & Kanuk, 2010:20). Food labels are one of these communication resources and refer to any pictorial, brand, mark, tag, graphic or other descriptive matter, which is written, marked, stencilled, embossed, printed, impressed upon, or permanently attached to a container of a foodstuff (RSA, 2010:10). These labels are considered the most suitable source of information for consumers to acquire knowledge about food (Ali & Kapoor, 2009:725) and may thus serve as a valuable source of information for consumers.

The primary role of food labels is –

- to inform consumers by communicating nutrition information (Mackinson *et al.*, 2010:210);
- to assist in selling food products by providing product information (Cheftel, 2005:531) and
- to guide dietary behaviour (Lin & Lee, 2004:180; Mackinson *et al.*, 2010:210; Tarasuk, 2006:1217).

Modern food labels are developed to inform consumers regarding factors such as food preservation technologies, mass industrial food production, and the development of packaging (Cheftel, 2005:531). Food label information thus has the potential to be transferred into knowledge about food and nutrition, and it serves as an educational source for consumers, especially with respect to those who might lack knowledge regarding nutrition (Barreiro-Hurle *et al.*, 2008:190). In order for them to benefit optimally from food labels as an information source, consumers must consult the label, which can only occur if consumers have sufficient food label knowledge. Canavari and Nayga (2009:135) suggest that research should assess the main determinants of food label knowledge, which was addressed in the present study by determining associations of consumers' food label knowledge together with their demographic and other general characteristics, and variables such as frequency of main grocery purchases.

1.1.2 Problems that consumers face regarding food labels

Consumers are challenged with increased availability of nutrition and health information on food labels (Barreiro-Hurle *et al.*, 2010a:426), resulting in an information overload and a greater possibility of confusion (Lee & Lee, 2004:177). Consumers also tend to have a form of distrust in the accuracy and truthfulness of food labels (Misra, 2007:2131). Furthermore, research by Barreiro-Hurle *et al.* (2010a:426) suggests that consumers do not understand the information, although they demand nutrition and health information. It is thus imperative to understand which information consumers regard as important, what they understand, and what confuses them in order to determine consumers' knowledge of food labels. By determining consumers' food label knowledge, insight might be gained about the problems consumers face with regard to food labels, after which it can be attempted to bridge these problems. These possible problems or queries, as well as information regarding consumers' knowledge of food labels might be used as a criterion for food label education programmes, or other attempts to increase consumers' food label knowledge.

1.1.3 The relevance of consumer behaviour in terms of food label knowledge

Consumer behaviour is the behaviour that consumers display when they use, purchase, evaluate, and dispose of products and/or services, which they expect to satisfy their wants and needs (Schiffman & Kanuk, 2010:23). Although consumer behaviour was not the concern of this study, certain types of food label behaviour might be influenced by consumers' food label knowledge, or their behaviour might influence the acquisition of food label knowledge. Consumers' expectations, motivation, use, purchase and consumption decisions as well as their memory and comprehension, which might influence food label knowledge, are subsequently discussed.

1.1.3.1 Consumers' food label knowledge as linked to their expectations

Consumers expect food labels to provide accurate ingredient lists and health claims in order to make informed choices (Block & Peracchio, 2006:189). Food labels, however, have a limited function when consumers do not read, use or understand labels (Lin & Lee, 2004:33), or have insufficient knowledge of such labels. Therefore, this study attempted to provide insight about consumers' food label knowledge. When consumers have knowledge of food labels, they may also become aware of certain expectations that they have regarding food labels. Although not addressed in this study, these expectations need to be met by the food industry to ensure consumer satisfaction (BCS, 2012; Sheth & Mittal, 1996:137).

1.1.3.2 Motivation to obtain food label knowledge

Motivation is the driving force of consumers, which moves them into action (Schiffman & Kanuk, 2010:106). This driving force is the product of a tension state, which is created by an unfulfilled need (Schiffman & Kanuk, 2010:107). When consumers' needs are not fulfilled, it impels them to move into action; thus, motivating them to fulfil the specific need, such as the acquisition of food label knowledge. Once it is clear that their knowledge is not satisfactory, consumers might have intrinsic motivations to obtain knowledge (Osterloh & Frey, 2000:546), which might also be applied to food label knowledge. This motivation might not be restricted to obtain knowledge, but also to use food label information for various purposes, which might be health- and diet-related (Lin & Yen, 2008:437). Once consumers are, for example, aware of the prevalence of a disease, they might be motivated to modify their diets to inhibit the development of such a disease (Heimendinger & Van Duyn, 1995:1397S), which underscores the importance of food label knowledge and the need for research in this regard.

1.1.3.3 Interaction between food label use and food label knowledge

Knowledge regarding a particular food product may convince consumers to use that product, although they might not prefer it, with respect to its taste and similar attributes (Wansink *et al.*, 2004:266). Information found on food labels regarding quality, production and storage processes as well as nutrition is also important when determining the likelihood of consumers' use of food labels (Ali & Kapoor, 2009:724), and in order to increase consumers' label knowledge, their label use should increase (Drichoutis *et al.*, 2005a:23). Conversely, consumers who have more food label knowledge are more likely to use these labels, and consider mandatory food labelling as beneficial (Garcia *et al.*, 2007:161). Consumers who are more health and nutrition conscious are also more apt to use food labels (Drichoutis *et al.*, 2006:i), which might, in turn, influence their nutrition label knowledge, and motivate them to acquire the necessary food label knowledge. Sufficient food label use may then occur for consumers' benefit when they have adequate knowledge of food labels. Thus, food label knowledge may influence food label use, and vice versa.

1.1.3.4 Interaction between purchase and consumption behaviour and food label knowledge

Food label knowledge may assist consumers when making food-related purchases and consumption decisions. Consumers who read food labels are influenced by these labels during their purchasing decisions (Van der Merwe *et al.*, 2012:403), in that they might use food labels to evaluate a food product before consumption (Borgmeier & Westenhoefer, 2009:184). Purchasing decisions can influence consumers' consumption behaviour (Blackwell *et al.*, 2006:70) by either changing or increasing the consumption of a product (Godwin *et al.*, 2006:82), such as the increase of fruit and vegetables for a more healthy lifestyle (Heimendinger & Van Duyn, 1995:1397S). It can thus be expected that sufficient food label knowledge might positively influence food purchase decisions and consumption in favour of healthier product alternatives.

1.1.3.5 Memory and comprehension as part of food label knowledge

Memory, comprehension and knowledge are inseparable concepts. *Memory* can be divided into two sections: short-term memory (also referred to as "working memory") and the long-term memory. The working memory may hold information for a brief period and can only store about seven items (Sternberg, 2006:165). However, long-term memory stores and retains information for extended periods (Schiffman & Kanuk, 2010:226).

Comprehension refers to consumers' ability to understand the meaning of concepts and to interpret the required information (Wang & Garfurov, 2010:1). This definition of

comprehension may also be applied to consumers' comprehension of food label information. Several difficulties may be experienced when information is incompletely or incorrectly comprehended (Sternberg, 2006:160). Therefore it is important that food label information should be clear, correct and easily readable (EC, 2006:2) to enhance the possibility of comprehension of the label. Memory is needed for knowledge to reach its optimal potential, since knowledge gaps are defined as an "absence of information in memory" (Blackwell *et al.*, 2006:363). The consumer should have memory of food label information in order to obtain knowledge in this regard. Memory will aid the consumer to comprehend food labels, since information cannot be obtained sufficiently to become knowledge if a concept is not comprehended (Carlson *et al.*, 1992:129). Due to the importance of memory in establishing food label knowledge, the concept of memory could not be disregarded in the present study.

1.1.4 Education as resource to increase food label knowledge

Education efforts could be developed with the aim to increase consumers' food label knowledge. These efforts should focus on improving consumers' food label knowledge and bringing it in line with their personal food choices (Guenther *et al.*, 2005:1273). These efforts should be aimed at consumers less likely to use nutrition labels (Garcia *et al.*, 2007:172) in order to increase their knowledge in this regard. To ensure that consumer education occurs sufficiently, tailor-made education programmes should be developed for particular target markets (Unusan, 2004:636). Food label education programmes should start with nutrition background, which consumers may then implement during their label reading and purchasing (Van der Merwe *et al.*, 2012:403). It is suggested that a food and nutrition labelling programme needs to be developed in South Africa (SA), as also requested by consumers (Anderson & Coertze, 2001:28), since there is no such programme available because no program has been developed. Since consumers' objective and subjective food label knowledge was determined in the present study, the possible need for food label education programmes among the consumer groups under investigation, was identified which could ultimately benefit consumers (see 4.6.1).

1.1.5 Health profile of South African and United States of America consumers as influenced by diet

The health profile of consumers from SA and consumers from the United States of America (USA) will be discussed subsequently.

1.1.5.1 Health profile of consumers in the North-West province in South Africa

Since food consumption has a significant impact on consumers' health profile, it is important to refer to the health profile of consumers in the context of this study. Research has been

conducted on consumers' health profile with regard to cardiovascular health (Malan *et al.*, 2006:305), obesity (Kruger *et al.*, 2001:86; Kruger *et al.*, 2002:427; Kruger *et al.*, 2005:365) and other health-related issues (Vorster *et al.*, 2000:505) in the greater North-West province (NWP) of South Africa. There have been significant changes in consumers' food consumption patterns in this province (Kruger *et al.*, 2005:365). These dietary changes were associated with the urbanisation of consumers in the NWP (MacIntyre *et al.* 2002:249) and with changes in the prevalence of diet-related health concerns. A lack of variety often characterises lower-income consumers' diets, since they have less access to stores with a wide range of foods at reasonable prices (Kruger *et al.*, 2005:373). African consumers in the NWP with higher socio-economic status in wealthy areas have higher nutrition status, better health behaviours (in terms of HIV/AIDS infection, drinking and smoking), lower mean blood pressure and greater psychological wellbeing (Vorster *et al.*, 2000:505).

Consumers within the urban areas in NWP have a higher resting blood pressure, higher hypertension prevalence and bigger vascular responsiveness than their rural counterparts (Malan *et al.*, 2006:306). On the other hand, consumers who live in urban areas have a greater fat intake than rural consumers, which contributes to the increase in obesity (Kruger *et al.*, 2002:427). The diets of consumers from rural areas and middle-class African consumers consist mostly of carbohydrates (65%), protein (12%) and fat (22%), and they have lower fruit and vegetable consumption than urban consumers. Urban consumers' diets consist of 57% carbohydrate, 13% protein and 31% fat (MacIntyre *et al.*, 2002:239). The protein composition of consumers' diet in the rural group consists mostly of plant resources, which may suggest a risk of the lack of essential amino acids (MacIntyre *et al.*, 2002:251).

Some diseases and dietary health concerns with regard to females, have come to the fore, such as obesity, which is associated with the risk of non-communicable diseases among African women in the NWP (Kruger *et al.*, 2001:86). Among female consumers who have low levels of physical activity and a higher income, a greater susceptibility for obesity is possible, than among female consumers with greater physical activity and a lower income (Kruger *et al.*, 2002:423). However, obesity is not the only diet disease-related illness; hypertension and impaired glucose tolerance are among other health-related issues, which are prevalent among female consumers from both rural and urban areas (Vorster *et al.*, 2000:505).

More than half of the consumers in a study done by Kruger *et al.* (2005:365) had less than 67% of the recommended dietary intake of vitamin A, ascorbic acid, folic acid, iron, zinc and calcium. African consumers in this province have diets with low mineral intake (calcium and iron) and an overall low intake of milk and milk products, except among farm dwellers

(MacIntyre *et al.*, 2002:252). MacIntyre *et al.*'s research was done mainly among African consumers; thus, it is not clear what the general health profile of the entire population among all ethnic groups in NWP is.

1.1.5.2 Health profile of consumers in Arkansas in the United States of America

Research regarding consumers' health profile done in the NWP (Kruger *et al.*, 2001:86; Kruger *et al.*, 2002:427; Kruger *et al.*, 2005:365; Malan *et al.*, 2006:305; Vorster *et al.*, 2000:505) was more extensive than similar research in Arkansas (USA) (Arkansas Department of Health, 2008:9; Balamurugan *et al.*, 2007:270; Tokar *et al.*, 2003:170). A lack of disease awareness is associated with risk factors, which could account for some health differences among consumers, as found in Arkansas (Balamurugan *et al.*, 2007:270). A prevalence of arthritis has been found among 32% of consumers in Arkansas (Balamurugan *et al.*, 2007:270). There is also indications of osteoporosis and osteopenia in female college students in this state (Tokar *et al.*, 2003:170). Consumers in Arkansas show some differences within their ethnic groups as to the level of their health status and the causes of health-related issues (Arkansas Department of Health, 2008:9). Caucasian consumers' health concerns are associated with tobacco; among African-American consumers, it is cancer, heart disease, HIV/AIDS, oral health and physical activity; and among Latinas, it is the occurrence of diabetes (Arkansas Department of Health, 2008:9). Since less research was found regarding the health profile of consumers in Arkansas than about consumers' health profile in the NWP, it is difficult to compare consumers from both these countries from a health profile perspective, since less research based findings are available for comparison. It can, however, be summarised that the following diseases, which are relevant to this study, are associated with diet and foods consumed and are prevalent among consumers in both the NWP and Arkansas:

- arthritis (Messier *et al.*, 2004:1501);
- osteoporosis (Prentice, 2004:227);
- cancer (Brown *et al.*, 2013:360),
- coronary heart disease (CHD) (Bernstein *et al.*, 2010:876);
- diabetes (Jönsson *et al.*, 2013:105);
- hypertension (Sacks & Campos, 2010:2102);
- impaired glucose tolerance (Schwartz *et al.*, 2010:217);
- obesity (Pereira, 2013:443);

- oral health problems (Wu, 2012:270); and
- osteopenia (Cellier et al., 2000:806).

Consumers who have good knowledge about nutrition and food labels are also concerned about their health (Kolodinsky *et al.*, 2007:1409; Sääksjärvi *et al.*, 2009:138), which in turn has an influence on their use of nutrition labels (Barreiro-Hurle *et al.*, 2010b:222). Food labels cannot be used effectively if consumers do not have knowledge about the information provided on these labels. Van der Merwe *et al.* (2012:12) state that healthy dietary behaviour can be promoted by educating consumers to make nutritionally appropriate choices. Nutrition information and mandatory food label information on food packages are sources by which consumers can improve their dietary choices and health (Borra, 2006:1235S; Stuart, 2010:27). The new labelling legislation in SA was developed with the expectation that it might help consumers to obtain and sustain a healthy lifestyle from the food choices that they make (Kempen *et al.*, 2011:69). Consumers' health status could motivate them to improve their food label knowledge since they might realise the importance of both a healthy lifestyle and the benefits of having food label knowledge and the way these support each other (Barreiro-Hurle *et al.*, 2010a:426; Barreiro-Hurle *et al.*, 2010b:221; Fitzgerald *et al.*, 2008:960; Hess *et al.*, 2011:407).

1.1.5.3 Food label knowledge and health maintenance

The quadruple burden of disease experienced in SA includes communicable, non-communicable, maternal and perinatal, and injury-related disorders (Mayosi *et al.*, 2009:934). Non-communicable diseases include diseases such as cancer, chronic heart disease, chronic lung disease, diabetes, and high blood pressure (RSA, 2011:8). These diseases are emerging among poor consumers in both urban and rural areas (Mayosi *et al.*, 2009:934), due to risk factors including alcohol, smoking, poor diet and a lack of exercise (RSA, 2011:8), which increase pressure on chronic and health-care services (Mayosi *et al.*, 2009:934). Food labels might support consumers in their purchasing patterns (McEachern & Warnaby, 2008:414) and food consumption (Marietta *et al.*, 1999:445); it therefore sustains a healthy lifestyle which could prevent the development of some diseases (Barreiro-Hurle *et al.*, 2010a:426; Barreiro-Hurle *et al.*, 2010b:221; Hess *et al.*, 2011:407). Determining consumers' food label knowledge in the present study might result in efforts aimed at increasing consumers' knowledge. This will assist them in making more informed food choices to prevent nutrition-related diseases. Consumers' knowledge of food label information about synthetic ingredients (such as monosodium glutamate, also known as MSG) may assist them in avoiding the consumption of these ingredients that do not promote

a healthy lifestyle (Botes, 2011). Consumers' knowledge of ingredients might reduce their risk of developing diseases, such as the knowledge that omega 3 fatty acids may reduce the risk of heart disease (Kris-Etherton *et al.*, 2003:151). Combined with food label knowledge this might help them to choose the most suitable option for health benefits. To maintain healthy diets, consumers should thus understand the importance of all food label information and not only information regarding kilojoules and macronutrients (Kolodinsky *et al.*, 2008:298), which necessitates food label knowledge.

1.1.5.4 Food label knowledge and obesity and overweight

The diet-related health (Patermann, 2007, in EC 2007) and developing country (WHO, 2003) scene is currently dominated by a rise in the prevalence of obesity, while an increase in food-related illnesses such as obesity and diabetes is also found among consumers (McLean-Meynsse & Summers, 2008:94). In South Africa 61% of the population is overweight, obese or morbidly obese, while 71% of these consumers have never dieted and 49% do not exercise (Smith, 2010). In addition, 17% of children in SA are also overweight (Smith, 2010). Moreover, there has been a distressing increase in the frequency of obesity in the USA over the past 20 years (Centres of Disease Control and Prevention, 2012) to such an extent that obesity has become a matter of public health concern (Lando & Labiner-Wolfe, 2006:157). In the USA, 35.7% of adults and approximately 17% of children (aged 2–19 years) are obese (Centres of Disease Control and Prevention, 2012). With the increase of obesity in SA and the USA together with the health risks associated with being overweight, food label knowledge may assist consumers in maintaining a healthy weight and lifestyle as they can use food labels as a source to adapt their dietary choices for weight control.

1.1.6 Necessity of doing a study in a developing and developed country

Consumer knowledge has been studied within a wide variety of domains (Carlson *et al.*, 2008:864), although most theories regarding consumers' knowledge have been established in Western countries (Guo & Meng, 2008:260), suggesting that research is not necessarily representative of the global consumer. The present study aimed to compare consumers from Potchefstroom (NWP, SA) and Fayetteville (Arkansas, USA); thus, a developing and developed country respectively. A developing country has a clear focus on agricultural outputs (Mosby, 2008), whereas a developed country focuses on manufacturing and technology (Mosby, 2008). SA has an emerging economy (SAinfo, 2012b), focusing on agriculture, manufacturing, and technology. Furthermore, significantly more previously disadvantaged South-Africans nowadays have access to commodities and services (Gothan & Erasmus 2008:640), such as access to formal retail outlets with many products displaying food labels. Since SA have characteristics of both a developing and developed country, a

study comparing consumers from a city in this country to those of a city in a developed country context (USA) regarding food label knowledge was thought to be valuable.

According to Van der Merwe *et al.* (2012:404), international consumer research is not directly relevant to the unique South African environment. The knowledge of South African consumers with regard to food labels thus needed to be researched, although more research has been conducted in the NWP than in Arkansas, more label research has been done in the general USA context than in the South African context. As mentioned in 1.1, only Anderson and Coertze (2001:28) and Van der Merwe *et al.* (2012:403) have studied consumers' nutrition and food label knowledge respectively in the South African context. In the USA context, the following studies have been reported regarding consumers and various aspects of food labels and knowledge:

- consumers' knowledge of health claims on food labels (Fullmer *et al.*, 1991:166);
- consumer food label knowledge and other consumption behaviour (Biing-Hwan & Yen, 2008:437; Kim *et al.*, 2001:10; Lin & Yen, 2008:437; Walters & Long, 2012:350);
- nutrition knowledge of nutrition information found on food labels (Drichoutis *et al.*, 2005b:93; Grunert *et al.*, 2010:177; Nayga, 2000:97);
- student consumers' knowledge on food labels (Nurliyana *et al.*, 2011:1); and
- consumers' food label knowledge with regard to health-related issues (Miller & Achterberg, 2000:43; Tessier *et al.*, 2008:35).

It is evident that several studies have been done with regard to food label knowledge in the USA context, but most of these focused on aspects such as claims, consumption behaviour, nutrition knowledge, student consumers, and other health aspects, and not on overall food label knowledge.

From the above discussion, a lack of research regarding a comparison of consumers' food label knowledge in a developing (South Africa) and a developed country (United States) became clear. A similar study was done regarding nutrition labels in a developing country (Brazil) and a developed country (Germany) (Soriano *et al.*, 2012), where it was found that the respondents in the developed country did not have better knowledge regarding nutrition labelling than those in the developing country. It is, however, necessary to determine consumers' knowledge regarding the information on the entire food label in making healthy food choices and not only choices regarding nutritional information. Furthermore, the SA and USA contexts might differ from those of Brazil and Germany due to differences such as demographics and label regulations, and this needs further investigation.

Consumers in SA, as a developing country, do not hold the same education levels and opportunities as USA consumers (Nation Master, 2012). Consumers' knowledge regarding food labels in a SA or USA context thus had to be determined, to establish whether such knowledge reflects consumers' unique education needs. This was done in order to develop education programmes, which might be used in developing and developed countries for the purpose of obtaining and improving food label knowledge. Although SA is a developing country, access to education efforts has increased over the past few years with a greater investment by government (Media Club South Africa, 2012). These educational efforts might decrease the differences in the levels of consumers' knowledge of food labels between the two countries of interest for this study. Furthermore, food labels on products have increased globally over the past few years, as consumers insist on more label information to be available (Bernués *et al.*, 2003:1095; Wang *et al.*, 1995:368). The availability of food label information might affect consumers' knowledge of food labels in a developing and developed country context differently.

In both SA and the USA, more educational opportunities are available than before with an increase in educational efforts in the USA, such as home schooling, internet courses, and smaller colleges for consumers (Education USA, 2012), while the general consumer also experiences an increase in opportunities to obtain an education in SA (SAinfo, 2012a). South Africa thus has some characteristics similar to that of a developed country (Kinsey, 2006:142) such as a productive and industrialised economy. The country is however still classified as a developing country, with characteristics such as a labour division between formal and informal sectors and an uneven distribution of income (Global Literacy Project, 2012), as well as the population of unemployed South Africans (Du Toit, 2003:6). It was considered that a study in the South African and USA contexts on respondents' food label knowledge might contribute to identifying areas that need improvement.

A comparison between respondents from Potchefstroom (NWP, SA) and Fayetteville (Arkansas, USA) seemed plausible since these cities have similarities regarding:

- being cities with universities, the North-West University in Potchefstroom (SA) (NWU, 2012) and the University of Arkansas in Fayetteville (UA, 2012) (USA);
- equal gender distributions (CLR, 2010; Statssa, 2012)
- age distributions with the majority being 15–64 years of age (CLR, 2010; Stassa, 2012), which is the age group of school learners, university students and people below the age of retirement.

One major difference between the two cities is, however, the ethnic distribution in the two cities. Potchefstroom (NWP) has a large population of African consumers (Statssa, 2012) compared to Fayetteville (Arkansas), where the majority of the consumers are Caucasian (CLR, 2010).

1.1.7 Necessity of a study on consumers' food label knowledge

This study of consumers' knowledge of food label did not only determine their level of knowledge, but also identified areas where food label knowledge might be improved. In order to understand food labels, it is therefore suggested that consumers should have a basic knowledge of food label information, although extensive knowledge would be ideal. By understanding consumers' food label knowledge, the consumer scientist and consumer researcher may have a better understanding of these consumers' behaviour. Borra, (2006:1235S) states that consumers have mixed feelings on food labels. Some consumers believe that labels are too complicated and should be easier to use, while other consumers find labels useful in order to make better food choices. Food label knowledge may thus assist consumers in bridging these mixed feelings.

It would be beneficial for the consumer to rely on the nutrition label information rather than on their own knowledge of a food product (Drichoutis *et al.*, 2006:4), since the latter might be influenced by their subjective knowledge. Subjective knowledge is measured with reference to consumers' *self-reported knowledge* about a product or domain (Raju *et al.*, 1995:154). Subjective knowledge, as a self-generated knowledge without any objective verifications, may cause some consumers to make decisions in irrational or intuitive ways (Guo & Meng 2008:266). Consumers can use their (objective) nutrition knowledge as a way to seek and acquire nutrition information regarding food products (Drichoutis *et al.*, 2008:140). Conversely, it is also possible that nutrition labels might influence nutrition knowledge (Drichoutis *et al.*, 2006:6), whereas nutrition label use may be a source of information in obtaining this knowledge. This may also be applicable for food label knowledge, as the researcher aimed to determine in the present study.

1.2 Problem statement

Non-communicable diseases and obesity are becoming an increasing threat to consumers in developing and developed countries, such as SA and the USA. In order to benefit optimally from food labels as a source of information to make informed dietary decisions, consumers have to consult labels. This can only occur once consumers have sufficient food label knowledge. Consumers' effective use of food labels is, however, challenged by an overload of information, confusion, distrust, and lack of comprehension regarding label information.

The incorrect or incomplete comprehension of label information might also be identified as a challenge to consumers when trying to use the information. Furthermore, non-use of labels or ignorance would deprive consumers from benefiting from label information provided. Some of these challenges might be overcome by improved food label knowledge and in some instances, this might even increase consumers' use of food labels to make informed food choices. However, it is important that this knowledge be reflective of consumers' objective label knowledge and not their subjective knowledge, since the latter is based on what consumers think they know and not their actual knowledge. Therefore, this might result in irrational or intuitive decisions. It is thus evident that consumers' objective knowledge of food labels could benefit them on several levels. The difference between consumers' subjective and objective knowledge stresses the necessity of research in this regard, especially since research on consumers' knowledge of food labels is sparse in the context of a developing (SA) and developed (USA) country. Existing research focused mostly on the nutrition information on labels. Consumers' knowledge regarding other label aspects such as ingredients might, however, also benefit them when making decisions regarding aspects such as allergens. Research regarding consumers' knowledge of all label information is therefore required.

As a developing country, SA faces several problems that characterise developing countries, but since this country is also recognised as an emerging economy and because previously disadvantaged consumers have more access to the consumer market than before, more consumers have access to the formal retail sector and products with food labels. South African consumers might therefore show similarities to consumers in a developed country such as the USA, even though the demographic profiles of these countries differ vastly. Furthermore, more South Africans have access to education than before, which might result in better food label knowledge among consumers in this country, as the level of food label knowledge expected in the USA, but consumers in the SA context still do not have the same opportunities as in the case of the USA a developed country.

