

Using South African food companies' nutrition strategies and consumer knowledge, attitudes and practices pertaining to nutrition information, to develop guidelines for the promotion of the prevention of chronic diseases of lifestyle

by

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Thesis presented
in partial fulfilment
of the requirements for the degree of
Master of Nutrition at Stellenbosch University



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Date: December 2009

DECLARATION

Declaration

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ABSTRACT

Background

The prevalence of chronic diseases of lifestyle such as cardiovascular disease, cancer, type 2 diabetes mellitus and obesity are increasing worldwide due to changes in lifestyle patterns, including changes in the food consumption patterns of consumers. There are numerous players who need to be involved in addressing current lifestyle patterns and in encouraging positive behaviour change. Food companies have a role in evaluating the composition of the products that they offer, as well as in educating consumers with regard to healthy eating practices through both the on-pack information that they supply and in their nutrition strategies and programmes.

Objectives

The main objective of the study was to investigate the nutrition strategies that food companies in South Africa use to communicate with the consumers and to compare it with the knowledge, attitudes and practices of the consumers towards the nutrition information that they receive. The secondary objective was to develop guidelines for food companies in their promotion of the prevention of chronic diseases of lifestyle.

Methodology

The study population consisted of a sample of 7 food companies operating in South Africa and a sample of 230 South African consumers. Data were collected through test questionnaires aimed at each specific study population. The data were analysed statistically for each study population and the data between the two study populations were compared.

Results

Most food companies that participated stated that they have a nutrition strategy which outlines their consumer communication policy, but none of these were made available to the researcher. Seventy-one percent of the food companies also indicated that they address chronic diseases of lifestyle in their nutrition strategies, with cardiovascular disease being the main focus. The medium used most frequently by food companies for nutrition education of the consumer is the food label. The majority of

food companies agree that they do have a responsibility towards the education of the consumer, but stated that it is not solely their responsibility.

Ninety-six percent of consumers read (always or sometimes) the labels of food products when making a purchase. The older the consumer, the more unlikely they are to read the ingredients statement on the label. Consumers are most concerned with cardiovascular disease when purchasing food products. Ninety-five percent of consumers agreed that food companies have a responsibility towards them with regard to nutrition education. The consumers indicated that they prefer food labels and television as the medium for nutrition education, but that they trust doctors and nutritionists the most to relay nutrition messages.

Conclusion

Consumer education on the prevention of chronic diseases of lifestyle is essential if the behaviour change, necessary to address their rising prevalence, is to become a part of consumers' lifestyles. Food companies should be actively involved with consumer education pertaining to healthy eating and healthy lifestyle habits. Communication with regard to nutrition education is critical and should be consistent with an integrated approach involving all the role players including the food industry, the Department of Health (DOH) and the Department of Education (DOE).

OPSOMMING

Agtergrond

Die prevalensie van kroniese lewensstyl siektes soos hartvatsiektes, kanker, tipe 2 diabetes mellitus en vetsug is wêreldwyd aan die toeneem weens 'n verandering in die lewenstyl van verbruikers wat 'n weer 'n verandering in eetgewoontes teweeg bring. Daar is verskeie rolspelers betrokke wat 'n bydrae kan lewer om die huidige lewensstyl patronen van verbruikers aan te spreek en om positiewe gedragsveranderinge te bevorder. Voedselmaatskappye speel 'n tweeledige rol: deur die samestelling van voedselprodukte wat hulle versprei te evalueer, en deur die verbruiker op te voed oor gesonde eetgewoontes. Maatskappye se voedingstrategieë en programme, asook die verpakking van produkte, kan gebruik word om voedingsinligting te verskaf.

Doelwitte

Die studie se hoof doelwit was om die voedingstrategieë te ondersoek wat deur voedselmaatskappye in Suid Afrika gebruik word en om dit te vergelyk met die kennis, houding en praktyke van die verbruiker teenoor voedingsinligting wat hulle ontvang. Die sekondêre doelwit was om riglyne vir voedselmaatskappye te ontwikkel ter ondersteuning van die maatskappye se inisiatiewe om kroniese lewensstyl siektes te voorkom.

Metodologie

Die studiepopulasie het bestaan uit 'n steekproef van 7 voedselmaatskappye wat in Suid Afrika werksaam is en 'n steekproef van 230 Suid Afrikaanse verbruikers. Data is ingesamel deur twee uitgetoetsde vraelyste te gebruik wat spesifiek geteiken was vir elke studie populasie. Die data is statisties geanaliseer vir elke studie populasie en die studie populasies is ook met mekaar vergelyk.

Resultate

Die meeste voedselmaatskappye wat deelgeneem het aan die studie verklaar dat hulle 'n voedingstrategie het wat die wyse waarop daar met die verbruiker kommunikeer word uitstippe, nogtans was geeneen van die voedingstrategieë beskikbaar gestel aan die navorsers nie. Een en sewentig persent van die voedselmaatskappye het ook aangedui dat kroniese lewensstyl siektes

aangespreek word in hul voedingstrategieë en dat daar gefokus word op hartvatsiektes. Voedselmaatskappye gee voorkeur aan die voedseletiket as medium vir voedingvoorligting aan die verbruiker. Die meeste voedselmaatskappye het saamgestem dat hul wel 'n verantwoordelikheid het teenoor die verbruiker ten opsigte van voedingvoorligting, maar beskou dit nie as uitsluitlik hul verantwoordelikheid nie.

Ses en negentig persent van die verbruikers lees voedsel etikette (altyd of soms) wanneer hul aankope doen. Dit blyk dat die ouer verbruiker minder geneig is om die bestanddelelys te lees. Verbruikers is oorwegend bekommert oor hartvatsiektes wanneer hulle voedselaankope doen. Vyf en negentig persent van die verbruikers stem saam dat voedselmaatskappye 'n verantwoordelikheid het teenoor verbruikers ten opsigte van voedingvoorligting. Die verbruikers gee voorkeur aan die voedsel etiket en televisie as mediums vir voedingvoorligting, maar hul vertrou meestal op dokters en voedingkundiges om die voedingboodskappe oor te dra.

Gevolgtrekking

Om gedragsverandering by verbruikers mee te bring met die oog daarop om die toename in kroniese lewensstyl siektes aan te spreek, is dit essensiël om die verbruiker toe te rus met die nodige kennis oor die voorkoming van kroniese lewenstyl siektes. Voedselmaatskappye behoort aktief betrokke wees by verbruiker opvoeding oor gesonde leef- en eetgewoontes. Kommunikasie ten opsigte van voedingvoorligting moet konsekwent wees en 'n geïntegreerde benadering moet deur alle rolspelers gevolg word, insluitende voedselmaatskappye, die Departement Gesondheid en die Onderwysdepartement.

ACKNOWLEDGEMENTS

I would like to extend heartfelt gratitude to the following people and organisations:

My study leaders Ms Badham and Mrs Marais for their valuable contributions and guidance throughout this study. Prof Nel for his support and contributions with the statistical analysis. My employer, Pioneer Foods, for granting me permission to carry out this study and their financial support. My family and friends for their support, especially my husband, Fredrich and my son HJ for all their patience and understanding.

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LIST OF ABBREVIATIONS

ANOVA:	appropriate analysis of variance
BMI:	body mass index
CANSA:	Cancer Association of South Africa
CDL:	Chronic diseases of lifestyle
CHD:	coronary heart disease
CVD:	cardiovascular disease
DOE:	Department of Education
DOH:	Department of Health
EUFIC:	European Food Information Council
FAO:	Food and Agriculture organisation
FBDG:	Food Based Dietary Guidelines
FTSE:	Financial Times Stock Exchange
HR:	human resources
IFIC:	International Food Information Council
LSM:	living standard measurements
MRC:	Medical Research Council
NIDDM:	non-insulin dependent diabetes mellitus
NIH:	National Institutes of Health
NGO:	non-government organisation
SA:	South Africa
USA:	United States of America
WHO:	World Health Organisation

LIST OF DEFINITIONS

- Content validity:** Content validity refers to whether the questions accounts for all the variables that has to be tested.¹
- Face validity:** Face validity refers to the extent to which the question makes sense to the respondent.¹
- Health claim:** Any representation that states, suggests or implies a relationship between a food or a constituent of that food and health.²
- Health tips:** A useful hint or piece of advice that is usually based upon subjective information.³
- Nutrition education:** The provision of information and educational materials designed to improve health status, dietary habits and physical activity habits, and to emphasize the relationship between nutrition, physical activity and health, all in keeping with the individual's personal, cultural, and socioeconomic preferences.⁴
- Social responsibility:** The principle that companies should contribute to the welfare of society and not be solely devoted to maximizing profits.⁵

CHAPTER 1

INTRODUCTION AND STATEMENT OF PROBLEM

1.1 INTRODUCTION

The food consumption and lifestyle patterns of consumers around the world have undergone major changes in recent years as a result of amongst others, economic development, urbanisation and industrialisation. Consumers' demand for fast foods and convenience foods has grown along with the increased pace of living. At the same time, there has been a decrease in physical activity. Together these have contributed to an increase in chronic diseases of lifestyle (CDL) such as type 2 diabetes mellitus, coronary heart disease (CHD), hypertension, cancer and obesity, which are prevalent in both the developed world and the developing world.^{6,7}

Communication pertaining to healthy eating and exercise is an increasingly critical element of public health nutrition and plays a vital role in improving lifestyle practices. Nutrition communication mediums such as nutrition labelling and health claims rely on an aware, informed and educated consumer, as they have to interpret the information provided in the context of their own health status, in order to make appropriate food choices. The increase in the prevalence of diet-related, CDL (at a population and individual level) has to be addressed through a broad-based and systematic approach that includes communication mediums such as on-pack nutrition information on pre-packed food and beverages.⁸

1.2 MOTIVATION FOR THE STUDY

The food industry in South Africa (SA) can and should play a role in assisting the consumer towards following a healthier lifestyle by offering and promoting healthier food choices, that have been shown to play a role in the prevention of CDL. This can be done by reviewing the nutritional profile of products and the marketing messages; by exploring opportunities to make changes to existing products and to make more foods available that fit in with the dietary pattern as recommended by the South African Food Based Dietary Guidelines (FBDG). In addition, the food industry has a social responsibility to educate their consumers on healthy eating, using an evidence-based approach, but in a manner that is understandable and relevant. Partnerships with credible non-governmental organisations (NGOs) involved in health promotion, such as the Heart and Stroke Foundation, The Cancer Association of South Africa (CANS) and the 5-a-Day for Better Health TRUST, also play a role in developing the consumer's trust in the food industry and the messages communicated.

For the purposes of this research, the researcher undertakes an assessment of the nutrition strategies of South African based food companies and consumer knowledge, attitudes and practices pertaining to nutrition information. A set of guidelines for the communication of healthy eating and lifestyle messages has been developed for the food industry in SA, based on the findings. These guidelines aim to assist the food industry in conveying accurate, evidence-based nutrition and health messages to consumers, so that they in turn can understand and correctly interpret them, with the ultimate aim of decreasing the incidence of CDL in SA.

CHAPTER 2

REVIEW OF RELATED LITERATURE

Various lifestyle choices made by the general population are contributing to the increased prevalence of a range of chronic diseases such as cardiovascular disease (CVD), cancer, hypertension, type 2 diabetes mellitus and obesity. These lifestyle changes also influence the eating patterns of individuals.⁹ The food industry offers a variety of ready-made foods and fast foods which generally have a lower nutrient density, are high in total and saturated fat and low in fibre.⁷ The way in which on-pack information on food products is communicated to the consumer has changed significantly in recent years and this also influences food choices and eating habits.¹⁰

2.1 CHRONIC DISEASES OF LIFESTYLE

The literature cites three factors as being the greatest contributors to an unhealthy lifestyle and the associated increased prevalence of CDL - tobacco smoking, a sedentary lifestyle and an unhealthy diet.¹¹ Almost 60% of all deaths worldwide can be attributed to CDL and 80% of these deaths occur in developing countries. CVD and lifestyle-related cancers are the two CDL with the highest mortality rates. Chronic diseases of lifestyle have a major impact, especially in developing countries, as they result in loss of income and lower levels of economic development.¹²

The chronic diseases of lifestyle - CVD, cancer, type 2 diabetes mellitus and obesity will be discussed within both the global and South African context.

2.1.1 Cardiovascular disease

CVD is the leading cause of mortality worldwide in adults and is a major cause of disability. In the United States of America (USA), 33% of the adult population has CVD (hypertension, coronary heart disease (CHD), stroke, rheumatic heart disease and heart failure) and CHD is the leading cause of death (53%), while 17% of CVD deaths are from stroke.^{13,14}

A number of factors are associated with the increasing incidence of CHD, but the most commonly cited are high blood cholesterol, high blood pressure, obesity, cigarette smoking and low levels of physical activity.¹⁵⁻¹⁸

It has been shown that modest weight loss, changes in dietary intake (such as a reduction in saturated fat intake) and regular exercise have been shown to have positive effects on CHD risk factors.¹⁹

Several risk factors are associated with high blood pressure (*Table 2.1*).²⁰ According to the South African Comparative Risk Assessment Collaborating Group the prevalence of hypertension ($\geq 140/90\text{mmHg}$) in SA is 22.9% in men and 24.6% in women.²⁰ High blood pressure is associated with an increased risk of CHD and the prevention and management of hypertension has been shown to decrease the incidence of CVD symptoms.²¹ Sodium intake is also directly linked to blood pressure. A reduction in sodium intake can lower blood pressure and lead to a reduction in the risk of CHD.⁶

Table 2.1: The percentage of the burden of disease that is attributable to high blood pressure (systolic BP $\geq 115\text{mmHg}$) in SA in 2000.²⁰

Diseases	% of the burden of disease attributable to high blood pressure in SA
Stroke	50%
Ischemic heart disease	42%
Hypertensive disease	72%
Other CVD burden	22%

High blood cholesterol also contributes to a substantial proportion of CVD in SA and results in a considerable number of deaths and disability. In SA, 59% of ischaemic heart disease is attributed to raised cholesterol levels. High blood cholesterol can be controlled and lowered through lifestyle and diet modifications together with physical activity.¹⁷

Type 2 diabetes mellitus is a risk factor for CHD and most people with type 2 diabetes mellitus will die from CVD.¹⁴ Several studies have shown that a diet high in fibre, whole grains and vegetables and fruit combined with a controlled fat intake (total, saturated and trans fatty acid) can result in a decreased risk of CVD.⁶

Obesity is also an independent risk factor for CVD and is likely to increase morbidity and mortality.¹³ As the body mass index (BMI) of a person increases so does the risk of CHD.^{13,14}

A sedentary lifestyle is also associated with an increased risk of CHD. Individuals who are physically inactive have twice the risk of developing CHD as those who lead an active lifestyle.¹⁴

2.1.2 Cancer

Globally, cancer contributes to more than 7 million deaths per year. Six hundred thousand of these deaths occur in Africa and most of the predicted 15 million new cancer cases by the year 2020 are expected to be in developing countries.²² This prediction correlates with the increased prevalence of cancer in developing countries.²³

It is estimated that 80% of cancers are related to environmental factors and it can therefore be extrapolated that the majority of cases of cancer could be prevented.²⁴ Thirty percent of cancers in developed countries can be attributed to diet, making diet a major preventable factor in the development of cancer (second only to tobacco).⁶ Cancer prevalence is not only hereditary, but can also be associated with dietary habits, physical activity and obesity. One of the recognised key prevention strategies for cancer development is lifestyle modification that includes regular exercise, maintaining a healthy weight, avoiding tobacco smoke and following a balanced diet.²⁵

The consumption of plenty of vegetables and fruit has been shown to have a significant protective effect against most cancers. Fibre-rich diets have also been associated with a protective effect against colon cancers. The consumption of alcohol is associated with the development of certain cancers and it has a greater effect on those tissues directly exposed to it e.g. cancers of the mouth and pharynx. Cooking methods such as frying and smoking can also increase carcinogens. It is therefore important that the public is educated on how to alter their lifestyle in order to prevent the possibility of certain cancers.²⁴

The World Health Organisation (WHO) has issued recommendations aimed at reducing the risk of developing cancer - maintain a healthy weight, be physically active, use alcohol sparingly, minimise exposure to aflatoxins in food, consume a diet high in vegetables and fruit.⁶

2.1.3 Type 2 diabetes mellitus

Diabetes mellitus is associated with defects in the secretion and action of insulin and is the result of an interaction between genetic and environmental factors.²⁶ Environmental factors appear to be the main contributors to the increased incidence of type 2 diabetes mellitus.⁶ Obesity is strongly related to the development of type 2 diabetes mellitus, and even a moderate loss of weight is associated with an improvement in the glucose levels in the majority of type 2 diabetics.²⁶ Reduction in physical activity and changes in dietary patterns are two additional factors that contribute to type 2 diabetes mellitus.⁶

Prevalence of type 2 diabetes mellitus has risen sharply worldwide and apart from the direct impact on an individual's morbidity and mortality, it is also considered to be one of the major risk factors for the development of CVD. It is estimated that 5.9% of the adult population worldwide has type 2 diabetes mellitus and type 2 diabetes mellitus accounts for almost 95% of these cases.²⁷ It is estimated that by the year 2025, the global prevalence of type 2 diabetes mellitus will amount to approximately 300 million diabetics. Countries undergoing socio-economic development and a subsequent increase in urbanisation are expected to show the greatest increase in the prevalence of type 2 diabetes mellitus.²⁸ According to the South African Comparative Risk Assessment Collaborating Group, the prevalence of self-reported type 2 diabetes mellitus in SA is 2.4% in men and 3.7% in women.²⁹ Research shows that in 2000, 87% of the type 2 diabetes mellitus in SA was attributable to a body mass index (BMI) of ≥ 21 .³⁰

The primary goal for people living with type 2 diabetes mellitus is to achieve and maintain normal blood glucose levels. Altering an individual's lifestyle through improved eating habits, weight management/maintenance and increased physical activity, is considered key in preventing and managing most cases of type 2 diabetes mellitus.³¹ Recommended preventative measures include ensuring that total fat intake is limited to 30% of the total energy, saturated fat intake does not exceed 10% of total energy and dietary fibre is increased through the consumption of whole grains, legumes and vegetables and fruit.⁶

2.1.4 Obesity

Obesity refers to an excess of body fat and can be measured by the BMI, which is based on a measure of body weight that has been adjusted for height. The National Institute of Health (NIH) classifies a BMI of between 25 and 29.9 as overweight and a BMI of 30 or greater, as obese.⁹ Obesity has been associated with an increased risk for CDL.³²

In 2003 more than 300 million adults worldwide were obese, according to the WHO. One hundred and fifteen million of these cases were living in the developing world.³³ In SA the prevalence of obesity and overweight adults in 2000 was 25% in men and 56% in women.¹⁵

A study undertaken in SA (2000) to estimate the burden of disease attributable to excess body weight, showed the following diseases to be attributable to a $BMI \geq 21\text{kg}/\text{m}^2$: type 2 diabetes mellitus (87%), hypertensive disease (68%), endometrial cancer (61%), ischaemic stroke (45%), ischaemic heart disease (38%), kidney cancer (31%), osteoarthritis (24%), colon cancer (17%) and postmenopausal

cancer (13%).¹⁵ Type 2 diabetes mellitus is strongly associated with obesity, and blood pressure is very often elevated in individuals who are overweight. Weight gain is also associated with a higher risk of developing CVD, and certain forms of cancer are significantly increased in overweight individuals. Excess body weight also has a positive correlation with mortality.³⁴

The main causes of obesity, according to the WHO⁶, are:

- A sedentary lifestyle
- Increased intake of energy-dense and micronutrient-deficient foods
- Increase in marketing of fast foods
- An increased intake of sugar-containing soft drinks and juices
- Adverse socio-economic conditions of women
- Larger portion sizes
- A high percentage of food prepared and consumed outside the home
- An increase in alcohol consumption.

