

Is Junk Food Promoted Through Sport?

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Abstract

Energy-dense diets are associated with obesity, a major public health problem. High participation rates in sport suggest sports settings may be an ideal environment to influence food choices and promote healthy eating. Yet little is known about the marketing and availability of food and beverages in this setting. This thesis analysed the food and nutrition environment in New Zealand sport to determine whether energy-dense, nutrient-poor food and beverages ('junk food') are marketed and available in this context.

This case study was undertaken in two phases using a mixed methods approach. Phase One included a systematic literature review, 18 interviews with key informants from national and regional sporting organisations and an analysis of 308 websites of national and regional sporting organisations. Phase Two involved a study of two exemplar sports, rugby and netball. Data were collected from direct observations of food marketing, and foods and beverages available at six regional and seven national netball and rugby venues, 25 rugby clubs and 13 netball centres in three regions. Thirty-seven interviews with rugby and netball key informants and analysis of sponsors observed during televised coverage of five national netball and rugby games were also undertaken.

The characteristics and extent of food and beverage company marketing in New Zealand sport differed between sports and within different levels of sport. National and regional levels of popular sports were more favoured by sponsors. The review of websites found that almost one-third of food and beverage companies sponsoring national and regional sporting organisations and rugby clubs were unhealthy. Observations at venues found little food and beverage company marketing at rugby clubs, netball centres or netball clubs.

All key informants identified the main benefit of sponsorship as the additional income sponsors provided. Interviews revealed that although some sports organisations felt concerned about associating themselves with unhealthy food or beverage companies others considered sponsorship income more important.

Energy-dense, nutrient-poor foods and beverages dominated the types of food and beverages available at sports games. Most venues sold more unhealthy than healthy foods and beverages. Most informants considered these were normal foods and beverages to provide in sports settings. While many informants considered healthy food important none had implemented policy in their sports organisation. Food provision was determined by caterers motivated by profit.

Sport provides food and beverage companies with an unregulated setting in which to market food and beverages. This case study found food and beverage company sponsorship is associated with high profile, televised teams which attract international audiences. The marketing campaigns supporting these sponsorships likely influence food preferences and purchases.

Food environments in sport settings provide frequent opportunities to purchase and consume energy-dense, nutrient-poor foods. Achieving sustainable healthy change in sports settings will be challenging when the prevailing attitude normalises the unhealthy environment. New Zealand is a small country with popular sports different to those in other countries. Nevertheless these findings may be relevant elsewhere. There are implications for further research to strengthen understanding of food environments in sports settings.

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Abbreviations

ANGELO	Analysis Grid for Environments Linked to Obesity
BMI	Body Mass Index
IOM	Institute of Medicine
IOTF	International Obesity Task Force
NSOs	National Sports Organisations
NSO/RSOs	National and Regional Sports Organisations
NZF&B	New Zealand Food and Beverage Classification System
RSOs	Regional Sports Organisations
WHO	World Health Organization

Chapter One: Obesity and food environments

1.1 Introduction

This thesis explores the food and nutrition environment in sports settings and assesses to what extent and how energy-dense, nutrient-poor food and beverages (commonly referred to as junk food), are promoted through sport.

Energy dense diets are associated with obesity, a major public health issue affecting industrialised and developing countries (Hawkes et al., 2009; Finucane et al., 2011). Solutions to the seemingly simple problem of excess energy consumption are elusive. Globally, obesity is projected to affect over 570 million people by 2030 (Kelly et al., 2008). Evidence suggests people understand the causes of obesity but their food choices are influenced by structural factors in the food environment (Caraher and Coveney, 2004), such that they struggle to maintain a healthy weight. This thesis adopts an ecological view which reflects this perspective and considers that obesity results from the interaction between individuals and their environment with social, political and economic determinants of health all influencing the food choices of individuals and populations (Green et al., 2000).

One possible setting where environmental influences on diet could occur is sports environments. However, even though sports settings are important locations for marketing products, including food, and despite the global popularity of sporting codes and events, we know surprisingly little about the food environments in sports settings (Carter et al., 2011). Popular sports are often an important component of socio-cultural life. Many countries have high levels of participation in sport and international sporting events such as the Olympic Games and the FIFA World Cup attract global interest (Humphreys and Maresova, 2012). Even a single sporting event can attract wide interest.

For example, the American National Football League final (Super Bowl) was broadcast to 232 countries and commentary translated into 33 languages (Choi and Yoh, 2011).

This thesis explores whether, to what extent, and how energy-dense, nutrient-poor food is promoted through sport. Promotion is defined as the marketing and availability of food and beverages. This includes sponsorship, advertising and the foods and beverages provided and/or sold in sports settings. I address this question by using a case study of New Zealand, a developed country, to analyse the food and nutrition environment (policy and practice) in sport. New Zealand has many attributes that make it an appropriate case: it is a small country and thus easy to study; it has high rates of overweight and obesity (Ministry of Health, 2012); offers an open market where international and local food and beverage manufacturers compete; and sports participation rates are very high (Sport and Recreation New Zealand, 2008; Sport New Zealand, 2012). Specific research questions addressed in this thesis are:

- What knowledge and experience do key stakeholders have of marketing and sponsorship of food and beverages in sport, and what are their attitudes towards this practice?
- What are the characteristics of foods and beverages marketed and sponsored through sport, and what is the extent of food marketing and sponsorship in sport?
- What knowledge, attitudes and experience do key stakeholders have of food and beverage availability in sport?
- What are the characteristics of foods and beverages available at sporting events and to what extent are these available?

- What policies govern the marketing and availability of foods and beverages in selected sporting codes?

This chapter first defines obesity and outlines obesity prevalence before discussing the role of energy-dense, nutrient-poor foods and the impact of food environments on eating patterns and obesity. A summary of research in food environments, including New Zealand food environments, follows. As health promotion initiatives may effectively address public health issues, the chapter also contains an overview of health promotion theory and practice. This chapter concludes by outlining the thesis structure.

1.2 Definitions and health impact

The World Health Organization (WHO) defines obesity as *a condition of abnormal or excess fat accumulation in adipose tissue to the extent that health may be impaired* (World Health Organization, 2000, pp.2). Obesity is associated with debilitating and life threatening conditions and is caused by an energy imbalance resulting from excess intake of calories over those expended (Ministry of Health, 2004; World Health Organization, 2000).

Obesity imposes huge financial burdens on health care systems and communities. In 2008, the United States estimated \$147 billion could be attributed to overall medical spending on adult obesity (Whitehouse Task Force on Childhood Obesity, 2010). Indirect health care costs are thought to be greater than direct costs and include workdays lost, disability allowances and morbidity (World Health Organization, 2003a). In 2004, the direct health care costs of obesity in New Zealand were estimated at approximately \$460 million (Ministry of Health and Clinical Trials Research Unit, 2009).

Obesity is the second leading cause of preventable disease and death in many countries (Swinburn et al., 2011). For example, in the United States, there are

112, 000 preventable deaths as a result of obesity. Only smoking causes more preventable deaths than obesity (U.S. Department of Health and Human Services, 2010; Wang and Lobstein, 2006). The most recent New Zealand estimates suggest that overweight and obesity account for about 3200 deaths per annum (Ministry of Health, 2003).

As well as being a disease in its own right, obesity is one of the most important modifiable risk factors for many chronic diseases including diabetes, ischemic heart disease, ischemic stroke and several cancers (Ministry of Health and Clinical Trials Research Unit, 2008). The risks of diabetes, hypertension and cardiovascular disease rise continuously with increasing weight; furthermore as body mass index (BMI) increases so too does the proportion of people with one or more morbid conditions (World Health Organization, 2003a). Mortality rates increase with increasing weight and are greatly increased at a BMI over 30 (Swinburn et al., 2004).

Body Mass Index is a powerful predictor for the risk of type 2 diabetes. A BMI of 25 increases the risk of type 2 diabetes significantly compared to a BMI of less than 22 with an enormous increase in risk for a BMI over 30 (Swinburn et al., 2004). The prevalence of type 2 diabetes has increased most dramatically in societies experiencing the greatest increases in rates of overweight and obesity (World Health Organization, 2003a). Obesity is also associated with kidney disease, pulmonary embolism, fatty liver disease, musculoskeletal disorders, gout, gallstones, sleep apnoea, complications in pregnancy, complications in surgery and psychological and social problems (World Health Organization, 2003a; Swinburn et al., 2004).

1.3 Classification of obesity

Body Mass Index (BMI) provides an indirect measure of body fatness and is commonly used to classify people according to their body size. It is calculated

by dividing an individual's weight in kilograms by the square of their height in meters (kg/m^2) (Ministry of Health, 2008). BMI classifications are arbitrary in the sense that they do not measure body fatness; however, they highlight people or populations at increased risk of the health conditions associated with increasing BMI. The relationship between BMI and health outcomes is continuous and in all population groups the risk of disease increases with an increasing BMI (World Health Organization, 1995; Ministry of Health, 2008).

