

SOUTH AFRICAN CONSUMERS' BELIEFS ABOUT THE LINK BETWEEN FOOD AND HEALTH

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DECLARATION

I, the undersigned, hereby declare that the work contained in this thesis is my own original work and has not previously in its entirety, or in part, been submitted at any university for a degree.



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Date: 28 April 2005

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SUMMARY

Motivation

Diet and nutrition are important factors in the promotion and maintenance of good health throughout the entire life course. Their role as determinants of chronic noncommunicable diseases is well established. Alterations in diet, both positive and negative have strong effects on health throughout life. Consumers' awareness of a diet-disease relationship may stimulate interest in learning more about nutrition thus acquiring necessary knowledge for dietary improvement and disease prevention.

Objectives

- To investigate South African metropolitan consumers beliefs and attitudes about the link between food and health.
- To explore the demographic characteristics and beliefs of South African consumers regarding the link between food and health; and to investigate whether differences exist in this belief between gender, race, age group and Living Standard Measures (LSM).

Methodology

One thousand nine hundred and ninety seven South African adults (≥ 16 years), representing the four major race groups of South Africa, were selected by stratified random sampling from metropolitan areas in South Africa. The sample was weighted based on the South African 2000 National census data, to be representative of the adult metropolitan population based on gender, age and race distribution. Trained field workers administered the questionnaire by conducting face-to-face interviews with South African consumers. The questionnaire was designed by a multidisciplinary team and contained a number of statements on eating habits, food and health.

Results

There were no practically significant differences in consumers' responses in terms of gender or age. Practically significant differences were found between different race and LSM groups for some variables. A small practically significant difference was observed among the races in statement 1, and between LSM 2 to 3 and LSM 7 to 10; and between LSM 4 to 6 and LSM 7 to 10 in statement 1 and statement 6. In statement 2, a small practically significant difference was observed between Whites and Coloureds. Statement 4 indicated a small practically significant difference between Blacks and Indians. A medium practically significant difference was found between LSM 2 to 3 and LSM 7 to 10 for statement 4. A small practically significant difference was evident between Whites and Blacks; and between Blacks and Coloureds in statement 6. A medium practically significant difference was found between Blacks and Indians in statement 6. The overall response of South African consumers towards the belief that food has an effect on health, that food can influence health and the development of some diseases, and that healthy food is only for people that have a disease, was very positive. However 56% of South African consumers do not want to have to think about disease when choosing food.

Conclusion

Results from this study reveal that South African consumers have some understanding of the diet-disease relationship and believe that there is some link between food and health. This belief however differs between age, gender, race and LSM group. However, more research with regards what influences people's eating behaviour, attitudes towards healthy food and beliefs about the diet-disease relationship needs to be done in South Africa.

Key words: Consumer, beliefs, food, health, disease

OPSOMMING

Motivering

Dieet en voeding is belangrike faktore in die bevordering en handhawing van goeie gesondheid deur die loop van die lewe. Die rol daarvan as determinante van chroniese nie-oordraagbare siektes is welbekend. Dieetveranderinge, beide positiewe en negatiewe, het 'n aansienlike uitwerking op gesondheid dwarsdeur die lewe. Verbruikers se bewustheid van die verband tussen dieet en siekte kan hulle stimuleer om meer te wil leer omtrent voeding en sodoende die nodige kennis op te doen vir dieetverbetering en siektevoorkoming.

Doelstellings

- Om Suid-Afrikaanse metropolitaanse verbruikers se menings en houdings insake die verband tussen voedsel en gesondheid te ondersoek.
- Om die demografiese kenmerke en menings van Suid-Afrikaanse verbruikers insake die verband tussen voedsel en gesondheid te ondersoek en om te bepaal of meningsverskille in hierdie verband tussen geslag, ras, ouderdomsgroep en Lewenstandaardmetings (LSM) bestaan.

Metodiek

Eenduisend negehonderd sewe-en-negentig Suid-Afrikaanse volwassenes (>16 jaar), wat die vier hoofrassegroepe van Suid-Afrika verteenwoordig, is deur gelaagde ewekansige monsterneming uit metropolitaanse areas in Suid-Afrika gekies. Die monster is beswaar, gebaseer op die Suid-Afrikaanse 2000 Nasionale sensusdata, om verteenwoordigend van die volwasse metropolitaanse bevolking op die basis van geslag, ouderdom en rasseverspreiding te wees. Opgeleide veldwerkers het die vraelys ingevul deur persoonlike onderhoude met Suid-Afrikaanse verbruikers te voer. Die vraelys is deur 'n multidissiplinêre span saamgestel en 'n aantal stellings insake eetgewoontes, voedsel en gesondheid is daarin vervat.

Resultate

Daar was geen prakties betekenisvolle verskille in verbruikers se antwoorde in terme van geslag of ouderdom nie. Prakties betekenisvolle verskille is tussen verskillende rasse- en LSM-groepe vir sommige veranderlikes gevind. 'n Klein prakties betekenisvolle verskil is waargeneem tussen die rasse in stelling 1, en tussen LSM 2 tot 3 en LSM 7 tot 10, asook tussen LSM 4 tot 6 en LSM 7 tot 10 in stelling 1 en stelling 6. In stelling 2 is 'n klein prakties betekenisvolle verskil waargeneem tussen Blankes en Kleurlinge. Stelling 4 het 'n klein prakties betekenisvolle verskil tussen Swartes en Indiërs getoon. 'n Medium prakties betekenisvolle verskil is gevind tussen LSM 2 tot 3 en LSM 7 tot 10 vir stelling 4. 'n Klein prakties betekenisvolle verskil is aangetref tussen Blankes en Swartes, en tussen Swartes en Kleurlinge in stelling 6. 'n Medium prakties betekenisvolle verskil is gevind tussen Swartes en Indiërs in stelling 6. Die algehele reaksie van Suid-Afrikaanse verbruikers op die mening dat voedsel 'n uitwerking op gesondheid het, dat voedsel gesondheid en die ontwikkeling van sommige siektes kan beïnvloed, en dat gesonde voedsel alleenlik nodig is vir mense wat 'n siekte het, was baie positief. Nietemin wil 56% van Suid-Afrikaanse verbruikers nie aan siekte hoef te dink wanneer hulle voedsel kies nie.

Slotsom

Resultate van hierdie studie toon dat Suid-Afrikaanse verbruikers wel 'n mate van insig in die verband tussen dieet en siekte het en glo dat daar wel 'n verband tussen voedsel en gesondheid bestaan. Hierdie mening verskil egter tussen ouderdom, geslag, ras en LSM-groep. Dit is duidelik dat daar 'n behoefte bestaan aan verdere navorsing insake die faktore wat mense se eetgewoontes beïnvloed, houdings teenoor gesonde voedsel en menings oor die verband tussen dieet en siekte in Suid-Afrika.

Sleutelwoorde: Verbruiker, menings, voedsel, gesondheid, siekte

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CHAPTER 1: PREFACE

Diet and nutrition are important factors in the promotion and maintenance of good health throughout the entire life course. Their role as determinants of chronic noncommunicable diseases is well established. This study investigates South African consumers' beliefs about the link between food and health.

1.1 Title

South African consumers' beliefs about the link between food and health

1.2 Aims and objectives

The aims and objectives of this dissertation were:

- **Main aim:** To investigate South African metropolitan consumers' beliefs and attitudes about the link between food and health.
- **Objectives:** To explore the demographic characteristics and beliefs of South African consumers regarding the link between food and health; and to investigate whether differences exist in this belief between gender, race, age group and Living Standard Measures (LSM).

1.3 Structure of the dissertation

This dissertation is presented in article format. The experimental work was in the field of consumer sciences. Following the preface chapter, Chapter 2 consists of a literature review. Chapter 3 consists of a manuscript on the South African consumers' beliefs regarding food and health (prepared for submission to the South African Journal of Clinical Nutrition). In Chapter 4, a general discussion and summary of all the results are provided, conclusions drawn and recommendations made. The

relevant references of Chapter 2, 3, and 4 are provided at the end of each chapter. The references at the end of Chapter 3 are presented according to the editors instructions of the specific journal to which the manuscript was prepared.

1.4 Authors contributions

The study reported in this dissertation was planned and executed by a team of researchers. The contribution of each of the researchers is highlighted below. Also included in this section is a statement from the co-authors confirming their individual role in the study and their permission that the article may form part of this dissertation.

Name	Role in study
Mrs L M Reid (B.A., Hons. B.Sc Dietetics)	Responsible for literature searches, processing of data, statistical analysis, interpretation of results and writing of manuscript. Main author of this paper.
Prof. J C Jerling (Ph.D Nutrition)	Supervisor. Critically reviewed paper.
Ms J M Badham (B.Sc Dietetics, Dip Hosp Diet.)	Responsible for designing questionnaire in co-operation with business partners and liaising with the market research company.

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

Prof. J C Jerling

Ms J M Badham

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This literature review provides background information related to the diet-disease relationship. It evaluates the influence of gender, race, age and Living Standard Measures (LSM) on consumer knowledge and beliefs in the diet-disease relationship, and addresses behaviour modification in an attempt to lower the risk of chronic diseases. It also investigates the role that functional foods have to play in this regard.

