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An observational study of child-directed marketing on pre-packaged breakfast cereals in South Africa

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A mini thesis submitted in partial fulfilment of the requirements for the degree of Master's in Public Health Nutrition at the Department of Dietetics and Nutrition, University of the Western Cape

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Key phrases: child-directed marketing, childhood obesity, breakfast cereals, on-package marketing, obesogenic food environment, ultra- processed food, nutrients of concern, nutrient composition, photographic evidence

DECLARATION

By submitting this thesis electronically, I declare that the entirety of the work contained therein is my own, original work, that I am the sole author thereof (save to the extent explicitly otherwise stated), and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

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Abstract

Background: Childhood obesity is on the rise in South Africa (SA) and child-directed marketing (CDM) is one of the contributing factors to children's unhealthy food choices and consumption. This study assessed CDM on pre-packaged breakfast cereals available in South African supermarkets and describe the nutrient composition of these pre-packaged products.

Methods: A descriptive observational study of CDM on pre-packaged breakfast cereals was undertaken with quantitative analysis of the nutrient composition of these products. Secondary data from the "Researching obesogenic food environments in South Africa and Ghana" study in 2019 was examined. An independently reviewed codebook of definitions of CDM was developed and breakfast cereals were assessed to identify CDM. The CDM questionnaire was developed in REDCap, an online research database and data captured therein. Statistical Package for Social Sciences (SPSS) was used for cross tabulations and one-way ANOVAs. All analysis with p value < 0.05 was taken as significant.

Results: CDM was defined as the use of on-package marketing technique(s), targeting children under the age of 18 years. CDM strategies were classified as direct (to the child) or indirect (through the parent). A total of 222 breakfast cereals were studied, of which 96.9% had a nutritional or health claim, 95.0% had illustrations, 75.2% had product and consumption appeals, 10.8% had characters, 10.8% consisted of different appeals, 8.6% alluded to fantasy and 7.7% had role models. In breakfast cereals with direct CDM the protein and fibre content was significantly lower than in breakfast cereals without direct CDM. This study found a significantly higher total carbohydrate and mean total sugar content in breakfast cereals with direct CDM than those without direct CDM. No significant difference was found in the energy and sodium content of breakfast cereal with CDM compared to those without CDM.

Conclusion: CDM was found to be highly prevalent in breakfast cereals sold in South Africa and the ready-to-eat (RTE) breakfast cereals were excessive in some nutrients of concern. Policies to regulate CDM of pre-packaged breakfast cereals is recommended.

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Definitions

Word/ phrase	Definitions
Child	As per the definition in the South African constitution, any child under eighteen (18) years of age (Children's Act, 2006).
Child-directed marketing	In this study child-directed marketing is defined as any visual or text cue found on pre-packaged breakfast cereals targeted at children directly or through their parents to promote the purchase and consumption of such products.
Childhood obesity	Obesity in children aged between five and nineteen years is measured by a body mass index for age (BMI-for-age) greater than 2 standard deviations above the WHO Growth Reference median (WHO, 2020).
Food environment	The point of interaction between people and the wider food system to source and consume foods, and this includes the physical, economic, political and socio-cultural contexts in which people engage with food system to acquire, prepare and consume food (Turner *et al.*, 2017; European Health Alliance, 2019).
Breakfast cereal	Breakfast cereals are defined as any pre-packaged cereal product typically eaten at breakfast that may or may not require preparation.
Marketing	Marketing is a multifaceted process that supports sales by increasing awareness, consideration, purchases/ repurchase and preference for a product or service through consumer driven benefits, advertising, packaging, placement, pricing and promotions (TrinityP3, 2016).
Nutrient composition	In this study it is understood to mean the quantity of nutrients: energy, total carbohydrate, total sugar, saturated fat, fibre and sodium, per 100g as outlined on the pre-packaged product.

Nutrients of concern	These are nutrients that are linked to poor health outcomes and include: energy, sugar, saturated fat and sodium (Corvalán *et al.*, 2013).
Nutrient profiling	It is a scientific method to classify food and beverages based on their nutritional composition (WHO, 2019).
Nutrition transition	A shift from traditional to globalised and processed foods. This includes how food is sourced and prepared in terms of convenience, price and evolving culinary practices (Popkin, 2015).
On-package marketing	In this study it is understood to mean any printed illustration or information on pre-packaged breakfast cereals that may influence a consumer to purchase the product.
Photographic evidence	Photographs of all sides of pre-packaged breakfast cereals studied for child-directed marketing in this study.
Pre-packaged	Foodstuffs commercially processed and packaged through canning, bottling, sealed in bags or boxes and typically sold in grocery stores.
Sugar sweetened beverages (SSBs)	SSBs refer to any beverage with added sugar such as high fructose corn syrup, sucrose, and fruit juice concentrates among others (*The nutrition source. Sugary drinks*, 2020)
Ultra-processed	Commercially created attractive, highly palatable, cheap, ready-to-eat food products that are generally energy dense, high in fat, high in sugar or salt (Monteiro *et al.*, 2013) and have undergone extensive processing.

Acronyms

Acronym	Full form of acronym
AI	Adequate Intake
CDM	Child-directed marketing
FoP	Front of Pack
HICs	High income countries
HIV/AIDS	Human immunodeficiency virus infection and acquired immune deficiency syndrome
HSRC	Human Sciences Research Council
LMICs	Low- and middle-income countries
NCDs	Non-communicable diseases
RDA	Recommended Daily Allowance
RTE	Ready to eat
REDCap	Research Electronic Data Capture
ROFE	Researching the obesogenic food environment
SA	South Africa
SES	Socioeconomic status
SSBs	Sugar sweetened beverages
TB	Tuberculosis
UWC	University of the Western Cape

WHO	World Health Organisation

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1. INTRODUCTION

1.1 Background

Globally the prevalence of overweight and obesity among children and adolescents aged 5-19 has increased from 4% in 1975 to 18% in 2016 (WHO, 2018b). In Africa, the number of overweight children under five (5) has increased by nearly 50% since 2000 (WHO, 2018b). Childhood obesity is a strong predictor of obesity in adulthood, is linked to poor health outcomes and non-communicable diseases (NCDs) (Reilly et al., 2003), that result in adverse economic consequences on an individual and societal level (WHO, 2016). Obesity reduces productivity and life expectancy while increasing healthcare costs (Shekar and Popkin, 2020), and remains a challenge to national wealth accumulation and ending extreme poverty. Solutions require engagement with all stakeholders, including government and public health partners (Shekar and Popkin, 2020).

1.1.1 The South African Context

South Africa (SA) has a quadruple burden of disease as a consequence of communicable and non-communicable diseases, undernutrition and obesity. This includes communicable diseases such as human immunodeficiency virus, acquired immunodeficiency syndrome (HIV/AIDS) and tuberculosis (TB); non-communicable diseases (NCDs) such as hypertension and cardiovascular diseases, diabetes, cancer, mental illness and asthma; as well as injury and trauma (WHO, 2018a). Nationally, stunting still persists (Said-Mohamed *et al.*, 2015) whilst there is a concurrent increase in overweight and obesity among South African children (Shisana *et al.*, 2013; Dukhi, Sartorius and Taylor, 2020). There is a tendency for childhood obesity to persist into young adulthood, leading to consequences such as cardiovascular diseases, mental health and lower socioeconomic outcomes (Reilly *et al.*, 2003). Currently 13,3% of SA children aged 1-5 years are overweight or obese and it is predicted to reach 28,2% by 2030 (Nojilana *et al.*, 2016).

1.1.2 Socioeconomic status and urbanisation

Originally, obesity was considered a problem only in high-income countries and now is effectually on the rise in low- and middle-income countries, specifically in urban settings (WHO, 2014). A 2017 Lancet study found the increasing prevalence of obesity and overweight in Africa to be higher than in Europe where it is starting to plateau (Abarca-GÃ *et al.*, 2017). In developing countries, socioeconomic status (SES) groups with greater access to energy-rich diets carry an increased risk for obesity and overweight, showing a propensity among urban children and those from high-income families being at an increased risk for excess weight gain (Wang and Lim, 2012; Swinburn *et al.*, 2019). In developed countries behavioural change, as found in the USA, has led to children from a lower SES being 70% more likely to be overweight or obese in comparison to those from a higher SES (Williams *et al.*, 2018). Obesity is a repercussion of urbanisation, changing food environments and lifestyle changes once people migrate from rural to urban areas, and poverty affects the choices people make (Stern, Puoane and Tsolekile, 2010). A study in the North West province of South Africa found that urbanisation shows a positive association with micronutrient intake and status, but also an increase in overweight and obesity (Vorster *et al.*, 2005). South Africa has a vast proliferation of supermarkets and fast-food chains, even in communities of low SES when compared to the rest of Sub-Saharan Africa and thus a thriving retail food environment (Claasen and van der Hoeven, 2016). Euromonitor International© Passport shows a compelling shift in food and beverage consumption, from local fresh produce to ultra-processed packaged foodstuffs, in SA since 1994 (EC Swart 2021, personal communication, 13 June). A key determinant of obesity is diet and the interaction between food preferences and the environment in which these preferences are learned, expressed and reassessed (Hawkes *et al.*, 2015).

1.1.3 Nutrition transition

Nutrition transition refers to the change in diets towards high energy, sugar and saturated fats intake while reducing the intake of fresh fruits, vegetables, cereal grains and fibre, influenced by modernisation, urbanisation and global mass media that propagates a Western diet and lifestyle (Bray and Popkin, 1998;

Popkin, 2002). A study in the North West province of SA found that the nutrition transition is rapid with a significant increase in energy intake among urban men and women from animal proteins as well as added sugars (Wentzel-Viljoen *et al.*, 2018). Urban living and being in a higher SES category are predictors of overweight and obesity in Sub-Saharan Africa (Steyn and Mchiza, 2014). In developing countries, urbanisation has led to an increase in the urban poor and a change from dietary staples to processed foods leading to unhealthy eating by adopting a modernised Western diet associated with increasing the risk of chronic health conditions (Uusitalo, Pietinen and Puska, 2002; Dukhi, Sartorius and Taylor, 2020).

1.1.4 Food environment and marketing

Children are growing up in obesogenic environments with energy excess caused by changing types, availability, affordability and marketing of foods and a decline in physical activity (WHO, 2016). There is an influence on dietary preferences among youth exposed to food marketing (Grigsby-Toussaint, Moise and Geiger, 2011). Marketing practices promote ultra-processed, nutrient-poor food and beverages which are typically high in saturated fat, sugars and salt (Cairns *et al.*, 2013). A 13 country study found that, when watching television, children are exposed to an average of five unhealthy food advertisements per hour (Kelly *et al.*, 2010). In 2012 the total spend in the USA on marketing of healthy foods was $169 million compared to $4,6 billion which was spent on marketing fast foods restaurant chains alone (Kovic *et al.*, 2018). Food marketing has been shown to negatively influence children's food knowledge, preferences, consumption, diet quality and health (Kelly *et al.*, 2019). Children and adolescents are susceptible to marketing messages culminating in increased purchase requests, preferences, choices, unhealthy dietary patterns and dietary behaviour (Sadeghirad *et al.*, 2016; Qutteina, De Backer and Smits, 2019).

1.1.5 Front of pack marketing

Product packaging is a powerful food marketing technique (Elliott, 2019). Packaging attracts consumers' attention, positions a product within a specific category and communicates brand identity (Omez, Martin-Consuegra and Molina, 2015). Packaging becomes a critical factor in consumers' purchase decision as it

communicates to them in the store when they are actually making a decision (Omez, Martin-Consuegra and Molina, 2015). Front of pack (FoP) marketing elements such as the use of images of products or sports people; written claims such as those pertaining to taste, all form part of marketing and communications to consumers about the healthiness, tastiness or suitability to specific groups such as children of pre-packaged foods (Dixon *et al.*, 2013). On package marketing targets children directly and indirectly via their parents (Young, 2004; Hawkes, 2010). Apart from regulated nutritional information, marketers control the majority of information on food packages and FoP features and have the potential to influence a large proportion of consumers' food choices and therefore affect the health of a population (Russell *et al.*, 2017).

Amongst pre-packaged foods, studies have shown that many of the pre-packaged breakfast cereals are unhealthy and typically higher in sugar while low in protein and fibre (Chun *et al.*, 2012; Allemandi *et al.*, 2020).

1.1.6 Conclusion

The ongoing nutrition transition, rising childhood obesity rates and the lucrative nature of child-directed marketing (CDM) for the food industry, all perpetuated by globalisation, necessitate understanding the extent of CDM in South Africa.

1.2 Problem statement

Obesity amongst South African children is increasing (Nojilana *et al.*, 2016; Abarca-GÃ *et al.*, 2017). Many of the foods they consume are ultra- processed pre-packaged foods and these are typically high in energy, sugar, saturated fat and salt (Abrahams, Mchiza and Steyn, 2011). One of the contributing factors to overconsumption of ultra-processed foods and these nutrients of concern, is the constant exposure to direct or indirect CDM (Kelly *et al.*, 2019) on pre-packaged foods.

The nutrition transition from traditional, healthy foods to ultra-processed foods has played a role in increased rate of NCD related morbidity and mortality (Abrahams, Mchiza and Steyn, 2011; Lustig, Schmidt and Brindis, 2012; Pradeilles *et al.*, 2016). In SA, multinational food companies hold the majority of market share (Igumbor *et al.*, 2012). Availability of healthy food options are limited and expensive in the country (Labadarios *et al.*, 2011), while unhealthy food options that are cheap, energy-dense and ultra-processed are available and preferred (Armstrong, Lambert and Lambert, 2011).

The use of cartoon characters and media character branding are techniques used in marketing foodstuffs and are a powerful influence on children's preferences. These marketing techniques enhance the attractiveness of less healthy foods compared to fruits and vegetables (Enax *et al.*, 2015; Kraak and Story, 2015). Marketing actions predominantly promote tasty energy-dense foodstuffs and children perceive products with a fun element on them as being tastier than those in plain packaging (Roberto *et al.*, 2010; Enax *et al.*, 2015). Young children do not understand the persuasive intent behind marketing strategies and are highly vulnerable to them (Roberto *et al.*, 2010).

In SA, breakfast cereal consumption of both hot and ready-to-eat (RTE) cereals has increased by more than 42.9% between 1999 and 2012 (Ronquest-Ross, Vink and Sigge, 2015) and this trajectory is expected to have continued. Of the top five most frequently advertised food and beverage categories on television in SA, breakfast cereals were number one at 15% of all advertisements (Kelly *et al.*, 2019). There is a paucity of evidence from SA on marketing of pre-packaged foods to children. A study on televsion advertising directed at children (Yamoah *et al.*, 2021) and a master's thesis which looked at promotional characters on breakfast cereals (Delport, 2015) found that CDM strategies are prevalent in SA. Studies in other countries show that pre-packaged breakfast cereals are unhealthy and high in nutrients of concern (Schwartz *et al.*, 2008; Chun *et al.*, 2012; Devi *et al.*, 2014).

An understanding of the types of CDM and the nutritional composition of breakfast cereals sold in SA will add to the evidence base in SA. A better understanding of the nutritional quality of breakfast cereals

eaten by children and marketing strategies employed by companies may assist in understanding the importance of curbing the marketing of unhealthy breakfast cereals in SA. Marketing restrictions on unhealthy foods is one of the interventions stipulated by the WHO for obesity prevention (WHO, 2017).

1.3 **Research setting**

This study investigated the SA pre-packaged food supply of breakfast cereals. The photographic data was collected during 2019 from eight retail supermarkets in the Western Cape situated in different socio-economic areas to account for variation in stock. Data was extracted from an existing database for analyses of CDM on the pre-packaged foods; and photographs were further analysed to identify CDM strategies.

2. LITERATURE REVIEW

2.1 Introduction

South Africans endure both under- and over-nutrition which manifests in its quadruple burden of disease (WHO, 2018a). Modernisation has led to an increased consumption of highly palatable ultra-processed foods which is associated with excessive marketing of these products to children (Monteiro *et al.*, 2013; Anand *et al.*, 2015; Baker and Friel, 2016). The consumption of energy dense ultra-processed foods fuels obesity amongst children (Hawkes, 2006; Cuevas Garciá-Dorado *et al.*, 2019). All forms of malnutrition carry health, social and economic implications for the country and demand appropriate interventions (Steyn and Temple, 2008).

2.2 The nutrition transition

Changes in diets towards high intake of nutrients of concern such as energy, sugar, saturated fats and sodium while reducing the intake of fresh fruits, vegetables, cereal grains and fibre as a result of urbanisation leads to Western diets and lifestyle (Bray and Popkin, 1998; Popkin, 2002). Although SA is food secure on a national level, inequality within the country means many South Africans remain food insecure (Hochfeld *et al.*, 2016). Food insecurity increases the risk of obesity, due to consumption of cheap energy dense foods, together with metabolic vulnerability as a result of prior undernutrition (Dhurandhar, 2016; Misselhorn and Hendriks, 2017; Tester, Rosas and Leung, 2020).

2.2.1 Childhood obesity

The WHO recognises childhood obesity as the most serious public health challenge of the 21st century (WHO, 2017). Obesity is defined as abnormal or excess fat accumulation presenting a health risk (WHO, 2014). It has been established as a risk factor for diabetes type 2, hypertension, dyslipidaemia, cardiovascular diseases, cancer, obstructive sleep apnoea and psychological problems to name a few(Higuera-Hernández *et al.*, 2018). Micronutrient deficiencies also known as “hidden hunger” are found

in well-fed individuals and their detrimental consequences occur in underweight, normal and even obese children (Vorster, 2010; Via, 2012; Engle-Stone *et al.*, 2019).

The prevalence of childhood obesity is on the rise in all countries and expeditious in low- and middle-income countries (LMICs) (WHO, 2016). A 42 year analysis of data from 1975 to 2016 of global trends shows that obesity among children and adolescents increased in all regions with the largest proportion being in Southern Africa (400% per decade) (Abarca-GÃ *et al.*, 2017). In SA the combined overweight and obesity prevalence is 13,5% in children aged 6-14 years (HSRC, MRC and DOH, 2012) which is higher than the global prevalence of 10% among school children (Gupta *et al.*, 2012). SA is expected to have the 10th highest childhood obesity level in the world by 2030 (Lobstein and Brinsden, 2019).

2.2.2 Globalisation

Interdependence of world economies due to cross-border trade of goods and services, flow of international capital and expansion of technology is referred to as economic globalisation (Gao, 2000). Globalisation creates a dynamic marketplace, but this alters the quantity, type, cost and preference of foods available for consumption. This supports poor quality obesogenic diets in low-income groups and is a structural cause for obesity (Hawkes, 2006; Cuevas Garciá-Dorado *et al.*, 2019). Global food marketing is perceived as an enabling mechanism to changing diets (Hawkes, 2006). Global economic policies on investment, agriculture, trade and marketing influence what people eat and thus are global food and health policies (Hawkes, 2006).

2.2.3 Food systems and current trend

Food systems were once dominated by local production for local markets, which involved little processing before foods reached households (Anand *et al.*, 2015). In the modern era the need to maximise efficiency and reduce costs led to overproduction of food and thus a need to put that overproduction to use, resulting in either their export or reformulation into ultra-processed new products with a longer shelf-life, which

were then exported to LMICs leading to the increased consumption of ultra-processed foods (Anand *et al.*, 2015; Baker and Friel, 2016). This global food system originating in high income countries (HICs) to address national food insecurity changed production systems in LMICs to address hunger (Anand *et al.*, 2015). This propelled the growth of processed food manufacturers at a time when technological innovations in food processing, persuasive mass marketing, supermarket retailing and fast foods were on the rise (Popkin, Adair and Ng, 2012; Anand *et al.*, 2015).