An overall increase in the prevalence of sedentary lifestyles and the increased consumption of convenience foods has been recognised.³⁵ Physical inactivity and the composition of food intake seem to be the two most influential risk factors for overweight and obesity.³³ An imbalance between energy intake and energy expenditure is noted as the main cause of obesity.^{34,36} This together with advertising that promotes an increased food intake, especially of foods high in fat and sugar and with a low nutrient density, has raised obesity concerns. Urbanisation also has a role to play in the obesity pandemic, as it enhances conditions that favour unhealthy eating habits and a decline in physical activity. The global trend shows that work has become less labour intensive and the availability of transport has resulted in fewer people travelling by foot.³⁶

According to the United States Centre for Disease Control (CDC), media coverage and awareness of the global obesity pandemic has increased significantly over the past few years. It would seem that as a result of the increase in media coverage on the subject of obesity, informed consumers are now demanding interventions aimed at reducing the prevalence of overweight people and especially obesity.^{32,35}

2.2 THE ROLE OF FOOD COMPANIES IN ADDRESSING CHRONIC DISEASES OF LIFESTYLE

The education of consumers on what constitutes healthy eating is a complex task, as consumers have their own unique interpretation of sources of information, have different backgrounds from which they shape their knowledge and therefore respond differently.³⁷

The role played by the food industry in providing the foods that people generally and habitually choose to make up their dietary patterns, has the potential to either negatively or positively influence the health of the consumer.³⁸ Through innovative changes of the food products on offer; such as smaller package sizes, portion control, changed nutrient profile, the addition of functional ingredients, provision of accurate nutrition information and broadening the selection of products, the food industry can assist consumers in making improved and appropriate food choices.³⁹

Consumers expect foods to contribute to their health and well being.⁴⁰ Food companies can produce foods that have health benefits. Innovations such as the replacement of fats and fermentation to enhance flavour and aroma without adding salt are just two examples of how food companies can actively make a positive contribution to addressing CDL.⁴⁰

Food companies are increasingly being criticised for the role that they are perceived to have played in the obesity pandemic and the increasing prevalence of other CDL. Beyond the reformulation of products and communication through food labels, food companies also need to concentrate on practical changes, such as the introduction of smaller portion sizes (smaller packages for portion control) and marketing practices which include an emphasis on nutrition. This can be achieved by making use of registered dietitians and nutrition scientists in evidence-based communication campaigns.⁴¹

2.3 THE EDUCATION OF THE CONSUMER

The food industry cannot be solely responsible for educating consumers on what constitutes healthy eating in order to prevent the development of CDL; however they can contribute as part of a broader national health promotion strategy. The development and implementation of such a national strategy has to be the result of a co-ordinated effort by government, the health- and social sectors, non-governmental organisations (NGO's), the food industry and the media.⁴² Some food companies provide information on their websites as a means of educating the consumer on the use of nutrition labels on food. Advertising is also used as an education tool by some food companies and retailers.⁴³

Research from Australia shows that health promotion and the education of consumers on healthy lifestyle practices should start at school level. Young people spend a great deal of their time at school and it is the main setting for formal education. Health promotion should be incorporated into the curriculum at schools, since health education increases awareness and has been shown to change attitudes and behaviour.⁴⁴ In the USA it has been shown that health education can increase awareness and subsequently change behaviour and attitudes.⁴⁵

In providing nutrition education to the consumer, care must be taken to reduce nutrition confusion. Nutrition advice can include the following: total diet should be emphasised over individual nutrients, appropriate portion sizes and the promotion of regular physical activity.⁴⁶

2.4 COMMUNICATION MEDIUMS

Health strategies are continuously being communicated to consumers via various channels, but have often not been successful in promoting healthy eating. The health illiteracy of the consumer is one of the major contributors to this limited success.⁴⁷ The relationship between literacy and health is still largely ambiguous, but research has found that people with limited literacy are more likely to report having poor health, and are more likely to have type 2 diabetes mellitus and heart failure.¹⁰ Research in the United Kingdom shows that there is also a negative correlation between education and obesity, specifically, and interventions aimed at improving the education of specific groups may lead to a reduction in obesity.³⁶

There are several marketing mediums that are generally used when communicating to consumers. These include: national and regional newspapers, magazines, classified advertisements, radio, television, web sites, public relations, telemarketing, direct mail, brochures (printed/electronic), pamphlets/fliers, outdoor advertising, exhibitions and tradeshows.⁴⁸ Consumers draw their information on the nutritional value of a food product from several of these sources as well as from their existing knowledge, health professionals, family and friends and on-pack nutritional information.⁴⁹ Three communication mediums which are commonly used are nutrition labelling, health claims and mass media.

2.4.1 Nutrition labelling

On-pack nutrition information tables provide the consumer with information on the nutritional content of food products.⁵⁰ The comprehension, interpretation and application of the nutritional information provided on food labels, largely depends on the reason behind the consumer using the information. The literature shows that on-pack nutrition information used on its own, has little effect on the overall nutritional health of a population.⁵¹

Consumer research conducted by the European Food Information Council (EUFIC) found that nutrition labels do not play a significant role in the management of healthy diets and the way that food is assessed in terms of nutritional quality. Consumers find the design of food labels and the technical language used daunting and tend, therefore, not to use them routinely.⁵² Surveys conducted in America reported that 60 - 80% of consumers read food labels and only 30 - 40% of consumers reported that the label had an influence on their purchase. These surveys also revealed that consumers become confused by conflicting nutritional messages sent out by the media, nutritionists and fad diet advocates.⁵³

Other research conducted by the International Food Information Council (IFIC) Foundation in the USA in 2003, reported that 83% of consumers look at ingredients or nutrition information sometimes, at least; 40% of consumers looked sometimes, 11% always looked, and 4% never looked. According to the IFIC Foundation, nutrition information can also be ranked in order of consumer awareness: calories (89%), total fat (81%), sodium (75%), sugars (73%), carbohydrates (72%), saturated fat (71%) and cholesterol (66%). When considering the nutritional value of food for purchase, calories (58%) and total fat (56%) rank first.⁵⁴ It seems that consumer use of food labels and nutrition information varies widely.⁵⁰

2.4.2 Health claims

Health claims can be a powerful communication medium to enhance consumers' knowledge in relation to nutrition and healthy eating habits.⁵⁵ Health claims on food labels can be used to communicate certain intrinsic health attributes of the product. According to the current Codex Alimentarius^a

^a The Codex Alimentarius Commission was created in 1963 by FAO and WHO to develop food standards, guidelines and related texts such as codes of practice under the Joint FAO/WHO Food Standards Programme. The main purposes of this Programme are protecting the health of the consumers and ensuring fair trade practices in the food trade, and promoting coordination of all food standards work undertaken by international governmental and non-governmental organizations.

guidelines, there are three types of permitted health claims: '*nutrient function*' claims, '*other function*' claims and '*reduction of disease risk*' claims. A '*nutrition function*' claim refers to a nutrient that can assist in normal physiological growth, development and functions of the body. '*Other function*' claims refer to nutrients (or other substances) that may improve or modify the normal functions of the body. '*Reduction of disease risks*' claims refer to foods that can reduce the risk of a disease.² These health claims are used on various levels by the consumer and are generally believed to be helpful in making healthy food choices. It is important however that health claims be evidence-based and be regulated by government in order to protect the consumer from practices that exploit this information for the sole purpose of increasing sales.⁵⁶ The issue of health claims is currently under review by the South African Department of Health.⁵⁷

In general, consumers think that health claims are useful to them in making informed food choices; however the extent to which they use health claims is unclear. They prefer short, concise claims to long and complex phrases and believe that health claims should be approved and regulated by government. Health claims can have a negative effect on nutrition communication as consumers tend to stop looking for any other nutrition information once they have identified a health claim on a food product, and so the composition of the total diet might be neglected.⁵⁶

2.4.3 Mass media

Mass media in the form of television, radio, newspapers and magazines can be successful in communicating health messages provided that the messages are not contradictory. The most effective impact of mass media is evident when it serves as a supplement to existing interpersonal communication.⁴⁵

Radio has the largest audience of all the mass media and is important as it generally reaches into rural areas where illiteracy is often greater. If health education is to have a significant impact, it has to go beyond simple mass media programmes and needs to be integrated with other supportive channels such as print media. Messages should be consistent and be based on consumer research.⁵⁸

Much of the literature cites similar recommendations to the South African FBDG in order to prevent and manage the CDL. This would be a good basis to continue from in educating the South African consumer on healthy eating.

The FBDG are evidence-based and were consumer-tested:⁵⁹

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

Communication campaigns aimed at nutrition education should be based on behavioural models, within the larger context of food choices. Thus, the consumers' preferences, current knowledge and the availability of foods should be known before a nutrition education model is developed.⁴⁶

2.5 CONCLUSION

It is clear from the literature that consumers in general are increasingly moving towards less healthy dietary patterns and a more sedentary lifestyle. These changes are predominantly driven by urbanisation and an improved standard of living in developing countries. However, consumers are also increasingly being exposed to a wider variety of foods and this presents an opportunity for educating the consumer on the principles of healthy eating.⁶⁰

Most CDL are also associated with physical inactivity. A sedentary lifestyle can increase the risk of diseases such as ischaemic heart disease, type 2 diabetes mellitus and hypertension by 1.5 to 2.0 fold. Communication and education goals should therefore also include activities/exercises that promote an active lifestyle together with healthy eating and energy balance.¹⁸

Government, food companies and the community should ideally work together to develop a unified strategy and plan and implement initiatives aimed at combating the CDL. Strategies could be developed to change consumers' behaviour towards adopting healthy diets and a healthy lifestyle.⁶ To design the

most suitable educational intervention to teach consumers about healthy eating and living, a variety of nutrition information, communication, endorsements and intervention strategies should be integrated. In order to be successful and sustainable, this intervention will take co-ordinated efforts from all parties involved.⁴⁶

CHAPTER 3

METHODOLOGY

3.1 RESEARCH AIM

The main aim of the study was to use South African food companies' nutrition strategies and consumer knowledge, attitudes and practices pertaining to nutrition information, to develop guidelines for the promotion of the prevention of CDL.

3.2 STUDY OBJECTIVES

- To investigate whether internationally represented and local food companies operating in SA have a strategy relating to nutrition.
- To investigate and compare the specifics of the nutrition strategies which are used by internationally represented and local food companies operating in SA.
- To research the mediums used by food companies to communicate their nutrition strategies to the consumer.
- To investigate the knowledge, attitudes and practices of South African consumers regarding the nutrition information that they receive.
- To investigate the knowledge, attitudes and practices of South African consumers regarding the mediums used by food companies to communicate their nutrition strategies.
- To compare the nutrition strategies of the food companies with the perceptions of the consumers.
- To combine the useful practices of nutrition strategies with the perceptions of the consumer, in order to establish guidelines for the South African food industry for the promotion of the prevention of CDL.

3.3 STUDY PLAN

A conceptual framework was developed to depict the study plan visually (*Figure 3.1*). Due to an increase in CDL, various strategies are employed by the government, NGOs, food companies and global corporations to combat this phenomenon. On the other hand, consumers have their own knowledge, attitudes and practices towards the strategies that are implemented. Different

communication mediums are used to communicate the strategies to the consumer. In this study the knowledge, attitudes and practices of the consumer are investigated and then compared to the nutrition strategies employed by companies. The aim is to develop nutrition guidelines for use by the food industry in order to accelerate the reduction in CDL in SA.

3.3.1 Conceptual framework

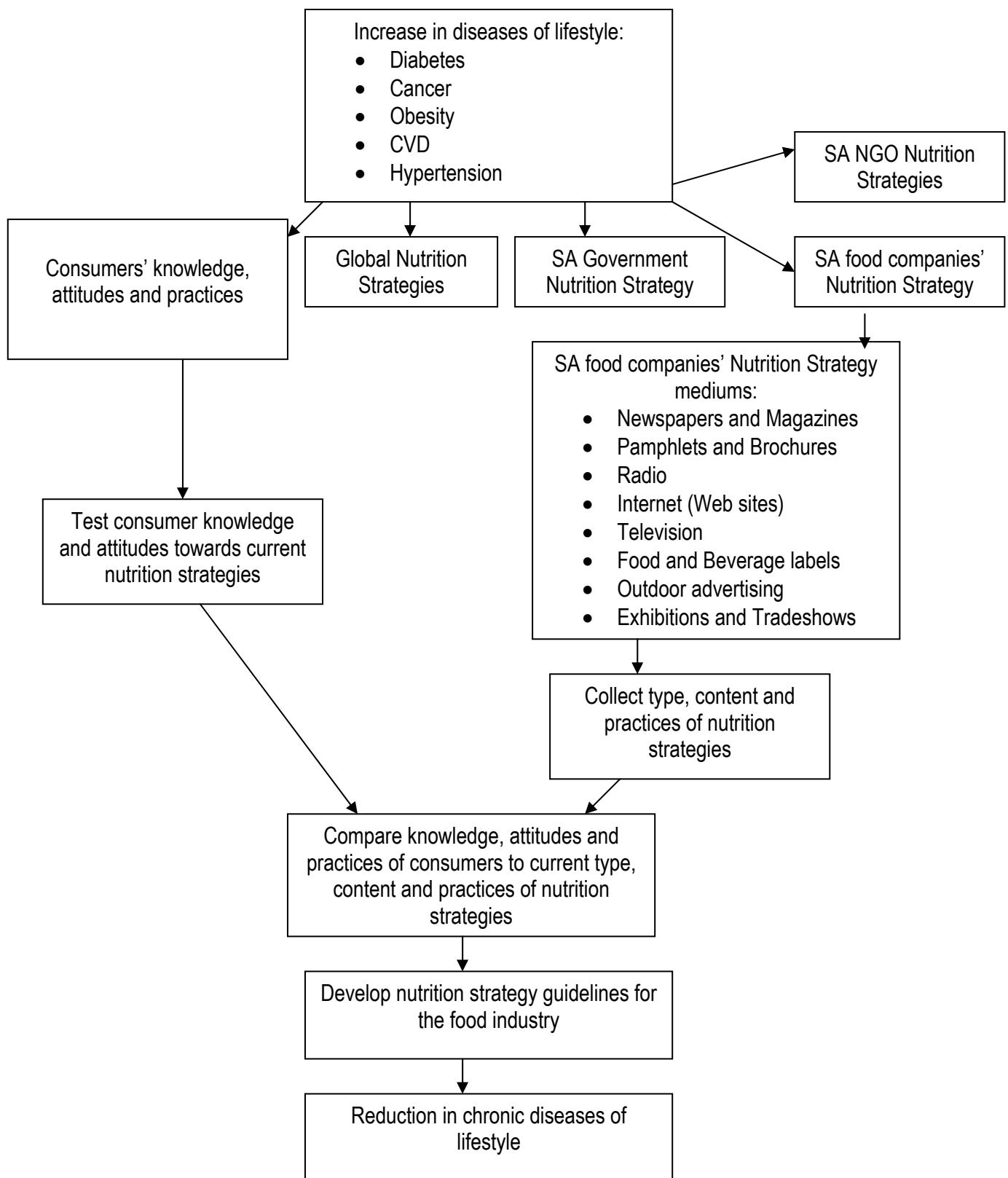


Figure 3.1: Diagrammatical representation of the conceptual framework

3.3.2 Study design

The study design is observational, descriptive and cross-sectional.

3.3.3 Study population

Two different study populations were included to meet the study objectives:

- International and local food companies operating in SA. Information on their nutrition strategies was obtained by means of a questionnaire.
- Consumers were questioned regarding their knowledge, attitudes and practices pertaining to nutrition information and mediums used.

3.3.3.1 Sample of food companies

A database of food companies in SA was used as a sampling frame.⁶¹ This database has been built up by the Fletcher Media Group, through researching approximately 3000 companies over a cycle period of 4 to 5 months.^b Approximately 1500 companies are included in this database. The non-cyclical categorisation, according to the Financial Times Stock Exchange (FTSE) Global Classification System, was used to divide the food companies into sectors. This categorisation process is used in approximately 20 countries worldwide.

The following categories under the “Non-cyclical Consumer Goods sector” were used as a database:

- Beverages
 - Soft Drinks
- Food Producers and Processors
 - Farming and Fishing
 - Food Processors

Eighty-two companies were listed in the ‘Top 300 National Companies 2004/2005’^b under the categories ‘Beverages’ and ‘Food Producers and Processors’.⁶¹

^b The 2004/05 edition of the publication has 25 000 copies in circulation.

3.3.3.1.1 Sample selection

A purposive sampling method was used. The names of all 82 companies included in the 'Top 300 National Companies 2004/2005'⁶¹ under the categories 'Beverages' and 'Food Producers and Processors' were captured in the Microsoft Excel data analysis programme.

The sample size was calculated on the basis of a 95% confidence interval of any proportion the researcher needed to estimate. A precision of 8% yielded 54 companies to be chosen from the sample frame of 82.

3.3.3.1.2 Sample size

A stratified random sample of 54 international and local food companies operating in SA was drawn. The number of companies selected was dependent on the expected response rate (between 30% and 40%) as well as confidentiality clauses which restricted the companies from taking part in the survey. The researcher sent out a set, validated questionnaire to 54 companies. Additional companies were contacted according to the random stratified sampling in an attempt to obtain 54 responses.

3.3.3.1.3 Inclusion/Exclusion criteria

Inclusion criteria:

Food companies were included if they:

- gave consent to participate and were willing to complete the questionnaire.

Exclusion criteria:

Food companies were excluded if they:

- had a confidentiality clause that prevents access to their nutrition strategies
- participated in the pilot study.

3.3.3.2 Sample of consumers

A sample of South African consumers was drawn to determine their level of knowledge, attitudes and practices pertaining to the nutrition strategies and mediums used by food manufacturing companies in SA.

