

THE NUTRIENT QUALITY AND LABELLING OF READY-TO-EAT SNACK
FOODS WITH HEALTH AND OR NUTRITION CLAIMS

by

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ABSTRACT

Aim: The incidence of non-communicable diseases (NCDs) and obesity in South Africa is increasing at an alarming rate. The nutrition transition and urbanisation has contributed to the adoption of a diet of highly processed, convenience foods. The development of nutrient marketing has the potential to influence purchasing and consumption behaviour. Nutrient content and health claims are prevalent across convenience foods, it is important to determine whether these claims are accurate and whether these foods possess superior qualities to other similar products to prevent the misleading of consumers. This study was conducted to determine the nutrient quality and labelling of South African-produced ready-to-eat (RTE) snack foods displaying health and or nutrition claims.

Objectives: To determine: the types of claims displayed on RTE snack foods and the accuracy of these claims; the average nutrient content per category of snack food items; the accuracy of reported total energy content compared to the energy content calculated using the conversion factors in the R146 labelling legislation; and the eligibility of current claims once the R429 legislation is implemented.

Method: A descriptive analysis method was used in this study. The study sample consisted of 93 South African-produced RTE snack food products displaying health and or nutrition claims on the label. The following product categories were included in the study: oat, corn or rice cakes; crisps or chips; pretzels and crackers; protein snack bars; fruit bars or snacks; energy or high-performance bars; trail mix; chocolates; biscuits and popcorn.

The compliancy of each type of claim, according to the R146 labelling legislation, was investigated. The mean nutrient content per product category was calculated and compared to the mean across the sample. The reported total energy content was compared to the calculated total energy content, as specified in the R146 legislation. The nutrient profile score of products in the sample was analysed using the proposed R429 nutrient profiling model (NPM) to determine whether current health and nutrition claims will be valid once the new legislation is implemented.

Results: Nutrient content claims were the most commonly displayed health and or nutrition claim amongst products, twenty three out of 91 (25.3%) nutrient content claims displayed were non-compliant according to the R146 labelling legislation. Items with comparison claims were compliant according to the legislation, however the overall nutrient profile of two of the items with claims were desirable. In terms of the calculated versus reported total energy content, 64 products (68.8%) had a higher reported total energy content than calculated using conversion factors. The R429 NPM deemed that only 22 (23.7%) of the products would be eligible to make health and or nutrition claims once the R429 legislation is implemented.

Conclusion: The results found in this study highlight the need for more stringent regulation of nutrition labelling in South Africa. The proposed R429 labelling legislation may have a drastic effect on current nutrition labelling amongst food manufacturers. It can be concluded that the claims displayed on RTE snack food products are not always accurate and regulatory compliance is therefore important to stipulate amongst food manufacturers. A multi-pronged approach including the strengthening of public nutrition education may be needed to improve food choices which may reduce the incidence of NCDs and obesity in South Africa. The standardisation of front-of-package (FOP) labelling with the proposed legislation may improve the current labelling practices in South Africa. This study has highlighted areas where work can be done to improve public health in South Africa.

DECLARATION OF ORIGINALITY

I, Andrea Susan Bursey, hereby declare that:

- (i) The research reported in this dissertation, except where otherwise indicated, is my original research.
- (ii) This dissertation has not been submitted for any degree or examination at any other university.
- (iii) This dissertation does not contain other person’s data, pictures, graphs or other information unless specifically acknowledged as being sourced from those persons.
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I hope to contribute something positive to the dietetic and health industry, which I am proud to be part of.

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CHAPTER 1: INTRODUCTION TO THE PROBLEM AND ITS SETTING

1.1 Background to the importance of the study

There is a high incidence of obesity in South Africa. According to Statistics South Africa, 35.9% of women and 7.9% of men between the ages of 15 and 49 years respectively are obese (Statistics South Africa 2017).

The surge in the prevalence of obesity may be positively influenced by the increased availability of low-priced, high-energy foods which are mass produced by large co-operations (Swinburn, Sacks, Hall, McPherson, Finegood, Moodie & Gortmaker 2011). The nutrition transition and urbanisation has resulted in easier access to processed, RTE food products (Swinburn *et al* 2011).

Nutrient marketing such as the display of health and nutrient content claims may influence the purchasing and consumption decisions of consumers. Consumers may be led to assume that these products are superior to other similar food items and consume a higher volume of perceived healthy foods which may increase energy intake and the risk of weight gain (Wansink & Chandon 2006).

In South Africa, the criteria that food manufacturers need to meet to make a health claim is regulated by the Regulations Relating to the Labelling and Advertising of Foodstuffs, No. R146 of the Foodstuffs, Cosmetics and Disinfectants Act, 1972 which has been revised into the drafted R429 regulations (DoH 2014, DoH 2010).

The promulgation of the R429 regulations will result in the implementation of mandatory nutrition information labelling on all packaged food products and stricter regulations on claims relating to health, weight loss, reduction of disease and glycaemic index (DoH 2014).

The implementation of stricter nutrition labelling in South Africa has a potentially positive consequence whereby where food manufacturers could influence purchasing and consumption patterns. Compliance of health and or nutrition claims to the R146 legislation in South Africa is important to protect consumers from inaccurate or misleading claims.

The nutrient quality of RTE food items displaying claims on products such as the information displayed on a fruit bar or snack should be examined by consumers to determine whether they are a healthy choice. Nutrition labels are designed to advise the consumer and should therefore be an accurate representation of the contents of the product. A North American study found that the actual energy content of a range of popular packaged foods was different to that listed on the nutrition information table (Jumpertz, Venti, Le, Michaels, Parrington, Krakoff & Votruba 2013).

A NPM is included in the R429 to aid the determination of eligibility to display claims on labels or implement FOP labelling (DoH 2017). The stipulation of a NPM may result in manufacturers needing to remove ineligible health and or nutrition claims from labels or adjust the formulation of products to fit the new criteria.

Nutrition marketing is a tool which holds the potential to improve public health through nutrition education. Nutrition education may encourage consumers to make better food choices, which may reduce the incidence of NCDs and obesity in South Africa (Van der Merwe, Bosman & Ellis 2014).

It is therefore imperative that the regulations for food labelling in South Africa be adhered to, to prevent confusion among consumers. Falsified claims and inaccurate nutrient contents displayed on products could potentially lead to an excessive consumption of these food products. Considering that an excessive consumption of these food products may lead to the development of obesity and NCDs of lifestyle.

1.2 Statement of the research problem

The purpose of the study was to determine the nutrient content, accuracy of total energy content and packaging information of RTE snack foods displaying health and or nutrition claims which were sold in grocery stores and pharmacies in East London, South Africa over a period of 24 months.

1.3 Research objectives

The following objectives were investigated surrounding the nutrient content and packaging of RTE snack foods displaying health and or nutrition claims:

- 1.3.1 To identify the type of health and or nutrition claims made on each product and determine whether each health and or nutrition claim was compliant with the current labelling legislation.
- 1.3.2 To determine and compare the nutrient quality in terms of energy, carbohydrate, sugar, fibre, protein, total fat, saturated fat and sodium content per category of RTE snack foods.
- 1.3.3 To determine whether the energy content represented on the nutrition information panel was accurately calculated using the R146 legislation's conversion factors for protein, carbohydrates and fat.
- 1.3.4 To assess and determine, using the DoH NPM, whether products with health or nutrition claims will be allowed to make these claims when the proposed R429 legislation is promulgated.

1.4 Null hypotheses

- 1.4.1 All health and or nutrition claims displayed on RTE snack foods were not compliant with the criteria specified in the R146 labelling legislation.
- 1.4.2 The total energy content displayed on the nutrition information panel was not accurately represented in accordance with the R146 legislation's conversion factors for protein, carbohydrates and fat.
- 1.4.3 All RTE snack foods that displayed health and or nutrition claims would not comply with the criteria specified in the R429 regulations to make a health or nutrition claim and would not be able to make health claims once the R429 is promulgated.

1.5 Inclusion and exclusion criteria

1.5.1 Inclusion criteria

- All South African-produced RTE snack foods that displayed health and or nutrition claims on the label as defined in the R146 labelling legislation in the selected grocery stores and pharmacies.

1.5.2 Exclusion criteria

- RTE snack food products that were not produced in South Africa.
- Snack foods with health and or nutrition claims that required additional preparation before consumption.
- RTE snack foods which do not display health or nutrition claims as defined in the R146 labelling legislation.
- RTE foods that were not sold in in the selected grocery stores and pharmacies.
- Compliance with letter size, colour and other details was not investigated.

1.6 Definitions

For this study the following are defined:

- Cherry picking: “Using a few selected illustrations to demonstrate a point, as if those examples exemplify a generalized trend when they actually don’t” (Johnson 2015).
- Claim: “In relation to a foodstuff, means any written, pictorial, visual, descriptive or verbal statement, communication, representation or reference brought to the attention of the public in any manner including a trade name or brand name and referring to the characteristics of a product, in particular to its nature, identity, nutritional properties, composition, durability, origin or method of manufacture or production” (DoH 2014).
- Food label: Tags, pictures or descriptive material which can be utilised by the consumer in the promotion, consumption and disposal of the food product (South Africa 2010).
- Food labelling: Written, printed or graphic matter that is present on the label, accompanies the food, or is displayed near the food, including that for promoting its sale or disposal (WHO 2004).
- Function claim: “A claim that describes the physiological role and function of a nutrient or substance in growth, development and normal physiological functioning of the body” (DoH 2014).
- Glycaemic Load (GL): “A numerical expression of how much impact a specific carbohydrate food serving will have in affecting blood glucose levels and which is calculated according to the formula:
- $$GL = \frac{\text{Carbohydrate content (in grams) per serving} \times GI}{100}$$
- (DoH 2014).

Health claim:	<p>“An effect on the human body, including an effect on one or more of the following –</p> <ul style="list-style-type: none">(a) a biochemical process or outcome;(b) a physiological process or outcome;(c) a functional process or outcome;(d) growth and development;(e) physical performance;(f) mental performance;(g) a disease, disorder or condition; and(h) oral hygiene” (DoH 2014).
Macronutrients:	<p>Include carbohydrates, proteins (including essential amino acids), fats (including essential fatty acids), macrominerals, and water (Youdim 2013).</p>
New Atkins diet:	<p>A diet focused on a high protein intake and a carbohydrate allowance of only 20-25 g per day. The aim of this diet is to reach a state of ketosis (National Health Service 2017).</p>
Nutrition claim:	<p>“Any representation that refers to a specific nutrient or food constituent content of a food such as a nutrient content claim, a comparative claim, but excludes:</p> <ul style="list-style-type: none">(a) the mention of substances within the list of ingredients; and(b) the mention of substances in the Table with Nutritional Information” (DoH 2014).
Nutrient content claim:	<p>The description of the present level of certain micro- and macro-nutrients, carotenoids or energy contained in an end-product food (DoH 2014).</p>
Nutrient declaration:	<p>The nutrient declaration is a standardised statement or listing of the nutrient content of a food (Codex 2013).</p>

Nutrition labelling:	<p>A description intended to inform the consumer of nutritional properties of a food. Nutrition labelling consists of two components:</p> <ul style="list-style-type: none">(a) Nutrient declaration;(b) Supplementary nutrition information (Codex 2013)
Nutrient Profiling Model:	<p>An electronic tool based on a set of scientific criteria to categorise foods according to their total nutritional composition and screen foods to determine whether nutrient, ingredient content and or health claims may be made or not (DoH 2014).</p>
Nutritional quality:	<p>The value of the product for the consumer's physical health, growth, development, reproduction and psychological or emotional well-being (Köpke 2005).</p>
Obesogenic:	<p>The sum of influences that the surroundings, opportunities, or conditions of life have on promoting obesity in individuals or populations (Lake & Townshend 2006).</p>
Obese	<p>A body mass index above 30 kg/m² (Statistics South Africa 2017).</p>
Paleo diet	<p>A popular diet, known as the caveman diet, which includes only unprocessed foods and restricts wheat, dairy, refined sugar, potatoes and salt (National Health Service 2017).</p>
Ready-to-eat:	<p>“Any food or beverage which is processed, mixed, cooked, or otherwise prepared into a form in which it is normally consumed without further preparation” (DoH 2014).</p>
Tertiary-educated	<p>“Of, relating to, or being higher education” (Merriam-Webster 2017a).</p>
Total sugar:	<p>“The sum of the mono-, di-, oligo- and polysaccharides included in a food stuff” (DoH 2014).</p>

Trail mix: A mixture of seeds, nuts, and dried fruits eaten as a snack especially by hikers (Merriam-Webster 2017b).

1.7 Abbreviations

BMI:	Body Mass Index
EU:	European Union
FAO:	Food and Agricultural Organisation
FDA:	The Food and Drug Administration
FOP:	Front-of-Package labelling
FSANZ:	Food Standards Australia New Zealand
IFBA:	The International Food and Beverage Alliance
ILAC:	International Laboratory Accreditation Cooperation
kCal:	Kilocalorie
kJ:	Kilojoule
MUFA:	Monounsaturated fatty acids
NCD:	Non-Communicable Disease
NFP:	Nutrition Facts Panel
NRV:	Nutrient Reference Values
NPM:	Nutrient Profiling Model
PASSCLAIM:	The Process for the Assessment of Scientific Support for Claims on Foods
PUFA	Polyunsaturated fatty acids
RTE:	Ready-to-eat

SANAS:	South African National Accreditation System
SEP:	Socio-economic position
SFA:	Saturated fatty acids
UK:	United Kingdom
USA:	United States of America
WHO:	World Health Organisation

1.8 Assumptions

For the study, the following assumptions were made:

- Food labels contained the specified nutrition information as recommended in the R146 legislation.
- These products were regularly purchased and consumed as snacks.
- When consumers purchased these items, they chose to purchase them from large stores and pharmacies.
- The products included were an accurate reflection of what is commonly available to South African consumers.

1.9 Summary

There has been an increase in the availability and distribution of energy dense convenience food products. Persuasive food advertising using health and nutrition claims has the potential to attract consumers to purchase and consume these products.

Food labelling has potential to both positively and negatively influence food choices. The R146 labelling legislation governs the information displayed on food labels in South Africa. Compliance to this legislation is important to ensure that consumers are correctly advised when choosing food products and are not misled.

This study aimed to investigate whether health and or nutrition claims displayed on RTE snack food products are accurate according to the legislation or not, the nutrient quality of food products displaying claims and the accuracy of the total energy content displayed

on labels. This study aimed to investigate whether RTE snack foods with health and or nutrition claims will be allowed to make these claims once the R429 legislation is implemented.

1.10 Dissertation overview

This dissertation contains six chapters. Chapter one outlined the background to the importance of the study and gave an overview of the purpose of the study and presented the research objectives and hypotheses. Chapter two looked at the relevant literature surrounding the labelling practices and legislation in South Africa and presented the implications of different types of food labelling on consumers. In chapter three, the methodologies used in this study were explained. Chapter three included the study design and methods of data collection and analysis. The results of the study were presented in Chapter four and these results were discussed in Chapter five. Chapter six concluded the findings of the study as well as included recommendations for further study.

1.11 Referencing style

This dissertation has been written according to the referencing style of the Discipline of Dietetics and Human Nutrition.

CHAPTER 2: REVIEW OF RELATED LITERATURE

2.1 Introduction

The rapidly increasing incidence of NCDs and obesity can be attributed to several factors. Urbanisation and the nutrition transition in South Africa has played a role in the development of food manufacturing and marketing of RTE snack foods. Consumers may be led to believe that these products are superior to other unprocessed snack foods and consume large amounts to reap the perceived health benefits.

Nutrition labelling seeks to educate, inform and protect the consumer. The R146 labelling legislation in South Africa regulates the display of health and or nutrition claim by guiding food manufacturers on the criteria to make claims. The regulatory compliance of food manufacturers is however important to ensure that consumers are aware of the nutritional value of food items in order to make an informed food decision.

The following chapter will provide a review of the related literature by looking at the effects of a food environment and the food industry on the health of both individuals and the public. The content and understandability of various nutrition labelling formats, including front-of-pack designs, will be explored. This chapter will also look at the nutrient content required in countries to make health claims and the validity of health and or nutrition claims made on food products.

Trends in food labelling in relation to the quality of information given to consumers will be explored as well as the history and regulations of food and nutrition labelling both internationally and in South Africa. The literature review will be followed by a conclusion that summarises the review.

2.2 Non-communicable diseases of lifestyle and obesity

According to the World Health Organisation (WHO), NCDs are the leading cause of deaths worldwide and it is estimated that there will be an increase of deaths caused by NCDs from 38 million in 2012 to 52 million by 2030 (WHO 2014). In 2010, it was found that NCDs contributed to 38.9% of deaths amongst South Africans (Nojilana, Bradshaw,

Pillay-van Wyk, Msemburi, Laubscher, Somdyala, Joubert, Groenewald & Dorrington 2016).

At the United Nations summit on NCDs in 2011 which was then named the “25 x 25” (Beaglehole, Bonita, Alleyne, Horton, Li, Lincoln, Mbanya, McKee, Moodie, Nishtar & Piot 2011; UN General Assembly 2011), the WHO set nine voluntary global targets towards the prevention and control of NCDs to be achieved by the year 2025 which included a halt to the rise in diabetes and obesity (WHO 2014).

The Strategic Plan for the Prevention and Control of Non-Communicable Diseases 2013-2017 was launched in September 2013 by the DoH to tackle the burden of NCDs in South Africa. A focal point of the strategic plan was to “Legislate for a better food environment”, this section acknowledged the role that the DoH had played in enforcing food legislation, although stated that further regulations should be considered (DoH 2013).