The global food system is shaped by transnational food manufacturing, retailing and fast food service corporations whose businesses are highly profitable, massively promoted ultra-processed products (Monteiro *et al.*, 2013; Baker and Friel, 2016). Intense palatability is achieved in ultra-processed products by adding high content of fat, sugar, salt and other additives. This, coupled with sophisticated and aggressive marketing strategies, drives the increased consumption of ultra-processed foods and the reduced consumption of fresh, minimally processed foods (Monteiro *et al.*, 2013). The production, marketing and consumption of commercially produced food and drink are associated with risks of major non-communicable diseases (Buse, Tanaka and Hawkes, 2017).

Modern food environments are changing: snacking and snack foods are more common; eating frequency has increased; eating away from home has increased to include restaurants, fast food outlets and take-away meals (Anand *et al.*, 2015). SA's food environment also experienced this rapid change, with a rise in the consumption of processed foods and sugar sweetened beverages (SSBs) (Stacey, Tugendhaft and Hofman, 2017) and multinational food companies holding a majority of the market share (Igumbor *et al.*, 2012). SA children in lower, middle- and high - income communities have easy access to processed foods and canned soft drinks which are available in school tuck shops (Temple *et al.*, 2006). Food choices are negatively influenced by the cheap, readily available, energy-dense and convenient processed foods in the food environment (Popkin, Adair and Ng, 2012; Monteiro *et al.*, 2013).

2.2.4 Breakfast cereals

There is large consumption of breakfast cereals in modern diets and particularly among children (Goglia *et al.*, 2010). Breakfast cereals are shown to substantially influence dietary intake by contributing greatly to daily energy and nutrient intakes among children (Goglia *et al.*, 2010; Devi *et al.*, 2014). Ready-to-eat (RTE) breakfast cereals are considered a convenient option requiring little to no preparation (Michels *et al.*, 2016). A number of countries found that pre-packaged breakfast cereals targeted to children and sold in supermarkets are unhealthy and high in nutrients of concern (Schwartz *et al.*, 2008; Chun *et al.*, 2012; Devi *et al.*, 2014). Unhealthy pre-packaged breakfast cereals are higher in sugar while low in protein and fibre (Chun *et al.*, 2012; Allemandi *et al.*, 2020). High sugar content was found in breakfast cereals with CDM in New Zealand (Devi *et al.*, 2014), Australia (Chun *et al.*, 2012), Mexico (Nieto *et al.*, 2017), Guatemala (Soo *et al.*, 2016), Canada (Chepulis *et al.*, 2020) and the USA (Schwartz *et al.*, 2008). Table 2.2.4 depicts a summary of the nutrient composition of RTE breakfast cereals with CDM in other countries.

Nutritious food options are expensive and in limited availability in SA (Labadarios *et al.*, 2011), while unhealthy, cheap and ultra-processed foods are readily available and preferred (Armstrong, Lambert and Lambert, 2011). There has been an increase in breakfast cereal consumption in South Africa since 1994 (Ronquest-Ross, Vink and Sigge, 2015).

Table 2.2.4: Mean nutritional composition per 100g of RTE breakfast cereals with CDM as observed in other countries.

Nutrients	New Zealand[a] (2013)	Australia[b] (2010)	Guatemala[c] (2013)	Guatemala[d] (2018)	Mexico[e] (2018)	United Kingdom[f] (2018)	United States of America[g] (2006)
	(n=36)	(n=16)	(n=54)	(n=43)	(n=31)	(n=41)	(n=73)
Energy (kJ)	1608.61	1574.0	1603.9	1595.8	1594.2	1681.5	1640.1
Protein (g)	8.5	6.3	-	5.2	5.2	6.8	5.0
Carbohydrates (g)	79.6	80.6	-	83.3	84.0	76.0	84.0
Sugar (g)	26.3	27.3	33.7	31.5	32.6	24.6	36.0
Saturated fat (g)	0.6	0.7	-	1.0	0.7	2.4	1.0
Fibre (g)	4.9	4.4	4.2	2.7	2.3	4.3	4.0
Sodium (mg)	298.4	367.2	478.3	-	-	-	552.0

Note: Data are from (Al-Ani *et al.*, 2016) [a], (Chun *et al.*, 2012) [b], (Soo *et al.*, 2016) [c], (Garcia *et al.*, 2020) [d,e,f], and (Schwartz *et al.*, 2008) [g]. Blanks indicate values not given.

2.2.5 Children's dietary intake in South Africa

The National Food Consumption Survey (NFCS) of 1999 found that almost 90% of children in South Africa ate breakfast regardless of socio-economic status across all provinces (Labadarios *et al.*, 2005). Older children aged seven (7) to nine (9) years from the Free State, Mpumalanga, Northern Cape, Northern Province and North-West Province consistently had a lower mean energy intake than the recommended daily allowance (RDA) of 8400kJ (Labadarios *et al.*, 2005). The protein contribution to the overall energy intake was found to be less than 15% while carbohydrate intake was more than 60% in all provinces except the Western Cape and Gauteng (Labadarios *et al.*, 2005). Sugar consumption as part of total energy intake was found to be the highest in the Western Cape (15%) and Northern Cape (13%). Calcium intake in 95% of children in all provinces but the Western Cape was less than half of the RDA (Labadarios *et al.*, 2005). Among South African children, as a whole, the intakes of energy, calcium, iron,

zinc, selenium, vitamins A, D, C and E, riboflavin, niacin, vitamin B6and folic acid were below two-thirds of the RDAs (Labadarios *et al.*, 2005). Maize porridge, salty snacks and potatoes/ sweet potatoes were the main food contributors to kilojoule intake among children one (1) to nine (9) years of age (Steyn *et al.*, 2020). The percentage contribution of free sugar to total energy intake was found to be higher than the WHO cut-off of 10% (Steyn *et al.*, 2020).

Maize porridge was found to be the major contributor of fibre intake amongst children followed by high fibre cereal and sweet potatoes, however fibre intake among South African children from one (1) and nine (9) years is significantly low (Steyn *et al.*, 2020). The adequate intake (AI) for total fibre is among children is: 13 grams for one (1) to three (3) year olds and 25 grams for four (4) to nine (9) year olds (Steyn *et al.*, 2020). Increased fibre intake is shown to improve the gut microbiome and thus improving immunity and reducing the risk of non-communicable diseases (NCDs) (Post *et al.*, 2012; McRae, 2017; Indarti, 2020) Amongst adolescents aged 13- 18 years, increased fibre intake is shown to reduce elevated cholesterol, elevated diastolic blood pressure and reduce the risk of obesity (Fulgoni *et al.*, 2020).

Protein intake of South African children are within recommendations: protein RDA for one (1) to three (3) year olds is 13 grams, RDA for four (4) to eight (8) year olds 19 grams and for nine (9) year olds is 34 grams, with more protein contributed from animal sources than plant sources (Steyn *et al.*, 2020).

2.3 Marketing

Advertising that promotes the sale of specific foods or food products is known as food marketing (Canada Food Guide, 2020). Exposure to unhealthy food and beverage marketing is an environmental determinant of dietary intake (Vanderlee *et al.*, 2021).

2.3.1 Types of marketing

Television, radio and print are considered traditional media while websites, internet, digital, word-of-mouth and viral marketing are considered new media (Leibowitz *et al.*, 2012). Additionally, food marketers influence children through packaging, labelling, promotions such as premiums and contests, cross promotion, product placement in stores, movies and video games, branded advergaming, licensing of popular children's characters, and tie-ins with children's movies and programs (Public Interest, 2003; Majoras *et al.*, 2006).

Food marketing in schools is a lucrative business focusing on direct sales through vending machines, rebates programs, book covers, free product samples, fundraising activities, posters, billboards, and indirect advertising through corporate-sponsored educational materials, teacher training and corporate gifts (Public Interest, 2003).

Children are highly exposed to unhealthy food and beverage marketing including alcohol advertisements (Yamoah *et al.*, 2021). Furthermore, children from socioeconomically disadvantaged backgrounds are excessively exposed to unhealthy food marketing (Backholer *et al.*, 2021).

2.3.2 On-package marketing

Product packaging is a persuasive food marketing technique that attracts consumers' attention (Omez, Martin-Consuegra and Molina, 2015; Elliott, 2019). The use of images of products or sports people; unregulated written claims such as those pertaining to taste are influential pre-packaged food marketing and communications to consumers about the healthiness, tastiness or suitability to children (Dixon *et al.*, 2013). Packaging influences children's product preferences as well as the purchase of unhealthy foods (Ogba and Johnson, 2010).

Visual and child-oriented elements of breakfast cereal packaging such as images, colours, brand mascots, brand logos, licensed characters and premiums trigger an increased purchase influence in younger children

(Hota and Charry, 2014). Illustrations on packaging: depiction of the product, an ingredient, fruit, vegetable or animal are visual cues used to attract children (Stoltze *et al.*, 2017). Animations or cartoon characters, games and gifts within packaging are all techniques used to market pre-packaged products to children (Hawkes, 2010; Osei-Assibey *et al.*, 2012). The use of character marketing techniques influence children to choose less healthy pre-packaged foods in place healthier foods, fruits and vegetables (Kraak and Story, 2015). Where on-package marketing techniques are featured on a product, they are usually of poor nutritional quality (Aerts and Smits, 2019).

On-package marketing cues, both visual and text, promoting product qualities such as taste, texture or fun elements such as enjoyment are targeted to children and children perceive these products as tastier than a plain product (Enax *et al.*, 2015). Another technique used is the notion of fantasy or creating a magical mood through visual cues or text to appeal to children (Stoltze *et al.*, 2019).

Health and nutritional claims and labels are on-package marketing techniques used to influence children indirectly and, adolescents and parents directly; influencing their purchase decisions (Hawkes, 2010; Russell *et al.*, 2017).

Package size and portion size are techniques used to market foods as value packs to the consumer (Chandon and Wansink, 2012). Larger package sizes are profitable for manufacturers in terms of packaging costs and product sales, while significantly increasing the consumption by consumers (Chandon and Wansink, 2012). Reducing portion sizes reduces consumption however, it may be perceived as a lack of value for money by consumers (Chandon and Wansink, 2012). Labelling smaller portions as “small” makes people eat more but think that they are eating less (Chandon and Wansink, 2012).

2.3.3 Effects of marketing to children

The pervasive marketing of energy-dense, nutrient-poor food and beverages is a key modifiable influence of childhood dietary patterns and obesity (Jenkin *et al.*, 2014). Restricting children's exposure to marketing of unhealthy foods and beverages is a global obesity prevention priority (Kelly *et al.*, 2019). Reducing the impact of marketing of unhealthy foods and beverages to children in order to reduce premature mortality from NCDs by 25% by 2025 is one of 25 indicators for change stipulated in the WHO Global Action Plan for the prevention and control of NCDs (WHO, 2013). A majority of foods marketed to children are of poor nutritional value (Harris, Schwartz and Brownell, 2010).

Marketing negatively influences children's food knowledge, preferences, consumption, diet quality and health (Kelly *et al.*, 2019). Children and adolescents are most vulnerable to the effects of marketing. This results in increased preference towards unhealthy products, and purchase requests for these products; resulting in the development of unhealthy dietary patterns (Sadeghirad *et al.*, 2016; Qutteina, De Backer and Smits, 2019). Limited cognitive and executive skills mean children may be vulnerable to child-directed marketing (Stoltze *et al.*, 2019). Advertisements are shown to positively affect attitudes towards branded foods (Qutteina, De Backer and Smits, 2019). Furthermore, food advertising discourages making healthy food choices (Popkin, Adair and Ng, 2012; Gatou *et al.*, 2016). Media food marketing exposure is significantly associated with food intake among pre-adolescents and adolescents, especially food high in sugar (Qutteina, De Backer and Smits, 2019). Studies show that media characters on packaging alters a child's perception of taste and child targeted advertising impacts family purchases of snacks and meal preparations (Kovic *et al.*, 2018). Marketing of unhealthy food and beverages which are energy dense and high in sugar such as SSBs, breakfast cereals, snacks and candies utilise fun characters, collectable gifts and various strategies to appeal to children (Stoltze *et al.*, 2019). Marketing strategies on packaging are designed to influence consumers at point-of-purchase and during consumption (Stoltze *et al.*, 2019). A study in the United Kingdom (UK) in 2005 showed that the most advertised products on television were sugary breakfast cereals, confectionery and soft drinks (Rodd and Patel, 2005). An American study found

that two-thirds of packaged food marketing was in the cereals, fruit snacks, meal products, frozen desserts and candy categories (Harris, Schwartz and Brownell, 2010).

2.3.4 Marketing to children in South Africa

South African children consume many ultra- processed pre-packaged foods and these are typically high in energy, sugar, saturated fat and salt (Abrahams, Mchiza and Steyn, 2011). In SA, the consumption of prepared and ready-to-eat (RTE) breakfast cereals increased (Ronquest-Ross, Vink and Sigge, 2015). Amongst food and beverage categories, breakfast cereals were the most advertised on television in S (Kelly *et al.*, 2019) A. One study on televsion advertising directed at children (Yamoah *et al.*, 2021) and a master's thesis which observed promotional characters on breakfast cereals (Delport, 2015) found that marketing to children is prevalent in SA. There is limited evidence from SA on marketing of pre-packaged foods to children and necessitates further study.

2.4 Regulation of marketing to children

In 2010, the WHO recommended that countries regulate food and beverage marketing of products high in saturated fats, trans-fatty acids, sugars and/ or salt to children. This was endorsed by 192 countries relying on food industry self- regulation (WHO, 2010). This self-regulation has proven ineffective and in fact marketing of unhealthy food and beverages to children has since increased (Kovic *et al.*, 2018). Industry led self-regulation efforts only attempt to address marketing that targets children directly, putting the indirect marketing to children out of scope in the marketing pledges (Hawkes, 2010).

Australia, Mexico, Thailand, United Kingdom and Canada are a few of the countries with some form of regulation on food marketing (Bernstein *et al.*, 2019; Kelly *et al.*, 2019). A study of the relationship between Canadian foods with on-package marketing to children and excessive free sugars found the foods to be less healthy especially with regard to sugar levels and such evidence implies that industry self-regulation is ineffective (Bernstein *et al.*, 2019). A survey within two cities in Mexico found the number of food marketing advertisements was significantly higher around public schools than private schools and

identified a need to protect children from food marketing particularly in low-income areas (Barquera *et al.*, 2018) and such evidence led to the recent regulation putting front of pack warning labels on pre-packaged foods (Mexico, 2020).

Chile has one of the highest obesity rates worldwide and introduced their government-led, mandatory child-directed marketing regulation in 2016 (Kelly *et al.*, 2019). Foods "high-in" energy, saturated fat, sugar and salt as per predetermined criteria, carry warning labels and are barred from sales and promotions within schools and restricted from marketing to children below 14 years (Stoltze *et al.*, 2019). A pre- and post-study of the Chilean statutory regulation found that 85% of "high-in" breakfast cereal packages were compliant within 7 months of regulation implementation with a significant reduction in child- directed marketing in products with high levels of nutrients of concern and calories (Stoltze *et al.*, 2019). Post implementation of the regulation, the "non-high-in" products with child-directed marketing were significantly more prevalent than prior to implementation (Stoltze *et al.*, 2019).

The Advertising Standards Authority (ASA) initiated the South African Marketing to Children pledge in 2008 which was signed by members of the major food corporations in 2009. SA has only this industry self regulation pledge which remains unsuccessful at curbing unhealthy food marketing targeted to children. Coco-Cola Beverages South Africa (CCBSA) pledged not to advertise or sell sugar sweetened beverages (SSBs) near or in schools and two years post the pledge have been found to violate it (Erzse *et al.*, 2021).

The current draft R429 has proposed some restrictions to allow South African consumers to make informed and healthier choices in their brand purchases (South Africa, 2014). R429 stipulates per 100g/ml cut-off points for energy, fat, saturated fat, cholesterol, sugar, sodium, alcohol and caffeine in order for a product to carry a "low in" nutrient claim on the package (South Africa, 2014). Similarly, per 100g/ml cut-off points are stipulated for "a source of" or "high in" nutrient claims for energy, carbohydrate, fibre, protein, polyunsaturated fatty acids, monounsaturated fatty acids, omega-3 fatty acids, vitamins and minerals (excluding potassium and sodium), and carotenoids (South Africa, 2014). Health claims such as glycaemic index and load, function claims about nutrients and reduction of disease claims are permitted

based on specified nutrient compositioncut-off points (South Africa, 2014). Foods and non-alcoholic beverages that do not comply with the nutrient and health claims restrictions stated in R429 may not be marketed to children (South Africa, 2014).

The Department of Communications and Digital Technology Audio- and Audio-Visual Content Services Policy Framework (AAVCS) white paper promotes the protection of children and consumers as a guiding principle in respect of broadcasting services and acknowledges the need to expand the application of a code of conduct to broadcasting services offered on the internet. AAVCS proposes analysing and defining good practices and creating an action plan for digital media literacy in South Africa to better meet the needs of children, young people and adults.

2.5 Conclusion

The rising childhood obesity rates in SA and the increasing consumption of ultra-processed foods and beverages warrant an understanding of the extent of child-directed marketing in the country. A survey of the current situation will inform policy decisions and regulatory requirements to protect South African children from an obesogenic environment. Multiple studies have shown an increase in the pervasive marketing of foods high in nutrients of concern to children and its link to childhood obesity (Public Interest, 2003; Majoras *et al.*, 2006; Zimmerman, 2011; Corvalán *et al.*, 2013; Hawkes *et al.*, 2015; Cohen and Lesser, 2016; WHO, 2016), but there is limited data on the on-package marketing strategies employed by the food industry in SA.

3. METHODOLOGICAL CONSIDERATIONS

This study examined the use of child-directed marketing (CDM) strategies on South African breakfast cereal packaging sold in the major retailer stores in the Western Cape province of South Africa. A quantitative content analysis (White and Marsh, 2006) of breakfast cereals package photographs was used to identify CDM strategies and descriptive analysis was applied to study the nutrient composition of these breakfast cereals. For the purposes of this study, and in accordance with the South African constitution, a child is defined as anyone younger than 18 years of age (Children's Act, 2006).

3.1 Aim, research questions and objectives

The purpose of this research and specific research questions examined are outlined below.

3.1.1 Aim

The aim of this study was to assess CDM on pre-packaged breakfast cereals available in South African supermarkets.

3.1.2 Research questions

a. What are the types of CDM strategies found on the packages of breakfast cereals in South Africa?
b. What are the differences in nutritional composition of breakfast cereals that have on-package CDM compared to those without CDM?

3.1.3 Objective 1

To develop a data entry template and codebook defining types of CDM for the South African context.

3.1.4 Objective 2

To determine the most used child-directed marketing strategies on pre-packaged breakfast cereals in South Africa.

Justification

Globally, breakfast cereals influence the dietary intake of children, adolescents and young adults (Goglia *et al.*, 2010). Food consumption changes in SA show an increase in the intake of breakfast cereals by 42,9% between 1999 and 2012 (Ronquest-Ross, Vink and Sigge, 2015). Marketing techniques may have

contributed to the increase in consumption of breakfast cereals (Infinium Global Research, 2018). There is a positive association between refined grains (such as those in breakfast cereals) intake and abdominal obesity (Ji *et al.*, 2020). The effect of globalisation on obesity rates, resulting from shared global cultures (Costa-Font and Mas, 2016) such as eating breakfast cereals, may also have contributed to the increase in consumption. The paucity in studies relating to the marketing of pre-packaged breakfast cereals in South Africa warrants further study.

3.1.5 Objective 3

To describe and compare the nutritional composition of breakfast cereals marketed to children, to those without child-directed marketing in South Africa.