3.3.3.2.1 Sample selection

The sample population comprised a convenience sample of South African consumers employed by Pioneer Foods (Pty) Ltd. There were several reasons for limiting the sample population to the employees of Pioneer Foods (Pty) Ltd. By using the sample frame of Pioneer Foods employees, the data collection period was expected to be shortened considerably. Postage cost would also be minimised by using the Human Resources (HR) personnel to distribute the questionnaires. It was also easier and more effective to make contact with the sample population through the human resource personnel. The Pioneer Foods Group employees originate from diverse socio-demographic backgrounds, cultures and Living Standard Measurements (LSM's) and the researcher would therefore have a sample population with a good socio demographic representation of the South African population as well as national representation.

3.3.3.2.2 Sample size

All the permanent employees of Pioneer Foods (Pty) Ltd were included in the sampling frame. The number of permanent employees as on December 2006 was 9699. Employees were divided per job grade, with job grade 1 being the lowest and above 16 the highest (*Appendix 1*). The sample was then stratified for job grade to ensure that all levels were represented in the study.

Appendix 2 provides the distribution of Pioneer Foods (Pty) Ltd staff throughout SA grouped per division, and subsequently the extent to which the sample is distributed throughout SA.

The sample size was calculated on the basis of a 95% confidence interval of any proportion which needed to be estimated. A precision of 5% would yield 370 employees to be chosen from the sampling frame of 9699. The sample size was however doubled to 740 employees to allow for the known low response rate on questionnaires.

To clarify the representivity of the sample, the researcher investigated the distribution of the South African population per province and compared it to the distribution of the Pioneer Foods employees per province. The population sample of 740 employees from Pioneer Foods (Pty) Ltd. was then chosen to reflect the distribution of the South African population (*Table 3.1*).

Table 3.1: Pioneer Foods staff distributed per province to reflect the South African population

Province	South African population as distributed per province (%) ⁶²	Distribution of Pioneer Foods staff per province (%)	Total of Pioneer Foods staff selected per province (as per SA population distribution)
Eastern Cape	14.4	6.89	107
Free State	6.2	5.88	46
Gauteng	20.2	12.36	149
KwaZulu Natal	20.9	9.29	155
Limpopo	11.3	13.27	84
Mpumalanga	7.4	2.88	55
Northern Cape	2.3	6.52	18
North West	7.1	3.49	53
Western Cape	10.1	39.41	75
Total	100	100	740

3.3.3.2.3 Inclusion/Exclusion criteria

Inclusion criteria:

- All permanent employees of Pioneer Foods (Pty) Ltd, i.e. all races, both genders, all age groups, all LSMs.
- Employees with access to the HR /Factory manager who distributed questionnaires.
- Literate in English.

Exclusion criteria

- Employees who have a tertiary education in any food/nutrition related field.
- Employees who participated in the pilot study.

3.3.4 Methods of data collection

Data was collected using two separate validated questionnaires that had been tested and approved:

- Questionnaire aimed at food companies, developed to obtain data on nutrition strategies which they had used.

- Questionnaire aimed at consumers, developed to gather data on the knowledge, attitudes and practices of consumers pertaining to nutrition information and mediums.

Necessary changes to the questionnaires were made before the questionnaires were implemented. (Refer to 3.4: the description of the Pilot Study). The data was then captured and statistically analysed.

3.3.4.1 Questionnaire to obtain information on nutrition strategies used by the food companies

The researcher contacted the marketing departments of the selected food companies telephonically to investigate willingness to participate in the study. Each food company had to provide written consent for the researcher to use the data confidentially and anonymously (*Appendix 3*). Subsequently the information was collected from the consenting food companies in the form of a set, validated questionnaire (*Appendix 4*). The questionnaires were either emailed or posted to the designated contact person at the food company as provided by the marketing department.

Information on the nutrition strategies used by the participating food companies was obtained using the questionnaire that consisted of thirty-two close-ended questions: three continuous, one ordinal and twenty-eight nominal questions. Three questions covered the general information pertaining to the company. Seventeen questions were asked concerning the specifics of the nutrition strategies/initiatives of the food company. A further twelve questions were asked pertaining to education initiatives and communication mediums used for the education of consumers.

3.3.4.2 Questionnaire to assess knowledge, attitudes and practices of consumers pertaining to nutrition information

Consent to conduct the data collection at Pioneer Foods (PTY) Ltd was obtained from the Managing Director of Pioneer Foods (*Appendix 5*). Each questionnaire received a unique codified number but no names were requested to ensure confidentiality. An information leaflet (*Appendix 6*) and the questionnaire for consumers (*Appendix 7*) were sent to each randomly selected employee via the HR manager or a factory manager. The contact name and phone number of the researcher were provided for assistance if required. The anonymous questionnaires were returned to the HR and factory managers at a set return date.

A questionnaire for consumers was developed to investigate the current knowledge, attitudes and practices of the consumers pertaining to nutrition information and mediums. The questionnaire consists of thirty-three closed-ended questions: one continuous, four ordinal and twenty-eight nominal questions. Four questions covered the general information pertaining to the consumer and seven questions covered aspects of the label and nutritional table information on food products. A further fifteen questions were directed towards nutrients and their relationship to CDL. The consumers' knowledge and perceptions were also investigated pertaining to communication mediums (one question) and the responsibility that food companies have in educating the consumer, using five questions. Consumers' attitudes towards nutrition strategies used by food companies were determined by using four similar questions. The Likert scale used the options of *strongly agree*, *agree*, *disagree* and *strongly disagree*. One open-ended question was used to assess whether consumers are aware of any nutrition education programmes aimed at the consumer that are run by food companies.

During analysis of the data, a number of questions from the two questionnaires were paired to compare the responses between the two groups (*Appendix 9*).

3.3.5 Questionnaire Validity

Face and content validity of the questionnaires were tested during the pilot study.

Face validity refers to the extent to which the question makes sense to the respondent.¹ Both questionnaires were tested for face validity during the pilot study to ensure that the respondents understood the questions. The questionnaires were tested during the pilot study by having consumers and food companies complete the questionnaires. The researcher then assessed whether the content and phrasing of the questions were understood by the respondents.

Content validity refers to whether the questions account for all the variables that need to be tested.¹ Content validity of both questionnaires was evaluated by three experts: an Account Manager from Research International (Pty) Ltd who specialises in quantitative research, a lecturer from Stellenbosch University, Division of Human Nutrition and a Marketing Consultant from Stellenbosch University.

3.4 PILOT STUDY

3.4.1 Pilot study methodology

The Pilot study was conducted between June and August 2008, to assess the face validity of the two questionnaires.

Two of the food companies from the sampling frame were used to test the questionnaire aimed at the food industry. The companies were contacted telephonically and the questionnaires were then emailed to them. These companies have been excluded from the main study.

Twenty employees of Pioneer Foods (Pty) Ltd consented to test the questionnaire aimed at the consumer. All the job grade levels were represented and these consumers were excluded from the main study.

3.4.2 Changes made from information collected from the Pilot Study

The information obtained from the Pilot study was used to make the following changes to the two questionnaires:

- Questionnaire to obtain information on nutrition strategies used by food companies: five questions were altered to include an option of 'not applicable' to ensure that the questionnaire was completed in full.
- Questionnaire to assess knowledge, attitudes and practices of consumers pertaining to nutrition information: two questions were altered. Both questions provided the same instructions to answer the question: '*Make one tick in the block where..... has the biggest influence and two ticks in the block where it has the second biggest influence*'. These questions were misinterpreted by several people and they made ticks in all the blocks (one and two ticks). The instructions were therefore altered by requesting the respondent to choose only one option.

The feedback from the pilot study helped to improve the quality of the questionnaires and ensured that the overall objectives of the research study were met through the data collection.¹

3.5 DATA ANALYSIS

3.5.1 Analysis of data

The researcher captured the data of both questionnaires using Microsoft Excel Version 2003 and was assisted by Professor DG Nel from Stellenbosch University as the appointed statistician to analyse the data.

The data were stratified for gender, age and race to assess whether these variables made a significant contribution to the answers provided.

3.5.2 Statistical Methods

The data analysis software system STATISTICA version 8 (StatSoft Inc. (2008), www.statsoft.com) was used to analyse the data.

Summary statistics were used to describe the variables. Distributions of variables were presented with histograms and frequency tables. Medians or means were used as the measures of central location for ordinal and continuous responses and standard deviations and quartiles as indicators of spread.

The relationships between continuous response variables and nominal input variables e.g. Age vs. Read labels were analysed using appropriate analysis of variance (ANOVA). Where the residuals (observed values minus the group or treatment means) were not normally distributed, either non-parametric Mann-Whitney tests or Kruskal-Wallis tests were used, e.g. when Age was compared to Ingredients.

The relationship between two nominal variables was investigated with contingency tables and likelihood ratio chi-square tests. For example where Dairy company (Yes or No) is compared to Source (Consumers and Companies).

A p-value of $p < 0.05$ represented statistical significance in hypothesis testing and 95% confidence intervals were used to describe the estimation of unknown parameters.

3.6 ETHICS

3.6.1 Consent

The Food companies approached provided written consent, giving the researcher permission to use data extracted from the questionnaires as part of the thesis and publications (*Appendix 3*). Written consent to undertake the study within Pioneer Foods (Pty) Ltd was obtained from the Managing Director (*Appendix 5*).

The employees of Pioneer Foods (Pty) Ltd did not complete a consent form; however an information leaflet (*Appendix 6*) accompanied the questionnaire, explaining that they would be giving consent to participating in the study by completing the anonymous questionnaire. This leaflet also explained the purpose of the study to the respondents, and informed them that the data obtained from their questionnaire would be treated as confidential and disseminated collectively.

3.6.2 Ethics Review Committee

The Protocol was submitted to the Committee for Human Research at Stellenbosch University and obtained ethics approval (N08/01/002: 07/05/2008; *Appendix 8*), The study was conducted according to the ethical guidelines and principles of the international Declaration of Helsinki, South African Guidelines for Good Clinical Practice and the Medical Research Council (MRC) Ethical Guidelines for Research.

CHAPTER 4

RESULTS

4.1 DATA COLLECTION

4.1.1 Data collection from food companies

It proved exceptionally difficult to obtain information from the selected food companies. Due to the very low response rate, all 82 food companies on the sample frame were contacted and not only the 54 as calculated to achieve a 95% confidence interval. The researcher found that 24 companies were barred from participating by a confidentiality clause. Despite the fact that the data collection period extended over a period of four months, 47 of the food companies had severe time constraints and never returned the completed questionnaires. The researcher followed up telephonically on all the questionnaires that were sent out. Only 7 completed questionnaires were received back from the food companies with a resultant response rate of 8.3%.

4.1.2 Results of the questionnaire to obtain information on nutrition strategies used by the food companies

Of the food companies (n=7) that participated in the study, 86% were multinationals.

None of the food companies revealed their annual turnover. Participating companies indicated the following categories of product involvement: beverages (71%), savoury snacks (29%), grains/cereals/pasta (14%), bakeries/biscuits (14%), fats/oils/spreads (14%), sweets/chocolates/desserts (14%). Of these food companies, 71% were involved in other food categories as well.

Eighty-six percent of the food companies (n=7) stated that they do have a specific strategy pertaining to the provision of nutrition information to consumers. While keeping in mind that 86% of the companies are represented internationally, 77% have a global nutrition strategy that is adapted for the local market. The rest have a locally developed nutrition strategy. The results also show that 33% of the companies target consumers only with their nutrition strategies, while 67% target both consumers and their employees.

Eighty-six percent of the food companies (n=7) have nutrition strategies that define which products within their portfolio may make nutrition and health claims, while 71% have nutrition strategies that define the construction of how the nutrition information should be presented.

According to the food companies (n=7), 86% of South African consumers in LSM 1-4 are believed to have limited nutritional knowledge and only 14% a sufficient nutritional knowledge. In LSM 5-6 food companies reported that they believed 71% of consumers have an intermediate nutritional knowledge and 14% a limited nutritional knowledge. Finally, according to the food companies 57% of consumers in LSM 7-10 have a high nutritional knowledge and 43% an intermediate nutritional knowledge.

The food companies (n=7) were asked to indicate which of the CDL the company considers to be most important. Heart disease was named by 50% and obesity or overweight by 33%. Seventy-one percent of the food companies reported that they address specific CDL in their nutrition strategies.

The following nutrients are specified when nutrition information is presented: total energy (86%), total fat (100%), trans fatty acids (71%), carbohydrates (100%), sugar (67%), protein (100%), fibre (86%), sodium (86%), and other nutrients (57%). Seventy-one percent of the food companies (n=7) have nutrition strategies that include the alteration of a product's profile to be in line with global health trends. This includes a focus on investigating, developing and applying new technologies to preserve the optimum nutrition value of raw ingredients in their nutrition strategies.

Advertising and marketing guidelines that encourage consumers towards healthier eating are included in 86% of the food companies' (n=7) nutrition strategies, while 57% have guidelines to encourage consumers towards healthier lifestyles, including the promotion of a more active lifestyle and a healthier way of living. Fifty-seven percent of the food companies have nutrition strategies that include advertising and marketing restrictions and the same percentage have nutrition strategies that define how they should communicate with the consumer. Food labels (40%) are most frequently used to communicate nutrition strategies, followed by pamphlets and brochures, the internet and newspapers and magazines (20%).

Forty-three percent of the food companies (n=7) indicated that their nutrition strategies are freely available to the consumers, 29% stated that it is available on request but 14% reported that they do not have and 14% indicated 'not applicable'. The tracking of the success of the nutrition strategies is

generally not undertaken (57%), while 29% use quantitative market research and 14% use other, unspecified methods.

According to 43% of the food companies (n=7), the responsibility for the nutrition education of South African consumers lies with the DOH, yet 57% feel that it lies with the DOE. Interestingly, 33% of the food companies also strongly agree and 50% agree that their food company also has a responsibility towards the education of the consumer and only 17% felt that they were not responsible for educating the consumer on nutrition.

Food companies (n=7) mostly use doctors (29%) to deliver nutrition education messages. While family, friends and teachers are used by 14% of food companies and 14% deliver nutrition messages themselves.

Seventy-one percent of the food companies (n=7) have partners for their consumer education messages: professional associations (100%), the government (50%), NGO's (50%) and celebrities (50%). Schools are specifically targeted as part of the nutrition education strategy by 86% of the food companies. One of the companies reaches as many as 200 schools with their nutrition education strategies. In response to the question of whether they target vulnerable groups with their nutrition education strategies, two (14%) of the food companies responded positively.

4.1.3 Data collection from Consumers

The data collection ran over a four month period from June 2008 to August 2008. Of the 740 Pioneer Foods employees who received a questionnaire, 242 completed the questionnaires and returned them with a resultant response rate of 32.7%. Five percent of these consumers reported that they had received tertiary education in a food or nutrition related field and were excluded from the study.

The sample of 230 consumers consisted of 68% male and 32% female consumers and the mean age was 39 years (ranged between 19 and 60 years). The race distribution was 48% Black, 22% White, 20% Coloured and 11% Asian.

4.1.4 Results of the Questionnaire to assess knowledge, attitudes and practices of consumers pertaining to nutrition information

In view of the fact that packaging is one of the main mediums used to convey nutrition messages, the consumers (n=230) were asked several questions with regard to the information provided on the packaging of foodstuffs.

Thirty-seven percent of consumers (n=230) reported that they always read labels on food products when purchasing food, while 65% always read the nutritional information table. Only 25% of the consumers stated that the nutritional table always has an influence on their purchase. Half of the consumers (52%) always find the nutrition information table useful when the functions of added vitamins and minerals are explained on the label (*Table 4.1*).

Table 4.1: Results depicting frequency of behaviour of the consumer (n=230)

Statement	Always	Sometimes	Never
Do you read the labels on food products (before or after purchasing)	37%	59%	4%
Do you read the nutritional information table on the packaging of a food product	65%	29%	6%
Does the information contained in the nutritional information table on the product influence your purchase	25%	57%	18%
I find it useful when a food product explains the function of any added vitamins and minerals	52%	42%	6%

The race and gender of the consumers showed no correlation with any of the variables tested and will therefore not be reported on.

According to the Kruskal-Wallis method, no significant link was found between the age of the consumers (n=230) and whether they read labels. However, more than two thirds (69%) of consumers (n=230) indicated that they read the ingredients statement on the label. Age does seem to have a significant influence on whether the ingredients statement is read or not, according to the Mann-Whitney method of analysis ($p=0.03$) (*Figure 4.1*). The mean age of consumers that do read (n=159) and do not read (n=71) the ingredient statement is 38 years and 41 years respectively.

Current effect: $F(1, 231)=4.5631$, $p=0.03$ Mann-Whitney U $p=0.03$

Vertical bars denote 0.95 confidence intervals

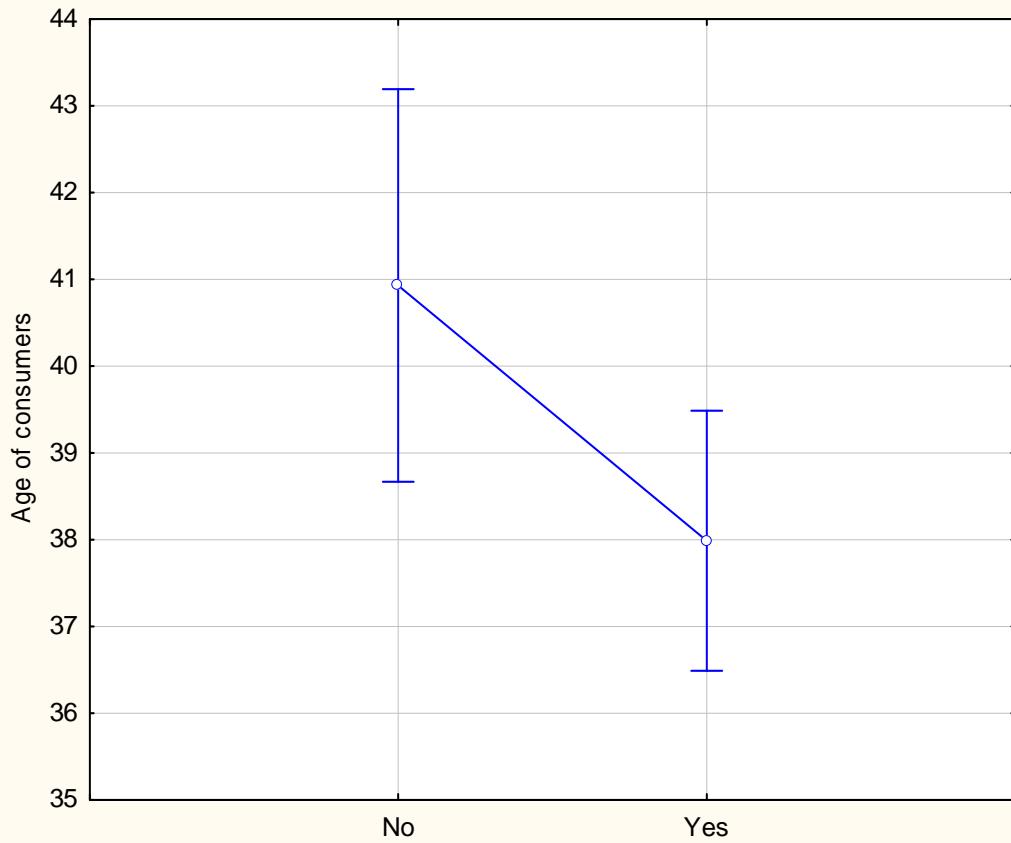


Figure 4.1: Relationship between age and whether consumers (n=230) read the ingredients statement on food labels

The nutritional information table is read by 61% of the consumers. Sixty-five percent of these consumers (n=150) further reported that they 'sometimes read the nutritional information table', 29% 'always read the nutritional information table' and 6% 'never read the nutritional information table'. Fifty-five percent reported that they only read the nutritional information table when they buy the product for the first time, 24% read the nutritional information table of products that they know and trust, 16% always read the nutritional information table while only 4% never read the nutritional information table. Of the total sample (n=230), 92% believe that the nutritional information table on a product contains information regarding the levels of the nutrients in the product, while 8% believed that this information is false.