BMI fails to differentiate between lean and fat body mass and therefore does not account for wide variations in populations. This has led to international debate about the suitability of BMI classifications for some populations. Adults and children in some populations have a BMI in the overweight and obese range without carrying excess body fat. For example, Māori and Pacific people have a lower level of body fat than Europeans and higher BMI cut-offs have been proposed to account for this difference (Ministry of Health, 2004). Nevertheless, the WHO Expert Committee on physical status recommends retaining existing BMI cut-off points for classifying adults regardless of ethnicity because in all population groups the health risks associated with increasing BMI begin at a BMI below 25 (Ministry of Health, 2008). Individuals with a BMI of 30 have a 50 – 100 percent increased risk of premature death due to all causes compared with those who have a BMI of 20 – 25 (National Health and Medical Research Council, 2003).

The WHO recommends the medium BMI for the adult population to achieve optimum health should be the range of 21 – 23 kg/m^2 (World Health Organization, 2003a). Classifications for BMI are shown in Table 1.

Table 1: BMI cut-off points for adults aged 18 years and over

Classification	BMI Score (kg/m ²)	Risk of Health Conditions
Underweight	< 18.50	Low risk
Normal Range	18.50 – 24.99	Average risk
Overweight	25.00 – 29.99	Increased risk
Obese	≥ 30.00	Substantially increased risk
Obese (class i)	30.00 – 34.99	Moderate risk
Obese (class ii)	35.00 – 34.99	Severe risk
Obese (class iii)	≥ 40.00	Very severe risk

Source: Ministry of Health 2008

While not a perfect indicator of an individual's obesity BMI is a valuable public health tool as the graded classifications provided enables comparisons within and between populations. These comparisons help identify groups at increased risk of morbidity and mortality and thus assist in developing priorities for community interventions and evaluations (World Health Organization, 2000).

Obesity in childhood is of special importance due to its long-term effects on health and psychosocial development. Childhood obesity increases the risk of chronic disease such as type 2 diabetes and heart disease (Ebbeling et al., 2002) as obese children are more likely to be obese adults (Wang and Lobstein, 2006; U.S. Department of Health and Human Services, 2010).

There are no widely agreed classifications of obesity in children and therefore it is difficult to make international comparisons of obesity prevalence.

Classification of children's weight status is difficult because their height and body composition changes with growth and these changes vary in different populations (World Health Organization, 2000). Nevertheless, the data suggests the prevalence of childhood obesity is increasing in all industrialised countries and in several lower income countries (Wang and Lobstein, 2006).

BMI for age reference charts and BMI for age percentiles vary with age and gender. Data for developing BMI reference charts are usually derived from a single reference population thus the classification of any individual assumes that an individual is comparable to the reference population. Several countries developed their own BMI reference charts for children using local data e.g. the United Kingdom and France (Lobstein et al., 2004). The United States BMI reference values for children are derived from United States survey data and have been recommended by a WHO expert committee (World Health Organization, 1995). It is unclear at which BMI level adverse health risk factors increase in children and it is thought that adult cut-offs may not be universally applicable to children (Lobstein et al., 2004). Because of changes in children as a result of growth and development, the WHO recommends a high BMI is used to classify obesity. Children with a high BMI are likely to have high levels of body fat and so those with a BMI $\geq 95^{\text{th}}$ percentile are classified as obese (U.S. Department of Health and Human Services, 2010).

Despite measurement difficulties, most countries where data are available, show childhood obesity is increasing. In the United States, one in every three children aged two to 19 years is obese (Ogden et al., 2010). Data from Europe suggests childhood obesity has increased steadily over the last 20 to 30 years with the highest prevalence observed in southern Europe. The prevalence of overweight and obesity in Australian children doubled between 1985 and 1995 (Lobstein et al., 2004), with the 2007/08 National Health survey estimating that

25 percent of Australian children and adolescents are overweight or obese (Australian Government Department of Health and Ageing, 2010).

The New Zealand Health Survey uses the International Obesity Taskforce (IOTF) BMI reference values to classify New Zealand children as overweight and obese. A child with a BMI of 25 is classified as overweight, and a BMI of 30 is classified obese. IOTF reference values were developed using data from nationally representative cross sectional surveys in Hong Kong, Great Britain, Singapore, Netherlands, and the United States to establish BMI cut-off points linking to the adult cut-off points of 25 – 30. Many experts consider these are less arbitrary and more international than the WHO cut-off points as the reference population included different countries with different rates of obesity prevalence (Cole et al., 2000).

1.4 Prevalence of obesity

The prevalence of obesity is rapidly increasing in both developed and developing countries. Age standardised mean global BMI increased by 0.4-0.5 kg/m² per decade in both men and women between 1980 and 2008 (Finucane et al., 2011). Projections suggest that by 2030 approximately 1.3 billion adults will be overweight and more than 570 million will be clinically obese worldwide (Kelly et al., 2008). In the United States, obesity prevalence doubled between 1980 and 2004 and it is estimated that 33 percent of United States adults are overweight and 34 percent are obese (Khan et al., 2009). Between 1980 and 1995, the United Kingdom experienced a nine percent increase in obesity prevalence (Swinburn et al., 2004). An analysis of BMI trends in 199 countries from 1980-2008 indicates age standardised BMI in men is highest in Australasia (27.6) and North America (28.4) (Finucane et al., 2011). New Zealand women are second only to the United States for the highest mean BMI in high income countries (Finucane et al., 2011). Obesity is now prevalent in countries where

previously it was rare. For example, in China, the prevalence of obesity among pre-school children living in urban areas rose from two percent in 1989 to 13 percent in 1997 (U.S. Department of Health and Human Services, 2010).

Obesity is widespread in New Zealand. As in all developed countries, the proportion of overweight or obese adult New Zealanders increased rapidly during the past three decades, from approximately 10 percent of adults in 1989 to 28 percent in 2011/12 (Ministry of Health, 2012). The 2011/12 New Zealand Health Survey found 35 percent of adults are overweight and 28 percent obese (Ministry of Health, 2012). Pacific adults are more likely to be obese than adults in the total population with 62 percent obese while obesity prevalence among Māori adults increased from 42 percent in 2006/07 to 44 percent (Ministry of Health, 2012). When comparing obesity prevalence by gender, European (26%) and Māori women (45%) have similar obesity prevalence to European (26%) and Māori men (44%). Pacific women (64%) are more obese than Pacific men (59%). Māori and Pacific peoples have higher rates of the chronic diseases associated with obesity (e.g. cardiovascular disease and diabetes) than European New Zealanders (Ministry of Health, 2012).

Obesity prevalence in New Zealand children continues to increase with recent data indicating one child in ten is obese (10%) (Ministry of Health, 2012b). In 2006/07 one child in eight was obese (Ministry of Health, Clinical Trials Research Unit, 2008). The burden of obesity is higher for Māori children; the most recent data indicate 17 percent of Māori children are now obese with prevalence higher among boys (19%) than girls (14%) (Ministry of Health, 2012b). By contrast, in 2006/07, 12 percent of Māori children were obese (Ministry of Health and Clinical Trials Research Unit, 2008). While obesity prevalence for Pacific children remains stable at 23 percent for both boys and girls, Pacific children are three times more likely to be obese than New Zealand European children (Ministry of Health, 2012b).

Obesity is a global health issue, with prevalence increasing rapidly in both developed and developing countries (Finucane et al., 2011). Like other countries, obesity rates continue to rise in New Zealand. As obesity prevalence rises, so too do rates of chronic disease, increasing the burden on health care systems and communities. This section has discussed the prevalence of obesity. The next section describes the role environments and energy-dense foods play in the obesity epidemic.

1.5 The role of energy-dense, nutrient-poor food and beverages

Energy-density refers to the energy content of food and beverages and is usually expressed per unit weight as kilojoules/gram (kJ/g). Fat provides 37.7kJ/g of energy compared with the 16.7kJ/g of energy provided by carbohydrates and protein (National Health and Medical Research Council, 2005). Energy intake exceeding energy expenditure results in a positive energy balance. Over time individuals with even a small positive energy balance will become overweight or obese. Once an individual becomes obese, it is difficult to achieve a healthy body weight as many inter-related factors interact to maintain a positive energy balance (World Health Organization, 2000).

There is convincing evidence that a high intake of energy-dense foods promotes weight gain (World Health Organization, 2003a). Laboratory experiments in animals and clinical studies in humans show that dietary factors, particularly the level of fat, energy intake and palatability, are strongly and positively associated with excess body weight (National Health and Medical Research Council, 2003). Foods with a high fat and sugar content are very palatable providing “more sensory enjoyment and more pleasure” (Drewnowski and Specter, 2004 pp. 8) than other foods. Studies suggest these foods are less satiating than less energy dense foods leading individuals to eat

more of them thus increasing their energy intake and promoting weight gain (Drewnowski and Specter, 2004).