2.2 Diet-disease relationship

The diets people eat, in all their cultural variety, define to a large extent people's health, growth and development (WHO, 2003). The role of diet and nutrition in preventing and controlling morbidity and premature mortality resulting from noncommunicable diseases has been well established (WHO, 2003). Scientific evidence increasingly supports the view that alterations in diet have strong effects, both positive and negative, on health throughout life. Most importantly, dietary adjustments may not only influence present health, but may determine whether or not an individual will develop diseases such as cancer, cardiovascular disease, and diabetes (Variyam & Golon, 2002).

Chronic diseases such as diabetes, cancer and cardiovascular disease remain the main causes of premature death and disability in industrialised countries and in most developing countries (WHO, 2003). The awareness of a relationship between diet and health (diet-disease relationship) may stimulate consumer interest in learning more about nutrition and improving dietary eating habits. Attitudes and beliefs can play an important role in shaping eating behaviour (Frazao, 1999) and it has been demonstrated that knowledge of diet-health relationships has encouraged changes in

dietary habits (Bhaskaran & Hardley, 2002). As can be expected, belief about the diet-disease relationship varies among various demographic groups. Food and eating is seen in a different light depending on the gender of an individual (Saher *et al.*, 2004). Age and race group may also influence the beliefs and attitudes of consumers towards healthy eating and the diet-disease relationship.

2.2.1 Obesity and dietary intake

The increasing industrialisation, urbanisation and mechanisation occurring in most countries around the world has been associated with changes in dietary intake and behaviour (WHO, 2003). Diets are becoming richer in high-fat, high-energy foods and lifestyles are becoming more sedentary resulting in an increase in obesity (Shepherd, 2002). The World Health Organisation has emphasised that obesity is becoming a major health problem in many developing countries, particularly in adult women (WHO, 2003). This presents a significant threat to the emergence of noncommunicable diseases in the developing world. Obesity is associated with increasing risk of developing hypertension, coronary heart disease, diabetes, stroke and some forms of cancer in both African and white populations (Puoane *et al.*, 2002).

In the South African National Demographic and Health Survey, it was found that there is a trend toward higher levels of obesity in the urban setting compared with the nonurban setting, particularly for the African population (Puoane *et al.*, 2002). There is currently an increase in the rate of urbanisation among the African population in South Africa and this could impact significantly on obesity. In a study conducted by Peltzer, it was found that many South Africans consume too many kilojoules and too much fat (especially saturated fat), cholesterol and sodium, and insufficient complex carbohydrate and fibre (Peltzer, 2002). Bourne *et al.* indicated that urban blacks in South Africa have increased their fat intake from 16.4% to 26.2% of total energy (a

relative increase of 59.7%) while carbohydrates intakes have decreased from 69.3% to 61.7% of total energy (a relative decrease of 10.9%) in the past 50 years (Bourne et al., 2002). Large meals consisting of high-kilojoule foods, and between-meal snacks, were found to be the two dietary habits which are responsible for obesity in individuals (Peltzer, 2002). Ignorance of the kilojoule value of various foods is to some extent a contributory factor, so is poverty, for families with limited incomes have to buy cheap foods and these are usually high in saturated fat and carbohydrates.

The prevalence of obesity, in the age group 15 to 64 years, in 1988 in South Africa for black females was 44%, white females 18%, black males 8% and white males 15%. As assessed by the National Demographic and Health Survey, this seems to have increased over 10 years, since approximately 28% of men and 55% of women were found to be obese in South Africa (Puoane *et al*, 2002). White men and the most educated men are the most overweight or obese of all men in South Africa (Peltzer, 2002). The African urban women have the highest rate of obesity, while Asian women have the lowest rate (Peltzer, 2002). Recommendations to restrict salt and fat (especially saturated fat) intake and increase complex carbohydrate and fibre consumption are central to public nutrition health programmes to help decrease obesity.

2.2.2 Cardiovascular disease and dietary intake

Cardiovascular disease (CVD) is the leading cause of unexpected premature deaths in Western countries (WHO, 2003). Morbidity and mortality associated with CVD have great potential to be reduced by lifestyle changes, including dietary factors. Dietary factors believed to contribute to CVD include high consumption of saturated fats, salts and refined carbohydrates, as well as low consumption of fruits, vegetables, dietary fibre, fish and fish oils (WHO, 2003). Dietary factors that have been implicated in helping to prevent CVD include the increase in the consumption of

unsaturated fats, omega-3 fatty acids, fruits, vegetables, nuts and whole grains (WHO, 2003).

The National Heart Lung and Blood Institute (NHLBI) initiated the National Cholesterol Education Program in 1985 to help educate the public about the prevention of cardiovascular disease by lowering blood cholesterol through diet (Frazao, 1999). By 1995, over 60% of consumers identified saturated fat as a dietary factor related to heart disease (Frazao, 1999). According to the South African Heart Foundation, a desirable level of total blood cholesterol is generally accepted to be below 5.0mmol/L, yet it is estimated that 4.5 million South Africans have elevated total blood cholesterol levels way above this level (Biesman-Simmons, 2003). Saturated fatty acids raise total blood cholesterol and low-density lipoprotein (LDL) cholesterol. It has been indicated that the most effective replacement for saturated fatty acids in terms of cardiovascular disease outcome are polyunsaturated fatty acids, especially linoleic acid (WHO, 2003).

2.2.3 Hypertension and dietary intake

Hypertension is one of the major risk factors leading to an increased risk of stroke, myocardial infarction, end-stage renal disease, congestive heart failure and peripheral vascular disease. Of the many risk factors associated with hypertension, the dietary factor that has been investigated the most is daily sodium intake (WHO, 2003). According to the 1981 national survey by the National Heart, Lung and Blood Institute (NHLBI) only 12% of consumers were aware of a link between sodium consumption and hypertension in 1978. (Blumenthal, 1989). By 1982, following a FDA (Food and Drug Association) / NHLBI sponsored initiative to educate the public and encourage manufacturers to display sodium content on food labels, the proportion who mentioned sodium as a 'likely cause of high blood pressure' nearly tripled (Frazao, 1999).

In the Dietary Approaches to Stop Hypertension (DASH) trial, it was found that 8.5 servings or more of fruit and vegetables per day (particularly in combination with low fat dairy products) effectively lowers blood pressure in subjects with normal and high blood pressure (Appel *et al.*, 1997, Worsley 2000). It has also been shown that modifying fat intake not only with regard to saturated fats, but also ensuring an increased intake of omega-3 and omega-6 polyunsaturated fatty acids, has a protective effect on blood pressure (Appel *et al.*, 1997).

There is a high prevalence of hypertension in the black population in South Africa (Steyn *et al.*, 2001, Schutte *et al.*, 2004). The national prevalence of hypertension in South Africa blacks was 24.4% using the cut-off point of 140/90 mmHg (Bourne *et al.*, 2002). Many believe that the underlying cause of the decreased health status of black people is due to the Westernised lifestyles adopted in urban environments. The decline in health status among people adopting a more Westernised lifestyle has been reported in various studies in which low socio-economic status, altered diet, high alcohol intake, smoking and low levels of exercise seemed to be factors that could possibly have contributed to the altered state of health (Schutte *et al.*, 2004).

2.2.4 Cancer and dietary intake

Researchers estimate that poor diets account for over 300 000 deaths a year and that about 35 percent of cancer deaths are attributable to poor diet, making diet second only to tobacco as a theoretically preventable cause of cancer (Rodolfo & Nayga, 2000). The awareness of a diet-disease relationship for cancer has increased significantly in recent years, but it remains at a lower level than for cardiovascular disease (Frazao, 1999). In 1984, consumers were most likely to mention food additives as dietary factors related to cancer. Later, when dietary fibre received considerable attention from both public health authorities such as the National

Cancer Institute, dietary fibre was the most frequently mentioned dietary factor for preventing cancer. More recently, fruits and vegetables have received increasing recognition, with the National Cancer Institute promoting its 'five-a day' campaign. By 1995, one in three consumers mentioned fruits or vegetables as a dietary factor for preventing cancer, nearly three times as many as mentioned dietary fibre (Frazao, 1999). Research to date has however revealed few definite relationships between dietary intake and cancer risk (WHO, 2003).

2.2.5 Diabetes Mellitus and dietary intake

Type 2 diabetes results from an interaction between genetic and environmental factors. Lifestyle modification is the cornerstone of both treatment and attempts to prevent type 2 diabetes. Environmental as well as genetic factors appear to be involved in type 1 diabetes but there is no convincing evidence of a role for lifestyle factors which can be modified to reduce the risk (WHO, 2003). The association between excessive weight gain, central adiposity and the development of type 2 diabetes is convincing (WHO, 2003). A high saturated fat intake has been associated with a higher risk of impaired glucose tolerance, and higher fasting glucose and insulin levels. Higher unsaturated fatty acids from vegetable sources and polyunsaturated fatty acids have been associated with a reduced risk of type 2 diabetes (WHO, 2003).