Twenty-five percent of product purchases by consumers (n=230) are influenced by the information contained in the nutritional information table and 57% reported that this information sometimes influences their purchase, while 18% stated that it never influences their purchase. The food categories where the nutritional information table has the greatest influence on product purchasing are dairy (40%),

fats/oils/spreads (34%) and grains, cereals and pasta (30%). The information on foods considered less nutritious, has a lesser influence on product purchasing - bakery products/biscuits (24%), beverages (17%), sweets/chocolates/desserts (15%), snacks (14%) and other (2%).

The first thing consumers (n=230) look for in the nutritional information table of a product, is the total fat content (32%) followed by energy value (29%), protein content (8%), sugar content (8%), carbohydrate content (6%), fibre content (4%), sodium level (2%) and total fatty acid content (2%).

When the information on the nutritional information table is depicted as 'Value per portion or serving', 48% find it more useful than 'Value per 100g/100ml' (42%) while 10% indicated that they do not use either. Age has no influence on whether the nutritional information table is read or not.

The majority (68%) of consumers (n=230) reported that they do not look for the presence of allergens on the food label. Health tips are read by 56% and health claims are read by 37% of consumers. Of the sample, 68% reported that they understand kilojoule better than calorie as the energy value. Age and gender has no influence on whether the presence of allergens, health claims or health tips on-pack is read.

The significance of different fat values in the nutritional information table and their influence on purchasing choices was assessed. The results show that the polyunsaturated fat content has the biggest influence on consumer purchases (82%) and total fat content the least influence (72%). Monounsaturated fat content has an influence on 80% of consumer purchases, trans fatty acid content 74% and saturated fat content 73%.

The consumers (n=230) were further questioned on various aspects of CDL. When prompted on factors that play an important role in the prevention of heart disease, polyunsaturated fat and monounsaturated fat were listed as the most important factors at 86% each, followed by trans fatty acids and saturated fat at 85% each, total fat at 69% and cholesterol at 49%.

Consumers' knowledge of the influence various factors have as possible causes of obesity, heart disease and hypertension was also investigated. '*Too much fatty food*' (63%) was listed as playing the biggest role in causing obesity, followed by '*too much sugar and refined starch*' (22%) and the misconception of '*too much salty food*' (12%). The main causes of heart disease were listed as being, '*too much fatty food*' (80%), followed by '*too much salty food*' (11%) and '*too much sugar and refined*

starch' (8%). The greatest attributing factors for hypertension were reported as being '*too much salty food*' (42%), '*too much sugar and refined starch*' (28%) and '*too much fatty food*' (24%).

Ninety percent of consumers (n=230) agreed that healthy eating habits can reduce the risk of developing CDL, while 10% believed this to be false. When asked whether buying a low fat food product may play a role in the prevention of various CDL, 81% of the consumers agreed.

The health issues that consumers are most concerned about when buying a food product are cholesterol and heart disease (39%), hypertension and type 2 diabetes mellitus (24% each), obesity (23%) and cancer (13%).

Consumers' responses to statements indicating their attitudes, have been combined as agreement (agree and strongly agree) and disagreement (disagree and strongly disagree). Fifty four percent of consumers (n=230) agree that health claims are used as a marketing tool by food companies, while 46% disagree. Eighty seven percent of the consumers agree that information on the levels of nutrients in food, can assist them with making healthier food choices and 86% of the consumers agreed that a claim that describes how a disease condition can be prevented or managed, is useful when making food choices. Sixty two percent agree that a health claim is more useful to them than the nutritional information table (*Table 4.2*).

Table 4.2: Likert scale illustrating the attitude of the consumer (n=230) towards health claims and information on levels of nutrients

Statement	Strongly agree	Agree	Disagree	Strongly disagree
I believe that all health claims on food products are just a marketing tool that food producers use to increase the sales of their products	16%	38%	34%	12%
I feel that information on the levels of the nutrients in the food is useful in helping me make healthier food choices	27%	60%	11%	2%
I believe that a claim on a food product that describes how it can help prevent or manage a disease condition is useful in helping me make food choices	25%	61%	12%	2%
I feel that a claim on a food product that describes how it can help prevent or manage a disease condition, is more useful to me in making healthier food choices than the nutritional information table	14%	48%	34%	4%

With regard to on-pack information on vitamins and minerals, 94% of consumers (n=230) reported that they find it useful when a food product explains the function of any added vitamins and minerals, (52% always useful and 42% sometimes useful) but only 6% never find it useful. This corresponds with 89% of consumers who agreed with the statement that 'the information available on food products increased my understanding of why I should take vitamins and minerals' while 11% did not agree.

With regard to consumer education, 95% of consumers felt that it is important that food companies are involved in educating them about healthy eating and living. Only 13% of the consumers are aware of any nutrition education programmes that are run by food companies.

The communication mediums, in order of preference, to inform consumers about healthy eating habits are: the food label or packaging (31%), television (30%), radio (13%), newspapers and magazines (11%), pamphlets and brochures (7%), exhibitions and tradeshows (5%), the internet (1%) and outdoor advertising (1%).

The persons or institutions that consumers (n=230) felt should be providing them with information on what constitutes healthy eating and living, in order of preference were: food companies (31%), DOH (28%), health professionals (15%), television (13%), schools (5%), newspapers or magazines, clinics or hospitals (4%) and radio (1%). When asked whom they trust the most to give truthful nutrition messages, the consumers rated doctors as most trustworthy (30%), followed by nutritionists (29%), food companies (15%), dietitians (12%), DOH (6%), nurses, teachers, television/radio show hosts (2%) and family and friends, pharmacists and journalists (1%).

4.1.5 Data comparison between the results obtained from the food companies and the consumers.

The researcher's aim was to compare similar questions between the two questionnaires (*Appendix 9*).

Food companies (n=7) indicated the categories of food with which they are involved and consumers (n=230) indicated in which food category the nutritional information table had the biggest influence on their purchase (*Table 4.3*). The only significant categories were *dairy* and *other food*. As seen in Table 4.3, in the *dairy* category, 40% of consumers indicated that the nutritional information table had the biggest influence on their purchase, but none of the companies that participated were involved in the *dairy* category. In the '*Other food*' category, 2% of the consumers indicated that the nutritional

information table had the biggest influence on their purchase, while 71% of the food companies that participated are involved in a food category other than the categories listed.

Table 4.3: Categories of food in which companies were involved compared to consumers' perceptions of the food category in which the nutritional information table had the biggest influence on their purchase

Variable	Companies (n=7)	Consumers (n=230)	P value
Beverages	29%	17%	p=0.472
Savoury snacks	29%	14%	p=0.312
Grains/Cereals/Pasta	14%	30%	p=0.343
Bakeries/Biscuits	14%	24%	p=0.546
Fats/Oils/Spreads	14%	34%	p=0.236
Sweets/Chocolates/Desserts	14%	15%	p=0.941
Other food categories	71%	2%	p=0.000
Dairy	0%	40%	p= 0.008

Food companies indicated whether their nutrition initiatives or strategies focus on specific nutrients and consumers indicated which nutrients they look for first when studying the nutritional information table and reportedly both groups first considered the total fat content (*Figure 4.2*).

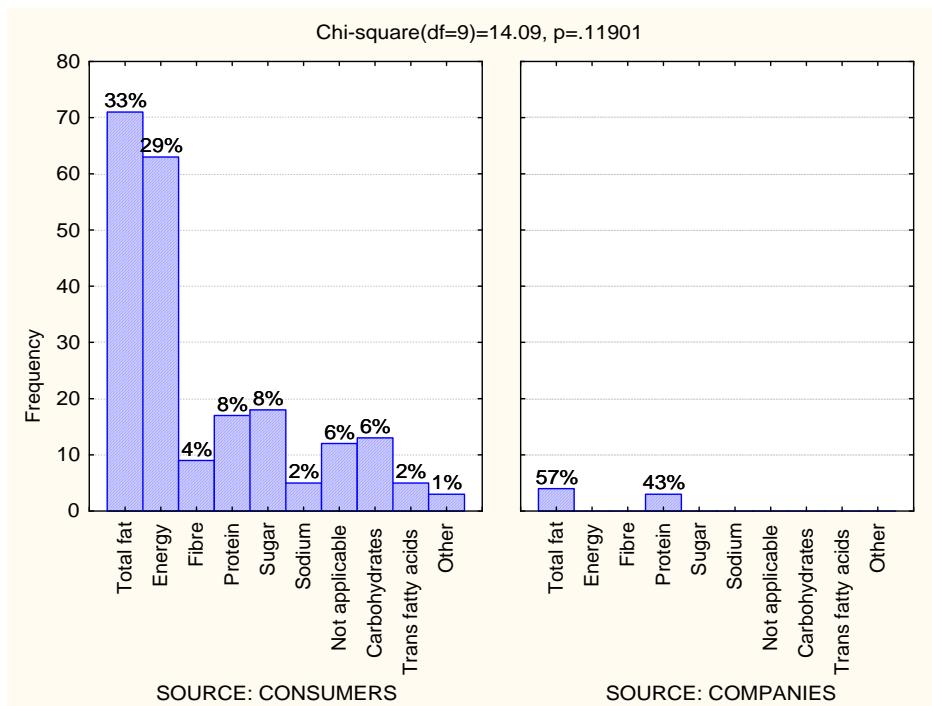


Figure 4.2: Consumers' (n=230) behaviour towards specific nutrients they look for first when studying the nutritional table compared to the specific nutrients that food companies (n=7) focus on

With cancer, hypertension, heart disease, type 2 diabetes mellitus, obesity/overweight and other diseases there was no significant difference between what the consumers (n=230) perceive as being an important chronic disease of lifestyle and what the food companies (n=7) focus on as being an important chronic disease of lifestyle (*Table 4.4*).

None of the 7 food companies focuses on cholesterol as being a risk factor of CVD, while 39% of the consumers (n=230) are concerned with the cholesterol content of food. There is a significant difference ($p=0.015$) in the perceived importance of cholesterol as a risk factor of CVD (*Table 4.4*). It would seem that the food companies are more concerned with heart disease as a chronic disease of lifestyle (50%).

Table 4.4: Consumers' perceptions with regard to the importance of certain chronic diseases of lifestyle compared to the practices of food companies

Variables	Companies (n=7)	Consumers (n=230)	P value
Cholesterol	0%	39%	p=0.015
Cancer	57%	13%	p=0.195
Hypertension	0%	24%	p=0.072
Heart disease	50%	39%	p=0.599
Type 2 diabetes mellitus	0%	24%	p=0.072
Obesity/Overweight	33%	24%	p=0.593
Other	17%	1%	p=0.072

Food companies (n=7) indicated whether their nutrition policies educated the consumers (n=230) on healthier eating habits and healthier lifestyle respectively, and consumers indicated whether it is important to them that food companies educate the consumer regarding healthy eating and living. Both groups indicated that it is important for food companies to educate consumers with regards to healthy eating (86% food companies; 95% consumers) (*Figure 4.3*).

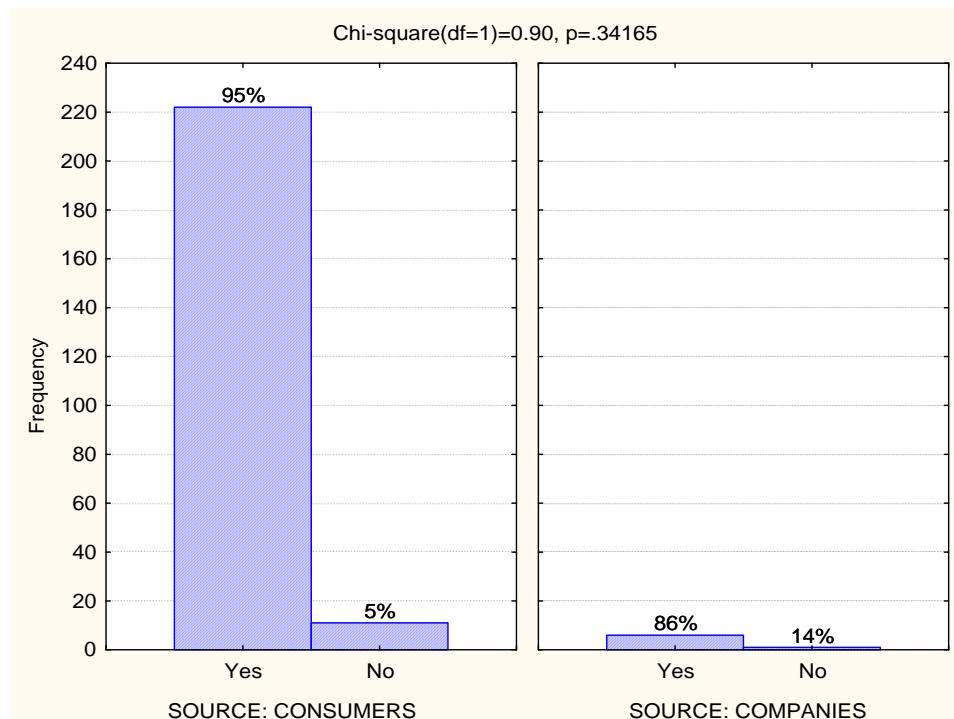


Figure 4.3: Comparison between the perceptions of the consumer (n=230) and the food companies (n=7) on the importance of educating the consumer on healthy eating habits

There was however a significant difference ($p=0.004$) between the perceptions of the consumers ($n=230$) and the food companies ($n=7$) on education with regard to healthier lifestyles. Of the consumers, 95% agreed that food companies should educate them on a healthier lifestyle, while only 57% of the food companies agreed (*Figure 4.4*).

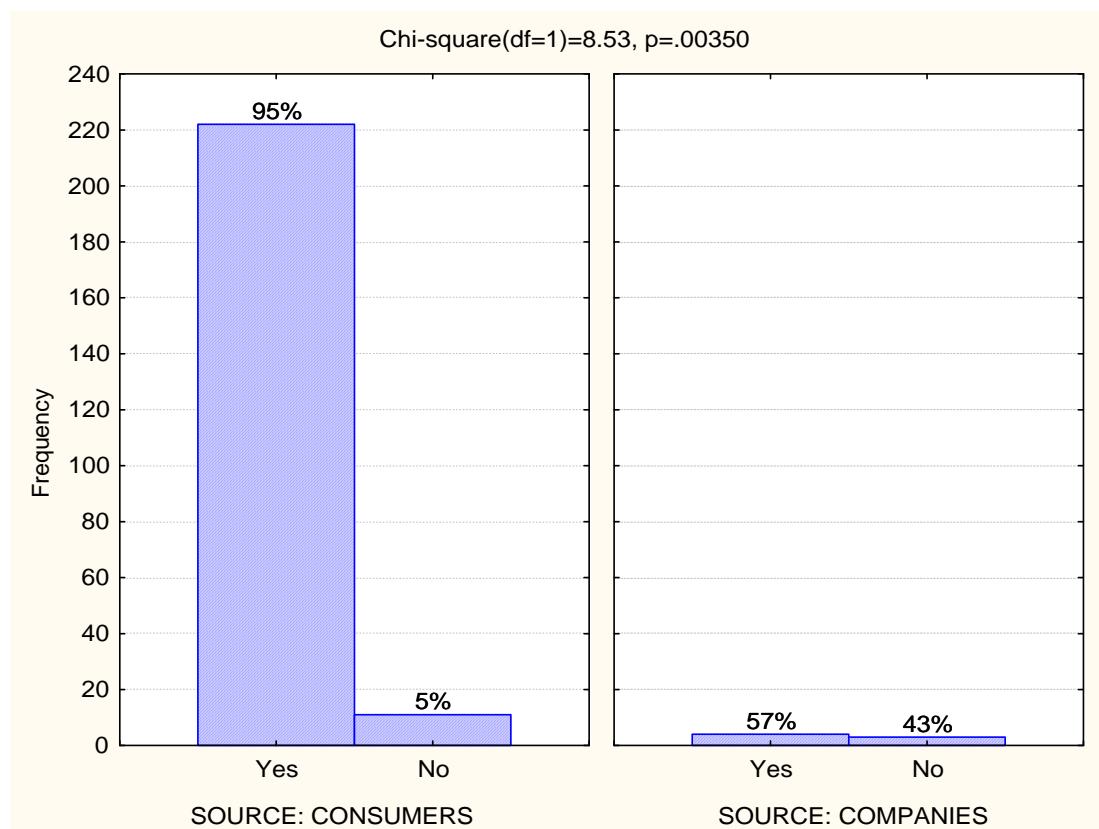


Figure 4.4: Comparison between the perceptions of the consumer ($n=230$) and the food companies ($n=7$) on the importance of educating the consumer on healthy lifestyles

The communication channels most used by food companies and those preferred by consumers were compared. The results indicated that there were no significant differences in the communication channels most frequently used by companies and those preferred by consumers.

There was no significant difference between persons/institutions used most commonly by food companies ($n=7$) to deliver nutrition messages and those most trusted by consumers ($n=230$) to deliver the most truthful nutrition messages. Both groups trusted doctors the most and consumers preferred nutritionists and food companies themselves to dietitians or the DOH.

The majority of food companies (83%, n=7) indicated that their nutrition policies are freely available to the consumer, however only 13% of consumers (n=230) were aware of company nutrition programmes aimed at them. There was a significant difference ($p= 0.000$) between the two perceptions.

CHAPTER 5

DISCUSSION

5.1 INTRODUCTION

This study investigated the use of nutrition strategies by food companies and the knowledge, attitudes and practices of consumers pertaining to the nutrition information which they receive from food companies. According to the literature, CDL are rapidly increasing due to a nutrition transition and changes in lifestyle patterns. The aim was to analyse the results of both the food company questionnaire and the consumers' questionnaire and to develop guidelines for the food industry for the promotion of the prevention of CDL.