Justification

A study in Belgium found breakfast cereals to be predominantly unhealthy whilst frequently carrying health claims (Vermote *et al.*, 2020). A high proportion of ready-to-eat (RTE) breakfast cereals marketed to children in New Zealand, Australia, United Kingdom, Canada and the USA have an unhealthy nutrient profile and contained substantial levels of total sugar (Chepulis *et al.*, 2020). Nutritional and health claims found on breakfast cereals used as a marketing technique may influence a consumer's purchase decision (Colby *et al.*, 2010). Parents who purchase breakfast cereals for their children have been found to misinterpret the meaning of nutritional claims (which is a marketing strategy) on children's cereals to mean that they are more nutritious and provide more health-related benefits to children than cereals without any claims (Harris *et al.*, 2011). As such, it was important to investigate the nutritional composition of breakfast cereals in South Africa, particularly in relation to marketing on the packaging.

3.2 Research approach and design

This was a descriptive observational study to ascertain the extent of CDM in South Africa. Observational studies are known as analytical surveys wherein a sample survey of a population of interest is obtained and statistical analysis is conducted on variables of specific interest (Small, 2015). Photographic evidence of breakfast cereal packaging previously collected (in 2019) was studied and the types of CDM on these packages was categorised and coded for quantitative analysis using a codebook. The codified data on

CDM was then merged with the previously collected nutrient composition information to allow for a quantitative comparison of nutrients of concern related to obesity and non-communicable diseases (energy, sugar, salt, and saturated fat).

3.3 Population and sample

A population refers to people, objects, events, procedures or observations being researched (Swinscow and Campbel, 1997). Secondary data, that was collected as part of "Researching the obesogenic food environment, its drivers and potential policy levers in SA and Ghana" (ROFE) study, from February to May 2019 was used in this study. All breakfast cereal information gathered in the ROFE study was extracted and included all pre-packaged breakfast cereals sold in South Africa. The total population of breakfast cereals found in major retailers in the Western Cape was included in this study due to the heterogeneity of breakfast cereals. An investigation is commonly restricted to a subset or sample of the population that contains most of the information about the population being studied (Swinscow and Campbel, 1997). A total sample of 223 breakfast cereals were obtained from eight (8) supermarkets within three (3) sites in the Western Cape province of South Africa representing six (6) large retail chains in South Africa. Only one (1) breakfast cereal was excluded for not having a nutritional information label on package. Four of the six national supermarket chains collectively account for 72% of the formal retail segment in South Africa (Cheadle and Mtanga, 2019). These national supermarket chains are vertically integrated with their own distribution and supplier channels suggesting homogenity of stock and standardise on their pricing, branding and quality (Cheadle and Mtanga, 2019). The six retail chains are situated in different socio-economic areas and selected to account for variation in stock. Stores were purposefully selected for inclusion to ensure a representative sample of packaged foods available on the SA market. Supermarkets in middle-income suburbs carry a larger selection of products, and as all pre-packaged products were being explored it was necessary to include stores in these areas. Durbanville was included as the middle-class suburb, Khayelitsha and Langa were included as low-income suburbs.

3.4 Process and methods

3.4.1 Codebook development

The codebook for CDM is the instrument containing a set of guidelines to analyse CDM on pre-packaged foods. Currently there is limited research into on-package marketing in SA and thus no existing, country-specific, appropriate tool is available, requiring a country-appropriate codebook to be developed. The development of a new instrument in research requires extensive research, time and effort (Bastos *et al.*, 2014). Existing literature was reviewed and international and local experts consulted to identify and define appropriate CDM categories. Procedural guidance in selecting appropriate strategies to include was taken from published child-directed marketing studies (Cairns *et al.*, 2012, 2013; Elliott, 2012; Stoltze *et al.*, 2017) and adapted to develop a codebook that took the South African context into consideration.The questionnaire and codebook were designed to be generic and capture all on-package CDM observed on any pre-packaged food item to allow for wider application of the codebook to other food categories. The development of the codebook was an iterative process of refinement through constant engagement with the literature, nutrition and research experts in SA, as well as international experts on mass media effects and CDM. A pilot study of 10 products was undertaken to specify robust parameters in defining CDM strategies, categories and subcategory types.

This form was first developed in Microsoft 365 Family plan Word 2020 and refined before finalising the form in REDCap (Addendum A). The codebook was used as the backend logic or engine and developed as part of this study.

3.4.2 Data collection

Secondary data, that was collected as part of ROFE study, from February to May 2019 was used. The original data collected for the ROFE project consisted of in-store photographs taken of all packaged food and beverages that contained a barcode and nutritional information. Photographs were taken of the front of pack, nutrition facts panel, barcode, package size, ingredients, manufacturer and distributor (see Addendum B for an example of photographic evidence). The photographs were then stored on Sharepoint, an online document management and storage system that is a web-based collaborative platform that integrates with Microsoft Office. The corresponding data extracted from the photos was entered, quality checked, cleaned and stored in a Research Electronic Data Capture (REDCap) project, a web application for building and managing online surveys and databases particularly for research studies and operations. For this study, data was extracted for breakfast cereals to complete secondary data analysis on CDM.

3.4.3 Data entry

A team of seven (7) nutritionists and dietitians with previous experience in capturing nutritional information of pre-packaged food items, were trained as coders for CDM. The training was an iterative process with two rounds of data entry proceeded by discussions to streamline definitions of the variables of interest to improve both inter- and intra-coder reliability.

Coder training was provided through a pre-recorded video simulation of the data entry (see Addendum C) and via interactive online training sessions and documentation resources within a training environment on the REDCap database, to ensure inter-rater reliability. Data entry only began once the team had been adequately standardised through training.

CDM data on the FOP was evaluated as per the pre-determined criteria for CDM on pre-packaged breakfast cereals and this data was then entered into the REDCap system via an electronic data entry form as an interface (Addendum A). Double entry was performed as part of a two-step verification process and inter-rater operability agreement was reached. Differences were discussed in conjunction with CDM strategy definitions and consensus was reached in the instances that differed prior to data analysis.

3.4.4 Pilot study

The pilot study of 10 products was conducted to assess data entry procedures and the acceptability of the questions as recommended in observational studies (Small, 2015). The 10 products were chosen for their obvious inclusion of several CDM strategies and some for the lack of CDM strategies. The products were also chosen from differing brands, those requiring preparation and those that are ready-to-eat. No changes were required to the codebook post pilot study.

3.4.5 Data analysis

All nutrient composition and CDM data were downloaded from the REDCap database to Microsoft 365 Family plan Excel 2020 and the cleaned data was imported into Statistical Package for Social Sciences (SPSS) version 27 copyrighted in the year 2020, for analysis. Descriptive statistics were run to determine the frequency of marketing strategies, subcategories and specific subcategory types.

The nutritional composition of ready-to-eat (RTE) breakfast cereals has been described and these include: energy, protein, total carbohydrates, total sugars, saturated fat, fibre and sodium levels for all breakfast cereals with direct CDM were compared to products without direct CDM. The presence of non-sugar sweeteners has also been analysed.

One-way ANOVA tests were used to determine the differences in nutritional composition of breakfast cereals with direct CDM and without direct CDM; and to compare the nutritional composition of breakfast cereals by the number of CDM strategies used. Cross tabulation and chi-squared tests were used to understand the differences in the prevalence of ready-to-eat breakfast cereals in those with direct CDM and those without direct CDM. P-value less than 0.05 was taken as significant.

The complete data entry and analysis process undertaken is depicted in figure 3.4.5 below.

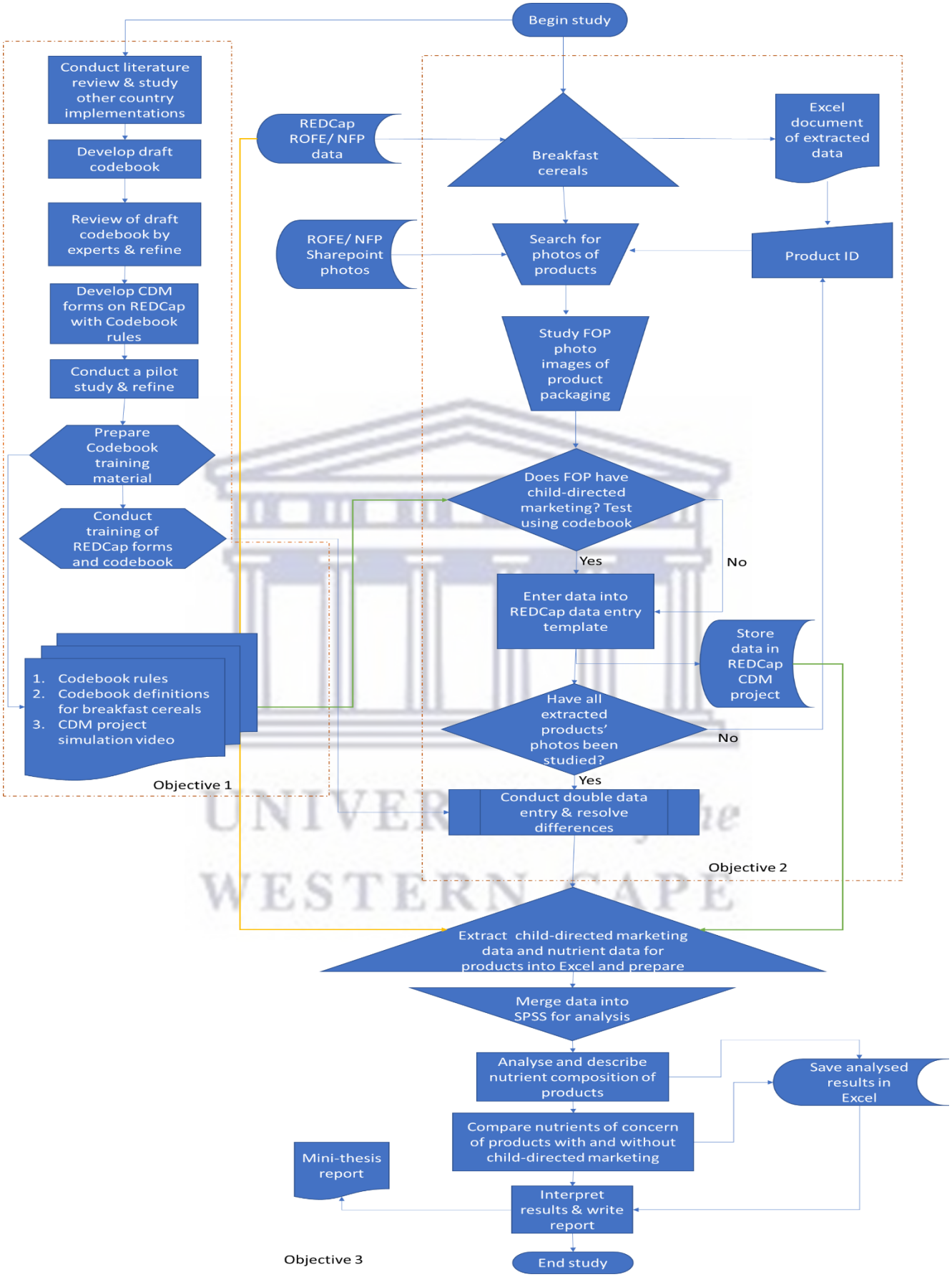

Figure 3.4.5: Data collection and analysis process.

3.4.6 Validity and reliability

Internal validity is a noted challenge in quantitative observational studies and thus methods to reduce bias are imperative (Walter, Dunsmuir and Westbrook, 2015). To minimise bias nutrition and subject experts were engaged, no open response questions were used in the codebook and question wording was reviewed by nutrition researchers. Given that all available breakfast cereal products sold in all four major retailers found in the Western Cape (which represent those found throughout the country) were included in the study, this improved the external validity of the research.

Two independent experts in nutrition research and mass media communications reviewed the developed codebook to improve content validity. The success of a codebook constitutes consistently high inter-rater reliability (Moreno, Egan and Brockman, 2011). To minimise variations in observer interpretation (Walter, Dunsmuir and Westbrook, 2015) of the codebook definitions being applied to the study of the pre-packaged breakfast cereals, training was provided to ensure inter-rater reliability.

As part of a two-step verification process independent double-data entry was conducted. Data enterers consisted of a team of seven (7) trained dietitians and nutritionists. Double entry is accepted as the gold standard among data checking methods (Barchard *et al.*, 2020). The initial data entry by the researcher in REDCap of the 222 products was then compared to the 222 captured by the data entry team. There were 49950 unique data entry points actualised in the double entry process and only a five percent (5%) difference was noted. These differences were discussed with the data entry team at the end of each day's data entry exercise and consensus reached prior to data analysis.

3.5 Inclusion and exclusion criteria

All available pre-packaged breakfast cereals sold in the six major retail chains were included. CDM on the front-of-pack (FOP) of the packages was studied. Pre-packaged breakfast cereals without nutrition information panels were excluded from the study, as were photos that are blurry and unclear. Only one

product had to be excluded. Only front of pack (FOP) of breakfast cereals were studied and marketing from side and back of pack was excluded due to inadequate photographic evidence.

3.6 Confidentiality and risk of the study

The data collected is available in the public domain. However, to protect the identity of manufacturers, data was only reported by type of product and not by brand name. No supermarket names were included in the database.

3.7 Ethical considerations

The University of the Western Cape (UWC) Biomedical Research Ethics Committee (BMREC) has given ethics approval for the ROFE study (ethics reference number: BM 17/8/20) from which secondary data was extracted for analysis. The ethics approval letter is attached (Addendum D). Ethics approval (ethics number: HS 20/4/3) for this study was received from the UWC Senate Higher Degrees Committee as well as the Humanities and Social Sciences Research Ethics Committee (Addendum E).

3.8 Data management

The REDCap and Sharepoint databases are managed by the University of North Carolina (UNC), a research partner of UWC. The data is securely stored and access to the data for this study are password protected, accessible only by permitted researchers. Once downloaded to Excel and SPSS the data has only been used by the student and supervisors of this study. Data will be stored for five years after as per the UWC policy to allow for scrutiny by examiners and reviewers of (anonymised data) if needed. Anonymised data will exclude product names, brand names and barcodes. The access to the database by the researcher in her capacity as a student was approved for this study only and as such will be terminated on completion of this dissertation and the subsequent intended publication. The student is not permitted to continue analyses and publications from this particular database independently after the completion of this study.

4. RESULTS

This section details the results of the analyses performed and is outlined in three sections as per the three objectives of this study.

4.1 Child-directed marketing codebook and definitions

Objective 1
To develop a data entry template and codebook defining types of child-directed marketing for the South African context.

Breakfast cereals are defined as any pre-packaged cereal product typically eaten at breakfast that may or may not require preparation. For the purposes of this mini-thesis CDM was defined as the use of on-package marketing technique, targeting children under the age of 18 years, consisting of the following CDM strategies: illustrations, characters, role models, different appeals, fantasy, product and consumption appeals. Analysis of the codebook resulted in two (2) types of CDM being identified: direct and indirect. Direct CDM is defined as any on-package marketing technique used to target children directly while indirect CDM is defined as on-package marketing to children via the parents or primary caregiver. While a superhero on a breakfast cereal package is CDM directly targeting children, a nutritional claim or product affordability aspect is directed at a parent although the product is targeting children. Figure 4.1 below depicts the overall CDM categories, subcategories and subcategory types classified as direct and indirect CDM. Addendum F provides further details. Sixty-six (66) of the 117 sub-category types were classified as direct CDM. The remaining 51 subcategory types were classified as indirect CDM. Among the overall marketing strategies, only one (1) strategy, claims marketing strategy, contained no direct CDM elements. Four (4) of the CDM strategies contained only direct CDM elements: character, role models, different appeals and fantasy.

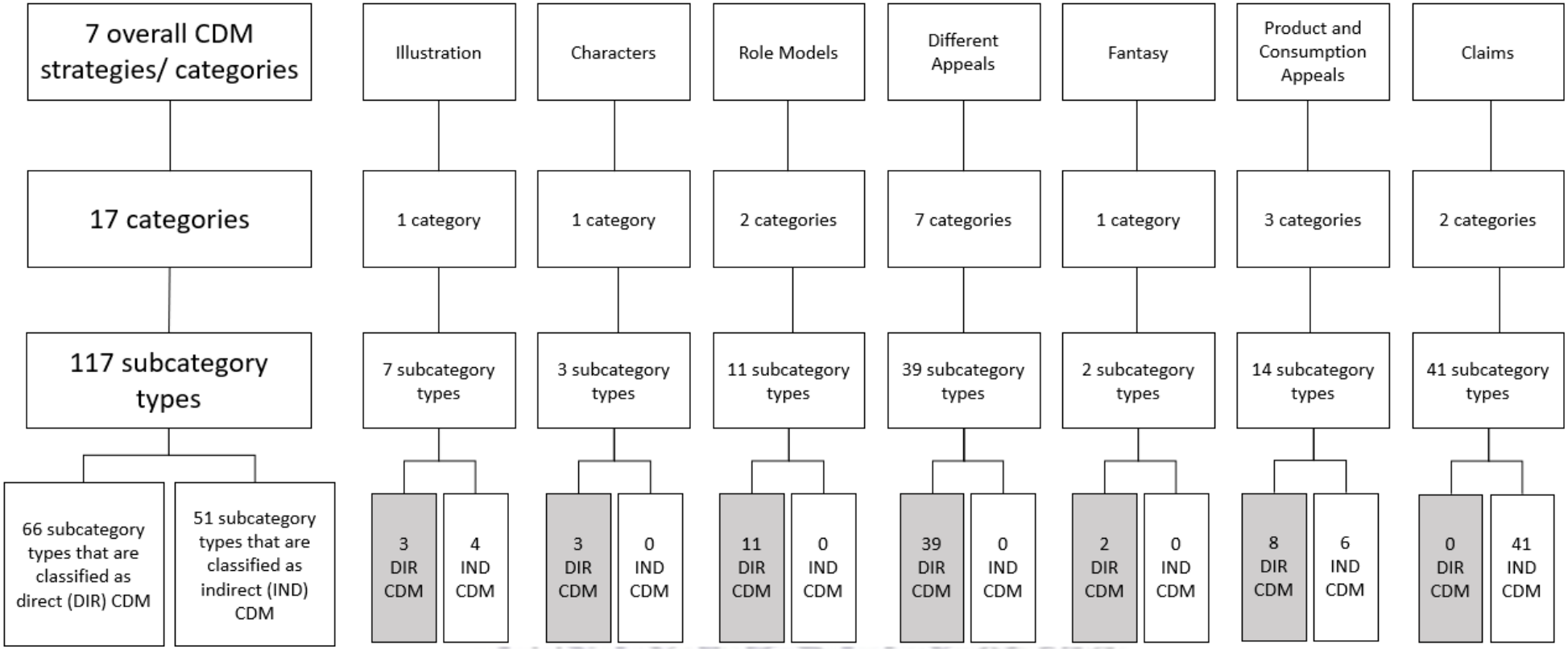

Figure 4.1 Overall CDM strategies and CDM subcategory types with direct (DIR) and indirect (IND) CDM split

The iterative analysis process for the codebook resulted in the following definitions for seven (7) overall CDM strategies with direct CDM for on-package marketing.

Illustrations are any pictorial depiction of the product, an ingredient, fruit, vegetable, animal, object or imaginary creature that may be drawn or photorealistic. For example, a picture of a bowl of cereal would be considered an illustration.

Characters are any pictorial depiction of a personified animal, object or imaginary creature that may be drawn or photorealistic. For example, a cartoon character on the box of the cereal that may or may not be interacting with the product.

Role models are youth or non-youth persons that may be licensed or known characters, known celebrities, sports athletes or superheroes. For example, a movie star or famous soccer player's image on the box of cereal.

Different appeals are a grouping of school, toy, family or family situations, sports, social media, cross promotions and gift references. For example, a depiction of a family having a picnic, offering free toys or collectible stickers in the cereal box, or depicting a person playing soccer.

Fantasy refers anything that gives out of the ordinary fantastical effects like cereal grains flying or a character swirling in the milk, a rainbow around the package or any attempt to create wonder and amazement. This excludes fantastical characters which are included under characters strategy.