2.2.6 Osteoporosis and dietary intake

Osteoporosis is a disease affecting millions of people around the world. It is characterised by low bone mass and micro—architectural deterioration of bone tissue, leading to bone fragility and a consequent increase in risk of fracture (WHO, 2003). Diet appears to have only a moderate relationship to osteoporosis, but calcium and vitamin D are both important, at least in older populations. Many other nutrients and dietary factors may be important for long-term bone health and the prevention of osteoporosis. Among the essential nutrients, plausible hypotheses for

involvement with skeletal health, based on biochemical and metabolic evidence, can be made for zinc, copper, manganese, boron, vitamin A, vitamin C, vitamin K and B vitamins, potassium and sodium (WHO, 2003).

There is little known regarding the bone health of older blacks in South Africa, however one study reported that the prevalence of hip fractures in blacks in South Africa was about tenfold lower than that seen in white women. It also indicated a low prevalence of osteoporosis and related conditions in black populations who consume little dietary calcium and vitamin D (Walker & Charlton, 2001). This finding is interesting and warrants further investigation.

2.3 Functional Foods and the diet-disease relationship

Functional foods provide a new way of expressing healthiness in food choices by promising specific effects caused by particular food products. A food can be regarded as functional 'if it is satisfactorily demonstrated to beneficially affect one or more target functions in the body, beyond adequate nutritional effects' (Saher *et al*, 2004). Functional foods differ from conventional foods in a number of ways. Firstly, conventional 'healthy' foods are typically presented as types of foods contributing to a healthy diet eg. low fat products, high fibre foods, fruits and vegetables, without emphasising the role of any single product. In functional foods, particular components are directly connected with well-defined physiological effects and the health benefit is linked to a single product (Urala & Lähteenmäki, 2004). Usually scientifically proved substantiation about the health effect is required when manufacturers develop specific, functional products. Secondly, functionality creates a novelty aspect on the food without necessarily changing the sensory quality of the product (Urala & Lähteenmäki, 2004). Thirdly, the manufacturer of functional foods often requires modern food technology, since a constituent needs to be added, removed or modified (Urala & Lähteenmäki, 2004).

Functional foods can help in addressing specific consumer needs and can contribute to the improvement of public health (Weststrate et al., 2002). Relatively little is known about consumers' associations and responses to functional foods but it is believed that consumers may have a different image in their minds about functional foods compared to conventional healthy products (Saher *et al.*, 2004).

2.3.1 Functional foods and the consumer

Knowledge, attitudes and beliefs have been indicated to explain a large part of the variations in consumer decision-making and acceptance towards functional foods (Verbeke, 2004). A belief in the health benefits of functional foods has also been found to correlate positively with accepting functional foods (Verbeke, 2004). Multiple conceptualisations of beliefs in the context of functional foods have been examined extensively. These include a belief in one's impact on personal health, health benefit beliefs, belief in the food-disease prevention concept, belief in the disease-preventative nature of natural foods and the opinion of the relationship between food and health (Verbeke, 2004).

In the IFIC 1999 report of a qualitative study, it was demonstrated that knowledge and beliefs are the major motivations for either purchasing and consuming, or for not yet having adopted functional foods in the diet (IFIC, 1999). Furthermore, IFIC pointed to a lack of knowledge as the major reason for not consuming functional foods (IFIC, 1999). Functional foods presumably enable the consumer to lead a healthier life without changing eating habits (Grunert *et al.*, 2000). It has been shown that American consumers' perceptions of the healthiness of functional foods are rather based on prior belief about the type of base product than on the specific health claims (Grunert *et al.*, 2000).

Childs identified the USA functional food consumer as being women, well educated, higher income class in a broad 35-55 age group (Childs, 1997). A more recent quantitative study by IFIC (1999) reported that women, college graduates and consumers aged 45 – 74 are most likely to have adopted functional foods in their diets (IFIC, 1999). Gilbert (1997) reported a higher proportion of 55+ individuals and college educated among the functional food users in the USA (Gilbert, 1997). The latest quantitative follow up study from IFIC (2000) confirmed that the largest consumer group using functional foods to target a specific health concern consists of 55+ individuals (IFIC, 2000).

2.3.2 Positioning functional foods in the market

Although recent research has shown that growing consumer knowledge about the relationship between diet and health has resulted in a market that should be ready for functional foods, the results of the first functional foods on the market have been mixed. The functional food market has been driven by many influences such as changing consumer attitudes and expectations, and growing the understanding of the link between dietary constituents and physiological processes (Hilliam, 1998). The success of functional foods relies on a number of inter-relating factors. These include consumers level of concern about general health and different medical conditions, belief in the possibility of influencing one's own health through diet and an awareness of knowledge of the foods/ingredients that should be of benefit (Hilliam, 1998).

Economic and social consequences as well as experience with relatives' loss of good health have been reported to act as incentives to adopt disease preventative food habits. Due to the fact that prevention is a major motivation of functional food use, it can be hypothesised that experience with illness increases probabilities of functional food acceptance. Studies have indicated that age, gender, education, presence of

young children, and the presence of ill family members emerge as socio-demographic determinants of functional food acceptance (Gilbert, 1997).

Functional foods are slowly beginning to make an impact in the market. Their success however, will depend on credible science with thorough consumer understanding in the diet-disease relationship, uncompromised taste and convenience. It is also very important to successfully communicate the health benefits to the consumer and for the market to understand who the 'functional food consumer' is.

Changes in consumer beliefs, attitudes and responses to the consumption of functional foods will impact on the food industry (Bhaskaran & Hardley, 2002). Within the food industry, there is a need for further research into consumer behaviour. The competitive environment for functional foods has been reported to suffer from a lack of data and understanding of consumer market segments (Gilbert, 1997). For greater acceptance of functional foods as a means of disease prevention and control, there must be a symbiotic relationship between manufacturers and health and government organisations in providing legitimacy and encouraging preventative health behaviours. To better understand what drives consumers to choose or not to choose functional foods, their attitudes behind food choices and their beliefs about the link between food and health need to be extensively explored.

2.4 Factors influencing consumers beliefs about the diet-disease relationship

2.4.1 Gender

Research indicates that women are significantly more likely than men to be strong believers of the health benefits of foods (Childs & Poryzees, 1998). In general, women have been shown to be more reflective about food and health issues and

have demonstrated a greater interest in healthy eating (Verbeke, 2004). In a recent study, approximately 40 percent of respondents displayed a strong interest in regularly purchasing a food or food products that can help prevent disease and enhance health (Childs & Poryzees, 1998). As with believability, women showed stronger purchase interest in food that can help prevent disease compared to men. Overall purchase interest is also significantly higher in women than men (Childs & Poryzees, 1998). This may be as a result of women being the primary food shopper for the household and therefore responsible for food selection.

In a study of adults and college students from Flemish, Belgium, France, USA and Japan, the group that generally associated food most with health and least with pleasure was the Americans, and the group most food-pleasure orientated and least food-health orientated was the French (Rozin *et al.*, 1999). In all four countries, women as opposed to men show a pattern of attitudes that is more like the American pattern, and less like the French. (Rozin *et al.*, 1999). In this study, the strongest belief in the diet-health link was achieved by Japanese adult females. The weakest diet-health link belief was seen in the French adult males (Rozin *et al.*, 2003). The study concluded that there is a small consistent tendency for women and adults to hold stronger diet-health beliefs than men or college students.

Depending on the diet-health claim of food products, men and women may have different interests and beliefs in functional foods (Saher *et al.*, 2004). Men, for example, may be more interested in foods that have energy boosting effects compared to women (Saher *et al.*, 2004). However, for the present, very little knowledge about the impressions consumers actually have about functional foods is available (Saher *et al.*, 2004). The gender differences in the diet-disease belief may be due to the generally acknowledged greater concern for issues of nurturance in women. The greater health concern women have, with respect to food, may be

related to the fact that in most countries, women bear a greater responsibility for selecting and preparing food for the family.

2.4.2 Race

Food habits play an important role in cultures and traditions (Pollard, 2002). Food choice decisions are said to be built on cultural and traditional practices (Pollard, 2002). In a study conducted by Childs & Poryzees (1998) the belief in the diet-disease relationship was less among Hispanics than among Whites or Blacks. Hispanics may have a greater problem with understanding the health benefits of good nutrition because of the language barriers preventing them from gaining access to public health information (Childs & Poryzees, 1998). The study suggested that Hispanics are therefore less inclined to believe that a diet-health link actually exists (Childs & Poryzees, 1998). It was found in another study that the awareness of health consequences associated with fat, saturated fat, vitamins, sodium and energy balance was greater with educational level, and was higher among Whites than African-Americans (Papkonstantinou *et al*, 2002). It can be suggested that race and cultural beliefs play a significant role in the belief of the diet-health relationship.

2.4.3 Age Group

It has been postulated in research that general health interest in food related matters increases with age (Saher *et al.*, 2004). One study demonstrated that older age participants (> 55 years) were more aware than younger participants of diet-health relationships and indicated that the older age participants had changed their dietary habits and purchase behaviour due to this belief (Bhaskaran & Hardley, 2002). This age group also demonstrated the most significant switching behaviour to functional foods and seemed less sceptical of manufacturer claims (Bhaskaran & Hardley, 2002). Younger age consumers were found to be less likely to switch to functional foods as a major disease preventative initiative (Bhaskaran & Hardley, 2002). This obviously has major concerns and implications for the food industry.