5.2 DISCUSSION OF RESULTS

5.2.1 Discussion of the questionnaire aimed at food companies

There was a low response rate from the food companies with only 7 completed questionnaires returned. Due to the small sample size, the results and conclusions drawn from the statistical analysis have to be interpreted with caution as they are not representative of food companies in SA. The researcher, however, discusses the results and where possible draws conclusions from the statistical analysis.

The lack of response by the food industry indicates an apparent apprehension and/or an unwillingness to share information on their nutrition policies and strategies. The reason for this is not understood and a further study to gain greater insight into companies' apprehension and/or unwillingness to share this type of information would be valuable. The value of this study would have been greatly enhanced had the food industry been more open to sharing this information.

Most of the food companies (86%) that participated in the study have a specific strategy with regard to providing nutrition information to consumers. Eighty-six percent of the companies that responded are represented internationally and 77% have a global nutrition strategy that is adapted for the local market. This indicates that these food companies feel that it is necessary to adapt these global strategies to accommodate the needs of local consumers. Some basic principles regarding nutrition education can be applied globally, but it is also appropriate to make adaptations to suit the specific public health needs and culture of the South African consumer. The results show that in addition to a nutrition strategy for

consumers, most companies also have a nutrition strategy targeting their own employees, indicating a certain measure of commitment towards nutrition education.

Even though the researcher requested the nutrition strategies from the food companies, not one nutrition strategy was received, despite the fact that 43% of them indicated that their nutrition strategies are freely available and a further 29% indicated that their nutrition strategies are available on request. It is important that consumers have access to nutrition strategies and initiatives, in order to understand and contextualise the strategy and to be able to make comparisons between companies and brands. The nutrition strategies of food companies should be more openly available to consumers.

The majority of food companies (86%) state that they have guidelines that prescribe which products in their portfolio can make nutrition and health claims, and it would seem that they also have guidelines on how the nutritional information must be presented. No specific details were requested in the questionnaire, although the nutrition strategies were requested and the researcher intended to analyse these guidelines. The overall low response rate and the lack of provision of nutrition strategies by food companies is the major limiting factor of this study.

Seventy-one percent of the food companies reportedly address specific CDL in their nutrition strategies. According to the literature, almost 60% of all deaths worldwide can be attributed to CDL and 80% of these deaths occur in the developing countries.¹⁰ Food companies appear to be aware of these facts, as the majority have strategies that address specific CDL, but these programmes could be expanded.

Heart disease is the chronic disease that food companies (50%) generally focus on. More than 300 million adults worldwide are obese, and of these 115 million live in the developing world.³³ In SA the prevalence of obesity and overweight is 25% in men and 56% in women.¹⁵ It is estimated that 5.9% of the adult population worldwide has type 2 diabetes mellitus, and type 2 diabetes mellitus accounts for almost 95% of these cases.²⁷ Cancer is globally contributing to more than 7 million deaths per year. Six hundred thousand of these deaths occur annually in Africa.²² Food companies have the potential to play a crucial role in the prevention of all CDL and should be encouraged to be more actively involved in addressing the broad spectrum of chronic diseases.

Reportedly the food companies focus mainly on total fat (100%), carbohydrates (100%) and protein values (100%) when nutritional information is presented although total energy, sodium and fibre are focused on by 85% of the food companies. The focus on these nutrients is understandable because of

the need to comply with the South African regulatory requirements for the provision of voluntary nutritional information.

According to the World Health Organisation (WHO), the increased intake of energy-dense and micronutrient-deficient foods and of high sugar soft drinks and juices are some of the main causes for obesity. It was thus a positive finding in this study that 67% of companies stated that they also focus on sugar content. The finding that 71% of food companies also focus on trans fatty acids confirms the current awareness regarding trans fatty acids and their role in CHD.¹⁹

Research shows that a high fibre diet can lower the risk of CHD and sodium intake is directly linked to blood pressure.⁶ Thus, the provision of nutritional information on fibre and sodium should be encouraged in order to allow consumers to make fully informed food choices.

In addition, food companies can make a positive contribution towards addressing CDL through innovative changes to food product formulations.⁴⁰ The majority of food companies (71%) in this study state that they keep abreast of global health trends and have strategies in place to alter the nutritional profile of some of their products, by investigating and implementing new technologies to preserve and/or enhance the nutritional quality of the food they offer to the consumer.

According to the food companies, they focus more on educating consumers on healthy eating (86%) than on a healthy lifestyle (57%) and this corresponds with consumers' reported expectations. As healthy eating and a healthy lifestyle are integrated, they should be addressed simultaneously, and it is therefore recommended that the food companies consider implementing an integrated approach that includes healthy eating and healthy living messages. The South African FBDG can be used as an example; 'Be active' is one of the eleven guidelines, illustrating the importance of integrated health messaging.

Fifty-seven percent of the food companies have nutrition strategies that include advertising and marketing restrictions and the same percentage have nutrition strategies that define how the various marketing mediums should communicate with the consumer.⁴⁷ At all times companies should bear in mind that research has shown that communication to the consumer should be evidence-based, consistent and consider consumer needs.⁵⁸ More than half of the food companies (57%) do not track the success of their nutrition strategies, which limits their potential impact on consumer decision making and public health. It is critical that nutrition strategies be measured to assess their public health impact.

The food label is most frequently used by this group of food companies (40%) to communicate with the consumer. This corresponds with consumer research reporting that consumers prefer the food label as a communication medium. This should however be interpreted with caution, as other studies in this field have found that on-pack nutrition information, used on its own as a communication medium, has little effect on the overall health of a population.⁵¹

Pamphlets and brochures, the internet, newspapers and magazines are the communication mediums that are indicated by the food companies as being used more often than radio, television, outdoor advertising and exhibitions and tradeshows. The literature cites radio as the medium that has the largest audience of all the other mediums. In addition, a valuable attribute of radio is the fact that it can reach into rural areas where illiteracy has a high prevalence.⁵⁸ However, it must be kept in mind that consumers do not necessarily implement what they hear on radio into their own lives. In this study, radio was rated as the third (13%) most preferred medium by consumers.

According to the WHO, CDL are becoming most prevalent in the lower economic groups.⁶ Although the food companies indicated that they believe that the higher LSMs (LSM 7-10) are the most knowledgeable about nutrition, it stands to reason that companies should ensure that they also focus nutrition education campaigns on the lower LSM groups. It is interesting to note that food companies (57%) believe that the DOE has the biggest responsibility with regard to the education of the consumer on nutrition. This is supported by the literature that cites that health promotion and education on healthy lifestyles can be incorporated into the school curriculum, promoting healthy eating habits and lifestyle from a very young age.⁴⁴

The majority of food companies (83%) agree that they do have a responsibility towards the education of the consumer with regard to healthy eating with only 17% denying this responsibility. Findings from the literature encourage food companies to position marketing campaigns with an emphasis on nutrition, where applicable, and to utilise dietitians in the communication campaigns.⁴¹

In this study dietitians are preferred by food companies (29%) to deliver nutrition education messages. However, this does not correspond with the consumers' perceptions which show that they trust nutritionists (29%) and doctors (30%) more often to provide them with nutrition information. Most companies state that they also use partners to convey nutrition education messages. One hundred percent of the food companies state that they use professional associations.

According to the literature all parties involved (government, food companies, NGOs and the community) as well as relevant education and communication experts should work together to design suitable educational interventions to educate consumers with regard to healthy eating and healthy living.⁴⁶ Although schools are specifically targeted as part of nutrition education strategies by 86% of the food companies, very few of the consumers (13%) were aware of such strategies. This emphasises the need for food companies to market their nutrition strategies to consumers. The research shows that vulnerable groups such as the elderly are almost never targeted with nutrition education initiatives, highlighting an important opportunity to communicate with, and educate this important group of consumers.

Food companies can assist in combating the increase of CDL by communicating the risk factors, the influence of eating and lifestyle patterns and the positive role, where applicable, played by the products they offer, based on their nutritional composition.

5.2.2 Discussion of the questionnaire aimed at consumers

This research shows that the majority (96%) of this group of consumers (n=230) 'always' or 'sometimes' read the labels on food products when they are purchasing food. Surveys conducted in the USA report that 60 - 80% of American consumers read food labels.⁵³ The high percentage of label reading reported in this study could be due to the fact that all the consumers that participated in the study were literate. If illiterate consumers had participated in the study, the percentage would probably have been different. This warrants further investigation, using a methodology that would include illiterate consumers.

The 96% of consumers that read labels also include those consumers who read the ingredients statement on the packaging. An inverse relationship was found between age and reading of the ingredients statement. There is a significant difference between the mean ages of the consumer and the reading of the ingredients statement and those not reading the statement. It seems that the older the consumer is, the more unlikely they are to read the ingredients statement. This is contradictory to a study conducted in the USA, where it was found that young adults (aged 20- 29 years) are the group that reads labels less often than other age groups. The researchers postulated that this finding may be due to this age group's tendency to eat out more often and the fact that restaurants are not required to display nutritional information of meals served. It could also be due to the greater use of the Internet by this age group, where they can find nutritional information on food groups.⁶³

This study found that the nutritional information table is not widely read, with only 39% of consumers stating that they 'always' look at the nutrition information table. Eight percent of consumers stated that they did not understand that the nutritional information table provides them with information on the nutritional value of the food. These tables offer possibly the most critical information required to enable consumers to make informed food choices, based on sound nutrition and the South African FBDG. It also highlights the need for an extensive consumer education programme with regard to the content and interpretation of the information contained on food labels in SA.

The nutritional information table only influences consumer purchases 25% of the time. Research conducted by the European Food Information Council (EUFIC) found that consumers tend not to use food labels because of the technical language used, and because they find that the frequently changing designs of food packages confuses them.⁵² More research is needed to understand the reasons for the limited use of the nutrition information table by South African consumers. It may be that consumers do not understand the information, have never been educated as to the meaning and interpretation of the table or are not concerned with the nutritional value of the foods that they purchase. This information is critical, if programmes are to be designed to promote the use of food labels which can improve food choices in order to prevent chronic diseases. This finding also needs to be taken into cognisance when considering food labelling legislation. Another valuable finding is that 'values per portion or serving' are considered by consumers to be slightly more useful than 'value per 100g/100ml'. The difference however was not significant, and more research should be undertaken to gain greater insight and assist regulators and public health educators in planning effective regulations and consumer education campaigns. Another finding was that the term 'kilojoule' as the indicator for energy, is better understood (68%) than the term 'calorie'. This could be as a result of the fact that kilojoule is the official term used in SA and is the most commonly used term by food companies.

Consumers reported that the nutritional information table has the biggest influence on purchases in two categories: dairy (40%) and fats/oils/spreads (34%). This corresponds with the results, in that consumers first look for the fat content in the nutritional information table, since these products contain / are perceived to contain high levels of fat. The research indicates that companies offering products in these categories have an opportunity to supply nutritional information on the products as they already have a captive audience. However, all foods should provide nutrition information in a consistent manner so as not to confuse the consumer and to allow accurate comparisons. This highlights the need for regulations to mandate the format of the nutritional information provided.

The information that consumers first look for in a nutritional information table is the fat content (32%) followed by the energy value (29%). Although the values differ, a similar trend is reported in the literature. Research conducted in the USA, which ranked the nutrients in order of consumer awareness, showed: energy value (89%) and total fat (81%).⁵⁴ It is important that consumers have nutritional information available to them on-pack, but more importantly for improved public health outcomes, it is important that they understand the role of the nutrients with regard to CDL and how to use the information to make appropriate and healthy food choices.

This is supported by the finding that 61% of consumers agree that information on the nutrient content assists them in making healthier food choices. In addition 52% of consumers find it useful when a food product explains the function of added vitamins and minerals, with 89% believing that the information that is available on food products increases their understanding of why vitamins and minerals are essential in their diet. These findings indicate that it should be mandatory for all food products to include some basic nutrition information in a standardised format, if consumers are to be empowered to use food labels to assist them in making informed food choices. Nutrient function claims are perceived to be valuable when making food choices.

Health tips and health claims are important methods for conveying nutrition messages. A health tip according to the Webster Universal Dictionary, ‘is a useful hint or piece of advice that is usually based upon subjective information’³, whereas a health claim ‘means any representation that states, suggests or implies a relationship between a food or a constituent of that food and health’.² Health tips are generally written in a simple, user friendly manner. According to the literature, health claims written in a simple form are better understood than those that are written in scientific verbiage e.g. reduction of disease risk claims.⁵⁵ This was supported by the finding that health tips are more widely read (56%) than health claims (37%).

Considering the value consumers place on health tips, the food industry should be responsible in terms of the information they supply and need to ensure that it is evidence based. Interestingly, more than 50% of consumers believe that health claims are used by food companies merely as a marketing tool to increase their sales. This shows a large degree of scepticism regarding health claims. Yet, 54% of consumers agree that health claims are useful when making food choices that describe how the product can help prevent, or manage a disease. These results highlight the importance of health claims being controlled by legislation and the need for a strong evidence-based approach to establishing health

claims. Consumer education is essential if consumers are to understand, trust and apply health claims when making food choices.

This research shows that consumers appear to understand the risk factors for obesity and heart disease, although more education is required regarding hypertension. Ninety percent of consumers indicated that a healthier diet could reduce the risk of developing CDL. Some awareness exists amongst consumers regarding nutrition, but their knowledge and understanding needs to be enhanced by designing programmes that educate consumers on the important role of behaviour modification and correct food choices to lower their risk of CDL.

Consumers are mostly concerned with heart disease (39%) when buying food. This corresponds with the results from the food companies, which indicated that their key focus with regard to CDL is heart disease. Various programmes (e.g. heart awareness week) and organisations (e.g. the Heart Foundation), play an important role in promoting awareness of heart disease and this may have had an impact on these findings. Clearly there is also a need for the education of consumers on the other CDL and the important role played by diet.

Both the food companies (83%) themselves and consumers (95%) indicated that it is important for food companies to be involved in the education of consumers with regard to healthy eating and lifestyle. Consumers rated food companies (31%) and the DOH (28%) as being most responsible for this education. In contrast, food companies felt that the DOH was chiefly responsible for consumer education on healthy eating and healthy lifestyles. Despite the fact that food companies accepted that the food industry has a role to play in educating consumers with regard to nutrition, most consumers (87%) were not aware of nutrition education programmes run by food companies. The food industry needs to promote their nutrition education initiatives more effectively.

It is crucial that the source of nutrition information provided to consumers is reliable and accurate. This research shows that consumers trust doctors and nutritionists more with providing accurate nutrition information than other sources (food companies, the DOH, friends and family, dietitians, nurses, pharmacists, teachers, TV hosts and journalists). This is a concern, considering how little nutrition training doctors are given and the fact that the term 'nutritionist' is used by many quacks without adequate training. It highlights the need for dietitians to further communicate their important role to the consumers, and the need for them to clearly differentiate between nutritionists and dietitians. However, the fact that dietitians are most commonly used by food companies to deliver nutrition education

messages provides dietitians with a golden opportunity to play an active role in advocating healthy nutrition and to establish their credibility in delivering evidence-based nutrition education messages.

Preference is given by consumers to the use of food labels and television as mediums for education. Similarly, food labels are the main communication medium utilised by food companies, although according to the literature, it seems that the use of food labels and nutrition information by the consumer varies widely.⁵⁰ This information should be considered when planning consumer nutrition education programmes and in determining the mediums to use when communicating nutrition messages.

It is essential that consumers understand the messages conveyed by food labels. Apparently consumers have a reasonable understanding of the fat content and total energy value indicated on the nutritional information table, but consumers need to be educated about the functionality of the rest of the nutrients, as well.

5.2.3 Discussion of comparison between the food companies and consumer questionnaires

Some questions were duplicated in both the questionnaires in order to compare the nutrition strategies used by the food companies with the nutrition information that consumers are receiving from food companies. These questions (*Appendix 9*) were statistically analysed to establish whether a significant difference existed between the two groups.

Fat is clearly a nutrient that is very important for both food companies and consumers: consumers indicated that they first look for the fat content on a nutritional table and similarly, food companies reported that the most important nutrient that their nutrition policies focus on, is total fat. The dairy sector would do well to declare total fat content, as consumers indicate that they specifically look for this when selecting dairy products. The consumer should be educated on the components contributing to the total fat content and the functionality of monounsaturated fat, polyunsaturated fat, saturated fat and trans fatty acids, if they are to make wise choices based on fat content.

There was a significant difference in perception of the importance of high cholesterol as a chronic disease of lifestyle by consumers and food companies. Consumers are significantly more concerned with elevated cholesterol, than the food companies who pay scant attention to cholesterol. It is possible that food companies address cholesterol as a risk factor together with heart disease, and as this is

supported by the literature, the total fat and its individual components are possibly considered to be more important in this context, than the cholesterol content of the food.¹⁷

Although food companies are already involved with the education of the consumer on healthier eating habits, the consumers expressed a need to be educated on healthier lifestyles as well. Healthy eating habits and healthy lifestyles go hand in hand and food companies should therefore use an integrated approach with regard to nutrition education. The South African FBDG highlight this by including a guideline 'Be active'. It is important that communication initiatives, educating consumers about healthy eating and living, should include a variety of nutrition information, communication, endorsements and intervention strategies.⁴⁴

The food label is the preferred medium to communicate nutrition strategies, for both food companies and consumers. However, it is important to remember that the literature shows that on-pack nutrition information as a communication medium, used on its own, has little effect on the overall nutritional health of a population and should thus be integrated as part of other education initiatives.⁵¹

As there is a significant difference between the consumers' awareness of companies' nutrition policies and the companies saying they are readily available, food companies should do more to promote consumers' awareness of their nutrition policies and the programmes that they run. Also to be promoted is the support the companies offer that is aimed specifically at educating the consumer with regard to healthy eating and healthy lifestyles. This will also assist in establishing a greater trust in food companies by the consumer.

5.2.4 Guidelines

The main aim of the study was to combine the best practices of food companies' nutrition strategies with the perceptions of the consumer, in order to establish guidelines for the South African food industry for the promotion of the prevention of CDL.

The following guidelines are a summary of the findings of the study together with international best practices that give a practical guide for the food industry to assist with the promotion of reducing CDL:

1. Basic nutrition information is mandatory on all packaged foods making health claims. Health claims should always be evidence based. Health tips, which consumers found useful, are

2. All food companies should have nutrition strategies that are freely available to the public. These nutrition strategies should explain how the food company is targeting CDL.
3. Food companies should promote the use of the South African Food Based Dietary Guidelines.
4. Food companies should assist with the updating of the South African Food Based Dietary Guidelines to ensure that it remain relevant, based on the latest available knowledge.
5. Food companies should collaborate with and partner the government (the DOE and the DOH), NGOs and professional societies to ensure that the principles of healthy eating (as per the South African FBDG) and a healthy lifestyle are included in the curriculum (and that this should include how to read food labels).
6. Vulnerable groups such as young children, women of childbearing age, pregnant and breastfeeding mothers and the elderly should be specifically targeted to receive nutrition education.
7. Food companies should encourage and support local research on food labels, health claims and the effect specific nutrients have on the prevention and management of the CDL.
8. Nutrition education should start at school level and the food industry should advocate that evidence-based nutrition education is included in the school curriculum in SA.
9. All nutrition communication should be evidence-based, include consumer research and be communicated through a number of relevant channels.
10. Nutrition strategies should be tracked regularly and evaluated for efficacy and impact.
11. Through innovation of technology, portion control and improved nutrient profiles, the food industry should assist the consumer in making better food choices.