The World Economic Forum and the Harvard School of Public Health proposed out a set of evidence-based “best buy” interventions in 2011 – suitable for low- and middle-income countries. These interventions include cost-effective suggestions to address population-based health issues such as an unhealthy diet through raising awareness about health conditions, education on healthy eating and public health strategies such as restricting advertisements of food products (World Economic Forum & Harvard School of Public Health 2011).

The latest South African National Health and Nutrition Examination Survey (SANHANES-1 2013)¹ revealed that 30.9% of males and 55.7% of females were obese, indicating that obesity in South Africa is of serious concern. The prevalence of obesity has been associated with an increase in the incidence of all major NCDs, highlighting the potential need to find solutions to alleviate the burden of both obesity and NCDs in South Africa (Banjare & Bhalerao 2016).

Obesity is defined as a BMI equal to or more than 30kg/m² (WHO 2014). The term “obesogenic” is a word used to describe environmental factors that promote obesity

¹ Shisana, Labadarios, Rehle, Simbayi, Zuma, Dhansay, Reddy, Parker, Hoosain, Naidoo, Hongoro, Mchiza, Steyn, Nwane, Makoae, Maluleke, Ramlagan, Zungu, Evans, Jacobs, Faber & SANHANES-1 Team

(Swinburn & Egger 2004). A high intake of energy dense food and beverages; easy access to takeaway foods; larger serving sizes of ready-to-eat (RTE) foods and beverages and an increasingly sedentary population are all factors that can be described as obesogenic (Swinburn & Egger 2004).

South Africa can be described as a multicultural country that is in the process of a transition from traditional, rural lifestyles to more “Westernised” lifestyles (Vorster 2010). The move of rural dwellers to urban areas for employment has resulted in an increased number of black South Africans choosing to purchase convenience snacks and easy-to-prepare foods that are generally processed and higher in fat (Bourne, Lambert & Steyn 2002).

A nutrition transition may be linked to the increased risk of overweight and obesity through increased consumption of foods that are energy-dense and high in sugar and dietary fat (Mchiza, Steyn, Hill, Kruger, Schönfeldt, Nel & Wentzel-Viljoen 2015; Vorster, Kruger, Wentzel-Viljoen, Kruger & Margetts 2014). Processed foods are easier to access in an urban than in a rural setting (Swinburn *et al* 2011).

According to Lawrence (2009), urbanisation and industrialisation along with developments in the environmental, social, technological, political and economic sector has resulted in a surge of processed convenience foods that are high in sugar, fat and or salt which may highlight the need to further develop food regulatory systems to protect the consumer.

The recent surge in the incidence of obesity, has resulted in an increased consumer awareness of nutrition (Borgmeier & Westenhoefer 2009). Nutrition labels play a role in communicating information about the nutritional content of a product with consumers during the pre-purchase decision-making process (Van der Merwe, Kempen, Breedts & de Beer 2010).

“Big Food” is used as a way of describing large commercial entities, both local and international, that dominate the food and beverage environment. It has been suggested that “Big Food” companies may contribute towards the increase in obesity in South Africa

by making their products more accessible, affordable and acceptable to consumers (Igumbor, Sanders, Puoane, Tsolekile, Schwarz, Purdy, Swart, Durão & Hawkes 2012).

A study on the consumption of various categories of food products by South Africans between the years 1999 and 2012 found that the consumption of savoury biscuits or crackers and sweet biscuits had increased by 0.5-0.8 kg per capita per year. It was also found that the intake of sweet and savoury snacks (0.2-0.3 kg per capita per year), which included nuts (0%), chips or crisps (66.7%), extruded snacks (33.3%), tortilla or corn chips (0%) and fruits snacks (0%) had risen by 53.5% (1.5-2.3 kg per capita per year) (Ronquest-Ross, Vink & Sigge 2014).

An Australian and New Zealand survey conducted on 7850 food products displaying health claims found food categories with the highest proportions of health claims to be sports drinks (92%), energy drinks (84%), sports bars (57%) and breakfast cereals (54%) (Williams, Yeatman, Ridges, Houston, Rafferty, Roesler, Sobierajski & Sprat 2006).

The food industry is developing rapidly, with many processed food options being readily available to the consumer and the labelling of these products having a possible influence on purchasing and consumption patterns. Compliance of food manufacturers with labelling legislation may also improve consumer health through the truthful marketing of beneficial properties that a food product may possess as well as an accurate and honest display of nutritional content and ingredients to allow the consumer to make an informed choice.

2.3 Background to food and nutrition labelling

Food manufacturers have the potential to influence food choices and consumer health either negatively or positively by means of price, marketing and availability of food products (Pitt, Kendall, Hills & Comans 2014). Consumers may be influenced by the marketing of food products and may require assistance to interpret these labels. Nutrition labelling has been designed as a means of protecting the consumer through the regulation of information displayed on food products. Nutrition labelling is governed by several legislations both internationally and locally to enable consumers to make

educated food choices and assist trade (Food and Agricultural Organisation of the United Nations and WHO 2001).

2.3.1 History

The WHO and the Food and Agricultural Organisation (FAO) have worked together since 1963 to implement and manage the Codex Alimentarius Programme (Codex). Codex Alimentarius, Latin for “food law or code”, was designed to implement definitions and standards for foods and therein facilitate international trade and protect consumer health (Codex Alimentarius Commission 2001). Codex was first accepted in 1985, after which several revisions were made, the most recently being 2016 (Codex Alimentarius Commission 2016).

The Guidelines on Nutrition Labelling (Codex Alimentarius Commission 2013), aims to provide consumers with information about food to encourage “wise” food choices, deliver information regarding nutrient content of food products to consumers, promote public health by encouraging acceptable food standards for manufacturers and to allow for the opportunity to provide supplementary nutrition information on the label. Supplementary nutrition information is described as additional information that may increase consumers understanding of a nutrition label and is usually presented in conjunction with a specific nutrition education programme implemented by each country (Codex Alimentarius Commission 2013).

According to the Codex Alimentarius Commission (2013), nutrition labelling is a subsection of food labelling that is deemed mandatory when a nutrition or health claim is made. A food displaying a nutrition or health claim must provide the consumer with a nutrient declaration that should include the energy value, protein, available carbohydrates, total fat, saturated fat, sodium, total sugar, the amount of the specific nutrient for which the claim is made and other nutrients that are relevant for maintaining good health as described in a nations legislation (Codex Alimentarius Commission 2013).

According to the European Food Safety Authority, a nutrition claim suggests that a food product has nutritional properties that may benefit health, such as “no added sugar” or “high in fibre”. A health claim is described as a statement on food labels or advertising

that suggests that the consumption of a food may improve the health of an individual. For example, a claim that a food may “boost immunity” (European Food Safety Authority 2017).

According to the Codex guidelines, health claims can be divided into three categories: (i) nutrient function claims – this is a claim that describes the role of a nutrient in growth, development and normal physiological functions of the body; (ii) other function claims – a claim describing specific beneficial properties of food other than the claims listed in nutrient function claims; and (iii) reduction of disease risk claims – a claim referring to the lessening of the risk factors that relate to diet-related chronic diseases (Codex Alimentarius Commission 2004).

Codex is adhered to by 187 nations including South Africa and the European Union (EU) and is adapted according to country-specific practices and requirements (FAO & WHO 2001). Several companies, excluding South Africa have implemented mandatory nutrition on all packages food products regardless of whether claims are made or not.

Nutrition labelling is compulsory on all packaged foods in the EU. A study conducted by Grunert, Wills and Fernández-Celemín (2010) found that roughly 84% of processed food products sold in the EU display nutrition labels.

The following countries have declared nutrition labelling mandatory only where a nutrition claim is made or if a food is designed for specific dietary purposes: Gulf Cooperation Council countries, Japan, Kenya, Mauritius, Nigeria, Philippines, Singapore, South Africa, Thailand, Turkey and Venezuela (European Food Information Council 2013).

2.3.2 International use

Nutrition labelling which varies between different countries, has developed significantly over the years and has been found to be a potentially valuable tool for the improvement of public health. Different legislations are implemented in different countries (Table 2.1), however several countries are progressing their nutrition labelling practices, particularly with the initiation of FOP and mandatory nutrition labelling.

Table 2.1: Comparison of nutrition labelling laws across various countries

Country name	Regulatory body	Mandatory nutrition labelling	Nutrients displayed	Type of front-of-package labelling
Australia and New Zealand	Food Standards Australia New Zealand	All pre-packaged foods	Energy, protein, carbohydrates, total sugar, total fat, saturated fat and sodium	Health star rating
South Africa	Department of Health	All pre-packaged foods with health and or nutrition claims	Energy, protein, carbohydrate, total sugar, total fat, saturated fat and total sodium	Not in place
United States of America	Food and Drug Administration	All pre-packaged foods	Energy, protein, carbohydrate, dietary fibre, total sugar, total fat, saturated fat, trans fat, cholesterol, sodium, vitamin A, vitamin C, calcium, iron	Multiple designs, no standardised design
United Kingdom	Food Standards Agency	All pre-packaged foods	Energy, protein, carbohydrates, total sugar, total fat, saturated fat, and sodium	Percentage of daily intake coloured traffic light

The USA labelling legislation required the display of a wider range of nutrients on nutrition labels than other countries. The UK, Australia and New Zealand and South Africa are all required to display the same nutrients on food labels, South Africa is the only country without FOP labelling or mandatory nutrition labelling in place. The proposed R429 labelling legislation includes the implementation of FOP labelling and mandatory nutrition labelling, however this legislation has not yet been executed.

2.3.3 Food and nutrition labelling in South Africa

Food labelling in South Africa is controlled by The DoH, Directorate: Food Control. The Food Control body has the responsibility of developing and regulating the regulations for food labelling in South Africa which are based on the principals of Codex Alimentarius (DoH 2017).

The Regulations Relating to the Labelling and Advertising of Foodstuffs, No. R146 of the Foodstuffs, Cosmetics and Disinfectants Act, 1972 was published in the Government Gazette by the DoH, Directorate: Food Control in March 2010 (DoH 2010). The R146 legislation was then implemented on 1 March 2012 as an interim legislation, awaiting the application of a more comprehensive labelling law (Koen, Blaauw & Wentzel-Viljoen 2016; DoH 2010). The key objective behind the update of the regulations was to improve the advertising and labelling of food products to provide consumers with honest, accurate information which may aid consumers to make healthier food choices (Wicks 2012).

The current R146 guidelines therefore regulate the information to be displayed on food labels using minimum requirements, disclosure of ingredients and specification of nutritional information to avoid ambiguous reporting of nutrients that may confuse consumers (DoH 2010). The R146 regulations often refer to Codex Alimentarius standards when a local description is not available. For example, the R146 states that food products should display the name of the product on the label and where applicable should use names that have been established in a Codex Alimentarius Standard (DoH 2010).

The R146 labelling legislation benefits include the regulation of health and or nutrition claims displayed on food labels. The R146 labelling legislation does not enforce mandatory nutrition labelling or legislate for FOP labelling, as stipulated in other nations. Mandatory nutrition labelling and FOP labelling may provide an opportunity for honest communication between the food manufacturer and consumer and may play a role in facilitating better food choices.

Stipulated information in general

Under the current labelling guidelines it is mandatory for the following information to be displayed on the labels of all food products produced in South Africa: the expiry date; the name and address of the manufacturer, importer or seller; country where the product is produced and packaged; ingredient list containing all materials or ingredients used in the product; directions for use; special storage conditions; the net weight or volume of the product, a batch number and a date marking (DoH 2010).

Nutrient content claims

The R146 describes nutrition claims as “any representation that refers to a specific nutrient or food constituent content of a particular foodstuff namely a nutritional content claim or a comparative claim”. Food manufacturers who wish to display nutrient content claims on their products should comply with the wording and criteria set out in the R146 to substantiate their claim. The R146 legislation prohibits the use of the words “nutritious”, “wholesome”, or any statements denoting that the product may possess superior health-giving properties (DoH 2010).

Minimum mandatory nutritional information must be declared only on the labels of food products displaying nutrition claims as well as the content of the nutrient for which the nutrient content claim is made. The following nutrients per 100g and per single serving should be declared: energy, protein, carbohydrates, total sugar, total fat, saturated fat and total sodium.

Manufacturers of RTE food products sold in South Africa must declare the amount of each macro- and micronutrient by mass (DoH 2010). The total energy content is regulated by the application of an energy conversion factor to the individual macronutrient weight as found in the Codex Alimentarius international guidelines (DoH 2010; Codex Alimentarius Commission Joint FAO/WHO Food Standards Programme 2001). This states that one gram of available carbohydrate and one gram of protein should each contribute 17 kilojoules, while one gram of fat contributes 37 kilojoules to the total energy content.

If a food manufacturer wishes to make a nutrient content claim describing a product that is lower in nutrients, it should be worded in a generic manner as specified in the R146 to prevent the denotation of superiority to other similar products and which may cause consumer confusion. An example of a nutrient content claim which may be confusing to consumers is the claim “fat free” being displayed on a pack of jelly babies. Consumers may assume that this product will not cause weight gain, yet it contains a high amount of sugar which is high in energy.

Food products are required to comply with specific values as set out in the R146 to qualify to make a nutrient content claim (Table 2.2) (DoH 2010). The proposed R429 specifies the same criteria for “low”, “free” or “virtually free” claims as the R146 (DoH 2014).

Table 2.2: R146 conditions for nutrient content claims (DoH 2010)

Nutrient	R146 claim	Amount (not more than)
Energy	“Low”	170 kJ per 100 g (solids) 80 kJ per 100 ml
Total fat	“Virtually free” or “free from”	17kJ per 100ml (liquids)
	“Low”	3 g per 100 g (solids) 1.5 g per 100 ml (liquids)
Saturated fat	“Virtually free” or “free from”	0.5 g per 100 g/ml
	“Low”	1.5 g per 100 g (solids) 0.75 g per 100 ml (liquids) Not more than 10% of energy
Cholesterol	“Virtually free” or “free from”	0.1 g per 100 g (solids) 0.1 g per 100 ml (liquids)
	“Low”	20 mg per 100 g (solids) 10 mg per 100 ml (liquids)
Mono- and disaccharides	“Virtually free” or “free from”	0.5 g per 100 ml/g
	“Low”	120 mg Na per 100 g (equals 305 mg NaCl)
Sodium	“Very low”	40 mg Na per 100 g (equals 102 mg NaCl)
	“Virtually free” or “free from”	5 mg Na per 100 g (equals 13 mg NaCl)

For food products to display a nutrient content claim describing a food product as higher in specific desired nutrients, the generic wording “source of”, “high in” or “very high in”

should be stated if the nutrient is compliant with the specified cut-offs (Table 2.3) (DoH 2010).

Table 2.3: Conditions for nutrient content claims (DoH 2010)

Nutrient	R146 claim	Amount
Energy	“Source of”	80 kJ per 100 ml
	“High in”	950 kJ per 100 g (solids) 250 kJ per 100 ml (liquids)
Carbohydrate	“High in”	13 g per 100 g (solids) 6.5 g per 100 ml (liquids)
	“Source of”	2.4 g per 100 g (solids)
Dietary Fibre Englyst Method	“High in”	4.8 g per 100 g (solids)
	“Source of”	3 g per 100 g (solids)
Dietary Fibre AOAC Method	“High in”	6 g per 100 g (solids)
	“Source of”	5 g per 100 g (solids) 2.5 g per 100 ml (liquids) 2.5 g per 418 kJ
Protein	“High in”	10 g per 100 g (solids) 5 g per 100 ml (liquids) 5 g per 418 kJ
	“Source of”	≥40% PUFA, ≤20% saturated fatty acids and < 1 g trans fatty acids
PUFA	“High in”	≥60% PUFA, ≤20% saturated fatty acids and <1 g trans fatty acids
	“Source of”	≥35% MUFA, ≤20% saturated fatty acids and <1 g trans fatty acids
MUFA	“High in”	≥60% MUFA, ≤20% saturated fatty acids and <1 g trans fatty acids
	“Source of”	75 mg per single serving
Omega-3 fatty acids	“High in”	150 mg per single serving
	“Very high in”	300 mg per single serving
	“Source of”	15% of NRV per serving
Vitamins and minerals excluding Na and K	“High in”	30% of NRV per serving
	“Very high in”	60% of NRV per serving
	“Source of”	

Prohibited statements in general

According to the R146 labelling legislation of South Africa, food products shall not display the following:

- Logos, pictorial representations, words, marks or descriptions that suggest that a product maybe endorsed by a health practitioner or an organisation, association, foundation unless approved by the Director-General and the company does not contradict the health claims criterion of the R146 regulations.
- The words: ‘health’ or healthy’ or other words or symbols implying that the foodstuff in and of itself, or a substance of the foodstuff, has health-giving properties in any manner including the name or trade name, except in the case of the fortification logo for food vehicles.
- The words ‘wholesome’ or ‘nutritious’ or any word with a similar meaning in any manner including the name and trade name.
- Claims that a food stuff provides complete or balanced nutrition in any manner including the name and trade name.
- The words “cure” or any other medicinal claim – including prophylactic and therapeutic claims.

Negative claims

It is compulsory for food labels to comply with the regulations set out in Section 14 of the R146: “negative claims”. An example of a negative claim on a food product is highlighting the presence or absence of an ingredient, such as displaying “a naturally fat free product” on a food that is does not contain any fat.

The regulation of negative claims aims to reduce misleading information relayed to consumers when it is suggested that a food product is superior to similar products unless the claim is worded in the stipulated manner and can be justified (DoH 2010). Negative claims also cast a denigrating light on other similar products while playing on consumer’s concerns that consuming the product without the negative claim may be a poor choice (Carreño & Vergano 2014).

The Canadian nutrition labelling legislation also prohibits the use of negative claims on food labels unless certain conditions are met. The Canadian legislation bases its rationale behind banning negative claims on the fact that it may mislead consumers by over-emphasising the presence or absence of a property in a food product when similar products possess the same properties. For example, emphasising that the presence of butter in a cake, when butter is typically used as a minor ingredient in the recipe of a cake (Canada Food Inspection Agency 2017).