Older age participants (> 55 years) tended to make food choices and decisions that could be described as preventative (Bhaskaran & Hardley, 2002), whereas younger age participants tended to choose food based on price, taste and promotional offer. The behaviour of older age participants could be influenced by their perceived vulnerability as a result of seeing more sick people around them and their awareness that they are at higher risk than younger individuals of chronic diseases. In this study, younger age participants indicated that problems such as bowel cancer and cholesterol were not pre-eminent health concerns for them and therefore were quicker in switching to low fat products for weight loss compared to consuming high fibre and calcium fortified foods for health (Bhaskaran & Hardley, 2002). Another study indicated that there is a significantly higher belief in the health benefits of foods among respondents aged 35 – 64 years compared to younger or older age groups (Childs & Poryzees, 1998).

2.4.4 Socio-economic status

A study concluded that respondents in higher income groups display higher levels of the diet-health belief than those in lower income groups, and that education has a positive relationship with belief in the functional food promise, that is, believability increases as education level increases (Childs & Poryzees, 1998). Another study indicated that although people on a lower income spend less money, a greater percentage of their income is spent on food. Potentially, this has important implications for the likelihood of them adopting healthy eating practices. It was found that people on a lower income were eating more red meat, hamburgers, sausages, whole milk, white bread and chips and less fruit and vegetables, low-fat milk, lean meat and whole-wheat bread (Shepherd *et al*, 1996). There may be some cause for concern in relation to the healthiness of the diet in this group.

Shepherd *et al.* (1996) state that positive attitudes towards eating a healthy diet are expressed by people of all income levels and, therefore, it would seem to be unlikely that general attitudes towards healthy eating were the major determinant of differences between the diets of higher and lower income groups. They found that a change in income has a destabilising effect on food habits. When there is a decrease in income, it will lead to a change in the variety and quantity of foods eaten. If there is a long-term reduction in income, it may lead to a greater proportion of income being spent on food, but a reduction in intake of several foods currently recommended for a healthy diet. In contrast, an increase in income did not necessarily lead to increased expenditure on food nor improved diet quality overall (Shepherd *et al.*, 1996).

The South African Advertising Research Foundation (SAARF) classifies people according to their living standards using criteria such as degree of urbanisation, ownership of cars and major appliances (Haupt, 2003). The SAARF LSM is uniquely South African and divides the South African population into ten groups, from LSM 1 ranked at the bottom to LSM 10 ranked at the top. There are many variables that are considered when classifying people into various LSM groups. Income is one of these variables that can be used to estimate the socio-economic status of an individual. It must be stressed that many variables need to be considered when classifying an individual into an LSM group.

2.4.5 Attitudes

Attitudes are predicted as the result of the consequences people expect from the behaviour (beliefs) and the way people value those expected consequences (the importance of the belief). Attitudes can be quantitatively determined as the sum of measures of a set of relevant beliefs (eg. the extent to which eating a given food is believed to reduce heart disease risk) weighted by the corresponding evaluation of

these beliefs (eg. the perceived importance of eating foods which reduce heart disease risk) (Stubenitsky & Mela, 1999).

Attitudes represent an individual's subjective feelings about an issue or an object. Many behavioral theorists consider attitudes to be crucial predictors of behaviour. Knowledge may provide an individual with the information necessary to implement a behaviour change, whereas attitudes may determine whether the individual is motivated to actually implement that change. Negative attitudes about some of the perceived consequences of changing dietary behaviour may be barriers to positive dietary change (Frazao, 1999). Attitudes frequently assessed by nutrition surveys include belief in the relationship of diet and health, the importance of nutrition compared with other food attributes, the importance of following specific dietary guidelines and perceived barriers to dietary change (Frazao, 1999).

2.5 Behaviour modification to lower risk of noncommunicable diseases

Socio-economic differences in health behaviours are associated with a number of factors such as childhood background, education, material hardship and social integration. Some of these factors influence attitudes, beliefs in health benefits, self efficacy and perceived barriers to healthy choices (Wardle & Steptoe, 2002). Nutrition knowledge encompasses both health-oriented and food-related principles (Frazao, 1999). Health-oriented principles can provide a deeper understanding of diet-health relationships than simple awareness, thus improving an individual's ability to understand and implement dietary change (Frazao, 1999). Food-related principles facilitate dietary improvement by providing relatively simple decision rules for consumers to use when making food choices. Although aware of the diet-disease relationships, consumers may have an erroneous perception of the nutrient adequacy of their diets (Frazao, 1999). In the 1994-95 Diet and Health Knowledge Survey (DHKS), of the respondents that said their diets were about right in calcium,

only 38% met the 1989 RDA for calcium (Frazao, 1999). It cannot be assumed that simply by increasing awareness of diet-disease relationships, dietary change will always occur. There are other influential factors that need to be considered when shaping dietary change (Armitstaed, 1998).

Generally, students seem to have below average nutrition knowledge levels. Gracey et al. studied nutritional knowledge, beliefs and behaviours among Australian secondary school students, and found that ignorance about the nutrient content of food was recognised as a barrier to change (Gracey et al., 1996). Steptoe, Pollard and Wardle indicate that effective modification of dietary patterns depends on an understanding of the factors governing food choices (Steptoe et al., 1995). However, Peltzer indicates that choosing everyday foods is not associated with dietary recommendations, source of nutrients and diet-disease relationships (2002). This seems to confirm that nutrition knowledge does not influence the choice of everyday foods. Some of the factors include taste or sensory appeal, weight control, stress and negative emotions (Peltzer, 2002).

Food choice and dietary change, like any complex human behaviour, are influenced by many interrelating factors such as personal attitudes, environmental factors, social and cultural factors (Shepherd, 1999). The antecedents to preventative health care behaviour are motivation, knowledge and consciousness. These are mediated by self efficacy (a belief that target behaviour that mitigate health threat's can be successfully implemented). response efficacy (the extent to which a person believes a particular health care action mitigates a health threat) and health value (an individual's assessment of benefits relative to costs in engaging in preventative health care behaviour). Contrary to some literature, consumers with greater health knowledge do not exhibit greater levels of general preventative health care

behaviours. Education is critical to promoting health-promoting behaviours (Bhaskaran & Hardley, 2002).

For some consumers, the gap between optimal and actual diet may be a result of misperceptions about diet quality. Although consumers may be aware of the relationships between diet and disease, many consumers have an erroneous perception of the nutritional adequacy of their own diets. Another reason for the gap between actual and healthful diet is that some consumers may maximise satisfaction through unhealthy food choices. Given their preferences over a wide variety of food attributes, including taste, convenience, familiarity and health benefits, some consumers choose to consume unhealthy foods, even when their knowledge of health and nutrition is high. Information will continue to play an important role in influencing consumer food choices. With the expansion of the internet and other sources of information, the potential to educate more consumers about the link between diet and health is growing, thereby increasing the potential for substantial reductions in nutrition-related diseases (Variyam & Golon, 2002).

Results of a survey conducted among employers at Arthur D Little, Inc. concluded that the vast majority of employers believed the diet-disease prevention link but did not necessarily change their diets for the specific types of dietary recommendations that they were aware of. In addition, employers stressed that their acceptance of nutritional information was dependent on consistent and repeated exposure to the message by a credible source (Childs & Poryzees, 1998). In a separate study, all participants indicated that the most trusted sources of advice on nutrition and diet-health relationships are doctors, dietitians, educational institutions and family members. Participants said that most of their basic knowledge on diet and healthy eating came from their mothers and from school and indicated that information of

accreditation from organisations such as the Heart Foundation increased the reliability and trust worthiness of the information (Bhaskaran and Hardley, 2002).

Most respondents in the study (80%) claimed that they do not trust manufacturer claims. Their purchase decision was based on the hope that the product had a therapeutic attribute but they did not necessarily believe that it would help with an existing health problem (Bhaskaran & Hardley, 2002). This may have an enormous impact on the success of functional foods.

Education, law and marketing all have a role to play in managing and changing consumer behaviour, and policy makers need to adopt an integrated approach in their behavioural change strategies (Bhaskaran & Hardley). It is important that a multidisciplinary team consisting of health organisations, government and the food industry be involved in food and health policies. It has been concluded that consumer self interest motivates behaviour change and more importantly that the benefits of behaviour changes need to be evident or, if not, at least soon become obvious for behaviour changes to take place and be sustained (Bhaskaran & Hardley, 2002).

2.6 Conclusion

The phrase "You are what you eat" is literally true. Food contains a variety of nutrients that are essential if the body is to function effectively. Nutrients are required to perform a particular role(s) in the body including growth and repair, heat and energy and protection from disease. It is important that the food an individual eats provides a combination of nutrients for bodily functions and protection against diet related diseases.