The presence of food labels and the amount of information on those labels have increased globally, due to consumers' need for access information. The question arises as to which extent consumers in both a developing and a developed country context have sufficient knowledge regarding such labels to allow them to make use of the abundance of label information in order to make healthier food choices.

1.3 Aim, objectives, research question and theoretical framework

The aim, objectives, research question and theoretical framework will be discussed subsequently.

1.3.1 Aim

The aim of this study was to compare the food label knowledge of consumers in the context of a developing country (Potchefstroom, NWP, SA) and a developed country (Fayetteville, Arkansas, USA) to determine whether there is a difference between the food label knowledge of these consumers.

1.3.2 Objectives

In order to reach the aim stated above, the following objectives were applicable, namely to determine:

- whether and how the objective and subjective food label knowledge of consumers from Potchefstroom (NWP) and Fayetteville (Arkansas) differs;
- the association between the subjective and objective knowledge of consumers from Potchefstroom (NWP) and Fayetteville (Arkansas); and
- whether and how the demographic variables of consumers from Potchefstroom (NW) and Fayetteville (Arkansas) are associated with their objective and subjective food label knowledge.

1.3.3 Research questions

- Does the objective and subjective food label knowledge of consumers from Potchefstroom (NWP) and Fayetteville (Arkansas) differ and if so, how?
- Is the subjective and objective knowledge of consumers from Potchefstroom (NWP) and Fayetteville (Arkansas) associated and if so how?
- Are the demographic variables of consumers from Potchefstroom (NWP) and Fayetteville (Arkansas) associated with their objective and subjective food label knowledge and if so, how?

1.4 Theoretical framework

The conceptual framework for the present study explains the basic concepts relevant to consumers' food label knowledge and the interrelationship between these concepts and food label use in this study (Figure 1-1). As mentioned before, for the purpose of this study, consumers will be viewed in a developing country context, namely SA and a developed country context, namely the USA. Consumers who are exposed to food labels might have a need to obtain information regarding these labels; thus, a need exists to acquire food label

knowledge. Consumers in developing and developed countries, such as SA and the USA, have unique demographic characteristics. Although some of these characteristics might be the same, such as the age or gender distribution, other demographic characteristics such as language and ethnicity, which are country-specific, might differ. Food labelling is regulated by different regulations and legislation, depending on the relevant country. These regulations often stipulate the format in which food label information is to be provided. Information of food labels presents the allergens, claims, expiry date, ingredients, manufacturer, mass, nutrition, serving size, storage instructions and usage instructions. Consumer knowledge can be categorised into objective and subjective knowledge (see Chapter 2). In order for optimal food label knowledge to be obtained, label information should be comprehended with the information stored in the memory for later retrieval. In turn, regular food label use might increase consumers' knowledge regarding food labels.

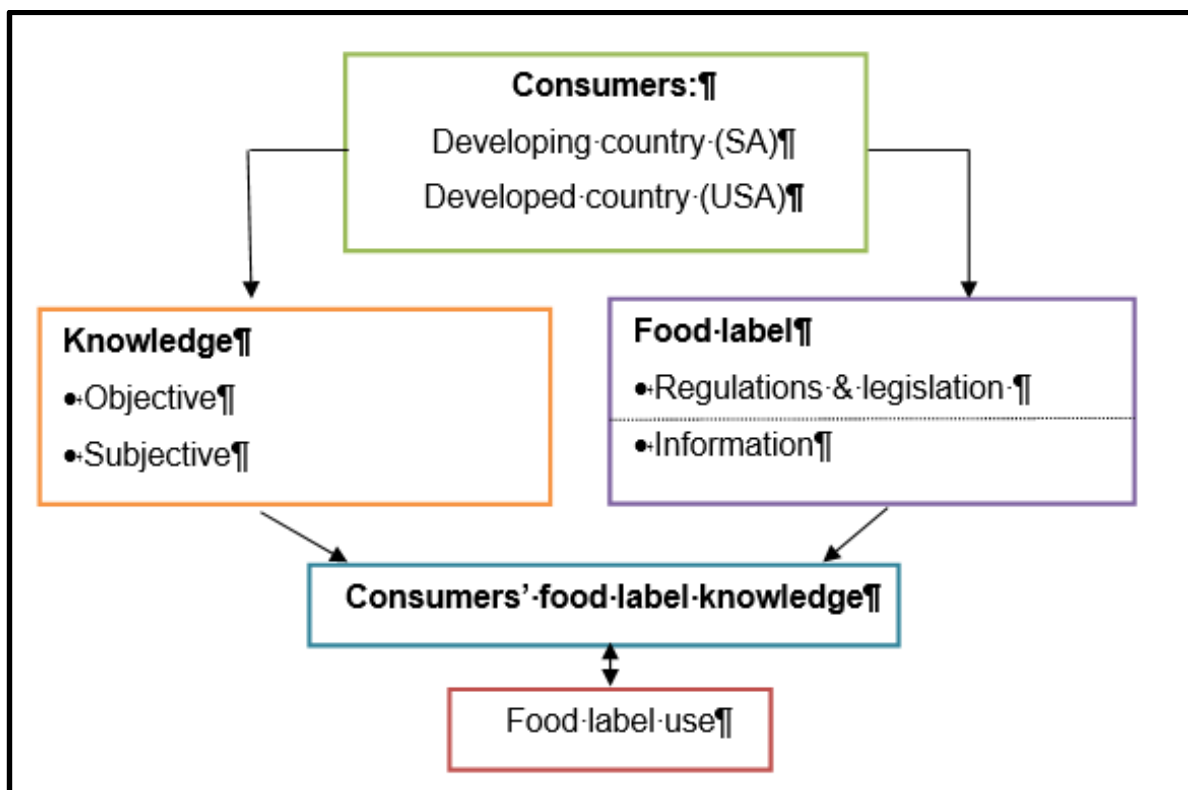


Figure 1-1 Conceptual framework for a study concerning consumers' food label knowledge.

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Chapter 2: Literature Review

2.1 Introduction

Food plays two significant roles in the consumer's lifestyle, namely the pleasure of consuming food, and the fulfilment of energy and nutrition requirements (Drichoutis *et al.*, 2008:141). For the latter, it might be necessary for consumers to have thorough food label knowledge, since this might influence consumers' consumption patterns to fulfil their nutrition requirements (Marietta *et al.*, 1999:445). Food labels refer to any pictorial, brand, mark, tag, graphic or other descriptive matter, which is written, marked, stencilled, embossed, printed, impressed upon, or permanently attached to the container of a foodstuff, and include labelling for the purpose of promoting the product's sale and information regarding disposal (RSA, 2010:10) and are considered to be the most suitable source of information for consumers to acquire knowledge about food (Ali & Kapoor, 2009:725). The provision of label information is justified by ethics, and consumers' right and need to know the nutrition content of the foods they purchase (EU, 2011:26). Consumers are however challenged by increased availability of health and nutrition information on food labels (Barreiro-Hurle *et al.*, 2010a:426), and other resources such as magazines, resulting in an information overload, and a greater possibility of confusion (Nieburg, 2012). Previous research regarding nutrition labels suggested that consumers do not understand the information, although they demand labels (Barreiro-Hurle *et al.*, 2010a:426). These consumers have a need for food labels to understand the information and to use during food purchasing decisions (Kolodinsky *et al.*, 2008:297). Although the understanding of food labels was not the main concern of the present study, such understanding should be taken into consideration when determining consumers' food label knowledge. Consumers who are concerned about health and nutrition are more likely to use food labels (Drichoutis *et al.*, 2006:i), which might influence their nutrition label knowledge, and motivate the acquisition of food label knowledge.

For the purpose of this study, knowledge is defined as a cognitive need of consumers and the familiarity gained through experience and understanding of a science and the awareness of an idea or object within the range of the individual's understanding (Schiffman & Kanuk, 2010:260; Merriam-Webster, 2012). For the optimal use of knowledge, the information has to be retained, which is done in the memory process (Munro, 2012:9). Memory is thus the means by which consumers recollect their previous experiences and practices and draw on it, to use the information for present situations (Sternberg, 2006:157). The aim of this literature chapter is to present a review of food labels, their contents and consumers'

knowledge thereof. The consumer, food labels and knowledge as individual concepts will thus be discussed.

2.2 Theoretical framework

The theoretical framework explains the basic concepts relevant to consumers' food label knowledge and the interrelationship of these concepts and food label use in this study (Figure 2-1). In the focus of this study, consumers will be viewed in a developing country context, namely South Africa (SA) and a developed country context, namely the United States of America (USA). Consumers in developing and developed countries, such as SA and the USA, have unique demographic characteristics. Although some of these characteristics might be the same, such as the age or gender distribution, other demographic characteristics such as language and ethnicity, which are country-specific, might differ. Consumer knowledge has been studied within a wide variety of domains (Carlson *et al.*, 2008:864), although most theories regarding consumers knowledge has been established in Western countries (Guo & Meng, 2008:260), suggesting that such research is not necessarily representative of the global consumer. When considering the present study, consumer knowledge may be categorised into objective or subjective knowledge (Carlson *et al.*, 2008:864). In order for optimal food label knowledge to be obtained, label information should be comprehended with the information stored in memory for later retrieval (Bransford & Johnson, 1972:717). Consumers who are exposed to food labels might have a need to obtain information regarding these labels; thus, a need to acquire food label knowledge. This knowledge may then later be used by consumers for various purposes, such as purchasing-, consumption- and health-related decisions. In turn, regular food label use might increase consumers' knowledge regarding food labels. Food labelling is regulated by different regulations and legislation, depending on the applicable country. These regulations often stipulate the format in which food label information is to be provided.

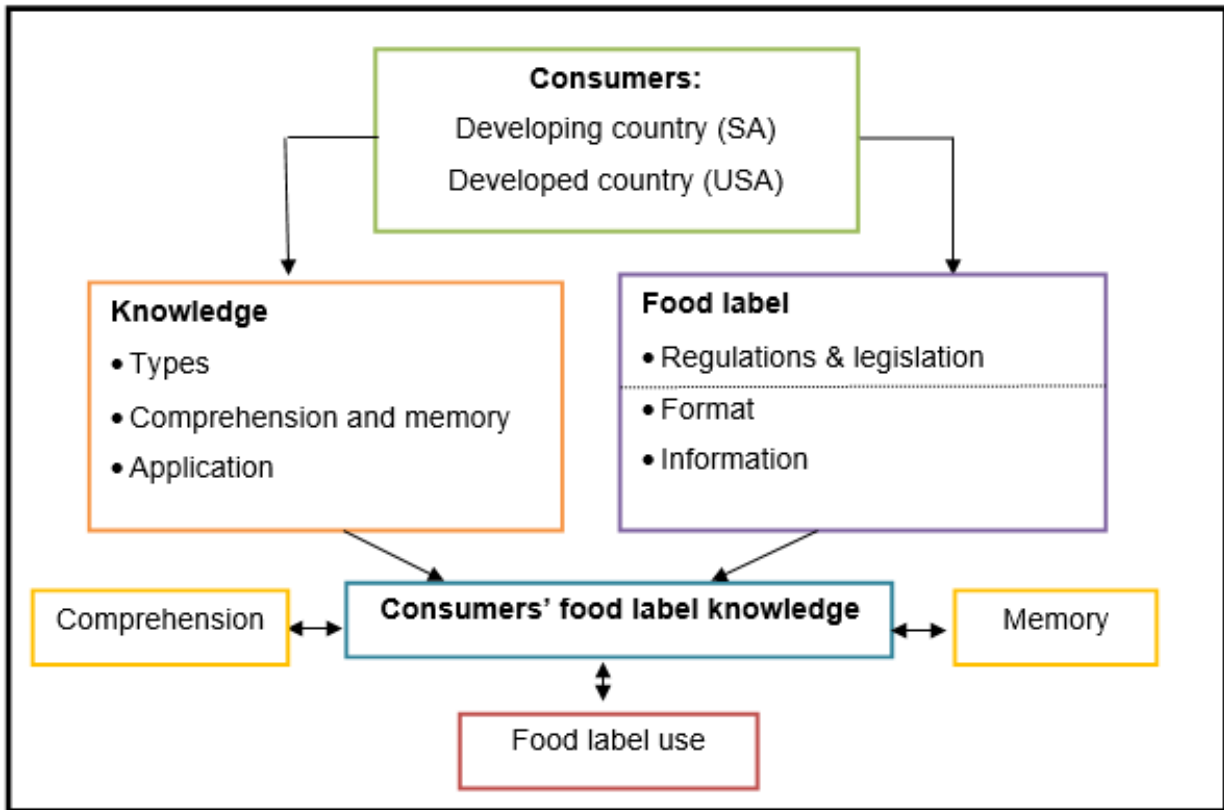


Figure 2-1 Theoretical framework for a study concerning consumers' food label knowledge (author's own compilation).

2.3 Consumers

Globally, various groups of consumers with distinguishable behavioural patterns, valuations (Barreiro-Hurle *et al.*, 2008:178) and demographics may be identified. Demographic differences could have an influence on consumers' behaviour towards food labels (Osei *et al.*, 2012:353), since demographics define consumers' lifestyles and could even influence their consumption patterns (Osei *et al.*, 2012:355). For the purpose of this study, consumers were divided into two groups (Figure 2-1), namely SA (a developing country) and USA (a developed country) and with specific reference to consumers from Potchefstroom, North-West Province (SA) and Fayetteville, Arkansas (USA) as discussed in 2.3.1 and 2.3.2.

2.3.1 South African consumers

A comparison of the demographic profile of Potchefstroom and South African consumers versus Fayetteville, Arkansas and USA consumers is provided in Table 2-1. With regard to gender and age, the population distribution is similar in Potchefstroom and in SA (Table 2-1). However, when ethnicity is taken into consideration, a slight difference is visible, as 69.6% of

the Potchefstroom population belongs to the black or African ethnic group, whereas the black or African population in SA comprises 79.4%. Spoken languages in Potchefstroom are English, Afrikaans, Tswana and eight other African languages, with Tswana the most spoken language in the city of Potchefstroom. In the study group, there were a greater number of respondents in Potchefstroom who spoke Afrikaans and Tswana, and fewer respondents who spoke English when compared to the SA population (table 2.1).

2.3.2 United States of America consumers

The gender distribution in the America and in Fayetteville is similar, with an almost equal distribution of male and female consumers (Table 2-1). Similar age distributions were also found for consumers within Fayetteville and the USA population. With regard to languages, the distribution was similar for Fayetteville and the USA population. More consumers were able to speak English in the USA (82.2%) than in SA (8.2%). Both Fayetteville and Potchefstroom had more consumers between the ages of 15 and 64 years than in any other age group. This is the age group of school learners, university students, and people below the age of retirement. The ethnic distribution in Fayetteville was similar to that of the entire USA population.

Table 2-1 Demographic characteristics of South African (Potchefstroom) and USA (Fayetteville) consumers

	South Africa (%)		United States of America (%)	
	Potchefstroom	National	Fayetteville	National
	Gender			
Male	49.2	48.7	50.3	49.1
Female	50.8	51.3	49.7	50.9
	Age			
0–14 years	24.9	31.0	16.8	21.4
15–24	20.8	20.5	28.9	13.9
25–34	16.9	17.1	17.3	14.2
35–54	24.6	20.5	23.0	29.4
55+	12.8	10.9	14.0	21.1
	Ethnicity			
White/Caucasian	27.1	9.2	86.5	79.5
Black/African	69.6	79.4	5.1	12.9
Indian (SA)/Asian(USA)	0.4	2.6	2.6	4.6
Coloured (SA)	2.9	8.8	-	-
Other	-	-	5.8	3.0
	Language			
English	3.9	8.2	90	82.1
Afrikaans	35.7	13.4	-	-
Tswana	35.9	8.2	-	-
Spanish	-	-	4	10.7
African languages (SA)*	24.5	70.2	-	-
Other languages (USA)**	-	-	6	7.2

	South Africa (%)		United States of America (%)	
	Potchefstroom	National	Fayetteville	National
	Education			
No high school/GED***	79.1	–	11	13.4
High school/GED	16.6	–	24.1	19.2
Tertiary/college/university	4.9	7.8	64.9	55.4

* IsiNdebele, IsiXhosa, IsiZulu, Sepedi, Sesotho, SiSwati, Tshivenda, Xitsonga

** Indo-European, Asian and Pacific island languages

*** General Education Diploma

References: AreaConnect, 2000; Area Vibes, 2010; Index Mundi, 2012a; Index Mundi, 2012b; Shrestha & Heisler, 2011:21; SouthAfrica.Info, 2011; Stats SA, 2010:4; Stats SA, 2011a; Stats SA, 2011b:43; Tlokwe City Council, 2010:6

2.4 Food labels in the Consumer Environment

The primary role of food labels is to inform consumers by communicating nutrition information (Mackinson *et al.*, 2010:210), and to assist in selling food products by providing label information (Cheftel, 2005:531). Consumers expect food labels to provide accurate ingredient lists and health claims which are easy to interpret (Gorton *et al.*, 2008:364), in order to make informed choices during food purchasing and consumption decisions, to prevent confusion and the misuse of food products (Block & Peracchio, 2006:189). To maintain healthy diets, consumers should thus understand the importance of all food label information and not only the information regarding kilojoules/calories and macronutrients (Kolodinsky *et al.*, 2008:298). The main focus of the information on the food label is the consumer and his or her needs; therefore, it is necessary to determine consumers' knowledge of these labels.

Modern food labelling was developed to –

- respond to current and future challenges;
- respond more efficiently to the needs of the consumer, government and industries with regard to food labelling;
- have better access about food label information;
- increase awareness of purchasing decisions (FDA, 2013); and
- inform the consumer on factors such as food preservation technologies, mass industrial food production, and the development of packaging (Cheftel, 2005:531).

Food labels are therefore not only a source of nutrition information, but also indicates safety information by providing information regarding ingredients, manufacturing and best before

dates (Gavaravarapu *et al.*, 2009:344), which can be seen as an additional function of food labels. Information on nutrition and quality, storage, production processes and the basic information regarding the product is found to be significant to consumers, suggesting that these factors may influence the use of food labels (Ali & Kapoor, 2009:724). Consumers however tend to have a form of distrust in the accuracy and truthfulness of food labels (Misra, 2007:2131) and labels should therefore be developed to be understood by all consumers (Hess *et al.*, 2011:413) to fulfil its function. In order to understand food labels it is thus suggested that consumers should have a basic knowledge of food label information, although extensive knowledge would be ideal.

Food product labels describe product contents and other details (Higginson *et al.*, 2002:92). Elements found on labels that ease the reading and finding of information include the following: colour contrast, letter case, paragraph justification, organisation, print style, print size, reverse print, space between the lines, and type of surface (Mackey & Metz, 2009:379). The amount of information provided on food labels is increasing since, in addition to the name of the product and its ingredients, labels should also indicate whether a product is nut-free, gluten-free or suitable for vegetarians/vegans, whether it is suitable for home freezing, the guidelines of daily amounts, healthy eating endorsements, logos, nutrition claims (Higginson *et al.*, 2002:92) and instructional information on the storing and use (Mackey & Metz, 2009:369). The food label is thus an essential resource for fair competition, safe food handling and nutrition policy (Mackey & Metz, 2009:369).

2.4.1 Food labelling legislation and regulations

Food labelling legislation is provided for the protection of both the consumer and the manufacturer (Hayward, 2012). By setting clear rules and indications of how food labels should be applied, consumers can be ensured of standardised food labels, which might have an influence on their behaviour regarding food labels, as confirmed by previous studies (Cheftel, 2005:531; Gracia *et al.*, 2007:160; Kolodinsky *et al.*, 2007:1409; Lin & Yen, 2008:437). A standard food label has been endorsed in various countries (Sharf *et al.*, 2012:532) to guide consumers when evaluating food product healthiness (Lin *et al.*, 2000:432). By providing a rigorous legal framework, a wider audience will be reached with the information provided, creating a more consistent influence on consumers' choices (Barreiro-Hurle *et al.*, 2008:190). Table 2-2 provides a comparison of mandatory label information in SA and the USA.

Table 2-2 Nutrition information mandatory to be provided on South African and American food labels

Information	South Africa	United States of America
Energy	✓ (kJ)	✓ (kcal)
Energy per serving	✓ (kJ)	✓
Protein	✓ (g)	✓ (g)
Carbohydrate (glycaemic)	✓ (g)	✓ (g)
Sugar (natural & added)	✓ (g)	✓ (g)
Fibre (dietary)	✓ (g)	✓ (g and % DV)
Fat	✓ (g)	✓ (g and % DV)
Unsaturated	x	✓
Saturated fat	✓ (g)	✓ (g and % DV)
Trans-fat	✓ (g)	✓ (g)
Cholesterol	✓ (g)	✓ (mg and % DV)
Monounsaturated fat	✓	x
Polyunsaturated fat	✓	x
Omega-3 fatty acids	✓	x
Sodium	✓ (mg)	✓ (mg and % DV)
Vitamins	x	✓ *
Vitamin A	x	✓
Vitamin C	x	✓
Minerals	x	✓ **
Iron	x	✓
Calcium	x	✓

✓ – Information mandatory; x – Information not mandatory

*USA – provision of five vitamins is mandatory

**USA – provision of two minerals is mandatory

References: Parker, 2003:67, RSA, 2010:46 Whitney & Rolfes, 2008:55

2.4.1.1 South African regulations related to food labelling

South African legislation regarding food labelling (Foodstuffs, Cosmetics and Disinfectants Act, Act 54 of 1972) has changed on 1 March 2010 (RSA, 2010:3) and came into effect on 1 March 2011 (Department of Health, 2012). The reason for the new labelling regulations was –

- to establish national standards and norms relating to the protection of the consumer;

- to promote responsible consumer behaviour by providing improved standards of consumer information (Brown et al., 2013); and
- to bring the legislation and regulations in line with international standards (Du Plessis, 2012).

This regulation (Foodstuffs, Cosmetics and Disinfectants Act, Act 54 of 1972) was thus changed in order to protect the consumer within legislative parameters. According to this regulation, the following should appear amongst others on a food product label:

- manufacturer's name and address, or that of the importer or distributor;
- usage instructions;
- net contents;
- country of origin;
- batch identification number;
- expiry date and the nutrient content (RSA, 2010:18).

The ingredients should be listed in table format, per 100 g of the product as consumed, or 100 ml for liquids and in values per serving (RSA, 2010:33). According to legislation, no claims such as "nutritious", "healthy", "healthful", "wholesome", "complete nutrition" or "balanced nutrition" may be made on food products (RSA, 2010:34). The terms "sugar free" (RSA, 2010:36) and "fat free" (RSA, 2010:34) may only be used when they meet the specific requirements as set by food labelling regulations (RSA, 2010:34). Claims are however prohibited in South Africa when they do not comply with the regulations set for claim use (RSA, 2010:21).

2.4.1.2 USA labelling legislation

The USA has acknowledged the possibility that the provision of mandatory nutrition information could assist consumers in making healthier food choices (Drichoutis *et al.*, 2008:149). The USA food label (featuring the nutrition facts panel) thus includes more information than the traffic light or EU-type food labels, which might create a possibility that consumers who use these labels could learn more from food labels since they are exposed to more information (Drichoutis *et al.*, 2009:566).

The Nutrition Labelling and Education Act (NLEA), which forms part of USA legislation (Marietta *et al.*, 1999:445), came into effect on 8 November 1990 (FDA, 2009c). The NLEA regulates the provision of information on food labels in the USA for the purpose of assisting consumers (Satia *et al.*, 2005:399). The increasingly important role of nutrition in the

prevention of diseases and the promotion of health, and consumers' demand for clear and easily understandable information led to the introduction of the NLEA (Parker, 2003:483). The three major aims of the NLEA are:

- the provision of incentives to the food industry to create healthier and innovative new food products for consumers;
- to promote consumers' nutrition education; and
- to enable consumers to make healthier food choices (Nayga, 2001:41).

The objective of the NLEA is to provide understandable, consistent and useable information to assist consumers in choosing healthier foods (Nayga, 2001:39) and to protect consumers against mixed messages and fraudulent and partially true nutrition information (Parker, 2003:478) by mandating the presence of specific nutrition information on food labels (Drichoutis *et al.*, 2006:1).

2.4.2 Formats of food labels

Several recent studies have been undertaken on the format of food labels (Gaschler *et al.*, 2010:141; Grunert, Fernandez-Clemin *et al.*, 2010:261; Grunert, Wills *et al.* 2010:177; (Nørgaard & Brunsø, 2009:597; Sacks *et al.*, 2011:122; Wills *et al.*, 2009:11) since various food label formats are becoming available to consumers (Barreiro-Hurle *et al.*, 2010b:221), such as traffic light labels (see 2.4.2.1), the nutrition facts panel, typical nutrition information and front-of-pack labelling. The different label formats have different functions, and might therefore have different influences on their use by consumers. Label designs incorporate print styles, colour contrast combinations and layouts (Mackey & Metz, 2009:371). In a study by Byrd-Bredbenner *et al.* (2000:622), 60% of respondents answered questions correctly, regardless of which food label format was used. Even though the traffic light and front-of-pack label formats were not of concern for the purpose of this study, since they are not applicable or mandatory to both the South African and USA context, they are briefly discussed in the literature review to provide a more comprehensive background on label formats.

2.4.2.1 Traffic light label

The main focus of the traffic light food label is to enable consumers to evaluate the nutrient content of food at a glance (Drichoutis *et al.*, 2009:560). Traffic light labels easily attract the attention of consumers (Jones & Richardson, 2007:243) because of the bright colours (Figure 2.2) and communicate meaningful information to them (Gorton *et al.*, 2008:1364). Traffic light labels are more valued by consumers than any other food label (Drichoutis *et al.*,

2009:572) because of the useful information and the format, but consumers' ability to use these labels varies when the provided information with regard to the nutrient values and colour combinations is not clear (Gorton *et al.*, 2008:1364). The colour combinations may result in confusion since the consumer cannot understand the information.