Product and consumption appeals consist of two (2) subcategories. The product subcategory includes any reference to a product quality being enhanced; being traditional in terms of its recipe, origin or cultural affiliation; being new or improved; a suggestion of its affordability, comparison to a competitor's product or offering a money back guarantee. Consumption appeals include image and text cues with an emotional appeal alluding to happiness, pleasure and enjoyment, suggestions to consume the product such as "try it" and suggestions of overconsumption, for example, "you can't stop at one".

Specific terminology and elements of CDM are defined further in (Addendum G).

4.2 Analyses of CDM strategies on packaged breakfast cereals

Objective 2
To determine the most used child-directed marketing strategies on pre-packaged breakfast cereals in South Africa.

This section is outlined in two (2) parts: description of all CDM strategies identified on breakfast cereals and a deep dive into the most observed CDM subcategories. Two hundred and twenty-two breakfast cereals were included in the analysis.

4.2.1 Summary of CDM strategies observed.

Overall, seven (7) on-package CDM strategies were identified. Within the seven (7) strategies, 17 categories were identified. The summary of this is found in Figure 4.2.1a and Table 4.2.1b. The most frequently used CDM strategies were claims (n=216, 96.7%) relating to nutrition and health claims, followed by illustrations (n=211, 95%) and then product and consumption appeals (n= 167, 75.2%).

The most frequently used CDM category on the 222 breakfast cereals analysed was nutritional claims which appeared on 95.5% of the products (n = 212); followed by illustrations (95%, n = 95), health claims (n=150, 67,6%,) and product appeals (n=147, 66.2%); making up the top four (4) CDM categories used. Consumption appeals was the fifth most used CDM category (n=56, 25.2%). Less frequently used CDM categories were characters (n=24, 10.8%), fantasy (n=19, 8.6%), non-youth (n=16, 7.2%) and family (n=11, 5%). Six (6) of the CDM categories had minimal presence (less than 3.5% of breakfast cereals). No products made any reference to toys or cross promotions.

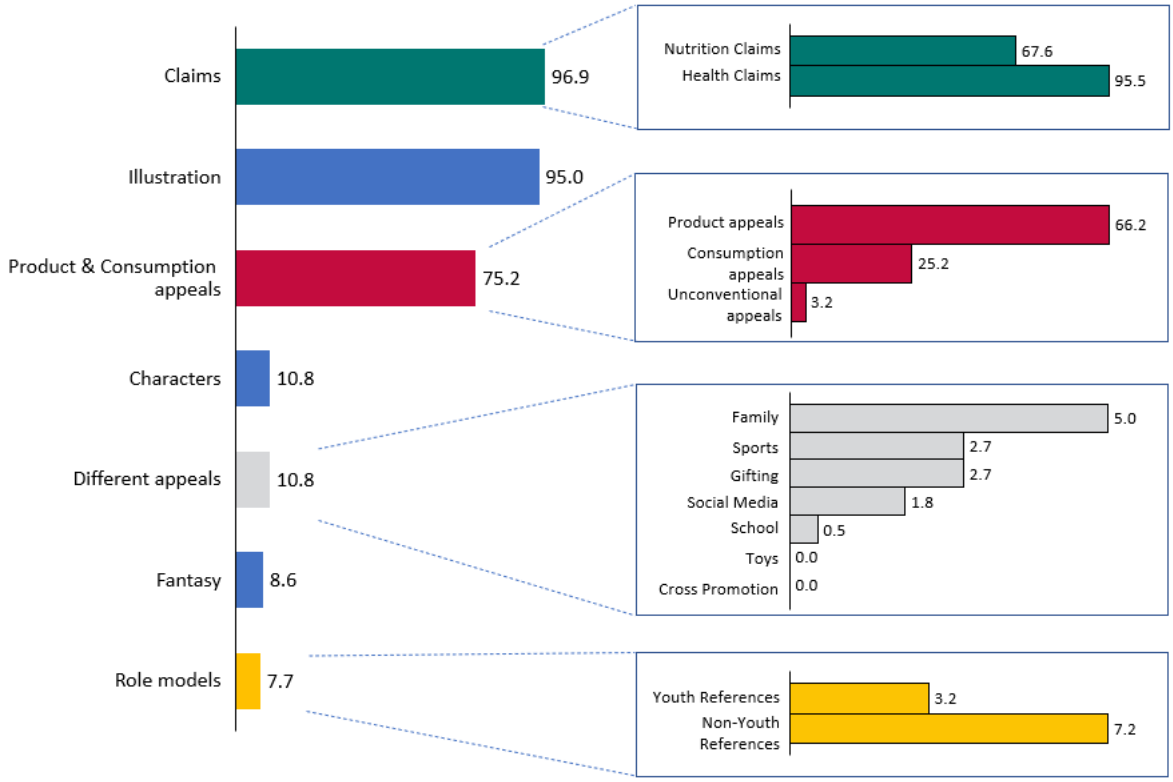

Figure 4.2.1a A graphical representation of the prevalence of the seven (7) marketing strategies and their categories on South African pre-packaged breakfast cereals.

Illustrations, characters and fantasy have only one category each.

Table 4.2.1b **A summary of the seven (7) marketing strategies studied on South African pre-packaged breakfast cereals (n=222) presented by number and percentage.**

Strategy	**Present on packaging n (%)**	**Category**	**Present on packaging n (%)**
Illustration	211 (95.1)	Illustration	211 (95.1)
Characters	24 (10.8)	Characters	24 (10.8)
Role models	17 (7.7)	Youth references	7 (3.2)
		Non-youth	16 (7.2)
Different appeals	24 (10.8)	School	1 (0.5)
		Toy	0 (0.0)
		Family	11 (4.9)
		Sports	6 (2.7)
		Social Media	4 (1.8)
		Cross promotion	0 (0.0)
		Gifting	6 (2.7)
Fantasy	19 (8.56)	Fantasy	19 (8.6)
Product & Consumption appeals	167 (75.23)	Product	147 (66.2)
		Consumption appeal	56 (25.2)
		Unconventional	7 (3.2)
Claims	215 (96.85)	Nutritional claims	150 (67.6)
		Health claims	212 (95.5)

4.2.2 Breakdown of major CDM strategies observed.

Within the CDM categories most frequently used, additional subcategory types were observed. The most frequently observed subcategories and subcategory types are specified below.

Illustrations:

Product illustrations (n=198, 93.8%) is the most frequently used illustration type, followed by ingredient (n=88, 41.7%) and fruit illustrations (n=71, 33.6%), animal illustrations (n=37, 17.5%) and object illustrations (n=27, 12.8%). Imaginary creatures (n=6.2.8%) and vegetable illustrations (n=4,1.9%) were minimally used. Please refer to Table 4.2.2a for more detail.

Table 4.2.2a Proportion of pre-packaged breakfast cereals using the various illustration sub-category types (n=211).

Subcategory type (Illustration type)	Direct or indirect CDM	Total	Proportion of total sample with illustration
		n (%)	%
Product illustration	Indirect	198 (93.8)	89.2
Ingredient illustration	Indirect	88 (41.7)	39.6
Fruit illustration	Indirect	71 (33.6)	32.0
Animal illustration	Direct	37 (17.5)	16.7
Object illustration	Direct	27 (12.8)	12.2
Imaginary creature illustration	Direct	6 (2.8)	2.7
Vegetable illustration	Indirect	4 (1.9)	1.8
All illustrations		**211 (100.0)**	**95.0**

Characters:

Personified illustrations of animals (n=15, 62.5%) and imaginary creatures (n=9, 37.5%) are the only two character subcategories present. No products made use of personified illustrations of objects (Table 4.2.2b).

Table 4.2.2b: Proportion of pre-packaged breakfast cereals using character strategy types (n=24).

Subcategory type (Character type)	**Direct or indirect CDM**	**Total**	**Proportion of total sample with character (n=222)**
		n (%)	**%**
Personified illustration of an animal	Direct	15 (62.5)	6.8
Personified illustration of an imaginary creature	Direct	9 (37.5)	4.1
Personified illustration of an object	Direct	0 (0.0)	0.0
All character strategies		**24 (100.0)**	**10.8**

Family:

Family images (n=9, 81.8%) is the most frequently used family reference type (see Table 4.2.2c).

Table 4.2.2c Proportion of pre-packaged breakfast cereals using family reference type (n=11).

Subcategory type (Family reference type)	**Direct or indirect CDM**	**Total**	**Proportion of total sample with family references (n=222)**
		n (%)	**%**
Image depicting family	Direct	9 (81.8)	4.1
Text depicting family	Direct	2 (18.2)	0.9
All family reference		**11 (100.0)**	**5.0**

Fantasy:

Among all products observed with fantasy reference, fantasy images (n=19, 100%) were the most observed and (n=2, 10.5%) of those carried fantasy reference text as well (see Table 4.2.2d)

Table 4.2.2d Proportion of pre-packaged breakfast cereals using fantasy reference types (n=19).

Subcategory type (Fantasy reference type)	**Direct or indirect CDM**	**Total**	**Proportion of total sample with fantasy references (n=222)**
		n (%)	**%**
Fantasy reference image	Direct	19 (100.0)	8.6
Fantasy reference text	Direct	2 (10.5)	0.9
All fantasy reference		**19 (100.0)**	**8.6**

Product appeals:

Product quality enhancement cues (n=90, 61.2%), traditional product appeal (n=50, 34%) and new or improved product cues (n=26,17.7%) are the main 3 product appeal subcategory types used (see Table 4.2.2e).

Table 4.2.2e Proportion of pre-packaged breakfast cereals using product appeal types (n=147).

Subcategory type (Product appeal type)	Direct or indirect CDM	Total	Proportion of total sample with product appeals (n=222)
		n (%)	%
Product quality enhancement cue	Direct	90 (61.2)	40.5
Traditional product appeal	Indirect	50 (34.0)	22.5
New or improved product cue	Indirect	26 (17.7)	11.7
Suggestion of affordability of product	Indirect	16 (10.9)	7.2
Product compared to competitor	Indirect	2 (1.4)	0.9
Product with money back guarantee	Indirect	21 (14.3)	9.5
All product appeals		**147 (100.0)**	**66.2**

Consumption appeals:

Table 4.2.2f shows the consumption appeal types observed. Emotional consumption appeal using images (n=29, 51.8%), text cues (n=15, 26.8%) and consumption suggestions (n=17, 30.4%) are the main 3 consumption appeal types used.

Table 4.2.2f Proportion of pre-packaged breakfast cereals using consumption appeal (n=56).

Subcategory type (Consumption appeal type)	**Direct or indirect CDM**	**Total**	**Proportion of total sample with family references(n=222)**
		n (%)	**%**
Emotional consumption appeal image cue	Direct	29 (51.8)	13.1
Consumption suggestion	Direct	17 (30.4)	7.7
Emotional consumption appeal text cue	Direct	15 (26.8)	6.8
Overconsumption appeal	Direct	6 (10.7)	2.7
All consumption appeals		**56 (100.0)**	**25.2**

Health claims:

In the health claim marketing category (n=212), portion consumption recommendation (n=158, 74.5%), health purity claims (n=89, 42.0%) and nature images (n=88, 41.5%) are the most used health claim subcategory types (see Table 4.2.2g).

Table 4.2.2g Proportion of pre-packaged breakfast cereals using health claim sub-category types (n=212).

Subcategory type (Health claim type)	Direct or indirect CDM	Total	Proportion of total sample with health claims (n=222)
		n (%)	%
Portion consumption recommendation	Indirect	158 (74.5)	71.2
Health purity claim	Indirect	89 (42.0)	40.1
Nature images	Indirect	88 (41.5)	39.6
Cue on health benefits or reduction of risk	Indirect	71 (33.5)	32.0
Health seals from professional bodies	Indirect	41 (19.3)	18.5
Health recommendation	Indirect	14 (6.6)	6.3
Text cue on natural/ fresh product	Indirect	12 (5.7)	5.4
Addition of sweetener	Indirect	0 (0.0)	0.0
All health claims		**212 (100.0)**	**95.5**

Nutritional claims:

In the nutritional claims category (n=150), reduction or elimination of sugar (n=25, 16.7%), addition of vitamins other than vitamin C (n=44, 29.3%), addition of energy (n=33, 22%), text cues suggesting a good source of nutrients (n=55, 36.7%) and other information cues on added nutrients (n=40, 26.7%) are the most observed nutritional claim subcategory types (see Table 4.2.2h)

Table 4.2.2h Proportion of pre-packaged breakfast cereals using nutritional claim marketing sub-category types (n=150).

Subcategory type (Nutritional claim type)	Direct or indirect CDM	Total	Proportion of total sample with family references (n=222)
		n (%)	%
Reduction/ elimination of sugar	Indirect	25 (16.7)	11.3
Reduction/ elimination of sodium	Indirect	21 (14)	9.5
Reduction/ elimination of other nutrients	Indirect	13 (8.7)	5.9
Reduction/ elimination of total fat	Indirect	10 (6.7)	4.5
Reduction/ elimination of salt	Indirect	7 (4.7)	3.2
Reduction/ elimination of saturated fat	Indirect	7 (4.7)	3.2
Reduction/ elimination of trans fat	Indirect	7 (4.7)	3.2
Reduction/ elimination of cholesterol	Indirect	7 (4.7)	3.2
All reduction of nutrients		**70 (46.7)**	**31.5**
Addition of fibre	Indirect	72 (48)	32.4
Addition of vitamins other than vitamin C	Indirect	44 (29.3)	19.8
Addition of energy	Indirect	33 (22.0)	14.9
Addition of minerals	Indirect	21 (14.0)	9.5
Addition of protein	Indirect	21 (14.0)	9.5
Addition of other nutrients	Indirect	13 (8.7)	5.9
Addition of Omegas/ EPA/ DHA	Indirect	7 (4.7)	3.2
Addition of vitamin C	Indirect	1 (0.7)	0.5
All addition of nutrients		**107 (71.3)**	**48.2**
Text cue suggesting a good source of nutrients	Indirect	55 (36.7)	24.8
Additional information (number, symbols) provided on added nutrients	Indirect	40 (26.7)	18.0
All nutritional claims		**150 (100.0)**	**67.6**

4.2.3 Summary of direct CDM strategies observed.

Table 4.2.3a shows that of the 222 breakfast cereals studied, 153 (69%) were found to use direct CDM strategies on their packaging. Only one (1) product was observed with direct CDM and no indirect CDM present.

Table 4.2.3a Percentage of products with direct and indirect CDM.

		Indirect CDM		
		Present	Not present	Total
Direct CDM	Present	152	1	153 (69.0)
	Not present	69	0	69 (31.0)
	Total	221	1	222 (100.0)

Table 4.2.3b below depicts the number and percentage of products using one (1) or more direct CDM strategies. Forty-one percent (41.2%) of breakfast cereals containing direct CDM use multiple direct CDM strategies on packaging. Of the 153 cereals classified as using direct CDM, 20.9% were found to use two strategies, 11.8% used three strategies and 8.5% were found to use four or more strategies.

Table 4.2.3b Percentage of products using one or more direct CDM strategies.

Number of direct CDM marketing strategies used on-packaging	**Total (n=153) n (%)**
1	90 (58.8)
2	32 (20.9)
3	18 (11.8)
4	4 (5.2)
5	5 (3.3)
Total	**153 (100.0)**

4.3 Analyses of nutritional composition of breakfast cereals by direct CDM strategy types

Objective 3
To describe and compare the nutritional composition of breakfast cereals marketed to children, to those without child directed marketing in South Africa.

This section specifies three main analyses. The nutritional composition of ready-to-eat breakfast cereals (n=134) with direct CDM are compared to those without direct CDM. The nutritional composition is also analysed by the number of CDM strategies used per breakfast cereal. Finally, a summary is provided of breakfast cereals by direct CDM presence and their preparation requirement. In all the analyses the mean, standard error, interquartile range and intervals for the mean are reported. Breakfast cereals that only contained nutritional information in the as-purchased format, but did not contain nutritional information in the RTE format (n=88) were excluded from analysis.

4.3.1 Nutritional composition of RTE breakfast cereals with and without direct CDM

The nutrient composition for eight nutrients: energy, protein, total sugar, free sugar, saturated fat, fibre, sodium and carbohydrates was compared across breakfast cereals by direct CDM usage to understand if there was a significant difference in the nutritional content in breakfast cereals where direct CDM was used. The presence of non-sugar sweetener was also analysed.

The overall nutrient composition of breakfast cereals is presented in Table 4.3.1. In products where direct CDM strategies were present, statistically significant differences were identified in five (5) nutrients. All nutrient analysis was conducted per 100g of nutrient composition. The mean protein content (9.74g ±3.33; p<0.00) and mean fibre content (7.85g ±4.73; p<0.00) were statistically significantly lower in breakfast cereals with direct CDM than in breakfast cereals without direct CDM containing mean protein (12.53g ±4.47) and mean fibre (12.36g ±7.03). The mean total sugar content (17.17g ±10.08; p=0.01) and mean free sugar content (17.17g ±10.08; p=0.01) of breakfast cereals with direct CDM as compared to breakfast

cereals without direct CDM (11.24g ±6.72; p=0.01) for both total sugar and free sugar content was statistically significantly higher. The mean carbohydrate content (60.55g ±16.26; p=0.01) was also statistically significantly higher in breakfast cereals with direct CDM than in breakfast cereals without direct CDM (52.23g ±20.55). No significant differences were found in breakfast cereals with direct CDM with mean energy content (1597.20g ±307.17; p=0.22), mean saturated fat content (3.62g ±4.42; p=0.26) and mean sodium content (155.99g ±132.91; p=0.88) when compared to those without direct CDM with mean energy content (1667.00g ±298.95; p=0.22), mean saturated fat content (4.71g ±6.53; p=0.26) and mean sodium content (159.91g ±155.25; p=0.88). None of the breakfast cereals are reported as containing any non-sugar sweeteners.

Figure 4.3.1a, figure 4.3.1b and figure 4.3.1c illustrate the nutrient composition with significant differences in breakfast cereals with and without direct CDM.

Table 4.3.1: Nutritional composition per 100g of RTE breakfast cereals with and without direct CDM.

Nutrient	RTE Breakfast cereals using direct CDM strategies								RTE Breakfast cereals not using direct CDM strategies								P-value
	n	Mean	Standard Deviation	Median	Minimum	Maximum	95% Confidence Interval for Mean		n	Mean	Standard Deviation	Median	Minimum	Maximum	95% Confidence Interval for Mean		
							Lower Bound	Upper Bound							Lower Bound	Upper Bound	
Energy (kJ)	93	1 597.20	307.17	1 597.00	283.00	2 517.00	1 533.94	1 660.46	41	1 667.00	298.95	1 624.00	1 054.00	2 352.00	1 572.64	1 761.36	0.22
Protein (g)	92*	9.74	3.33	9.25	1.90	20.40	9.05	10.43	41	12.53	4.47	11.30	5.10	24.00	11.12	13.95	0.00
Carbohydrates (g)	93	60.55	16.26	61.00	6.00	86.00	57.20	63.91	41	52.23	20.55	57.00	4.00	89.00	45.74	58.71	0.01
Total Sugar (g)	93	17.17	10.08	17.20	0.90	49.90	15.10	19.25	41	11.24	6.72	12.40	0.50	24.60	9.11	13.36	0.01
Free Sugar (g)	93	17.17	10.08	17.20	0.90	49.90	15.10	19.25	41	11.24	6.72	12.40	0.50	24.60	9.11	13.36	0.01
Saturated fat (g)	93	3.62	4.42	1.70	0.10	27.70	2.71	4.53	41	4.71	6.53	2.30	0.16	25.20	2.65	6.77	0.26
Fibre (g)	93	7.85	4.73	6.90	1.10	26.10	6.88	8.82	41	12.36	7.03	10.50	1.00	29.30	10.15	14.58	0.00
Sodium (mg)	93	155.99	132.91	119.00	-	497.00	128.63	183.37	41	159.91	155.25	113.00	0.40	496.00	110.91	208.91	0.88

One way ANOVA classification of nutrient composition by the number for breakfast cereals with direct CDM and without direct CDM. P<0.05 is taken as statistically significant.