5.3 LIMITATIONS OF THE STUDY

The main limitation of this study is the limited availability of data from food companies and therefore the statistical analysis and the validity of the data could be questioned. Due to the large number of consumers versus food companies that participated, only trends could be identified when statistically comparing the questionnaires.

The first aim of the study was not attained as only seven food companies participated. If a representative sample of food companies was obtained, more relevant results could be reported. This however does not impact on the findings regarding the consumer perceptions.

If a greater number of food companies had participated in the study, it is possible that additional communication mediums, used to convey nutrition strategies, would have been identified. Thus the study objective of: 'To research the mediums used by food companies to communicate their nutrition strategies to the consumer' was not fully reached. As the researcher received no nutrition strategies from the food companies, no comparisons could be made.

The sample frame of the study could be a limitation in view of the fact that it consisted of a group of consumers employed by Pioneer Foods Ltd (Pty). Although they have national representation and a wide socio-demographic population, all the consumers involved in this study are employed by a food company and they might be more aware of food products and communication around it, than the general consumer. The researcher decided to use this large sample frame (9699 employees) for convenience and logistical reasons.

Only consumers literate in English were included in the study because it is the official language used for communication in Pioneer Foods. If consumers using other languages were included in the study, the results may have differed.

In order to obtain a homogenous study sample, no illiterate consumers were included in the study. Communication of nutrition policies to illiterate people needs to be handled differently, and the question of how nutrition education can be implemented will have to be investigated.

The literature cites that health strategies are continuously being communicated to consumers via various channels, but have often not been successful in promoting healthy eating. Health illiteracy of the

consumer is one of the major contributors to this limited success.⁴⁷ A further study to include illiterate consumers will have to be conducted and other methods of data collection will have to be employed.

CHAPTER 6

CONCLUSION

6.1 CONCLUSION

The majority of food companies that participated in the study have nutrition strategies in place, but the availability of these strategies and their communication to the consumer is sub-optimal. Food companies should make a concerted effort to ensure that the public knows what their nutrition strategies are and what programmes they are planning and implementing for the promotion of healthy eating and healthy lifestyles. If these strategies were available, best practice guidelines could be developed that could assist in addressing the CDL in SA.

The findings of the study supported by the literature show that:

- Consumer education on nutrition, food labels and nutrient function is essential to empower consumers to adjust their eating habits towards the prevention of CDL.
- Consumer education on the CDL and the relationship of food and specific nutrients to these diseases is essential.
- Consumers should be given tools, including the ability to read and understand food labels, to apply the education they receive and implement it into their daily lives in order for them to achieve healthy eating habits and a healthy lifestyle.
- Consumers should be educated on both the benefits of healthy eating and the benefits of an active lifestyle.
- Media messages about nutrition should be consistent and evidence-based and communication campaigns aimed at nutrition education should implement an active, behavioural approach. This should be done within the context of food choices that are available in SA.

Food companies cannot be held solely responsible for bringing about behavioural change in consumers to prevent and manage the CDL. They do, however, have a role to play and so should work together with other relevant parties (especially public-private partnerships) to achieve the goal of improved health through improved nutrition.

The research shows that South African consumers do read food labels and that they are the communication medium most preferred for nutrition messages. The challenge lies in the fact that consumers do not necessarily understand the nutritional information contained on the food label.

Nutrition messages may therefore fail in their main purpose, namely to positively affect consumers' eating habits and lifestyles towards better health.

Nutrition messages on food labels must be communicated in a way that will be useful and beneficial to the consumer and also be evidence-based. The nutrition information table, health claims and other health tips on the label can be used to convey nutrition messages to the consumer. To achieve a change in behaviour however, nutrition messages on food labels will have to be implemented in conjunction with education and legislation. The consumer will have to be educated on the content of nutritional information and be taught how to apply the information received. The nutrition information table can be an important tool for the consumer when making healthy food choices, if applied correctly. Nutritional information on food labels should be mandatory and in a standardised format, to ensure that consumers can make informed choices and comparisons when they purchase food products.

Health claims must be evidence-based and must therefore be legislated with strict enforcement. Food companies that are found to misuse the health claims, should face severe consequences in order to enable consumer trust in health claims. Consumers will have to be taught about the meaning and categorisation of health claims and their role and function. The science behind the claims and their role in promoting public health needs to be understood.

Health claims, where relevant, should also be linked to CDL. This can be done in the 'reduction of disease' category, or a new category under health claims could be created to specifically address chronic disease of lifestyle and what can be done to prevent them. Several studies have linked the use of certain nutrients to the management and reduction of some CDL.

Food companies can also use health tips, as these seem to be more acceptable to the consumer since the language used is perceived as being simpler and easier to understand. The use of health tips will however have to be regulated by government, or food companies should self-regulate their use based on evidence, to ensure that these tips do not promote misinformation.

Food companies, although they are not solely responsible for consumer education, should take responsibility for their role in the nutrition education of the consumer. Food companies should ideally become involved with nutrition initiatives and programmes that promote healthy eating and healthy lifestyles (including exercise). Nutrition messages should always come from sources that consumers trust and they should be consistent and truthful.

Consumers are aware of CDL, but they do not understand the extent to which they are affecting their lives. Education as to what CDL are, and how they are managed by adapting healthy eating habits and lifestyle, is essential. Consumers also need to understand the relationship between food, nutrients and CDL. This type of education should start at school level and should be jointly undertaken by the DOH and the DOE.

REFERENCES

1. Katzenellenbogen JM, Joubert G, Abdool Karim SS. Data collection and measurement. In: Epidemiology: A Manual for South Africa. 1st ed. Cape Town: N1 City; 2004. Ch 9.p82-94.
2. Report of the Thirty-First Session of the Codex Committee on Food labelling, Ottawa, Canada, April 28-2 May 2003. Rome, Codex Alimentarius Commission, 2003. [cited 20 March 2009]. Available from: www.codexalimentarius.net.
3. Wyld HC, Partridge EH. Webster Universal Dictionary. Unabridged International Edition.
4. Oregon Department of Human services. Oregon WIC – Nutrition Education Guidance. [cited 9 November 2009]. Available from: www.oregon.gov/DHS/ph/wic/docs/ne_guidance_2006.pdf.
5. Investopedia Inc. Investment dictionary, 2000. [cited 9 November 2009]. Available from: <http://www.answers.com/topic/social-responsibility>.
6. WHO/FAO Expert Consultation on Diet, Nutrition and the prevention of Chronic Diseases. Diet, Nutrition and the prevention of chronic diseases. Geneva 2003.
7. Popkin BM. Global nutrition dynamics: the world is shifting rapidly toward a diet linked with noncommunicable diseases. Am J Clin Nutr. 2006;84:289-298.
8. Hawkes, C. Nutrition Labels and Health Claims: The Global Regulatory Environment. Geneva: World Health Organisation; 2004.
9. Issued by Fortitech: Chaudhari R. Strategic Nutrition for Weight Management. Technical paper; 2002.
10. Cowburn G, Stockley L. Consumer understanding and use of nutrition labelling: a systematic review. Public Health Nutrition. 2005;8(1):21-28.
11. Steyn K, Fourie J, Temple N. Chronic Diseases of Lifestyle in South Africa: 1995-2005. Chronic Diseases of Lifestyle Unit. Medical Research Council Technical Report. May 2006.

12. Unwin N, Alberti KGMM. Chronic non-communicable diseases. *Annals of Tropical & Parasitology*. 2006;100(5&6):455-464.
13. Mensah GA, Brown DW. An overview of cardiovascular disease burden in the United States. *Health Affairs*. 2007;26(1):38-48.
14. Krummel DA. Medical Nutrition Therapy for Cardiovascular Disease. In: Mahan LK, Escott-Stump S, editors. *Krause's food, nutrition and diet therapy*. 12th ed. Philadelphia: W.B. Saunders Company; 2008. Ch32.p833-864.
15. Joubert J, Norman R, Bradshaw D, Goedecke JH, Steyn NP, Puoane T. The South African Comparative Risk Assessment Collaborating Group. Estimating the burden of disease attributable to excess body weight in South Africa in 2000. *SAMJ*. 2007;97(8):683-690.
16. Naidoo J, Wills J. Influences on Health. In: *Health Promotion: Foundations for Practice*. 5th ed. London: Tindall; 1998. Ch 2.p24-43.
17. Norman R, Bradshaw D, Steyn K, Gaziano T and the South African Comparative Risk Assessment Collaborating Group. Estimating the burden of disease attributable to high cholesterol in South Africa. *SAMJ*. 2007;97(8):708-711.
18. Joubert J, Norman R, Lambert EV, Groenewald P, Schneider M, Bull F, Bradshaw D and the South African Comparative Risk Assessment Group. Estimating the burden of disease attributable to physical inactivity in South Africa in 2000. *SAMJ*. 2007;97(8):725-731.
19. Villareal DT, Miller III BV, Banks M, Fontana L, Sinacore DR, Klein S. Effect of lifestyle intervention on metabolic coronary heart disease risk factors in obese older adults. *Am J Clin Nutr*. 2006;84:1317-1323.
20. Norman R, Gaziano T, Laubscher R, Steyn K, Bradshaw D. The South African Comparative Risk Assessment Collaborating Group. Estimating the burden of disease attributable to high blood pressure in South Africa in 2000. *SAMJ*. 2007;97(8):692-698.

21. Couch SC, Krummel DA. Medical Nutrition Therapy for Hypertension. In: Mahan LK, Escott-Stump S, editors. Krause's food, nutrition and diet therapy. 12th ed. Philadelphia: W.B. Saunders Company; 2008. Ch33.p865-883.
22. Vorobiof DA, Abratt R. Editorial. The cancer burden in Africa. SAMJ. 2007;97(10):937-939.
23. Kanavos P. The rising burden of cancer in the developing world. Annals of Oncology. 2006;17(Suppl 8):viii15-viii23.
24. Grant B. Medical Nutrition Therapy for Cancer. In: Mahan LK, Escott-Stump S, editors. Krause's food, nutrition and diet therapy. 12th ed. Philadelphia: W.B. Saunders Company; 2008. Ch 37.p959-990.
25. Kushu LH, Byers T, Doyle C, Bandera EV, McCullough M, Gansler T, Andrews KS, Thun MJ. The American Cancer Society 2006 Nutrition and Physical Activity Guidelines Advisory Committee. American Cancer Society guidelines on nutrition and physical activity for cancer prevention: reducing the risk of cancer with healthy food choices and physical activity. CA Cancer J. 2006;56:254-281.
26. Franz MJ. Medical Nutrition Therapy for Diabetes Mellitus and Hypoglycemia of nondiabetic origin. In: Mahan LK, Escott-Stump S, editors. Krause's food, nutrition and diet therapy. 12th ed. Philadelphia: W.B. Saunders Company; 2008. Ch30.p764-809.
27. Bartels DW, Davidson MH, Gong WC. Type 2 Diabetes and Cardiovascular Disease: Reducing the Risk. J Manag Care Pharm. 2007;13(Suppl 2):S1-S17.
28. Green A, Christian HN, Kroger PS. The changing world demography of type 2 diabetes. Diabetes Metab Res Rev 2003;19(1):3-7.
29. Bradshaw D, Norman R, Pieterse D, Levitt NS, The South African Comparative Risk Assessment Collaborating Group. Estimating the burden of disease attributable to diabetes in South Africa in 2000. SAMJ. 2007;97(8):700-706.

30. Joubert J, Norman R, Bradshaw D, Goedecke JH, Steyn NP, Puoane T and The South African Comparative Risk Assessment Collaborating Group. Estimating the burden of disease attributable to high blood pressure in South Africa in 2000. SAMJ. 2007;97(8):692-698.
31. Puska P. Nutrition and global prevention on non-communicable diseases. Asia Pacific J Clin Nutr. 2002;11(Suppl):S755–S758.
32. Evans WD, Finkelstein EA, Kamerouw DB, Renaud JM. Public perceptions of Childhood obesity. Am J Prev Med. 2005;28(1):26-32.
33. Editorial. World pandemic of obesity – any hope of its being controlled? SAMJ. 2003;93(8):598-600.
34. Bray GA. Risks of Obesity. Endocrinol Metab Clin N Am. 2003;32:787-804.
35. Hoek J, Gendall P. Advertising and Obesity: a behavioural perspective. J Health Commun. 2006;11(4):409-423.
36. Foresight: Trends and drivers of obesity: A literature review for the Foresight project on obesity (literature review on the Internet). Foresight Programme of the Office of Science and Technology; 2007 [cited 4 August 2009]. Available from: http://www.foresight.gov.uk/Obesity/Literature_Review.pdf.
37. Abusabha R, Peacock J, Achterberg C. How to make nutrition education more meaningful through facilitated group discussions. J Am Diet Assoc. 1999;99:72-76.
38. Short D. When Science met the consumer: the role of industry. Am J Clin Nutr. 2005;82(suppl):256S-258S.
39. Blackburn GL, Walker WA. Science-based solutions to obesity: what are the role of academia, government, industry, and health care? Am J Clin Nutr. 2005;82(suppl):207S–210S.
40. Hsieh YHP, Ofori JA. Innovations in food technology for health. Asia Pac J Clin Nutr. 2007;16(1):S65-S73.

41. Sunley NC. The Food Industry's approach to the obesity issue – a perspective. 2008 May.
42. World Health Organisation. Ottawa Charter for a Health promotion. 1986:WHO/HPR/HEP/95.1. [cited 20 March 2008]. Available from: http://www.who.int/hpr/NPH/docs/ottawa_charter_hp.pdf.
43. Global update on nutrition labelling. EUFIC: Based on input from the Global Food Information Organisations. June 2008. [cited 9 April 2009]. Available from: <http://www.eufic.org>.
44. Patton G, Butler H, Glover S. Changing schools, changing Health? Design and implementation of the Gatehouse project. *J Adolesc Health*. 2003;33:231-239.
45. Alcalay R. The impact of mass communication campaigns in the health field. *Soc Svi Med*. 1983;17(2):87-94.
46. Position of the American Dietetic Association: Total diet approach to communicating food and nutrition information. *J Am Dietetic Ass*. 2002;102(1):100-108.
47. Marcus EN. The silent epidemic – The health effects of illiteracy. *N Engl J Med*. 2006;355(4):339-341.
48. Parker E. Corporate identity and marketing. In: Parker E. Eric Parker's road Map to Business Success. 1st ed. Northcliff: Troupant Publishers; 2004. Ch 5.p153-198.
49. Blackburn GL. Teaching, Learning, Doing: Best practices in education. *Am J Clin Nutr*. 2005;82(suppl):218S–221S.
50. Global update on nutrition labelling. EUFIC: Based on input from the Global Food Information Organisations. June 2008. [cited 9 April 2009]. Available from: <http://www.eufic.org>.
51. Hawkes C. Nutrition Labels and Health Claims: The Global Regulatory Environment. Geneva: World Health Organisation; 2004. [cited 16 February 2009]. Available from: whqlibdoc.who.int/publications/2004/9241591714.pdf.

52. EUFIC Forum. Consumer Attitudes to Nutrition Information and Food Labelling: results of the EUFIC consumer research 2004. [cited 16 February 2009]. Available from: <http://www.eufic.org/article/pt/page/FARCHIVE/expid/19/>.
53. Philipson, T. Government perspective: food labelling. *Am J Clin Nutr.* 2005;82(suppl):262S-4S.
54. Borra, S. Consumer perspective on food labels. *Am J Clin Nutr.* 2006;83(suppl):1235S.
55. Leathwood PD, Richardson DP, Sträter P, Todd PM, Van Tripp HCM. Consumer understanding and health claims: source of evidence. *Br J Nutr.* 2007;98:474-484.
56. Williams P. Consumer understanding and use of health claims for foods. *Nutrition Reviews.* 2005;63(7):265–264.
57. Foodstuffs, Cosmetics and Disinfectants act . No.R.642, 20 July 2007 [sighted 7 November 2009] Available from: www.capetown.gov.za/regulations.
58. Clift E. Social marketing and communication: Changing health behaviour in the third world. *Am J Health Promot.* 1989;3(4):17-24.
59. Vorster HH, Love P, Brown C. Development of Food based dietary guidelines for South Africa-The process. *SAJCN.* 2001;14(3):S3-S6.
60. Martorell R, Stein AD. The Emergence of Diet-related Chronic Diseases in Developing Countries. In: Bowman BA, Russel RM. Present knowledge in nutrition. 8th ed. Washington:ILSI Press; 2001. Ch 58.p665-685.
61. Fletcher, R. Top 300 National companies 2004/05. 1st edition. Cape Town: Fletcher Media Group. 2004.
62. Statistics South Africa. Mid-year population estimates 2007. Statistical release P0302. 3 July 2007. Available from: <http://www.statssa.gov.za>.

63. Todd JE, Variyam JN. The Decline in Consumer Use of Food Nutrition Labels, 1995-2006. *Amber Waves*. 2008;6(4):4.

APPENDICES

Appendix 1

Pioneer Foods Staff per job grade

Job grade	Number of staff
1	2094
2	1698
3	800
4	742
5	282
6	1621
7	484
8	182
9	192
10	715
11	275
12	226
13	163
14	75
15	34
16	7
Above 16	109

Appendix 2

Pioneer Foods (Pty) Ltd staff per area

This table is included to illustrate the distribution of Pioneer Foods (Pty) Ltd staff throughout South Africa and subsequently the extent to which the sample is representative of the general South African population.