Traffic light labels reduce the amount of nutrition information which consumers need to examine to guide their decisions since these labels give a clear indication of levels of the nutrients present (Jones & Richardson, 2007:243). When consumers use traffic light labels, their attention is guided to the nutrients which are important (Jones & Richardson, 2007:243) (Figure 2-2), such as sodium and fat. Traffic light labels might thus be a significant educational resource for consumers when evaluating food labels for the healthiness of a food product, since the label gives a clear indication of the food ingredients, their quantities and whether these are ideal or not. The colours used indicate whether a product is high (red), medium (yellow) or low (green) in a nutrient or energy (Figure 2-2). Although traffic light labels are frequently used in European countries (Beard, 2007:1), this labelling format is allowed in the USA as part of front-of-pack labelling (FDA, 2009a), but are prohibited in South Africa (Sunley, 2012:1) due to the unique South African law and legislation.

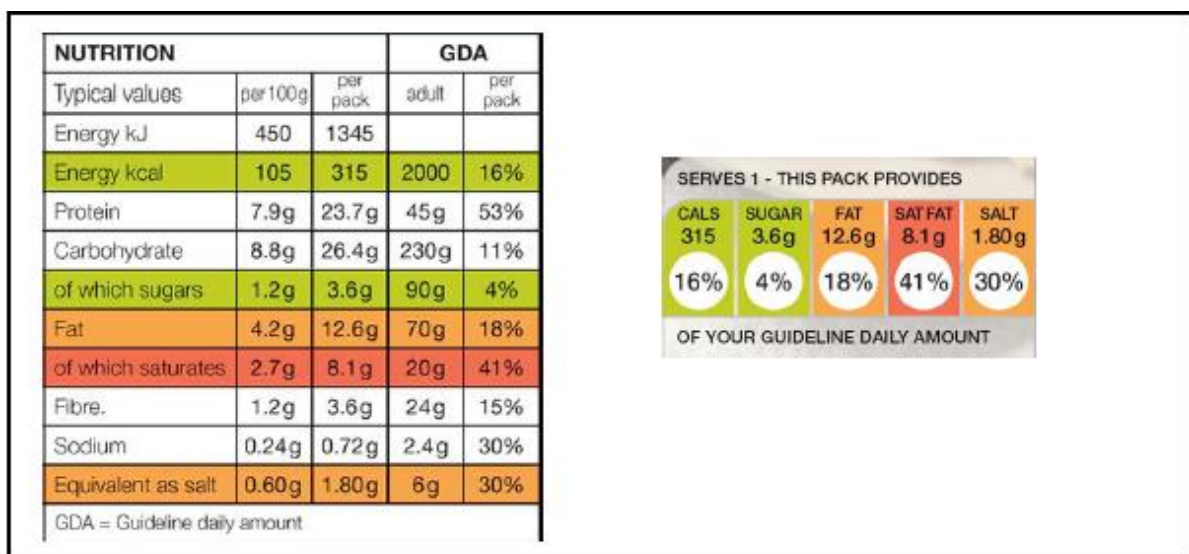


Figure 2-2 An example of traffic light labelling on EU food labels

2.4.2.2 Front-of-pack label

The new front-of-pack labelling initiative developed by the FDA provides clear guidance for the food industry regarding nutrition labelling on the front of food packages (FDA, 2010). The motivation behind this type labelling is to assist consumers to choose healthy diets (FDA, 2010). In addition to information on the back of food packaging, information is also presented

on front-of-pack labels regarding energy fat, saturated fat and sodium (Figure 2-3) (GMA, 2010). Thus, front-of-pack labels provide information to consumers regarding the food products and nutrition at glance, which makes it more beneficial to consumers since they do not have to perform comprehensive searches for nutrition information of food labels.

Front-of-pack labels are allowed in South Africa on a voluntary basis for food products (EUFIC, 2011:15). Front-of-pack labelling should however not be the only nutrition information provided to the consumer on a food label, since more extensive information needs to be provided (Hawley *et al.*, 2012:2). However, the usefulness of front-of-pack labels for consumers appears to be limited; thus, manufacturers should consider the benefits carefully before choosing these labels to be used, since they might not have a significant influence in assisting consumers who find food labels difficult to use (Gorton *et al.*, 2008:1364).

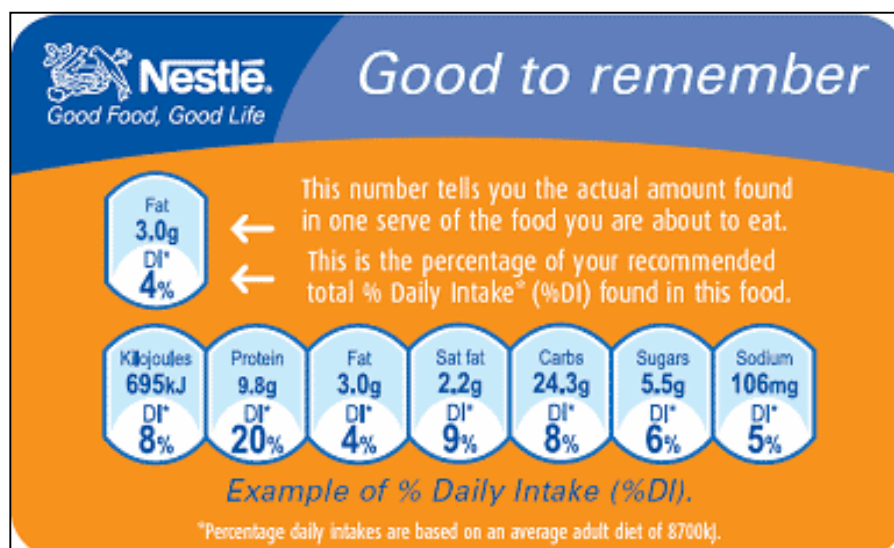


Figure 2-3 An example of a front-of-pack label on food products (Nestlé, 2012)

2.4.2.3 Typical nutrition information (South Africa) and nutrition facts panel (United States of America)

The nutrition facts panel is consumers' most preferred method of information provision (Gracia *et al.*, 2009:469). Nutrition information labels on a food package, add additional value since they not only provide information to the consumer but are also necessary to verify nutrition claims (Barreiro-Hurle *et al.*, 2010a:437). The aim of nutrition information is to support healthy eating habits by providing the information needed to make informed food purchasing decisions (Barreiro-Hurle *et al.*, 2010a:427) and knowledgeable dietary choices (Lin *et al.*, 2004:1955; Sharf *et al.*, 2012:531). Nutrition information should be provided under

the heading “typical nutrition information” (Figure 2-4, RSA, 2010:30) and “nutrition facts panel” (FDA, 2009a) for South African and USA labels respectively. It is mandatory for manufacturers to provide this information on food labels (FDA, 2009a; RSA, 2010) and to provide information regarding the food content and composition (Sharf *et al.*, 2012:531).

The first format which was used on food labels was known as the “Big 4”, which included four key elements, namely energy, protein, carbohydrate and fat (Byrd-Bredbenner *et al.*, 2000:616). With energy (kJ), there are seven nutrients, which are generally found on most food labels, namely protein, fat, saturated fat, glycaemic carbohydrates, sugars, fibre and sodium (Jones & Richardson, 2007:239; RSA, 2010:46). This information is found on the Typical nutrition information (SA) and the Nutrition facts panel (USA).

The typical nutrition information label as used in SA has to comply with certain inclusion criteria, which compel the food manufacturer to provide certain information. Information has to be provided per 100 g/ml, and per single serving. This information also has to be expressed in grams or millilitres, while % RDA per serving is optional (RSA, 2010:44). In addition to energy, the following nutrients have to be provided: glycaemic carbohydrate (g), total sugar (g), total fat (g), and an indication of saturated fat (g), where trans-fat, monounsaturated fat, polyunsaturated fat, and omega-3 fatty acids if applicable. Cholesterol should also be indicated where applicable. Dietary fibre (g) and total sodium (mg) also have to be included. Vitamins and minerals should be expressed in grams (g), milligrams (mg), micrograms (mcg/µg), or appropriate unit of measure (RSA, 2010).

TYPICAL NUTRITION INFORMATION				
Serving Size: 30 g = 250 ml = 1 cup				
Number of servings per pack: 1				
NUTRIENT	UNIT OF MEASURE	PER 100 g	PER 30 g SERVING	% RDA** PER SERVING
Energy	kJ	1511	453	
	kcal	361	108	
Protein	g	7.5	2	4%
Carbohydrates	g	81	24	
Sugars	g	5	2	
Starch	g	76	23	
Fat	g	0.8	0.2	
Saturates	g	0.2	0.1	
Monounsaturates	g	0.2	0.1	
Polyunsaturates	g	0.4	0	
Trans fatty acids	g	0	0	
Fibre	g	3	1	25-30 g per day*
Sodium	mg	898	269	less than 2400 mg per day*
VITAMINS				
Vitamin A	µg RE	500	150	15%
Vitamin C	mg	30	9	15%
Vitamin B1 (Thiamine)	mg	0.7	0.2	15%
Vitamin B2 (Riboflavin)	mg	0.8	0.2	15%
Niacin	mg	9	2.7	15%
Vitamin B6 (Pyridoxine)	mg	1	0.3	15%
Folic acid	µg	100	30	15%
Vitamin B12 (Cyanocobalamin)	µg	0.50	0.15	15%
Pantothenic acid	mg	2.3	0.69	12%
MINERALS				
Phosphorus	mg	40	10	
Iron	mg	7	2.1	15%
Magnesium	mg	11	3	
Potassium	mg	110	33	
* South African Prudent Dietary Goals				
** RDA - Recommended Dietary Allowance for persons 10 years of age and older				

Figure 2-4 An example of a South African Typical nutrition panel (Kellogg's, 2014) as found on a food label

When looking at the USA food label provided in Figure 2-5, it is clear that information provided (serving size, calories, macronutrients [protein, carbohydrates and fat], percentage daily value [% DV], micronutrients [vitamin and mineral content] and dietary fibre) on the nutrition facts panel may vary between different food products, as it contains specific information regarding the food product's specifications. The footnote provides the nutrition information regarding daily values, which provide consumers with important nutrition and dietary information. This footnote is the same on all food products in terms of calorie or kilojoule specific daily values (2000- or 2500-calorie diet), but is common only on large food packages (FDA, 2004). Nutrition information provides the consumer with information

regarding the amount of macro- (protein, carbohydrate and fat content) and micronutrients (vitamin and mineral content).

The USA nutrition label provides more information than the EU label, which creates the possibility that consumers who use the USA nutrition label may learn more than what they would have learned from the EU label (Drichoutis *et al.*, 2009:566). Consumers' food label perceptions and nutrient intake are possible factors which might influence their search for nutrient information on food labels (Lin *et al.*, 2004:1964). Similarly, consumers with positive attitudes towards nutrition labelling (Daly, 1976:170) might be more motivated to seek nutrient information than those with negative attitudes. Furthermore, dietary behaviour, resulting from a lack of health consciousness, could influence consumers' motivation to seek nutrient information on food labels (Lin *et al.*, 2004:1955).

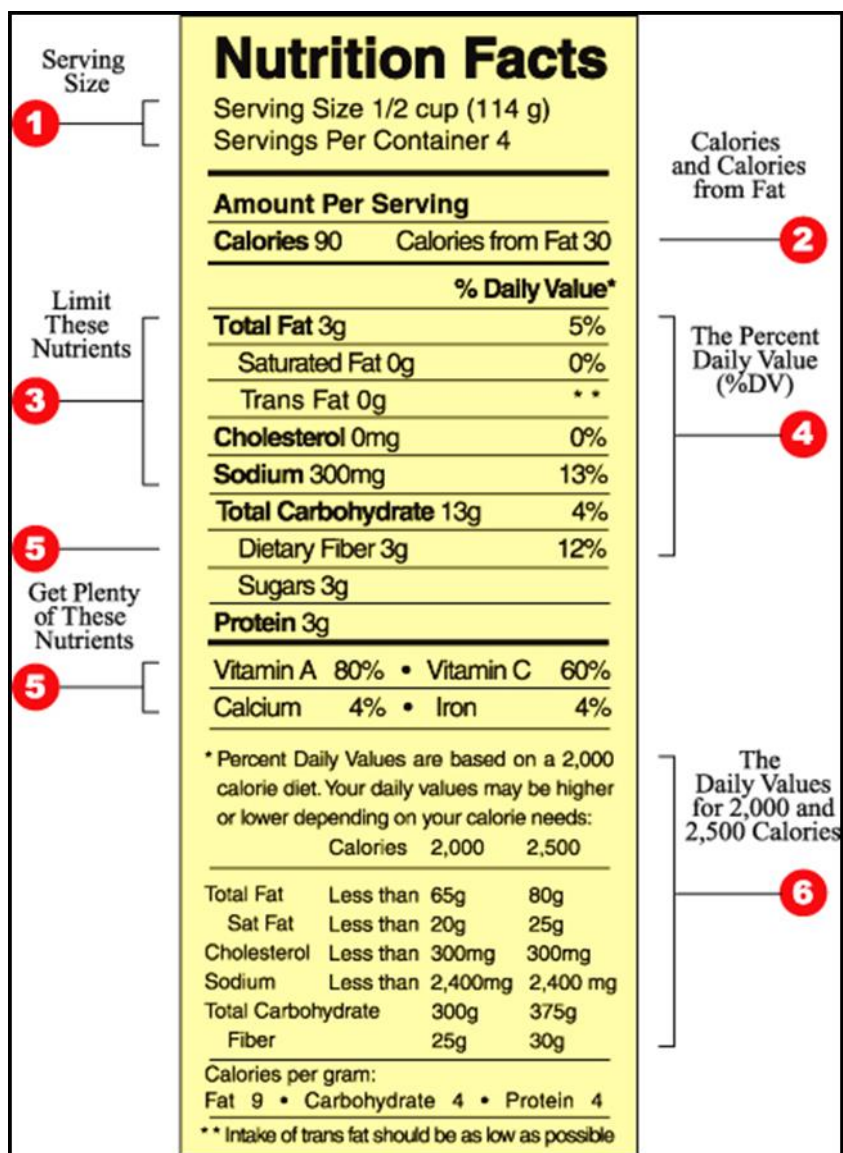


Figure 2-5 Example of a nutrition facts panel – USA (FDA, 2004)

2.4.3 Food label information

The information provided on food labels has evolved over time as the purposes of food labels have increased and become more complex (Cheftel, 2005:531). As discussed in 2.4.2, different types of information are found on different formats of food labels. Food labels should however contain information as prescribed by food labelling legislation, as discussed in 2.4.1. Food label information should be easily understandable to increase the benefits of consumers' confidence in using food labels (Chen *et al.*, 2011:768). According to Chen *et al.* (2011:767), food label information influences food label use, regardless of whether consumers understand the information. Research by Boulanger *et al.* (2002:980) among Latino consumers (Hartford, Connecticut, USA) however suggests a link between nutrition knowledge and label use.

Information provided on food labels is limited due to space limitations on food packages; therefore, other means of information, such as leaflets and the Internet, are used to provide the consumer with additional information (Cheftel, 2005:532). Information found on food packaging often creates confusion among consumers by providing misleading or inaccurate information, or too much information with dense and small writing, which leads to poor readability (Silayoi & Speece, 2004:612), resulting in a certain amount of distrust in the accuracy and truthfulness of the information provided (Misra, 2007:2132). Since consumers often do not have sufficient scientific background knowledge to interpret the technical information on food labels, some consumers might for instance be suspicious about modern food technology (Cheftel, 2005:550) emphasising the need for research regarding consumers' knowledge about food labels. To ensure that consumers make informed food choices, access to information, education and knowledge is necessary (Ippolito, 1999:295).

2.4.3.1 Ingredient list

The ingredient list on a food label is the listing of each ingredient in descending order of predominance of weight (FDA, 2009a; RSA, 2010:22; Whitney & Rolfes, 2008:55). All the ingredients in the food product should be listed, as well as other names by which they might be known, such as monosodium glutamate should also be indicated as MSG (FDA, 2009a; RSA, 2010:10). In South Africa, added water should also be listed on food labels (RSA, 2010:23). In the USA, ingredient listings are mandatory for food products containing more than one ingredient including the following:

- protein sources which may be used in some food products as flavours and flavour enhancers;
- FDA-certified colour additives; and

- milk derivatives (such as caseinate) in food products which claim to be non-dairy, such as coffee creamer (Parker, 2003:496).

South Africa has specific legislation for the provision of mandatory information on food labels (RSA, 2010:47). The motivation behind labelling legislation is, among others, to allow consumers to avoid the consumption of allergens in these products (Parker, 2003:496). The ingredient list is thus important to consumers to know what the ingredients of a food product are, and whether these ingredients are acceptable to them.

2.4.3.2 Nutrition information

Nutrition information was discussed in detail in 2.4.2.3. Consumers who have a need for more nutrition information favour food labels as an ideal and appropriate resource for diet- and disease-related information (Anderson & Coertze, 2001:33). Nutrition claims and the nutrition facts panel are two ways in which information is provided to the consumer (Gracia *et al.*, 2009:464).

2.4.3.3 Food label claims

In addition to nutrient content and the nutrition facts panel, nutrition information is also provided by nutrition claims (Gracia *et al.*, 2009:464). Food label claims refer to any reference made to a food product and the characteristics of the product (RSA, 2010:6). Consumers' use of food labels increase when both health claims and nutrition information are present on food products, since claims are more useful than only the information on the nutrition facts panel (Barreiro-Hurle *et al.*, 2010a:439). Williams (2005:256) came to the following conclusions with regard to claims on food labels:

- consumers dislike complex wording on claims and prefer short, concise claims on the front of the food label;
- consumers do not make clear distinctions between different claims (nutrition content versus health claims);
- consumers are sceptical about health claims from food companies, and believe that these should be approved by government; and
- health claims on labels are regarded as useful by consumers, and they are more likely to purchase the product when they view the product to be healthy.

It can thus be concluded that consumers react differently towards food label claims. They either question certain health claims as a result of their lack of trust or they might be more likely to purchase food products with health claims since they perceive these to be more healthy than products without health claims.

Label claims differ among countries, and consumers find these claims helpful resources to assist them when purchasing or consuming a food product since labels provide users with information (Williams, 2005:256). However, the use of the claims panel does not necessarily increase consumers' knowledge about nutrition information as in the case of the nutrition facts panel (Barreiro-Hurle, 2010b:228). There are strict descriptions and definitions for certain claims on food labels (Table 2-3), which should comply with the regulations of the specific country (Mandal, 2010:525). No claim may be made on a food label if it does not comply with the regulations provided for nutrient claims in SA (RSA, 2010:34). The NLEA requires food labels that include certain health messages and nutrient content claims to meet specific requirements (FDA, 2009a).

Nutrition claims: Nutrition claims are found on food labels in addition to the nutrition information provided on the nutrition panels (Williams, 2005:256), and refers to the “representation of a specific nutrient or food constituent content in a particular foodstuff, namely a nutritional content claim or a comparative claim” (RSA, 2010:12), such as “source of calcium” or “high in fibre”. Nutrition claims are allowed in South Africa and the USA, on condition that they comply with legislation and that the food label provides supporting material on the food label (FDA, 2009a; RSA, 2010:34). Scepticism may however occur among consumers regarding nutrition claims, due to previous conflicting information/studies and marketing information (Nayga, 2008:50), although younger consumers are more likely to use this information than older consumers (Nayga, 2008:52).

Nutrient content claims: A claim highlights specific nutrition characteristics of a food product and “refers to the level of a nutrient or the energy which is contained in a certain food” product (RSA, 2010:12) and characterises the quantity of a nutrient in a food product (Whitney & Rolfes, 2008:58), such as “low in fat” and “reduced salt” (Rowlands & Hoadley, 2006:36; Williams, 2005:256). Nutrient content claims are frequently found on food products in the international food market (Williams, 2005:256), although they are no longer allowed in SA without specific proof that the claims are true (RSA, 2010:34). Nutrition facts panels are compulsory when nutrient content claims are made on food products in the USA (Barreiro-Hurle *et al.*, 2010a:427), and in SA (RSA, 2010:10). Distrust is however still prevalent among consumers (Cowburn & Stockley, 2005:24) about food label claims such as “good source of”, “reduced kilojoules” and “fat-free”, while claims such as “contains no ...”, “without ...”, and “less ...” are only moderately understood (Sharf *et al.*, 2012:533).

Health content claims: Increased attention has been given globally to the labelling of food label health claims (EUFIC, 2014:5, Wansink *et al.*, 2004:659). Health claims are allowed on

food labels in the USA for eight nutrients (see below), which may assist in the prevention of certain diseases (Parker, 2003:495; Whitney & Rolfes, 2008:59). The FDA (2013b) states that no health claim may be used on a food label if there is no supporting evidence. Furthermore, according to the NLEA, health claims issued by the FDA require that the claim should be stated accurately and understandably and that it should also describe the significance of the substance's relationship towards the disease (Rowlands & Hoadley, 2006:38). Although these claims for food are increased in a variety of countries (Williams, 2005:256), claims which imply health-giving properties are not allowed in South Africa (RSA, 2010:20), in particular words such as "wholesome", "nutritious", "health" or "healthy" are among the claims which are prohibited, as previously mentioned, except for the fortification logo which is determined by the Foodstuffs, cosmetics and disinfectants act, Act 54 of 1972, under regulation 51(2). According to legislation in the USA, the eight associated nutrients and diseases (Parker, 2003:496; Whitney & Rolfes, 2008:59) are:

- calcium and the reduced risk of osteoporosis;
- folic acid and the reduced risk of neural tube defects;
- fruits, vegetables and the reduced risk of cancer;
- dietary fat and the increased risk of cancer;
- fibre-containing grain products, fruits, vegetables and the reduced risk of cancer;
- saturated fat, cholesterol and the increased risk of coronary heart disease (CHD);
- fibre-containing grain products, fruits and vegetables and the reduced risk of CHD; and
- sodium restriction and the reduced risk of high blood pressure.

Furthermore, six additional health claims (the "A"-list) (Whitney & Rolfes, 2008:59) include the following:

- sugar alcohols and the increased risk of tooth decay;
- potassium and the reduced risk of hypertension and stroke;
- wholegrain and the reduced risk of certain cancers and CHD;
- soluble fibre (oats and psyllium husks) and the reduced risk of CHD;
- plant sterol and plant stanol esters and the reduced risk of CHD; and
- soy protein and the reduced risk of CHD.

Consumers expect food labels to provide accurate health claims and ingredient lists in order to make informed food choices (Block & Peracchio, 2006:189). They perceive a food product to be healthier if it contains a health claim than not containing a health claim, although the perceiving of a product as healthier produces a “halo effect” that might prevent them from seeking further nutrition information (Williams, 2005:256). It is however suggested that health claims improve consumers’ knowledge of the diet–disease link and their dietary choices (Williams, 2005:256).

Table 2-3 Descriptions of food label claims as regulated in the United States of America

Claim	Description
High	A food product contains 20% or more of a certain nutrient’s daily value per serving.
Good source	Refers to a serving of a nutrient which provides 10–19% of the daily value.
More	Refers to a product containing 10% more of the daily value than the regular product, whether altered or not.
Less/Fewer	Refers to a 25% reduction of a nutrient or calories of the regular product with or without product alteration.
Reduced	Refers to a 25% reduction of a nutrient or kilojoules of the regular product by means of product alteration.
Light	Refers to a product which contains either a third of the kilojoules or 50% less fat than the regular product.
Low	Used on foods eaten regularly without exceeding dietary guidelines for a specific component, such as cholesterol. <ul style="list-style-type: none"> • Low kJ: 160 kJ or less per serving • Low cholesterol: 20 mg or less per serving • Low fat: 3 g or less per serving • Low saturated fat: 1 g or less per serving • Low sodium: 35 mg or less per serving
Lean & extra lean	Refers to the fat content of game meat, poultry, red meat and seafood.
Without	Indicates that the food product is naturally free from this substance.
Free, zero & “no ...”	A product contains none or only minor quantities of the specified food component.
Contains no	Indicates that this claim’s validity was achieved by certain manufacturing processes.

Claim	Description
Healthy	A food product which is low in fat and saturated fat with limited quantities of cholesterol and sodium, and should contain at least 10% more of either vitamin A or vitamin C, with calcium, iron, protein and fibre.
Fortified, added and enriched	Specifications are the same as the food label claims “more”; it is specified that with the use of these claims the food product was altered.
Fresh	Can only be used on food products that are raw, and has never been frozen or heated.









References: Parker, 2003:492; Sharf et al., 2012:533; Whitney & Rolfes, 2008:58

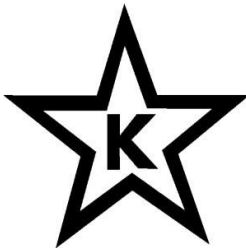






2.4.3.4 Food label symbols


Background of food label symbols: Food symbols provide food label information in a concise pictorial format and thus have the potential to assist consumers when evaluating food labels. There has been an increase in the number and use of food label symbols on food products worldwide (Latortue & Weber, 2010:517). Regardless of the increase of food symbol provision, some critique points are mentioned: food symbols are only included to some degree due to space limitations on food labels (Cornelisse-Vermaat *et al.*, 2008:675), symbols may not assist consumers in making nutrient specific food choices (Colby *et al.*, 2010:92), and a food symbol's meaning may confuse consumers. Therefore, there is an increased requirement to develop effective regulations to define specific criteria for food label symbols (Latortue & Weber, 2010:517).

Food label symbols in SA and in the USA: The description of several symbols might differ between countries. Examples of these are the kosher symbol and the Heart Foundation symbol, which are used in both SA and the USA, as shown in Table 2-4. In South Africa, the Heart and Stroke Foundation symbol is known as the Heart Mark (The Heart and Stroke Foundation South Africa, 2012) and in the USA as the American Heart Association symbol (American Heart Association, 2014). Even though these labels represent the same cause, their label description and inclusion criteria differ. Symbols commonly recognised by the American Dietetic Association are the Whole Grain Stamp (Whole Grains Council, 2014) and the Heart Mark (Table 2-4) (Latortue & Weber, 2010:517). It is important to note that food label symbols are not necessarily all nutrition-related, such as the recycling food symbol (Table 2-4). Food label symbols may also serve as a marketing strategy, for example to prevent obesity in the USA by assisting consumers to identify which food product is healthy, and which one is not (Colby *et al.*, 2010:92).