A scientific research article on the use of negative claims amongst countries in the EU highlighted that negative claims, such as “free from gluten”, may confuse consumers as they may perceive the product as healthier (Canada Food Inspection Agency 2017).

2.4 Consumer interpretation of nutrition labels

Nutrition labelling is a supportive strategy which, if well designed, can encourage consumers to make healthier food choices in a non-forceful manner whilst taking control of their own health (Cowburn & Stockley 2005). The concern with ambiguous claims being displayed on the labels of food products, is that many consumers may perceive these products as beneficial to health and may in turn consume more than the specified serving size to reap more benefits (Wansink & Chandon 2006).

Consumer profiling

Nutrition education through the nutrition information displayed on food products and menus has been considered a relevant method of encouraging consumers to choose healthier food products (genannt Bonsmann & Wills 2012). The consumer interpretation of nutrition labels is varied amongst individuals of different nationalities, gender, age, socio-economic status and education level. According to Parmenter, Waller and Wardle (2000), there is a significant relationship between the socioeconomic position (SEP) of individuals and their nutrition knowledge depicting a decline in nutritional knowledge where there is a decline in socioeconomic status. It is therefore important to consider a variety of variables when proposing regulations for nutrition labelling, as well as FOP labelling.

A descriptive study was conducted by Van der Merwe *et al* (2014) which surveyed the perceptions of 229 individuals living in an urban-hybrid area in the North West province of South Africa, found that 51% of consumers were confused by the information on some food labels. The convenience sample consisted of 229 mostly female, tertiary educated, employed consumers between the ages of 18-29 years. These results also suggested that although South African consumers may appreciate food labels as a useful information source, the information displayed on labels may be confusing. This highlights the need for education and awareness campaigns about food labels to improve consumer use and understanding (Van der Merwe *et al* 2014).

The consumer interpretation and ability to understand food and nutrition labels is important. The information provided on food labels may be redundant if the consumer does not understand the format and types of information displayed.

Misleading information

A randomized, cross-sectional study (n=1997) conducted by Bosman, Van der Merwe, Ellis, Jerling and Badham (2014) in South Africa, on a stratified randomly selected sampled of male and female subjects of Caucasian, African, Coloured and Indian descent, found that 67% chose food products that displayed claims related to health benefits. This suggests that many South African consumers trust the health claims displayed on the labels of food products and may even select products based on these claims.

An exploratory, descriptive study was conducted on the label use and knowledge of a sample of 229 South African consumers, who were mainly Afrikaans females with a tertiary education living in Potchefstroom (Van der Merwe, Bosman, Ellis, de Beer & Mielmann 2012). It was found only 19% of the consumers were able to correctly identify health or nutrition claims, while 97% correctly identified symbols such as “Halaal”. This highlights that South African consumers may need to be made more aware of the criteria food products should comply with to make a health or nutrition claim. Consumers also struggled to identify false and misleading health and nutrition claims.

Consumers may trust nutrition content claims at face value and viewing these food products as a healthier choice without an understanding of the nutritional content or ingredient list. This therefore indicates the possible need for the food label education programmes in South Africa (Van der Merwe *et al* 2012). Labelling of food products presents healthcare professionals an opportunity to educate consumers on the proper utilisation of food labels to improve food choices and avoid being misled (Köen, Blaauw & Wentzel-Viljoen 2016).

A systematic review by Cowburn & Stockley (2005) on studies based in Europe and USA found that although nutrition labelling may play a supportive role in motivating consumers to make better food choices, labelling may be limited by the consumer's ability to interpret the information displayed. It was reported that consumers were confused by the display of technical and numerical information on labels as well as the relationship between calories and energy; sodium and salt; and sugar and carbohydrates. Nutritional content per 100 grams and serving size also proved difficult for consumers to understand (Cowburn & Stockley 2005).

According to Cowburn & Stockley (2005), consumers may make healthier choices if they are surrounded by an environment that supports the promotion of health. Nutrition labelling is described as a "population-based approach" to assist consumers in making better nutritional choices through the transparency of nutritional content (Cowburn & Stockley 2005).

According to Cowburn and Stockley (2005) nutritional information on food labels may be redundant if consumers lack nutrition knowledge to interpret labels. It is also important to note that the amount of information displayed on a food label plays a role in the consumers understanding. Too much information may lead to an information overload which may see consumers overlooking nutritional information in general, as seen by the consumer preference for the Keyhole symbol (Wang, Oostindjer, Amdam & Egelanddsdal 2016; Kempen, Bosman, Bouwer, Klein & Van der Merwe 2011).

An experimental study, conducted on 1460 North American shoppers over the age of 18 years, found that consumers were confused by the daily recommendations column in the

nutritional information table and felt unsure of the way these recommendations fitted into a healthy diet (Levy, Fein & Schucker 1992).

In a Norwegian study, it was found that 54% of consumers reported having knowledge on how to read food labels, whilst 46% stated that they did not consider or know how to interpret the information on food labels (Wang *et al*/2016). This highlights a possible lack of consumer understanding of the interpretation of food labels.

A descriptive, cross-sectional study conducted by Van der Colff, Van der Merwe, Bosman, Erasmus and Ellis (2016) on the consumer understanding of the information displayed on food labels of a convenience sample of consumers living in Gauteng. Of the 279 consumers, 42% were between the ages of 25-34 years, most were African language speakers and 51% had a highest level of education being a Grade 12 or a Diploma. It was found that 57% proposed recommendations to improve the information on food labels. These recommended changes included optimising the nutrition and health information displayed on food labels and how it was presented.

A literature review by Soederberg Miller and Cassady (2015) reported that the number of studies surrounding the influence of consumer knowledge on the interpretation of nutrition claims is limited and that there is a consensus that nutrition education supports more effective interpretation of claims on food labels and in turn better food choices. In South Africa, a transitional country, it has been noted that there may be a lack of nutritional knowledge amongst the public which may compromise the ability of consumers to make healthier food choices (Van der Merwe *et al* 2012).

A systematic review by Campos, Doxey and Hammond (2011) found that middle aged and younger Caucasian females were more likely to use food labels than any other ethnic, age or gender group. Lower-income individuals were less likely to use food labels than middle- and high-income participants (Campos, Doxey & Hammond 2011).

Consumer interpretation of food labels varies amongst consumers based on several factors. The food industry has a potentially large impact on consumer purchasing and consumption through nutrition marketing such as health and or nutrition claims. This highlights the importance of both consumer nutrition education and regulations on the

food industry to ensure that the consumer is both well-informed and protected against misleading information.

2.5 Regulatory compliance of food labels

Despite legislations stipulated by regulatory bodies, it has been suggested that food manufacturers may display claims that may be misleading to the consumer (Prinsloo, Van der Merwe, Bosman & Erasmus 2012).

An American multivariate analysis of variance study, conducted by Schwartz, Vartanian, Wharton & Brownell (2008), focused on the health claims displayed on the labels of 73 breakfast cereals marketed for children. The study compared the claims with the actual nutritional content of the cereals before comparing this with the American dietary guidelines specific to children. The study found that breakfast cereals that displayed claims of containing wholegrains had a significantly higher fibre content than those without wholegrain claims (Schwartz *et al* 2008).

A North American study on the actual nutrient content of 24 popular, energy-dense snack foods: candy bars, cereal bars and pastries, chips, cookies, crackers, ice cream, nuts and yogurt found discrepancies between the nutritional content displayed on the nutrition information table compared with the nutrient content calculated using both bomb calorimetry and the energy conversion factors described in the Code of Federal Regulations (Jumpertz *et al* 2013).

On average, the displayed serving size was 4.3% higher in energy with a carbohydrate content 7.7% higher than reported (Jumpertz *et al* 2013). This highlights the potential importance of accurate nutritional analysis by the food manufacturer to ensure that consumers can access products that contain what it specified on the label and choose appropriate items to suit their nutrition needs.

A North American study on 56 900 packaged food products found that 49% made use of nutrition marketing. This included methods to highlight nutritional properties including health and nutritional content claims. It was found that 48% with nutrition marketing were high in saturated fat, sodium and or sugar. This indicated that the information displayed on food labels may be misleading to consumers who are attracted to nutrient content

claims and may overlook the overall nutrient content of the food product (Colby, Johnson, Scheett & Hoverson 2010).

The regulatory compliance of food manufacturers is essential to avoid false advertising of food products with health or nutrition claims. Under- and over-reporting of nutrients, particularly the under-reporting of carbohydrates and energy has occurred. This therefore poses a risk for consumers who may think the food item that seems to have a lower energy and carbohydrate content is healthier and may consume more than recommended.

2.6 Nutrient profiling

The WHO defines nutrient profiling as the science of classifying foods according to their nutritional composition in relation to health promotion and disease prevention. Nutrient profiling has been used frequently for the marketing of foods to children; health and nutrition claims; to inform and educate consumers and to legislate product labelling logos or symbols (WHO 2017).

The purpose of nutrient profiling is to aid the evaluation of the nutritional quality of a single food; to assist consumers in choosing “healthier” foods; to control the types of foods advertised to children; and to screen products for eligibility to make a health or nutrition claim (WHO 2017; European Commission 2006).

FOP labelling, a type of nutrient profiling, is a means of presenting various forms of condensed nutritional information on the front of a food or beverage package.

2.6.1 International nutrient profiling

A North American experimental study on 125 participant’s preferences of various types of FOP labels versus traditional nutrition facts panels (NFP) (Figure 2.1) on the side panels of breakfast cereal boxes labels found that colour FOP labels significantly drew more attention than NFP labels (Becker, Bello, Sundar, Peltier & Bix 2015). Therefore, it can be hypothesised that FOP labelling provides a platform to highlight important information to consumers to promote healthier food choices.

Nutrition Facts	
Serving Size 2/3 cup (55g)	
Servings Per Container About 8	
Amount Per Serving	
Calories 230	Calories from Fat 72
% Daily Value*	
Total Fat 8g	12%
Saturated Fat 1g	5%
<i>Trans</i> Fat 0g	
Cholesterol 0mg	0%
Sodium 160mg	7%
Total Carbohydrate 37g	12%
Dietary Fiber 4g	16%
Sugars 1g	
Protein 3g	
Vitamin A	10%
Vitamin C	8%
Calcium	20%
Iron	45%
* Percent Daily Values are based on a 2,000 calorie diet. Your daily value may be higher or lower depending on your calorie needs.	
	Calories: 2,000 2,500
Total Fat	Less than 65g 80g
Sat Fat	Less than 20g 25g
Cholesterol	Less than 300mg 300mg
Sodium	Less than 2,400mg 2,400mg
Total Carbohydrate	300g 375g
Dietary Fiber	25g 30g

Figure 2.1: Food and Drug Administration Nutrition Facts Panel

There is no internationally defined format of standardised requirements for FOP labelling which may cause confusion amongst consumers. The variation of formats can result in difficulties when comparing the nutritional properties of food products. In addition, food manufacturers could selectively report and manipulate the information displayed on their nutrition labels (Draper, Adamson, Clegg, Malam, Rigg & Duncan 2013; Hawley, Roberto, Bragg, Liu, Schwartz & Brownell 2013).

It has been found that 98% of processed food products in the USA display Nutrition Facts Panels (NFPs) which include information on the serving size, energy and macronutrient content and the vitamin and mineral contents as a percentage of the recommended daily values for each nutrient (Legault, Brandt, McCabe, Adler, Brown & Brecher 2004). The

UK nutrient profiling model was developed by the Food Standards Agency (FSA) as a tool to manage the differentiation of foods based on their nutritional composition to control the advertisement of foods to children. This model utilises a scoring system that is based on the nutrient content per 100g food or beverage products. In the model, points are awarded for “A” nutrients (energy, total sugar, sodium and saturated fat), from which the score for the addition of points from “C” nutrients (fruit, vegetable, nuts, fibre and protein) gives the final nutrient profile score that determines whether the product is suitable for advertising or not (Food Standards Agency 2009).

A traffic light model (Figure 2.2) was developed by the UK FSA. This system classifies food products using the colours of a traffic light – red, orange and green, which highlights the amount of fat, saturated fat, sugar and salt in a food product (Table 2.4) (Scarborough, Hodgkins, Raats, Harrington, Cowburn, Dean, Doherty, Foster, Juszczak, Matthews, Mizdrak, Mhurchu, Shepherd, Tiomotijevic, Winstone & Rayner 2015).

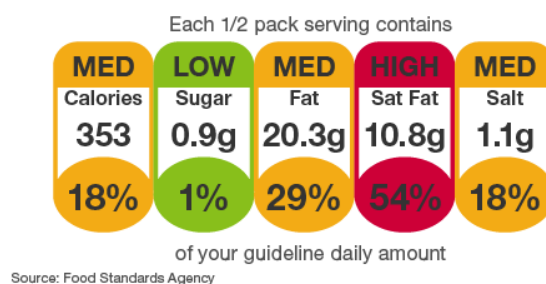


Figure 2.2: UK Traffic Light Front-of-Product Label

Table 2.4: Classification of traffic light label (Food Standards Agency 2009)

Nutrient per 100g	Green (not more than)	Orange (between)	Red (more than)
Sugar (g)	5	5 - 15	15
Salt (g)	0.3	0.3 - 1.5	1.5
Fat (g)	3	3 - 20	20
Saturated fat (g)	1.5	1.5 - 5	5

A UK 2 x 9 repeated measures design study was conducted by Jones & Richardson (2007) on the effectiveness of two food label types on the response of 92 consumers, one a standard nutrition label and the other displaying the UK traffic light system. The effectiveness of the food label design was measured by the eye movements of British consumers whilst grocery shopping to determine which type of label consumers paid more attention to. The results from the study significantly indicated that the traffic light system was more effective in directing the attention of consumers to healthier choices (Jones & Richardson 2007).

The impact of FOP labels on actual sales of food products has not been researched in depth, however a study conducted in the UK by Sacks, Rayner and Swinburn (2009) found that the traffic light FOP system did not influence the sales of healthier food and beverage products significantly. However, there were several study limitations such as using only two categories of food over a short period of time. This study examined ready-made meals (n=6) and sandwiches (n=12).

A study conducted on the utilization of nutrition labelling in all 27 EU member states and Turkey on 37 365 food and beverage products from five categories (sweet biscuits, breakfast cereals, pre-packed ready meals, carbonated soft drinks and yoghurts) found that the display of the Guideline Daily Amount (GDA) (Figure 2.3) was the most common form of FOP label across the board (genannt Bonsmann, Celemín, Larrañaga, Egger, Wills, Hodgkins & Raats 2010). The GDA format differs from the traffic light system in that it does not display colours to highlight more and less desirable nutrients.

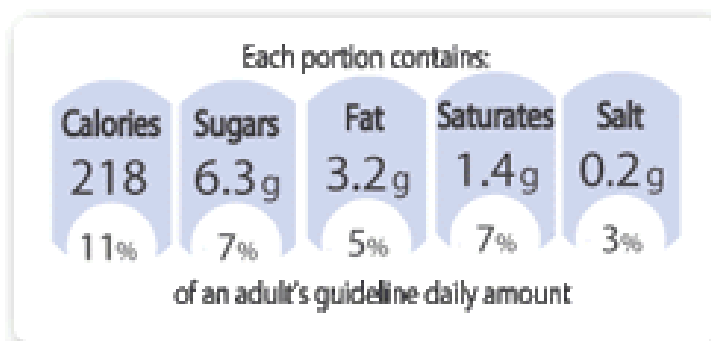


Figure 2. 3: Guideline Daily Amount

In Norway, Denmark and Sweden, a Keyhole symbol (Figure 2.4) is displayed on foods when a product has a lower fat, sugar and salt content and a higher fibre content (Wang *et al* 2016). This symbol can be found on all food products except artificial sweeteners, plant sterols, plant stanols, plant sterol esters or foods for use in children under three years of age (Lovdata 2015).



Figure 2.4 Keyhole symbol

Specific nutrient criteria for separate food categories is stipulated in the legislation for food products to display a Keyhole symbol. There are 33 different product categories which specify different criteria for the Keyhole symbol, this may be difficult for food manufacturers to utilise. The criteria for snack foods, described under the category “prepared meals not intended to constitute a complete meal” should contain:

- At least 420kJ of energy per portion;
- Vegetables (except potatoes), legumes (excluding peanuts), root vegetables, fruit or berries of at least 50g per 100g of product;
- Total fat content of a maximum of 33% of the total energy;
- Saturated fat content of 10% of the total energy or less;
- Added sugar of 3g per 100g or less;
- Salt content of not more than 0.8g per 100g and not more than 2.5g salt per serving.

The Keyhole symbol describes only four nutrients and may therefore be simpler but less informative than the traffic light FOP design which considers the content of nine nutrients. A study conducted on a sample of 561 adolescents living in Norway found that 47.2% chose to purchase snacks displaying the Keyhole mark compared to 25.8% who chose snacks displaying the percentage of daily values on the label and 27% who selected snacks with plain labels (Wang *et al* 2016). This indicates that products displaying the keyhole symbol may be more desirable to consumers, despite listing the content of only four nutrients. This may indicate that consumers prefer simpler FOP designs.

The Health Star Rating system (Figure 2.5), a voluntary FOP labelling scheme which is endorsed by the Australian and New Zealand Ministerial Forum on Food Regulation, was made available for the public to utilise in June 2014 (Commonwealth of Australia 2016). The Health Star Rating system was designed to summarise key nutrition information on the FOP labels and consists of three elements: health star rating, energy declaration and nutrient content declarations (Commonwealth of Australia 2016).