Staff area	Number of Staff
Agri Protein Processing PTY Ltd	14
Agri-Broilers (GG Abattoir)	252
Agri-Broilers (GG D/berg Hatch)	15
Agri-Broilers (GG P/delph Brds)	1
Agri-Broilers (GG Tydstr Bellvue)	9
Agri-Broilers (GG Tydstr Bulhoek)	29
Agri-Broilers (Tydstr Durbanv)	617
Agri-Broilers (Tydstr Fynbos)	1
Agri-Eggs (Amaquanca Pck)	6
Agri-Eggs (Brackenfel Pck)	71
Agri-Eggs (Brandvlei Lay)	7
Agri-Eggs (Broncon Breed)	4
Agri-Eggs (Bultfontein Lay)	3
Agri-Eggs (Clearspring – Hatfield)	8
Agri-Eggs (DeWildt Lay)	4
Agri Eggs (Driehoek Lay)	2
Agri-Eggs (Eggcor Lay)	6
Agri-Eggs (Eigendom Rear)	8
Agri-Eggs (Esperanza Rear)	9
Agri-Eggs (Fransrug Rear)	32
Agri-Eggs (Gauteng)	15
Agri-Eggs (George Pck)	1
Agri-Eggs (Gold Reef Cull)	7
Agri-Eggs (Hekpoort Lay)	2
Agri-Eggs (Hens Nest)	8
Agri-Eggs (Hi-veld Hat)	8
Agri-Eggs (Irene Pck)	9
Agri-Eggs (Klipheuwel Egyp)	17
Agri-Eggs (Kosmos Rear)	8
Agri-Eggs (Kwazulu-Natal)	16
Agri-Eggs (Malmesbury)	30
Agri-Eggs (Morester Breed)	22
Agri-Eggs (Nest Egg Lay)	10
Agri-Eggs (New Thorndale R)	12
Agri-Eggs (Paardefontein)	26
Agri-Eggs (Phokeng Cull)	3
Agri-Eggs (Pinetown Pck)	13
Agri-Eggs (Platrand Lay)	11
Agri-Eggs (Port Elizabeth)	23

Agri-Eggs (Protea Cull)	2
Agri-Eggs (Rankuwa Cull)	10
Agri-Eggs (Ruxton Lay)	12
Agri-Eggs (Songloed Lay)	23
Agri-Eggs (Sova Eggs)	133
Agri-Eggs (Sova Lay)	13
Agri-Eggs (Steinbro Eggs)	7
Agri-Eggs (Steinbro Lay)	10
Agri-Eggs (Swartkop Lay)	18
Agri-Eggs (Tongaat Rear)	8
Agri-Eggs (Vlakdrif Lay)	21
Agri-Eggs (White Lodge Lay)	11
Agri-Eggs (Winterton Pck)	1
Agri-Eggs (Zonke Cull)	3
Agri-Feeds (Divisional Off)	2
Agri-Feeds (George)	54
Agri-Feeds (Malmesbury)	146
Agri-Feeds (Pretoria)	49
Barvale (Edms) Bpk (Barvale)	15
Bokomo/Sasko Central Procurement (BS Cntrl Procure)	35
Breakfast Foods (Atlantis)	223
Breakfast Foods (Epping)	113
Breakfast Foods (Kwality Biscuits)	9
Breakfast Foods (Moirs)	34
Breakfast Foods (Moirs Epping)	31
Breakfast Foods (Nature Source)	99
Breakfast Foods (ProNutro)	166
Breakfast Foods (Weet-Bix)	88
Eastern Cape Depot (De Aar)	10
Eastern Cape Depot (East London)	13
Eastern Cape Depot (Graaff-Reinet)	7
Eastern Cape Depot (Queenstown)	15
Eastern Cape Depot (Umtata)	7
Free State Depot (Benrose)	12
Free State Depot (Bethlehem)	5
Free State Depot (Bloemfontein)	5
Free State Depot (Kimberley)	5
Free State Depot (Welkom)	4
Grain (Accolade)	56
Grain (Aliwal North)	137
Grain (Bethlehem)	112
Grain (Durban)	93
Grain (Epping)	20
Grain (Estcourt)	140
Grain (Grain Management)	8
Grain (Klerksdorp)	193
Grain (Krugersdorp)	103
Grain (Maize Milling)	24

Grain (Malmesbury)	154
Grain (Paarl)	48
Grain (Polokwane)	69
Grain (Port Elizabeth)	90
Grain (Sales Cape Metro)	18
Grain (Western Cape)	70
Natal Depot (Empangeni)	4
Natal Depot (Vryheid)	7
Northern Province Depot (Louis Trichardt)	5
Northern Province Depot (Mhkuhle)	3
Northern Province Depot (Polokwane)	6
Pasta (Malmesbury)	57
Pioneer Head Office (Pioneer Head Office)	127
SAD (Benoni)	23
SAD (Coffee, Tea & C)	54
SAD (Durban)	12
SAD (Kakamas)	7
SAD (Lavld Evergreen)	69
SAD (Lavld Macadamia)	10
SAD (Montaque Gardens)	12
SAD (Sador)	27
SAD (Sugarbird)	98
SAD (Upington)	216
SAD (Vredendal)	5
SAD (Wellington)	63
SAD (Werda)	97
SAD (Worcester)	187
Safari Nuts (Safari Nuts)	39
Sasko Bread Depots – Bakeries (Aliwal N Depot)	13
Sasko Bread Depots – Bakeries (Bethlehem Depot)	37
Sasko Bread Depots – Bakeries (Durban Depot)	17
Sasko Bread Depots – Bakeries (East London Depot)	16
Sasko Bread Depots – Bakeries (Eshowe Depot)	46
Sasko Bread Depots – Bakeries (Grahamstown Depot)	16
Sasko Bread Depots – Bakeries (Jeffreysbay Depot)	10
Sasko Bread Depots – Bakeries (Kimberley Depot)	33
Sasko Bread Depots – Bakeries (Klerksdorp Depot)	30
Sasko Bread Depots – Bakeries (Lebowakgomo Depot)	38
Sasko Bread Depots – Bakeries (Malmesbury Depot)	28
Sasko Bread Depots – Bakeries (Mkuze Depot)	3
Sasko Bread Depots – Bakeries (Mossel Bay Depot)	9
Sasko Bread Depots – Bakeries (Nelspruit Depot)	14
Sasko Bread Depots – Bakeries (Newcastle Depot)	56
Sasko Bread Depots – Bakeries (Oudtshoorn)	15

Depot)	
Sasko Bread Depots – Bakeries (Rusterburg Depot)	44
Sasko Bread Depots – Bakeries (Ulundi Depot)	3
Sasko Bread Depots – Bakeries (VDBijl Park Depot)	4
Sasko Bread Depots – Bakeries (Vredenburg Depot)	10
Sasko Group Bakeries (Aerton)	362
Sasko Group Bakeries (Bethlehem)	1
Sasko Group Bakeries (Bloemfontein)	147
Sasko Group Bakeries (Bochum)	75
Sasko Group Bakeries (Britos)	295
Sasko Group Bakeries (Britos Connect)	21
Sasko Group Bakeries (Brits)	164
Sasko Group Bakeries (Cape Bake)	7
Sasko Group Bakeries (Duens)	318
Sasko Group Bakeries (Elim)	132
Sasko Group Bakeries (Ellisras)	55
Sasko Group Bakeries (Enterprise)	294
Sasko Group Bakeries (FState Bak Off)	12
Sasko Group Bakeries (Grobblersdal)	144
Sasko Group Bakeries (Jan Kempdorp)	48
Sasko Group Bakeries (Krugersdorp)	142
Sasko Group Bakeries (Ladysmith)	176
Sasko Group Bakeries (Limpopo Bak Off)	12
Sasko Group Bakeries (Mokopane)	140
Sasko Group Bakeries (Olifantsfontein)	219
Sasko Group Bakeries (Paarl Bak H/Office)	24
Sasko Group Bakeries (Polokwane)	218
Sasko Group Bakeries (Qwa Qwa)	97
Sasko Group Bakeries (Sibasa)	185
Sasko Group Bakeries (Stanger)	191
Sasko Group Bakeries (Tubatse)	145
Sasko Group Bakeries (Tzaneen)	165
Sasko Group Bakeries (Vryheid)	89
Sasko Group Bakeries (Worcester)	103
Western Cape Depot (George)	13
Western Cape Depot (Klawer)	9
Western Cape Depot (Springbok)	8
Western Cape Depot (Swellendam)	9
Western Cape Depot (Upington)	14
Western Cape Depot (Worcester)	2

Appendix 3

PARTICIPANT INFORMATION LEAFLET AND CONSENT FORM FOR FOOD COMPANIES

1. GENERAL INFORMATION ON RESEARCH STUDY:

a. TITLE OF THE RESEARCH PROJECT:

Using food company nutrition strategies and consumer knowledge, attitudes and practices pertaining to nutrition information to develop guidelines to promote the prevention of chronic diseases of lifestyle

b. REFERENCE NUMBER: N08/01/002

c. PRINCIPAL INVESTIGATOR: Louise Kriek

d. ADDRESS:

45 Pascali Street
Sonstraal Heights
Durbanville
7550

e. CONTACT NUMBER:

Tel (021) 530 3600
Cell: 084 677 0610
Fax: 086 660 2737

You are being invited to take part in a research project. Please take some time to read the information presented here, which will explain the details of this project. Please contact the researcher if you have any questions about any part of this project that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research entails and how you could be involved. Also, your participation is **entirely voluntary** and you are free to decline to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part.

This study has been approved by the Committee for Human Research at Stellenbosch University and will be conducted according to the ethical guidelines and principles of the international Declaration of Helsinki, South African Guidelines for Good Clinical Practice and the Medical Research Council (MRC) Ethical Guidelines for Research.

2. WHAT IS THE RESEARCH STUDY ALL ABOUT?

- One of the objectives of the study is to investigate and compare the currently available nutrition strategies of internationally represented and local food companies operating in South Africa.
- A valid sample of 54 local and international food companies operating in South Africa were approached for information on their nutrition communication strategies.

3. WHY HAVE YOU BEEN INVITED TO PARTICPATE?

Your food company has been identified through a statistically approved sampling method.

4. WHAT WILL YOUR RESPONSIBILITIES BE?

To complete the accompanying questionnaire and to send it back with the nutrition strategy of your company and information on any nutrition education initiatives that the company are involved in.

5. WILL YOU BENEFIT FROM TAKING PART IN THIS RESEARCH?

The Food Industry will benefit from the guidelines that will be developed. The consumers will also benefit by way of a possible reduction in chronic diseases.

6. ARE THERE ANY RISKS INVOLVED IN YOUR TAKING PART IN THIS RESEARCH

No, all information supplied will be treated as confidential and will not be made known at all.

7. WILL YOU BE PAID TO TAKE PART IN THIS STUDY AND ARE THERE ANY COSTS INVOLVED?

No, you will not be paid to take part in the study. There will be no costs involved for you, if you do take part.

8. IS THERE ANYTHING ELSE THAT YOU SHOULD KNOW OR DO?

You can contact the Committee for Human Research at 021- 938 9207 if you have any concerns or complaints that have not been adequately addressed by the researcher.

Declaration by representative of the Food Company

By signing below, I agree to take part in a research study entitled "Using food companies' nutrition strategies and consumer knowledge, attitudes and practices pertaining to nutrition information, to develop guidelines for the promotion of the prevention of chronic diseases of lifestyle".

I declare that:

- I have read or had read to me this information and consent form and it is written in a language with which I am fluent and comfortable.
- I understand and are comfortable with the way in which the information that I will provide, will be applied
- I understand that taking part in this study is **voluntary** and I have not been pressurised to take part.

Signed at (*place*) on (*date*) 2008.

.....
Signature of participant

.....
Signature of witness

Declaration by investigator

I, Louise Kriek, declare that:

- I have provided my contact details to the participant in case that he/she has any questions regarding the study
- All questions will be answered truthfully and honestly
- The information supplied will be treated as confidential.
- I am satisfied that I have explained all the aspects of the research that this participant will be involved in.

Signed at (*place*) on (*date*) 2008.

.....
Signature of investigator

.....
Signature of witness

Appendix 4

Questionnaire to obtain information on nutrition strategies used by food companies

FOR OFFICIAL USE		
QUESTIONNAIRE NUMBER		

Please read carefully through all the questions and answer all the questions in full.
Answers must be indicated with a tick (✓) or as otherwise requested.

Date of completion	
--------------------	--

General Information

1. Is your company internationally represented?

Yes	
No	

2. What is your annual turnover as per the last financial report?

R

3. What food categories are you involved in? Choose all that are relevant.

Beverages	
Dairy	
Grains/ Cereals/ Pasta	
Bakeries/ Biscuits	
Fats/Oils/Spreads	
Sweets/Chocolates/Desserts	
Savoury Snacks	
Other (Name)	

Nutrition strategies

4. Does your company have a specific strategy pertaining to the provision of nutrition information to consumers?

Yes	
No	
Nutrition initiatives incorporated in other strategies	

5. Is your nutrition strategy/ initiatives:

Global	
Local	
Global, but locally adapted	
Not applicable	

6. Who is the target group of your nutrition strategy/ initiatives? Choose one.

Only consumers	
Consumers & employees	
Only employees	
Not applicable	

7. Do your nutrition strategy/ initiatives define which products within your portfolio may make nutrition and health claims?

Yes	
No	

8. Do your nutrition strategy/ initiatives define the construction of how the nutrition information is presented?

Yes	
No	

9. Do your nutrition strategy/ initiatives focus on specific nutrients? Please choose all that are relevant.

Total Energy	
Total Fat	
Trans fatty acids	
Sodium	
Carbohydrates	
Sugar	
Protein	
Fibre	
Other (Name them)	
Not applicable	

10. Do you address specific chronic disease of lifestyle (e.g. Diabetes Mellitus, Cancer, and Hypertension) in your nutrition strategy/ initiatives?

Yes	
No	

11. Which chronic diseases of lifestyle does your company address as being the most important?
Please choose one.

Cholesterol	
Cancer	
Hypertension (high blood pressure)	
Heart disease	

Diabetes (high blood sugar)	
Obesity/Overweight	
None of these	

12. Do your nutrition strategy/ initiatives include changing your product's profile to be in line with global health trends (e.g. less sodium, less fat)?

Yes	
No	

13. Do your nutrition strategy/ initiatives include a focus to investigate, develop and apply new technologies to preserve the optimum nutrition value of raw ingredients?

Yes	
No	

14. Do your nutrition strategy/ initiatives include advertising and marketing guidelines that encourage consumers towards healthier eating?

Yes	
No	

15. Do your nutrition strategy/ initiatives include advertising and marketing guidelines that encourage consumers towards healthier lifestyles?

Yes	
No	

16. Do your nutrition strategy/ initiatives include advertising and marketing restrictions?

Yes	
No	

17. Do your nutrition strategy/ initiatives define how you communicate with consumers?

Yes	
No	

18. Which of the following communication channels does your company use most frequently to communicate your nutrition communication strategies/ initiatives to the consumer? Please choose one.

Newspapers and Magazines	
Pamphlets and Brochures	
Radio	
Internet (web sites)	
Television	
Food and Beverage Labels	
Outdoor advertising	
Exhibitions and Tradeshows	

19. Are your nutrition strategy/ initiatives openly available to consumers?

Yes	
No	
On request	
Not applicable	

20. How do you track the success of your nutrition strategy/ initiatives? Please choose one.

Quantitative market research	
Qualitative market research	
None	
Other methods (specify)	

Nutrition education

21. Do your nutrition strategy/ initiatives include educating consumers on healthier eating habits?

Yes	
No	

22. Do your nutrition strategy/ initiatives include educating consumers on how to live a healthier lifestyle?

Yes	
No	

23. What in your company's experience/knowledge is the nutritional knowledge level of SA consumers? Please indicate for each LSM.

	High	Intermediate	Low	Do not know
LSM 1- 4				
LSM 5 – 6				
LSM 7 – 10				

24. Who do you think should mostly be responsible for nutrition education of South African consumers? Please choose one.

The Department of Health	
Schools	
Newspapers/Magazines	
Radio	
Television	
Clinics/Hospitals	
Food companies	
Health professionals (such as a doctor/ nurse/ dietitian)	
Health promotion NGOs	

25. If you look at the statement below, please tick the appropriate box.

I believe my company has a responsibility towards educating consumers regarding healthier eating habits.

Strongly Agree	
Agree	
Disagree	
Strongly disagree	

26. Who do you mostly use to deliver the nutrition education messages? Please choose one.

Nutritionist	
Nurse/ Clinic sister	
Journalist	
Doctor	
Celebrity	
Food companies	
Dietician	
TV / radio show host	
Family and Friends	
The Department of Health	
Teachers in partner/targeted schools	
Pharmacist	
Other (Specify)	
Not applicable	

27. Do you have partners for your consumer education activities?

Yes	
No	

28. If yes, who are your partners for your consumer education activities? Please choose all that are relevant.

Government	
Professional association	
Non-Governmental organisations	
Celebrity	
Other (specify)	

29. Do you specifically target schools as part of your nutrition education strategy?

Yes	
No	

30. If yes, how many schools are reached? Please indicate the number.

31. If yes, how many children are reached? Please indicate the number.

32. Do you target any other vulnerable groups with a nutrition education strategy? Please choose all that are relevant.

The elderly	
Immuno-supressed (e.g. HIV or cancer)	
Pregnant and lactating woman	
Other (specify)	
None	

Appendix 5

CONSENT TO USE PIONEER FOODS (PTY) LTD STAFF BASE AND RESOURCES TO CONDUCT RESEARCH STUDY

1. GENERAL INFORMATION ON RESEARCH STUDY:

a. TITLE OF THE RESEARCH PROJECT:

Using food company nutrition strategies and consumer knowledge, attitudes and practices pertaining to nutrition information to develop guidelines to promote the prevention of chronic diseases of lifestyle

b. PRINCIPAL INVESTIGATOR: Louise Kriek

c. ADDRESS:

Bokomo Moirs
5 Sunrise Circle
Ndabeni
7405

d. CONTACT NUMBER:

Tel (021) 530 3600
Cell: 084 677 0610

e. ETHICAL CONSIDERATIONS

The study has been approved by the Committee for Human Research at Stellenbosch University and will be conducted according to the ethical guidelines and principles of the International Declaration of Helsinki, South African Guidelines for Good Clinical Practice and the Medical Research Council (MRC) Ethical Guidelines for Research.

2. WHAT IS THE RESEARCH STUDY ALL ABOUT?

- For the research study, a sample population is needed. The proposed sample population is: all permanent employees of Pioneer Foods (Pty) Ltd.
- Reason for choosing Pioneer Foods (Pty) Ltd employees as a sample frame:
 - Time – by using the sample frame of Pioneer Foods staff, the data collection period will be shortened considerably
 - Cost – the cost will be minimised by using the Intranet of the company as a data distribution and collection vehicle.
 - Contactability of sample population – 3622 of the sample frame is reachable on email and has access to the Intranet. Those that do not have access to the Intranet will receive questionnaires via their HR/Factory Manager.

- Socio demographic representation – staff originates from a diverse socio-demographic background, cultures and different LSM's.
- National representation – Pioneer Foods (Pty) Ltd. has national representation.
- Incentive – to increase response rate an incentive per division will be given in the form of a Bokomo product hamper - respondents will be drawn randomly from those that did respond.

➤ *Logistics:*

Consent to involve employees and use resources (including Intranet and email facilities) of Pioneer Foods (Pty) Ltd to conduct the research study, will be obtained from the Managing Director.

A sample of 740 employees will be randomly drawn from the sample frame to participate in the study. A questionnaire will then be set up on the Pioneer Intranet and an email will be send to all the employees from the sample with email access with a link to the site and a request to fill in the questionnaire.

Those that do not have access to email will be contacted via the HR/Factory manager. The HR/Factory mangers will be requested to hand the questionnaires out as well as collect them back afterwards.

Contact name and phone number of the researcher will be provided to all for assistance if necessary.