Table 2-4 South African and American food label symbols

Country	Symbol	Name	Description
International		Radura symbol	An international symbol indicating that a food product has been treated with ionising radiation.
International		Halal	A food label is stamped halal if the contents of the food conform to Muslim dietary laws.
International		Recycle	Indicates that the packaging material, which is used is recyclable. A product labelled as “recycled” contains material that has been reprocessed or recovered.
International		Vegetarian	Indicates that a product is organic, natural, vegetarian or vegan, and produced without animal testing.
International		Nestlé whole grain symbol	Nestle-specific symbol indicating that the cereal product contains whole grain.
SA		Kosher	Represents an agency's certification that the food has been processed according to Jewish dietary laws.
SA		Heart Mark	Guidelines to identify heart-healthy products, which are lower in cholesterol, saturated fat, added sugar, and sodium while being higher in fibre.
SA		Proudly South African	This label indicates that 50% of the cost production occurred in South Africa, and that the product is of high quality and complies with environmental standards.

Country	Symbol	Name	Description
USA		Kosher	Kosher Supervision of America examine the ingredients used to make the food, supervise the preparation process, and inspect the processing facilities to make sure that kosher standards are maintained.
USA		Sensible solutions symbol	Developed by Kraft Foods to assist consumers in choosing healthy food and beverage products.
USA		Smart choices	Assisting consumers to remain within their daily calorie needs and to make calorie comparisons within and across product categories easy.
USA		USDA organic seal	These foods have to be grown and processed according to United States Department of Agriculture's National Organic Programme's (USDA NOP) organic standards.
USA		American Heart Association (AHA)	Food products meet AHA standards: cholesterol, fibre, high in calcium, iron, low in total fat, protein, saturated fat, sodium, trans-fat and vitamins A and C.
USA		Whole grain stamp	Indicates whether an item is certified with a 100% stamp (all grains are whole grains) or a basic stamp (product contains at least eight grams of whole grain per 100 g)
USA		Smart spot symbol	Food products meet nutrition criteria based on authoritative statements; designed as a quick way to ensure that consumers' choices are contributing to a healthier lifestyle.

Country	Symbol	Name	Description
USA		Eat smart, drink smart	Unilever logo found on labels of foods and drinks that meet healthy eating criteria based on USA Dietary Guidelines.

References: Cookinglight, 2011; Dolceta, 2010; Hannaford, 2012; Heart and Stroke Foundation South Africa, 2012; IFT: 2012b; Shimoni, 2012; Union of Orthodox Synagogues, 2012; WHO, 2004; Yacoubou, 2006

2.4.3.5 Usage and storage instructions

These instructions refer to the usage or storage which needs to take place in order to ensure optimum quality of the food product (Label Buster, 2010) and should be followed, since these instructions might directly affect the usability and consumers' satisfaction with a food product. Usage instructions refers to the use of a product, and how the product may or should be prepared for the preferred results (FDA, 2009b). Storage instructions, however refers to how and under which conditions a product should be stored (Dolceta, 2010).

2.4.3.6 Manufacturing, best before, sell by and use by dates

Various dates exist to inform the consumer regarding the manufacturing, best before, sell by, and use by dates of the product (Figure 2-6).



Figure 2-6 Examples of food labels: sell by, best before and use by dates

The manufacturing date refers to when the product was manufactured or produced (RSA, 2010:7). The best before date indicates the end of the storage period during which the food

is consumable (RSA, 2010:7). In addition, the sell by date implies the last date that a product might be sold, after which a limited storage time remains (RSA, 2010:14). The term use by, refers to the date by which the product has to be consumed or used. After this date, the food product will no longer possess its ideal quality attributes as expected by the consumer (RSA, 2010:16).

2.4.3.7 Serving size and weight of product

Serving size refers to the portion of the food product which is consumable and within the reference quantities (Parker, 2003:486). Since there may be more than one serving per product, various servings may be indicated on a certain product. Therefore the total weight of a product is also required (RSA, 2010:19). Although food labels present nutrition information per serving, the serving size must be identified and expressed in both household sizes (such as one cookie) and metric measures (such as one cookie = 28 g) (Whitney & Rolfes, 2008:55). Serving sizes on labels do however not always conform to dietary guidelines prescribed for consumption, and might thus lead to confusion (Whitney & Rolfes, 2008:55).

2.4.3.8 Name and address of the manufacturer

The name and the address of the seller, importer or manufacturer need to be provided (RSA, 2010:19).

2.5 Knowledge

Knowledge refers to information and cognitive skills acquired and familiarity gained by means of experience or educational efforts, understanding of a science, and the awareness of an idea or object within the range of the individual understanding (Schiffman & Kanuk, 2010:260; Merriam-Webster, 2012).

2.5.1 Types of knowledge

As proposed in 2.2, four types of knowledge can be distinguished, namely procedural, declarative, objective and subjective knowledge (Figure 2-7). These different types of knowledge may support consumers' behaviour and will be outlined and discussed in the following subsections.

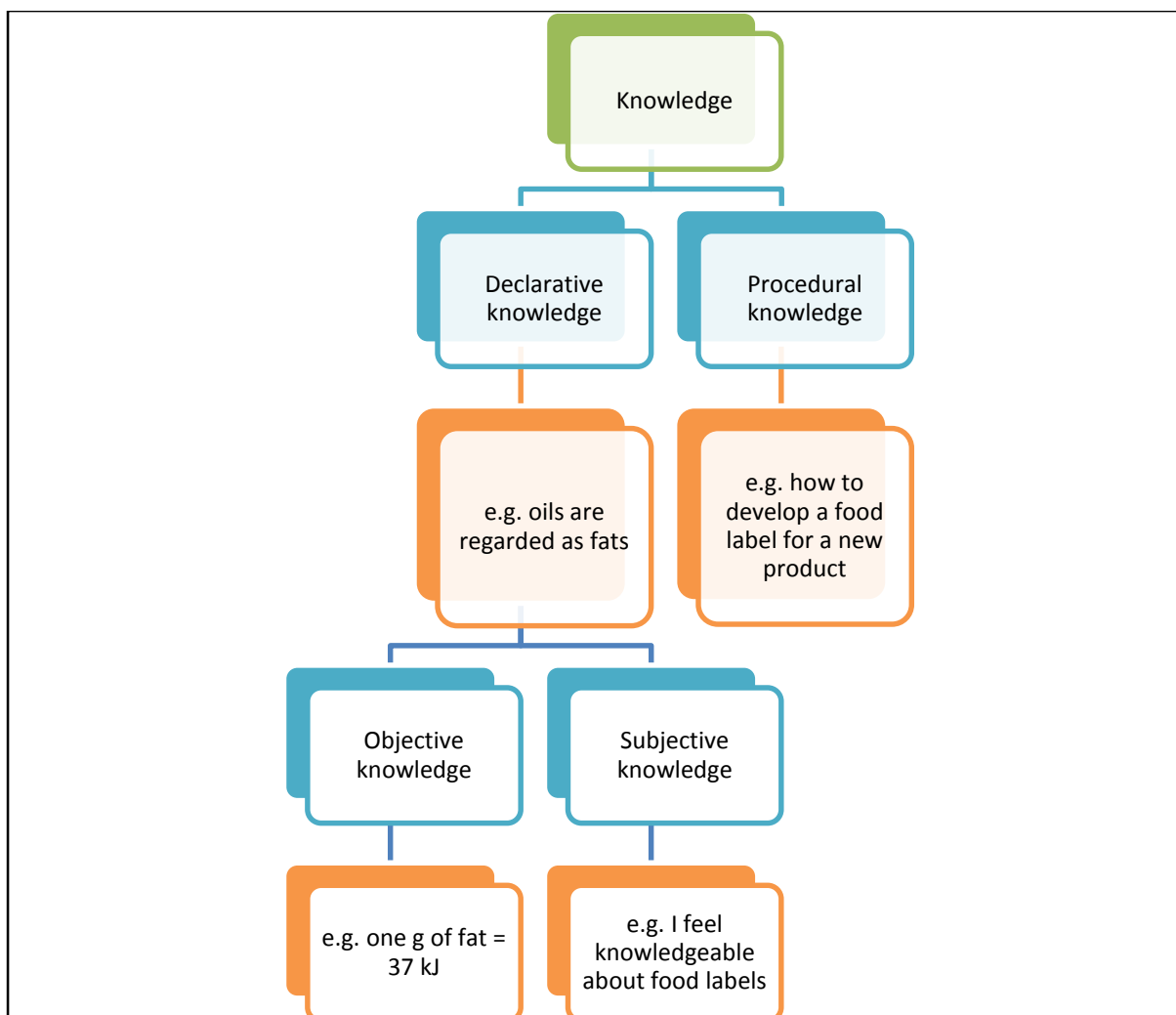


Figure 2-7 Framework regarding the positioning of different types of knowledge within this study.

2.5.1.1 Declarative and procedural knowledge

Declarative knowledge is identified as the knowledge of facts (what) whereas procedural knowledge is known as the knowledge of certain procedures which can be implemented (how) (Sternberg, 2006:229). These types of knowledge might assist in understanding consumers' knowledge of food label information, and the process of how it is obtained. For the purpose of this study, the focus was on declarative knowledge with specific reference to objective and subjective knowledge.

2.5.1.2 Objective and subjective knowledge

Both objective and subjective knowledge have been used to determine consumers' knowledge of a product (Selnes & Grønhaug, 1986:67). The distinct difference between objective and subjective knowledge is the manner in which they are measured (Raju *et al.*, 1995:154). Objective knowledge is measured by determining individuals' extent of

knowledge regarding a certain product or domain (Raju *et al.*, 1995:154). Objective knowledge is preferred when focusing on consumers' cognitive abilities (Selnes & Grønhaugh, 1986:69) to process and recall information.

Subjective knowledge is measured with reference to consumers' self-reported knowledge about a product or domain (Raju *et al.*, 1995:154). Subjective knowledge, as a self-generated knowledge without any objective verifications, causes some consumers to make decisions in irrational or intuitive ways (Guo & Meng 2008:266), since what they believe they know is not a true reflection of what truly know.

Objective knowledge is therefore required to enable the consumer to comprehend the information on food labels. Consumers who only rely on their subjective knowledge regarding food labels might not use such labels as effectively or benefit from food labels as much as consumers who use their objective knowledge (Raju *et al.*, 1995:173). With subjective knowledge, consumers may focus on their own perception of their knowledge about food labels, and might not pursue external resources to obtain objective knowledge of these labels. The differences between consumers' subjective and objective knowledge of food labels should thus be distinguished in an attempt to understand consumers' knowledge of food labels fully.

2.5.2 Memory and comprehension of food label information

Knowledge, memory and comprehension are inseparable concepts (Maguire *et al.*, 1999:1839. Memory can be divided into two sections, short-term memory (also referred to as "working memory") and long-term (Sternberg, 2006:170). Working memory may hold information for a brief period and can only store about seven items (Sternberg, 2006:165). The long-term memory however stores and retains information for extended periods (Schiffman & Kanuk, 2010:226). "Memory" also refers to dynamic processes, which are constantly changing and are associated with the storing, retaining and retrieving of information regarding previous experiences (Sternberg, 2006:157).

Comprehension refers to the action of understanding a specific concept (Wang & Garfurov 2010:1). It entails a higher-order activity that constructs an internal representation of the long-term memory (Rapp *et al.*, 2007:289). For example, to comprehend descriptions, a skilled reader is required to read and reread the text, set goals, monitor and understand the content and make the required connections to foster a deep understanding or comprehension thereof (Ylvisaker *et al.*, 2005). Comprehension thus refers to consumers' ability to understand the meaning of concepts and to interpret the required information

(Sternberg, 2006:349) on food labels. Their comprehension of label information influences whether consumers understand this information accurately. Efforts aimed at food labelling regulations may ease understanding for consumers, resulting in fewer difficulties for them regarding food labels (Silverglade & Heller, 2010:11). Therefore it is important that food label information be clear, correct and easy readable to enhance the comprehensions thereof (Silverglade & Heller, 2010:1).

2.6 Consumers' food label knowledge

Although knowledge and information are required by the consumer in the food label context, consumers need to obtain and comprehend this label information properly to ensure that the label reaches its full knowledge provision potential. The “what” (declarative knowledge, 2.5.1.1) of food labels refers to the facts, content and information provided on food labels, whereas “how” (procedural knowledge, 2.5.1.1) may refer to, for example, how a food label should be adapted for a product in use or be developed for a new product (Figure 2-7). Food label information thus has the potential to be transferred into knowledge about food and nutrition and serves as an educational source for consumers, especially with respect to those who might lack knowledge regarding nutrition (Barreiro-Hurle *et al.*, 2008:190).

2.6.1 Food and nutrition label knowledge

The information provided on food labels should be verified by the manufacturer and governing bodies (FDA, 2008) and should be an accurate representation of the food product's characteristics. It is thus more beneficial for consumers to rely on the nutrition label information, than on their own knowledge of a food product (Drichoutis *et al.*, 2006:4), since their own knowledge may be influenced by their subjective knowledge (see 2.5.1.2). Consumers can use nutrition knowledge as a way to seek and acquire nutrition information regarding food products (Drichoutis *et al.*, 2008:140) on the food label. Conversely, it is also possible that nutrition labels might influence nutrition knowledge (Drichoutis *et al.*, 2006:6), whereas repeated nutrition label use may thus be a means of obtaining nutrition label knowledge. It is proposed that the same principle might be applicable to food label knowledge.

2.6.2 Consumers' demographic with regard to food label knowledge

The use of food labels may vary among consumers with various socio-demographic characteristics (Chen *et al.*, 2011:763), which might imply that consumers' comprehension and knowledge of food labels could be associated with similar demographic characteristics. Consumers' demographics refer to among others, their age, education levels, ethnicity, gender, household size, income, language, marital status and religion (McLean-Meynsse,

2001:111). According to Drichoutis *et al.* (2005a:22), consumers who are more prone to use food labels' nutrition information are typically those who have a higher income, are highly educated, are not price-sensitive, and are nutritionally more knowledgeable than consumers with different demographic characteristics. Considering the differences in consumers' food label knowledge with respect to demographic subgroups, was particularly important in this study which investigated consumers' food label knowledge in a developing and developed country context. Specific consumer demographic characteristics are subsequently discussed.

2.6.2.1 Gender

Male consumers are more likely to consider the ingredients of food products, whereas female consumers are more likely to use the energy value, vitamin and mineral contents of food (Drichoutis *et al.*, 2005b:111) when evaluating food labels. Studies indicate that female consumers search more frequently for label information (Blitstein & Evans, 2006:362; Grunert Fernandez-Clemin *et al.*, 2010:268;), since they share a greater interest in food label information, are more knowledgeable regarding nutrition (Gracia *et al.*, 2007:169) and also consider nutrition claims of higher value (Nayga, 2008:52) than males. Research in particular shows that female consumers with a higher education understand food label information better (Chen *et al.*, 2011:767), read labels more frequently (Misra, 2007:2132), have better nutrition knowledge scores (Misra, 2007:2132) and use food labels more than their male counterparts since they tend to be more health-conscious (Hess *et al.*, 2011:412). It was found that male and female respondents had the same performance on food label knowledge (Sørensen *et al.*, 2013:291) and nutritional knowledge (Carrillo *et al.*, 2012:H1). These results are however not conclusive, and it is suggested that this should be further investigated.

2.6.2.2 Age

The use of food labels decreases among consumers with an increase in age (Drichoutis *et al.*, 2005b:111), whereas younger, female and well-educated consumers tend to attach a higher value to foods which are labelled with nutrition claims than other consumers (Nayga, 2008:52). Younger consumers are also more likely to consult the Internet for food or nutrition information (Ellis & Glanville, 2010:9). Sharf *et al.* (2012:533), however, indicate that food label understanding of young consumers is unsatisfactory. Older consumers, on the other hand, are more likely to perceive the benefits of mandatory implementation of nutrition label programmes (Gracia *et al.*, 2007:171), where they may be taught how to read and interpret food and nutrition labels. Increased label-reading behaviour was found among older female consumers who have a positive food label-reading attitude, using supplements and having

prior nutrition education exposure (Misra, 2007:2132). Contradictory findings in literature and a lack of literature regarding the association between food label knowledge and age, provided an area for further investigation.

2.6.2.3 Household size

Limited research regarding consumer behaviour in the context of household size could be traced. Consumers living in larger households are less inclined to use nutrition labels (Gracia *et al.*, 2007:170; Prathiraja & Ariyawardana, 2003:35) than consumers living in smaller households, which might decrease their possibility to obtain food label knowledge since they do not expose themselves to food labels by reading it. In contrast, Radam *et al.* (2010:71) found a positive relationship between consumers in larger households and their willingness to pay for food label information, than those from smaller households. Consumers' food label knowledge as associated with household size thus remains to be investigated further.

2.6.2.4 Education

Consumers with a higher educational level have more nutrition label knowledge than those with lower levels of education (Barreiro-Hurle *et al.*, 2010b:226; Drichoutis *et al.*, 2005b:104; Drichoutis *et al.*, 2006:1; Gracia *et al.*, 2007:169). Furthermore, well-educated consumers also attach a higher value to nutrition claims, suggesting that they are more likely to believe the information provided by these claims (Nayga, 2008:52), than consumers who are not well educated. However, in a USA study among student consumers, a significant difference was found between undergraduate and post-graduate respondents regarding their knowledge of food labels (Misra, 2007:2131). Although undergraduate respondents had better nutrition knowledge and more positive attitudes towards food labels than their graduate consumer counterparts, it should be taken into consideration that undergraduate students had more nutrition education exposure (Misra, 2007:2133). A possible explanation might be that attention might only have been given to food label education programmes the past few years (ORC-MACRO, 2004:2), suggesting that graduate consumers might not have experienced the same level of food label exposure and education as their undergraduate counterparts, since such information was not always available to the extent that it is today. Since results regarding different educational levels and food label knowledge are inconclusive, the researcher in the present study is of opinion that education with regard to food label knowledge should be further investigated since it might be of particular interest in the developing vs. developed country context.

As depicted in Table 2-5, educational levels in SA and the USA differ with reference to the educational classification. Since education was not the main focus of this study, only some background is provided. In SA, high school education starts in Grade eight, whereas in the USA, it starts in Grade nine. While South African consumers refer to post-high school education as tertiary education, the USA refers to this as post-secondary education. These terms are important to comprehend the educational structures of these two countries (SA and USA).

Table 2-5 Educational groups of South African and United States of America consumers

South Africa		USA	
Classification	Age group	Classification	Age group
High school (secondary education)		High school (secondary education)	
Grade 8	13–14	N/A	-
Grade 9	14–15	9th Grade (Freshman)	14–15
Grade 10	15–16	10th Grade (Sophomore)	15–16
Grade 11	16–17	11th Grade (Junior)	16–17
Grade 12	17–18	12th Grade (Senior)	17–18
Tertiary education		Post-secondary education	
Tertiary education (university)	18–22	Tertiary education (College or university)	Ages vary, often 18– 22
Post-graduate	Ages vary	Graduate education	Ages vary

(ISG, 2012).

2.6.2.5 Income

Several studies confirm that a higher income has a positive effect on consumer's nutrition knowledge (Barreiro-Hurle *et al.*, 2010b:222; Drichoutis, 2005b:104), rather than those with a lower income. Consumers who are more price-sensitive tend to pay less attention to the nutrition content of food during food purchases (Gracia *et al.*, 2007:171), while female consumers with a higher income are more likely to report reading and using food labels (Cowburn & Stockley, 2005:24), than females with a lower income. Income is thus likely to

be associated with food label knowledge, was relevant for this study where the average income of consumers in a developing country was less than those in a developed country context.

2.6.2.6 Culture, religion, ethnicity and language

Consumer knowledge is a multidimensional construct among various cultures (Guo & Meng, 2008:261). Some studies indicate no significant differences for the use of food labels among various ethnicities (Blitstein & Evans, 2006:363), while knowledge of trans-fat, as one of the most important determinants for food label use, is associated with ethnicity (Jasti & Kovacs, 2010:312). Although research relevant to consumers' label knowledge among different cultures is inconclusive and limited, the following findings within specific cultural and language groups were indicated:

- French consumers evaluated information found on products (such as label information) conclusive with respect to the knowledge they obtained from food consumption (Guo & Meng, 2008:266).
- Female respondents in a United Kingdom study were able to use and manipulate information on both EU labels as well as nutrition facts labels (Byrd-Bredbenner et al., 2000:624).
- Brazilian consumers have better food label behaviour than German consumers (Soriano et al., 2012).
- Caucasian respondents in the USA had better nutrition knowledge than non-Hispanic blacks and Hispanic respondents (Nuss et al., 2007:1801).
- Persistent bi-directional relationships were found between healthy food choices, nutrition label use and nutrition knowledge among European respondents in two Spanish cities (Barreiro-Hurle et al., 2010b:228).

Furthermore, consumers who have been brought up to consume food without reading food labels, will be less likely to read these labels in future because of their cultural backgrounds and food consumption habits (Lin & Lee, 2004:20). Cultural differences could therefore have an influence on the nutrition knowledge and healthy eating behaviour among consumers (Grunert, Fernandez-Clemin *et al.*, 2010:268). Consumers are often motivated by their religion to maintain a healthy body by eating food specified by their religion (Norman, 2003:19); which directly affects their diets by setting strict rules (Just *et al.*, 2007:786). The cultural and religious behaviours among consumers are thus diverse, and it is therefore important to understand their food label knowledge in the context of culture, religion, ethnicity and language, especially in this study focusing on the SA vs. USA context.

2.6.3 Consumers' health consciousness and food label knowledge

Food labels are designed to improve the health of the public by providing consumers with nutritional and other information (Lin & Lee, 2004:18). To maintain healthy diets, consumers should understand the importance of all food label information and not only information regarding energy value and macronutrients (Kolodinsky *et al.*, 2008:298), and use this information to make healthy food choices. Consumers' health consciousness will be discussed with regard to diet, health and exercise in the next sections.

2.6.3.1 Diet

It is believed that obesity is caused by a lack of food knowledge and food label use to maintain a healthy body (Blitstein & Evans, 2006:364). Furthermore, consumers who believe that a lack of food label knowledge is a cause of obesity are more inclined to use these labels (Blitstein & Evans, 2006:364). Many consumers realise the importance of the credible information found on food labels to help them maintain a healthy weight (Mandal, 2010:525) and will thus be able to make healthy food choices with the assistance of understandable, complete and accessible food labels (Van der Merwe *et al.*, 2010:17).

Student consumers who are more knowledgeable regarding dietary guidelines are more likely to meet these guidelines (Kolodinsky *et al.*, 2007:1409). Food labels offer a way to assist consumers to meet these guidelines, since a positive correlation is found between nutrition knowledge and food label use, suggesting that when consumers have better nutrition knowledge, there is a better probability that they might be using food labels (Drichoutis *et al.*, 2005a:21). Some consumers are also concerned about the vitamin and mineral contents of food (Nehila, 1999:A96) and may therefore have a high interest in obtaining this information from food labels. Drichoutis *et al.* (2005a:22) found that consumers who have more knowledge regarding nutrients are more likely to use specific information such as information regarding vitamins, minerals and fat on food labels. It is thus evident that food label knowledge might assist consumers in their efforts to follow a healthy diet.

2.6.3.2 Health and exercise

Consumers who have a greater nutrition and food knowledge are more concerned about their own health (Kolodinsky *et al.*, 2007:1409; Sääksjärvi *et al.*, 2009:138), than those who have less knowledge in this regard. In turn, the health of consumers has an influence on their nutrition label use (Barreiro-Hurle *et al.*, 2010b:222) and the likelihood to look for nutrition information. Although nutrition labels are designed to improve the health of consumers (Lin & Lee, 2004:18), consumers who are following less healthy lifestyles may tend to avoid food label information (Lin & Lee, 2004:33). In a study by Gracia *et al.*

(2007:169), consumers participating in sport have better nutrition knowledge than sedentary consumers. Food label users who do not exercise have a greater likelihood of losing weight than consumers who exercise but do not read food labels (Mandal, 2010:516). Consumers do however need to comprehend this information in order to use it correctly during decision-making. Thus, when health and exercise are taken into consideration these two factors may contribute to consumers' food label knowledge by being a motivational force in obtaining this knowledge.

2.7 Consumer food label use

Consumers' food label use is widely discussed in literature, with respect to formats of food labels, comprehension of food label information, consumer behaviour, knowledge and education.

2.7.1 Food label use and formats

Different consumers use different formats of nutrition labels (Barreiro-Hurle *et al.*, 2010b:221). The use of nutrition facts panel increases nutrition knowledge, whereas the use of food label claims does not increase nutrition knowledge (Barreiro-Hurle *et al.*, 2010b:226). Consumers with higher levels of nutrition knowledge are more prone to be motivated to use the provided nutrition facts panel since they are more proficient in understanding labels (Barreiro Hurlè *et al.*, 2008:180; Barreiro-Hurle *et al.*, 2010b:226; Gracia, 2007:161) and the specific product content information (Drichoutis *et al.*, 2005a:22), than consumers with lower levels of nutrition knowledge.

2.7.2 Food label use and comprehension

Research on nutrition labels suggests that consumers do not use or understand labels, although they demand labels (Barreiro-Hurle *et al.*, 2010a:427). Consumers will however make better food choices if they use and comprehend food labels. Studies have indicated that comprehension of food label information is more common than the use of the same information (Grunert, Fernandez-Clemin *et al.*, 2010:261; Grunert, Wills *et al.*, 2010:187), suggesting that, although consumers understand the information, they do not necessarily use it. However, Ellis and Glanville (2010:9) indicate that, although consumers have the ability to compare food products regarding nutrient content, it remains uncertain whether they have a full comprehension of nutrition information, such as kilojoules, protein, carbohydrate and fat content. Concepts which consumers consider difficult to comprehend on food labels are the relationship between sodium and salt, carbohydrates and sugar, kJ/kCal and energy, as well as the terms cholesterol, percentage energy, and fatty acids (Cowburn & Stockley, 2005:23). These terms are mandatory and commonly found on food

labels, and it is therefore important that consumers have sufficient knowledge regarding food labels to understand this information and use it during decision-making.