Changing needs and lifestyles, the link between diet and disease, dietary guidelines and media attention, have all stimulated great interest in nutrition. Trends in society have an influential effect on consumer choice and demand. Healthy living is a term

frequently used, with the benefits of exercise, a healthy diet, reduction in alcohol and stress management. Life expectancy has increased and people want to lead an active and healthy lifestyle in the latter part of their lives. The growing incidence of chronic disease as a major cause of death in today's society has increased research interest in this area. Although mainly based on epidemiological studies, such research has emphasized the relationship between diet and disease. This has caused concern among consumers, motivating them to become aware of dietary requirements and the diet-disease relationship. Dietary guidelines have been introduced in an effort to tackle these problems.

Noncommunicable diseases are largely preventable diseases. Although more research may be needed on some aspects of the mechanisms that link diet to health, the currently available scientific evidence provides a sufficiently strong basis to justify taking action and to educate and motivate consumers on healthy eating (WHO, 2003). Beyond the appropriate medical treatment for those already affected, the public health approach of primary prevention is considered to be the most cost-effective, affordable and sustainable course of action to cope with the chronic disease epidemic worldwide. The adoption of a common risk-factor approach to chronic disease prevention is a major development in the thinking behind an integrated health policy (WHO, 2003). While age, gender and genetic factors are non-modifiable risk factors, many of the risks associated with age and gender are modifiable. Such risks include behavioural factors (eg. diet, physical activity, tobacco use, alcohol consumption), biological factors (eg. dyslipidaemia, hypertension, overweight) and societal factors such as a mixture of socioeconomic, cultural and other environmental parameters (WHO, 2003).

The food industry has increasingly realised that functional foods have the potential to add value to their business. While the precise size of the functional food market is

difficult to determine, there is general agreement that it has large potential for growth. Consumers believe more and more that foods contribute directly to their health. This increasing consumer awareness in combination with advances in various scientific areas, provides companies with unique opportunities to develop an almost infinite array of new functional food concepts. However, despite considerable promotional expenditure and effort being put into explaining the health benefits of functional foods to consumers, many products have faced problems on the market (van Kleef *et al*, 2002). It is therefore of great importance for food companies to understand the beliefs and attitudes of consumers with regards functional foods and to explore the various demographic differences in the belief of the diet-disease relationship.

The aim of this study was to explore the demographic characteristics and beliefs of South African consumers regarding the link between food and health. The results obtained are of public health importance and can be used by the South African government to initiate target programmes and dietary guidelines for target groups. Food companies may use the results for a more individualised and specific target group approach when developing functional foods and marketing companies may find the information beneficial for targeted marketing programmes. All healthcare professionals will find the information relevant for continued education and better insight into South African consumer beliefs about the link between food and health.

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CHAPTER 3: ARTICLE

SOUTH AFRICAN CONSUMERS' BELIEFS ABOUT THE LINK BETWEEN FOOD AND HEALTH

LM Reid, JM Badham, JC Jerling

3.1 Summary

Objectives: To investigate South African consumers' beliefs about the link between food and health; and to evaluate whether differences exist between gender, age, race and LSM (Living Standard Measure) groups with regards consumers' beliefs about the link between food and health.

Methodology: One thousand nine hundred and ninety seven South African adults (≥ 16 years), representing the four major race groups of South Africa, were selected by stratified random sampling from metropolitan areas in South Africa. The sample was weighted based on the South African 2000 National census data, to be representative of the adult metropolitan population based on gender, age and race distribution. Trained field workers administered the questionnaire by conducting face-to-face interviews with South African consumers. The questionnaire was designed by a multidisciplinary team and contained a number of statements on eating habits, food and health. The following statements were selected to evaluate South African consumers' beliefs about the link between food and health: 1. The food you eat can influence the development of diseases, 2. Some food types can actually make me healthier, 3. Some food types can actually prevent the development of some diseases, 4. Healthy food is only for people that already have a disease, 5. I don't want to have to think about disease when I chose my food and 6. I don't believe food can have an effect on my health. Analysis of variance with post hoc analysis was

performed. In addition, the practical significance of statistically significant differences between groups was assessed.

Results: There were no practically significant differences in consumers responses in terms of gender or age. Practically significant differences were found between different race and LSM groups for some variables. A small practically significant difference was observed among the races in statement 1, and between LSM 2 to 3 and LSM 7 to 10; and between LSM 4 to 6 and LSM 7 to 10 in statement 1 and statement 6. In statement 2, a small practically significant difference was observed between Whites and Coloureds. Statement 4 indicated a small practically significant difference between Blacks and Indians. A medium practically significant difference was found between LSM 2 to 3 and LSM 7 to 10 for statement 4. A small practically significant difference was evident between Whites and Blacks; and between Blacks and Coloureds in statement 6. A medium practically significant difference was found between Blacks and Indians in statement 6. The overall response of South African consumers towards the belief that food has an effect on health, that food can influence health and the development of some diseases, and that healthy food is only for people that have a disease, was very positive. However 56% of South African consumers do not want to have to think about disease when choosing food.

Conclusion: Results from this study reveal that South African consumers have some understanding of the diet-disease relationship and believe that there is some link between food and health. This belief however differs between age, gender, race and LSM group. However, more research with regards what influences people's eating behaviour, attitudes towards healthy food and beliefs about the diet-disease relationship needs to be conducted in South Africa.

Key words: Consumer, beliefs, food, health, disease

Short title: Consumers' beliefs, food and health

3.2 Introduction

One of the largest trends gaining momentum in the United States is an increasing awareness of the role of diet and proper nutrition, to maintain health and prevent disease.¹

Nutrition is concerned with the relationship of food and health, and nutrition knowledge can encompass both health and food-related principles. Health-orientated principles can provide a deeper understanding of diet-health relationships, thereby improving an individual's ability to understand and implement dietary change.² The awareness of a diet-disease relationship may stimulate interest in learning about nutrition and healthy eating habits, thus acting as a step in acquiring the knowledge necessary for dietary improvement and disease prevention.²

Beliefs and attitudes are strongly founded in cultural values. Attitudes are predicted as the result of the consequences people expect from the behaviour (beliefs) and the way people value those expected consequences (the importance of the belief). Attitudes can be quantitatively determined as the sum of measures of a set of relevant beliefs.³ Changes in consumer beliefs, attitudes and responses to the consumption of healthy foods, and in particular functional foods could impact largely on the food industry and may influence product development.⁴

The South African Advertising Research Foundation (SAARF) classifies people according to their living standards based on wealth, access to facilities and geographic indicators.⁵ The SAARF LSM divides the South African population into ten groups, from LSM 1 ranked at the bottom to LSM 10 ranked at the top.⁵ For the purpose of this study, the LSM's were grouped together based on personal convenience and not for any specific theoretical reasons. LSM 1 is not included in

this study because there are no people in LSM 1 living in metropolitan areas. It is important to note that LSM 2 to 3 is made up of two race groups only and this may have influenced the response and associated differences between LSM groups in all questions.

This study is the first consumer study to investigate South African consumer beliefs about the link between food and health. It focuses on the influence of gender, age, race and LSM (Living Standard Measures) groups on consumers responses towards food and health.

3.3 Methods

Subjects

One thousand nine hundred and ninety seven South African adults (≥ 16 years), representing the four major race groups of South Africa, were selected by stratified random sampling from metropolitan areas from the nine provinces in South Africa.⁶ The total population represented both genders and major race groups from LSM 2 to 10. The racial split of the sample is an accepted sampling size that allows for analysis and an acceptable sample error. The sample was based on the 2000 National census data of South Africa and was weighted before analysis took place. Weighting of the data ensures that the sample is representative of the South African population and that the results can be extrapolated to reflect the adult metropolitan population based on gender, age, LSM and race distribution.

The sample was stratified by province and within province, by community size, city, township and suburb. Within each group, sampling points were determined by a systematic random selection, based on cumulative population figures per group. A starting point per sample point was selected at random. A low integer was randomly selected and the first interview took place at the house with the lowest number

ending in the low integer. Every third household was chosen until a cluster of 5 was completed. When there was more than one household on a stand, one was randomly selected. Within a household, all qualifying members of the household were listed and the qualifying respondent determined by a random selection grid. Every effort was made to interview this individual. If this was impossible after three calls (including weekend and night calls) or if the individual refused to participate, another individual of the same gender, age, and working status, living in the same street, was selected to be interviewed.

The face-to-face interview was carried out in the respondents home, in the preferred language of the respondent. The language of the questionnaire was English, but it was translated into other languages by a translator whose home language matched the one into which the questionnaire was being translated. This version was then re-translated into the base language by someone whose home language was the base language. In this way translation errors could be identified and corrected. Trained field workers, with a minimum matric education, administered the questionnaire. A minimum 20% back-check, either by personal visit or telephonic call, was made by the team supervisor to ensure reliability and validity of the data collected by the interviewer.

Questionnaire

The questionnaire consisted of a number of statements and was designed by a team of researchers and business partners. One of the sections contained statements on eating habits, food and health. Out of this section, six statements were selected to evaluate South African consumer beliefs about the link between food and health (Table 3.1).