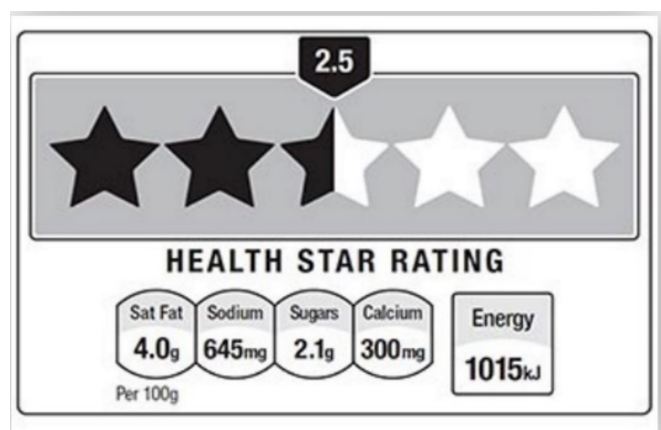


Figure 2.5: Australia and New Zealand Health Star Rating Front-of-pack label

The Health Star Rating calculator requires that a food product be categorised into one of six categories:

1. Category 1: Beverages other than dairy beverages
2. Category 1D: Dairy beverages
3. Category 2: All foods other than those included in category 1 or 1D
4. Category 2D: Dairy foods other than those included in category 1, 1D, 2D or 3D
5. Category 3: Oils and spreads, for example: edible oil, margarine and butter
6. Category 3D: Cheese and processed cheese (with a calcium content above 320mg per 100g)

The calculator then considers the baseline points (energy, saturated fat, sugar and sodium) to which modifying points are added (protein, fibre and fruit, vegetables, nuts and legumes) which then ranks the food product with a star rating of between $\frac{1}{2}$ and 5. The ranking refers to the desirability of the food product in terms of nutrition content, with 5 being the most nutritional food (Commonwealth of Australia 2016).

2.6.2 South African nutrient profiling

In 2014, the DoH proposed amendments to the current labelling and advertising legislation (R146), namely the R429 regulations, to improve current labelling practices and comply with international trends in nutrition labelling. The proposed date for the implementation of the R429 has not yet been specified by the DoH.

Upon the implementation of the R429 legislation, South African food manufacturers will be required to implement mandatory nutrition labelling on all food products, and not just those with nutrition claims. However, this excludes products sold by a food home industry such as bread made and sold in a bakery (DoH 2014). This ruling is in line with several international countries, for example: Australia, New Zealand, USA and the UK.

The R429 stipulates that the same minimum, mandatory nutrition information as the R146 but includes the addition of dietary fibre which is in line with the legislation of the EU,

USA, Australia, New Zealand and Canada (DoH 2014; European Food Information Council 2013).

Additions include regulations on glycaemic index (GI) claims whereby food products displaying GI claims should display the words “high”, “intermediate” or “low” and ensure that specified criteria are met. Reduction of disease risk claims, weight loss claims, function claims, as well as stricter control over the marketing of unhealthy food to school children between grades 0 and 12 also appear in the R429 legislation (DoH 2014).

The lack of scientific evidence in current nutrition labelling practices highlighted the potential need for nutrition profiling in South Africa (Wicks 2012). The DoH has proposed to implement a NPM in the proposed R429 regulations, based on the work done by the Food Standards Agency of the UK with adaptations based on the model used by Food Standards Australia New Zealand (FSANZ 2016) (DoH 2017). The term NPM describes an electronic tool, based on the nutritional composition of a food product, to determine the classification or ranking of a food product. This tool was designed to determine whether food products qualify to make nutrient, ingredient content and or health claims (DoH 2014).

The aim would be to introduce qualifying criteria for food manufacturers to meet in order to make health claims. This could help the consumer to make healthier food choices (WHO 2017). A report by Wentzel-Viljoen, Jerling and Badham (2012) found that a slightly modified version of the FSANZ NPM may be the most appropriate method of NPM for use in the South African food market. This conclusion was reached using five different validation approaches (Wentzel-Viljoen, Jerling & Badham 2012). The rationale behind basing the nutrient profiling in South Africa on the FSANZ model was that South Africa utilises the same reference values as Australia and New Zealand and agrees with the nutritional recommendations set out by the UK.

The South African NPM, which is freely available on the DoH website, requires specification of the category of food product: “1. Beverages, 2. Any foods other than 1 or 3, and 3. Cheese, oils etc.” Food products are required to meet several specifications in order to qualify to make a health claim on the label as seen earlier in Table 2.3 (DoH 2017).

The following nutritional information per 100g of food product must be entered into the nutrient profiling calculator to calculate a nutrient profile score: energy (kJ); saturated fat (g); total sugar (g); sodium (g); fruit, vegetable, nut and legume content (%), fibre (g) and protein (g). This follows the same procedure as the Australian and New Zealand nutrient profiling model. Fruit, vegetable, nut, legume and lentil content is an additional item which differentiates the South African NPM from the FSANZ NPM (DoH 2017) (FSANZ 2016; Food Standards Agency 2009).

Each of the categories (1, 2 and 3) specify a different cut-off for eligibility to make health or nutrition claims to ensure that food products are in fact good choices for the consumer (Table 2.5).

Table 2.5: Criteria and nutrition profile score required to display a health or nutrition claim as proposed in the R429 (DoH 2017)

Category	Food and beverage products	Examples	Final score required
1	Beverages, including milk.	Milk, malt beverages prepared with milk, fruit juice.	Less than 1.
2	Foods other than those included in category 1 or 3.	Meat and meat products, fish and fish products, chicken and chicken products, grains and cereals, cottage cheese.	Less than 4.
3	Cheese and processed cheese with a calcium content of more than 320mg per 100g, edible oil and oil spreads, margarine and butter.	Cheddar cheese, brick margarine, tub margarine, butter and peanut butter.	Less than 28.

In keeping with various international labelling legislations, FOP labelling has also been included in the revised R429 regulations. It was proposed that FOP labelling will be voluntary in South Africa, although if displayed on a label the information should meet a specified set of criteria. The proposed R429 legislation, however does not include any suggestions on the FOP labelling design to be utilized (DoH 2014).

A limited amount of research has been conducted on the impact of the proposed regulations on consumer health and the food industry. This study will focus on the impact of the impending R429 legislation on the validity of health and or nutrition claims currently displayed on products in the market.

Regulations for the labelling of health and nutrition claims have been described as a way of protecting the consumer from being misled. Internationally, the regulations behind health and nutrition claims have evolved over time to include FOP labelling which may assist consumers' interpretation of nutrition information and health and or nutrition claims. The implementation of a standardised FOP labelling design may improve consumer food choices in South Africa.

2.7 Conclusion

South Africa is a multi-ethnic country, home to individuals of varying socio-economic and educational backgrounds. Urbanisation and the nutrition transition has resulted in an increased consumption of convenience foods, which are often highly processed. This literature review has looked at the development of nutrition labelling in conjunction with the changes in the health status of individuals both in South Africa and worldwide.

Food and nutrition labelling has progressed at a rapid pace both in South Africa and worldwide, and although originally designed to as a method to support healthier food choices, food and nutrition labels may be confusing to consumers and may be misleading through the display of non-compliant health and or nutrition claims. Consumers may be led to believe that food products marketed as being healthy are superior to unprocessed foods and may consume large amounts of these products, potentially increasing the incidence of NCDs and obesity.

The R146 labelling legislation is designed protect consumers to a certain degree by stipulating criteria to make a health claim, however there are limited studies on the regulatory compliance of food manufacturers to the regulations. South African and international nutrition labelling practices and legislation have been explored in this chapter. The methodology used in this study will be reported on in the following chapter.

CHAPTER 3: METHODOLOGY

To gain insight into the methodology used in this study, the following will be discussed in this chapter: the type of study; background information on the study site; the techniques used to obtain the primary data and the methods utilised to ensure reliability and validity.

3.1 Type of study

This was a descriptive analysis study on the nutrient quality and labelling of South-African-produced RTE snack foods. It aimed to determine the presence and accuracy of health and or nutrition claims, nutrient quality, accuracy of energy content and the implications of the proposed R429 labelling legislation on these products.

3.2 Study design

A descriptive analysis method was utilised in this study. A descriptive study design relies on words as its main vehicle of communication (Sandelowski 2000). This study design allows the researcher to thoroughly investigate an unlimited number of variables which was appropriate for this study as many aspects of the labelling of RTE food items were analysed. The descriptive study design is a good choice of methodology when conducting research relating to policy making (Sandelowski 2000).

According to Sandelowski (2000), a descriptive study is an effective method of presenting the facts in everyday language, making it an appropriate study method for the investigation of food labelling. Possible disadvantages to this choice of study design was that there may be more room for misinterpretation as opposed to the use of a phenomenological or grounded theory study. Although a descriptive study may hold the potential of possible bias, it has been found that this method is effective to present foundational information (Sandelowski 2000).

3.3 Sample selection and background information on the study sites

All South African-produced RTE snack foods labelled with health and or nutrition claims were purchased. Ten product categories were formed from the snack food items.

The products were purchased from six large pharmacies and grocery stores in East London namely Pick n Pay, Shoprite, Spar, Woolworths, Clicks and Dis-Chem. Reasons for targeting these specific stores were that Pick 'n Pay, Shoprite, Spar, Woolworths were considered as South Africa's largest retailers in 2016 (Business Tech 2017). Woolworths was found to have made a 25.5% growth in profit in its food segment in the 2016 financial year 2016 (Woolworths Holdings Limited 2016).

Pick n Pay made a turnover of R72.4 billion, with a gross profit of 17.9%, in the 2016 financial year (Pick n Pay Stores Limited 2016). Shoprite made a turnover of R141 billion for the financial year, with a profit of R8 billion (11.4%) (Shoprite Holdings 2017). The Spar had a total turnover of R90.7 billion in the financial year and have 2033 stores in South Africa (The Spar Group Limited 2016).

The Clicks Group has a shareholder value of R32.6 billion rand and made an operating profit of 12.6% in the 2016 financial year (Clicks Group Limited 2016). Dis-Chem Pharmacies have been touted as the fastest growing healthcare retailer and were listed on the JSE in 2016. Dis-Chem reportedly made a turnover of R17.3 billion in the 2016 financial year (Business Day 2017).

The sales data of RTE snack foods was not used in the selection of items as this is not available in South Africa. The categories of RTE snack foods were selected as they were found in all the chosen grocery stores and pharmacies. These grocery stores and pharmacies were included as data collection sites to gather information about the labelling practices of a range of RTE snack food products as they are popular stores which have a high rate of sales and a large variety of stock available.

3.4 Data collection methods

Information on the front, back and side panels of each of the South African RTE snack food item displaying health and or nutrition claims was collected and then analysed.

3.4.1 Information on the front panels

The occurrence of an endorsement, comparative, negative and or nutrient content claims was investigated by assessing the front panel of all selected products. Claims are typically displayed on the front panel of food products to attract the attention of consumers.

Each of the food products were separated into the following ten categories by the product description on the label to analyse differences per category. These categories were decided upon as they were found in all the high-grossing retailers.

RTE snack food product categories:

1. Oat, corn or rice cakes
2. Crisps or chips
3. Pretzels and crackers
4. Protein snack bars
5. Energy or high-performance bars
6. Trail mix
7. Fruit bars or snacks
8. Chocolates
9. Biscuits
10. Popcorn

3.4.2 Information on the side and back panels

Nutrition information was collected from the nutrition information table (Figure 3.1) typically displayed side and back panels of RTE snack food items.

TYPICAL NUTRITIONAL INFORMATION (as packed /ready-to-eat)

Quantified single serving size expressed in grams or millilitres, whatever is appropriate

	Per 100 g/ml	Per per serving	% MDR* per serving
Energy (kJ)		-	
Protein (g)			
Carbohydrate (g) of which sugar		-	
Total fat (g)		-	
Saturated fat (g)		-	
Trans fat (g)			
''			
''			
'''			
Total dietary fiber (g) ''		-	
Sodium (mg)		-	
(insert any other nutrient or food component to be declared in accordance with these Regulations here or as appropriate under the relevant main nutrient heading in g, mg, mcg, or other units as appropriate) in the order: vitamins, minerals, any other nutrient not made provision for already, in alphabetical order			

* Minimum Daily requirement (MDI) for individuals 4 years and older (see Annexure 3)

Place for the statement required by regulation 52(1)(c) or regulation 56, whatever is appropriate

** place for a subgroup nutrient, such as monounsaturated fat, polyunsaturated fat, omega-3 fatty acids, soluble fiber et cetera

***place to insert cholesterol when cholesterol information is given

Figure 3.1: Nutrition information required on nutrition labels (DoH 2010)

The information in the nutrition information table was collected to:

- a. Compare the nutrient content of each food item with the criteria required to make a health and or nutrition claim according to the R146.
- b. Calculate the mean nutrient content for each category per serving and per 100 g to determine the nutritional quality of food products across the categories.
- c. Calculate the energy content using the displayed macronutrients (protein, carbohydrates and fat) with the conversion factors (Appendix A, p99) according to the R146 and compare this value with the displayed total energy content.
- d. Calculate the nutrient profile score of each food item with the R429 NPM using the energy; total sugar; saturated fatty acid (SFA); sodium; percentage of concentrated fruit, vegetables and legumes; % fruit, vegetables, nuts and legumes, and protein content to determine whether each product would qualify to make a health or nutrition claim once the R429 is implemented.

3.5 Data capturing and analysis

3.5.1 Data capturing

The information collected from the nutrition labels was captured into a Microsoft® Excel® 2013 spreadsheet by the researcher with information separated into the specified RTE snack food categories.

The following data was collected: presence and validity of health and or nutrition claims, nutrient content per serving, nutrient content per 100 g, total energy content and the energy content calculated by applying the R146 conversion factors to protein, carbohydrate and fat contents.

The data was cleaned, entered independently twice to prevent human error. Results were coded accordingly by the researcher. The data was imported into the Statistical Package for the Social Sciences (SPSS version 22) software.

3.5.2 Data analysis

The data was analysed for statistical significance using SPSS version 22 software.

The following tests were used:

- A Chi-square test of independence to determine if a significant relationship could be found between two variables, such as the incidence of claims across a range of product categories.
- A Fisher's Exact test to determine a relationship between two variables within a small sample size. This test was conducted when analysing the data amongst RTE snack food categories which contained a small number of items.
- A Binomial test to determine whether claims were met according to the criteria stipulated in the R146.
- A One-sample t-test to determine the distribution of average nutrient contents of products categories from the mean across the entire sample.
- A Chi-square goodness of fit test to determine whether the sample data was consistent with the hypothesized distributions.
- The Kruskal Wallis Test to determine if statistical differences between two or more groups could be found. This test was conducted on the nutrient profile score of the products to determine which product category would be most desirable.

A summary of the tests used to analyse the data in the study can be found in Table 3.1.

Table 3.1: Data analysis table

Objective	Variables required for the analysis	Statistical tests to be applied
1. To identify the type of health and or nutrition claims made on each product and determine whether each health and or nutrition claim was compliant with the current labelling legislation.	RTE snack foods labelled as having healthy benefits. R146 labelling legislation.	Chi-square test of independence. Fisher's Exact test. Binomial test.
2. To determine and compare the nutrient quality in terms of energy, carbohydrate, sugar, fibre, protein, total fat, saturated fat and sodium content per category of RTE snack foods.	Nutrition information. "Non-claim" products from each category.	One-sample t-test. Chi-square test of independence.
3. To determine whether the energy content represented on the nutrition information panel was accurately calculated using the R146 legislation's conversion factors for protein, carbohydrates and fat.	Macronutrient and energy content on label. R146 conversion factors.	Chi-square goodness of fit test
4. To assess and determine, using the DoH NPM, whether products with health or nutrition claims will be allowed to make these claims when the proposed R429 legislation is promulgated.	Nutritional information displayed on the labels of RTE snack food products. DoH Nutrient Profiling Model.	Chi-square goodness-of-fit test. Kruskal Wallis Test.

3.6 Data quality and control

3.6.1 Reduction of bias

Bias can be described as "a systematic as opposed to a random distortion of a statistic as a result of sampling procedure" (Online Etymology Dictionary 2010). Bias was minimised by the inclusion of products from large retail stores which increased the range of products investigated in this study. The use of sales data to determine which RTE snack food products are purchased most regularly in South Africa would have further reduced the incidence of bias.

3.6.2 Validity

Internal validity refers to the accuracy and reliability of results which is dependent on the minimisation or elimination of bias. A high level of internal validity is based on a true association between the exposure and the outcome (Pannucci & Wilkins 2010).

Internal validity in the study was increased through the method of data collection. The use of actual figures reported on product labels is reliable and increases internal validity. The actual collected data was measured against the R146 and R429 labelling legislations as well as the R429 NPM, which are standardised documents and can be used repeatedly for the same standard of results

External validity, which refers to whether the results can be generalised beyond the immediate study (Pannucci & Wilkins 2010). External validity was ensured as data was collected directly from product labels. This data is freely available to the public and can therefore be accessed repeatedly.

Products exclusively from large grocery stores and pharmacies in East London, South Africa were analysed to get a larger variety of RTE snack food products displaying health and or nutrition claims. The use of smaller, less frequented stores to obtain products would have reduced external validity as would reflect a smaller variety of RTE snack food products displaying health and or nutrition claims.

The study focused on a specified category of food products, RTE snack foods displaying health and or nutrition claims, which were available for purchase at the time of data collection therefore the results found are only applicable to this group of products.

3.6.3 Reliability

Reliability relies on the quality of measurement. It is the assurance of consistency, stability and repeatability of the variables as well as the accurate collection and capture of information (Research Methods Knowledge Base 2006).

A high level of reliability was ensured in this study using a criteria list (Appendix B p100). The criteria list comprised the wording described in the R146 labelling legislation that a product may display when making health and or nutrition claim.