The links between a high intake of refined carbohydrates and obesity are unclear. Foods containing a high proportion of refined carbohydrates (or sugars) are very energy-dense (Lobstein et al., 2004). It has been suggested that excess consumption of refined carbohydrates contributes to obesity; however, the evidence has varied (Swinburn et al., 2004). A systematic review found while some studies suggest a diet high in refined carbohydrate contributes to weight gain, others show little impact on weight gain (National Health and Medical Research Council, 2011). This review noted that the studies used different methodologies and many were influenced by confounding. It was therefore difficult to determine the link between refined carbohydrates and obesity (National Health and Medical Research Council, 2011). Despite the different research findings, the evidence that consumption of excess calories from fats and refined carbohydrates in energy-dense food is associated with obesity is clear (U.S. Department of Health and Human Services, 2010).

Energy in the form of sugar consumed as drinks should be considered separately as sweetened beverages are very energy-dense and, unlike other forms of carbohydrate, these have low satiety. As a result individuals may consume large quantities of energy-dense beverages without feeling replete (Lobstein et al., 2004; Malik et al., 2010). Volumes of sweetened beverages consumed are growing and in the United States these are one of the largest single sources of sugar intake among young people (Lobstein et al., 2004).

Within New Zealand, beverages are the main source of sucrose for children, almost half of whom regularly drink soft drinks, powdered fruit cordials and fruit juice (Ministry of Health, 2003b). Studies show associations between sugar-sweetened beverage consumption and increased energy intake (Malik et

al., 2006; Vartanian et al., 2007). However, variability in the research methods and differing obesity definitions complicate the comparison of results across studies (Malik et al., 2006; Vartanian et al., 2007).

1.6 Changing patterns in food consumption

Experts agree that genetic or demographic changes fail to explain the rapid global increase in obesity. Food environments rather than biology are thought to be driving this epidemic. Individuals struggle to manage their weight in an environment that supports consumption of energy-dense, micronutrient-poor diets and discourages energy expenditure (Swinburn et al., 2011; World Health Organization, 2000; Hill et al., 2003; Ministry of Health, 2004; Lobstein et al., 2004; Khan and Sobush, 2009; U.S. Department of Health and Human Services, 2010; Wilding, 2012).

Swinburn et al., (1999) call the environment obesogenic, “the sum of influences that the surroundings, opportunities or conditions of life have on promoting obesity in individuals or populations” (Swinburn et al., 1999. pp. 564). Individuals are exposed to frequent opportunities to eat palatable energy-dense food, which makes it difficult for them to act on weight loss intentions (Brug et al., 2006). Advice to simply eat less and be more active ignores the complex influence of environments on individuals’ access to food, and is unlikely to be effective or sustainable (Sacks et al., 2008). There is widespread agreement that stemming the obesity epidemic requires major changes to the current obesogenic environment (Glanz et al., 2005; Swinburn et al., 2011).

Interventions targeting the environment may be more effective and more sustainable than individually targeted interventions because environmental interventions can become incorporated into organisations, systems, policies and socio-cultural norms. They create conditions supporting healthy choices because they influence the context in which people live and work (Bauer et al.,

2004). Many authors and agencies, including the International Obesity Taskforce and the World Health Organization (WHO), consider environmental and policy interventions are the most promising strategies for creating population-wide improvements in eating (Kumanyika et al., 2002; World Health Organization, 2004; Glanz et al., 2005; Swinburn et al., 2011). Further, environmental approaches may also be more equitable as they can reach multiple sectors of the community, including socio-economically disadvantaged populations where obesity levels remain disproportionately high (Sacks et al., 2008).

Studies of global food consumption trends suggest that, regardless of location, rising incomes in low-to-middle income countries result in food consumption patterns that are converging with those of high-income countries (Fabiosa, 2011). Swinburn et al., (2011) suggests these changes result from governments' attempts to achieve economic prosperity. Less regulated global food markets, allow the food industry to increase production and supply of cheaper energy-dense foods which inevitably drives overconsumption leading to obesity (Swinburn et al., 2011).

Also termed the nutrition transition, these changing patterns see population eating patterns shift from diets based on locally (or nationally) grown staple grains, such as wheat or rice to higher-fat, salt and sugar diets containing more meat, dairy products and processed convenience foods (Caraher et al., 2005; Fabiosa, 2011). For example, Southern European countries, which traditionally consumed healthier low-fat diets now have higher animal fat intakes and consume less fruits and vegetables as a result of converging food patterns in Europe (Elinder and Jansson, 2008). In China and India, household consumption of rice and wheat has decreased while consumption of dairy products and soft drinks has increased (Fabiosa, 2011). In New Zealand, households spend proportionally less on fresh foods and more on non-

alcoholic beverages, takeaway foods and eating out than they did in 1980. Between 1980 and 2008 spending on fruit and vegetables, meat, poultry and fish fell from 37 percent to 30 percent of total household spending on food. In comparison, spending on non-alcoholic beverages increased from seven percent in 1980 to 10 percent in 2008 (Statistics New Zealand, 2010).

The availability of fat in the food supply has increased globally. Fat consumption at lower levels of per capita income has increased due to the availability of relatively cheap vegetable oils (Jensen, 2011). The total amount of fat in the United States food supply increased by 57 grams per capita between 1909 and 2004, a 23 percent increase. At the same time, sources of fat have changed with decreasing consumption in fat sourced from meat, poultry and fish and increasing consumption of oils (Jensen, 2011).

Increased consumption of fats and oils has occurred concurrently with increased consumption of sugar, caloric sweeteners and high fructose corn syrup used in soft drinks and other beverages (Drewnowski, 2004). Since 1970, the level of carbohydrate consumed in the United States has increased by 100 grams per capita per day, with sugars and sweeteners contributing 37 percent of this change (Jensen, 2011). Market research data indicates soft drink consumption in the 1990s increased faster than consumption of any other food group; these changes occurred alongside increased availability of vending machines and a decline in milk consumption (French et al., 2001). In Australia, soft drink, cordial and syrup manufacturing grew by 15 percent from 2002 to 2007, growing more than any other category of food products manufactured in Australia (Australian Food and Grocery Council, 2009).

Eating foods away from home (defined as any food not prepared in a consumer's kitchen (Stewart, 2011) is a rapidly growing trend. Estimates suggest United States families increased their spending on foods eaten away

from home by 25 percent since the 1970s. Similar patterns in spending have been observed elsewhere with rapid growth in food service in middle income countries such as China, the Czech Republic and Indonesia (Fabiosa, 2011; Stewart, 2011). Ready-to-eat foods and meals eaten outside the home account for almost 25 percent of total New Zealand food expenditure (New Zealand Trade and Enterprise, 2010), with cafes and restaurants accounting for around 14 percent and takeaway outlets about nine percent of New Zealand food sales (New Zealand Trade and Enterprise, 2008).

Accompanying the demand for foods eaten away from home is the growth of quick-service chain restaurants or fast food outlets (Stewart, 2011). Foods purchased from fast food outlets are up to 65 percent more energy-dense than those prepared at home and intakes of selected nutrients including fibre, iron, calcium, folate and vitamin C are lower in population groups consuming more takeaway foods (Burns et al., 2002; Cummins and Macintyre, 2006). Consumers of these foods tend to be heavier than infrequent consumers, even after controlling for demographic variables including income (Cummins and Macintyre, 2006).

Few studies investigate associations between area deprivation, density of fast food outlets and obesity prevalence. Cummins and Macintyre (2006) found poorer neighbourhoods in Melbourne, Australia had 2.5 times more fast food outlets than wealthier neighbourhoods, and evidence from New Orleans showed higher density of fast food outlets in predominantly African American neighbourhoods. However, other studies reported no relationship between obesity and proximity to takeaway outlets for adults in Victoria, Australia or for children in Cincinnati (Cummins and Macintyre, 2006). A New Zealand study found access to both multi-national and locally operated fast-food outlets was better in more deprived neighbourhoods and around more socio-economically disadvantaged schools (Pearce et al., 2007). This study also found

access to other types of food outlets, including supermarkets was also better in poorer neighbourhoods (Pearce et al., 2007).

Guthman, (2011) posits that arguments explaining obesity through proximity to fast food outlets are flawed. In her view, they ignore how people navigate their environments and *“implicitly assumes that the environment simply acts on people, so that people are objects, not agents in these environments”* (Guthman, 2011 p.68). Measuring the relationship between the built environment and obesity prevalence leads to supply oriented interventions and the simplistic conclusion that increasing proximity to grocery stores will reduce levels of obesity. (Guthman, 2011).