2.7.3 Food label use and consumer behaviour

Consumers can be identified with distinguishable behavioural patterns and valuation regarding nutrition labels (Barreiro-Hurle *et al.* 2008:178). Consumers' health and eating behaviour are predictors of their use of food labels (Hess *et al.*, 2011:412), which improves their dietary and purchasing behaviour (Drichoutis *et al.*, 2006:ii). Furthermore, consumers may use food labels because they have an interest in healthy eating, and not necessarily to prevent illness. On the other hand, shopping habits, such as habitual purchases, influence consumers' food label use negatively, resulting in less food label use (Hess *et al.*, 2011:412).

2.7.4 Food label use and knowledge

For food labels to be used to their full potential, consumers should obtain food label knowledge. Knowledge may convince consumers to use a product although they might not have a preference for the food in terms of taste and similar attributes (Wansink *et al.*, 2005:266), such as the knowledge that beef liver is a good source of iron (Whitney & Rolfes, 2008:450), convincing consumers to consume the product, regardless of the taste. Similarly, to increase consumers' label knowledge, their label use should increase (Drichoutis *et al.*, 2005a:23). Consumers who have more food label knowledge are more prone to use these labels, and consider mandatory food labelling as beneficial (Gracia *et al.*, 2007:161).

2.7.5 Food label use and education

Drichoutis *et al.* (2005a:23) found that a third of consumers who are educated and nutritionally knowledgeable often use food labels. The development of information campaigns to educate consumers on nutrition labelling may result in better label use and consumption patterns (Drichoutis *et al.*, 2006:ii).

Educators' nutrition knowledge is of significant importance (Unusan, 2004:630), since the educator needs to have a thorough understanding and knowledge of nutrition and food labels to be able to educate consumers regarding these topics. Nutrition education efforts should focus on improving consumers' food knowledge and bringing it in line with their personal food choices (Guenther *et al.*, 2005:1273). These efforts should be aimed at consumers less inclined to use nutrition labels (Gracia *et al.*, 2007:172), to increase their knowledge in this regard. To ensure that consumer education occurs sufficiently, tailor-made education programmes should be developed for particular target markets (Unusan, 2004:636). Anderson and Coertze (2001:28) already indicated that consumers in SA

requested nutrition labelling education campaigns. The present study will provide valuable information on the possible need for food label education programmes within a SA and the USA context.

2.8 Conclusion

It can thus be concluded that to understand the food label knowledge of consumers (in both developing and developed countries), food labels and the information found on these labels as well as the relevant types of knowledge should be considered and understood. The demographic differences of consumers in developing and developed countries prove to be a criterion for vast differences in food label knowledge. The information found on labels is vital for consumers to understand the label as an entity. It is therefore vital that all labels should include this information, so that consumers may be exposed to the information, assisting them in attempts to obtain knowledge. Lastly, an attempt should be made to increase food label knowledge, not only subjectively but also objectively, as the objective knowledge of consumers hold positive health implications once the food label information is understood, for the benefit of the consumer, the industry and research.

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Chapter 3: Research Article

The article is to be submitted to the journal: *Cross-Cultural Research* and is prepared according to the editorial prescriptions of this journal, including the referencing style attached as Appendices F. Due to word count limitations within the article, a more comprehensive methodology section is provided in Appendix A .

Short title

Food Label Knowledge: A Comparison between a Developing and Developed Country Context

Keywords

consumer, demographics, food labeling, food label knowledge, South Africa, United States of America

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Abstract

Subjective and objective knowledge in the context of food labels as compared between respondents in developing and developed country contexts has not been investigated previously. A quantitative study was therefore conducted among respondents in these contexts by means of interviewer-administered questionnaires. Only one practically significant difference was found between respondents' subjective knowledge of expiry dates, where respondents from Potchefstroom (South Africa) regarded themselves more knowledgeable than respondents from Fayetteville (USA). Practically significant differences were found regarding objective knowledge between respondents from Potchefstroom and Fayetteville, with the latter group having more objective knowledge regarding the location and manipulation of label information than respondents from Potchefstroom regardless of certain label-reading, demographic, purchasing and health behavior variables. Subjective and objective knowledge of food labels were found not to be related. This research may have significant value in the development of educational programs regarding food labels, particularly in a developing country context, since it is evident that the gap with regard to objective food label knowledge was more prominent in this context.

Introduction

Food contributes significantly to consumers' lifestyle, in providing pleasure and in fulfilling consumers' energy and nutrition requirements (Drichoutis, Lazaridis, & Nayga, 2008). In order for consumers to make informed dietary decisions, they need nutrition information on food labels (Borra, 2006; Byrd-Bredbenner, Wong, & Cottee, 2000), and thorough food label knowledge, since this might influence their consumption patterns (Marietta, Welshimer, & Anderson, 1999) and overall health (Fusaro & Toops, 2012).

From the consumers' perspective, the primary role of food labels is to inform them on nutrition information and to guide dietary behavior (Mackinson, Wrieden, & Anderson, 2010). Modern food labels inform consumers regarding food preservation technologies, food production, and the development of packaging (Cheftel, 2005). Food label information thus has the potential to be transferred into knowledge about food and nutrition and serves as an educational source for consumers, especially those who might lack knowledge regarding nutrition (Barreiro-Hurle, Garcia, & De-Magistris, 2008). In order to benefit optimally from food labels, the label has to be consulted by consumers with sufficient food label knowledge.

Consumers' understanding of food and food production and their attitudes towards health and diet form part of a multi-disciplinary and increasingly important research area in consumer science (Patermann, 2007 in EC 2007). Previous research (Block & Peracchio, 2006; Gorton, Mhurchu, Chen, & Dixon, 2009; Marietta et al., 1999) has been conducted on consumers' knowledge regarding nutritional information on labels, but not on their overall knowledge of food labels. There is however little literature regarding the food label knowledge of consumers in general or within the South African and American contexts. The only study, done on food label knowledge in the South African context, was by Van der Merwe, Bosman, Ellis, De Beer, & Mielmann (2012), while Anderson and Coertze (2001) did a similar study on nutrition label knowledge. In the USA, food label knowledge was studied amongst children and adolescents (Hawthorne, Moreland, Griffin, & Abrams, 2006; Reynolds Treu, Njike, Walker, Smith, Katz & Katz, 2012), and not the entire consumer population. These studies in general indicated a lack of nutrition label knowledge among consumers in South Africa (SA), while USA adolescent consumers showed sufficient but not ideal food label knowledge.

The present study compared the food label knowledge of consumers in a developing country (SA) and a developed country (USA) context. A similar study regarding nutrition label knowledge in Brazil and Germany showed that respondents in the developed country had similar nutrition label knowledge as those in the developing country (Soriano, Da Conceição, Galhardo, De Andrade, & De A Gonçalves, 2012). It is however, necessary to

determine consumers' knowledge regarding additional food label information, such as allergens (Joshi, Mofidi & Sicherer, 2002:1019). Furthermore, the South African and USA contexts differ from those of Brazil and Germany due to differences in demographics, education opportunities and label regulations, which thus need further investigation. As a developing country, SA does not hold the same education levels and opportunities as USA consumers (Nation Master, 2012), which could affect food label knowledge. The global increase in consumer demands for and availability of food labels on products (Bernués, Olaizolab, & Corcoranc, 2003) might also influence consumers' knowledge of food labels in a developing and developed country context differently.

The aim of the current study was to determine whether the objective and subjective food label knowledge of consumers from Potchefstroom (North West Province) and Fayetteville (Arkansas, USA) differ. This was done in order to develop education programs, which might be used in developing and developed countries.

Literature Review

The literature review provides an overview of literature regarding food labels, consumers in the South African and USA context, and food label knowledge. Although the authors attempted to incorporate the most recent literature in this research area, some classical references needed to be incorporated, especially with regard to basic theory on knowledge for the sake of comprehensiveness.

Food Labels

Consumers need to have food label knowledge, since knowledge mediates the association between accuracy of decisions and motivation (Petrovici, Fearne, Nayga, & Drolias, 2012), while it might also influence their food choices and dietary intake (Marietta et al., 1999). Food labels refer to pictures or graphics, brands, or other descriptive material, attached to food packaging, and include labeling for promotional, sales and disposal purposes (RSA, 2010). These labels are considered the most suitable source of information for consumers to acquire knowledge about food (Ali & Kapoor, 2009) and are subject to different labeling legislation in SA and the USA, demanding different mandatory food label information (Food and Drug Administration [FDA], 2009; RSA, 2010).

The information provided on food labels has evolved over time as the purposes of food labels have increased and become more complex (Cheftel, 2005). Since consumers often do not have sufficient scientific background knowledge to interpret the technical information on food labels, some consumers might be suspicious about modern food

technology (Cheftel, 2005), which emphasizes the need for research regarding consumers' knowledge about food labels. Given that information on food labels is mainly intended for consumers for the fulfilment of their needs, it is important that consumers should have sufficient knowledge of these labels.

Consumers in South Africa and the United States of America

A developing country has a large focus on agricultural outputs, whereas a developed country focuses on manufacturing and technology (Mosby, 2008). South Africa has an emerging economy (SouthAfrica.info, 2012), focusing on agriculture, manufacturing and technology. Furthermore, significantly more previously disadvantaged South-Africans nowadays have access to commodities and services (Gothan & Erasmus, 2008), such as access to formal retail outlets with more products displaying food labels than stores found in informal areas. Since SA has characteristics of both a developing and developed country (Global Literacy project, 2012) a study comparing consumers in this context to those in a developed country context (such as the USA) regarding their food label knowledge might prove to be valuable.

In the global context, there are various consumer groups with distinguishable behavioral valuations and patterns (Barreiro-Hurle et al., 2008) as well as demographics. These demographic differences might have an influence on consumers' behavior towards food labels (Osei, Lawer, & Aidoo, 2012), since demographics define consumers' lifestyles and might even influence their consumption patterns (Osei et al., 2012). The use of food labels may thus vary among consumers with various socio-demographic characteristics (Chen, Jahns, Gittelsohn, & Wang, 2011), which might imply that consumers' comprehension and knowledge of food labels might be associated with similar demographic characteristics. According to the literature, the specific demographic characteristics which might influence consumers' food label behavior are:

- gender (Grunert, Fernandez-Clemín, Wills, Bonsman, & Nureeva, 2010; Hess, Visschers, & Siegrist, 2011);
- age (Chen et al., 2011);
- income (Barreiro-Hurle, Garcia, & De-Magistris, 2010; Drichoutis, 2005);
- culture, religion, ethnicity, language (Barreiro-Hurle et al., 2010; Jasti & Kovacs, 2010; Soriano et al., 2012); and
- education (Barreiro-Hurle et al., 2010; Garcia, Loureiro, & Nayga, 2007; Misra, 2007).

The demographic profile of consumers from Potchefstroom, SA and Fayetteville, Arkansas, USA differed vastly. Some of the most visible differences among USA consumers from Fayetteville, Arkansas were a greater frequency of English-speaking consumers, higher

education levels, and more Caucasian consumers than was the case in Potchefstroom, whereas within the latter group there were more black/African consumers (Area vibes, 2010; Index Mundi, 2012a; Stats SA, 2010; Stats SA, 2011; Tlokwe City Council, 2010). Languages spoken in Potchefstroom at the time of the study were English, Afrikaans, Tswana and eight other African languages, with Tswana the most spoken language in the city of Potchefstroom (Stats SA, 2011). Both Fayetteville and Potchefstroom have more consumers between the ages of 15 and 64 years than consumers outside of this age group. The age group 15 – 64 year old consumers include: school learners, university students, working people and people below the age of retirement.

Consumer Knowledge of Food Labels

Consumer knowledge is defined as a cognitive need of consumers and the familiarity gained through experience and understanding of a science and the awareness of an idea or object within the range of the individual's understanding (Schiffman & Kanuk, 2010; Merriam-Webster, 2012). Knowledge also refers to information and skills acquired by means of experience or educational efforts (Schiffman & Kanuk, 2010; Merriam-Webster, 2012). Two types of knowledge were distinguished for the purpose of this study: objective and subjective knowledge (Rehorick, 1981). These types of knowledge may support consumers' behavior (Matilla & Wirtz, 2002; Raju, Lonial, & Mangold, 1995). The distinct difference between objective and subjective knowledge is the manner in which they are measured (Raju et al., 1995). Objective knowledge is measured by determining individuals' actual extent of knowledge regarding a certain product or domain (Raju et al., 1995), and is preferred when focusing on consumers' cognitive abilities (Selnes & Grønhaugh, 1986) to process and recall information. Subjective knowledge is measured with reference to consumers' self-reported knowledge about a product or domain (Raju et al., 1995) and what they think they know without any objective substantiation. This could cause some consumers to make decisions in irrational or intuitive ways (Guo & Meng, 2008), since what they believe they know is not necessarily a true reflection of what they truly know. Food label information thus has the potential to be transferred into (objective) knowledge about food and nutrition and serves as an educational source for consumers, especially with respect to those who might lack knowledge regarding nutrition (Barreiro-Hurle et al., 2008).

Methodology

Research Design

The current study employed a non-experimental comparative descriptive design, which is suitable where two or more study groups are present (Hair, Moneu, Samouel, & Page, 2007) and compared.

Sampling

For the purpose of this study, respondents were divided into two groups, namely those from South Africa (a developing country) and those from the USA (a developed country) with specific reference to respondents from Potchefstroom, North West Province (SA) and Fayetteville, Arkansas (USA). The researchers used purposive sampling and, although this sampling technique does not ensure representativeness (Maree & Pietersen, 2010b) it allowed the respondents to comply with certain inclusion criteria. In order to participate, male and female respondents had to be older than 18 years and needed to be permanent residents of either Potchefstroom or Fayetteville. Their spouses may not have worked as dietitians, consumer scientists, nutritionists or pharmacists, since such consumers might have better food label knowledge (Van der Merwe et al., 2012). The respondents also had to be literate and the main purchaser of the household's food products. Even though it was a non-probability sample, the researchers attempted to collect data as inclusive as possible with respect to the demographics (language, gender and age) of these populations. The total sample ($N = 713$) included 400 respondents from Potchefstroom, and 313 from Fayetteville. The researchers strived to include at least 30 respondents from each ethnic group, with the same number of male and female respondents, and the same distribution of age among the four groups, as recommended by the Statistical Consultation Services of the North-West University (NWU). However, in Fayetteville a smaller number of Asian ($n = 16$), and male ($n = 70$) respondents and a larger number of respondents in the age group 35–53 ($n = 106$) were recruited due to a lack of availability of a sufficient number of respondents within certain groups.

The study location comprised different public areas in both Potchefstroom and Fayetteville where respondents had time to fill out the questionnaires. The researchers sought permission from local authorities from the intended study locations for data to be collected. The respondents were recruited by the researchers; the researcher in Potchefstroom was assisted by a trained fieldworker due to difficulty in finding respondents.

Measuring Instrument

Questionnaires were used to enable the researcher to measure multiple variables at once (Maree & Pietersen, 2010a) and because a standardized data collection technique enabled the researchers to make comparisons between populations (Corbetta, 2003). A standardized questionnaire, which was used in a previous study by Van Der Merwe et al., (2012), was used to collect data for the present study. This instrument was originally adapted by Van der Merwe et al. (2012) for food label knowledge from previous USA instruments (Alfieri & Byrd-Bredbenner, 2000; Byrd-Bredbenner, Alfieri, Wong, & Cottee, 2001), which determined consumers' nutrition label knowledge. The instrument was slightly adapted for the present study with regard to some demographic and general information items, adding subjective knowledge as well as additional claims and symbols. The USA version of the questionnaire was adapted from the South African questionnaire considering demographic and other context specific information. Since only slight changes were made to the questionnaire, the study by Van der Merwe et al. (2012) served as a pilot study for the present study.

Data were collected as part of a six-section interviewer-administered questionnaire. The sections were divided into six subsections, namely:

- Section A: Opening (which collected information regarding the inclusion criteria);
- Section B: Demographics and general information of the respondents;
- Section C: Subjective food label knowledge;
- Section D: Nutrition beliefs;
- Section E: Label reading; and
- Section F: Objective food label knowledge.

Data Analysis

Prior to data analysis, data were weighted according to the most recent statistical census data on ethnicity of the two cities (Area vibes, 2010; Index Mundi, 2012a, Index Mundi, 2012b; Statistics South Africa [Stats SA], 2010; Tlokwe City Council, 2010), to ensure a more representative distribution of the population groups. IBM SPSS Statistics version 20, release 20.0 was used for data analysis in this study. Descriptive statistics (frequencies and means) were conducted. Differences between variables were determined with one- and two-way ANOVAs where practically significant differences were calculated using Cohen's d -values, where $d \geq 0.7$ were interpreted as of practical significance for this study. Although statistical significance was determined ($p = \leq 0.05$), it was not reported since only large effect sizes were considered of importance. Some patterns identified with the interaction effects were however noted, although they were not of practical significance since these patterns might explain objective knowledge differences between respondents from Potchefstroom

and from Fayetteville. Associations between variables were determined with Spearman's correlations (r) and cross-tabulations (Cramer's V), where once again only effect sizes $\geq .5$ were reported as of practical significance.

Reliability and Validity

Due to the adaptations made to the original questionnaire and the different contexts in which the questionnaire was applied, reliability and validity of the questionnaire for the present study were determined again. Face and content validity were determined to ensure that the questions were clear and that the questionnaire extracted the required information. Exploratory factor analysis via principal axis factoring with Oblimin rotation was employed for the different scales within the measuring instrument to construct factors of knowledge and determine construct validity of the measuring instrument. Internal reliability of the different scales was determined by Cronbach's alpha coefficient.

Exploratory factor analysis delivered the exact same factors in all sections of subjective knowledge (SK) and objective knowledge (OK), in Potchefstroom, Fayetteville and the total study sample, which is ideal. SK yielded two factors, "food label information" (SK-F), and "general label information" (SK-G). SK-F was information found only on food labels, such as general label information, nutritional information, nutrition and health claims, symbols and serving calculations, while SK-G is information with regard to expiry dates, country of origin and brand names, which is information found on most labels, and not only on food labels. According to the Kaiser-Meyer-Olkin (KMO) values, the factor analysis for SK was acceptable (Table 1) (Malhotra, Birks, & Wills, 2012), with relatively compact, distinct and reliable factors (Field, 2013). SK-F had a mean inter-item correlation falling slightly outside the recommended range of .15 to .55, suggesting a high correlation among the items in the factor. SK-G, however, had an inter-item correlation which fell well within the recommended parameters (Clark & Watson, 1995). According to the Cronbach alpha value, SK-F had an internal consistency, showing excellent reliability, whereas SK-G had an acceptable internal reliability (Table 1) (Nunnally & Bernstein, 1994). The internal reliability and construct validity for SK were therefore acceptable.

OK was divided into five sections on the questionnaire: locating information (OK-L), manipulating information (OK-M), health claims (OK-H), nutrition claims (OK-N) and food label symbols (OK-S). Each of these sections yielded one factor only, named after the section names. The KMO for each of these sections (Table 1) indicated acceptable correlations (KMO = .67–.94) according to the classification by Malhotra (2012). Mean inter-item correlations were mostly within the prescribed parameters described by Clark and

Watson (.15–.55), except for OK-L and OK-N with higher values, suggesting a high degree of similarity between the items within these factors. According to the Cronbach alpha values, excellent reliability was shown for OK-L, a good reliability with regard to OK-S, and an acceptable reliability within OK-M, OK-H and OK-N (Table 2-1). This suggests that for SK, all the factors within OK displayed acceptable reliability and validity.

Table 1 Reliability and validity for exploratory factor analysis of subjective and objective knowledge of food labels

	Abbreviation	Inter-item correlation	Cronbach's α	KMO
Subjective knowledge	SK			.91
Food label knowledge	SK-F	.59	.91	
General label knowledge	SK-G	.48	.73	
Objective knowledge	OK			
Locating information	OK-L	.58	.93	.94
Manipulating information	OK-M	.48	.73	.67
Health claims	OK-H	.25	.67	.67
Nutrient claims	OK-N	.73	.74	.71
Symbols	OK-S	.51	.85	.75

Ethical Considerations

In social sciences, the test subjects are human, who bring unique ethical considerations to the fore and therefore data could not be obtained at the expense of the respondents (Strydom, 2011). To ensure that the study was done in an ethical manner, the project was approved by both the Ethics Committees of the North-West University (NWU) (reference code: NWU-00024-09-A1) and the University of Arkansas (reference code: IRB-13-01-382USA). By signing a letter of consent, the respondents agreed to participate in the present study. Respondents were not compelled to answer the questionnaire and they could withdraw from the study at any time and were ensured that their information would be handled confidentially.

Results and Discussion

Demographic Profile of the Sample

The demographic profile of the sample within the two cities, as well as the total sample (N = 713) are provided in Table 2. Vast differences in the demographic profile of respondents from the two cities were found for all demographic variables, except for age and number of children, which showed similar distributions. With respect to gender, the sample in Fayetteville had a greater number of female respondents, since there was a lack of availability of male respondents willing to participate. There was also a greater number of white/Caucasian respondents in Fayetteville than in Potchefstroom, and a greater number of black/African respondents in Potchefstroom than in Fayetteville, which corresponded with the ethnic distribution of the cities respectively. There was a difference between the number of respondents from Potchefstroom (20.6%) and Fayetteville (0.6%) with less than a high school diploma or General Education Diploma (GED), while only 29.3% of respondents from Potchefstroom had a tertiary qualification, as compared to 61.3% respondents from Fayetteville. This might be explained by the general lower level of education found in developing than developed countries (Todaro & Smith, 2013), as SA has lower levels of education and experiences difficulties with education even when compared to other developing countries (Department of Education, 2012). Finally, there were a larger number of respondents in Potchefstroom in the low-income group than in Fayetteville, while more respondents from Fayetteville had a medium income than those from Potchefstroom. This corresponds with statistics indicating that developing countries generally have low levels of income, while developed countries have high levels of income (Braitstein et al., 2006)

Table 2 Frequencies and Distribution of Respondents' Demographics

Demographic characteristics	Potchefstroom		Fayetteville		Total sample	
	(n)	(%)	(n)	(%)	(N)	(%)
Gender (n = 713)						
Male	199	49.8	70	22.4	269	37.7
Female	201	50.3	243	77.6	444	62.3
Ethnicity (n = 747)						
White/Caucasian	150	37.5	225	64.8	375	50
Black/African American	150	37.5	56	16.1	206	27.6

Demographic characteristics	Potchefstroom		Fayetteville		Total sample	
	(n)	(%)	(n)	(%)	(N)	(%)
Colored (SA)	70	17.5	–	–	70	9.4
Indian (SA)/Asian(USA)	30	7.5	16	4.6	46	6.2
Other	–	–	50	14.4	50	6.7
Age (n = 713)						
18–24	105	26.3	69	22.0	174	24.4
25–34	100	25.0	73	23.3	173	24.3
35–54	101	25.3	106	33.9	207	29.0
≥ 55	94	23.5	65	20.8	159	22.3
Education (n = 712)						
No high school diploma/GED	82	20.6	2	0.6	84	11.8
High school diploma/GED	200	50.1	119	38.0	319	44.8
College/university degree	117	29.3	192	61.3	309	43.4
Children under 18 (n = 712)						
0	217	54.4	207	66.1	424	59.6
≥ 1 child	182	46.0	106	34.0	288	40
Income (n = 708)						
Low income	347	88.9	168	53.7	515	72.7
Medium income	28	7.1	103	32.9	131	15.8
High income	20	5.1	42	13.4	62	11.5

Profile Regarding Shopping, Label Reading and Health

Most respondents did their purchases for the entire household (Potchefstroom = 70%; Fayetteville = 65%) and their main grocery shopping, less than twice a month (Potchefstroom = 71%; Fayetteville = 51%), although respondents from Potchefstroom (40%) on average spent less time (< 1 hour) than respondents from Fayetteville (52%; 1–2 hours). Fewer respondents from Potchefstroom (65%) were aware of labeling legislation than respondents from Fayetteville (80%). The majority of the respondents from both Potchefstroom (69%) and Fayetteville (81%) indicated that they sometimes to always read food labels. Similar results were found by a previous study indicating frequent food label

reading among respondents (Cowburn & Stockley, 2005). Most respondents (Potchefstroom = 65%; Fayetteville = 67%) also indicated that food label information sometimes to always had an influence on their purchasing decisions, and that food labels were consulted for first-time purchases (Potchefstroom = 74%; Fayetteville = 77%), confirming previous results by Marietta et al. (1999). These results suggested similar behavior among respondents from Potchefstroom and Fayetteville regarding the reading and consultation of food labels, even though fewer respondents from Potchefstroom (65%) were aware of food labeling legislation than their Fayetteville counterparts (80%).

There was some difference with regard to the individuals and sources that assisted respondents in their efforts to read food labels. Respondents from Potchefstroom were mostly assisted by relatives/friends (43%), television (43%) and magazines (40%). In Fayetteville, respondents were mostly assisted by relatives/friends (71%), the Internet (43%) and television (41%). Relatives and friends, as well as television were thus important sources of information to both groups of respondents as confirmed by Pérez-Escamilla et al. (2001). Nuss, Freelan-Graves, Clarke, Klohe-Lehman, and Milan (2007) who studied Latino consumers and 1-year post-partum mothers in the USA, also found magazines, family, friends and television to be helpful information sources.

Both respondents from Potchefstroom (45%) and Fayetteville (33%) indicated reasons which kept them from reading food labels. Potchefstroom respondents indicated that it takes too much time to read (28%), there is too much information/information is too detailed (25%), and the print is too small to read (23%). Respondents from Fayetteville in addition stated that the information is confusing (58%), and similar to those from Potchefstroom, that the print is too small to read (41%), and that it takes too much time to read the labels (38%). These reasons indicated for both groups of respondents were similar to previous studies (Borra, 2006; Cowburn & Stockley, 2005; Godwin, Speller-Henderson, & Thompson, 2006). Some of these reasons may be attended to, such as simplifying detail, and assisting consumers to understand the information by means of food label education programs.

The majority of respondents from both cities rated the nutritional quality of diet (Potchefstroom = 63%; Fayetteville = 86%), their overall health (Potchefstroom = 79%; Fayetteville = 94%), and their nutritional knowledge (Potchefstroom = 58%; Fayetteville = 48%) as good to excellent. However, only 27% of respondents from both Potchefstroom and Fayetteville followed a specific diet. Most respondents from Potchefstroom (96%) and Fayetteville (90%) believed that food could enhance their health, while the majority (Potchefstroom = 61%; Fayetteville = 54%) also indicated that they eat food for the health

benefits that it offers. This suggests that the health beliefs and dietary behavior of respondents from both cities might be the same, which could have similar implications for their label-reading behavior.