**One breakfast cereal using direct CDM did not contain a protein value on the nutritional facts panel.*

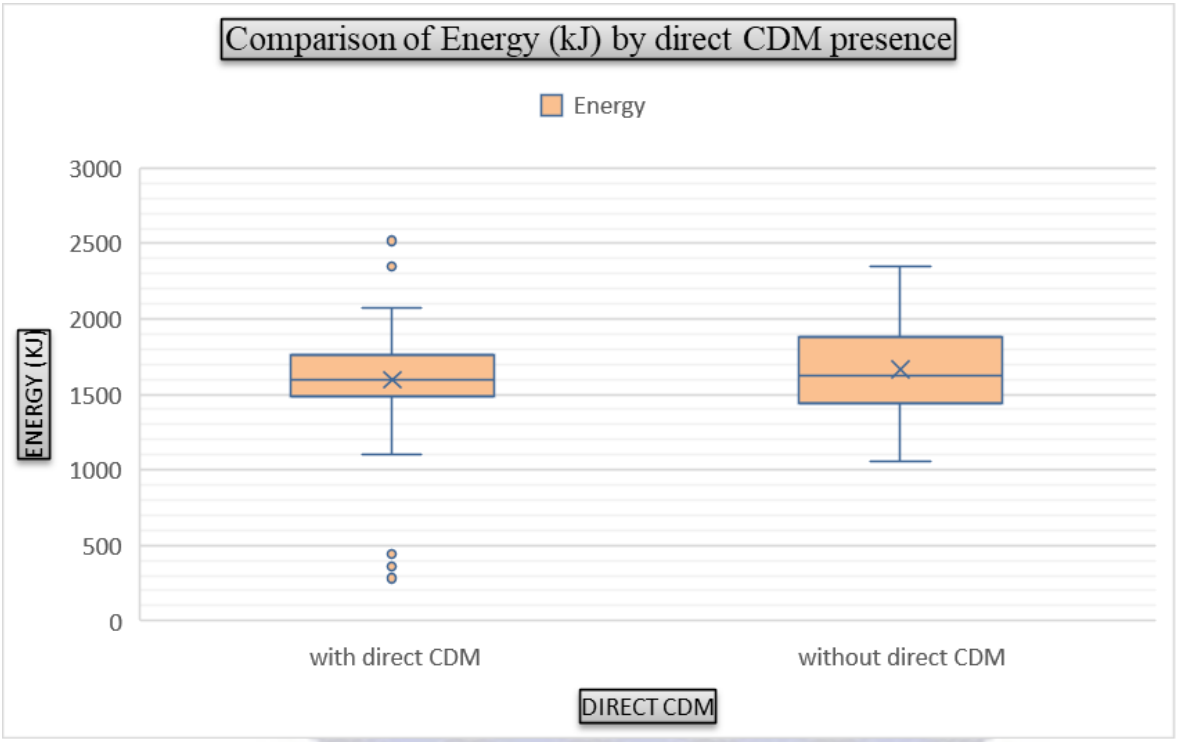

Figure 4.3.1a Energy(kJ) composition of RTE breakfast cereals with and without direct CDM

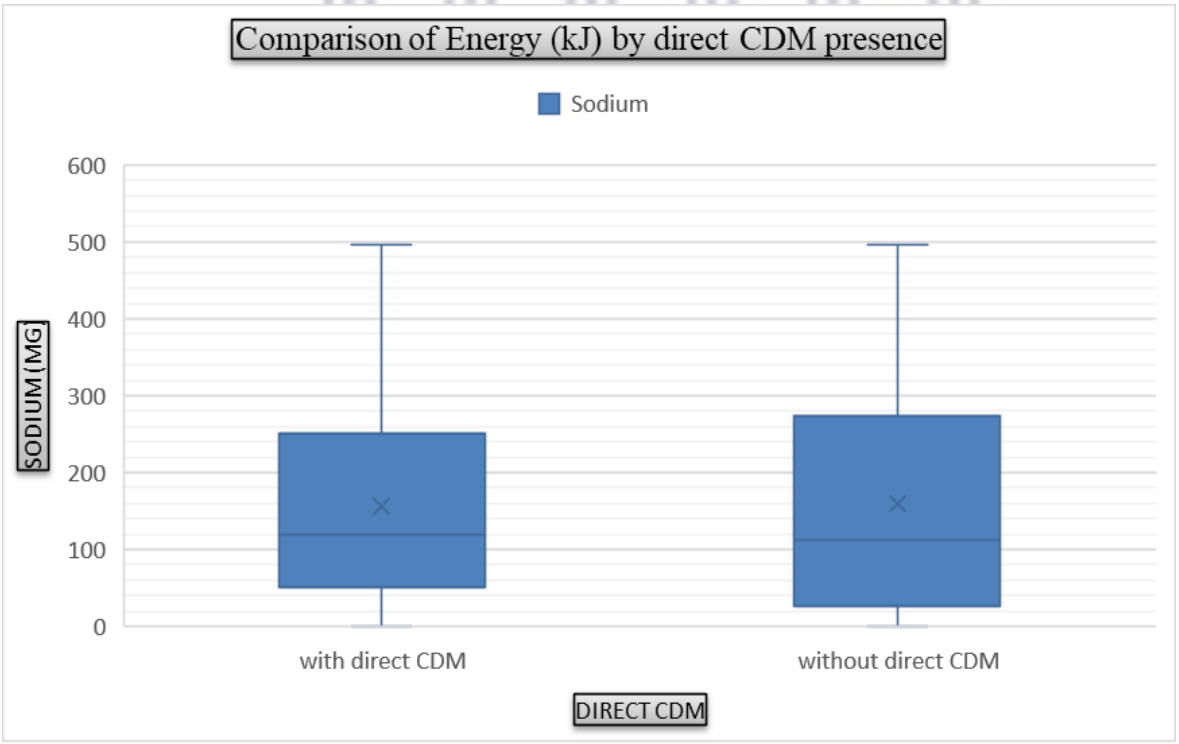

Figure 4.3.1b Sodium(mg) composition of RTE breakfast cereals with and without direct CDM.

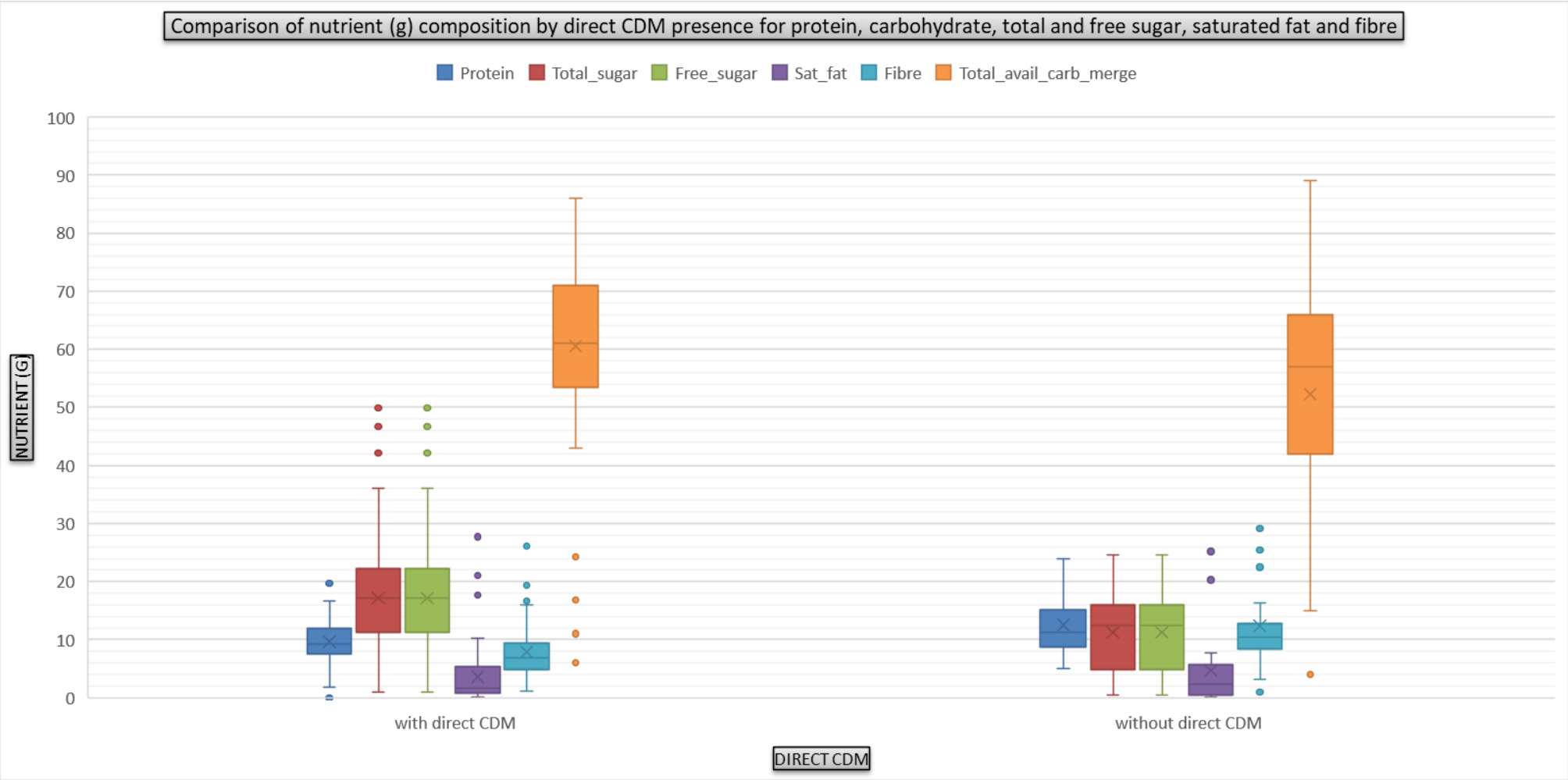

Figure 4.3.1c Nutrient (g) composition of RTE breakfast cereals with and without direct CDM.

4.3.2 Summary of nutrient composition of RTE breakfast cereals by the number of direct CDM strategies used.

When comparing the nutrient composition of breakfast cereals by the number of direct CDM strategies used, by grouping products into two groups, those with less than three CDM techniques, and those with three or more, there were no statistically significant differences noted in the mean carbohydrate or mean fibre content in breakfast cereals. However, statistically significant differences were noted in the mean total energy content ($p<0.01$), mean protein ($p<0.01$), mean sugar content ($p<0.01$), mean free sugar content ($p<0.01$), mean saturated fat content ($p<0.01$) and mean sodium content ($p<0.01$). In all instances, the means of total sugar, free sugar, and sodium in breakfast cereals was higher when three or more direct CDM strategies were used. (see Table 4.3.2 below). Figure 4.3.2a, figure 4.3.2b and figure 4.3.2.c illustrate the nutrient composition with significant differences based on the number of direct CDM strategies used.

Table 4.3.2 Nutritional composition per 100g of RTE breakfast cereals with less than three (3) and more than three (3) direct CDM strategies.

Nutrient	RTE Breakfast cereals using less than 3 direct CDM strategies								RTE Breakfast cereals using 3 or more direct CDM strategies								P-value
	n	Mean	Standard Deviation	Median	Minimum	Maximum	95% Confidence Interval for Mean		n	Mean	Standard Deviation	Median	Minimum	Maximum	95% Confidence Interval for Mean		
							Lower Bound	Upper Bound							Lower Bound	Upper Bound	
Energy (kJ)	64	1 668.88	272.64	1 640.00	283.00	2 517.00	1 600.77	1 736.98	29	1 439.02	324.19	1 495.00	361.00	1 827.00	1 315.70	1 562.34	<0.01
Protein (g)	63*	10.42	3.11	10.50	1.90	20.40	9.63	11.20	29	8.26	3.37	7.90	1.90	16.70	6.97	9.54	<0.01
Carbohydrates (g)	64	58.34	14.89	59.50	6.00	86.00	54.62	62.06	29	65.42	18.29	71.00	11.00	85.00	58.46	72.38	0.05
Total Sugar (g)	64	15.02	7.67	16.00	0.90	36.00	13.10	16.93	29	21.93	12.95	21.90	1.10	49.90	17.01	26.86	<0.01
Free Sugar (g)	64	15.02	7.67	16.00	0.90	36.00	13.10	16.93	29	21.93	12.95	21.90	1.10	49.90	17.01	26.86	<0.01
Saturated fat (g)	64	4.63	4.92	3.70	0.10	27.70	3.41	5.86	29	1.39	1.54	0.70	0.10	5.60	0.80	1.97	<0.01
Fibre (g)	64	8.44	4.02	7.75	1.10	26.10	7.44	9.45	29	6.54	5.89	4.70	2.20	26.10	4.31	8.78	0.07
Sodium (mg)	64	121.08	111.77	91.00	-	497.00	93.16	149.00	29	233.05	144.91	243.00	0.10	494.00	177.93	288.18	<0.01

One way ANOVA classification of nutrient composition of RTE breakfast cereals by the number of CDM strategies used. P<0.05 is taken as statistically significant. 3 products requiring preparation were included in the analysis due to the presence of "as-consumed" nutritional information being provided on package.

**One breakfast cereal using less than three direct CDM did not contain a protein value on the nutritional facts panel.*

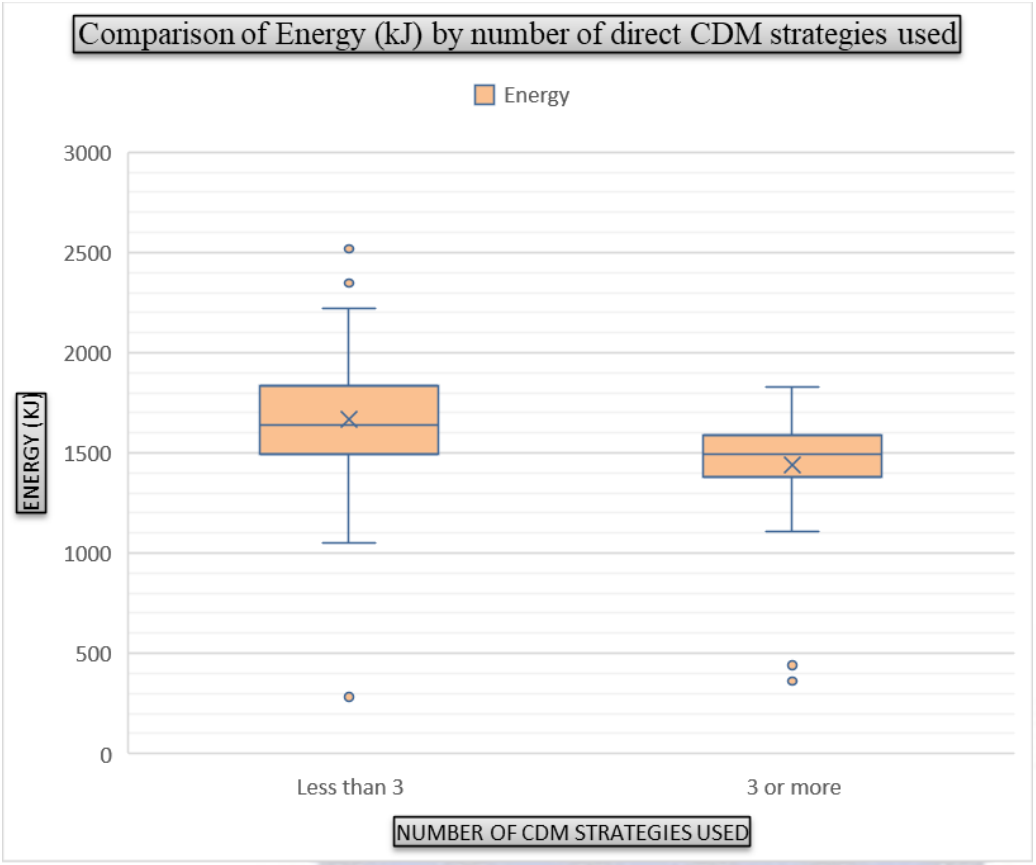

Figure 4.3.2a Energy(kJ) composition of RTE breakfast cereals with less than three or three or more direct CDM strategies.

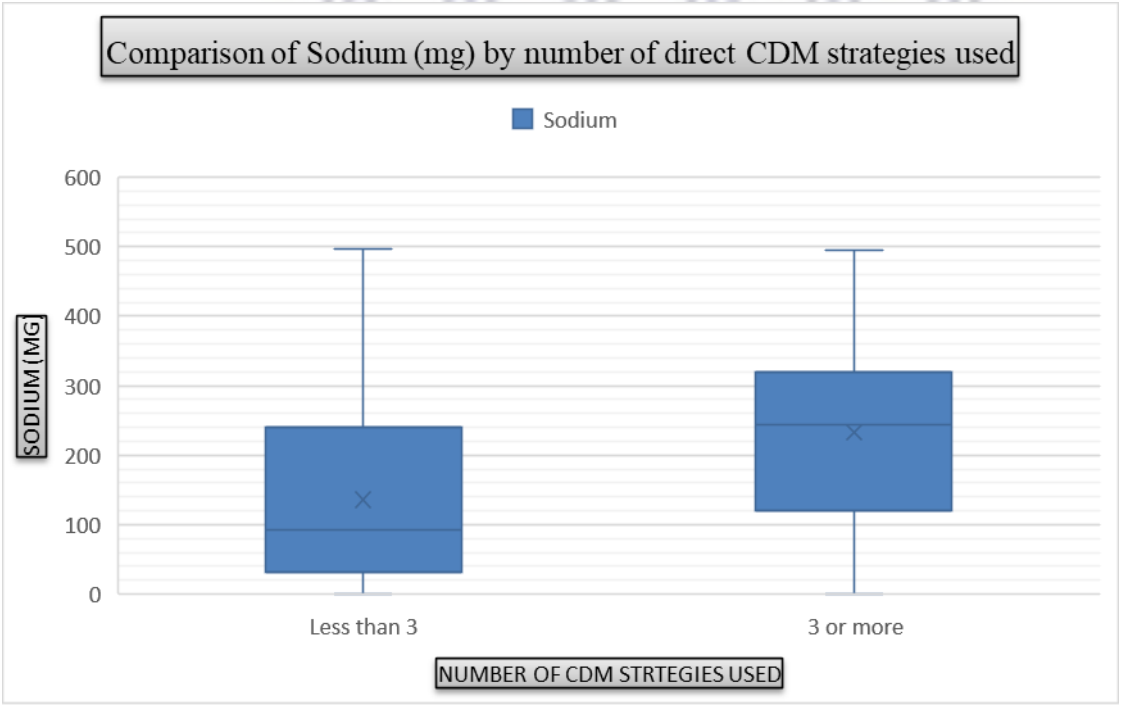

Figure 4.3.2b Sodium(mg) composition of RTE breakfast cereals with less than three or three or more direct CDM strategies.