Cost is the second most important factor in food decisions behind taste (Story et al., 2002; Glanz et al., 2005). Studies have found an inverse relationship between energy density (MJ/kg) and energy cost (\$/MJ) such that energy-dense foods are the cheapest options for consumers in the United States. Using linear programming models, Drewnowski and Specter, (2004) found an increase in the costs of food leads to the purchase of high-fat, energy-dense diets. T (Drewnowski and Specter, 2004).

In the United States and other developed countries, income is not associated with the total quantity of food consumed but is associated with the types of food consumed (French et al., 2001). For example, an intervention study involving 12 worksites found reducing the price of low fat snacks increased the sales of these products and the percentage by which the price decreased influenced the percentage by which sales increased (French et al., 2001). Story et al., (2002) reported that three studies in schools found large effects on the sale of healthier choices in both school canteens and vending machines following price reductions (Story et al., 2002). Price discounts had a significant effect on healthy food purchases in a randomised controlled study involving

1104 New Zealanders. Study participants receiving price discounts purchased 0.79kg/wk more healthy products than participants assigned to the control group. This effect was sustained after price discounts were discontinued (Ni Mhurchu et al., 2010). The difference reported is important as it may actually underestimate the effect of price discounts because participants also purchased foods from stores other than the supermarkets offering discounts, and the study used a relatively small database to identify healthy foods. A larger database and inclusion of more stores may have identified more change resulting from price discounts (Ni Mhurchu et al., 2010). Discounting foods is a marketing technique regularly used by food stores and it seems logical that applying this approach to healthy food purchases changes behaviour.

The global food environment is changing rapidly and is associated with structural changes to the food supply resulting from industrialisation and mechanisation (Fabiosa, 2011). The increased availability and overconsumption of energy-dense, nutrient-poor foods, changes in eating behaviour, price, increased portion sizes and extensive advertising, promotion and marketing of food (to be discussed in chapter two) all arguably play a role in the obesity epidemic (French et al., 2001; Hill et al., 2003; World Health Organization, 2009; Swinburn et al., 2011). The next section discusses the ANGELO framework (Swinburn et al., 1999), a model for analysing food environments.

1.7 The ANGELO framework

The ANGELO (analysis grid for environments linked to obesity) framework is an ecological model developed to conceptualise obesogenic environments and capture environmental, biological and behavioural influences on obesity (Swinburn et al., 1999). An ecological view of health emphasises the interaction of individuals with the environment and identifies environmental attributes that influence health behaviours (Giskes et al., 2007). Conceptual models are

useful in understanding and explaining the dynamics of health behaviours, and how these are shaped by external influences (Story et al., 2002; Van der Horst et al., 2007).

The ANGELO framework is a grid that identifies and prioritises environmental elements for research and intervention. On one axis ANGELO categorises two sizes of environment (macro or micro). Macro-environments are large, complex structures operating at national and international levels and encompass infrastructure such as national policies, national and international food manufacturing, distribution and marketing. These environments profoundly influence micro-environments and, due to their complexity, are usually beyond the control of individuals (Swinburn et al., 1999). In contrast, ANGELO defines micro-environments as geographically distinct settings where people gather, such as sports clubs, stadia or schools. Micro-environments may be influenced by individuals (Swinburn et al., 1999).

The other axis of the ANGELO framework categorises four types of environment: physical; economic; political; and socio-cultural. The physical environment refers to “what is available in a setting” (Swinburn et al., 1999 pp. 566) including food and beverages, marketing and advertising. The political environment denotes “the rules related to food” (Swinburn et al., 1999 pp. 566) including formal and informal policies or rules. The economic environment “refers to the costs related to food” (Swinburn et al., 1999 pp. 566) such as income generated from food sales and sponsorship agreements. The socio-cultural environment “refers to a community’s or society’s attitudes, beliefs and values relating to food” (Swinburn et al., 1999 pp. 566).

The ANGELO framework is useful for analysing food environments but it provides no theory explaining how the different elements influence an individual’s food choices, what processes are involved or how external

influences impact on these behaviours. Nevertheless, as described below (section 1.8.1) it has been used successfully in studies of the food environment.

1.8 Research on food environments

Food environments are difficult to study and determining the precise role individual factors play in influencing eating patterns remains challenging (Hill et al., 2003). Researchers must explore patterns of correlation across studies to identify associations influencing food choice (Hoek, 2007). For example, it is only comparatively recently that the WHO recognised the many studies linking food advertising and obesity and categorised the marketing of energy-dense foods and fast food outlets as a probable cause of obesity (World Health Organization, 2003a).

1.8.1 Reviews of studies using the ANGELO framework

Reviews analysing the research of food environments have used the ANGELO framework to classify studies by the type of environment they explore (e.g. macro or micro, physical economic, political, or socio-cultural) and identify associations that influence food choices and /or obesity. Table 2 summarises these methods and the studies included in reviews using the ANGELO framework. Two studies were systematic literature reviews (Van der Horst et al., 2007; Giskes et al., 2007). Brug et al., (2006) analysed the results of six previous systematic reviews and Kirk et al., (2009) used a scoping review methodology to assess studies not included in previous systematic reviews. Scoping reviews use broad research questions to understand the range and breadth of the literature and identify research gaps. They do not always assess included studies for quality. As a result, data synthesis and interpretation can be limited (Armstrong et al., 2011; Levac et al., 2010).

Table 2: Reviews of the food environment using the ANGELO framework

Authors	Methods	Studies Included n=	Studies excluded n=
Brug et al., (2006)	Analysed results from 6 previous systematic reviews	409	
Van der Horst et al., (2007)	Systematic review	58	28
Giskes et al., (2007)	Systematic review	21	46
Kirk et al., (2009)	Scoping review including studies not included in previous reviews	146	

The findings differed between the reviews. Three reviews found micro-level environmental factors (e.g. homes, schools, workplaces, supermarkets) were explored more than macro-level environmental factors (e.g. town planning, policy, healthcare systems) (Brug et al., 2006; Giskes et al., 2007; Kirk et al., 2009). Two reviews found the physical environment was studied most often (Brug et al., 2006; Kirk et al., 2009). Van der Horst et al., (2007) found socio-cultural and economic factors were studied most often and fewer studies explored physical environments such as schools and neighbourhoods (Van der Horst et al., 2007). Few studies explored aspects of the physical environment such as food marketing, density and location of quick service restaurants or the socio-cultural environment (Giskes et al., 2007). Two reviews found few studies investigated the political environment (Kirk et al., 2009; Van der Horst et al., 2007).

Brug et al., (2006) found differences between observation studies and intervention studies. Most observational studies reported no significant associations between environmental factors and energy intake or food choices. Intervention studies were associated with changes in the food choices of children and adolescents (Brug et al., 2006). Van der Horst et al., (2007) found

consistent evidence for a relationship between parental food intake (fat, energy, fruit and vegetables) parenting practices, and children's diet (Van der Horst et al., 2007). Giskes et al., (2007) identified forty-one significant associations between environments and food intake, with most focusing on fat intake (Giskes et al., 2007).

All of these reviews found significant gaps in the literature. Despite the number of studies undertaken, all these reviews reported finding few high-quality studies and noted a lack of replication work (Brug et al., 2006; Van der Horst et al., 2007; Giskes et al., 2007; Kirk et al., 2009). Many studies were poorly designed with only a few using objective observation instruments to assess factors in the physical environment (Brug et al., 2006; Giskes, et al., 2007; Van der Horst et al., 2007).

Literature reviews suggest associations between environmental factors and energy intake or obesity lack strong evidence (Brug et al., 2006; Van der Horst et al., 2007; Giskes et al., 2007; Kirk et al., 2009). Studies investigating the obesogenic environment are diverse and demonstrating patterns of correlation is difficult, which may explain why few associations between the environment and obesity have been confirmed. In the reviews undertaken, few studies posited key contributing factors such as food marketing or the location and availability of food outlets. Overall, despite the work undertaken, further research is necessary to document how food environments influence food choice and which interventions might ameliorate these effects.

1.8.2 Issues with measuring food environments

Environmental factors influencing the obesity epidemic are complex, interrelated and difficult to measure. Measurement and evaluation tools must identify the forces shaping food environments, explain how environments influence health, and highlight possible interventions that could positively

influence health (Lytle, 2009). Accurate measurement is a cornerstone of science. Improvements in knowledge depend on measures that are “reliable (consistent and repeatable), valid (measuring what it purports to measure) and are sensitive to meaningful change” (Saelens and Glanz, 2009 pp. S166). High quality measures of food environments can be used to describe different food environments and variations across these including socio-economic and ethnic disparities (Glanz, 2009). Measurements may improve our knowledge of how environments and policies shape behaviour, identify leverage points for interventions, and evaluate interventions targeting food environments (Glanz, 2009).