To increase the reliability of the study, test-retest reliability was conducted by entering the data collected from the labels of the RTE snack food products into two spreadsheets at separate points in time (Phelan & Wren 2005). The data from both spreadsheets were then compared to ensure that no human errors occurred during the data capture process.

3.6.4 Accuracy of data entry

The accuracy of this study was ensured by entering the data collected from the food labels into the Microsoft® Excel® spreadsheet twice on separate occasions after which spreadsheets were examined against each other to detect any errors.

3.7 Ethical considerations

Due to the non-human nature of this investigation, full exemption from ethical clearance was obtained from the Humanities and Social Sciences Research Ethics Committee (Appendix C, p101).

3.8 Summary

A descriptive analysis was conducted to examine the information displayed on the labels of RTE snack food products labelled as having healthy benefits sold in popular South African grocery stores and pharmacies. This type of study allowed various categories of health claims and macronutrient contents to be investigated. The results of the data analysis are presented in chapter 4.

CHAPTER 4: RESULTS

This chapter will focus on presenting the analysis of information displayed on the labels of RTE snack foods displaying health and or nutrition claims. The results will be presented in accordance with the study objectives.

4.1 Sample characteristics

A total of 93 RTE snack food products that met the inclusion criteria, by displaying health and/or nutrition claims, were from six high-grossing grocery stores and pharmacies. In order to investigate the labelling practices of a larger range of products, ten different categories of RTE snack foods were included in the following proportions: trail mix (n=20); oat, corn or rice cakes (n=15); protein snack bars (n=13); energy or high-performance bars (n=12); crisps or chips (n=7); fruit bars or snacks (n=12); pretzels and crackers (n=6); biscuits (n=5); chocolates (n=2); and popcorn (n=1).

4.2 Health and or nutrition claims

4.2.1 Nutrient content claims

Nutrient content claims were the most frequently used type of health or nutrition claim as they featured on 91 of the 93 (97.8%) RTE snack foods (Figure 4.1). The two that did not display nutrient content claims were found in the energy or high-performance bars category, where one displayed an endorsement claim and the other a comparative claim.

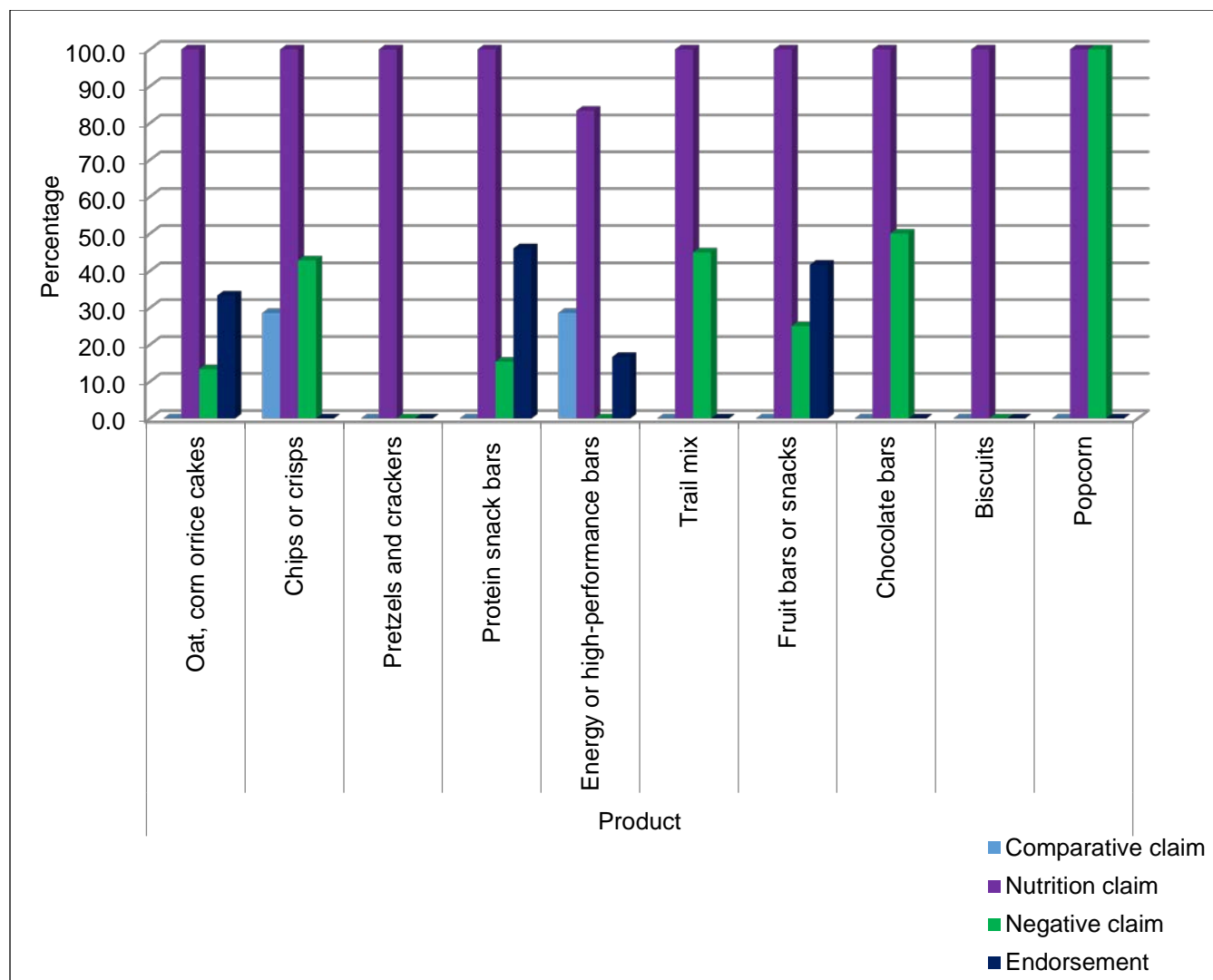


Figure 4.1: The presence and frequency of claim types displayed across RTE snack food categories

No statistical significance was found between the occurrence of nutrient content claims and the various product categories when using chi-square tests. The occurrence of nutrient content claims was investigated (Table 4.1).

Table 4.1: The occurrence of nutrient content claims per nutrient across the sample

Nutrient	Very low	Low	Free	Source	High	Total	%
Energy		13			16	29	31.2
Carbohydrates					1	1	0
Mono- and disaccharides			5			5	5.4
Fibre (Englyst)					1	1	0
Fibre (AOAC)				27	28	55	59.1
Protein				8	11	19	20.4
Total fat		8	5			13	14.0
Saturated fat		0				0	0
Cholesterol			8			8	8.6
Polyunsaturated fatty acids				1		1	0
Monounsaturated fatty acids		0				0	0
Vitamins and minerals				6		6	6.5
Minerals				3		3	3.2
Vitamins				1	7	8	8.6
Sodium	4	10				14	15.1

Energy claims

Twenty-nine of the products displayed energy claims. The claims “low in” and “high in” energy were displayed on 14% (n=13) and 17.2% (n=16) of the products respectively (Figure 4.2) and none of the items claimed to be virtually free from or a source of energy.

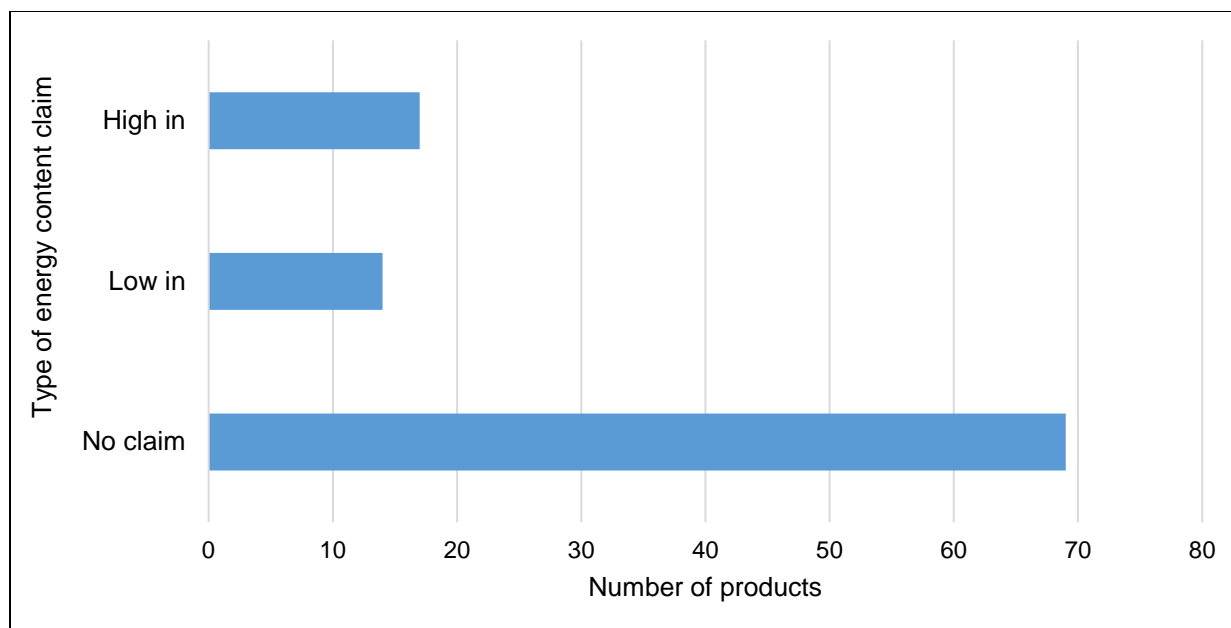


Figure 4.2: Bar graph displaying the occurrence of energy content claims across the sample

The occurrence of “low in” energy claims were significantly higher across products in the pretzels and crackers (n=3, 50%); crisps or chips (n=4, 57.1%) and biscuits (n=2, 40%) categories compared to other energy content claims (Fisher’s Exact=47.74, $p<0.000$).

The occurrence of “high in energy” claims were more common across items in the energy or high-performance bars (n=4, 33%); trail mix (n=9, 45.0%) and biscuits (n=3, 60%) categories. It was found that the protein snack bars were significantly more likely not to have an energy claim present (n=13, 100%) (Fisher’s Exact=47.74, $p<0.000$).

A binomial test found that only 17 of the 29 products with energy claims met the criteria to display an energy claim as set out in the R146, this result however did not reach statistical significance. The 12 non-compliant claims were specifically “low in energy” claims. No invalid “high in energy” claims were found amongst items in the sample.

Carbohydrate claims

Only one carbohydrate claim was found across the products categories. This claim was found on an item in the trail mix product category which stated it was “high in” carbohydrates. It was found to be compliant according to the R146 labelling legislation.

Mono- and disaccharide claims

Five out of 93 products in the sample (5.4%) made claims stating that they were “free/virtually free” from mono- and disaccharides. “Free” or “virtually free” from mono- and disaccharides was statistically more likely on products in the oat, corn or rice cakes and chocolates categories (Fisher’s Exact=16.61, $p<0.004$).

Three out of the five claims did not meet the criteria to make a mono- or disaccharide claim, however this did not reach statistical significance. Two of the non-compliant claims were found on items in the oat, corn or rice cakes and one was found on an item in the protein snack bars category.

Fibre claims

Fibre claims were the most common type of nutrient content claims across the sample as fifty-six (60.2%) out of 93 RTE products made fibre related claims. Of these 55, (98.2%) used the AOAC method and one (1.8%) made use of the Englyst method for fibre analysis. Fibre claims were found to be the most common type of nutrient content claims across the sample. Items in the trail mix ($n=10$, 50%), fruit bars or snacks ($n=6$, 50%) and biscuits ($n=3$, 60%) were significantly more likely to display a “source of fibre” claim (Fisher’s Exact=31.69, $p<0.006$).

Fibre claims using the AOAC method were significantly more likely to be absent from products in the protein snack bars ($n=10$, 76.9%); energy or high-performance bars ($n=8$, 66.7%) and chocolate bars ($n=2$, 100%) categories (Fisher’s Exact =31.69, $p<0.006$).

It was found that 53 out of 55 fibre claims determined using the AOAC method were compliant according to the specifications set out in the R146 ($p<0.0005$). The invalid claims were found to be displayed on items in the oat, corn or rice cake category. Only one “source of” fibre and one “high in” fibre claim did not meet the criteria.

The one Englyst method “high in” fibre claim was also found to be non-compliant. Among the non-compliant fibre claims, “source of” fibre was found to be 93% below the required content, while the two “high in” claims were 73% and 78% lower in fibre than the required content.

Protein claims

Most products did not have a protein claim. It was found that 8.6% (n=8) and 11.8% (n=11) displayed a “source of” and “high in” protein claim respectively. The “source of” protein claim was statistically more likely to be made by products in the oat, corn or rice cakes (n=3, 20%), protein snack bars (n=8, 61.5%) and energy or high-performance bars (n=3, 25%) categories (Fisher’s Exact=40.51, $p<0.000$). All protein claims were compliant with the R146 legislation

Total fat claims

Thirteen out of the 93 products (14.0%) displayed total fat claims. It was found that the fruit bars or snacks category comprised of the largest portion of products that made claims related to total fat content. Six (46.2%) items in the fruit bars or snacks category displayed “low in” fat claims and two items in this category (15.4%) displayed “virtually free/free from fat” claims (Fisher’s Exact=27.72, $p<0.004$). All total fat claims were compliant according to the R146 labelling legislation.

Cholesterol claims

The claim “virtually free” or “free” from cholesterol were displayed on eight of the 93 (8.6%) RTE snack food labels. The product categories most likely to display claims related to cholesterol were trail mix; energy or high-performance bars and oat, corn or rice cakes.

No claims were made regarding a product being low in cholesterol. One product in the oat, corn or rice cakes category was non-compliant as the amount of cholesterol in the product was not specified in the nutrition information table as required by the R146.

Fatty acid claims

None (100%, n=93) displayed claims for SFA or MUFA or omega-3 content. Only one product from the protein snack bars category made a “source of” PUFA claim (n=1, 7.7%) which was found to be non-compliant as the PUFA content of the total fat was 15.1%, compared to the required 40% content according to the R146 legislation.

Vitamin and mineral claims

Six of the 93 (6.5%) products displayed a “source of” vitamin and mineral claim. This was most common in the oat, corn or rice cakes (n=2, 13.3%); protein snack bars (n=2, 15.4%) and energy or high-performance bars (n=2, 16.7%) categories.

No claims for “high in” and “very high in” were found across the sample. Fifty percent (n=3) of the “source of” vitamin and mineral claims together were non-compliant. These items were found in the oat, corn or rice cakes (n=2) and energy or high-performance bars (n=1) as these products did not contain the proportion of vitamins and minerals required to make this claim according to the R146 specifications.

Mineral claims

Three (3.5%) displayed the claim “source of minerals”, without making a simultaneous vitamin claim. It was found that these claims most common in the protein snack bars category (n=3), although did not reach statistical significance according to the Fisher’s Exact Test. All claims were compliant with the R146 labelling legislation.

Vitamin claims

Eight of the (9.4%) products displayed claims related to vitamin content, without making a simultaneous mineral claim. This was most common amongst items in the: protein snack bars (n=3, 37.5%), energy or high-performance bars (n=1, 12.5%), trail mix (n=3, 37.5%) and fruit bars or snacks (n=1, 12.5%) categories. All claims were compliant with the R146 labelling legislation.

Sodium claims

A total of 14 sodium claims including the claims “low in” (n=10, 10.8%) and “very low in” (n=4, 4.3%). The claim “low in” sodium was found to be higher on products in the oat, corn or rice cakes (n=4, 26.7%) and trail mix (n=6, 30%) categories. The claim “very low in” was found to be higher in the trail mix category (n=4, 20%) (Fisher’s Exact=26.18, $p<0.013$).

Thirteen (93%) were compliant according to the R146 ($p<0.002$). One “very low in” sodium claim on a product in the trail mix category was found to be non-compliant as it

contained double the required amount of sodium required to make this claim according to the R146 legislation.

Claims for fibre content were found to be the most commonly displayed nutrient content claim. No saturated fat, omega-3 fatty acids and MUFA claims were found. Vitamin, carbohydrate, protein, total fat and mineral claims content claims were the most commonly compliant claims (Figure 4.3). The highest amount of non-compliant nutrient content claims were claims for energy, vitamins and minerals combined and mono- and disaccharides.