TABLE 3.1: STATEMENTS USED FOR STATISTICAL ANALYSIS

The food you eat can influence the development of diseases
Some food types can actually make me healthier
Some food types can actually prevent the development of some diseases
Healthy food is only for people that already have a disease
I don't want to have to think about disease when I chose my food
I don't believe food can have an effect on my health

Consumers' opinions were evaluated on a five-point Likert scale (Table 3.2), indicating 'very likely', 'likely', 'neither likely nor unlikely', 'unlikely' and 'very unlikely'.

TABLE 3.2: THE FIVE-POINT LIKERT RESPONSE SCALE

Response	Scale
Very unlikely	1
Unlikely	2
Neither likely nor unlikely	3
Likely	4
Very likely	5

The variables that were investigated for each of the statements in the questionnaire were gender, race, age and Living Standard Measures (LSM). The variables were subdivided into groups as indicated in Table 3.3.

TABLE 3.3: VARIABLES AND THEIR SUBGROUPS USED IN THE STUDY

Variable	Subgroups			
GENDER	Men		Women	
RACE	White	Black	Coloured	Indian
AGE	16-29		30-49	
			50-65+	
LSM	2 to 3		4 to 6	
			7 to 10	

LSM = Living Standard Measure

Statistical analysis

The data collected by the contracted field workers was captured manually and transferred into a computer database using the computer software package Quanvert. The quantitative data was stored as an ASCII flat file and later loaded onto the computer software package Statistica[®] 6.0.⁷ for analysis. One thousand nine hundred and ninety seven questionnaires were used to analyse the data. The data was weighted so that it represented the total South African metropolitan consumer population. Cross tabulations were carried out for the different variables to examine frequencies of observations that belong to specific combinations of categories on more than one variable. Descriptive statistics was done to calculate the means and standard deviation (SD) of variables and subgroups for each statement. One-way ANOVA (analysis of variance) was performed on the weighted data of the different variables to determine if statistical significant differences ($p < 0.05$) existed between the means of the variables. The Tukey Honest Significant Difference test for unequal numbers was used as post hoc test to determine the significant differences between group means. To determine if statistically significant differences were also of practical significance a procedure described by Steyn was used.⁸ Practically significant differences can be interpreted as a large enough difference to have an effect in practice. Practical significance was calculated as the standardised difference

between two means divided by the estimate for standard deviation, for means that differed significantly in the study. This measure is called the effect size (d), which not only makes the difference independent of units and sample size, but also relates to the spread of the data.⁸Further calculations were made to determine where the practically significant difference existed between groups. This calculation yielded a d-value of which the effect size could be interpreted as follows: no practical significance $d \leq 0.29$; small practical significance $d = 0.3 - 0.49$; medium practical significance $d = 0.5 - 0.79$ and large practical significance $d \geq 0.8$.^{9,10}

3.4 Results

Although statistical analyses were performed on the five-point Likert response scale, results given as percentages have been reported using a three response scale, namely: 'likely', 'neither likely nor unlikely' and 'unlikely', which were obtained by combining 'very likely' with 'likely' and 'very unlikely' with 'unlikely'. Practically significant differences and statistically significant results have been reported. Figure 3.1 represents the percentage, mean and standard deviation (\pm SD) response of the total population of South African consumers to the six selected statements. The closer the mean value is to 5 the more likely the belief and the closer to 1 the less likely the belief in the particular statement. In Table 3.4 the respective mean response of the different variables and subgroups are given for each selected statement.

Figure 3.1: South African consumers' beliefs about the link between food and health

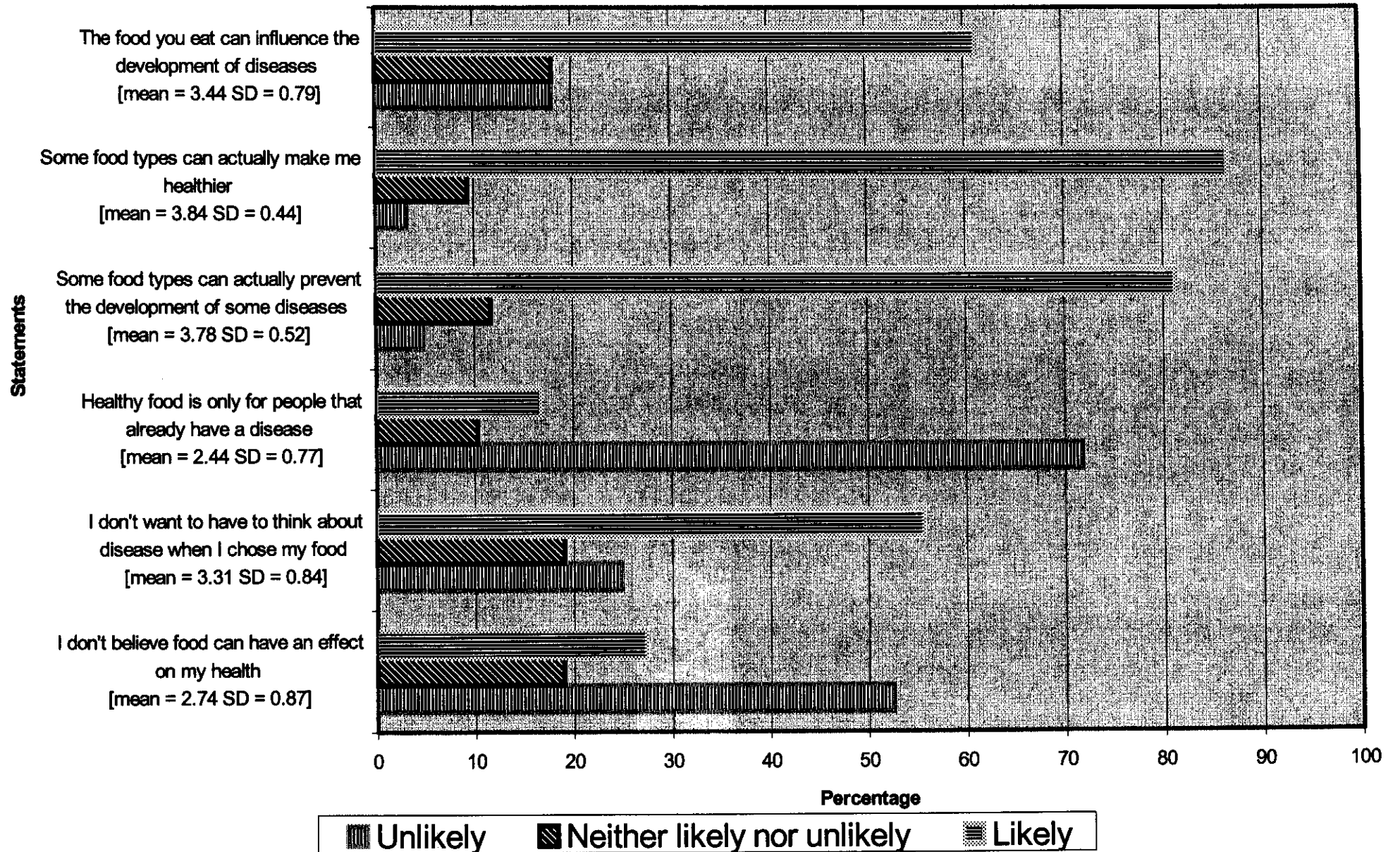


Table 3.4

South African consumers beliefs about the link between food and health

Variables	Food can influence the development of diseases	Some food types can make me healthier	Some food types can prevent diseases	Healthy food is only for people that have a disease	Don't want to think about disease when choosing food	Don't believe food can have an effect on my health
	Mean	Mean	Mean	Mean	Mean	Mean
Gender						
Male (n=5423)	3.52 [@] n=5296	4.27 n=5355	4.14 n=5274	2.13 n=5351	3.44 n=5407	2.61 [@] n=5359
Female (n=5272)	3.65 [@] n=5107	4.29 n=5232	4.16 n=5170	2.15 n=5218	3.40 n=5249	2.69 [@] n=5216
Race						
White (n= 2615)	3.80 ^a n=2573	4.21 ^{@a} n=2578	4.05 ^{@s} n=2543	1.96 ^{@s} n=2607	3.43 [#] n=2615	2.3 ^a n=2607
Black (n = 6252)	3.43 ^{abc} n=6052	4.27 ^{@#} n=6198	4.18 [@] n=6119	2.28 ^{@#a} n=6146	3.37 [@] n=6224	2.88 ^{abA} n=6151
Coloured (n=1255)	3.79 ^b n=1223	4.48 ^{a#*} n=1243	4.24 ^{##} n=1223	1.99 ^{*#} n=1243	3.65 ^{##@s} n=1244	2.41 ^b n=1249
Indian (n= 573)	3.79 ^c n=555	4.29 [*] n=568	4.10 [#] n=559	1.77 ^{##a*} n=573	3.33 ^s n=573	2.25 ^A n=568
Age						
16-29 (n= 4126)	3.58 n=4006	4.27 ^s n=4093	4.17 ^s n=4063	2.24 ^{@#} n=4091	3.51 ^{@#} n=4120	2.73 ^{##} n=4086
30-49 (n= 4346)	3.58 n=4230	4.32 ^{s@} n=4302	4.16 [@] n=4235	2.07 [@] n=4299	3.38 [@] n=4323	2.63 ^{##@} n=4315
50-65+ (n= 2223)	3.60 n=2167	4.23 [@] n=2192	4.10 ^{s@} n=2146	2.06 [#] n=2179	3.32 [#] n=2213	2.53 ^{s@} n=2174
LSM Group						
2 to 3 (n=1079)	3.36 ^a n=1055	4.29 n=1066	4.12 n=1060	2.53 ^{@A} n=1045	3.53 ^{##@} n=1071	2.93 ^a n=1057
4 to 6 (n= 5649)	3.45 ^b n=5465	4.28 n=5591	4.19 [@] n=5521	2.2 ^{@#} n=5571	3.40 [#] n=5629	2.82 ^b n=5560
7 to 10 (n= 3967)	3.83 ^{ab} n=3883	4.28 n=3930	4.11 [@] n=3863	1.94 ^{A#} n=3953	3.41 [@] n=3956	2.33 ^{ab} n=3958

KEY

Number Mean value on a 5 point response scale for each separate statement, where: 1 = Very unlikely; 2 = Unlikely; 3 = Neither likely nor unlikely; 4 = Likely; 5 = Very likely

@, #, \$, * Means from groups for a particular statement with a symbol in common differ statistically from one another (p<0.05).