Although many studies investigate changes in nutrition environments, the literature provides little guidance on how best to measure these changes (Glanz et al., 2005). McKinnon et al., (2009) consider that because research on environmental factors is relatively recent, the tools currently available are first generation measures with few developed standard measures (McKinnon et al., 2009). Environmental influences are difficult to define, measure and study experimentally. Documenting influences on eating behaviours poses a greater challenge than documenting individual behaviour (French et al., 2001).

The challenges of studying environments include establishing the predictive validity of environmental measures; determining causal relationships between environmental measures and behaviour; increasing the variety, reliability, and user friendliness of measures; and using measures to advocate for environmental level interventions (Richter et al., 2000; Gregson et al., 2001).

Environmental measures are difficult to develop because neighbourhoods and organisations are complex and multidimensional with food quality, quantity and preparation all being important issues (Glanz, 2009). Lytle (2009) argues that documenting the obesogenicity of an environment requires data on

specific attributes of, and then examined against causal models (Lytle, 2009). Lytle (2009) stressed that testing the obesogenicity of one environment over another required detailed information that was complicated by the interactions of individuals with the environment under observation (Lytle, 2009). This challenge is difficult to address and researchers may instead need to collect data on multiple variables, consider interactions and analyse the associated patterns, and then compare results across similar locations or settings.

Food environments differ between settings. To date, most studies have focussed on urban food environments. Based on their experiences assessing food environments in low-income rural communities, Gittlesohn and Sharma (2009) recommend that systematic assessment of the food environment should be based on prior formative research in each setting to determine relevant aspects of physical and social environments. Gittlesohn and Sharma (2009) suggest that it is possible to modify existing tools when studying a new food environment but caution that including all potential environmental characteristics may be too difficult to achieve. They suggest researchers should conduct formative research using focussed tools that incorporate the physical, political, economic and socio-cultural characteristics of the setting most relevant to the research questions (Gittlesohn and Sharma, 2009).

Areas identified as surveillance priorities include: access to healthy food and beverages, pricing and quality of healthy compared with unhealthy foods; advertising in both the local food environment and the larger food environment (although these may not be independent); concentration of fast food establishments and other food stores; portion sizes; and a comparison of vending machine pricing of healthy with unhealthy options (Salens and Glanz, 2009).

In summary, research in food environments is relatively recent and very little published work describes the properties of environmental measures. Tools to measure environments should be based on prior formative research to ensure they capture relevant aspects of the environment. ANGELO and the use of it suggests including physical, economic, political and socio-cultural aspects. Food environments are very difficult to study as factors influencing food choice are interdependent, making it challenging to isolate the role played by any one factor.

1.8.3 Research on New Zealand food environments

Few studies have investigated the New Zealand food environment and most have focussed on different aspects of school food environments. Carter and Swinburn (1999) analysed changes in food and beverage sales in school canteens following participation in a health promotion programme (Carter and Swinburn, 1999). In a later study, Carter and Swinburn (2004) used the ANGELO framework to identify and measure the obesogenic elements of New Zealand primary schools (Carter and Swinburn, 2004). Walton et al., (2010) identified barriers to promoting healthy nutrition in primary schools (Walton et al., 2010) while Cushman (2012) identified changes that followed the introduction of regulations governing the foods and beverages sold and promoted in schools, and the effect when these were repealed (Cushman, 2012).

Three studies relied on self-reported data, two of these were surveys (Carter and Swinburn, 2004; Cushman 2012) while the third collected data at baseline and annually from the registration forms in a health promotion programme (Carter and Swinburn, 1999). In contrast Walton et al., (2010) used an in-depth case-comparison approach with a purposely selected sample of five primary schools in the Wellington region. The multi-method form of inquiry included

interviews with school management; review of food sales and food policies; and a survey of the area surrounding the school (Walton et al., 2010).

Two studies found interventions in schools influenced food environments. One reported changes following voluntary participation in a health promotion intervention while the other described responses to government intervention by schools. Carter and Swinburn, (1999) found participation in a health promotion programme influenced the sale of foods in schools. Statistically significant changes were found in sales of 14 food items, all were in a healthy direction e.g. sales of doughnuts, sausage rolls, pies, and potato chips decreased while sales of sandwiches, filled rolls, muffins and scones increased. Moreover, changes were achieved with a low level of programme support as schools enrolling in the programme received limited assistance from the programme staff. Self-selection bias may limit these results, as schools registering with the programme may have been more committed to creating a healthy environment than other schools (Carter and Swinburn, 1999).

Two thirds of the 225 responding schools reported changing their food environment to meet regulatory requirements, 18 percent complied with regulations prior to their introduction while five percent ignored the new requirements and left their food environment unaltered (Cushman 2012). Most schools modified the foods and beverages available in the school canteen to comply with regulations. Eighty-nine percent retained these changes when regulations were rescinded. Only three secondary schools subsequently reversed the changes they had made. While another three schools reported changes in legislation prompted them to again review their canteen menu and further enhance the healthy choices offered (Cushman, 2012). While this small study, with self-reported data, may not be generalised to all New Zealand schools the findings suggest policies can create sustainable change in organisations (Cushman, 2012).

The cross-sectional study by Carter and Swinburn (2004) found school food environments were not conducive to healthy food choices. This study was the first systematic attempt to measure indicators of a school food environment at a national level and so used first generation measures. This study found the most frequently sold foods in schools were pies and sausage rolls, and juice was the most frequently sold beverage. Filled rolls were more expensive than any other food item. Few schools had food policies; however, most of those that did found their policies were effective. Fewer than half of the schools thought their schools sold healthy foods, or that the management supported the sale of healthy foods. The study relied on self-assessments to determine the level of policy effectiveness and attitudes towards healthy foods. However, the authors noted the self-assessments reflected food sales data for each school and were probably a fair assessment of the school environment. Carter and Swinburn (2004) concluded that this study demonstrated surveys of the food environment are valuable but further research was required to improve the validity and robustness of the measures used (Carter and Swinburn, 2004). Direct observations of school canteens, policy reviews and key informant interviews may provide stronger evidence in further studies.

Walton et al., (2010) created a qualitative model of the food environment for each school studied. They found common barriers to creating a healthy food environment in all schools including the types of food brought from home, the crowded curriculum, and limited resources to implement change. Some barriers varied across socioeconomic context. Selling unhealthy food to fundraise was a barrier to improving food environments in less socio-economically deprived schools but not in more socio-economically deprived schools, which received supplemental government funding. Parents in less socio-economically deprived schools resisted changes to improve the food environment, although the authors provided no examples of this behaviour. In

more socio-economically deprived schools parents were less engaged and environmental change was easier. The authors concluded that schools differ across socio-economic contexts and to be successful in influencing school food environments interventions need to be flexible and tailored to meet the needs of individual schools (Walton et al., 2010). However, they provided no guidance to identify which areas interventions should address.

Several studies explored food environments around schools. A pilot study explored the environment in a radius around a randomly selected sample of New Zealand schools to identify the characteristics and extent of food and beverage advertising and food outlets (Maher et al., 2005). Day and Pearce (2010) examined whether food outlets are clustered around schools and if so the extent of clustering by school and neighbourhood socio-demographic characteristics (Day and Pearce, 2010). Walton et al., (2009) considered whether food advertising around schools contradicted school nutrition messages in four Wairarapa schools (Walton et al., 2009).

Maher et al., (2005) systematically searched a one kilometre radius around 10 randomly selected schools in the Wellington region for food and non-food product advertisements and food outlets (Maher et al., 2005). Day and Pearce (2010) geo-coded the locations of all schools, fast food outlets and convenience stores in five urban areas. Using GIS analysis they calculated the number and proportion of fast food outlets within 1.5km of schools and analysed the type of food outlet, school level, socio-economic distribution and population density (Day and Pearce, 2010). Walton et al., (2010) analysed and calculated the shortest route for each student's journey to school then calculated the number of food advertisements and food outlets each student passed on her or his journey (Walton et al., 2010).

All found schools are surrounded by unhealthy food and beverage company advertising and also convenience and fast food stores selling energy-dense, nutrient-poor foods and beverages. Maher et al., (2005) found 1408 advertisements with 61.5 percent of these advertising food products (95% confidence interval = 58.9 – 64.1). Most (70%) advertised unhealthy foods and beverages, the major categories being soft drinks (21.6%), frozen confectionary (16.2%), savoury snacks (11.4%) and alcohol (8.1%). Most of the 224 stores near schools were food outlets (Maher et al., 2005). Day and Pearce (2010) found the median number of food outlets increased with the level of social deprivation. Schools in the lower quintiles (i.e. more socially deprived) had three times the median number of food outlets within 1.5km compared to schools in the higher quintiles. Food outlets were located within walking distance from schools. Schools in areas with high population density and in the highest quintile of commercial land use density had more food outlets within 800m regardless of level of deprivation or school level (Day and Pearce, 2010). Walton et al., (2009) found most students in three of the schools passed at least one food outlet or advertisement while travelling to school. Subtle differences in the location of food outlets in relation to students' travel routes affected exposure to advertising (Walton et al., 2009).