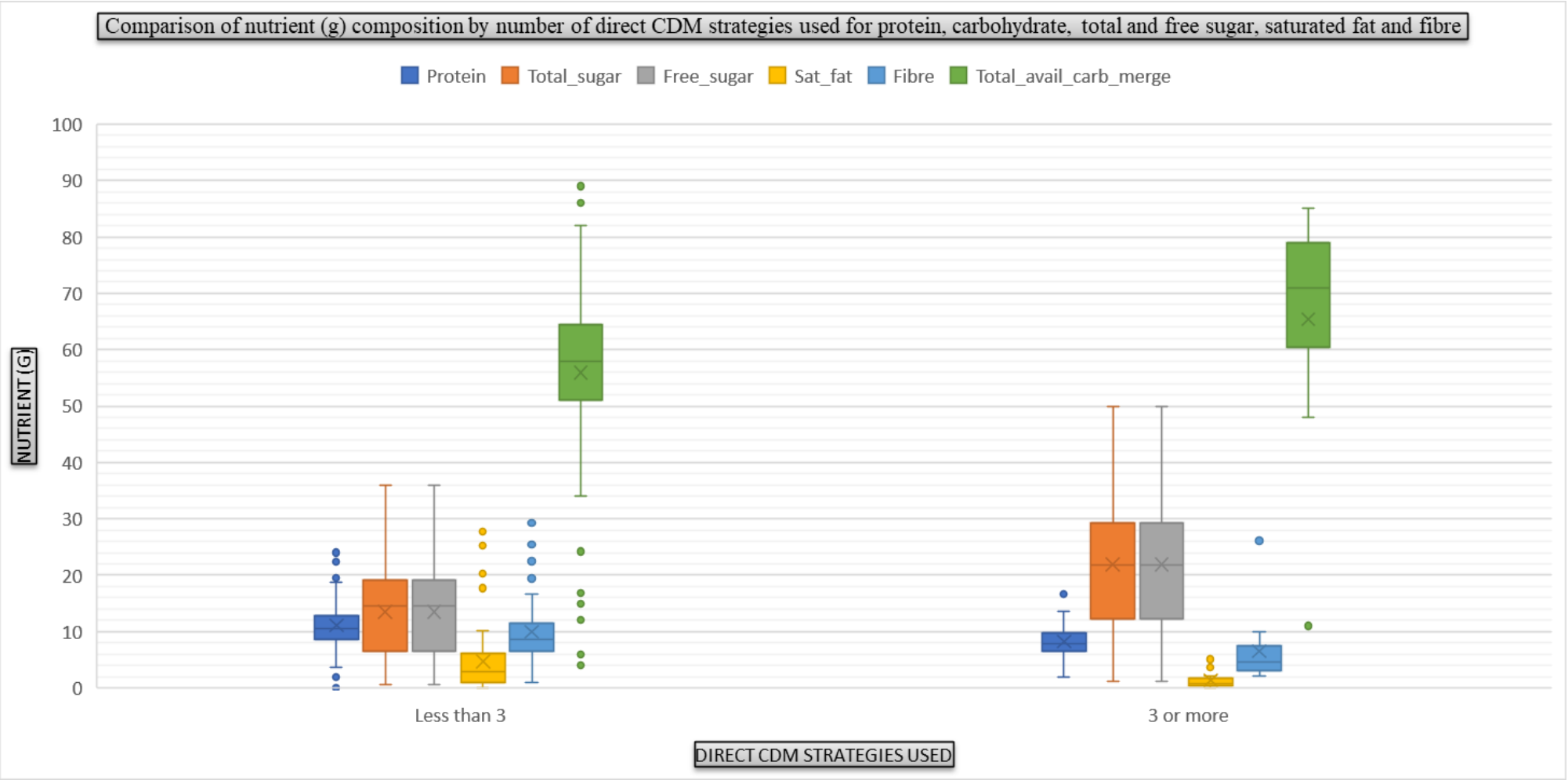

Figure 4.3.2c Nutrient(g) composition of RTE breakfast cereals with less than three or three or more direct CDM strategies.

4.3.3. Summary of breakfast cereals with and without direct CDM by preparation requirements

As stated, the nutritional composition of products that required preparation (i.e., that did not contain information in the RTE format) could not be examined. However, Table 4.3.3 shows the differences in the prevalence of breakfast cereals requiring preparation amongst breakfast cereals with CDM and breakfast cereals without CDM. No statistical significance was observed (p=0.85) as 60.7% (n=93) of breakfast cereals with CDM required no preparation, compared to 59.4% (n=41) of breakfast cereals without CDM that did not require preparation.

Table 4.3.3 Breakfast cereals with and without direct CDM cross tabulated with preparation requirement.

Direct CDM presence	Preparation requirements		Total n (%)	P-value
	RTE n (%)	Preparation required n (%)		
No direct CDM present	41 (59.4)	28 (40.6)	69 (100.0)	0.85
Direct CDM present	93 (60.7)	60 (39.3)	153 (100.0)	
Total	134 (60.3)	88 (39.7)	222 (100.0)	

Cross tabulation of direct CDM presence with preparation requirement. Chi-square test with P<0.05 is taken as statistically significant.

5. DISCUSSION

The discussion chapter is contextualised to the South African situation and compared to other countries findings. This study described the observed CDM strategies, and the nutritional composition of pre-packaged breakfast cereals sold at major South African retailers in 2019.

5.1 Child-directed marketing

Child directed marketing was present on 95% of breakfast cereals analysed with direct CDM strategies present on the majority of pre-packaged breakfast cereals in this study (69.0%). CDM is known to influence purchase choices and has been linked to increased intake of unhealthy foods (Ogba and Johnson, 2010) and thus the presence of CDM strategies on South African breakfast cereals is cause for concern.

Elsewhere, direct CDM prevalence on breakfast cereals is also high in Guatemala at 50.9% (Soo *et al.*, 2016), and lower in Chile at 35.7% (Stoltze *et al.*, 2019), and USA at 31% (Song, Halvorsen and Harley, 2014). The pervasiveness of CDM in SA and Guatemala is aligned with evidence that points to more aggressive marketing strategies used by multinational companies in LMICs resulting in rising consumption of unhealthy foods faster than has occurred previously in HICs (Stuckler *et al.*, 2012). Chile, classified as an upper-middle income country within the World Bank LMIC classification system (*The World Bank in Chile*, 2021), has introduced effective regulations to restrict CDM (Stoltze *et al.*, 2019), and this explains their lower prevalence of CDM.

Just under half (41.2%) of the products in this study with CDM made use of multiple CDM strategies. These products with multiple direct CDM strategies had a higher sugar and sodium content. This is supported by another study that found when more on-package marketing techniques are featured on a product, the product has a lower nutritional quality (Aerts and Smits, 2019).

Illustrations (95%) strategy was the most predominantly used on-package CDM, of which animal illustration (16.7%), object illustration (12.2%) and imaginary creature illustration (2.7%) were the direct

CDM illustrations strategies. Among visual marketing tactics, illustrations in general are shown to influence children's choice of food products (Hallez *et al.*, 2020) and this is worrisome as almost all South African pre-packaged breakfast cereals carry a type of illustration. Illustrations could be utilised on healthier breakfast cereals to attract children to healthier choices (Hallez *et al.*, 2020).

Product (66.2%) and consumption appeals (25.2%) were the second most used CDM strategy. Of these, product quality enhancement cues including taste and texture were found on 40.5% of all breakfast cereals. Children have reported perceiving a reference to taste plus a label insinuating fun on a product as being tastier than a plain product or one carrying a health only label (Enax *et al.*, 2015). Image cue of emotional consumption appeal (13.1%) pertaining to enjoyment, pleasure and creating a positive mood was the most used consumption appeal type noticed.

Character strategies which were defined as personified animals, objects or imaginary creatures in this study were present on 10.8% of breakfast cereals. This strategy was less prevalent on South African breakfast cereals when compared to Guatemala (31%) (Soo *et al.*, 2016), Belgium (18.8%) (Vermote *et al.*, 2020), Chile (29.7%) (Stoltze *et al.*, 2019) and Argentina (29%) (Allemandi *et al.*, 2020). The draft R429 stipulates that image directed at children and the inclusion of toys may not be used to advertise foods containing nutrients of concern above nutrient composition cut-off points (South Africa, 2014)and this may account for the reduced use of character strategies. Character strategy in this study relates to cartoon characters or promotional characters as referred to in several studies. Eye tracking studies find that children aged six (6) to nine (9) years pay more attention to products with cartoon characters (Osei-Assibey *et al.*, 2012). The use of characters on products is shown to increase purchase request from children (Connor, 2006). Characters make pre-packaged foods more appealing to children while health and nutritional claims reassure the parent in their choice to purchase these items for their children (Elliott, 2019). The use of characters and media branding influences children's food preferences away from fruits and vegetables towards less healthy choices (Kraak and Story, 2015).

Fantasy strategy defined as a display of fantastical or magical effects was found on 8.6% of breakfast cereals. Role models (7.7%) constituting of non-youth (7.2%) which are adult role models and youth (3.2%) who were obvious youth were observed. This was slightly lower than role models observed in Chile (9.52%) (Stoltze *et al.*, 2019). Family (5%) reference to image or text about family situations were also observed.

Very few appeals were used, and none of the breakfast cereals sold in SA made any reference to toys or cross promotions which contrasts with Chile with 6% toy reference and 3.6% cross promotions. The draft R429 prohibition on the use of toys to promote foods high in nutrients of concern may account for the absence of toys in breakfast cereals packaging. (South Africa, 2014) This is encouraging as the use of gifts, toys and cross promotions as marketing techniques have been shown to influence purchase decisions (Barquera *et al.*, 2018; Stoltze *et al.*, 2019).

5.2 Health and nutritional claims

South African breakfast cereals have a high prevalence of health and nutritional claims (96.85%) of which 95.5% have health claims and 67.6% have nutritional claims. UK shows a lower prevalence of health claims (44%) but a higher prevalence of nutritional claims (82%) when compared to SA (Garcia *et al.*, 2020). Similarly, in Argentina, health claims (55%) were less prevalent and nutritional claims (71%) were more prevalent (Allemandi *et al.*, 2020).

Amongst the health claims, portion consumption recommendation (71.2%) is most common, which was coded as the depiction of the cereal product in a bowl. Portion recommendations have been shown to influence parent's purchase choice the most (Russell *et al.*, 2017). This was followed by health purity (40.1%) claims such as being gluten free, lactose free, free of preservatives. Nature images (39.6%), cue on health benefits or reduction of risk (32%) and health seals from professional bodies (18.5%) were also present on breakfast cereals. Visual cues such as nature images are shown to influence parents' purchase choice (Russell *et al.*, 2017).

Of the 67.6% of nutritional claims present the most prevalent was addition of fibre (32.4%), followed by text cues suggesting the breakfast cereal is a good source of nutrients (24.8%) and the addition of vitamins other than vitamin C (19.8%). The addition of vitamin C (0.5%) was the least prevalent nutritional claim and claims on the reduction of salt, saturated fat, trans fat and cholesterol were also less prevalent at 3.2% for all four. Front of package nutritional claims on children's cereals are potentially misleading especially when placed on products with a high amount of nutrients of concern (Harris *et al.*, 2011). Food marketing is likely to directly address parents to promote foods for children's consumption (Hebden, King and Kelly, 2011) leading to an increased consumption of breakfast cereals high in nutrients of concern and putting the health of children at risk.

Dietary patterns need to change, and an environment should be created that encourages the increased intake of nutritious and traditional foods while reducing the intake of pre-packaged unhealthy foods. This requires regulation of the food industry to curb harmful CDM which entices children towards unhealthier choices (Hawkes *et al.*, 2015).

5.3 Nutrient composition

Statistically significant differences were noted in four (4) nutrient compositions: protein, fibre, total sugar and total carbohydates. In breakfast cereals with direct CDM the protein and fibre content was significantly lower than in breakfast cereals without direct CDM. This finding was similar to studies in New Zealand (Devi *et al.*, 2014), Australia (Chun *et al.*, 2012) and the USA (Schwartz *et al.*, 2008).

The mean total sugar content was significantly higher in breakfast cereals with CDM compared to those without CDM. Similarly, significantly high sugar content was found in breakfast cereals with CDM in New Zealand (Devi *et al.*, 2014), Australia (Chun *et al.*, 2012), Mexico (Nieto *et al.*, 2017), Guatemala (Soo *et al.*, 2016), Canada (Chepulis *et al.*, 2020) and the USA (Schwartz *et al.*, 2008). Foods high in sugar have a negative impact on children's nutrition preferences, purchase behaviour, consumption

patterns and diet-related health (Sadeghirad *et al.*, 2016), and excessive consumption has been linked to adverse health outcomes, such as dental caries, cardiovascular disease and metabolic disorders.

No significant difference was found in the energy content of breakfast cereal with CDM compared to those without CDM in SA, which was in contrast to New Zealand (Devi *et al.*, 2014) and the USA (Schwartz *et al.*, 2008) where the energy content was significantly higher.

There was no significant differences noted in the sodium content of breakfast cereals with direct CDM when compared to those without direct CDM, which was similar to Guatemala (Soo *et al.*, 2016) but different to New Zealand (Devi *et al.*, 2014) where the sodium content was significantly higher. This could be a positive effect of the implementation of the South African sodium regulation which restricted breakfast cereal sodium levels to below 500mg/100g in June, 2016 (South Africa, 2017). Although this study was conducted in 2019, data collection was completed before the stricter sodium limits (400mg/100g) of phase two of the R214 were implented in South Africa in June 2019. Further reductions in sodium levels may be likely.

This study found a significantly higher total carbohydrate content in breakfast cereals with direct CDM than those without direct CDM, which was similar to the findings in Australia (Chun *et al.*, 2012) and the USA (Schwartz *et al.*, 2008). No significant difference was noted in the saturated fat content and this was similar to the US findings (Schwartz *et al.*, 2008).

It is concerning that breakfast cereals marketed to children are substantially higher in sugar, a nutrient of concern if consumed in excess, associated with poor health outcomes and free sugar is excessively consumed by South African children (Igumbor *et al.*, 2012; Steyn *et al.*, 2020). Fibre intake among one (1) to nine (9) years old in South Africa are significantly low and the fibre content of breakfast cereals with direct CDM are also significantly low and a cause for concern (Steyn *et al.*, 2020) Although protein content in breakfast cereals with direct CDM are low compared to those without direct CDM, the adequate intake of protein among South African children (Steyn *et al.*, 2020)alleviates some concern. Given South Africa's burden of undernutrition and stunting, adequate protein intake is important amongst children

(Abrahams, Mchiza and Steyn, 2011);. The low fibre content of breakfast cereals with direct CDM is worrisome as majority of South African children from one (1) to nine (9) years of age have a very low fibre intake (Steyn *et al.,* 2020) and fibre intake is linked with good health outcomes (Wentzel-Viljoen *et al.*, 2018) and shown to reduce elevated cholesterol, blood pressure and obesity risk among adolescents (Fulgoni *et al.,* 2020) . Fibre intake is linked to the prevention of non-communicable diseases and improved immunity (Post *et al.*, 2012; McRae, 2017; Indarti, 2020) This study finds the nutritional content of breakfast cereals marketed to children to be unhealthier than those not targeted to children and yet more than 95% of all breakfast cereals carry a health or nutritional claim. This is misleading to parents who may assume that these products are healthy and fit for children's consumption and thereby influence their purchase decision (Russell *et al.*, 2017; Kovic *et al.,* 2018)

Given the excessive use of marketing techniques, and high sugar content of breakfast cereals found in this study. implementing restrictions on the marketing of unhealthy pre-packaged breakfast cereals is important. The Advertising Standards Authority (ASA) initiated the South African Marketing to Children pledge in 2008 which was signed by members of the major food corporations in 2009. This volunatry pledge is the only form of regulation that exists in SA as an industry self regulation effort and remains ineffective. The pledge violation by Coco-Cola Beverages South Africa (CCBSA) not to advertise or sell sugar sweetened beverages (SSBs) around school premises is a clear indicator of the ineffectiveness of self-regulation (Erzse *et al.,* 2021). Neither the current draft R429 nor the draft Department of Communications and Digital Technology Audio and Audio Visual Content Services Policy Framework (AAVCS) white paper are adequate to curb unhealthy food marketing to children (South Africa, 2014, 2020). R429 could be strengthened by regulating CDM on packaging, among various forms of media and the internet. AAVCS could expand on food related maketing to children rather than promoting industry self regulation.

Mexico has recently implemented on-package marketing regulations (Mexico, 2020), and the UK has announced plans to implement regulations. Chile has one of the highest obesity rates worldwide and

introduced their marketing to children regulation in 2016 (Kelly *et al.*, 2019) and within seven (7) months of regulation implementation there was a significant reduction in child- directed marketing in products with high levels of nutrients of concern and calories (Stoltze *et al.*, 2019).

5.4 Scope and limitations

This study reports on CDM strategies on pre-packaged breakfast cereal packaging only and therefore cannot conclude on CDM of these products in general as it excludes all other forms of marketing such as television, media, catalogues and online advertising. As data was collected from large, established supermarket chains CDM on breakfast cereal products informally imported and sold in stores in ethnic enclaves around South Africa (Indian enclave, Somalian enclave and Chinese enclave to name a few) was not captured. Another potential limitation is the exclusion of specific brands if they are sold exclusively in a province other than the Western Cape. The lack of adequate photographic evidence of the back of packs and sides of packages available from the secondary data used in the study limited the study to the FOP. Products without "as-consumed" nutritional information were excluded from the nutrient composition analysis, limiting the analysis to RTE breakfast cereals.

6. CONCLUSION

6.1 Conclusion

Child directed marketing was commonly observed on breakfast cereal packaging in South Africa. It is concerning that breakfast cereals targeted to children are more likely to display promotional characters and illustrations, as well as product and consumption appeals. Significant differences exist in the nutritional composition of breakfast cereals with CDM compared to those not marketed to children. Overall children's breakfast cereals with CDM are less nutritious with significantly less protein and fibre while containing significantly high levels of sugar. There is an urgent need for regulation of the food industry to protect children from harmful CDM. Don't South African children deserve better?

6.2 Recommendations

This study's findings suggest that CDM strategies in other food categories popular with children need to be examined as well. Policy recommendations based on the results of this study include: regulating child-directed marketing of less healthy pre-packaged breakfast cereals and other pre-packaged foodstuffs typically high in sugar, saturated fat and sodium; and implementing front of pack labels (FOPL) that could increase the awareness of the "high-in" nutrients of concern on breakfast cereals. As front of pack marketing has an influence on food choice and purchase decision, front of pack labeling (FOPL) could be utilised on pre-packaged breakfast cereals to garner consumers' attention to the nutrients of concern on these products when making their purchase decision (Grunert and Wills, 2007; Mansfield, Wahba and De Grandpré, 2020). Such a FOPL system needs to be easy for South African consumers to understand and evaluate and use the information to guide their purchase decision (Grunert and Wills, 2007; Mansfield, Wahba and De Grandpré, 2020).

Existing draft regulation (R429) on health and nutrition claims should be revisited by the Department of Health and the utilisation of a nutrient profiling model will aid in this regard. These policies are important in enabling a healthier food environment wherein parents and children are provided with healthier choices.

The Department of Health together with qualified nutrition and public health experts should engage and educate the public to make healthier choices regarding breakfast cereals. However, the need of the hour is enabling a healthier food environment for South Africans.

6.3 Future research areas

Further research is required on the persuasive power of children and the influences on parents to purchase these breakfast cereals that are high in sugar and low in protein and fibre. Research is lacking in South Africa and worldwide on the influence of food packaging on adolescents (Hallez *et al.*, 2020) and adolescent directed on-package marketing studies may be beneficial. Marketing strategies and health and nutritional claims are widely used on the back of pack (BOP) and on the sides of packaging and further studies on all sides of the packaging will give a comprehensive picture of on-package marketing on pre-packaged foods in any food category. Food categories marketed to children like sweet baked goods such as biscuits and cookies, pre-packaged chips, sweetened beverages, fruit snacks and two (2) minute noodles warrant further investigation on the presence of CDM and health and nutritional claims.

Although other nutrients of concern: energy, saturated fat and sodium were not substantially higher in products with CDM a comparision to acceptable levels of these nutrients of concern would be insightful into the true healthfulness of these products. This would require evaluating nutrients of concern in pre-packaged foods against an appropriate nutrient profiling model.

7. REFERENCES

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ADDENDUM A

Questionnaire and action sequence for child-directed marketing for South African pre-packaged foods

Legend

	Activities a user will undertake but no development is required for questionnaire.
	These sections contain variables and inputs required on a questionnaire and the data is to be entered by a user.
	Information below this belongs on one page (form) of the questionnaire and to be developed in REDCap.
	These sections explain/ describe the fields, action to be taken by user and descriptions for each sequence of events.