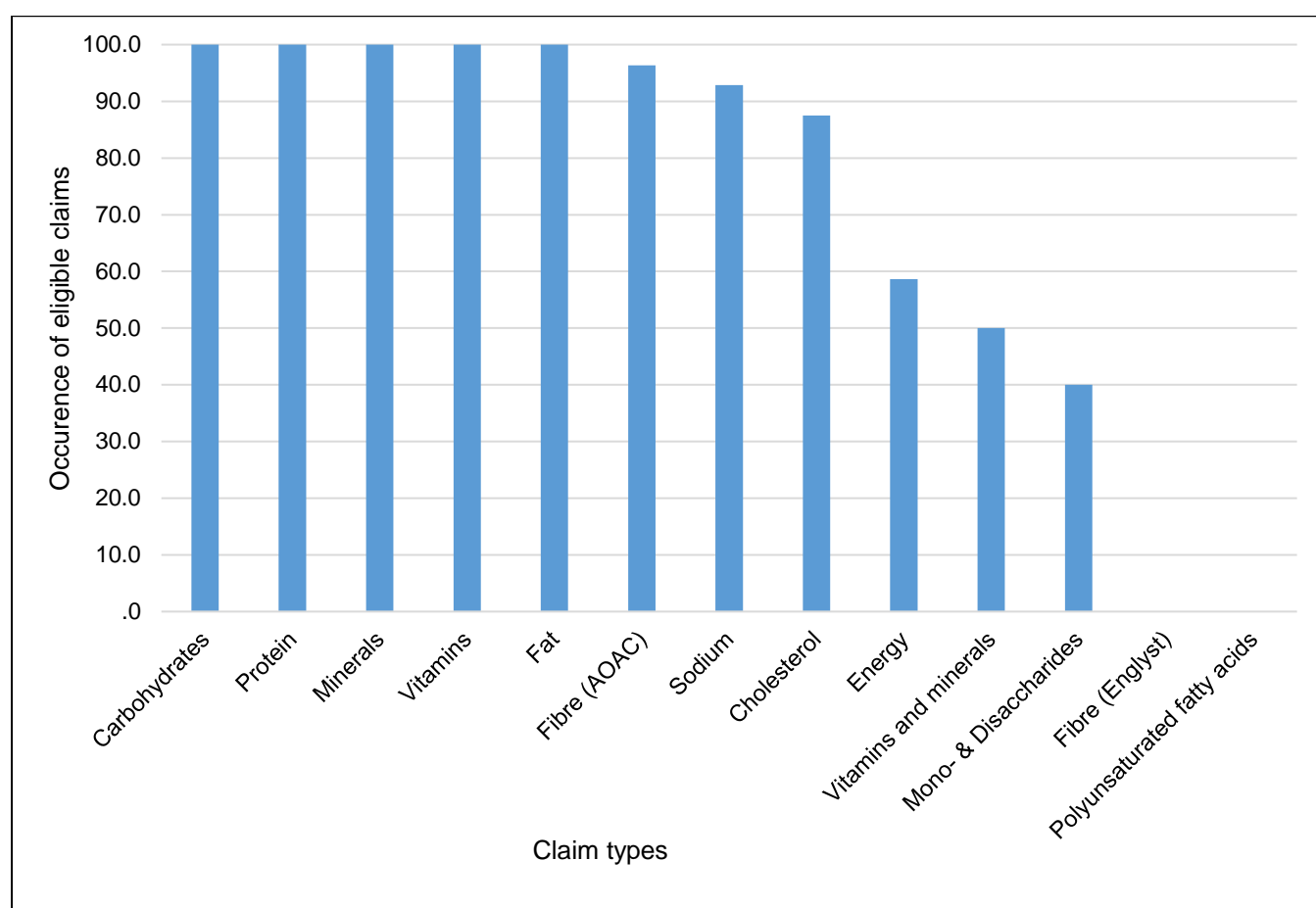


Figure 4.3: Occurrence of confirmed nutrient content claims across RTE snack food product categories

4.2.2 Comparative claims

Only four out of 93 (4.3%) products made comparative claims. It was found that all comparative claims were eligible according to the R146 labelling legislation.

Products displaying comparative claims all listed the nutrient and percentage difference between a comparison product from the same brand and product. The nutrient differences between the products displaying comparison claims and the stipulated comparison products were analysed. For the purpose of this explanation, the two items from the chips or crisps category that displayed comparison claims are referred to as “claim a” and “claim b” crisps or chips and the two items in the energy or high-performance bars category with comparison claims are referred to as “claim a” and “claim b” energy or high-performance bars.

Two packets of crisps or chips which claimed to contain 50% less fat were compared to the regular potato chips of the same amount stipulated as the comparison product from the same brand (Table 4.2). The total fat content of “claim a” chips or crisps was 58.4% lower than that of the regular chips which made the claim eligible. The SFA content of the “claim a” crisps or chips was 89.8% lower than the regular chips. The “claim a” crisps or chips however contained 94.3% more sugar and 28.6% more carbohydrates than the regular chips.

The total fat content of the “claim b” crisps or chips was 54.0% lower than the regular chips which made the comparison claim eligible. The SFA content of the “claim b” chips or crisps was 67.8% lower than the regular chips. It was found that the “claim b” chips or crisps contained 93.4% more sugar and 34.8% more carbohydrates than the regular chips.

Table 4.2: Nutrient content of “claim a” and “claim b” crisps or chips versus comparison product

Nutrient	Regular chips	“Claim a” crisps or chips	Percentage difference	“Claim b” crisps or chips	Percentage difference
Energy (kJ)	802	647	19.3	672	16.2
Carbohydrate (g)	15	21	28.6	23	34.8
Sugar (g)	0.9	15.8	94.3	13.6	93.4
Dietary fibre (g)	2.8	2.7	3.6	2.6	7.1
Protein (g)	2.3	3.1	25.8	1.7	26.1
Total fat (g)	13.7	5.7	58.4	6.3	54
Saturated fat (g)	5.9	0.6	89.8	1.9	67.8
Sodium (mg)	212	255	16.8	226	6.2

The nutrient content of two items in the energy or high-performance bars category, “claim a” and “claim b” stating “83% less total sugar” were compared with the same amount of a regular energy bar from the same brand (Table 4.3).

Table 4.3: Nutrient content of “claim a” and “claim b” energy bars versus comparison product

Nutrient	Regular energy bar	“Claim a” energy bar	Percentage difference	“Claim b” energy bar	Percentage difference
Energy (kJ)	756	716	5.3	684	9.5
Carbohydrate (g)	25	25	0	25	0
Sugar (g)	9.8	1.7	82.6	1.7	82.7
Dietary fibre (g)	3.2	2.4	25	3.1	3.1
Protein (g)	2.2	2.8	21.4	2.7	18.5
Total fat (g)	7.7	6.5	15.6	5.6	27.3
Saturated fat (g)	3.7	2.5	32.4	2.1	43.2
Sodium (mg)	24	29	17.2	30	20

“Claim a” energy or high-performance bar contained 82.6% less sugar than the regular energy or high-performance bar, making the comparative claim eligible. The “claim a” energy or high-performance bar contained 25% less fibre and 32.4% less saturated fat than the regular energy or high-performance bar.

The nutrient content of an item in the energy or high-performance bars category (claim b) that displayed the claim “lite” was compared to the same amount of product it claimed to have “83% less total sugar” (Table 4.3).

The sugar content of “claim b” energy or high-performance bar was 82.7% less than the regular energy or high-performance bar, which made the comparison claim eligible. The total fat and saturated fat content of “claim b” energy or high-performance bar was 27.3% and 43.2% lower than the regular energy bar or high-performance respectively. The “claim b” energy bar contained 20% more sodium than the regular energy or high-performance bar, however this was a difference of only 6 mg of sodium.

4.2.3 Negative claims

Twenty-one (22.6%) negative claims were found across the sample. The occurrence of claims in the trail mix (n=9, 45%), popcorn (n=1, 100%) and crisps or chips (n=3, 43%) categories were significantly higher than other categories (Fisher’s Exact=17.76, $p<0.015$). Three of the 21 negative claims (14.3%) were found to be ineligible.

Examples of negative claims were Vital Bites Almond & Cocoa (Figure 4.4) which displayed the claim “preservative free” and Clicks Smartbite Rice Pops (Figure 4.5) which displayed the claim “no added MSG”, these negative claims were found to be compliant with to the R146 legislation.



Figure 4.4: Negative claim displayed on Vital Bites Almond & Cocoa



Figure 4.5: Negative claim displayed on Clicks Smartbite Rice Pops

An example of a negative claim being non-compliant was the use of the claim “trans-fat free” on a product in the protein snack bars category. According to the R146, in order to make this claim, the generic wording: “A naturally trans-fat free food” or “(generic or category name of food but no brand name) is a naturally trans-fat free food” must be used.

4.2.4 Endorsement claims

Eighteen out of 93 (19.4%) products displayed endorsement claims. Endorsement claims were significantly more likely in the oat, corn or rice cakes category (n=5, 27.8%); energy or high-performance bars (n=2, 11.1%), fruit bars or snacks (n=5, 27.8%) and protein snack bars category (n=6, 33.3%) (Fisher’s Exact=19.65, p<0.005).

Examples of types of endorsement claims were the “Slimmer’s Choice” logo (Figure 4.6) and the “MODUCARE®” logo (Figure 4.7)



Figure 4.6: Slimmer's Choice logo on a fruit bar



Figure 4.7: MODUCARE logo on an energy bar

The R146 legislation specifies that for a food product to make an endorsement claim, the food manufacturer must possess the appropriate certification in order to make this claim, such as a manufacturer certifying a food product as Halaal and possessing the appropriate justification to make this claim.

4.3 The mean nutrient content of snack foods per category

The mean nutrient content of each product category per serving was calculated (Table 4.4). This was done to compare the average nutrient content between RTE snack food product categories.

Table 4.4: Mean nutrient content per serving

Energy

The fruit bars or snacks (311.3 kJ) (χ^2 11, $p < 0.003$); oat, corn or rice cakes (248.1 kJ) (χ^2 14, $p < 0.001$) and pretzels and crackers (341.8 kJ) (χ^2 5, $p < 0.008$) contained a significantly lower amount of energy than the mean (M) across the entire sample (487.6 kJ)

It was also found that items in the energy or high-performance bars (731 kJ) (χ^2 11, $p < 0.001$); protein snack bars (697.1 kJ) (χ^2 12, $p < 0.001$) and trail mix (642.3 kJ) (χ^2 19, $p < 0.007$) categories contained significantly more energy than the mean across all products (M=487.6 kJ).

Carbohydrates

The energy and high-performance bars (23.2 g) (χ^2 11, $p < 0.000$) and trail mix (20.1 g) (χ^2 19, $p < 0.005$) categories had a significantly higher carbohydrate content than the mean across all product categories (M=15.0 g). None of the product categories were significantly lower in carbohydrates than the mean.

Sugar

It was found that the average sugar content of the oat, corn or rice cakes (0.8 g) (χ^2 14, $p < 0.000$); the pretzels and crackers (0.8 g) (χ^2 5, $p < 0.000$) and the biscuits (5.8 g) (χ^2 4, $p < 0.008$) categories was significantly lower than the overall mean (M=8.0 g). The trail mix (17.1 g) (χ^2 19, $p < 0.000$) category was found to be significantly higher in sugar than the overall mean.

Fibre

It was found that the fibre content of the oat, corn or rice cakes (0.5 g) (χ^2 14, $p < 0.000$); pretzels and crackers (1.4 g) (χ^2 5, $p < 0.046$) and biscuits (0.9 g) (χ^2 4, $p < 0.009$) was significantly lower than the overall mean (M=2.1 g). The trail mix (3.4 g) (χ^2 19, $p < 0.004$) was found to contain significantly more fibre per serving than the overall mean.

Protein

The mean protein content of oat, corn or rice cakes (1.1 g) (χ^2 12, $p < 0.001$); pretzels and crackers (2.0 g) (χ^2 5, $p < 0.000$); fruit bars or snacks (1.5 g) (χ^2 11, $p < 0.000$) and biscuits (1.7 g) (χ^2 4, $p < 0.000$) was significantly lower than the mean across all products ($M = 3.8$ g). The protein snack bars category (11.1 g) (χ^2 12, $p < 0.001$) was found to contain significantly more protein than the overall mean.

Total fat

The mean total fat content of the oat, corn or rice cakes (1.4 g) (χ^2 14, $p < 0.000$); pretzels and crackers (3.3 g) (χ^2 5, $p < 0.033$) and fruit bars or snacks (6.8 g) (χ^2 11, $p < 0.009$) was lower than the overall mean ($M = 4.5$ g). The mean total fat content of the protein snack bars category (5.5 g) (χ^2 12, $p < 0.035$) was found to be significantly higher than the mean across all categories.

Saturated fat

The mean SFA content in the oat, corn or rice cakes (0.7g) (χ^2 14, $p < 0.000$); chips or crisps (1.0g) (χ^2 6, $p < 0.015$); pretzels and crackers (0.7g) (χ^2 5, $p < 0.000$) and fruit bars or snacks (0.5g) (χ^2 11, $p < 0.000$) was significantly lower than the overall mean ($M = 1.9$ g).

It was found that the mean SFA content of the protein snack bars (4.1 g) (χ^2 12, $p < 0.000$) and energy or high-performance bars (2.9 g) (χ^2 11, $p < 0.050$) was significantly higher than the overall mean.

Sodium

It was found that the trail mix (14.7 mg) (χ^2 19, $p < 0.000$.) and fruit bars or snacks (40.1 mg) (χ^2 11, $p < 0.005$) categories contained significantly less sodium than the overall mean ($M = 69.2$ mg). It was found that the chips or crisps (163.3 mg) (χ^2 6, $p < 0.027$) and the protein snack bars (125.0 mg) (χ^2 12, $p < 0.007$) contained per serving significantly more sodium than the overall mean.

4.4 The accuracy of the total energy content displayed on the nutrition information panel

Overall, 64 (69.6%) of the products had a higher reported energy content than calculated when converting the macronutrients to energy. It was found that 18.5% (n=17) and 12.0% (n=11) of the reported energy contents were lower and accurate when compared to the calculated energy content respectively (Figure 4.8).

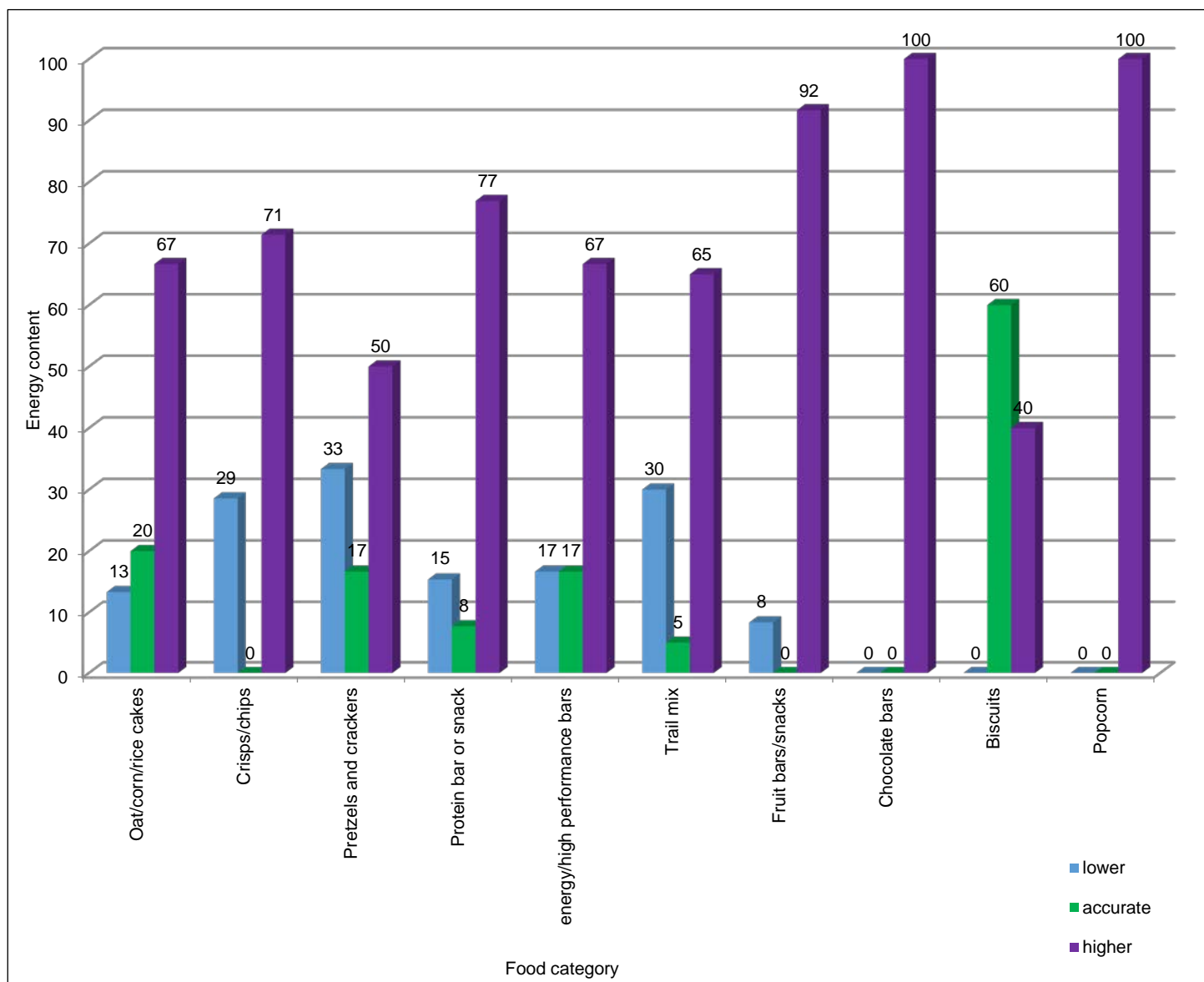


Figure 4.8: The accuracy of reported total energy content of RTE snack food items across the product categories

A Chi-square goodness of fit test demonstrated that the oat, corn or rice cakes category was significantly more likely to have a higher calculated energy content than what was reported (χ^2 2, $p < 0.022$).

Products in the chocolates (χ^2 2, $p < 0.135$), pretzels and crackers (χ^2 2, $p < 0.607$) and chips or crisps (χ^2 2, $p < 0.066$) category were more likely to have a higher reported energy content than the calculated total energy content, although this was not statistically significant. The biscuits category contained more accurate reported energy contents than inaccurate, although the differences in data were not statistically significant.

Ten out of the 13 (76.9%) items in the protein snack bars category had a higher reported total energy content than the calculated energy content which reached significance, (χ^2 2, $p < 0.004$). A Chi-square goodness of fit test on items in the energy or high-performance bars category found that a significant number ($n=8$, 66.7%) of the reported energy contents were higher than the calculated total energy content, (χ^2 2 $p < 0.050$).

A Chi-square goodness of fit test found that the trail mix product category contained a significant number of items displaying total energy contents that were higher than the calculated total energy content ($n=13$, 65%), (χ^2 2, $p < 0.004$). The fruit bars or snacks RTE snack food category was found to contain a significant occurrence of higher calculated energy content than reported ($n=11$, 91.7%) (χ^2 11, $p < 0.000$).