Differences in Subjective Knowledge Regarding Food Labels of Respondents from Potchefstroom and Fayetteville

Respondents from Potchefstroom did not differ regarding the two factors, namely SK-F ($d = 0.0$; Potchefstroom: $\bar{x} = 2.52$; Fayetteville: $\bar{x} = 2.52$) and SK-G ($d = 0.1$; Potchefstroom: $\bar{x} = 3.18$; Fayetteville: $\bar{x} = 3.09$) of food labels and regarded themselves as not well to somewhat informed. A practically significant difference was only found between respondents' self-reported knowledge of expiry dates (Table 3), where respondents from Potchefstroom had a better average subjective knowledge (well informed vs. somewhat informed), than respondents from Fayetteville.

Table 3 Mean Subjective Knowledge of Respondents from Potchefstroom and Fayetteville

	Potchefstroom		Fayetteville		Study sample		Effect size
	N	Mean	SD	N	Mean	SD	$d^{\#}$
Food label information (SK-F)							
Food label information in general	397	2.51	0.93	304	2.61	0.87	0.1
Locating information on food labels	400	2.58	0.99	304	2.75	0.96	0.2
Nutrition information on food labels	396	2.57	0.95	304	2.50	0.86	0.1
Ingredients listed on food labels	399	2.65	0.98	304	2.65	0.92	0.0
Claims on food labels	396	2.45	0.96	304	2.44	1.00	0.0
Symbols on food labels	393	2.48	1.04	304	2.45	0.95	0.0
Calculating servings of a product	396	2.36	1.04	304	2.22	1.10	0.1
General label information (SK-G)							
Expiry dates on food labels	399	3.67	0.70	304	3.09	0.82	0.7
Country of origin on food labels	400	2.59	1.05	304	3.00	0.93	0.4
Brand names on food labels	400	3.30	0.95	304	3.18	0.83	0.1

Mean of responses of 4-point Likert-type scale: 1 = not informed at all; 2 = not well informed; 3 = somewhat informed; 4 = well informed

SD = standard deviation

$d^{\#}$ Effect size (Cohen's d -value): 0.3 = small; 0.5 = medium, 0.7 = large

Differences in Objective Knowledge of Respondents from Potchefstroom and Fayetteville

A few practically significant differences were observed in OK between the two populations (Table 4). With respect to respondents from Potchefstroom and Fayetteville, large practically significant differences were only found within the factors OK-L and OK-M, where respondents from Fayetteville had higher mean factor scores (correct responses), which indicate that they were more knowledgeable on locating information on food labels, and their ability to manipulate information. These differences are of importance since it implies respondents' ability to use food label information effectively and correctly for informed decision-making. A general pattern of better OK was evident among respondents from Fayetteville who also tended to have better OK-S than respondents from Potchefstroom. Although respondents from Potchefstroom performed statistically better on OK-H (small effect size) and OK-N, it was not of practical significance.

Table 4 Differences between percentages correct responses of respondents from Potchefstroom and Fayetteville regarding their objective knowledge with respect to different factors

	Potchefstroom	Fayetteville	Effect size
OK factor	(%) [✓]	(%) [✓]	<i>d</i> [#]
Locating information (OK-L)	61.8	91.9	0.8
Manipulating information (OK-M)	50.1	88.3	1.0
Health claims (OK-H)	73.7	61.9	0.4
Nutrition claims (OK-N)	74.7	71.6	0.1
Symbols (OK-S)	66.0	89.3	0.6

[#]Effect size (Cohen's *d*-value): 0.3 = small; 0.5 = medium, 0.7 = large

Table 5 shows that respondents from Potchefstroom in particular had a practically significantly lower average OK-L with regard to saturated fat content, main ingredient, storage instructions and preservatives than respondents from Fayetteville. This implies that respondents from Potchefstroom in particular experienced problems with these knowledge-related tasks, with only 40% knowing what the preservative was. Regarding OK-M, it was also insightful that respondents from Fayetteville on average had practically significantly more knowledge on the fiber content per serving and the number of servings than respondents from Potchefstroom, as found formerly by Van der Merwe et al. (2012) for respondents from Potchefstroom. However, this might rather be a cognitive ability from numerical reasoning (Fuchs et al., 2010) than representing their knowledge of food label information since more respondents from Potchefstroom (20.6%) had less than a high school diploma/GED than those from Fayetteville (0.6%). This could pose a possible threat

for these respondents with lower knowledge, as they did not have the ability to calculate nutrition related information of concern for healthy food choices, with regard to nutrient content, serving size, and nutrient content per serving. A large practically significant difference was also found regarding respondents' average OK of the vegetarian symbol, where respondents from Fayetteville had more knowledge. This may be due to the greater focus that consumers in the USA place on vegetarianism (Sareen, 2013) as compared to South Africans.

Table 5 Objective knowledge of respondents from Potchefstroom and Fayetteville (% correct) regarding specific knowledge items

	Potchefstroom	Fayetteville	Effect size
	% [✓]	% [✓]	<i>d</i> [#]
Locating information (OK-L)			
How many kilojoules/calories in 100 g of this food?	57.8	74.9	0.3
How much protein is there in 100 g of this food?	71.2	97.4	0.5
How much saturated fat is there in 100 g of this food?	59.2	92.6	0.7
Name the manufacturer of this product.	71.5	97.7	0.5
What is the main ingredient of this product?	56.7	94.4	0.8
Which type of allergy should avoid this product?	62.2	93.8	0.6
What is the "best before/by date" of this product?	65.3	94.2	0.6
How/where should this product be stored?	61.1	93.5	0.7
Phone number to complain about this product?	72.6	95.2	0.5
Name the preservative in this product.	40.4	85	0.9
Manipulating information (OK-M)			
How much sugar would one consume in 100 g of food?	68.6	95.2	0.5
How much fiber would one consume in one serving?	51.0	90.3	0.8
How many servings from the contents of this product?	30.8	79.4	1.0
Health claims (OK-H)			
High in vitamin A	79.6	87.4	0.2
High in fiber	68.3	51.8	0.3
Trans-fat free	75.1	94	0.4
Low in saturated fat	75.8	53.2	0.5
Nutrition claims (OK-N)			
Healthy	72.6	56	0.3
Wholesome	60.2	31.2	0.6
95% fat-free	63.5	87.4	0.5
Source of calcium	77.5	65.1	0.3
Fat-free	82.3	87.5	0.1
High in energy	86.1	56.3	0.6
Symbols (OK-S)			
Halal	63.1	72.9	0.2
Heart Foundation	78.4	99	0.4
Suitable for vegetarians	56.8	97.4	0.8
Recycled	78.7	98.3	0.4
Radura symbol	53.4	71.4	0.4
Wholegrain symbol	65.9	96.5	0.6

✓Percentage correct

[#]Effect size (Cohen's *d*-value): 0.3 = small; 0.5 = medium, 0.7 = large

Two-way ANOVAs showed statistically significant interaction effects between city and age as well as education for OK-L, OK-M and OK-S (Table 6). Among respondents from Potchefstroom, practically significant ($d \geq 0.7$) better OK-L, OK-M and OK-S were found for the age group 18–24 years and 35–54 years (OK-L: $d = 0.7$; OK-M: $d = 0.8$; OK-S: $d = 0.7$) as well as for the age group 18–24 years and the age group older than 55 years (OK-L: $d = 0.9$; OK-M: $d = 0.9$; OK-S: $d = 0.8$). This may indicate better OK among younger respondents from Potchefstroom, while in Fayetteville no practically significant difference between the different age groups was found. This may be explained by younger consumers growing up in a health-conscious era (Kim, Nayga, & Capps, 2001) and having better food label knowledge than older generations. However, the OK of respondents from Fayetteville showed no practically significant differences with regard to age, and their OK remained good, with a similar distribution among the age groups.

Table 6 Practically significant interaction effects found within the different study populations with regard to different OK factors

	Age (years)			Education			Nutritional quality of diet*			Nutritional knowledge*			Time spent on grocery shopping		
	18–24	25–34	35–54	≥ 55	< High school diploma/GED	High school diploma/GED	Poor	Good	Excellent	Poor	Good	Excellent	< 1 hour	1–2 hours	≥ 2 hours
Locating information (OK-L)															
Potchefstroom	83.5	64.0 ^{ab}	55.9 ^b	49.1 ^b	38.8 ^b	64.7 ^a	68.8 ^a	67.0 ^a	42.5 ^b	50.4 ^a	69.9 ^a	47.1 ^a	75.5 ^a	73.0 ^a	37.4 ^b
Fayetteville	95.4	89.0 ^a	91.6 ^a	90.9 ^a	90.0 ^a	93.2 ^a	100.0 ^a	92.3 ^a	97.1 ^a	81.5 ^a	97.3 ^a	94.4 ^a	91.1 ^a	92.8 ^a	92.7 ^a
Manipulating information (OK-M)															
Potchefstroom	71.8	54.3 ^{ab}	41.4 ^b	40.7 ^b	26.6 ^b	52.8 ^a	51.7 ^a	58.1 ^a	37.2 ^a	40.0 ^a	55.6 ^a	39.8 ^a	61.5 ^a	61.3 ^a	30.1 ^b
Fayetteville	94.9	88.2 ^a	87.4 ^a	81.4 ^a	100.0 ^a	89.0 ^a	100.0 ^a	90.5 ^a	95.2 ^a	74.6 ^b	90.8 ^a	96.3 ^a	88.1 ^a	88.7 ^a	89.7 ^a
Symbols (OK-S)															
Potchefstroom	85.0	69.8 ^{ab}	58.8 ^b	53.7 ^b	40.8 ^b	68.1 ^a	62.1 ^a	73.9 ^a	51.3 ^a	47.0 ^b	73.5 ^a	59.5 ^{ab}	75.8 ^a	74.6 ^a	48.6 ^b
Fayetteville	92.5	83.3 ^a	87.4 ^a	92.4 ^a	83.3 ^a	90.5 ^a	100.0 ^a	89.9 ^a	90.5 ^a	88.0 ^a	90.8 ^a	92.6 ^a	89.0 ^a	90 ^a	88.2 ^a

a, b, c refer to practically significant values within Potchefstroom or Fayetteville for a particular variable horizontally

*Measured subjectively among respondents.

With regard to education levels, two-way ANOVAs showed statistically significant interaction effects between the OK of city, and education levels (Table 6). Practically significant better OK (OK-L: $d = 0.7$; OK-M: $d = 0.7$; OK-S: $d = 0.7$) was found among respondents from Potchefstroom with a high school diploma as compared to those with less than a high school diploma/GED, while in Fayetteville, no practically significant differences between the different education levels were found. In the Potchefstroom context, this suggests that having a high school diploma might result in increased food label knowledge in the developing country context. Once again, respondents from Fayetteville had similar high levels of OK, regardless of their level of education. It is possible that these respondents might have had more exposure to food labels or food label education even at lower educational levels than respondents from Potchefstroom.

Two-way ANOVAs showed statistically significant interaction effects between city and perceived nutritional quality of diet with regard to OK-L (Table 6). Respondents from Potchefstroom had practically significantly better OK-L among those regarding themselves to follow a poor ($d = 0.7$) or a good ($d = 0.7$) nutritional quality diet as compared to those following an excellent quality diet, while in Fayetteville, no practically significant differences were found between the different levels of perceived nutritional quality of diet. This indicated that the subjective evaluation of respondents from Potchefstroom of the nutrition quality of their diets did not agree with their actual OK of labels.

The two-way ANOVA also showed that statistically significant interaction effects were found between city and perceived nutritional knowledge with OK-S (Table 6). Respondents from Potchefstroom had practically significantly better OK-S ($d = 0.7$) when having a good perceived nutritional knowledge than having a poor perceived nutritional knowledge. Although not practically significant, respondents from Potchefstroom who regarded their nutritional knowledge as excellent showed a pattern of lower OK-S, OK-L and OK-M than those who regarded their nutritional knowledge as good. These patterns among respondents from Potchefstroom suggest that these respondents might not have had a realistic view of their nutritional knowledge. Respondents from Fayetteville who perceived themselves to have poor nutritional knowledge had practically significantly lower OK-M ($d = 0.7$) scores than those who regarded themselves to have good or excellent nutrition knowledge, with a similar although not practically significant pattern for OK-L and OK-M, which implies that respondents from Fayetteville might have had more realistic views of their nutritional knowledge, than the respondents from Potchefstroom.

Two-way ANOVAs showed statistically significant interaction effects between city and the time spent on grocery shopping (Table 6). Respondents from Potchefstroom, had practically significantly lower OK-L, OK-M and OK-S respectively when spending more than

2 hours doing grocery shopping, as compared to those spending less than 1 hour (OK-L: $d = 1.1$; OK-M: $d = 0.9$; OK-S: $d = 0.7$) and those spending 1–2 hours (OK-L: $d = 1.0$; OK-M: $d = 0.9$; OK-S: $d = 0.7$) doing grocery shopping. This displays a pattern that respondents from Potchefstroom spending more time doing grocery shopping had less OK than those spending less time. This might be the result of lower OK levels among respondents shopping for longer, and the difficulty that they experienced during shopping therefore taking a longer time shopping or possibly because they utilize shopping as a recreational activity without a necessary interest in informed decision-making based on OK of food labels. Respondents from Fayetteville, however, had no practically significant differences in their OK regardless of the time spent grocery shopping.

Associations between Subjective and Objective Knowledge

No practically significant correlations were found between SK and OK factors for respondents from Potchefstroom, Fayetteville and the total sample. Ellen (1994) also did not find any relationship between SK and OK. This suggests that SK is not a good indicator of OK, and that SK cannot be used to determine OK, and vice versa, since consumers often tend to overestimate their SK (Veale and Quester, 2007). With respect to SK, it was observed that, as respondents' SK-F increased, their SK-G increased ($r = .56$), and vice versa. However, consumers should rather have OK than SK regarding food labels, since OK would equip a consumer better to make informed purchase and dietary decisions.

The only practically significant correlations found were between OK-L and OK-M for respondents from Potchefstroom ($r = .69$), Fayetteville ($r = .57$), and the total sample ($r = .74$). This suggests that as OK-L increased, OK-M increased, and vice versa. It is therefore evident that the cognitive skills required to locate (OK-L) and manipulate (OK-M) food label information are closely associated with one another.

Conclusion

Most respondents from Potchefstroom (69%) and Fayetteville (81%) indicated that they read food labels, especially for first-time purchases, and that labels play a significant role in their food purchases and decisions (Potchefstroom = 65%; Fayetteville = 67%). Respondents from both cities regarded their overall health to be good to excellent, as confirmed by self-evaluated nutritious diets and good to excellent nutritional knowledge. Most respondents (Potchefstroom = 96%; Fayetteville = 90%) believed that food could enhance their health through its health benefits. This indicates health consciousness and label-reading behavior that might be expected as reflective of acceptable levels of objective food label knowledge.

Respondents from both Potchefstroom and Fayetteville in general had acceptable objective knowledge of food labels in most respects. Despite the lack of differences in subjective knowledge, practically significant better scores were found for locating and manipulating label information and a general pattern of better objective knowledge among respondents from Fayetteville than among respondents from Potchefstroom. Good knowledge was observed only among respondents from Potchefstroom who were young and well educated, who spent little time shopping and who reported following either a poor or good nutritional quality diet and having good nutritional knowledge. It is thus evident that the objective knowledge of respondents from Potchefstroom was subjected to variation regarding specific variables, while knowledge among respondents from Fayetteville remained consistently high.

This research might have valuable implications for consumers, especially in a developing country context with regard to food label education. It is suggested that education programs should be developed to improve food label knowledge among consumers in Potchefstroom, especially older and less educated consumers who experience problems with food label skills. Respondents who have unrealistically high perceptions of the nutrition quality of their diets may also benefit from food label education as well as basic nutrition education.

Developing countries such as South Africa experience some social challenges, such as large household sizes, low income, poor health and poor and/or unavailable health care. The proposed education programs might therefore also prove to be valuable in other developing countries, which experience similar problems to South Africa. In an attempt to increase food label knowledge among consumers in a developing country context, television, magazines and relatives and friends could be incorporated, as these platforms were identified as important in assisting consumers with food label reading, suggesting a level of trust in these media, which can be used to the benefit of the consumer.

Increased consumer satisfaction might result from the food industry's awareness of the problems that consumers experience with regard to food label knowledge as indicated by this study and from identifying ways to simplify labels to ease understanding or to assist consumers with label interpretation. Although not generalizable to the larger context of SA and the USA or developing and developing countries, this research may serve as a basis for future studies conducted in these contexts. It is however recommended that focus be placed on objective knowledge, since subjective knowledge was not associated with objective knowledge nor did it show differences between respondents from the two cities even though the respondents from Potchefstroom and Fayetteville vastly differed.

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Chapter 4: Concluding Discussion

4.1 Introduction

This final chapter presents a summary of the main results, recommendations, limitations as well as contribution of this study.

The aim of this study was to compare the food label knowledge of consumers in the context of a developing (Potchefstroom, NWP, SA) and a developed country (Fayetteville, Arkansas, USA) to determine whether there was a difference in food label knowledge. This was determined by three research questions:

1. Does the objective and subjective food label knowledge of consumers from Potchefstroom (NWP) and Fayetteville (Arkansas) differ and if so, how?
2. Are the subjective and objective knowledge of consumers from Potchefstroom (NW) and Fayetteville (Arkansas) associated and if so how?
3. Are the demographic variables of consumers from Potchefstroom (NW) and Fayetteville (Arkansas) associated with their objective and subjective food label knowledge and if so, how?

4.2 Background profile of respondents to food label knowledge

The background profiles of respondents will be discussed subsequently with regard to label reading and health.

4.2.1 Label reading

Various individuals such as relatives and friends, and media, such as television, magazines and the internet assisted respondents to read and use food labels as an information source. Most respondents from Potchefstroom and Fayetteville confirmed that they read food labels, that these labels were consulted for first-time purchases, that labels influence their purchasing decisions and that they were aware of labelling legislation. However, respondents reported reasons for not reading food labels, such as too time-consuming, too much detail presented in a too small format and confusion.

4.2.2 Health

Respondents from both cities regarded their overall health and nutritional knowledge to be good to excellent, their diet to be nutritious, that they believed food can enhance their health and that they ate food for its health benefits. It was expected that their health consciousness

and label-reading behaviour would reflect acceptable levels of objective food label knowledge.

4.3 Research questions

The three research questions are answered in the subsections below.

4.3.1 Research question 1: Does the objective and subjective food label knowledge of consumers from Potchefstroom (NW) and Fayetteville (Arkansas) differ and if so, how?

When considering the knowledge aspect, it was found that the SK of respondents from Potchefstroom and Fayetteville did not differ practically significantly for the two factors, food label information (SK-F) and general information (SK-G). From this study, it is clear that respondents from both Potchefstroom and Fayetteville had the ability to locate (OK-L) and manipulate (OK-M) information and had acceptable OK regarding health claims (OK-H), nutrition claims (OK-N) and symbols (OK-S) on food labels. However, respondents from Fayetteville scored better than respondents from Potchefstroom regarding OK-L, OK-M and OK-S. Despite the good self-reported label-reading and health-related behaviour of respondents from Potchefstroom, their lower OK of food labels than that of respondents from Fayetteville did not reflect that they in fact have good label reading and health related behaviour. It can therefore be concluded that respondents from Potchefstroom's label-reading practices did not culminate in extremely high levels of OK, which may indicate that although they may read labels it might not always be done in a proper insightful way to be useful in practice. The same might be true for their health behaviour, which they might have overestimated.

4.3.2 Research question 2: Are the subjective and objective knowledge of consumers from Potchefstroom (NW) and Fayetteville (Arkansas) associated and, if so, how?

No practical significant correlations between SK and OK factors for respondents from Potchefstroom, Fayetteville and the total sample indicated that SK is not a good indicator or predictor of OK, and vice versa, since consumers often tend to overestimate their SK based on their own perception of their knowledge, which might be subjected to respondents' eagerness to impress the fieldworkers, while OK measures their true cognitive skills regarding food label information.

4.3.3 Research question 3: Are the demographic variables of consumers from Potchefstroom (NW) and Fayetteville (Arkansas) associated with their objective and subjective food label knowledge and, if so, how?

With regard to SK, no differences were observed in both Potchefstroom and Fayetteville when considering demographics. It was determined that only in Potchefstroom, variance in demographic factors was associated with better OK, such as in OK-L, OK-M and OK-S. Objective knowledge of respondents from Potchefstroom was subjected to variation regarding specific variables, whereas respondents from Fayetteville overall had practically significant better OK than respondents from Potchefstroom regardless of such variables, and their OK thus remained consistently high. Better OK was observed only among young, well-educated respondents from Potchefstroom. Although not demographic variables, variables such as spending less time shopping and reporting to follow a diet with either poor or good nutritional value and having good nutritional knowledge also resulted in better OK for respondents from Potchefstroom, while having no effect on OK in the case of respondents from Fayetteville.

4.4 Contribution of the study

The value of this study lies in the insight that was obtained regarding consumers' food label knowledge and whether food label knowledge was lacking among the two groups investigated. Consumer scientists, consumer researchers and the food industry need to identify areas in which food labels can be changed and modified to assist consumers in improving their food label knowledge and food label use. Despite the small scale of this study, the development and application of possible food label educational programmes may benefit by using these results since the study provides insight into the need and nature for food label educational efforts to increase label knowledge among consumers. This should however be done with care on account of the non-probability sampling method employed. The reasons contributing to a lack of food label reading as well as results regarding respondents' knowledge of food labels might be used as criteria for food label education programmes or other attempts to increase consumers' food label knowledge, especially in a developing country context.

4.5 Limitations

Although numerous studies have been done regarding consumers' nutrition knowledge (see 1.1), such research was found to be not directly relevant to food labels, which made the tracing of suitable and relevant literature in the context of this study difficult.

Certain problems were experienced regarding recruitment of respondents and data collection in both Potchefstroom and Fayetteville. In Potchefstroom, these difficulties were found to be related to language and ethnic constraints. Difficulties were also found in collecting data from coloured respondents, since these consumers were difficult to locate in condensed entities in the public sector. It also took significant effort to find a sufficient number of female Asian respondents. In Fayetteville, fewer male respondents were willing to participate than female respondents, which might have affected the labelling knowledge distribution in this study.

4.6 Recommendations

Recommendations will be discussed as five main focus points, encompassing food label education, health consciousness, media of knowledge acquisition, industry and future research.

4.6.1 Education

This research might have valuable applications for consumers, especially in a developing country context with regard to food label education. It is suggested that food label educational programmes should be developed on food labels to improve food label knowledge, especially among consumers in Potchefstroom. Such programmes might also prove to be valuable in other developing countries. It should be considered that there might be unique needs in a developing country context, such as South Africa, where some social challenges occur, such as large household sizes, low incomes, poor health and inaccessibility of health care. Food label educational programmes should take older age and lower education groups into account who experience problems with some areas of their objective food label knowledge. These possible problems, as well as information regarding consumers' knowledge of food labels might be used as criteria for food label educational programmes, or other attempts to increase consumers' food label knowledge.

4.6.2 Health consciousness

Educational campaigns should furthermore emphasise the importance of health consciousness and label reading in health maintenance and improvement of poor health. These should be aimed at all consumers in Potchefstroom, and not only at those with poor knowledge levels, as it was seen that respondents from Potchefstroom although indicating that they followed a diet of an excellent nutritional quality or that they had sufficient nutritional knowledge, had unsatisfactory objective knowledge.

4.6.3 Media of knowledge acquisition

In an attempt to increase food label knowledge among consumers in a developing country context, media, such as magazines and television may be incorporated, as well as personal sources such as family and friends, as these were identified as important in assisting consumers with food label reading in the Potchefstroom context, suggesting a level of trust in these sources, which can be used to the benefit of the consumer.

4.6.4 Industry

The food industry may benefit from the results in this study to optimise consumer satisfaction by being aware of consumers' needs and problems with regard to food label knowledge. The industry should strive to provide more satisfactory food labels by simplifying label information and symbols in the developing country context to accommodate consumers of advanced age or who are not well educated and to assist consumers' in understanding and interpreting food label information.

4.6.5 Future research

This research of food label knowledge in SA and USA, may be a basis for future studies to be conducted in a developing and developed country context. It is suggested that an in-depth qualitative research be done to gain a better understanding of consumers' needs. This might result in a better understanding of factors that contribute to consumers' confusion, distrust and lack of understanding of food label information, which may hinder food label knowledge in the developing country context. Demographic, label-reading and health-related factors that may contribute to increased knowledge might also be explored further in addressing specific needs among particular groups regarding their food label knowledge in developing country contexts.

It is recommended that future studies on this topic should not determine subjective knowledge which does not relate to objective knowledge and which is therefore not particularly useful in determining consumers' food label knowledge. Furthermore, it is recommended that future research should have access to more fieldworkers within the various ethnic groups, to assist respondents in filling out the questionnaires and limit language barriers.

4.7 Final Conclusion

The results from this study serve as evidence for a need to improve food label knowledge in the Potchefstroom context and raise the question about similar needs in other developing countries. Food labelling does not only imply the current information provided on these

labels, but also entails the legislation regulating the provided information. Once more efficient food label legislation is combined with consumer education focusing on the vulnerabilities identified with regard to age and education groups as well as the problems identified regarding label and symbol information provided, consumers might acquire optimal food label knowledge, to use these labels for improved decision-making and health.

Annexure A

Methodology

The aim of this section is to provide detail of the research methodology, which was used in conducting this study in addition to the method discussed in the research article (Chapter 3). In this section, additional insight will also be provided on the research design, the study population, sampling, study location, data collection, data analysis, reliability and validity, and ethical considerations.

The current study, which focused on consumers' food label knowledge, employed a positivistic approach since this approach is recognised by quantitative techniques and the use of variables (Corbetta, 2003:14) (see Table 1). Quantitative research is an objective and systematic process by which numerical data are obtained from a selected subgroup of a population (Maree & Pietersen, 2010a:145), as this is viewed as the most ideal manner of measurement (Babbie & Mouton, 2001:49). This research approach was most suitable for the present study since numeric data were collected from die sub-population of South Africa (SA) in the city of Potchefstroom (North-West province [NWP]), and the subpopulation of the USA in the city of Fayetteville (Arkansas). A summary of the methodology is subsequently depicted in Table 1.