Alphabetical Indicates that the result between the two groups with the same letter was both statistically significant and practically significant

Letters a,b,c Indicates a small practical significance d= 0.3 to 0.49

Letter A Indicates a medium practical significance d= 0.5 to 0.79

n Numbers of respondents in '000

The discrepancies between the n values under 'variable' and the n values for each statement are due to the fact that respondents who answered 'don't know' to the statement were not included in the data analysis.

The food you eat can influence the development of diseases

Sixty one percent of consumers agreed that the food you eat can influence the development of diseases (mean = 3.44, Figure 3.1). Table 3.4 demonstrates that there was no practically significant difference in the response between gender and age groups, however there was a small practically significant difference in the response between Whites (mean = 3.8) and Blacks (mean = 3.4), between Blacks and Coloureds (mean = 3.8) and between Blacks and Indians (mean = 3.8). If this is converted to numbers of South Africans living in metropolitan areas who took part in this question, it indicates that 6 052 000 Blacks, 2 573 000 Whites, 1 223 000 Coloureds and 555 000 Indians responded and Blacks tended to agree least with this statement (mean = 3.4). Similar responses occurred in the different LSM groups with LSM 7 to 10 agreeing the most with this statement (mean = 3.8). Table 3.4 indicates that a small practically significant difference was observed between LSM 2 to 3 (mean = 3.4) and LSM 7 to 10 (mean = 3.8); and between LSM 4 to 6 (mean = 3.5) and LSM 7 to 10. There was a statistically significant difference between the beliefs of men (mean = 3.5) and women (mean = 3.7) to this statement. Eighteen percent of the population (1 872 540) found the statement unlikely and a further 18% thought the statement neither likely nor unlikely.

Some food types can actually make me healthier

There was a strong belief in the statement 'some food types can actually make me healthier', with 86% of consumers agreeing with this statement (mean = 3.8, Figure 3.1). A very small percentage (3%) of consumers found this statement unlikely. There was no practically significant difference between the beliefs of men and women, or between different LSM groups. However, a small practically significant difference exists between Whites (mean = 4.2) and Coloureds (mean = 4.5), as indicated in Table 3.4. Statistically significant differences occur between Whites and Blacks (mean = 4.3), between Blacks and Coloureds (mean = 4.5) and between Coloureds and Indians (mean = 4.3). Coloureds tended to agree most with this statement.

(mean = 4.5), however the actual number of Coloureds is small compared to Whites and Blacks. There was a statistically significant difference between the age group 16-29 (mean = 4.27) and 30-49 (mean = 4.32), and between the age groups 30-49 and 50-65+ (mean = 4.2) as shown in Table 3.4.

Some food types can actually prevent the development of some diseases

A very positive response to this statement was found, with 81% of consumers (mean = 3.8) agreeing to the statement, as illustrated in Figure 3.1. Men and women consumers of different race, age and LSM group exhibited a similar belief towards this statement, however no practically significant difference was observed between groups or within groups. A statistically significant difference was observed between LSM 4 to 6 (mean = 4.2) and LSM 7 to 10 (mean = 4.1). The significance between Whites (mean = 4.1) and Blacks (mean = 4.2) was statistical, as was the difference between Whites and Coloureds (mean = 4.2) and between Coloureds and Indians (mean = 4.1). Statistically significant differences were noted between the age groups 16-29 (mean = 4.2) and 50-65+ (mean = 4.1), and between 30-49 (mean = 4.2) and 50-65+ (mean 4.1). This information is clearly indicated in Table 3.4.

Healthy food is only for people that already have a disease

It is interesting to note that 72% of consumers (mean = 2.44) believe that it is unlikely that 'healthy food is only for people that already have a disease'. No practically significant difference was noted between men (mean = 2.13) and women (mean = 2.15). Table 3.4 indicates that there was a small practically significant difference between Blacks (mean = 2.28) and Indians (mean = 1.77) and a statistically significant difference between Whites (mean = 1.96) and Blacks; Whites and Indians; Blacks and Coloureds (mean = 1.99) and Coloureds and Indians. There was no practically significant difference between age groups, however a statistically significant difference existed between age groups 16-29 (mean = 2.24) and 30-49 (mean = 2.07); and between 16-29 and 50-65+ (mean = 2.06). It was interesting to note that a medium practically significant difference is evident between LSM 2 to 3

(mean = 2.53) and LSM 7 to 10 (mean = 1.94). LSM 7 to 10 had the strongest belief in the unlikelihood of the statement compared to the other LSM groups. A statistically significant difference was found between LSM 2 to 3 and LSM 4 to 6 (mean = 2.2); and LSM 4 to 6 and LSM 7 to 10. This is noted in Table 3.4.

I don't want to have to think about disease when I chose my food

Fifty six percent of consumers (mean = 3.3) indicated that it was likely that 'I don't want to have to think about disease when I chose my food' and 25% of consumers indicating that this was unlikely. There was no practically significant difference between the response of men and women; between the different race groups; between the different age groups and between the different LSM groups. There was however a statistically significant difference between Whites (mean = 3.4) and Coloureds (mean = 3.7); between Blacks (mean = 3.4) and Coloureds and between Coloureds and Indians (mean = 3.3). Statistically significant differences also occurred between the age groups 16-29 (mean = 3.5) and 30-49 (mean = 3.4); and between 16-29 and 50-65+ (mean = 3.3). LSM 2 to 3 were most likely to agree with the statement (mean = 3.5) out of all the LSM groups. A statistically significant difference was found between LSM 2 to 3 and LSM 4 to 6 (mean = 3.4); and between LSM 2 to 3 and between LSM 7 to 10 (mean = 3.4). This is indicated in Table 3.4.

I don't believe food can have an effect on my health

Consumers' attitudes to this statement were positive, with 53% of consumers (mean = 2.74) disagreeing with this statement. Table 3.4 demonstrates a statistically significant difference between gender groups with regards this statement. A small practically significant difference exists between Whites (mean = 2.3) and Blacks (mean = 2.88); and between Blacks and Coloureds (mean =2.41). A medium practically significant difference was found between Blacks and Indians (mean = 2.25). There was no practically significant difference between the different age groups but a statistically significant difference exists between the 16-29 age group (mean = 2.73) and the 30-49 age group (mean = 2.63); and between the 16-29 group

and the 50-65+ group (mean = 2.53). There was also a statistically significant difference between the 30-49 age group and the 50-65+ group. A small practically significant difference was found between LSM 2 to 3 (mean = 2.93) and LSM 7 to 10 (mean = 2.33); and between LSM 4 to 6 (mean = 2.82) and LSM 7 to 10. This is illustrated in Table 3.4.

3.5 Discussion

Six statements were included in this study to investigate South African consumers beliefs about the link between food and health. None of the six statements produced practically significant gender or age differences in the consumers responses. Practically significant differences were found in the responses between race and LSM groups, and were noted for some variables. Statistically significant differences were reported for the variables.

The food you eat can influence the development of diseases

According to the WHO (World Health Organisation) /FAO (Food and Agricultural Organisation) Expert Consultation group, 'Diet and nutrition are important factors in the promotion and maintenance of good health throughout the entire life span. Their role as determinants of chronic noncommunicable diseases is well established and they therefore occupy a prominent position in prevention activities.¹¹ The Health and Diet Survey conducted by the FDA (Food and Drug Administration) tracked top-of-mind awareness of dietary risk factors associated with specific chronic diseases. A set of open-ended questions measured the levels of knowledge, awareness and perceived importance of individual dietary risk factors at the same time. It was found that American consumers show fairly high levels of awareness of the relationship between their diets and serious chronic diseases such as heart disease and cancer² In Leatherhead Food Research Association's European research programme in 1993, it was found that diet was perceived to be the most important factor contributing to health and disease, cited by 70% of respondents in Germany, 68% of

respondents in the UK and 55% of French respondents.¹² More than half of South African consumers agreed with the statement 'the food you eat can influence the development of diseases. Whites, Coloureds and Indians agree more strongly with this statement than Blacks. This has a potential public health impact as the effect size is 3.4 and the actual number of Blacks that responded to the statement was 6 052 000.