4.5 Eligibility of claims using proposed nutrient profiling model

Four out of the 93 products with nutrient content claims (4.4%) were missing nutrition information as required by the proposed NPM and could not be analysed. When the information from the remaining 89 products was entered into the calculator, it was found that 67 of products (72%) would be ineligible to make health and or nutrient claims once the R429 is implemented (χ^2 (2) = 67.670, $p < 0.005$) (Table 4.5).

Table 4.5: Eligibility of items across food product categories to make health and or nutrition claims according to the proposed R429 legislation

Product category	Total	Eligible		Not eligible		Information missing	
		n	%	N	%	n	%
Oat, corn or rice cakes	15	5	33.3	8	53.3	2	13.3
Crisps or chips	7	0	0	7	100		
Pretzels and crackers	6	0	0	6	100		
Protein snack bars	13	0	0	11	84.6	2	15.4
Energy or high-performance bars	12	3	25	9	75		
Trail mix	20	8	40	12	60		
Fruit bars or snacks	12	6	50	6	50		
Chocolate bars	2	0	0	2	100		
Biscuits	5	0	0	5	100		
Popcorn	1	0	0	1	100		
Total	93	22	23.7	67	72	4	0.04

A Chi-square goodness of fit test comparing product categories with the eligibility of claims found that products in the chips or crisps (100%, $n=7$ $\chi^2(2)=14.000$, $p<0.001$), pretzels and crackers (100%, $n=6$ $\chi^2(2)=12.000$, $p<0.002$) and biscuits (100%, $n=5$, $\chi^2(2)=10.000$, $p<0.007$) categories were significantly more likely not to be eligible according to the R429 labelling legislation.

Eleven out of 13 (85%) ($\chi^2(2)=15.846$, $p<0.0005$) food items in the category protein snack bars, nine out of 10 products (80%) in the energy and high-performance bars category ($\chi^2(2)=10.400$, $p<0.006$ and 12 ($\chi^2(2)=11.200$, $p<0.004$) and 12 out of 20 food items in the trail mix product category were significantly more likely not to be eligible to make health and or nutrition claims according to the DoH nutrient profiling calculator.

The mean nutrient profile score across 89 items in the sample was calculated and food items from product categories compared to the average (Table 4.6). The average nutrient profile score across different products categories differed significantly from the calculated mean (Kruskal Wallis $\chi^2(9) = 27.510$, $p < 0.001$).

Table 4.6: Mean nutrient profiling score across product categories

Items in the biscuits category had on average a significantly higher nutrient profile score than those in the oat, rice or corn cakes; trail mix, fruit bars or snacks and chocolate bars. It was found that the average nutrient profile score of items in the crisps or chips category was significantly higher than items in the trail mix and fruit bars or snacks categories. Analysis shows that the average nutrient profile score of items in the protein snack bars category was significantly higher than the score of items in the pretzels and crackers; trail mix and chocolates categories, $\chi^2(9) = 27.510$, $p < 0.001$.

4.6 Summary of results

Nutrient content claims were the most commonly displayed claims with 91 of the 93 products containing them. The other types of claims were comparative claims, negative claims and endorsement claims.

A significant number of nutrient content claims for fibre, vitamins; sodium; total fat and protein were compliant according to the criteria set out in the R146 legislation while 23 out of 91 nutrient content claims (25.3%) were found to be non-compliant according to the R146 legislation, this was not found to be statistically significant.

The nutrient content of four products displaying comparative claims were compared to the nutrient content of the item listed on the label for comparison. It was found that all four products met the criteria to make these claims. However, the items in the crisps or chips category that made comparative claims were found to contain more sugar and carbohydrates than the comparison product.

The fruit bars or snacks; oat, corn or rice cakes and pretzels and crackers categories were found to contain the lowest amount of energy. The energy and high-performance bars and trail mix categories were found to contain the highest amounts of energy and carbohydrate. The lowest sugar content was found amongst items in the oat, corn or rice cakes; pretzels and crackers and biscuits, all of which were also found to contain the least fibre. The trail mix category contained the highest amount of sugar and fibre.

The oat, corn or rice cakes; pretzels or crackers; fruit bars and biscuits categories contained the lowest amount of protein. Protein snack bars were found to contain the highest protein and total fat content. The categories with the lowest total fat content were found to be the oat, corn or rice cakes; pretzels and crackers and fruit bars or snacks.

The oat, corn or rice cakes; chips or crisps; pretzels and crackers and fruit bars and snacks categories contained the lowest amount of SFA, while the highest SFA content was found in the snack bars and energy or high-performance bars categories. The trail mix and fruit bars and snacks categories contained the lowest amount of sodium, while crisps or chips and protein snack bars contained the highest.

Sixty four of the 93 products in the sample displayed a total energy content that was higher than the energy content calculated using the macronutrient content and the R146 conversion factors. This trend was found to be consistent across all product categories.

The nutrient profiling calculator revealed that only 22 products (23.7%) would be eligible to make health and or nutrition claim when the proposed R429 labelling legislation is promulgated. Biscuits, crisps or chips and protein snack bars had a higher nutrient profile score than the upper level nutrient profile score to make a health and or nutrition claim.

A discussion of the results in relation to the findings from the literature will be addressed in the following chapter.

CHAPTER 5: DISCUSSION

This study was conducted to determine the nutrient quality and labelling of RTE snack foods displaying health and or nutrition claims. The first research objective was to determine the type of health and or nutrition claims made on RTE snack foods and verify whether claims were compliant with the current labelling legislation of South Africa. The second objective was to determine the nutrient quality of RTE snack foods within the categories. Thirdly, the accuracy of the reported total energy content was compared to the calculated total energy content. The fourth objective was to determine whether health and or nutrition claims currently displayed on RTE snack food products would be valid once the proposed R429 legislation is implemented.

5.1 Sample characteristics

The sample included 93 RTE snack food products commonly available to consumers in South Africa. These products were purchased from four grocery stores and two pharmacies.

5.2 Types of health and or nutrition claims displayed

5.2.1 Nutrient content claims

Nutrient content claims, displayed on 97.8% of the products, were the most commonly featured type of health and or nutrition claim.

A North American survey by Legault *et al* (2004) on the prevalence of claims on packaged foods (n=1281) between the years 2000 to 2001 found that 49.7% of processed packaged foods in USA displayed nutrient content claims, 4.4% displayed health claims and 6.2% displayed structural or function claims. This study, which focused on a range of processed foods including cereals, breads and other packaged food items, found a prevalence of nutrient contents claims in the snacks, granola bars and trail mixes category of 23.8% which was much lower than the prevalence of nutrient content claims amongst South African RTE snack foods (97.8%) (Legault *et al* 2004).

A survey conducted in both Australia and New Zealand found that 57% of sports bars displayed health claims (Williams *et al* 2006). The incidence of health claims on this type

of product indicates that a high level of influence may be directed at the consumer which could result in the purchase of the product.

Another North American survey of 56 900 packaged foods found that 75.7% of a sample displayed nutrient content claims. Of these packaged foods, 73.3% however contained high levels (>20%) saturated fat, sodium and or sugar. Products with claims may not have a superior nutrient content overall (Colby *et al*/2010). This was demonstrated where RTE snack food categories contained a low energy content but a high sugar content, as found in the fruit bars and snacks category.

Each individual nutrient content claim was analysed in the categories of RTE snack food products. Nutrient content claims were displayed on at least one product per product category. Some products displayed more than one nutrient content claim, for example “low in fat” and “high in fibre”.

5.2.2 Comparative claims

Comparative claims were found on 4.3% of the products particularly on items in the crisps or chips and energy or high-performance bars categories. The incidence of comparative claims was lower than other types of claims.

It was found that all the comparative claims were compliant according to the R146 legislation. The nutrient content of products with comparative claims was compared with that of the displayed product for comparison. All (n=4) the products displaying comparison claims were compliant with the difference in nutrients as displayed on the label. Comparative claims present the opportunity of highlighting the presence or absence of ingredients that may be desirable to consumers, however other nutrients may be overlooked leading to overconsumption and weight gain.

Two items in the chips or crisps category claimed to be 50% lower in fat than a similar product. Both contained at least 93% more sugar than the comparison product. This highlights that food manufacturers may “cherry pick” data by displaying a claim about one nutrient being favourable yet neglect to inform consumers of negative aspects of a food product.

The nutrient content of the two items in the energy or high-performance bars category did not contain high amounts of undesirable nutrients.

5.2.3 Negative claims

Twenty-one products were found to display negative claims, making this the second most commonly displayed type of health and or nutrition claim. It was found that three of the negative claims (14.3%) were non-compliant according to the R146 regulations. While the incidence of non-compliant negative claims was lower than the incidence of false nutrient content claims, controlling the manufacturer's display of information on food labels is important.

A literature review by Carreño and Vergano (2014) suggested that the display of negative claims should be controlled by stipulating that the negative claim be displayed within the list of ingredients following the replaced ingredient or be shown in a footnote below the ingredient list. It was advised that the displayed negative claim be printed in the same colour, font and size as the rest of the ingredient list.

Another idea proposed by Carreño and Vergano (2014) to control negative claims was for the EU to adopt a law which states that negative claims should not be misleading, deceiving to the consumer or discrediting to other food manufacturers. It suggests that all communication on the packaging which states that the product is free from or contains a specific nutrient should not be displayed without scientific evidence (Carreño & Vergano 2014).

The R146 legislation specifies that negative content claims should be worded in a specific way to prevent misleading consumers and reflecting negatively by highlighting nutritional properties which are commonly found in similar products in the same class or category (DoH 2010). The same negative claims regulations have been carried through into the proposed R429 labelling legislation (DoH 2014).

5.2.4 Endorsement claims

Endorsement claims were found on 8.6% of products (n=8). Most were present in the oat, corn or rice cake, protein snack bars as well as fruit bars and snacks categories. This type of claims is less commonly used amongst South African RTE snack food products.

Endorsement claims, referred to as prohibited statements in the R146, may suggest that a product is more superior to another similar product through the display of logos and images highlighting a desirable property which may mislead consumers if the claim is not true.

5.3 The nutrient quality and labelling of claims

It is important for food manufacturers to take note of nutrients that are desirable to consumers to develop appropriate products. A North American study by Drewnowski, Moskowitz, Reisner and Krieger (2010) was conducted on the consumer perception of nutrient content claims using conjoint analysis (n=320). The participants, who were recruited using online marketing, consisted of 78% females and 22% males, 67% of whom were 45 years or older and 38% of whom had a college degree or qualification.

The study found that consumers perceived foods displaying claims describing the presence of protein, fibre, calcium and vitamin C as healthy. Foods displaying claims describing the absence of saturated fat, cholesterol and sodium were considered as healthier choices. Consumers were less likely to be influenced by claims for the presence or absence of total fat, total and added sugars, iron and vitamin A (Drewnowski *et al* 2010).

Therefore, the presence of protein, fibre, calcium and vitamin C and the absence of saturated fat, cholesterol and sodium are aspects which consumers may be drawn to. Calcium and vitamin C claims are not required to be displayed in the nutrition information table, unless a claim regarding these micronutrients is made. A high occurrence of claims related to fibre content was found amongst South African RTE snack foods. A lower occurrence of claims related to protein, sodium and cholesterol were found and no claims regarding saturated fat content were found in this study.

A South African study conducted by Bosman *et al* (2014) on the consumer perceptions of health or nutrition claims found that 67% of consumers trust health or nutrition claims and may select products based on these claims. Foods claiming to be healthy may therefore be perceived as healthier than those not displaying claims, yet the nutrient content of these foods with claims compared to foods without claims may be overlooked. Consumer education on how to evaluate nutrition labels may enable better choices, as

nutrition labelling is a golden opportunity to aid consumers in better food choices (Koen *et al* 2016).

For the purpose of this discussion, the results from objective 1 to 3 will be discussed under each specific nutrient.

5.3.1 Energy

Energy claims were the second most commonly displayed nutrient content claim with 31.2% of the items displaying an energy claim. Both low and high energy claims were found across product categories, suggesting that the RTE snack foods consisted of a range of nutrient profiles, which target consumers with different nutritional requirements. Consumer profiling is important to consider as different individuals have varying body weight and or performance goals. Some individuals may be seeking a low kilojoule RTE snack to consume for supporting weight loss goals, while others may look for a high energy or protein snack to provide endurance during physical activity.

Items in the fruit bars or snacks category had the lowest energy content overall, however were found to contain the highest amount of sugar across the categories. The energy or high-performance bars category was found to contain the highest energy and carbohydrate content per serving across all categories, this may be since energy bars had a higher average serving size (44.8 g) than other RTE snack food categories (M=30.6 g).

Most of the “high in energy” claims were displayed on products in the energy and high-performance bars, trail mix and biscuits categories. The energy and high-performance bars had a high occurrence of “high in” energy claims, which was expected as these products were marketed at consumers wanting to increase energy levels. All the “high in” energy claims were found to be valid. The “low in energy” claims were mostly found amongst products in the chips or crisps, pretzels and crackers and biscuits categories, these categories had a smaller serving sizes than the protein bars or snacks and energy or high-performance bars which may have attributed to the lower energy content.

A concerning forty one percent (n=12) of these claims did not meet the criteria as set out in the R146. The energy content of the non-compliant “low in energy” claims amongst

the sample was found to range between 1076 to 2098 kJ per 100 g, whereas the specified cut-off for the same claims is not more than 170 kJ per 100 g, this is a large surplus energy content (DoH 2010). Food manufacturers of these 12 RTE snack food products are therefore misleading consumers by underreporting the energy content, resulting in them unknowingly consuming more kilojoules than they believe. This may contribute towards weight gain.

In general, however, 69.6% of the sample, over reported their energy content as they had a higher displayed total energy content than the energy content calculated using conversion factors as stipulated by the R146 legislation. These were particularly items in the oat, corn or rice cakes; protein snack bars; energy or high-performance bars; trail mix and fruit bars or snacks categories.

A higher reported energy content suggests that consumers may get less energy from RTE snack food products, this is more desirable for consumers who are using RTE snack foods for weight loss or maintenance as they will consume less energy than expected, compared to having a lower reported energy content which may result in consumers consuming more. Consumers seeking products to aid in weight loss or maintenance are, however unlikely to choose products with a higher reported energy content.

A study was conducted on the accuracy of energy content and other nutrients reported on the nutrition labels of 89 pre-packaged products by converting macronutrients into energy equivalents and adding them together to form the total energy content. It was found that in general, 51% of nutrition labels were found to over-declare nutrient content than what the product contained (Food Safety Authority of Ireland 2010).

A study conducted by Jumpertz *et al* (2013) found that the actual energy content of popular, energy-dense snack foods was 4.3% higher in energy than the reported content on nutrient labels. The actual energy content was calculated through bomb calorimetry (Jumpertz *et al* 2013).

5.3.2 Carbohydrates

Carbohydrate claims were one of the least commonly displayed type of nutrient content claim (n=1). One item in the trail mix category was the only “high in” carbohydrate claim found across the food categories which was compliant. This suggests that displaying a claim highlighting the presence of carbohydrate in a RTE snack food product may not be desirable to consumers. The R146, as well as the proposed R429 legislations do not include specifications for claims referring to foods that are “low in” or “free from” carbohydrates.

The trail mix and protein snack bars categories were found to contain the lowest amount of carbohydrates, while the biscuits and oat, corn or rice cakes categories were found to contain a higher carbohydrate content per serving. The higher carbohydrate content amongst items in the biscuits and oat, corn or rice cakes categories is because these products are carbohydrate-based. A higher carbohydrate content may be desirable to consumers who engage in sports or endurance events to improve energy and performance. This type of consumer may be the target of high energy claims on these products which are commonly used in endurance events.

The food-based dietary guidelines of South Africa promote the inclusion of carbohydrates in the diet through the guideline “make starchy foods part of most meals”. Carbohydrate intake in South Africa varies amongst race groups with the Whites, Coloureds and Indians carbohydrate content being less than 50% of their total energy intake while Black South Africans have an intake of 50-70% of their total energy intake (Vorster, Badham & Venter 2013).

There has been an increased interest in low-carbohydrate diets, with the Paleo diet and the New Atkins diet being included in the most popular diets for 2017 (National Health Service 2017). The restriction of carbohydrate consumption is therefore a growing trend amongst consumers which may account for the low incidence of carbohydrate claims on RTE snack foods in South Africa.

5.3.3 Mono- and disaccharides

Only five (5.4%) of the items displayed mono- or disaccharide claims. It was found that 60% of “free/virtually free” from mono- and disaccharides claims did not comply with the R146 specifications as they contained a higher mono- or disaccharide content than required. This highlights the need to ensure that food manufacturers comply with maximum amount of mono- or disaccharides when making these claims as this may prove misleading to consumers.

The oat, corn or rice cakes; pretzels and crackers and biscuits categories contained the lowest mono- or disaccharide content. Fruit bars or snacks, however were found to contain the highest sugar content per serving. This indicates that items in this category may not be the best choice for an individual who wants to lose weight.

Sugar, a high-energy and processed ingredient, has been noted as one of the factors which may contribute to weight gain and obesity (Lawrence 2009). In South Africa, a proposed tax on sugar-sweetened beverages was announced by the Minister of Finance in 2016 to be implemented on 1 April 2017. It was proposed that a tax be implemented per gram of sugar in all beverages that contain added caloric sweeteners and includes soft drinks, fruit drinks and sports drinks (ADSA 2017).

At this stage the sugar tax has only been targeted at sugar-sweetened beverages. If the sugar tax is extended to include processed foods that are high in sugar, there may be an impact on the labelling regulations imposed on these products. Regulation of mono- or disaccharide claims on South African RTE snack food products may provide consumers with accurate information about the sugar content in RTE snack food products which may contribute to the reduction of excessive sugar intake and potential weight gain.