Action		Description
Acquire list of product items sold in the South African market for the food subcategory being studied and observe the packaging of each product item. Analyse each product per subcategory for child-directed marketing on the package.		This is a physical observation of a product's photograph(s) to determine the extent of child-directed marketing used.
FORM 1 (General product information)		
Field	Action	Description
Key Fields	All Form1 key fields will be prepopulated from existing product data.	These fields are used to uniquely identify a product and match it to other REDCap forms carrying nutrient information for the same product.
Product_ID	Enter the product ID already allocated for this product on REDCap search. Example: 20200204_01_07_52 (YYYY_MM_DD_SS_PP_N)	This is the current product ID format for REDCap data. YYYY- Year MM- Month DD- Day

		SS- Store code PP- Photographer code N- numerical product number
Key fields below, except Data entry user code, will be auto-populated for the Product ID keyed in above.		
Product_Name	Example: NESTLE, MILO WHOLEGRAIN CEREAL, 400 G, C	Auto-populated field. Name includes brand, name of product, package size and unit, package type (C = carton).
Barcode	Verify the barcode on the product photo matches the barcode for this product on REDCap. Tick below if the barcodes match. Barcode match ☐ Example: 5900020034830	Auto-populated field. As found on product packaging. Tick the box to validate a barcode match.
Data_Entry_User_ Code	Enter the REDCap data entry user code allocated to person capturing the information. Example: 99	Each researcher entering data on REDCap is assigned a unique user identification number.
Product_Category	Example: Cereal and cereal products (02)	Auto-populated field. All products entered in REDCap have been categorised per food group. The food group “Cereal and cereal products” is allocated the number 02.
Product_Subcategory	Example: Breakfast cereals (201)	Auto-populated field.

		All products entered into REDCap have been further subcategorised within a food group category. The subcategory “Breakfast cereals” is allocated the number 201.
Package_size	Example: 500	Auto-populated field. A numeric value for package weight.
Package_size_unit	Example: G	Auto-populated field. A unit of the weight measurement in grams, kilograms, litres or millilitres.
Form_Complete	Tick COMPLETE or INCOMPLETE and SAVE the form. Example: Complete √ Incomplete	Key fields and marketing data will be captured on separate forms to allow for ease of use and allow for timely saving of electronic information
Action		Description
If Form 1 is complete, proceed to next section.		In the next section, child-directed marketing information for product item entered in Form 1 will be captured.

FORM 2 (Child-directed marketing information)			
Field	Condition	Questions (Action)	Description

Child-directed marketing fields	Conditions for answering questions in the "Questions" column	Enter the field values onto the REDCap questionnaire for child-directed marketing information found on product item being studied. If any of the following types of marketing strategies sections are applicable, answer the relevant questions by ticking the appropriate box and/ or inserting comments.	These fields will capture the types of marketing found on the product item. Questions for the types of marketing observed on packaging will be outlined in sections.
Barcode		Display information from previous form. (No user action required)	This field should be auto populated from Form 1
Product_Name		Display information from previous form. (No user action required)	This field should be auto populated from Form 1
Action			Description
Study all sides of the product packaging for CDM strategies and complete the sections below. Indicate where appropriate with a tick. If required, you may add additional information under comments.			Data entry user, studies all sides of the packaging and proceeds to complete appropriate sections below.
Field	Condition	Questions (Action)	Description
LANGUAGE			
Language_ number	Always answer	How many languages is the product name described in? 1 ☐ 2 ☐ 3 or more ☐	Field rule: All answers are optional but one must be selected.
Language_ name	Always answer	In which language(s) is the product name described? English ☐ Afrikaans ☐ Xhosa ☐ Zulu ☐	Field rule: All answers are optional. If other is chosen, a comment must be provided.

		Unknown ☐ Other ☐ Comment :_____ (Type the name of language used)	
PRODUCT OR INGREDIENT ILLUSTRATION			
Product_illustration	Always answer	Is there any illustration of the product on any part of the package? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Include product that can be seen through transparent packages. Field rule: More than 1 answer may be selected EXCEPT "None".
Ingredient_illustration	Always answer	Is there any illustration of ingredients on any part of the package? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Exclude stems, leaves and seeds (nature images). Include seeds in the cases like: chia cookies showing chia seeds. Field rule: More than 1 answer may be selected EXCEPT "None".
FRUIT OR VEGETABLE ILLUSTRATION			
Fruit_illustration	Always answer	Is there any fruit(s) illustration on the package? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Exclude any that is part of the product logo. Field rule: More than 1 answer may be selected EXCEPT "None".
Fruit_text	Always answer	Is there any text about fruit(s) on the package? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Exclude any that is part of the product logo.

			Field rule: More than 1 answer may be selected EXCEPT “None”.
Vegetable_ illustration	Always answer	Is there any vegetable(s) illustration on the package? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Exclude any that is part of the product logo. Field rule: More than 1 answer may be selected EXCEPT “None”.
Vegetable_ text	Always answer	Is there any text about vegetable(s) on the package? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Exclude any that is part of the product logo. Field rule: More than 1 answer may be selected EXCEPT “None”.
OBJECT, ANIMAL, IMAGINARY CREATURE			
Product_ illustration	Always answer	Is there any image of an object, animal, imaginary creature, product or product ingredient on the package? Object ☐ Animal ☐ Imaginary creature ☐ None ☐	Include animal or fantastic characters. Exclude humans. Field rule: More than 1 answer may be selected EXCEPT “None”.
Product_ illustration_ type	If Product_ illustration ≠ None.	Is the image of an object, animal, imaginary creature, product or product ingredient on the package drawn or photorealistic? Drawn ☐ Photorealistic ☐	Include real portrayal of a character but exclude personified animals. Field rule: More than 1 answer may be selected EXCEPT “None”.
Product_ illustration_ place	If Product_ illustration_ type ≠ None	Where on the package is the drawn or photorealistic illustration noticed? On FOP ☐ On other sides of the package ☐	Field rule: More than 1 answer may be selected.

Personified_ illustration	Always answer	Is there any object, animal, imaginary creature, product or product ingredient that is personified to look like it has HUMAN features, behaviour or characteristics? Object ☐ Animal ☐ Imaginary creature ☐ Product ☐ Product ingredient ☐ None ☐	Exclude humans. Field rule: More than 1 answer may be selected EXCEPT "None".
Personified_ Illustration_ place	If Personified_ illustration ≠ None	Where on the package is the personified illustration noticed? On FOP ☐ On other sides of the package ☐	Field rule: More than 1 answer may be selected.
Illustration_ legal	If Animal_ illustration_ type ≠ None OR Personified_ illustration ≠ None	Is the noticed illustration the brand's registered trademark or is it licensed? Licensed ☐ Registered trademark ☐	Field rule: More than 1 answer may be selected EXCEPT "None". FOP and other sides of package can both be selected.
YOUTH SECTION			
Youth_character	Always answer	Is there any person (human) on the product who looks obviously like a youth under age 12? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Include photos, drawn or cartoon images. Exclude if the person could be regarded as a teenager or young adult. Field rule: More than 1 answer may be selected EXCEPT "None". FOP and other sides of package can both be selected.

Youth_ licensed_ character	If Youth_character ≠ None.	Is there any youth character that is a licensed or known character from a movie, television show, book, comic, toy line or other trademarked or copyrighted source on the product? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Exclude the product brand. Include a known actor dressed as the character. Field rule: More than 1 answer may be selected EXCEPT "None". FOP and other sides of package can both be selected.
Youth_ known_ celebrity	If Youth_character ≠ None.	Is there any youth character that is a known celebrity that is representing himself of herself on the product? E.g., television personality, actor, singer or musician. If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Exclude sports athletes and celebrity in a licensed character costume. Field rule: More than 1 answer may be selected EXCEPT "None". FOP and other sides of package can both be selected.
Youth_Sport_ celebrity	If Youth_character ≠ None.	Is there any youth character that is a known sports athlete on the product? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Athlete maybe in their team uniform/ kit or not. Field rule: More than 1 answer may be selected EXCEPT "None". FOP and other sides of package can both be selected.
Youth_fantastic_characters	If Youth_character ≠ None.	Is there any youth that is a fantastic character playing pretend, doing magic, or acting out a fantasy? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Include flying, being a hero, villain, having superpowers, being in space or doing magical things. Do not include if it is just a personified animal/object/product. Field rule: More than 1 answer may be selected EXCEPT "None". FOP and other sides of package can both be selected.

NON-YOUTH SECTION			
NonYouth_ character	Always answer	Is there any person (human) on the product who is clearly a non-youth? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Include adults, older teenagers or ambiguous. Include photos, drawn or cartoon images. Field rule: More than 1 answer may be selected EXCEPT "None". FOP and other sides of package can both be selected.
NonYouth-Licensed_ character	If NonYouth_ character ≠ None.	Is there any non-youth character that is a licensed or known character from a movie, television show, book, comic, toy line or other trademarked or copyrighted source on the product? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Exclude the product brand. Include a known actor dressed as the character. Field rule: More than 1 answer may be selected EXCEPT "None". FOP and other sides of package can both be selected.
NonYouth_ known_ celebrity	If NonYouth_ character ≠ None.	Is there any non-youth character that is a known celebrity that is representing himself of herself on the product? E.g., television personality, actor, singer or musician. If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Exclude sports athletes and celebrity in a licensed character costume. Field rule: More than 1 answer may be selected EXCEPT "None". FOP and other sides of package can both be selected.
NonYouth_ sport_ celebrity	If NonYouth_ character ≠ None.	Is there any non-youth character that is a known sports athlete on the product? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Athlete maybe in their team uniform/ kit or not. Field rule: More than 1 answer may be selected EXCEPT "None". FOP and other sides of package can both be selected.

NonYouth_ fantastic_ characters	If NonYouth_ character ≠ None.	Is there any non-youth that is a fantastic character playing pretend, doing magic, or acting out a fantasy? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Include flying, being a hero, villain, having superpowers, being in space or doing magical things. Do not include if it is just a personified animal/object/product. Field rule: More than 1 answer may be selected EXCEPT "None". FOP and other sides of package can both be selected.
DIFFERENT APPEALS			
School_refer ence_image	Always answer	Is there any image that specifically references school and school-related activities and items? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Include: going to school, backpacks, school bus, breaktime, school playground (do not include playground not at school), school lunch, cafeterias, tuck shop, teachers, grades, homework, notebooks, erasers, pencils, other common school supplies, etc. Field rule: More than 1 answer may be selected EXCEPT "None". FOP and other sides of package can both be selected.
School_refer ence_text	Always answer	Is there any text that specifically references school and school-related activities and items? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Include: going to school, backpacks, school bus, breaktime, school playground (do not include playground not at school), school lunch, cafeterias, teachers, grades, homework, notebooks, erasers, pencils, other common school supplies, etc.

			Field rule: More than 1 answer may be selected EXCEPT “None”. FOP and other sides of package can both be selected.
Toy_reference_image	Always answer	Is there any image referencing toys? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Exclude characters or gifts. Field rule: More than 1 answer may be selected EXCEPT “None”. FOP and other sides of package can both be selected.
Toy_reference_text	Always answer	Is there any text referencing toys? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Exclude characters or gifts. Field rule: More than 1 answer may be selected EXCEPT “None”. FOP and other sides of package can both be selected.
Family_image	Always answer	Is there any image that specifically references family or family situations on the product? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	E.g., depiction of a family, father and child, mother and child, grandparents with children etc. Field rule: More than 1 answer may be selected EXCEPT “None”. FOP and other sides of package can both be selected.
Family_text	Always answer	Is there any text that specifically references family or family situations on the product? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	E.g., “share with family” or “brings the family together” etc. Field rule: More than 1 answer may be selected EXCEPT “None”. FOP and other sides of package can both be selected.

Youth_ text	Always answer	Are there any specific words that make reference to youth on the product? Namely, is there "kids," "children," "youth" or derivations of these specific words anywhere on the package? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Include words like "kid" or "child," in the product name. Field rule: More than 1 answer may be selected EXCEPT "None". FOP and other sides of package can both be selected.
Local_text	Always answer	Are there any words or phrases popularly known in South Africa that is present on the package in any of the 12 official languages including English? Woza weekend ☐ Local is lekker ☐ Image depicting sign language ☐ None ☐ Other ☐ If other, please state it here: _____	Include all local culture words or phrases that create appeal. Tick all applicable boxes Field rule: All fields are optional. If other is selected, comment must be provided.
Local_text_ place	If Local_text ≠ None.	Where on the package is the popular South African words or phrases noticed? On FOP ☐ On other sides of the package ☐	Field rule: More than 1 answer may be selected.
Sports_refer ence_image	Always answer	Other than characters engaged in competitive, organized sports, is there any image cue about organized, competitive sports? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Include seeing a sports jersey, sporting equipment, sports arenas or fields, sports emblems. Exclude seasonal sporting events like Rugby World Cup, Cricket World Cup or Olympics. Field rule: More than 1 answer may be selected EXCEPT "None". FOP

			and other sides of package can both be selected.
Sports_reference_text	Always answer	Other than characters engaged in competitive, organized sports, is there any text cue about organized, competitive sports? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Include seeing a team name. Exclude seasonal sporting events like Rugby World Cup, Cricket World Cup or Olympics. Field rule: More than 1 answer may be selected EXCEPT "None". FOP and other sides of package can both be selected.
Sports_reference_seasonal_image	Always answer	Is there any image referencing a seasonal sporting event? Rugby world cup ☐ Soccer World cup ☐ Cricket World cup ☐ IPL ☐ Olympics ☐ None ☐ Other ☐ If other, please state it here: _____	Include International and National sporting events. Exclude images referencing sport that is non-event related.
Sports_reference_seasonal_image_place	If Sports_reference_seasonal_image ≠ None.	Where on the package is the image cue reference to a seasonal sporting event noticed? On FOP ☐ On other sides of the package ☐	Field rule: More than 1 answer may be selected.
Sports_reference_seasonal_text	Always answer	Is there any text referencing a seasonal sporting event? Rugby world cup ☐	Include International and National sporting events. Exclude text

		Soccer World cup ☐ Cricket World cup ☐ IPL ☐ Olympics ☐ None ☐ Other ☐ If other, please state it here: _____	referencing sport that is non-event related.
Sports_reference_seasonal_text_place	If Sports_reference_seasonal_text ≠ None.	Where on the package is the text cue reference to a seasonal sporting event noticed? On FOP ☐ On other sides of the package ☐	Field rule: More than 1 answer may be selected.
Fantasy_image	Always answer	Other than characters engaged in fantasy, pretend, or magic, is there any image cue about fantasy or magic? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Include things like: a magician's hat or wand, images of other planets etc. Include image references to product fantastic effects. Field rule: More than 1 answer may be selected EXCEPT "None". FOP and other sides of package can both be selected.
Fantasy_text	Always answer	Other than characters engaged in fantasy, pretend, or magic, is there any text cue about fantasy or magic? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Include things like: text about superhuman powers. Include text references to product fantastic effects or fantastic arguments about the product itself. Exclude claims such as " rich chocolate flavour", (This is about taste).

			Field rule: More than 1 answer may be selected EXCEPT “None”. FOP and other sides of package can both be selected.
Cross_promotion_events_image	Always answer	Is there any image that specifically references non-sporting events? Christmas ☐ Easter ☐ None ☐ Other ☐ If other, please state it here: _____	These maybe limited-edition items. Tick all applicable boxes Field rule: More than 1 answer may be selected EXCEPT “None”. FOP and other sides of package can both be selected.
Cross_promotion_events_image_place	If Cross_promotion_events_image ≠ None.	Where on the package is an image referencing non-sporting event noticed? On FOP ☐ On other sides of the package ☐	Field rule: More than 1 answer may be selected.
Cross_promotion_events_text	Always answer	Is there any text that specifically references non-sporting events? Christmas ☐ Easter ☐ None ☐ Other ☐ If other, please state it here: _____	These maybe limited-edition items. Tick all applicable boxes Field rule: More than 1 answer may be selected EXCEPT “None”. FOP and other sides of package can both be selected.
Cross_promotion_events_text_place	If Cross_promotion_events_text ≠ None.	Where on the package is the text referencing non-sporting events noticed? On FOP ☐ On other sides of the package ☐	Tick all applicable boxes Field rule: More than 1 answer may be selected.
Cross_promotion_products	Always answer	Are there any other products from the same brand or another brand that is sold as part of a package deal? Same brand ☐ Different brand ☐ None ☐	Include products of the same type or different. E.g, a combo pack. Tick all applicable boxes

			Field rule: More than 1 answer may be selected EXCEPT “None”.
Social_media_reference	Always answer	Is there any text or symbol of any cues referring to digital media? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Include URLs, QR codes, emoticons (emojis) or reference to social media applications such as Facebook or Instagram Field rule: More than 1 answer may be selected EXCEPT “None”.
UNCONVENTIONAL PRODUCT APPEALS			
Unconventional_consumed_image	Always answer	Is there any image that shows or suggests the product can do something unconventional when consumed? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	E.g., image depicts the product is interactive, colours the tongue, “explodes” when eaten or the package opens differently. If the product can be used as a game/toy Field rule: More than 1 answer may be selected EXCEPT “None”. FOP and other sides of package can both be selected.
Unconventional_consumed_text	Always answer	Is there any text that shows or suggests the product can do something unconventional when consumed? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	E.g., texts such as “tickles your taste buds”, “changes your tongue colour”, “explodes in your mouth” etc. Field rule: More than 1 answer may be selected EXCEPT “None”. FOP and other sides of package can both be selected.
Unconventional_shapes	Always answer	Does the product have unconventional shapes? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	E.g., moon and star shape or scoops. Exclude balls, fruit loops or Otees shapes. Do not include character shapes on package.