It was found in a study that the awareness of health consequences associated with fat, saturated fat and energy balance was higher with age, educational level, and higher among Whites compared to African-Americans.¹³ Another study suggested that those with a lower income generally are less likely to be aware of the link between being overweight and heart disease.¹⁴ South African consumers aged 50-65+ are the strongest believers in the age category in the statement 'the food you eat can influence the development of diseases' Consumers in LSM 7 to 10 have the strongest belief in this statement.

Some food types can actually make me healthier

According to Saher *et al.* 'health is one of the frequently mentioned motivations behind food choices.¹⁵ In 1994 and 1995, the Health and Diet Survey asked consumers if they had heard of health problems related to eating too much or too little of nutrients recently identified as having potentially important health effects. The results indicated that the awareness of the relationship of calcium to health was quite high (86% in 1995). A smaller, but growing proportion of consumers had heard about health problems related to not eating enough antioxidant vitamins (45%) or eating enough folic acid (41%).² More than two-thirds of shoppers surveyed by HealthFocus in 1996 believed that foods contain active components that contribute to health enhancement and reach beyond basic nutrition.¹⁶ It is important to note that the 'HealthFocus' data is not peer reviewed data and therefore the quality of information obtained cannot be guaranteed. A high percentage (86%) of South African

consumers believe that some food types can make them healthier. The mean response of all groups ranged between 4.2 to 4.5 on the five point Likert response scale. It is interesting to note that Coloureds indicated the highest belief in the race category with regards this statement. It can be suggested that more research needs to be conducted in this area to explain the highest belief amongst the Coloured population. The strength of the belief amongst the different LSM groups was the same (mean = 4.3) indicating that there is a strong belief across the South African LSM spectrum that some food types can enhance health.

Some food types can actually prevent the development of some diseases

The 1994 Food Technology trend report highlights the increasing role of food and food ingredients in self-medication and disease prevention.¹ A new class of foods has emerged through the ever increasing diet-disease debate, called 'functional foods'. Functional foods provide a new way of expressing healthiness in food choices by promising specific effects caused by particular food products.¹⁵ A food can be regarded as functional 'if it is satisfactorily demonstrated to beneficially affect one or more target functions in the body, beyond adequate nutritional effects. However, relatively little is known about consumers' responses to functional foods.¹⁵

Approximately half (55%) of the US adult population believe that naturally occurring substances found in fruits, vegetables and cereal grains can help prevent disease.¹ Eighty one percent of South African consumers believe that some food types can actually prevent the development of some diseases. It is interesting to note again that Coloureds indicated the highest belief in the race category with regards this statement, indicating their strong belief in the health benefits of food. More research is needed to determine the reasons why Coloureds have such a strong belief compared to the other race categories in South Africa. It can be postulated that the majority of South African consumers envisage some link between some foods and their disease prevention properties.

Healthy food is only for people that already have a disease

A large percentage of South African consumers (72%) agree that it is unlikely that healthy food is only for people that already have a disease. The strongest belief in the unlikelihood of this statement lies with Indians. The strength of the belief amongst the different age groups was similar. This indicates that South Africans aged 16-65+ believe that healthy food can benefit everyone and not only people that already have an illness. South African consumers that fall into LSM 7 to 10 have the strongest belief in the unlikelihood of the statement. Due to the fact that some LSM groups were representative of only one (LSM 2), two (LSM 3) or three race groups, the distribution of the race groups in the various LSM groups may have influenced the response and associated differences between LSM groups.

I don't want to have to think about disease when I chose my food

Fifty six percent of South African consumers agree with this statement. South African consumers in the younger age group (16-29) have the strongest belief in this statement. According to Saher *et al* general health interest in food related matters increases with age.¹⁵This could be due to the fact that younger consumers do not view themselves at high risk for chronic diseases and thus consider a variety of variables when choosing their food. According to a study conducted by Bhaskaran and Hardley, a minority of younger consumers reported that health attributes influence purchase decisions and indicated that price, taste and promotional offer were important considerations when choosing food.⁴ It is interesting to note that the strongest belief in this statement in the LSM category was in LSM 2 to 3. LSM 2 to 3 is made up of two race groups only and this may have influenced the response and differences that were evident among the LSM groups.

I don't believe food can have an effect on my health

According to the results, more than half of South African consumers believe that food can have an effect (positive or negative) on their health. Indians agreed the most in the unlikelihood of this statement than any other race group. Most South African Indians are either Muslim or Hindu. The Hindu religion prescribes vegetarianism in many forms. Muslims follow the Islamic beliefs regarding religion, lifestyle, eating patterns and hygiene faithfully.¹⁷ Through their disciplined approach to life and religious beliefs, it is tempting to speculate that Indians place a large emphasis on the role food plays in their lives and hence the strong belief that food has an affect on their health.

South African consumers aged 50-65+ have the strongest belief in the unlikelihood of the statement 'I don't believe food can have an effect on my health'. It can be suggested that this age group has the strongest belief in food having an effect on health due to their perceived vulnerability as a result of seeing more sick people around them and their awareness that they are at a higher risk than younger age individuals of chronic diseases. According to Bhaskaran and Hardley, knowledge of diet-health relationships and actions in regard to this tend to be greatest among the older age consumers (>55 years)⁴ Respondents in higher income groups display higher levels of belief in the diet-health concept compared to those in lower income groups.¹ South African consumers in the LSM 7 to 10 bracket have the strongest belief in the unlikelihood of this statement

3.6 Conclusion

Results from this study reveal that South African consumers have an understanding of the diet-disease relationship, believe that there is some link between food and health and the majority believe that food can influence the development of some diseases. The belief however differs between age, gender, race and LSM group.

There is a definite need for more research into why the differences between various race groups, age groups, gender and LSM groups exist, and what influences people's eating behaviour, attitudes towards healthy food and beliefs about the diet-disease relationship. There is also a need to develop strategies to change people's behaviour towards adopting healthy diets and lifestyles, including research on the supply and demand related to this changing consumer behaviour. The results obtained are of public health importance and can be used by the South African government and health organisations to initiate programmes and dietary guidelines for target groups.

As consumers increase their preference for healthy diets and products, producers and suppliers of functional foods will want to orient their products and marketing to respond to this emerging demand in the market.

3.7 References

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CHAPTER 4: GENERAL SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

4.1 Introduction

In this final chapter, a summary of the main findings from the study reported in this dissertation is given. The results of the study have been discussed, interpreted and compared to the relevant literature in the preceding two chapters, thus only general conclusions will be made in this chapter. This is followed by general recommendations regarding the study, as well as recommendations to the food industry and health professionals as deduced from the findings.

4.2 Summary of main findings

- South African consumers gender and age did not influence their response towards the relationship between food and health. The race and LSM group of consumers did, however, influence their response to some of the statements.
- Blacks agreed the least with the statement 'the food you eat can influence the development of disease' with Whites, Coloureds and Indians having the same belief in the statement. Coloureds agreed most that some food types can actually make one healthier. Indians had the strongest belief in the unlikelihood of the statement 'healthy food is only for people that already have a disease', and they believe the most that food can have an effect on health.
- With regards to the difference in response in the various LSM groups, LSM 7-10 agreed more strongly than any other LSM group that the food you eat can influence the development of diseases, that healthy food is not only for people that already have a disease and that food can have an effect on health.
- The overall response of South African consumers towards the belief that food has an effect on health, that food can influence health and the development of some

diseases, and that food is not only for people that have a disease, was very positive. However 56% of South African consumers do not want to have to think about disease when choosing food.

4.3 Conclusion

The aim of this study was to explore the demographic characteristics and beliefs of South African consumers regarding the link between food and health, and to determine whether differences exist between gender, race, age group and LSM group. Results from this study reveal that South African consumers have an understanding of the diet-disease relationship and believe that a link between food and health exists. This belief however differs between gender, race, age and LSM groups. The reasons why differences exist was not explored. There is a need for more research on current and changing trends in food consumption in developing countries, including research on what influences people's eating behaviour, attitudes towards healthy food and beliefs about the diet-disease relationship, and what can be done to address this in South Africa..

4.4 Recommendations

The results obtained are of public health importance and can be used by the South African government to initiate programmes and dietary guidelines for target groups. The results indicate which race, gender, age and LSM groups believe the strongest in certain statements and this provides an indication as to which groups need

Food companies may use the results as a guide when developing functional foods. All healthcare professionals will find the information relevant when educating the public.

Further studies are, however, needed to further explore the South African consumers beliefs with regards the diet-disease relationship and to investigate in more depth the

reasons and differences in attitudes that exist between age, race, gender and LSM groups in South Africa.

There is also a need, on a continuing basis, to develop strategies to change people's behaviour towards adopting healthy diets and lifestyles, including research on the supply and demand related to this changing consumer behaviour. As consumers increase their preference for healthy diets and their belief in the diet-disease relationship increases, producers and suppliers of functional foods will want to orient their products and marketing to respond to the changing consumer behaviour and emerging demand in the market.