Two studies (Maher et al., 2005; Walton et al., 2010) were limited by small sample sizes and so may not be generalised. Maher et al., (2005) used a conservative approach to classify foods as healthy or unhealthy and so may have underestimated the extent of unhealthy food advertising. Walton et al., (2010) calculated shortest travel routes which may not reflect students' actual travel routes.

In summary, studies in and around New Zealand schools suggest children are exposed to obesogenic food environments at school and while travelling to and from school. Two studies found health promotion interventions influence food

environments in schools and these changes are sustainable over time (Carter and Swinburn, 1999; Cushman, 2012). One study found barriers to change in schools included lack of resources, crowded curriculum, fundraising through food sales, and resistance from parents. Three studies suggest any benefits derived from improving school environments may be negated by children's exposure to the unhealthy food environment surrounding school boundaries (Maher et al., 2005; Walton et al., 2009; Day and Pearce, 2010).

Several studies have explored food advertising to children on New Zealand television. (This topic will be explored in more detail in chapter two). A study using content analysis found the majority of food advertisements on New Zealand television were for foods high in fat and sugar, with 70.3 percent of food advertising for unhealthy foods (Wilson et al., 2006). When compared with a previous New Zealand study undertaken in 1997, it was found that food advertising had increased from eight advertisements per hour to 12.8 per hour (Wilson et al., 2006). Another study of New Zealand television advertising confirmed the majority of foods advertised during children's viewing times were for energy-dense foods. These foods included combo meals from fast food franchises, breakfast cereals, confectionery and carbonated beverages (Jenkin et al., 2008).

Clearly there are significant gaps in knowledge regarding the New Zealand food environment. Most of the published research focuses on the physical aspect of school food environments. The few studies investigating how interventions influence environments suggest health promotion approaches may be effective at the micro level. While the results are not replicated and therefore remain unconfirmed, these studies suggest policy, whether introduced as a health promotion intervention or imposed by regulation, results in sustainable improvements in food environments. Further research building a sound knowledge base about the New Zealand food environment is

required to better understand its role in obesity and potentially identify an effective public health response to this epidemic.

1.9 Health promotion – a framework for addressing public health issues

Health promotion is an internationally recognised approach to address public health issues (Scriven, 2005; Hearn et al., 2005; Tannahill, 2009). Health promotion recognises the interaction between people and their environment with the goal of improving the political, economic, socio-cultural and environmental conditions influencing health (World Health Organization, Health and Welfare Canada, & Canadian Public Health Association, 1986).

Health promotion is defined as *“the process of enabling people to increase control over, and to improve, their health”* (World Health Organization, Health and Welfare Canada, & Canadian Public Health Association, 1986, pp. 1). The Ottawa Charter was adopted at the WHO’s first global health promotion conference and provides a framework for health promotion. The Ottawa Charter identifies five key strategies (areas for action). These are: building healthy public policy; creating supportive environments; strengthening community action; developing personal skills and reorienting health services (World Health Organization et al., 1986). These principles are influential in the development of health promotion policies and frameworks globally (Scriven, 2005; Hearn et al., 2005). It has been argued that health promotion practice within individual countries reflects local priorities, cultures and political and socio-economic conditions (Scriven, 2005).

An early model (Tannahill, 1985) describes health promotion as a discipline comprising the common functions of health education (communications influencing the individual’s knowledge, attitudes and beliefs), health protection (including legislation, regulation and policy) and health prevention

(activities reducing the risk of disease or illness). The model is drawn as a Venn diagram with the common functions of each discipline represented by the overlapping spheres (Tannahill, 1985). Health promotion approaches are complex, they prioritise empowerment, community participation, policy development, environmental and social change (Laverack and Labonte, 2000; Keleher, 2007). Tannahill's model has been criticised as too simplistic, because it does not consider key concepts of health promotion such as equity, community-led health promotion and the physical environment. To redress these criticisms Tannahill, (2009) developed a broader model capturing: government and organisational policies promoting health; physical environmental and cultural factors; equity and diversity; and community-led health activities (Tannahill, 2009). This new model acknowledges the importance of achieving health equity by reducing differences between different populations (World Health Organization et al., 1986, World Health Organization 1997).

A central element of health not captured by either of Tannahill's models is empowerment. Empowerment is the ability of individuals and communities to control decisions influencing their own health (Laverack and Labonte, 2000). Empowerment is a challenging concept as many health determinants are beyond the control of individuals and communities (Green et al., 2000). For example health promotion initiatives directed at improving consumers' food choices are unlikely to result in health improvements when the global food supply is increasingly controlled by transnational food companies determining which foods and beverages are stocked at local supermarkets (Caraher et al., 2005). The notions of empowerment place the responsibility for addressing health issues on communities and assume they are able to, and interested in, addressing health issues, which may not always be the case.

Governments have a role in health promotion (World Health Organization, 2005). For example, by creating healthy public policy governments can regulate the marketing of unhealthy products. The 1990 Smokefree Environments Act introduced legislative control of tobacco sponsorship in New Zealand and established the Health Sponsorship Council, to replace tobacco company sponsorship and promote the Smokefree brand at community sports events (Thomson and Wilson, 2000; Laugesen and Swinburn, 2000). Similar approaches have the potential to influence food environments by restricting unhealthy food and beverage marketing.

1.9.1 A Settings approach to health promotion

Settings are “the place or social context in which people engage in daily activities in which environmental, organizational and personal factors interact to affect health and wellbeing” (Nutbeam and Kickbush, 1998, pp. 362).

Whitelaw et al., (2001) proposed five models for settings-based health promotion practice. The first is described as the ‘passive’ model where a setting is a location allowing access to individuals. Health promotion activities such as health education occur independently of the setting to influence the knowledge, attitudes or beliefs of individuals (Whitelaw et al., 2001). The second model also focuses on individual behaviour change and is termed the ‘active’ approach. Aspects of the environment are modified to solve a problem resulting from individuals’ behaviour (Whitelaw et al., 2001). The third approach, titled the ‘vehicle’ model views features of a setting as causing health problems. Health promotion activities in a ‘vehicle’ model emphasise policy and organisational change (Whitelaw et al., 2001). The fourth ‘organic’ model adopts principles of community development and views health as resulting from psycho-social factors of the setting. The organic model focuses on strengthening community action to improve the ethos or culture of a setting

(Whitelaw et al., 2001). The fifth or 'comprehensive' model seeks to bring about comprehensive change to a setting structure and culture and is the approach considered in this thesis. This model assumes individuals have little power and are unable to create significant changes. The deterministic view of this model suggests creating sustainable change requires senior staff in an organisation to commit to and participate in change processes. It emphasises policy development and structural change. In the context of food environments this may include changing food suppliers, altering food preparation facilities and restocking vending machines to offer healthy foods and beverages (Whitelaw et al., 2001).

The comprehensive approach to settings (Whitelaw et al., 2001) supports ecological perspectives of health promotion recognising that socio-economic conditions, culture, equity and access issues influence health (Green et al., 2000). This approach recognises that environmental and organisational factors play key roles in determining behaviour, and implies people should not be studied in isolation from their living and working environments (Green et al., 2000). By working in settings, health promoters can focus on determinants of health beyond an individual's control.

According to Dooris (2009) settings are complex systems; they are unpredictable and interact with other settings (Dooris, 2009). These complexities require complex solutions and for health promotion interventions to operate at multiple levels within a system (Green et al., 2001). When a limited range of responses is applied, a settings approach is unlikely to result in sustainable change (Dooris, 2009). Similarly narrow definitions that limit settings to formal organisations exclude informal locations such as parks and playgrounds that may be of relevance to a health issue (Dooris, 2009).

The settings approach assumes that settings are open to health promotion activities. However, competing interests, priorities and goals of key personnel within settings, can limit the extent to which settings approaches are implemented and the level of change resulting from these (Green et al., 2001). Health promotion approaches can create sustainable change which may differ between venues. Health promoters must be mindful that competing priorities may hinder progress in some settings and where appropriate, seek to work collaboratively with key personnel to create change that is acceptable to all parties and therefore sustainable.

An ecological approach to health promotion views health as a result of *“the interdependence between the individual and subsystems of the ecosystem”* (Green et al., 2000. pp. 16). The environment influences individuals’ behaviour and modifying the environment results in behaviour change. Successful health promotion impacts on specific elements of the environment (Green et al., 2000). However, influencing environments requires intervention by individuals and communities hence, health promotion aims to empower people to manage their health determinants (Green et al., 2000). The thesis focuses on identifying elements of the food environment in sports settings that impact on individuals’ food choices and explores opportunities to modify this environment to improve them.