➤ *Information availability*

- The Protocol is available on request. The results and conclusions of the research study will be made known to the Managing Director of Pioneer Foods (Pty) Ltd at the end of the research.

3. HOW WILL THE EMPLOYEES BE INVITED TO PARTICPATE?

They will be identified through stratified random sample selection.

4. WHAT WILL THEIR RESPONSIBILITIES BE?

The employees will be asked to complete a Questionnaire and to send it back to the investigator. By completing the questionnaire the employees will be giving their consent that the investigator can use the information. Participation in this research study is entirely voluntary.

5. ARE THERE ANY RISKS INVOLVED FOR THE EMPLOYEES IN TAKING PART IN THIS RESEARCH?

No, all information supplied will be treated as confidential and will not be made known to any other person.

6. WILL THEY BE PAID TO TAKE PART IN THIS STUDY AND ARE THERE ANY COSTS INVOLVED?

No, they will not be paid to take part in the study. There will be no costs involved for the employee, if they do take part.

Declaration by the Managing Director of Pioneer Foods (Pty) Ltd.

Iin my capacity as Managing Director of Pioneer Foods (Pty) Ltd hereby give consent to Louise Kriek that the Pioneer Food (Pty) Ltd employees may be used as a study population for the research study on "Using food companies' nutrition strategies and consumer knowledge, attitudes and practices pertaining to nutrition information, to develop guidelines for the promotion of the prevention of chronic diseases of lifestyle".

I further give consent that the Pioneer Foods (Pty) Ltd Intranet and other resources as mentioned above may be used as data distribution and collection vehicles.

I have read this consent form and am familiar with the contents thereof.

Signed at on.....2008.

.....
On behalf of Pioneer Foods (Pty) Ltd

.....
Witness

Declaration by investigator

I, Louise Kriek, declare that:

- I have provided my contact details to the employees in case that they have any questions regarding the study
- All questions will be answered truthfully and honestly
- The information supplied will be treated as confidential.
- I am satisfied that I have explained all the aspects of the research that the employees will be involved in.

Signed at (*place*) on (*date*) 2007.

.....
Signature of investigator

.....
Signature of witness

Appendix 6

PARTICIPANT INFORMATION LEAFLET FOR CONSUMERS

1. GENERAL INFORMATION ON RESEARCH STUDY:

a. TITLE OF THE RESEARCH PROJECT:

Using food company nutrition strategies and consumer knowledge, attitudes and practices pertaining to nutrition information, to develop guidelines to promote the prevention of chronic diseases of lifestyle

b. PRINCIPAL INVESTIGATOR: Louise Kriek

c. ADDRESS:

45 Pascali Street
Sonstraal Heights
Durbanville
7550

d. CONTACT NUMBER:

Tel (021) 530 3600
Cell: 084 677 0610

You are being invited to take part in a research project. Please take some time to read the information presented here, which will explain the details of this project. Please contact the researcher if you have any questions about any part of this project that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research entails and how you could be involved. Also, your participation is **entirely voluntary** and you are free to decline to participate at any point, even if you do agree to take part.

This study has been approved by the Committee for Human Research at Stellenbosch University and will be conducted according to the ethical guidelines and principles of the international Declaration of Helsinki, South African Guidelines for Good Clinical Practice and the Medical Research Council (MRC) Ethical Guidelines for Research.

2. WHAT IS THE RESEARCH STUDY ALL ABOUT?

- This study aims to use the food company nutrition strategies and consumer knowledge, attitudes and practices pertaining to nutrition information, to develop guidelines to promote the prevention of chronic diseases of lifestyle
- One of the objectives of the research study is: To investigate the level of knowledge, attitudes and perceptions the South African consumers has regarding nutrition information.
- 740 consumers will be approached and asked to complete a questionnaire. By evaluating this information, the investigator wants to know how much the average consumer understands on nutrition related issues and what do the consumer use as a reference to make an informed choice when buying food.

3. WHY HAVE YOU BEEN INVITED TO PARTICPATE?

You have been identified through the stratified random sample selection.

4. WHAT WILL YOUR RESPONSIBILITIES BE?

To complete the accompanying Questionnaire and to send it back to the investigator. By completing the questionnaire you are giving your consent that the investigator can use the information.

5. ARE THERE ANY RISKS INVOLVED IN YOUR TAKING PART IN THIS RESEARCH

No, all information supplied will be treated as confidential and will not be made known to any other person.

6 WILL YOU BE PAID TO TAKE PART IN THIS STUDY AND ARE THERE ANY COSTS INVOLVED?

No, you will not be paid to take part in the study. There will be no costs involved for you, if you do take part.

7. IS THERE ANYTHING ELSE THAT YOU SHOULD KNOW OR DO?

You can contact the Committee for Human Research at 021- 938 9207 if you have any concerns or complaints that have not been adequately addressed by the researcher.

Appendix 7

Questionnaire to assess knowledge, attitudes and practices of consumers pertaining to nutrition information

I understand that by completing this questionnaire I am giving my consent that the data collected can be used in the research study as stipulated in the information letter that I received.

FOR OFFICIAL USE	
QUESTIONNAIRE NUMBER	

Please read through all the questions carefully and answer all the questions in full.
Answers must be indicated with a tick (✓) or as otherwise requested.

Date of completion	
--------------------	--

General

1. Gender

Male	
Female	

2. Age

Years

3. Race

Asian	
Black	
Coloured	
White	
Other	

4. Have you received any Tertiary education in a Food/Nutrition related field?

Yes	
No	

Nutrition information

5. Do you read the labels on food products (before or after purchasing)

Always	
Sometimes	
Never	

6. Which of the following items do you normally look for/read on a label of a food item? Put a tick in the **Yes** column if you use the item when reading a label and a tick in the **No** column if you do not use the item.

	Yes	No
Ingredients list		
Nutritional Information Table		
Allergens		
Health tips		
Health claims		

7. A Nutritional information table on a product contains information regarding levels of the nutrients in the product.

True	
False	

8. Do you read the nutritional information table on the packaging of a Food product?

Always	
Sometimes	
Never	

9. When do you read the nutritional information table? Please choose one.

Only when I am buying/using a product for the first time	
When I am buying/using a product that I know and trust	
Always	
Never	

10. Does the information contained in the nutritional information table on the product influence your purchase? Please choose one.

Always	
Sometimes	
Never	

11. In which food category does the nutritional information table have the biggest influence on your purchase?

Beverages	
Dairy	
Grains/ Cereals/ /Pasta	
Bakeries/ Biscuits	
Fats/Oils/Spreads	
Sweets/Chocolates/Desserts	
Savoury Snacks	
Other (Name)	

12. In general when you look at the nutritional information table on a product label, what is the first thing that you look for? Please choose one.

Energy value	
Fat content	
Trans fatty acid level	
Sodium level	
Carbohydrate content	
Sugar content	
Protein content	
Fibre content	
Other (Name them)	
Do not use it	

13. Which energy value do you understand better? Please choose one.

kilojoules	
calories	

14. Which of the following information included in the nutrition information table do you find most useful? Please choose one.

Value per portion/serving	
Value per 100g/100ml	
None	

15. When you look at fat values do you look for:

Put a tick in the **Yes** column if you use the item to assist in making a purchasing choice, when reading a label and a tick in the **No** column if you do not use the item.

	Yes	No
Total fat content		
Saturated fat content		
Mono-unsaturated fat content		
Poly-unsaturated fat content		
Trans fatty acid content		

16. Which of the following factors play an important role in the prevention of heart disease?

Total fat content	
Saturated fat content	
Mono-unsaturated fat content	
Poly-unsaturated fat content	
Trans fatty acid content	
Cholesterol	

17. Choose the option that you think plays the biggest role in causing obesity.

Too much sugar and refined starch	
Too much fatty food	
Too much fruit and vegetables	
Too much salty food	

18. Choose the option that you think plays the biggest role in causing heart disease.

Too much sugar and refined starch	
Too much fatty food	
Too much fruit and vegetables	
Too much salty food	

19. Choose the items that you think should be limited when you suffer from hypertension.

Too much sugar and refined starch	
Too much fatty food	
Too much fruit and vegetables	
Too much salty food	

20. Buying a low fat product plays a role in the prevention of various chronic diseases of lifestyle (e.g. cancer).

True	
False	

21. Healthy eating habits can reduce the risk of developing chronic diseases of lifestyle such as diabetes (high blood sugar).

True	
False	

22. With which health issue are you most concerned with when buying a food product?

Cholesterol	
Cancer	
Hypertension (high blood pressure)	
Heart disease	
Diabetes (high blood sugar)	
Obesity/Overweight	
Other	

23. I believe that all health claims on food products are just a marketing tool that food producers use to increase the sales of their products.

Strongly Agree	
Agree	
Disagree	
Strongly disagree	

24. I feel that information on the levels of the nutrients in the food is useful in helping me make healthier food choices.

Strongly Agree	
Agree	
Disagree	
Strongly disagree	

25. I believe that a claim on a food product that describes how it can help prevent or manage a disease condition is useful in helping me make food choices.

Strongly Agree	
Agree	
Disagree	
Strongly disagree	

26. I feel that a claim on a food product that describes how it can help prevent or manage a disease condition, is more useful to me than the nutritional information table in making healthier food choices.

Strongly Agree	
Agree	
Disagree	
Strongly disagree	

27. I find it useful when a food product explains the function of any added vitamins and minerals.

Always	
Sometimes	
Never	

28. The information available on food products increased my understanding of why I should take in vitamins and minerals.

True	
False	

29. I think that it is important that food companies are involved in educating you the consumer, regarding healthy eating and living.

Yes	
No	

30. Which of the following mediums would you most prefer for food manufacturers to use, to inform you about healthy eating habits? Please choose one.

Newspapers and Magazines	
Pamphlets and Brochures	
Radio	
Internet (web sites)	
Television	
The food label/ Packaging	
Outdoor advertising	
Exhibitions and Tradeshows	

31. Who do you think should provide you the consumer with information on what constitutes healthy eating and living? Please choose one.

The Department of Health	
Schools	
Newspapers/Magazines	
Radio	
Television	
Clinics/Hospitals	
Food companies	
Health professionals (such as a doctor/ nurse/ dietician)	

32. Who do you trust mostly to give you truthful nutrition messages? Please choose one.

Nutritionist	
Nurse/ Clinic sister	
Journalist	
Doctor	
Celebrity	
Food companies	
Dietician	
TV / radio show host	
Family and Friends	
The Department of Health	
Teachers in partner/targeted schools	
Pharmacist	
Other (Specify)	

33. Are you aware of any nutrition education programmes for you, the consumer that are run by Food Companies?

Yes	
No	

If yes, please describe

Appendix 8

9 May 2008

Mrs L Kriek
Division of Human Nutrition
Dept of Interdisciplinary Health Sciences

Dear Mrs Kriek

RESEARCH PROJECT : "Using food companies' nutrition strategies and consumer knowledge, attitudes and practises pertaining to nutrition information, to develop guidelines for the promotion of the prevention of chronic diseases of lifestyle"

PROJECT NUMBER : N08/01/002

My letter dated 1 February 2008 refers.

At a meeting that was held on 7 May 2008, the Committee for Human Research ratified the approval of the above project by the Chairman.

Yours faithfully

FRANKLIN WEBER
RESEARCH DEVELOPMENT AND SUPPORT (TYGERBERG)
Tel: +27 21 938 9657 / E-mail: fweb@sun.ac.za

Appendix 9

Comparison of similar questions posed in the two questionnaires aimed at the food companies and consumers respectively

Questionnaire to obtain information on nutrition strategies used by the food companies	Questionnaire to assess knowledge, attitudes and practices of consumers pertaining to nutrition information																																
<p>3. What food categories are you involved in?</p> <table border="1" data-bbox="282 714 727 1230"> <tr><td>Beverages</td><td></td></tr> <tr><td>Dairy</td><td></td></tr> <tr><td>Grains/ Cereals/ /Pasta</td><td></td></tr> <tr><td>Bakeries/ Biscuits</td><td></td></tr> <tr><td>Fats/Oils/Spreads</td><td></td></tr> <tr><td>Sweets/Chocolates/Desserts</td><td></td></tr> <tr><td>Savoury Snacks</td><td></td></tr> <tr><td>Other (Name)</td><td></td></tr> </table>	Beverages		Dairy		Grains/ Cereals/ /Pasta		Bakeries/ Biscuits		Fats/Oils/Spreads		Sweets/Chocolates/Desserts		Savoury Snacks		Other (Name)		<p>11. Make 1 tick in the block where the nutritional information table has the biggest influence on your purchase and two ticks in the block where it has the second biggest influence</p> <table border="1" data-bbox="851 893 1295 1343"> <tr><td>Beverages</td><td></td></tr> <tr><td>Dairy</td><td></td></tr> <tr><td>Grains/ Cereals/ /Pasta</td><td></td></tr> <tr><td>Bakeries/ Biscuits</td><td></td></tr> <tr><td>Fats/Oils/Spreads</td><td></td></tr> <tr><td>Sweets/Chocolates/Desserts</td><td></td></tr> <tr><td>Savoury Snacks</td><td></td></tr> <tr><td>Other (Name)</td><td></td></tr> </table>	Beverages		Dairy		Grains/ Cereals/ /Pasta		Bakeries/ Biscuits		Fats/Oils/Spreads		Sweets/Chocolates/Desserts		Savoury Snacks		Other (Name)	
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<p>9. Does your nutrition policy focus on specific nutrients? Please choose all that are relevant.</p> <table border="1" data-bbox="303 1574 700 2025"> <tr><td>Total Energy</td><td></td></tr> <tr><td>Total Fat</td><td></td></tr> <tr><td>Trans fatty acids</td><td></td></tr> <tr><td>Sodium</td><td></td></tr> <tr><td>Carbohydrates</td><td></td></tr> <tr><td>Sugar</td><td></td></tr> <tr><td>Protein</td><td></td></tr> <tr><td>Fibre</td><td></td></tr> </table>	Total Energy		Total Fat		Trans fatty acids		Sodium		Carbohydrates		Sugar		Protein		Fibre		<p>12. In general when you look at the nutritional information table on a product label, what is the first thing that you look for? Please choose one.</p> <table border="1" data-bbox="863 1626 1276 2025"> <tr><td>Energy value</td><td></td></tr> <tr><td>Fat content</td><td></td></tr> <tr><td>Trans fatty acid level</td><td></td></tr> <tr><td>Sodium level</td><td></td></tr> <tr><td>Carbohydrate content</td><td></td></tr> <tr><td>Sugar content</td><td></td></tr> <tr><td>Protein content</td><td></td></tr> </table>	Energy value		Fat content		Trans fatty acid level		Sodium level		Carbohydrate content		Sugar content		Protein content			
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<input type="text" value="Other (Name them)"/>	<input type="text"/>	<input type="text"/>														
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<p>29. Do you think that it is important that food companies are involved in educating you the consumer, regarding healthy eating and living?</p> <table border="1" style="width: 100%;"> <tr><td>Yes</td><td></td></tr> <tr><td>No</td><td></td></tr> </table>			Yes		No											
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Yes																
No																

<p>18. Which of the following communication channels does your company use <u>most frequently</u> to communicate your nutrition communication strategies to the consumer? Please choose one.</p> <table border="1" data-bbox="276 518 736 968"> <tr><td>Newspapers and Magazines</td><td></td></tr> <tr><td>Pamphlets and Brochures</td><td></td></tr> <tr><td>Radio</td><td></td></tr> <tr><td>Internet (web sites)</td><td></td></tr> <tr><td>Television</td><td></td></tr> <tr><td>Food and Beverage Labels</td><td></td></tr> <tr><td>Outdoor advertising</td><td></td></tr> <tr><td>Exhibitions and Tradeshows</td><td></td></tr> </table>	Newspapers and Magazines		Pamphlets and Brochures		Radio		Internet (web sites)		Television		Food and Beverage Labels		Outdoor advertising		Exhibitions and Tradeshows		<p>30. Which of the following mediums would you most prefer for food manufacturers to use, to inform you about healthy eating habits? Please choose one.</p> <table border="1" data-bbox="843 518 1303 968"> <tr><td>Newspapers and Magazines</td><td></td></tr> <tr><td>Pamphlets and Brochures</td><td></td></tr> <tr><td>Radio</td><td></td></tr> <tr><td>Internet (web sites)</td><td></td></tr> <tr><td>Television</td><td></td></tr> <tr><td>The food label/ Packaging</td><td></td></tr> <tr><td>Outdoor advertising</td><td></td></tr> <tr><td>Exhibitions and Tradeshows</td><td></td></tr> </table>	Newspapers and Magazines		Pamphlets and Brochures		Radio		Internet (web sites)		Television		The food label/ Packaging		Outdoor advertising		Exhibitions and Tradeshows																	
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<p>26. Who do you <u>mostly use</u> to deliver the nutrition education messages? Choose one.</p> <table border="1" data-bbox="308 1260 700 1980"> <tr><td>Nutritionist</td><td></td></tr> <tr><td>Nurse/ Clinic sister</td><td></td></tr> <tr><td>Journalist</td><td></td></tr> <tr><td>Doctor</td><td></td></tr> <tr><td>Celebrity</td><td></td></tr> <tr><td>Food companies</td><td></td></tr> <tr><td>Dietician</td><td></td></tr> <tr><td>TV show host</td><td></td></tr> <tr><td>Family and Friends</td><td></td></tr> <tr><td>The Department of Health</td><td></td></tr> <tr><td>Pharmacist</td><td></td></tr> <tr><td>Other (Specify)</td><td></td></tr> </table>	Nutritionist		Nurse/ Clinic sister		Journalist		Doctor		Celebrity		Food companies		Dietician		TV show host		Family and Friends		The Department of Health		Pharmacist		Other (Specify)		<p>32. Who do you trust mostly to give you truthful nutrition messages? Choose One.</p> <table border="1" data-bbox="874 1260 1283 1980"> <tr><td>Nutritionist</td><td></td></tr> <tr><td>Nurse/ Clinic sister</td><td></td></tr> <tr><td>Journalist</td><td></td></tr> <tr><td>Doctor</td><td></td></tr> <tr><td>Celebrity</td><td></td></tr> <tr><td>Food companies</td><td></td></tr> <tr><td>Dietician</td><td></td></tr> <tr><td>TV show host</td><td></td></tr> <tr><td>Family and Friends</td><td></td></tr> <tr><td>The Department of Health</td><td></td></tr> <tr><td>Pharmacist</td><td></td></tr> <tr><td>Other (Specify)</td><td></td></tr> </table>	Nutritionist		Nurse/ Clinic sister		Journalist		Doctor		Celebrity		Food companies		Dietician		TV show host		Family and Friends		The Department of Health		Pharmacist		Other (Specify)	
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19. Is your nutrition policy openly available to consumers?

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>
On request	<input type="checkbox"/>

33. Are you aware of any nutrition education programmes for you, the consumer that are run by Food Companies

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>