			Field rule: More than 1 answer may be selected EXCEPT “None”. FOP and other sides of package can both be selected.
GIFT/ CONTEST			
Gift_in_package	Always answer	Is there any image or text indicating the presence of a gift in the package or a gift that can be obtained with information in the package? If so, where on the package is this noticed? On FOP ☐ On other sides of the package ☐ None ☐	E.g., Exclude games played on the package itself and contests. Field rule: More than 1 answer may be selected EXCEPT “None”. FOP and other sides of package can both be selected.
Gift_collectables	If Gift_in_package ≠ None.	Is there any reference to gifts that are collectable, stickers, school supplies or toys? If so, where on the package is this noticed? On FOP ☐ On other sides of the package ☐ None ☐	Field rule: More than 1 answer may be selected EXCEPT “None”. FOP and other sides of package can both be selected.
Gift_contest	If Gift_in_package ≠ None.	Is there any text about the ability to enter a contest or draw to win something? If so, where on the package is this noticed? On FOP ☐ On other sides of the package ☐ None ☐	Include contests you can enter your school into. Field rule: More than 1 answer may be selected EXCEPT “None”. FOP and other sides of package can both be selected.
Gift_game_in_package	If Gift_in_package ≠ None.	Is there any text or images indicating the presence of a game inside the package or information to access a game? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	E.g., colouring, snakes and ladders, making an image on the package itself come to life using a smartphone(may include website or URL) Field rule: More than 1 answer may be selected EXCEPT “None”. FOP

			and other sides of package can both be selected.
CONSUMPTION APPEALS			
Consumption_ Emotional_ image	Always answer.	Is there any image cue about general personal mood, enjoyment or pleasure? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	E.g image showing a change from sad to happy once product is consumed. Include any reference to creating a positive mood or removing a negative mood. Field rule: More than 1 answer may be selected EXCEPT "None". FOP and other sides of package can both be selected.
Consumption_ Emotional_ text	Always answer.	Is there any text cue about general personal mood, enjoyment or pleasure? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	E.g.,"Enjoy", Happiness". Include any reference to creating a positive mood or removing a negative mood. Field rule: More than 1 answer may be selected EXCEPT "None". FOP and other sides of package can both be selected.
Consumption_ try_it	Always answer.	Is there any text cue that makes a suggestion to consume the product? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	E.g.,"Try it", Enjoy it", "Drink Coca-Cola". "Enjoy Coca-Cola" would be under EMOTIONAL appeal. Field rule: More than 1 answer may be selected EXCEPT "None". FOP and other sides of package can both be selected.
Consumption_ over	Always answer.	Is there any text about becoming or being addicted to the product or binging? If so, where on the package is it noticed?	E.g., "You can't eat just one"

		On FOP ☐ On other sides of the package ☐ None ☐	Field rule: More than 1 answer may be selected EXCEPT "None". FOP and other sides of package can both be selected.
PRODUCT APPEALS			
Product_taste _texture	Always answer.	Is there any text about the colour, taste, texture, smell or preparation of the product? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Highlighting the quality of the taste/texture. E.g., "Smooth vanilla", "rich chocolate". Any text suggesting an enhancement of a quality. Field rule: More than 1 answer may be selected EXCEPT "None". FOP and other sides of package can both be selected.
Product_tradi tional	Always answer.	Is there any reference to tradition, authenticity, homemade or artisan food/recipe/ product/ ingredients? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Include "since 1890", "original recipe", reference to product origin and country of origin (not address). Field rule: More than 1 answer may be selected EXCEPT "None". FOP and other sides of package can both be selected.
Product_imp roved	Always answer.	Is there any text about the product being new, improved or limited edition? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Include if text compares current product to former version. E.g., "now with less fat." Field rule: More than 1 answer may be selected EXCEPT "None". FOP and other sides of package can both be selected.
Product_affor dability	Always answer.	Is there any text, symbol, or images on the package about the affordability of the product? If so, where on the package is it noticed?	Include price promotions, two-for-one or three-for-two deals, claims

		On FOP ☐ On other sides of the package ☐ None ☐	about more volume per unit, claims on value for price and discounts. Field rule: More than 1 answer may be selected EXCEPT "None". FOP and other sides of package can both be selected.
NUTRITIONAL CLAIMS			
Nutrient_ reduced	Always answer	Is there any reference to the reduction or elimination of any of the following nutrients on the package? Sugar (sugar-free) ☐ Sodium ☐ Salt ☐ Saturated fat ☐ Transfat ☐ Total fat ☐ Cholesterol ☐ None ☐ Other ☐ If other, please state it here: _____	Include "< 20%fat". If type of fat is not mentioned include it as Total Fat. Exclude vitamin and mineral claims. Tick all applicable boxes. Field rule: All fields are optional. If other is selected, comment must be provided. More than 1 answer may be selected EXCEPT "None". FOP and other sides of package can both be selected.
Nutrient_ reduced_place	If Nutrient_ reduced ≠ None.	Where on the package is the reference to reduction or elimination of nutrients noticed? On FOP ☐ On other sides of the package ☐	Field rule: More than 1 answer may be selected.
Nutrient_ added	Always answer	Is there any reference to the following nutrients being ADDED IN or being HIGH IN? Fibre ☐ Vitamin C ☐	Exclude reference to "a good source of fibre/ energy" etc. Tick all applicable boxes

		Vitamins (other than Vitamin C) ☐ Minerals ☐ Protein ☐ EPA/DHA/ Omegas ☐ Energy ☐ None ☐ Other ☐ If other, please state it here: _____	Field rule: All fields are optional. If other is selected, comment must be provided. More than 1 answer may be selected.
Nutrient_ added _place	If Nutrient_ added ≠ None.	Where on the package is the reference to ADDED IN or being HIGH IN nutrients noticed? On FOP ☐ On other sides of the package ☐	Field rule: More than 1 answer may be selected.
Nutrient_ added_ message	Always answer.	In addition to ADDED or HIGH IN, is there any text, symbol, image or number that conveys information about high-in or added nutrients or ingredients? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	E.g., "50% Cocoa", " 30% milk". Must include a numerical value. Exclude percentage mentioned in the ingredients list. Exclude GDA and Warning labels Field rule: More than 1 answer may be selected EXCEPT "None". FOP and other sides of package can both be selected.
Nutrient_sour ce	Always answer.	Other than ADDED or HIGH IN, is there any text that conveys information about the product or ingredient being "a good source of" any nutrient? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	E.g., "a good source of fibre". Field rule: More than 1 answer may be selected EXCEPT "None". FOP and other sides of package can both be selected.
HEALTH CLAIMS			

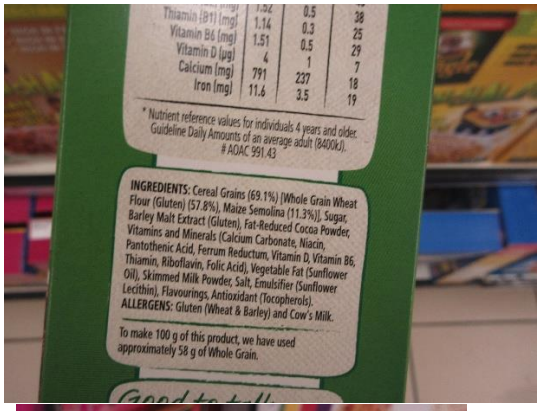
Health_message	Always answer.	Is there any text, symbol, image or number that conveys information about health benefits or reduction of health risk? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	E.g., “feel healthy”, “ good for you”, “nutritious”, “for growing kids”, “stronger”, “faster”, “part of a healthy breakfast”, “fitness”. Field rule: More than 1 answer may be selected EXCEPT “None”. FOP and other sides of package can both be selected.
Health_seal	Always answer.	Is there a seal from a medical institution or academic organisation ensuring healthy properties? Heart Foundation ☐ CANSA ☐ Diabetes Association ☐ Recommended by doctors or dietitians ☐ None ☐ Other ☐ If other, please state it here: _____	Include any professional institution endorsing the product. Tick all applicable boxes Field rule: All fields are optional. If other is selected, comment must be provided.
Nutrient_seal_place	If Health_seal ≠ None.	Where on the package is the health seal noticed? On FOP ☐ On other sides of the package ☐	Field rule: More than 1 answer may be selected.
Health_nature_image	Always answer.	Is there any image of nature including images of product ingredients in their original state? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	E.g., wheat stalks, wheat grass, stems, leaves and seeds. Exclude fruits and vegetables coded for Fruit and Vegetable section. Include flowers and trees as part of nature landscape.

			Field rule: More than 1 answer may be selected EXCEPT “None”. FOP and other sides of package can both be selected.
Health_nature_text	Always answer.	Is there any text referring to the product being fresh, natural or straight from the farm? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Include “100% natural”, Field rule: More than 1 answer may be selected EXCEPT “None”. FOP and other sides of package can both be selected.
Health_sweeteners	Always answer.	Is there any text or image that refers to the addition of sweeteners? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Field rule: More than 1 answer may be selected EXCEPT “None”. FOP and other sides of package can both be selected.
Health_portion	Always answer.	Is there any consumption recommendation other than any on the nutrition facts panel or GDA? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Field rule: More than 1 answer may be selected EXCEPT “None”. FOP and other sides of package can both be selected.
Health_recommendation	Always answer.	Is there any recommendation about healthy habits such as exercise or eating healthy? If so, where on the package is it noticed? On FOP ☐ On other sides of the package ☐ None ☐	Include educational text about healthy habits, text about healthy breakfasts, text about digestive processes. Field rule: More than 1 answer may be selected EXCEPT “None”. FOP and other sides of package can both be selected.
Health_purity	Always answer.	Is there reference to purity in terms of any of the following on the product packaging?	Include all allergens. Tick all applicable boxes

		Organic ☐ Non-GMO ☐ Lactose free ☐ Gluten free ☐ No colourants ☐ No preservatives ☐ No artificial flavouring ☐ None ☐ Other ☐ If other, please state it here: _____ On FOP ☐ On other sides of the package ☐ None ☐	Field rule: More than 1 answer may be selected EXCEPT "None". FOP and other sides of package can both be selected.
Health_purity _place	If Health_purity ≠ None.	Where on the package is the aspect of purity noticed? On FOP ☐ On other sides of the package ☐	Tick all applicable boxes Field rule: More than 1 answer may be selected. FOP and other sides of package can both be selected.
Form_Complete		Tick COMPLETE or INCOMPLETE and SAVE the form. Example: Complete ☑ Incomplete ☐	marketing information for all applicable sections are completed. Tick to validate and then SAVE form.

ADDENDUM B

Example of photographic evidence of a breakfast cereal product



ADDENDUM C

Pre-recorded video simulation of data entry in REDCap for coder training

https://drive.google.com/file/d/1hcac1Ig4RlrKarbf_UJ5J9o9rfz8DRJi/view?usp=sharing

ADDENDUM D

Ethics approval letter for ROFE project

UNIVERSITY of the WESTERN CAPE

OFFICE OF THE DIRECTOR: RESEARCH
RESEARCH AND INNOVATION DIVISION

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13 October 2017

Prof D Sanders
School of Public Health
Faculty of Community and Health Sciences

Ethics Reference Number: BM17/8/20

Project Title: Researching the obesogenic food environment, its drivers and potential policy levers in South Africa and Ghana.

Approval Period: 11 October 2017 – 11 October 2018

I hereby certify that the Biomedical Science Research Ethics Committee of the University of the Western Cape approved the scientific methodology and ethics of the above mentioned research project.

Any amendments, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.

Please remember to submit a progress report in good time for annual renewal.

The Committee must be informed of any serious adverse event and/or termination of the study.

Ms Patricia Josias
Research Ethics Committee Officer
University of the Western Cape

PROVISIONAL REC NUMBER -130416-050

FROM HOPE TO ACTION THROUGH KNOWLEDGE.

ADDENDUM E

Ethics approval letter for the study of child-directed marketing on pre-packaged breakfast cereals in South Africa

UNIVERSITY *of the* WESTERN CAPE

60 YEARS *of hope, action & knowledge*

10 June 2020

Mrs AS Khan
Dietetics and Nutrition
Faculty of Community and Health Sciences

Ethics Reference Number:	HS20/4/3
Project Title:	An observational study of child-directed marketing on packaged breakfast cereals and non-alcoholic beverages.
Approval Period:	22 May 2020 – 22 May 2023

I hereby certify that the Humanities and Social Science Research Ethics Committee of the University of the Western Cape approved the methodology and ethics of the above mentioned research project.

Any amendments, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.

Please remember to submit a progress report by 30 November each year for the duration of the project.

The permission to conduct the study must be submitted to HSSREC for record keeping purposes.

The Committee must be informed of any serious adverse event and/or termination of the study.

Ms Patricia Josias
Research Ethics Committee Officer
University of the Western Cape

Director: Research Development
University of the Western Cape
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NHREC Registration Number: HSSREC-130416-049

FROM HOPE TO ACTION THROUGH KNOWLEDGE.

ADDENDUM F

Broad CDM strategies, categories and subcategories aligned with type of CDM for pre-packaged breakfast cereals in SA

Marketing strategy	Category	Sub-category type	Type of CDM
Illustration	Illustrations	Product illustration	Indirect
		Ingredient illustration	Indirect
		Fruit illustration	Indirect
		Vegetable illustration	Indirect
		Object illustration	Direct
		Animal illustration	Direct
		Imaginary creature illustration	Direct
Characters	Characters	Personified object	Direct
		Personified animal	Direct
		personified imaginary creature	Direct
Role models	Youth references	Youth character	Direct
		Licensed youth character	Direct
		Youth known celebrity	Direct
		Youth sport celebrity	Direct
		Youth fantasy character	Direct
		Youth text	Direct
	Non-youth reference	Non-youth character	Direct
		Non-youth licensed character	Direct
		Non-youth known celebrity	Direct
		Non-youth sport celebrity	Direct
		Non-youth fantasy character	Direct
Fantasy	Fantasy	Image of fantasy	Direct
		Text about fantasy	Direct
Different appeals	School	Image reference about school	Direct
		Text reference about school	Direct
	Toy	Image reference to toy	Direct
		Text reference to school	Direct
	Family	Image about family situations	Direct

		Text about family situations	Direct
	Sport	Image reference to sports	Direct
		Text reference to sports	Direct
		Seasonal sport reference to rugby world cup	Direct
		Seasonal sport reference to soccer world cup	Direct
		Seasonal sport reference to cricket world cup	Direct
		Seasonal sport reference to Indian premier league	Direct
		Seasonal sport reference to Olympics	Direct
		Seasonal sport reference to any other sport	Direct
		Other specified seasonal sport reference	Direct
		Text reference to seasonal sport reference (rugby world cup)	Direct
		Text reference to seasonal sport reference (soccer world cup)	Direct
		Text reference to seasonal sport reference (cricket world cup)	Direct
		Text reference to seasonal sport reference (Indian premier league)	Direct
		Text reference to seasonal sport reference (Olympics)	Direct
		Text reference to seasonal sport reference (Other)	Direct
		Specified text reference to seasonal sport reference (Other)	Direct
	Cross promotion	Cross promotional image of Christmas	Direct
		Cross promotional image of Easter	Direct
		Cross promotional image of Eid	Direct
		Cross promotional image of Halloween	Direct
		Cross promotional image (Other)	Direct
		Specified cross promotional image (Other)	Direct
		Cross promotional text of Christmas	Direct
		Cross promotional text of Easter	Direct
		Cross promotional text of Eid	Direct
		Cross promotional text of Halloween	Direct
		Cross promotional text (Other)	Direct
		Specified cross promotional text (Other)	Direct
	Social Media	Social media reference	Direct
	Gift	Gift in package	Direct

		Collectable gift in package	Direct
		Contest in package	Direct
		Game in package	Direct
Product & Consumption appeals	Unconventional	Unconventional consumption image	Direct
		Unconventional consumption text	Direct
		Unconventional shape	Direct
	Consumption appeal	Emotional/ pleasant appeal image	Direct
		Emotional/ pleasant appeal text	Direct
		Consumption suggestion	Direct
		Over consumption suggestion	Direct
	Product	Product taste or texture	Direct
		Traditional product	Indirect
		Improved product	Indirect
		Affordability of product	Indirect
		Product comparison to competitor	Indirect
		Product money back guarantee	Indirect
		Cross promotion of products	Indirect
Claims	Nutrient claims	Eliminated/ reduced sugar	Indirect
		Eliminated/ reduced sodium	Indirect
		Eliminated/ reduced salt	Indirect
		Eliminated/ reduced saturated fat	Indirect
		Eliminated/ reduced trans fat	Indirect
		Eliminated/ reduced total fat	Indirect
		Eliminated/ reduced cholesterol	Indirect
		Eliminated/ reduced nutrient (other)	Indirect
		Specified eliminated/ reduced nutrient (other)	Indirect
		Added fibre	Indirect
		Added vitamin C	Indirect
		Added vitamins other than vitamin C	Indirect
		Added minerals	Indirect
		Added protein	Indirect

		Added Omega/DHA/ EPA	Indirect
		Added Energy	Indirect
		Other added nutrients	Indirect
		Other added nutrients specified	Indirect
		Additional information about added nutrient or ingredient	Indirect
		A good source of nutrients	Indirect
	Health claims	Health benefits or reduction of risk	Indirect
		Health seal (Heart Foundation)	Indirect
		Health seal (CANSA)	Indirect
		Health seal (Diabetes Association)	Indirect
		Health seal (recommended by doctors or dietitians)	Indirect
		Health seal (Weigh-less)	Indirect
		Health seal (Glycaemic index)	Indirect
		Health seal (Other)	Indirect
		Nature image	Indirect
		Text reference to fresh or natural	Indirect
		Reference to sweeteners	Indirect
		Portion consumption recommendation	Indirect
		Healthy habits recommendation	Indirect
		Health purity (Organic)	Indirect
		Health purity (Non-GMO)	Indirect
		Health purity (Lactose-free)	Indirect
		Health purity (Gluten-free)	Indirect
		Health purity (No colourants)	Indirect
		Health purity (No preservatives)	Indirect
		Heath purity (Others)	Indirect
		Other specified health purity	Indirect

ADDENDUM G

Codebook definitions for child-directed marketing on pre-packaged breakfast cereals in South Africa

Word/ phrase	Definitions
Added in/ high in	Any nutrient stated on the package with the following prefixes: added, high in, now with, or specifically stated on the packaging as vitamins, amino acids, minerals and so forth. This excludes nutrients with the prefix "a source of" or "a good source of".
Affordability	Any aspect pertaining to value for money that can include a bigger back for a lesser price or three-for-two deals. This excludes money back guarantees.
Animal	A realistic or drawn image of an actual and existing animal. Excludes images of made-up animals as these will be considered imaginary creatures.
Celebrity	Any famous person who is not a sporting figure and includes TV personalities, musicians and actors.
Child-directed marketing	The use of diverse marketing techniques and advertising activities to draw the attention of children to marketed products
Drawn image	A non-photorealistic depiction of a character, animal, object, product or product ingredient including cartoon images.
Fantastic character	Any character that is flying, being a hero, villain, having superpowers, being in space or doing magical things and includes superheroes.
Fantasy	Anything that gives out of the ordinary fantastical effects like cereal grains flying or a character swirling in the milk. A rainbow around the package or any attempt to create wonder and amazement.
Fruit illustration	A realistic or drawn image of fruits on their own or within a nature image/ setting.
Imaginary creature	Non-realistic, imaginary and non-earthly characters including monsters, ghosts and aliens.
Ingredients	Any component (raw ingredient or flavouring) of the final product. This can include a maize cob on a corn flakes box or even a banana in a banana flavoured cereal.
Licensed character	Any character licensed to the brand and includes superheroes. These characters are not owned by the brand of the pre-packaged product.
Missing photos	A photo of a FOP, back of pack or either of the sides is considered missing if there isn't at least one photo of that side, regardless of it being a full or partial photo of the said side.
Nature images	A depiction of nature including wheat stalks, leaves, flowers, buds and landscapes
Non-sporting events	Any event including religious, cultural, social or professional that excludes sports.
Non-youth	Any person or superhero who is an adult, older teenager or ambiguous as being a child or teenager.

Object	Anything from house to a table (any non-living item) depicted on the package. Technically, a bowl is an object and with other food categories it may be considered an object. For breakfast cereals almost all of them have a bowl with product on the front of package (FOP) and will not be included in this definition.
Organised competitive sport	Any inference to characters engaging in commonly known sports such as soccer, rugby, badminton, basketball to name a few. Depiction of friends engaged in such sports. Exclude inference to sporting events such as Rugby World Cup, these are seasonal sporting events.
Personified	The depiction of a non-human character or product ingredient as having human-like features or abilities. Examples are animals having teeth or fingers as humans do.
Photo-realistic	A realistic depiction of a character, animal, object, product or product ingredient as seen on a photograph.
Portion consumption recommendation	Any suggestion of portion size other than what is stated on the GDA or nutrition facts panel. A depiction of a bowl of cereal on the FOP is to be included as portion consumption recommendation.
Product	The actual product inside the package depicted on the box – the cereal itself usually in a bowl or as a shake in a glass (or both). A bowl/ glass/ jug or such items containing milk or anything other than the product being sold/ advertised is then an object.
Purity	Any aspect pertaining to the untainted nature of the pre-packaged product. Includes suggestions such as: no colourants, no preservatives, organic, lactose-free, non-GMO, no artificial colourings, wheat-free, multigrain, wholegrain, vegan or vegetarian.
Seal	An endorsement by a health, medical, academic or any institution regarding the qualities of the pre-packaged product.
Sport celebrity	A sporting figure who is famously known.
Registered trademark character	Any character that is associated only with the specific brand of product. This character is owned by the brand of the pre-packaged product.
Unconventional	A product shape or taste characteristics that is out of the ordinary or norm. This includes products shaped as scoops but excludes products shaped as balls or hoops.
Vegetable illustration	A realistic or drawn image of vegetables on their own or within a nature image/ setting. Exclude grains and grain plants.
Youth	Any person or superhero clearly below the age of twelve. Any youth that is ambiguous (unsure whether youth or not) should be coded as an non-youth.