1.10 Sport as a setting for health promotion

Settings can be conceptualised in different ways. Sports settings in this study are defined as locations where people play organised sport such as sports clubs, sports grounds, swimming pools, recreation centres and sports stadia. Organisations responsible for managing sport such as national and regional sporting organisations are included in this definition of sports setting. Sports settings vary considerably, from small community clubs to stadia hosting

international sporting competitions. All of them provide opportunities for *“sustained interaction, with pre-existing structures, policies, characteristics, institutional values and both formal and informal sanctions on behaviour”* (Green et al., 2000, p.23).

Sports settings provide considerable potential for marketers to promote their products. The WHO recognises this in the Framework Convention on Tobacco Control with article 13 requiring parties to restrict tobacco advertising, promotion and sponsorship to reduce tobacco consumption (World Health Organization, 2003). Tobacco sponsorship is defined as *“any form or contribution to any event, activity or individual with the aim, effect or likely effect of promoting a tobacco product”* (World Health Organization, 2003, p. 4). The International Obesity Taskforce’s Sydney Principles propose limiting sponsorship to protect children from unhealthy food and beverage marketing (Swinburn et al., 2008). Similarly, the WHO recommends restricting commercial promotions of unhealthy foods in children’s sports settings (World Health Organization, 2010).

Little is known about the characteristics or extent of food and beverage marketing and availability in sports settings. This study explores the overall food environment in New Zealand sport and conducts a detailed investigation of two exemplar sports, rugby and netball at national, regional and club levels identifying whether junk food is promoted in sport.

1.11 Thesis structure

This chapter provides the context for this study of food environments in sports settings. First it defines obesity and outlines obesity prevalence. Then the role of energy-dense, nutrient-poor foods is described. It outlines the importance of food environments in addressing the global obesity epidemic and summarises research exploring food environments internationally and in New Zealand. The

benefits of using health promotion to address public health problems in settings are described. The chapter concludes by describing sports settings.

Chapter two describes how sponsorship influences consumers. It commences by describing sponsorship and companies' objectives for investing in sports sponsorship then discusses a theoretical model explaining how marketers alter environments to influence consumers, particularly children, many of whom participate in sport. The chapter concludes by examining the impact of food marketing on children.

Little is known about food environments in sports settings. Chapter three describes the results of a systematic review identifying and critically appraising research on food environments in sports setting. The review includes research into the characteristics and extent of food and beverage company marketing in sports settings and the types of foods and beverages available. Findings from the literature review are used to inform the study methods.

The methodology and methods guiding this study are described in chapter four. This study was a case study undertaken in two phases. Chapter five describes the results of the first phase which focuses on key informant interviews and website content analysis of national and regional sporting organisations. Chapter six describes the findings from the second phase, where two embedded units of analysis (rugby and netball), and multiple data sources provides a detailed investigation of junk food promotion in two leading New Zealand sports.

Chapter seven discusses findings of this research, strengths and limitations of the study and suggests areas for further research. This chapter draws the thesis to a close by outlining recommendations and conclusions resulting from this research.

Chapter Two: Marketing, Sponsorship and Sport

2.1 Introduction

This chapter commences by defining sponsorship and describes the objectives of companies for investing in sports sponsorship. Sponsorship in sport has grown dramatically over the past 20 years with a number of multinational food and beverage companies investing in global sports events. Sport provides a setting in which food and beverage companies promote their products to children and their families. This chapter outlines a theoretical model explaining how manufacturers achieve their sports sponsorship goals by manipulating environmental factors to encourage brand awareness, create associations with positive attitudes and ultimately promote purchase. Children are particularly influenced by marketing and this chapter concludes by describing how marketing influences children's food preferences.

2.2 Sponsorship definitions and benefits for companies

Sponsorship represents one element of marketing communications, and outlines how marketers use associations with other activities to promote their brands (Meenaghan and Shipley, 1999). Sports sponsorship is a commercial agreement where a sponsor provides financial support to create an association between a sport or an event and the sponsor's brand, image or products (Lagae, 2005; Sport New Zealand, 2012b). Sponsors purchase the rights to associate specific brands with a sports team or sporting event and then market that association to consumers (Cornwell and Maignan, 1998). Sports sponsorship ranges from providing team equipment and uniforms to purchasing stadia and team naming rights (Lamont and Dowell, 2008). Evaluations of sports sponsorships show it attracts consumers' attention to a

wide range of products including food and beverages (Crimmins and Horn, 1996; Ferreira et al., 2008).

Sports sponsorship helps companies achieve specific marketing objectives. These objectives include: improving goodwill by being seen to act as a good corporate citizen; enhancing corporate image by creating associations with positively perceived events or sports; increasing brand awareness through increased exposure; and increasing sales (Cornwell and Maignan, 1998; Miyazaki and Morgan, 2001). Companies seek associations with locally relevant and prominent sports teams to achieve national and global brand visibility, which they hope will expand their markets (Scherer et al., 2008). Sport sponsorships offer unique benefits including committed fans, an activity which is viewed positively by most (i.e. an association with sport is good), an extensive (often international) television and other media audience, a generally apolitical event, and the ability to engage with consumers during their leisure time (McAllister, 2010).

Because investing solely in sponsorship is unlikely to achieve identified business objectives (as only a brand name or logo is displayed) many companies support their sponsorship with additional advertising and marketing activities (Cornwell, 2008). These activities enhance brand associations created with sponsored sports and may include themed advertising, product giveaways, display of event logos on products and event hospitality (Fahy et al., 2004; Lamont and Dowell, 2008).

Large corporations and small businesses both invest in sports sponsorship in the form of either cash payments or payment in products or services. However, while many studies describe sponsorship by large corporations, fewer have explored sponsorship by small businesses. Lamont and Dowell (2008) comment that sponsorship funding by small or medium sized United States businesses

facilitates sports events at a regional or local level. Without this funding, many of these events may otherwise not occur (Lamont and Dowell, 2008). Zinger and O'Reilly (2010) found small United States businesses primarily invest in sponsorship to support their local community, with employees usually involved in the sponsored sport. They concluded that small businesses typically view sponsorship funding as a donation and fewer use it to pursue specific marketing objectives (Zinger and O'Reilly, 2010).

2.3 The growth of sports sponsorship expenditure

Over the past 20 years, corporate sponsorship has been one of the fastest growing forms of promotional activity worldwide (Santomier, 2008). Almost 66 percent of all global sponsorship involves sport (McDaniel and Heald, 2000; Ferreira et al., 2008). Globally, sponsorship spending on sports increased from \$5.6 billion in the mid 1980s to nearly \$38 billion by 2007 (McAllister, 2010). More than \$9.9 billion was spent on sports sponsorship in 2007 in the United States and this was expected to exceed the \$10 billion mark in 2008 (McAllister, 2010). In 2007, the sports sponsorship market in Australia was estimated to be worth \$600 million per year with an average sponsor spend of \$3.3 million (Jones, 2010).

Sponsorship of high profile sports events requires substantial financial investment and is therefore only available to companies with significant resources. IEG, an international marketing company that analyses sponsorship spending, lists Pepsico Inc. and Coca-Cola Co. in the top five sponsorship spenders in their 2009 report. IEG reports those companies spent US\$260 million to US\$360 million on sponsorship (IEG, 2009). Other food and beverage companies listed by IEG include Mars Inc and Nestle USA (each spending US\$45m-\$50m), McDonald's, Kellogg Co. and Red Bull North America (each spending US\$25m-\$30m) (IEG, 2009). Data on sponsorship expenditure only

includes direct sponsorship costs and companies' investments in marketing activities promoting their sponsorships can be at least equivalent to the direct sponsorship costs (McAllister, 2010). However, without data on supporting expenditure it is difficult to determine the overall investment in sponsorship by companies (Meenaghan, 2001; McAllister, 2010).

2.4 Sports sponsorship reach

The introduction of televised coverage of the United States National Football League (NFL) in 1956 was a milestone in the development in sports sponsorship (McKelvey, 2006). The popularity of televised NFL football games grew rapidly achieving an estimated audience of 45 million for the 1958 season final. As a result, the NFL negotiated massive increases in fees for the television rights and corporate sponsorship. Significant, long term investments by companies purchasing NFL sponsorships suggest these provide substantial benefits (McKelvey, 2006).

Through internationally televised sports games, sponsorship reaches consumers globally (Hawkes, 2004). Sports events such as the FIFA World Cup, the Olympic Games and the NFL provide international corporations with opportunities for global marketing campaigns. In 2006, the FIFA World Cup attracted a cumulative audience of an estimated 26.9 billion viewers across 214 countries. In addition to this direct audience over 250 million visits were made to FIFA's web pages, with seven billion page views (FIFA, 2010). In 2008 a FIFA World Cup or Olympic sponsorship was estimated to cost US\$40 million with an additional estimated \$400 million spent on related television advertising, and on-site promotions supporting the sponsorship (Mickle, 2008). In 2012, it was reported that Coca Cola and McDonald's spent US\$100 million on worldwide sponsorship of the Olympic games (The Guardian, 2012).