Table 1 Summary of methodology for the present study

Paradigm	Positivistic
Approach	Quantitative
Design	Non-experimental <i>Comparative, descriptive</i>
Sampling	Non-probability sampling <i>Purposive sampling</i> <i>Convenience sampling</i>
Data collection	Interviewer-administered questionnaire
Data analysis	<i>Descriptive statistics</i> <i>Inferential statistics</i>
Reliability	Factor analysis Inter-item correlation Cronbach's alpha Kaiser-Meyer-Olkin (KMO)
Validity	Face validity Content validity
Ethics	Ethical procedures Ethical approval <i>University of Arkansas</i>

1.1 Research design

A non-experimental and comparative, descriptive research design was used. Quantitative research was executed to obtain numerical data from the selected samples (Lunenberg & Irby, 2008:19) from Potchefstroom (NWP, SA) and Fayetteville (Arkansas, USA), for statistical analysis.

Non-experimental designs are often used in studies with a descriptive research question, where the respondents have been selected to participate in the research and all the variables are measured at a certain time (Maree & Pietersen, 2010a:152). Using questionnaires is one of the ideal methods in social research for collecting original data from a large population, which is too vast to observe directly (Babbie & Mouton, 2001:232). *Comparative* studies can only be performed where two or more study groups are present (Babbie, 2010:351; Hair *et al.*, 2007:129), describing subpopulations independently (Babbie & Mouton, 2001:430). This was thus an ideal design for the present study since respondents from two cities (Potchefstroom, NWP and Fayetteville, Arkansas) in two different countries (SA and the USA) were used as the target population. The objective of *descriptive* studies is to describe the distribution of variables from different groups in the same context as accurately as possible (Babbie, 2010:93; Malhotra & Birks, 2006:726), avoiding bias (Corbetta, 2003:228), therefore making this a suitable design for describing consumers' food label knowledge.

1.2 Study population

The sample in this study comprised respondents from one city from a developing country (Potchefstroom, NWP, SA) and another from a developed country (Fayetteville, Arkansas, USA). These two cities both have universities, making them more comparable since the respondents have similar surroundings. The study sample was selected from these subpopulations. More detail about the study sample is provided in section 1.3.2.

1.3 Sampling

Sampling is a vital element of any research design (Malhotra & Birks, 2006:356). The term *sampling* refers to the process used to select a certain portion of a population to be studied and used as respondents (Nieuwenhuis, 2010:79). This sampling section gives insight into the study sample applicable to the present study.

1.3.1 Method of sampling

Non-probability sampling, namely purposive and convenience sampling, was used to collect data, by means of a questionnaire. *Non-probability sampling* is often used in situations where probability samples cannot be obtained, such as with large-scale social surveys (Babbie, 2010:192), as was the case in the present study. The researcher used purposive sampling, which is based on the researcher's judgement (Babbie, 2010:192), although this sampling technique does not necessarily ensure representativeness (Babbie & Mouton, 2001:166; Maree & Pietersen, 2010b:178). Purposive sampling was used to obtain a

specified number of respondents, as predetermined by Dr SE Ellis, Head of Statistical Consultation Services (SCS) of the North-West University (NWU), Potchefstroom Campus, to include a sufficient number of respondents from different gender, age and ethnic groups. *Purposive sampling* as a type of non-probability sampling is applied in specific situations where sampling needs to be done with a certain purpose in mind (Maree & Pietersen, 2010b:178), such as in the present study where the study population needed to adhere to certain inclusion criteria (see 1.5.2). Furthermore, *convenience sampling* is based on respondents who are conveniently and easily available (Maree & Pietersen, 2010b:177). Researchers often have to select samples based on their knowledge of the study population (Babbie & Mouton, 2001:166), which is appropriate since the researcher is familiar with the city of Potchefstroom (NWP), and the co-supervisor (Prof. M Warnock) with the city of Fayetteville (Arkansas). Even though it was a non-probability sample, the researcher and co-supervisor attempted to collect data as inclusive as possible with respect to the demographics (gender, age and ethnicity) of these populations.

1.3.2 Sample size

The study sample included N=713 respondents, with 400 respondents from Potchefstroom, SA, and 313 respondents from Fayetteville, Arkansas, USA. It was attempted to yield 800 useable responses; however, only 713 responses were usable. The sample strived to include at least 30 respondents from each ethnic group, with the same number of male and female respondents, and the same age distribution among the four groups, as recommended by the SCS of the NWU. In South Africa, the researcher was able to collect data according to the initial planning with regard to inclusion of different groups, but in the USA, fewer male and Asian respondents were available for recruitment. The researcher determined the number of respondents firstly by their ethnicity, then distributed the groups equally according to gender, and then within the genders according to the following age groups: 18–24, 25–34, 35–54 and 55+ years (Figure 1). The sample differed for Potchefstroom and Fayetteville (Arkansas) since the demographic distribution of these two cities differs with regard to ethnicity. However, as mentioned, data could not be collected in Fayetteville as planned due to the availability of respondents from the required groups, with a smaller number of Asian (n=16), and male (n=70) respondents, and more respondents in the age group 35–54 (n=106) than anticipated.

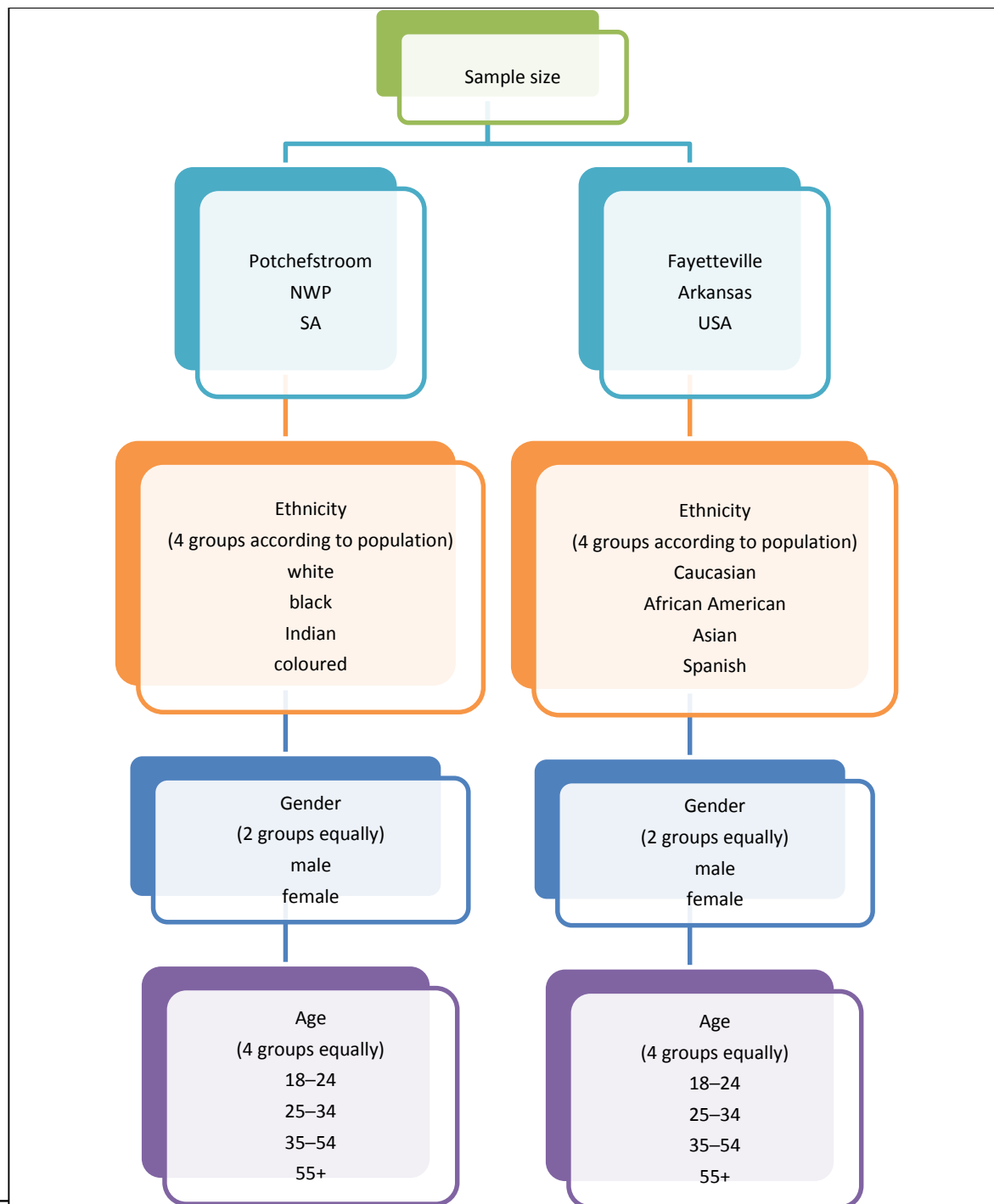


Figure 1 Sampling process diagram of the present study for obtaining the sample size.

The researcher selected a sufficient number of respondents to ensure representativeness of the different population groups from both locations. The sample selection was not proportional to the sizes of the population groups identified in Potchefstroom and Fayetteville (Arkansas). Prior to data analysis, data was weighed according to the most recent statistical census data of the two cities (Area vibes, 2010; IndexMundi, 2012a; IndexMundi 2012b;

Stats SA, 2010; Tlokwe city council, 2012) to ensure a representative distribution of the population groups.

1.4 Study location

The study location for this study comprised different public settings in both Potchefstroom (NWP) and Fayetteville (Arkansas). These settings were selected as areas where respondents had time to fill out the questionnaire and where they might have needed to queue or wait. These included stores, libraries, the university, the traffic department and the department of home affairs. The respondents were selected from various locations in both cities to get a more diverse respondent population. The researchers sought permission from local authorities from the intended study locations for data to be collected.

1.5 Data collection

Data collection for the present study is provided in Figure 2. The adaption of the questionnaire is thoroughly discussed in 1.5.1 below. Data collection locations were determined as specific areas in both Potchefstroom (NWP, SA) and Fayetteville (Arkansas, USA). Permission from authorities was obtained once the above-mentioned locations had been selected to ensure that ethical aspects were taken into consideration. The training of fieldworkers is discussed in Section 1.5.3. Finally, the questionnaire was administered in both Potchefstroom (NWP) and Fayetteville (Arkansas) simultaneously (4.3.3). A pilot study was conducted in 2009, by the Consumer Science Honours class who obtained the data as fieldworkers with the present questionnaire adapted and published by Van der Merwe *et al.* (2012), which served as the pilot study for the present study.

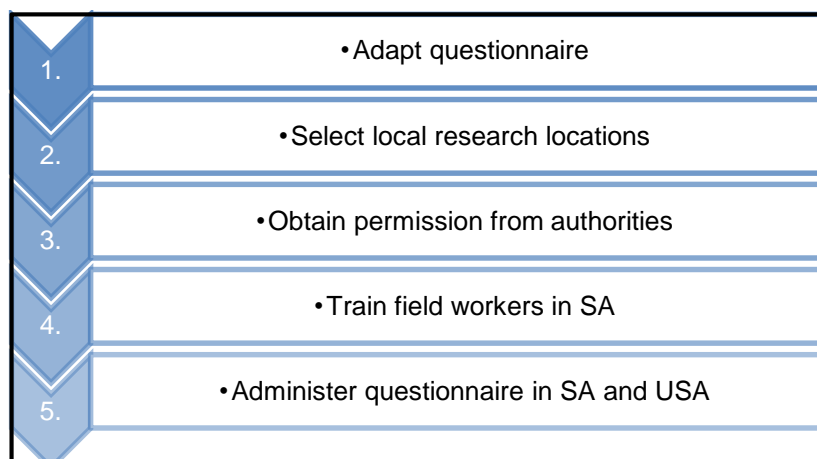


Figure 2 Process of data collection in the present study

1.5.1 Measuring instrument

Questionnaires are frequently used in social research (Babbie & Mouton, 2001:239) to enable the researcher to measure multiple variables at once (Maree & Pietersen, 2010a:155; Malhotra & Birks, 2006:326), and as a standardised data collection technique to allow the researcher to make comparisons between populations (Corbetta, 2003:207), as was the case in the present study. Questionnaires were used since they provided the researcher with a concise source of data, and the respondent with a convenient, fast manner of providing information.

Data collection requires the development of certain instruments (David & Sutton, 2004:27). An existing standardised questionnaire was used to obtain data for the present study. This instrument was originally adapted by Van der Merwe *et al.* (2012:403) to measure food label knowledge from previous studies (Alfieri & Byrd-Bredbenner, 2000:113; Byrd-Bredbenner *et al.*, 2001:265), which determined consumers' nutrition label knowledge, and was further adapted for the present study. The supervisors and the researcher for the present study modified the instrument by adapting some demographic and general information items, adding a section on subjective knowledge as well as additional claims and symbols. The USA questionnaire was adapted from the South African questionnaire considering demographic and other context specific information (Appendices D1 and D2).

Data were collected as part of a six-section interviewer-administered questionnaire. The sections were as follows:

- Section A: opening (which collected information regarding the inclusion criteria);
- Section B: demographics and general information of the respondents;
- Section C: subjective knowledge regarding food labels;
- Section D: nutrition beliefs of respondents;
- Section E: label reading; and
- Section F: objective knowledge regarding food labels.

1.5.2 Recruitment of respondents

The researcher (Miss SC Havenga), assisted by trained fieldworkers, recruited respondents in Potchefstroom, and the co-supervisor (Prof. M. Warnock), in Fayetteville (Arkansas). Respondents included both genders. Respondents had to be older than 18 years, while the distribution of age, and ethnicity of the two cities were taken into account. Since the target

sample was selected by considering the demographic profile of the two cities, the respondents needed to be permanent residents of either Potchefstroom (NWP) or Fayetteville (Arkansas). Their spouses were not to work as dietitians, consumer scientists, nutritionists or pharmacists, since these consumers might have better food label knowledge (Van der Merwe *et al.*, 2012:404). The respondents also had to be literate and the main purchaser of the household's food products.

1.5.3 Data collection procedure

Data collection was done in an objective manner within the same time parameter. Data were collected over an eight-week period from 08:00 to 18:00 on weekdays. Since data were collected in SA and the USA, certain practical precautions needed to be taken. Data from Fayetteville were captured in Microsoft Excel. This data, as well as the filled-out questionnaires, were returned to the researcher in SA, where all the data were statistically analysed.

1.6 Data analysis

The Statistical Consultation Services of the North-West University Potchefstroom Campus did the data analysis, using PASW statistics 18 (SPSS Inc., Chicago, IL, USA). Descriptive statistics (frequencies and means) and inferential statistics (one- and two-way ANOVAs, effect sizes, correlations and cross-tabulations) were determined. Differences between variables were determined with one- and two-way ANOVAs where practical significant differences were calculated using Cohen's *d*-values. Although statistical significance was determined ($p = \leq .05$) it was not reported since only large effect sizes that were of practical significance ($d = \geq .8$) were reported. Associations between variables were determined with cross-tabulations (Cramer's *V*) and Spearman's correlations (*r*), where once again only large values $\geq .5$ were reported as of practical significance. For a more detailed discussion, refer to Chapter 3.

1.7 Reliability and validity

Reliability and validity were of concern for this study since they were conducted within a quantitative research approach (Table 1). Reliability and validity were determined for the original questionnaire (Van der Merwe *et al.*, 2012:404), but due to the adaptations made to the questionnaire and the different context within which it was applied, reliability and validity of the questionnaire for the present study also needed to be determined by experts in the field of consumer science. Reliability ensures that similar results to the present study will be obtained from the questionnaire in the same population in the future (Babbie, 2010:150; Delport & Roestenburg, 2011:177). Internal reliability was determined by means of inter-item

correlations using Cronbach's alpha, to ensure that the internal items were strongly correlated (Pietersen & Maree, 2010:216).

Exploratory factor analysis of the different scales within the measuring instrument using principal axis factoring with Oblimin rotation was employed to construct factors of knowledge and determine construct validity of the measuring instrument. Validity is the extent to which the measurement is representative of the true characteristics of the phenomenon which is being investigated (Malhotra & Birks, 2006:314). For the purpose of this study, face and content validity was determined. Face validity was determined by experts in the field of consumer sciences and Dr SE Ellis (Statistical Consultation Services), to ensure that the questions were clear, retrieved the information needed, and that the questions were a reasonable measure of the variables (Babbie, 2010:153). Content validity is the degree of which a measurement covers the concept which is intended to be measured in its totality (Babbie, 2010:155). Content validity was determined to ensure that all necessary information was covered and requested in the questionnaire. For a more elaborate discussion, refer to Chapter 3.

1.8 Ethical considerations

In social sciences, the test subjects are humans who bring unique ethical considerations to the fore and therefore data cannot be obtained at the expense of respondents (Strydom, 2011:113). Ethical issues in social research are important, and formal codes of conduct describe what is considered professional and unprofessional behaviour (Babbie & Mouton, 2001:528). To ensure that the study was done in an ethical manner, the project was approved by the Ethical Committee of the North-West University (reference code: NWU-00024-09-A1) and from the University of Arkansas (reference code: IRB-13-01-382USA). A letter of consent was given to the respondents, and by signing the letter of consent, they gave their informed consent to participate in the present study, where they based their participation on the understanding of any possible risk which may be involved (Babbie, 2010:66). Respondents were not compelled to complete the questionnaire and they had the option to withdraw from the study at any given time. Confidentiality was attained as the researcher could not identify a respondent's response, however ensured the respondent that the researcher would not do so (Babbie, 2010:67). Respondents were ensured that their information was handled confidentially. The questionnaire and the informed consent form were handled separately to ensure that the respondents' information remained confidential. Data obtained in this study will be filed and stored in the Consumer Sciences Building (F15) of the Potchefstroom Campus of the North-West University for at least seven years. Researchers who request to view and study the original published data in order to verify the

validity and accuracy of the study will need to obtain permission from the North-West University. The data will remain the property of North-West University, Faculty of Health sciences, Subject group: Consumer Sciences.

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Annexure B

Requesting Permission to Conduct Research Study

To whom it may concern

REQUESTING PERMISSION TO CONDUCT RESEARCH STUDY

I am a student studying towards a master's degree in Consumer Science at the North-West University, Potchefstroom Campus. My research aim is to determine consumers' food label knowledge. For this, I need to select respondents from public areas. During a sampling procedure, your store was identified as a suitable location to collect data needed for this study.

I hereby request permission to fill in questionnaires inside your store. Furthermore, customers would only be recruited if they are willing to partake in the study. If you have any queries regarding the present study, please do not hesitate to contact me.

Kind Regards

S.C. (Roelien) Havenga
0795267819
(M. Cons Student)

Annexure C1

Letter of Consent

Letter of consent

Title of the study:

Food label knowledge: comparison between a developing and a developed country context.

Dear Mr. /Mrs. /Miss.

Date .../ .../2013

The aim AND nature of the study:

The aim of this research study is to determine and to compare South African (SA) and American (USA) consumers' knowledge of food labels. Prospective respondents will be approached at predetermined public – and private areas which are located in Potchefstroom and in Fayetteville, where they will be asked to make a contribution toward the study by means of completing an interviewer-administered questionnaire.

Research procedure:

- 1) You, as the respondent, will be asked to complete a questionnaire with the researcher/ fieldworker, aimed to determine South African and American consumers' knowledge of food labels.
- 2) The questionnaire will take approximately 15 minutes to complete.
- 3) You, as respondent's anonymity is assured as the questionnaire does not aim to obtain information on first and last names, contact information, identification number, or residential address. All the information obtained in SA and the USA will be handled and stored in a confidential manner. Upon publication of the study, the available information will prove to be insufficient for the identification of any respondents participating in this study.
- 4) You, as the respondent, may not personally benefit from participating in the study, but your contribution toward the study might benefit other individuals and communities in SA and the USA.

5) Upon agreement to participate in this study, you, as respondent, are also agreeing that the information can be used by the researcher for the purpose of conducting the study, by any means necessary. Respondents' personal information will not be linked to the information obtained.

POTENTIAL BENEFITS OF THE STUDY

This study will establish a relationship between South African and American consumers' knowledge of food labels which might lead to the proposal of educational programmes in SA and the USA that will make a contribution toward consumers' current understanding of the information presented on food labels. Such programmes might lead consumers to make more informed purchase decisions.

CONTACT INFORMATION

Should you, as respondent, require more information, please contact Prof. M. van der Merwe (study leader) at (+27)18 299 2476.

WITHDRAWAL OF PARTICIPATION

You, as the respondent, have the right to withdraw from the study at any time. Should you feel the need to do so, it is requested that you will only do so after careful consideration.

DECLARATION OF CONSENT

I, the undersigned _____ (Full names and surname) have read through the information provided about the research study and declare that I fully understand the content thereof. I hereby voluntarily agree to participate in the study. I would hereby like to exempt the University or any employee or any student of the University from any liability which I might incur during this study.

Furthermore, I waive my right to institute any claims whatsoever against the University which may arise during the running of the study or the conduct of any person involved in the study, except for claims arising from the negligent conduct of the University or its employees or students.

Signature of the respondent: _____

Signed at _____ on the _____ day of _____ 2013

Annexure D1

Questionnaire: South Africa



NORTH-WEST UNIVERSITY
YUNIBESITHI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT

THE PURPOSE OF THIS QUESTIONNAIRE IS TO DETERMINE SOUTH AFRICAN AND AMERICAN CONSUMERS' KNOWLEDGE OF FOOD LABELS.

To all respondents

A study is currently being conducted to determine and to compare consumers' knowledge of food labels that are situated in Potchefstroom, in the North West Province of South Africa (SA), and in Fayetteville, Arkansas, in the United States of America (USA). The researchers kindly ask your support towards the research being conducted as it will provide insights into South African and American consumers' use and comprehension of food labels that might lead to the proposition of educational programmes in SA and the USA to promote consumers' current understanding of the information presented on labels; enabling consumers to make more informed food purchase decisions.

Participation in the study is **voluntary** and all the information obtained in SA and the USA will be handled in an **anonymous** and **confidential** manner. It is asked of you as respondent to read and complete the following questionnaire with the researcher or fieldworker. This questionnaire will not take more than 15 minutes to complete.

Your contribution towards the study is appreciated.

S.C. (Roelien) Havenga

079 526 7819

Supervisor: Prof. M. van der Merwe

Co-supervisor: Prof. M.J.C. Bosman

Co-supervisor: Prof. M. Warnock

FOOD LABEL KNOWLEDGE SURVEY

Section A — Opening

1. Do you or your spouse/partner work as one of the following? **Please mark the appropriate box (An instruction for fieldworkers regarding most questions).**

	Yes	No	
Dietician			1
Consumer Scientist			2
Nutritionist			3
Pharmacist			4
None of the above			5.

If the respondent marked any option in 1-4, end interview.

2. For whom do you do the household food shopping?

	Yes	No	
For the entire household			1
For yourself and the children			2
For yourself and spouse/partner			3
Only for yourself			4
None (<i>end interview</i>)			5

3. To complete this interview, you will need to read certain items.

Do you need glasses to read?

Yes (continue with question 4)		1
No (continue with question 5)		2

4. Do you have them with you?

Yes		1
No		2

If the respondent answered No: Show them Card A and ask them to read the list of nutrients to you. If they can't read it, thank them and end interview.

Section B – Demographic and general information

5. Mark the respondent's gender

Male		1
Female		2

6. What is your home language

English	1	IsiNdebele	7
Afrikaans	2	Sepedi	8
Setswana	3	Tshivenda	9
Sesotho	4	SiSwati	10
IsiZulu	5	Xitsonga	11
IsiXhosa	6	Other	12

7. What is your age?

18-24		1
25-34		2
35-54		3
55 +		4

8. What is your educational background? Please mark the appropriate box.

Less than Matric (Grade 12)		1
Matric (Grade 12 completed)		2
Tertiary education (completed)		3

9. How many children under the age of 18 live with you? .

0		0
1		1
2		2
3		3
4		4
5+		5

10. What is your total monthly household income after deductions in rand (R)

0 to 4000		1
Between 4000 – 8000		2
Between 8000 – 20000		3
Between 20000 – 50000		4
Between 50000 – 100000		5
More than 100000		6

11. How often do you do shop for **main** food groceries? (Excluding fresh/convenience/impulse products such as bread and milk)

Once a month		1
Once in two weeks		2
Once a week		3
Two or more times a week		4

12. Approximately how much time do you spend each time you do your **main** food grocery shopping? (Excluding fresh/convenience/impulse products such as bread and milk.)