According to the 2017 Budget Speech, the sugar tax has not yet been implemented in South Africa as it was suggested by the DoH to include both intrinsic and added sugar and will be implemented later in the year (Gordan 2017). A position paper by the Association for Dietetics in South Africa (ADSA) concluded that a tax on sugar-sweetened beverages in South Africa has the potential to reduce sugar intake and the rate of obesity and NCDs, yet it may not be the final solution. ADSA highlights the need for a multi-

pronged approach to sugar intake in South African including the use of the revenue generated from the tax to support other strategies such as nutrition education (ADSA 2017).

5.3.4 Fibre

Fibre content claims were the most commonly displayed nutrient content claim across 56 (60.2%) of the sample, particularly in the trail mix, fruit bars or snacks and biscuit categories. This may be due to the natural high fibre content in fruit and wholegrains used in these products. Regarding the eligibility of fibre content claims, 96% were found to be valid according to the R146 legislation.

None of the protein snack bars displayed claims promoting fibre content, this may be due to the fact that protein snack bars are produced for athletes and active individuals. A high fibre content in foods like this may be undesirable due to the risk of digestive symptoms during sporting events.

Energy and high-performance bars and chocolates were less likely to display fibre content claims. The fibre content per serving of items in the oat, corn or rice cakes; pretzels and crackers and biscuits were lower than the mean across all categories, which is a contradiction as many items in the biscuits category made high fibre claims. The contradictory display of high fibre claims on items in the biscuit category may be to take the focus off the higher saturated fat and sugar content.

Fibre which is can be found in fruit, vegetables and wholegrains has benefits such as improving gut health, reducing blood lipids and slowing the digestion and absorption of carbohydrates (Vorster *et al* 2013). The food-based dietary guidelines of South Africa encourage a high intake of fibre from the diet. The inclusion of more fibre in RTE snack foods may be an opportunity for consumers to increase their fibre intake.

5.3.5 Protein

Protein content claims were the third most commonly displayed type of nutrient content claim with 20.4% of items displaying this claim. Claims describing RTE snack food products as a “source of” protein were most likely to be found on the oat, corn or rice

cakes and protein snack bars category. Ready-to-eat snack food products describing food as high in protein were most likely to be found on energy or high-performance bars and protein snack bars.

It is important to note that all the protein claims in the study were found to meet the criteria as set out in the R146 (DoH 2010). This indicates that consumers may be able to trust RTE snack food products displaying “high in” or “source of” protein content claims.

Claims describing RTE snack food products as a “source of” protein were most likely to be found on the oat, corn or rice cakes and protein snack bars category. The occurrence of “source of protein” claims on items in the oat, corn or rice cakes was surprising as one would not generally expect these items to be high in protein due to a high content of grains. Ready-to-eat snack food products labelled “high in” protein were most likely to be found on energy or high-performance bars and protein snack bars.

As expected, the average highest protein content across all categories was found in the protein snack bars, while the lowest protein content was found in both the oat, corn or rice cakes and fruit bars or snacks categories. It is misleading that oat, corn and rice cakes claimed to be a source of protein yet had one of the lowest protein contents (average of 1.1 g).

A study which analysed the actual protein content of 70 protein shake supplements on the South African market using SANAS-accredited testing methods, reported that five had over reported protein content by more than 25%. Interestingly, the protein supplement with the highest content discrepancy of 80.1% between what was reported compared to the actual protein content is no longer available on the South African market (Schönfeldt, Hall & Pretorius 2015). Although these results did not focus on RTE snack food products, the overreporting of protein content may be carried over to other categories of food products.

Protein has multi-factorial benefits in weight management. Dietary protein may promote lean body mass, increase satiety and reduce energy efficiency by aiding the body to overcome its natural resistance to weight loss (Paddon-Jones, Westman, Mattes, Wolfe, Astrup, Westerp-Plantenga 2008). An increase in protein content amongst RTE snack

foods may be beneficial to consumers who are aiming to lose weight or improve athletic performance.

5.3.6 Fat

Fourteen percent of the RTE snack foods were found to display claims regarding a low total fat content, particularly in the fruit bars or snacks category. The occurrence of these claims in the fruit bars or snacks category may be due to the fact that these products fruit-based and fruit is naturally fat free. These claims included “low” and “free/virtually free from” and were all were found to be valid.

No SFA, MUFA and omega-3 fatty acids content claims were found across products in the sample. This suggests that fatty acid content may not be important to consumers who purchase RTE snacks. One “source of” PUFA claim was found which was discovered to be invalid according to the legislation.

The average fat content of the oat, corn or rice cakes was lower than all other product categories, while the protein snack bars had the highest total and SFA content. The fruit bars or snacks category had the lowest SFA content which would be expected from a bar primarily from fruit as fruit does not contain saturated fat. The fruit bars or snacks had a lower total fat, protein, energy and sodium content across all categories.

An Australian qualitative study on 36 adults between ages 20 and 80 years found that most consumers did not trust fat content claims and were sceptical of the amounts of other macronutrients making up the total energy content when a low in fat claim was displayed (Chan, Patch & Williams 2005).

Studies have shown that consumption of a low-fat diet (intake of less than 30% total energy from fat) results in slower weight loss and quicker weight gain when compared to a low-sugar and carbohydrate diet (Bueno, De Melo, De Oliveira & Da Rocha Ataide 2013; Yancy, Olsen, Guyton, Bakst & Westman 2004).

5.3.7 Vitamins and minerals

Claims for vitamin content alone were found on eight products, all of which were found to be valid according to the R146. Claims for mineral content alone were found on three products in the sample and all were found to be compliant.

Six products, items in the oat, corn or rice cakes; protein snack bars and energy or high-performance bars, were found to be described as sources of vitamins and minerals, half of these claims were found to be non-compliant as not all the vitamin or mineral cut-offs were met.

5.3.8 Sodium

Sodium claims were found on 15.1% of the items (n=14). Claims describing products as “low” or “very low” in sodium were found to be present in the oat, corn or rice cakes and trail mix categories. It was found that 93% of these claims were accurate according to the R146 (DoH 2010). The high rate of deaths attributed to cardiovascular disease and stroke in South Africa has drawn attention to the fact that consumers eat too much sodium (World Health Organisation and World Economic Forum 2012). The regulation of sodium intake is important to public health and the control and reduction of NCDs (Webster, Crickmore, Charlton, Steyn, Wentzel-Viljoen & Naidoo 2017).

New regulations to reduce the public intake of sodium were implemented in South Africa in June 2016. The occurrence of sodium claims on only 15.1% of the sample is lower than expected with the sodium restriction currently in place in South Africa

5.4 Eligibility of claims using the nutrient profiling model

The proposed R429 labelling legislation includes a NPM which food manufacturers may use to determine whether products are eligible to make health claims. The DoH created this model to prevent the masking of overall nutrient content with health or nutrition claims, to encourage food manufacturers to develop healthier and better-quality products and to facilitate better food choices by the consumer (DoH 2017).

There is no NPM currently in use and the R146 legislation relies on food manufacturers consulting the minimum and maximum criteria in the legislation to determine whether a product is eligible to make a claim or not. The proposed legislation has not yet been

implemented, however it was important to determine whether local products displaying health and or nutrition claims which are currently on the market will still be able to display such claims once the R429 is implemented.

It was found that four of the products did not display the all the nutritional information necessary to apply to the NPM. The nutrient profile scores generated by the NPM indicated that 72% of products would not be eligible to make health and or nutrition claims once the R429 is implemented.

The high incidence of ineligible claims according to the R429 NPM highlights that many RTE snack food manufacturers may need to either alter the nutrient content or remove health and or nutrition claims from food products. This suggests that the current criteria for South African food products to make claims may be lenient and food products with claims may not be as beneficial as consumers perceive.

Nutrition education is necessary for consumers to understand the information displayed on nutrition labels. The current criteria to make claims is not as stringent as that in the R429 proposed legislation and consumers may benefit from being able to interpret the nutrient content of food items.

Nutrient profiling may be a way to regulate the claims displayed on food products and aid consumers by providing them with accurate nutritional information. Several countries have implemented FOP labelling to consolidate nutritional information on the front of a food product, aiding consumers to make healthier food choices. Front-of-package labelling has been included in the proposed R429, but the design or method has not been specified (DoH 2014).

It has been highlighted that the use of FOP labelling in South Africa may potentially benefit consumers by facilitating an understanding of nutrition labels and aiding better food choices (Wicks 2012). It was suggested that a modified version of the NPM utilised in Australia and New Zealand be most suitable in South Africa (Wentzel-Viljoen *et al* 2012). Australia and New Zealand use the Health Star Rating System as the chosen FOP design (Commonwealth of Australia 2016).

Introducing FOP labelling in South Africa may aid consumers to make healthier food choices by displaying nutrients clearly, summarised and easy to read. Utilising a specific design of FOP labelling in South Africa adds the benefit of regulating the information food manufacturers highlight and preventing bias (Draper *et al* 2013).

5.5 Summary

The accuracy of nutrition content and negative claims should be more stringently regulated by the government to protect consumers from being misled. The average nutrient content of RTE snack food items did not correlate with the claims displayed on these items. Cherry picking was found amongst items with comparison claims where manufacturers highlighted a desirable property, such as the display of the claim “low in fat” on a product but neglected to advise consumers that the product contained high amounts of sugar and carbohydrates.

The energy content of items in the sample was generally higher than the energy content calculated using the conversion factors specified in the R146. Consumers may be ingesting less energy than they expect, which is favourable for consumers who aim to reduce their energy intake but negative for consumers seeking high-energy snacks for endurance sports.

The proposed R429 labelling legislation will have a major effect on food manufacturers who will need to adjust the nutrient content of RTE snack food products to make a health and or nutrition claim. The implementation of more stringent criteria for health and or nutrition claims in South Africa indicates that the current criteria to make claims is not strict enough and RTE snack foods displaying health and or nutrition claims may contain an inadequate nutrient profile.

It was found that consumers should be educated on how to analyse nutrition labels and not assume RTE snack food products choices displaying health and or nutrition claims are automatically superior options. There may be a place for FOP labelling in South Africa to improve consumer interpretation of the nutrient content of different types of food.

CHAPTER 6: CONCLUSION

The growing incidence of obesity and NCDs in South Africa is cause for concern. There are several factors which may play a role in the rise of this epidemic. Urbanisation and the nutrition transition has resulted in a shift to an increased consumption of convenience foods which are often highly-processed and high in sugar, fat and salt. The boom in the market for RTE convenience foods has increased the development of nutrition marketing, such as the display of health and or nutrition claims on food products to attract customers. Consumers often accept these claims at face value and assume these products are superior to other similar products.

The concern with the surge of health and or nutrition claims is that some of them may not meet the R146 labelling legislation criteria and could contain high amounts of energy and sugar – overconsumption of which may lead to weight gain. The R146 labelling legislation was implemented to regulate nutrition labelling and protect consumers from misleading or inappropriate labelling and claims. There is limited research on the corrective action taken by authorities against food manufacturers who falsely label food products. Consumers have been found to feel confused by the claims and design of local nutrition labels which may lead to poor food choices.

6.1 The presence and accuracy of health and or nutrition claims

The presence and accuracy of health and or nutrition claims across a range of ten RTE snack food product categories were investigated. Nutrient content claims were the most commonly displayed type of claim and one-quarter of these were non-compliant with the R146. The second most popular type of claim was negative claims and 14% of these claims were non-compliant. Endorsement claims were the third most commonly displayed type of claim. Comparison claims were found to be displayed least often on labels, these claims were found to be compliant with the R146 legislation. Products with comparison claims were found to highlight the content of a particular nutrient on nutrition labels yet contained a high amount of other undesirable nutrients.

Reasons for non-compliance amongst health and or nutrition claims include: a nutrient content above or below the specified criteria, not including the “claim” nutrient in the nutrition information table and not complying with the wording specified in the R146 labelling legislation. There is limited evidence of consequences for food manufacturers who contravene the specifications to make health and nutrition claims. The implementation of mandatory nutrition labelling and the NPM, as stipulated in the proposed R429 may improve the labelling of health and or nutrition claims in South Africa.

6.2 The average nutrient content of RTE snack food product categories

The average nutrient content of each product category was calculated and compared to the overall mean nutrient content per serving. Individuals may select food items for different reasons, for example, to improve endurance in sports or to aid weight loss. Each item contained a different nutrient profile and would be suitable for consumers with different nutrition needs.

Consumer understanding of nutrition labels is an important factor to aid better food choices. The implementation of FOP labelling in South Africa to highlight nutrient content at a glance may aid consumers to choose the right type of snack according to their needs.

6.3 The accuracy of total energy content

This study found that nearly 70% of RTE snack food products had a higher total energy content displayed on the label compared to the energy content calculated by the addition of reported macronutrients multiplied by the conversion factors stipulated in the R146. This may be misleading to consumers who require snack foods that are high in energy, such as endurance athletes, as products were found to claim that they contain more energy than they do. The standardisation of methods to determine the total energy content of food products in South Africa may better control the information being distributed to the public.

6.4 The eligibility of health and or nutrition claims according to the R429

According to the R429 NPM, it was determined that more than 70% of products would not be eligible to make health and or nutrition claims once the R429 is implemented. This highlights the adjustments food manufacturers may need to make to the nutrient content of food products and the health and or nutrition claims displayed on labels once the new legislation has been promulgated.

6.5 Study critique

The main limitation in the study was that only South African RTE snack foods were investigated in this study. Consumers in South Africa have many imported RTE snack foods displaying health and or nutrition claims available to them. The use of sales data of types of RTE snack foods commonly sold in South Africa in the selection of product categories would have reduced the possibility of bias by self-selection of products. Time constraints prevented the researcher from including both local and imported RTE snacks in this study as this would have required the legislation from each imported product's country to be assessed and validated.

6.6 Implications for further research

This study gained insight into the current labelling practices of RTE snack foods displaying health and or nutrition claims and investigated the nutrient quality of these products and if products with claims are a better choice than regular RTE snack foods.

Expanding the study into investigating health and or nutrition claim labelling of RTE meals and other processed foods may provide further information regarding the eligibility of health and or nutrition claims. There are limited studies behind the actual compliance of food manufacturers to the labelling legislation and limited evidence of corrective action taken against those manufacturers making false or inappropriate claims.

The DoH NPM was used to test whether current health and or nutrition claims would still be valid with the regulations of the proposed R429 legislation, this found that many food manufacturers will need to adjust their labelling practices when the new regulation is promulgated. The NPM will assist manufacturers in assessing the healthiness of food

products and eligibility to make a claim, the next step is to develop a standardised format of FOP labelling for South Africa food products. Further research into the most appropriate model is necessary.

6.7 Recommendations for dietetic practice

The focus of this study was to investigate label claims and nutrient quality of RTE snack food products on the market. It is recommended that dietitians focus on educating consumers on the interpretation of nutrition labels which may facilitate better food choices. Dietitians should assist consumers in understanding the amounts of nutrients which may benefit them and those that are not healthy. Suggesting different unprocessed food options such as fresh fruit may improve snack choices. For the purpose of this study only urban areas were used as sites for product collection, however future research should explore semi-urban studies for more insight into products available in these areas.

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APPENDIX A: ENERGY CONVERSION FACTORS (DoH 2010)

In the calculation of the energy value of a foodstuff for the prescribed energy statement, the following conversion factors shall be employed:

- (a) Energy: 1 kcal equals 4.18 kJ;
- (b) 1 g of available carbohydrates expressed as monosaccharides and/or disaccharides shall be deemed to contribute 17 kJ. However, when expressed as monosaccharide equivalents, a conversion of 16 kJ should be used;
- (c) 1 g of starch and glycogen shall be deemed to contribute 17 kJ;
- (d) 1 g of protein shall be deemed to contribute 17 kJ;
- (e) 1 g of fat shall be deemed to contribute 37 kJ.

APPENDIX B: PRODUCT SELECTION CRITERIA LIST

Type of claim	Nutrient	Wording/description on product
Nutrient content claim	Energy	Low, free or virtually free from, source of, high in.
	Carbohydrates	Low, free or virtually free from.
	Protein	Source of, high in.
	Total fat	Low, free or virtually free from.
	Saturated fat	Low, free or virtually free from.
	Cholesterol	Low, free or virtually free from.
	Mono- and Disaccharides	“Free” or “Virtually free from”.
	Sodium	Low, very low, free or virtually free from.
	Dietary fibre	Source of, high in.
	Polyunsaturated fatty acids	Source of, high in.
	Monounsaturated fatty acids	Source of, high in.
	Vitamins and minerals	Source of, high in, very high in.
	Comparative claims	
Negative claims		Comparison of nutrient content between two products based on the presence or absence of a desirable or undesirable nutrient.
Endorsement claims		Presence of testimonial from a health practitioner or consumer advisory organisation, testimonial of an individual, nutrition logo, mark or symbol, the words “health”, “healthy”, “wholesome” or “nutritious”. Claim that a product may provide balanced nutrition. Claim that a product has medicinal benefits.

APPENDIX C: EXEMPTION FROM ETHICAL CLEARANCE



9 March 2016

Miss Andrea Susan Bursey 211534957
School of Agriculture, Earth and Environment Sciences
Pietermaritzburg Campus

Dear Miss Bursey

Protocol reference number: HSS/0218/016M
Project title: The nutrient quality and marketing of ready-to-eat snack foods and beverages labelled as healthy

FULL APPROVAL-NO RISK

In response to your application received 3 March 2016, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol has been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment /modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

.....
Dr Shenuka Singh (Chair)
Humanities & Social Sciences Research Ethics Committee

/pm

CC Supervisor: Dr Nicola Wiles & Dr Chara Biggs
Academic Leader: Professor Onesimo Mutanga
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