Less than 1 hour		1
Between 1 to 2 hours		2
More than 2 hours		3

13. Are you aware that food labelling is regulated by specific legislation in South Africa? Please mark the relevant option:

Yes		1
No		2

		Poor	Fair	Good	Excellent
14.	How would you rate the overall nutritional quality of your diet?	1	2	3	4
15.	How would you rate your overall health?	1	2	3	4
16.	How would you rate your knowledge about nutrition?	1	2	3	4

17. Do you or anyone who lives with you follow any special type of diet?

Yes (continue with question 18)		1
No (continue with question 19)		2

18. Why are you (or the household member) following this diet?

		Yes	No
18.1	Health reasons	1	2
18.2	Cultural reasons	1	2
18.3	Moral reasons	1	2
18.4	Religion	1	2
18.5	Vegetarian	1	2
18.6	Other (please specify)		

Section C: Subjective knowledge

Please mark the relevant option for the following questions:

		Not informed at all	Not well informed	Somewhat informed	Well informed
19.	In your opinion, how well informed are you about food label information in general?	1	2	3	4
20.	In your opinion, how well informed are you about locating information on food labels?	1	2	3	4
21.	In your opinion, how well informed are you about the nutritional information on food labels?	1	2	3	4
22.	In your opinion, how well informed are you about the ingredients listed on food labels?	1	2	3	4
23.	In your opinion, how well informed are you about the claims (nutrition, health and nutrient content claims) on food labels?	1	2	3	4
24.	In your opinion, how well informed are you about symbols on food labels?	1	2	3	4
25.	In your opinion, how well informed are you about calculating how many servings you can get from the total content of a product?	1	2	3	4
26.	In your opinion, how well informed are you about expiry dates on food labels?	1	2	3	4
27.	In your opinion, how well informed are you about the country of origin (manufacturing) on food labels?	1	2	3	4
28.	In your opinion, how well informed are you about the brand names on food labels?	1	2	3	4

Section D: 'Nutrition is important' beliefs

For each of the next two statements, I want you to tell me if you 'Strongly disagree', 'Disagree', 'Agree' or 'strongly agree' with the statement. **Show CARD B (card B shows the answer choices):**

		Strongly disagree	Disagree	Agree	Strongly agree
29.	I believe food can enhance your health.	1	2	3	4
30.	I don't eat food for the health benefits it offers	1	2	3	4

Section E: Label reading

		Never	Rarely (once in while)	Sometimes	Always
31.	How often do you read food labels?	1	2	3	4
32.	How often does the information on a food label affect your decision to buy a product?	1	2	3	4
33.	How often do you read food labels when you purchase a food product for the first time	1	2	3	4

34. Is there anything about food labels that keeps you from using them as often as you would like?

Yes (continue with question 35)		1
No (continue with question 36)		2

35. Select ALL the reasons why you do not read/use food labels as often as you would like?

		Yes	No
35.1	Takes too much time to read	1	2
35.2	Too much information/too detailed	1	2
35.3	Confusing/I don't understand	1	2
35.4	Print is too small for me to read	1	2
35.5	Too little information	1	2
35.6	Do not trust/believe the information	1	2
35.7	Unnecessary to know	1	2
35.8	Difficult to find information	1	2

35.9	Other (please specify)
------	------------------------

36. Select **ALL** the people or sources that have helped you learn how to read food labels.

(Mark "Yes" [1] OR "No" [2] for each of the following).

		Yes	No
36.1	Consumer Scientist/Food scientist	1	2
36.2	Store assistant	1	2
36.3	Relatives/Friends	1	2
36.4	Doctor	1	2
36.5	Dietician/Nutritionist	1	2
36.6	Nurse	1	2
36.7	Newspaper/Magazine	1	2
36.8	Books	1	2
36.9	Class/Course	1	2
36.10	Internet	1	2
36.11	TV	1	2
36.12	Radio	1	2
36.13	Other (please specify)		

Section F: Food label objective knowledge

Locating information

Please take a look at this label and answer the following questions. **(Show Card C)**

37. How many kilojoules are in 100g of this food?	_____	Correct	1
		Incorrect	2
38. How much protein is in 100g of this food?	_____	Correct	1
		Incorrect	2
39. How much saturated fat is in 100g of this food?	_____	Correct	1
		Incorrect	2
40. Name the manufacturer of this product	_____	Correct	1
		Incorrect	2
41. What is the main ingredient of this product?	_____	Correct	1
		Incorrect	2
		Correct	1

Incorrect	2
-----------	---

42. Consumers with what type of allergy should avoid this product? _____

Correct	1
---------	---

Incorrect	2
-----------	---

43. What is the “best before/by date” of this product? _____

Correct	1
---------	---

Incorrect	2
-----------	---

44. How/where should this product be stored? _____

Correct	1
---------	---

Incorrect	2
-----------	---

45. What number should I phone to complain about this product? _____

Correct	1
---------	---

Incorrect	2
-----------	---

46. Name the preservative in this product. _____

Manipulating Information

Please take a look at this label and answer the following three questions.

(Show Card D—card D is a Nutrition information label, not specifying a particular product. The Nutrition Information label on Card D is different from the label on Card C.)

Correct	1
---------	---

Incorrect	2
-----------	---

47. If you ate 100g of this food, how much sugar would you consume? _____

Correct	1
---------	---

Incorrect	2
-----------	---

48. If you ate one serving of this food, how much fibre would you consume? _____

Correct	1
---------	---

Incorrect	2
-----------	---

49. How many servings can you get from the total content of this product? _____

Health/Nutrient Claims

(Show Card E) Before every question, point to the nutrition label and say:

Based on this nutrition information are the following statements true or false?

		True	False
50.	High in Vitamin A	1	2
51.	High in fibre	1	2
52.	Trans-fat free	1	2
53.	Low in saturated fat	1	2







If food products contain certain ingredients or nutrients, there are regulations on how it should be presented on food labels.

NOTE: If a food product contains certain ingredients or nutrients, some statements or claims are allowed, while others are not. Please indicate if the following statements/claims are allowed or not allowed on food labels.

		Allowed	Not allowed
54.	“Healthy”	1	2
55.	“Wholesome”	1	2
56.	“95 % fat free”	1	2
57.	“Source of calcium”	1	2
58.	“Fat Free”	1	2
59.	“High in energy”	1	2

Identifying Symbols

Please identify the following symbols by marking the appropriate block in each row. You should mark only one block in each row.

								Correct	Incorrect
60.	Halaal							1	2
61.	Heart foundation							1	2
62.	Suitable for vegetarians							1	2
63.	Recycled							1	2
64.	Radura Symbol							1	2
65.	Wholegrain Symbol							1	2

Thank you for your participation.

Annexure D2

Questionnaire: United States of America



NORTH-WEST UNIVERSITY
YUNIBESITHI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT

THE PURPOSE OF THIS QUESTIONNAIRE IS TO DETERMINE SOUTH AFRICAN AND AMERICAN CONSUMERS' KNOWLEDGE OF FOOD LABELS.

To all respondents

A study is currently being conducted to determine and to compare consumers' knowledge of food labels that are situated in Potchefstroom, in the North West Province of South Africa (SA), and in Fayetteville, Arkansas, in the United States of America (USA). The researchers kindly ask your support towards the research being conducted as it will provide insights into South African and American consumers' use and comprehension of food labels that might lead to the proposition of educational programmes in SA and the USA to promote consumers' current understanding of the information presented on labels; enabling consumers to make more informed food purchase decisions.

Participation in the study is **voluntary** and all the information obtained in SA and the USA will be handled in an **anonymous** and **confidential** manner. It is asked of you as respondent to read and complete the following questionnaire with the researcher or fieldworker. This questionnaire will not take more than 15 minutes to complete.

Your contribution towards the study is appreciated.

S.C. (Roelien) Havenga

079 526 7819

Supervisor: Prof. M. van der Merwe

Co-supervisor: Prof. M.J.C. Bosman

Co-supervisor: Prof. M. Warnock

FOOD LABEL KNOWLEDGE SURVEY

Section A — Opening

1. Do you or your spouse/partner work as one of the following? **Please mark the appropriate box**
(An instruction for fieldworkers regarding most questions).

	Yes	No	
Dietician			1
Consumer Sciences			2
Nutritionist			3
Pharmacist			4
None of the above			5.

If the respondent marked any option in 1-4, end interview.

2. For whom do you do the household food shopping?

	Yes	No	
For the entire household			1
For yourself and the children			2
For yourself and spouse/partner			3
Only for yourself			4
None (<i>end interview</i>)			5

3. To complete this interview, you will need to read certain items.

Do you need glasses to read?

Yes (continue with question 4)		1
No (continue with question 5)		2

4. Do you have them with you?

Yes		1
No		2

If the respondent answered No: Show them Card A and ask them to read the list of nutrients to you. If they can't read it, thank them and end interview.

Section B – Demographic and general information

5. Mark the respondent's gender

Male		1
Female		2

6. What is your home language

English		1
Spanish		2
Other Indo-European languages		3
Asian and Pacific Island Languages		4
Other		5

7. What is your age?

18-24		1
25-34		2
35-54		3
55 +		4

8. What is your educational background? Please mark the appropriate box.

Less than High School Diploma or GED		1
High School Diploma or GED		2
Associate Degrees at the community college level or college/university degrees		3

9. How many children under the age of 18 live with you? .

0		0
1		1
2		2
3		3
4		4
5+		5

10. What is your total monthly household income after deductions in dollar (\$)?

0 to 1000		1
Between 1000 – 2000		2
Between 2000 – 4000		3
Between 4000 – 8000		4
Between 8000 – 10000		5
More than 10000		6

11. How often do you do shop for **main** food groceries? (Excluding fresh/convenience/impulse products such as bread and milk)

Once a month		1
Once in two weeks		2
Once a week		3
Two or more times a week		4

12. Approximately how much time do you spend each time you do your **main** food grocery shopping? (Excluding fresh/convenience/impulse products such as bread and milk.)

Less than 1 hour		1
Between 1 to 2 hours		2
More than 2 hours		3

13. Are you aware that food labeling is regulated by specific legislation in United States of America?
Please mark the relevant option:

Yes		1
No		2

		Poor	Fair	Good	Excellent
14.	How would you rate the overall nutritional quality of your diet?	1	2	3	4
15.	How would you rate your overall health?	1	2	3	4
16.	How would you rate your knowledge about nutrition?	1	2	3	4

18. Do you or anyone who lives with you follow any special type of diet?

Yes (continue with question 18)		1
No (continue with question 19)		2

18. Why are you (or the household member) following this diet?

		Yes	No
18.1	Health reasons	1	2
18.2	Cultural reasons	1	2
18.3	Moral reasons	1	2
18.4	Religion	1	2
18.5	Vegetarian	1	2
18.6	Other (please specify)		

Section C: Subjective knowledge

Please mark the relevant option for the following questions:

		Not informed at all	Not well informed	Somewhat informed	Well informed
19.	In your opinion, how well informed are you about food label information in general?	1	2	3	4
20.	In your opinion, how well informed are you about locating information on food labels?	1	2	3	4
21.	In your opinion, how well informed are you about the nutritional information on food labels?	1	2	3	4
22.	In your opinion, how well informed are you about the ingredients listed on food labels?	1	2	3	4
23.	In your opinion, how well informed are you about the claims (nutrition, health and nutrient content claims) on food labels?	1	2	3	4
24.	In your opinion, how well informed are you about symbols on food labels?	1	2	3	4
25.	In your opinion, how well informed are you about calculating how many servings you can get from the total content of a product?	1	2	3	4
26.	In your opinion, how well informed are you about expiry dates on food labels?	1	2	3	4
27.	In your opinion, how well informed are you about the country of origin (manufacturing) on food labels?	1	2	3	4
28.	In your opinion, how well informed are you about the brand names on food labels?	1	2	3	4

Section D: 'Nutrition is important' beliefs

For each of the next two statements, I want you to tell me if you 'Strongly disagree', 'Disagree', 'Agree' or 'Strongly agree' with the statement. **Show CARD B (card B shows the answer choices):**

		Strongly disagree	Disagree	Agree	Strongly agree
29.	I believe food can enhance your health.	1	2	3	4
30.	I don't eat food for the health benefits it offers	1	2	3	4

Section E: Label reading

		Never	Rarely (once in while)	Sometimes	Always
31.	How often do you read food labels?	1	2	3	4
32.	How often does the information on a food label affect your decision to buy a product?	1	2	3	4
33.	How often do you read food labels when you purchase a food product for the first time	1	2	3	4

34. Is there anything about food labels that keeps you from using them as often as you would like?

Yes (continue with question 35)		1
No (continue with question 36)		2

35. Select ALL the reasons why you do not read/use food labels as often as you would like?

		Yes	No
35.1	Takes too much time to read	1	2
35.2	Too much information/Too detailed	1	2
35.3	Confusing/I don't understand	1	2
35.4	Print is too small for me to read	1	2
35.5	Too little information	1	2
35.6	Do not trust/believe the information	1	2
35.7	Unnecessary to know	1	2
35.8	Difficult to find information	1	2
35.9	Other (please specify)		

36. Select **ALL** the people or sources that have helped you learn how to read food labels.

(Mark "Yes" [1] OR "No" [2] for each of the following).

		Yes	No
36.1	Consumer Scientist/Food scientist	1	2
36.2	Store assistant	1	2
36.3	Relatives/Friends	1	2
36.4	Doctor	1	2
36.5	Dietician/Nutritionist	1	2
36.6	Nurse	1	2
36.7	Newspaper/Magazine	1	2
36.8	Books	1	2
36.9	Class/Course	1	2
36.10	Internet	1	2
36.11	TV	1	2
36.12	Radio	1	2
36.13	Other (please specify)		

Section F: Food label objective knowledge

Locating information

Please take a look at this label and answer the following questions. **(Show Card C)**

37. How many calories are in 100g of this food? _____	Correct	1
	Incorrect	2
38. How much protein is in 100g of this food? _____	Correct	1
	Incorrect	2
39. How much saturated fat is in 100g of this food? _____	Correct	1
	Incorrect	2
40. Name the manufacturer of this product _____	Correct	1
	Incorrect	2
41. What is the main ingredient of this product? _____	Correct	1
	Incorrect	2
42. Consumers with what type of allergy should avoid this product? _____	Correct	1
	Incorrect	2

- | | |
|-----------|---|
| Correct | 1 |
| Incorrect | 2 |
43. What is the “best before/by date” of this product? _____
- | | |
|-----------|---|
| Correct | 1 |
| Incorrect | 2 |
44. How/where should this product be stored? _____
- | | |
|-----------|---|
| Correct | 1 |
| Incorrect | 2 |
45. What number should I phone to complain about this product? _____
- | | |
|-----------|---|
| Correct | 1 |
| Incorrect | 2 |
46. Name the preservative in this product. _____

Manipulating Information

Please take a look at this label and answer the following three questions.

(Show Card D—card D is a Nutrition information label, not specifying a particular product. The Nutrition Information label on Card D is different from the label on Card C.)

- | | |
|-----------|---|
| Correct | 1 |
| Incorrect | 2 |
47. If you ate 100g of this food, how much sugar would you consume? _____
- | | |
|-----------|---|
| Correct | 1 |
| Incorrect | 2 |
48. If you ate one serving of this food, how much fiber would you consume? _____
- | | |
|-----------|---|
| Correct | 1 |
| Incorrect | 2 |
49. How many servings can you get from the total content of this product? _____

Health/Nutrient Claims

(Show Card E) Before every question, point to the nutrition label and say:

Based on this nutrition information are the following statements true or false?

		True	False
50.	High in Vitamin A	1	2
51.	High in fiber	1	2
52.	Trans-fat free	1	2
53.	Low in saturated fat	1	2

If food products contain certain ingredients or nutrients, there are regulations on how it should be presented on food labels.

NOTE: If a food product contains certain ingredients or nutrients, some statements or claims are allowed, while others are not. Please indicate if the following statements/claims are allowed or not allowed on food labels.

		Allowed	Not allowed
54.	"Healthy"	1	2
55.	"Wholesome"	1	2
56.	"95 % fat free"	1	2
57.	"Source of calcium"	1	2
58.	"Fat Free"	1	2
59.	"High in energy"	1	2

Identifying Symbols

Please identify the following symbols by marking the appropriate block in each row. You should mark only one block in each row.

								Correct	Incorrect
60	Halaal							1	2
61	American Heart Association							1	2
62	Suitable for vegetarians							1	2
63	Recycled							1	2
64	Radura Symbol							1	2
65	Wholegrain Symbol							1	2

Thank you for your participation and time!

Annexure E

Show Cards

CARD A

NUTRITION INFORMATION		Per 30 g	Per 100 g
Energy	kJ/kcal	435	1450
Protein	g	0	0
Carbohydrates	g	3	10
Total Fat	g	10	35
Polyunsaturated Fat	g	5	18
Mono-unsaturated Fat	g	2	8
Saturated Fat	g	3	9
Trans Fatty Acids	g	0	0
Cholesterol	g	0	0
Sodium (MAX)	mg	115.20	384
Vitamin A	µg RE	270	900
Vitamin D	µg	2.25	7.50
Vitamin E	mg α TE	11.25	37.50

CARD B

Strongly Disagree

Disagree

Agree

Strongly Agree

Don't Know

CARD C

BB 1 DEC 13

ABC

Ingredients: Corn flour (30%), vegetable oils and fats, maltodextrin, milk solids, thickener, salt, emulsifiers: (including soya lecithin), preservative: (potassium sorbate), vitamin E, flavourant, colourant: (beta-carotene), vitamins A & D.

Allergen: Gluten

500 g

NUTRITION INFORMATION		Per 30 g	Per 100 g
Energy	kJ/kcal	360	1200
Protein	g	6	20
Carbohydrates	g	3	10
Total Fat	g	10	35
Polyunsaturated Fat	g	5	18
Mono-unsaturated Fat	g	2	8
Saturated Fat	g	3	9
Trans Fatty Acids	g	0	0
Cholesterol	g	0	0

Manufactured by ABC foods

Customer helpline: 0800 1234

www.abcfoods.co.za

Store in a cool dry place

CARD D

Serving = 50 g

NUTRITION INFORMATION		Per 50 g	Per 100 g
Energy	kJ/kcal	300	600
Protein	g	10	20
Carbohydrates	g	20	40
Sugar	g	5	10
Total Fat	g	10	20
Polyunsaturated Fat	g	5	10
Mono-unsaturated Fa	g	2	4
Saturated Fat	g	3	6
Trans Fatty Acids	g	0	0
Cholesterol	g	0	0
Fibre	g	5	10

Manufactured by ABC foods **500 g**Customer helpline: 0800 1234 www.abcfoods.co.za**CARD E**

ABC

High in Vitamin A

High in Fibre

Trans Fat Free

Low in Saturated Fat

NUTRITION INFORMATION		Per 30 g	Per 100 g
Energy	kJ/kcal	360	1200
Protein	g	6	20
Carbohydrates	g	3	10
Total Fat	g	10	35
Polyunsaturated Fat	g	5	18
Mono-unsaturated Fat	g	2	8
Saturated Fat	g	3	9
Trans Fatty Acids	g	0	0
Cholesterol	g	0	0
Dietary Fibre	g	5	17
Vitamin A (30% of RDA)	µg RE	300	1000
Vitamin E (15% of RDA)	mg α TE	1.5	5

Annexure F1

Cross-Cultural Research (CCR) Authors' Guidelines

Cross-Cultural Research (CCR) Authors' Guidelines

Cross-Cultural Research (CCR) is sponsored by the Human Relations Area Files, Inc. (HRAF) and is the official journal of the Society for Cross-Cultural Research. The mission of the journal is to publish peer-reviewed articles describing cross-cultural or comparative studies in all of the social/behavioral sciences and other sciences dealing with humans, including anthropology, sociology, psychology, political science, economics, human ecology, and evolutionary biology. Worldwide cross-cultural studies are particularly welcomed, but all kinds of systematic cross-cultural comparisons fitting the guidelines in the next paragraph will be considered if they deal explicitly with cross-cultural issues pertaining to the constants and variables of human behavior. Single-case within-culture comparisons may be considered if they include an in-depth study of the cultural communities in which people live and one or both of the following:

1. a research design that explicitly tests an assumption or a hypothesis from the cross-cultural literature that is difficult to test cross-culturally with the present state of information
2. measures of subgroup cultural variation that can be used to evaluate explanations of why subgroups vary. Although empirical articles are preferred, we will also consider ground-breaking theoretical and methodological articles with direct relevance to cross-cultural research. Special guest-edited issues with cross-cultural themes may be considered. Please send preliminary proposals to the editor.

Studies that deal with measured differences between or among cultures (or subjects therefrom) must link them to other measured differences between or among the cultures. The study must do more than just compare two or more cultures (or people from them). The dependent variable(s) must be linked statistically (or causally, at least by argument) to one or more independent variable(s) that have been measured. The journal has this requirement because an observed difference could be the result of any other difference(s) between or among the cultures compared. The study should present evidence that narrows down the causal possibilities with regard to the dependent variable(s). Examples of possibly explanatory variables may be cultural, geographic, historical, and biological. Measures could be based on ethnography, individual testing, behavior observations, or other information.

Manuscripts should be submitted via e-mail attachment to the editor (Carol.Ember@yale.edu) with a copy to the managing editor (Patricia.Andreucci@yale.edu). You should expect to receive a confirmation note of receipt within a week. Articles should be typewritten and double spaced, with abstract, footnotes, references, tables, and charts on separate pages, and they should follow guidelines of the **Publication Manual of the American Psychological Association (5th edition or higher)**. Manuscripts will be sent out anonymously for editorial evaluation, so the author's name and affiliation should appear only on a separate cover page. Each article should begin with a title and an abstract of about 150 words. Obtaining permission for any quoted or reprinted material that requires permission, and paying any associated fees, are the responsibility of the author. Submission of a manuscript implies commitment to publish in the journal. Authors submitting a manuscript to the journal should not simultaneously submit it to another journal, nor should the manuscript have been published elsewhere in substantially similar form or with substantially similar content. Authors in doubt about what constitutes prior publication should consult the editor.

Annexure F2

American Psychological Association Authors' Guidelines

American Psychological Association Authors' Guidelines

Overview

The following instructions pertain to all journals published by APA and the Educational Publishing Foundation.

Please also visit the web page for the journal to which you plan to submit your article for submission addresses, journal-specific instructions, and exceptions.

Manuscript Preparation

Prepare manuscripts according to the [Publication Manual of the American Psychological Association \(6th edition\)](#). Manuscripts may be copyedited for bias-free language (see Chapter 3 of the *Publication Manual*).

Double-space all copy. Other formatting instructions, as well as instructions on preparing tables, figures, references, metrics, and abstracts, appear in the *Manual*.

Below are additional instructions regarding the preparation of display equations and tables.

Display Equations

We strongly encourage you to use MathType (third-party software) or Equation Editor 3.0 (built into pre-2007 versions of Word) to construct your equations, rather than the equation support that is built into Word 2007 and Word 2010. Equations composed with the built-in Word 2007/Word 2010 equation support are converted to low-resolution graphics when they enter the production process and must be rekeyed by the typesetter, which may introduce errors.

To construct your equations with MathType or Equation Editor 3.0:

- Go to the Text section of the Insert tab and select Object.
- Select MathType or Equation Editor 3.0 in the drop-down menu.

If you have an equation that has already been produced using Microsoft Word 2007 or 2010 and you have access to the full version of MathType 6.5 or later, you can convert this equation to MathType by clicking on MathType Insert Equation. Copy the equation from Microsoft Word and paste it into the MathType box. Verify that your equation is correct, click File, and then click Update. Your equation has now been inserted into your Word file as a MathType Equation.

Use Equation Editor 3.0 or MathType only for equations or for formulas that cannot be produced as Word text using the Times or Symbol font.

Tables

Use Word's Insert Table function when you create tables. Using spaces or tabs in your table will create problems when the table is typeset and may result in errors.

If your manuscript was mask reviewed, please ensure that the final version for production includes a byline and full author note for typesetting.

Review APA's [Checklist for Manuscript Submission](#) before submitting your article.

Submitting Supplemental Materials

APA can now place supplementary materials online, available via the published article in the PsycARTICLES® database. Please see [Supplementing Your Article With Online Material](#) for more details.

Abstract and Keywords

All manuscripts must include an abstract containing a maximum of 250 words typed on a separate page. After the abstract, please supply up to five keywords or brief phrases.

References

List references in alphabetical order. Each listed reference should be cited in text, and each text citation should be listed in the References section.

Examples of basic reference formats:

Journal Article:

Herbst-Damm, K. L., & Kulik, J. A. (2005). Volunteer support, marital status, and the survival times of terminally ill patients. *Health Psychology, 24*, 225–229. doi:10.1037/0278-6133.24.2.225

Authored Book:

Mitchell, T. R., & Larson, J. R., Jr. (1987). *People in organizations: An introduction to organizational behavior* (3rd ed.). New York, NY: McGraw-Hill.

Chapter in an Edited Book:

Bjork, R. A. (1989). Retrieval inhibition as an adaptive mechanism in human memory. In H. L. Roediger III & F. I. M. Craik (Eds.), *Varieties of memory & consciousness* (pp. 309–330). Hillsdale, NJ: Erlbaum.

Figures

Graphics files are welcome if supplied as Tiff, EPS, or PowerPoint files. The minimum line weight for line art is 0.5 point for optimal printing.

When possible, please place symbol legends below the figure instead of to the side.

Original color figures can be printed in color at the editor's and publisher's discretion provided the author agrees to pay

- \$255 for one figure
- \$425 for two figures
- \$575 for three figures
- \$675 for four figures
- \$55 for each additional figure

Permissions

- Authors of accepted papers must obtain and provide to the editor on final acceptance all necessary permissions to reproduce in print and electronic form any copyrighted work, including, for example, test materials (or portions thereof) and photographs of people.

Publication Policies

- APA policy prohibits an author from submitting the same manuscript for concurrent consideration by two or more publications.
- See also [APA Journals® Internet Posting Guidelines](#).
- APA requires authors to reveal any possible conflict of interest in the conduct and reporting of research (e.g., financial interests in a test or procedure, funding by pharmaceutical companies for drug research).
- [Download Disclosure of Interests Form \(PDF, 38KB\)](#)
- Authors of accepted manuscripts are required to transfer the copyright to APA.
- [Download Publication Rights \(Copyright Transfer\) Form \(PDF, 83KB\)](#)

Ethical Principles

- It is a violation of APA Ethical Principles to publish "as original data, data that have been previously published" (Standard 8.13).
- In addition, APA Ethical Principles specify that "after research results are published, psychologists do not withhold the data on which their conclusions are based from other competent professionals who seek to

verify the substantive claims through reanalysis and who intend to use such data only for that purpose, provided that the confidentiality of the participants can be protected and unless legal rights concerning proprietary data preclude their release" (Standard 8.14).

- APA expects authors to adhere to these standards. Specifically, APA expects authors to have their data available throughout the editorial review process and for at least 5 years after the date of publication.
- Authors are required to state in writing that they have complied with APA ethical standards in the treatment of their sample, human or animal, or to describe the details of treatment.
- [Download Certification of Compliance With APA Ethical Principles Form \(PDF, 26KB\)](#)
- The APA Ethics Office provides the full [Ethical Principles of Psychologists and Code of Conduct](#) electronically on its website in HTML, PDF, and Word format. You may also request a copy by [emailing](#) or

calling the APA Ethics Office (202-336-5930 FREE 202-336-5930). You may also read "Ethical Principles," December 1992, *American Psychologist*, Vol. 47, pp. 1597–1611.

Other Information

- [Appeals Process for Manuscript Submissions](#)
- [Preparing Auxiliary Files for Production](#)
- [Document Deposit Procedures for APA Journals](#)

Annexure G

Turnitin Reports

Annexure H

Letter from language editor