It is difficult to comment on the reach of televised sport in New Zealand as different sports events attract different audiences. The introduction of pay-television has changed the availability of broadcast sport. Sports broadcast on free to air channels has reduced by almost half from 838 hours in 2002 to 458 hours in 2011 (New Zealand on Air, 2011). However, 49 percent of New Zealand homes subscribe to pay television with 560 303 homes subscribing to sports channels in 2013, up from 558 466 subscribers in 2012 (Sky Television Limited, 2013).

Studies describing the degree to which sports are watched through various media illustrate the potential reach of sports sponsorship. For example, a study of United States children and sports media found nine out of 10 children aged eight to 17 years viewed or heard sports media. Eighty-eight percent of the children surveyed reported that they viewed televised sports with more than half watching sports once a week and 13 percent reporting they watched sport every day (Nicholson and Hoye, 2010). New Zealand children are also keen sports spectators with at least 80 percent of boys aged 5-18 years and girls aged 11-14 years reporting they sometimes or often watched televised sport (Sport New Zealand, 2012). This number is lower in girls aged 5-10 years and 15-18 years with 69 percent and 78 percent respectively reporting they sometimes or often watched televised sport (Sport New Zealand, 2012). However, as the study did not define "sometimes" or "often" it is difficult to determine how much televised sport New Zealand children watch, even though sport is clearly popular with children.

While watching sport, children are repeatedly exposed to sponsors' logos. Using digital technology a sponsor's logo can appear multiple times on one screen through on screen graphics, scoreboard logos, news scrolls at the bottom of the screen, and background sets for broadcasters or interviews. Brands or logos may be incorporated into the logo of the game or tournament, printed

onto the field or surrounding billboards and printed on team uniforms (McAllister, 2010). Hawkes (2004) suggested that as television advertising of food to children became more regulated, marketers adopted less regulated forms of advertising such as sponsorship (Hawkes, 2004). For example, sports are often broadcast during time slots where regulations prohibit food advertising (Pettigrew et al., 2012).

2.5 The impact of new media and innovations

New media such as the internet and telecommunications are a key strategy contributing to the globalisation of sport and therefore to the growth of sponsorship (Santomier, 2008). The use of multiple new media platforms in sports sponsorship communications enables companies to communicate brands more pervasively to consumers. They use a range of media to develop brand awareness in new markets and new media provides fresh opportunities to market to consumers watching sport (Santomier, 2008).

New media have enabled diverse communication options including video on demand, 3G (third generation mobile communications), streaming audio and video, personal digital assistants, sports ticker (devices linking consumers with their favourite team's data) and internet websites (Choi, 2008; Santomier, 2008; Scherer et al., 2008). These options enable interactive experiences with brands, a strategy widely used through advergaming (company sponsored games including brand messaging) and competitions (Choi, 2008). For example, at the 2008 Beijing Olympics Coca Cola used new media to associate their brands with the Olympics by encouraging 120 million Chinese consumers to create a virtual Olympic torch by forwarding a text including the Coca Cola brand and an image of the Olympic torch (Choi, 2008).

New media allow companies to promote their sponsorships and products to consumers globally. New media is unconstrained by sports broadcast

timeframes or game schedules, and is constantly accessible via the internet. Through new media, consumers integrate brands into their everyday life. Repeat exposure to enjoyable experiences delivered through a brand, reinforces sponsorship associations, reminds users of the brands' favourable attributes and encourages product purchase.

2.6 Theoretical models explaining how sponsorship influences consumers

Theoretical frameworks explain how companies achieve sponsorship goals. Cognitive information processing theories emphasises awareness and attitudes. These theories suggest consumers search for and then consider and evaluate product information prior to purchase; that is they make a rational selection from the range of available products (Hoek et al., 1999). In contrast, behavioural modification theory focuses on the environmental factors influencing behaviour and suggests consumers' choices are often less pre-meditated and planned and more likely to be instinctive responses to marketing environments (Nord and Peter, 1980).

2.6.1 Cognitive information processing theories

The Awareness – Interest – Desire - Action (AIDA) model once dominated marketing literature and evolved from cognitive theories attempting to explain how advertising works (Gordon, 2006). In this model, purchase relies on consumers' movement down a sequential path from awareness of product availability, to developing an interest in it, desiring it and finally purchasing the product (Lavidge and Steiner, 1961; Gordon, 2006). Cognitive processing models suggest advertising and sponsorship have both persuasive and informational roles in which individuals' preferences, attitudes and beliefs about products are influenced by how they interpret marketing information. Individuals who actively attend to marketing make largely rational decisions

having evaluated the available product information prior to purchase (Lavidge and Steiner, 1961; Harris et al., 2009).

Cognitive processing theories have attracted criticism because they assume consumers acquire and review a large volume of information prior to making a rational choice (Bettman et al., 1998). Increasingly, researchers have argued that environments play a strong role in shaping the choice options open to consumers, and their behaviour with respect to these (Foxall, 1993). Cognitive processing models such as AIDA place less emphasis on environments even though the evidence suggests these shape the choices consumers make (Siefert et al., 2009). More behavioural models suggest much processing occurs below conscious awareness; external stimuli influence the individual's choices without deliberate processing of the stimuli (Gordon, 2006; Siefert et al., 2009; Harris et al., 2009).

2.6.2 Behaviour modification theory

Behaviour modification approaches focus on how environments shape and influence consumer behaviour (Nord and Peter, 1980). While cognitive models consider "attitudes and intentions inevitably precede, prefigure, and determine consumer behaviour" (Foxall, 2010 pp. 93), behaviour modification theory posit that consumers respond to environmental stimuli. These either stimulate or reward behaviour (respondent and operant conditioning, respectively), or use vicarious learning and ecological design (Nord and Peter, 1980; Foxall, 2010).

Nord and Peter (1980) define respondent conditioning as "a process through which a previously neutral stimulus, by being paired with an unconditioned stimulus comes to elicit a response very similar to the response originally elicited by the unconditioned stimulus" (Nord and Peter, 1980. pp. 37). More simply, respondent conditioning creates associations that stimulate behaviour. Respondent conditioning is concerned with involuntary responses and is often

used to promote a new brand for which people initially have neutral feelings. For example, by pairing a product with an external stimulus (e.g. a sports match) the product eventually generates its own interest. Over time, marketers hope the sustained pairing of a brand and the event increases the probability consumers will purchase (or re-purchase) that brand (Nord and Peter, 1980). Hoek et al., (1999), propose that respondent conditioning explains how associations of excellence and achievement attained by a highly successful sports team or player may become linked to a brand or product through sponsorship. Emotions created by the presence of a team or player draw attention to a brand or company, and increase the probability of a product purchase. Team supporters who already regularly purchase a product are reinforced because the brand reflects and promotes their values thus encouraging purchase (Hoek et al., 1999).

Operant conditioning occurs when the probability that an individual will behave in a certain way is altered by influencing the consequences of the behaviour. Operants reinforce a behaviour after it has occurred (Nord and Peter, 1980). Sponsorships draw attention to a brand and once the consumer has trialled the product, sponsorship then reinforces that behaviour by reminding consumers of the favourable attributes linked to that brand (Hoek et al., 1997).

The Weet-bix All Blacks team tags promotion provides an example of both respondent and operant conditioning. Purchase of Weet-bix breakfast cereal is rewarded by a gift of holographic All Blacks (New Zealand's national rugby team) team tags (cards with player images printed on them) with consumers encouraged to collect tags of the whole team. Weet-bix packaging and advertising feature images of the All Blacks that establish a relationship between the brand and team, and stimulate behaviour by offering rewards available through online branded games.

Vicarious learning occurs when behaviour is changed as a result of observing the actions of others (Nord and Peter, 1980). Hoek et al., (1997) consider that while vicarious learning may follow several routes, role modelling is the pathway most relevant to sponsorship (Hoek et al., 1997). Sporting heroes essentially educate consumers on how best to use a brand; because as role models they clearly experience positive consequences from using the brand. Consumers may see brand use as a conduit to the same positive outcomes (Hoek et al., 1997). Overall, pairing a sporting figure with a brand suggests that using the brand not only provides access to the same outcomes but may also enable the consumer to experience their role model's characteristics (Nord and Peter, 1980).

Dixon et al., (2011) tested how sporting celebrity endorsement of energy-dense, nutrient-poor foods influenced consumers' preference for these products (Dixon et al., 2011). Parents of children aged 5-12 years, who were the main household food buyer, were exposed to randomly selected, energy-dense, nutrient-poor food packages and similar healthier un-endorsed food packages on-line. Parents exposed to celebrity endorsements rated those food packages as healthier and of better quality than those exposed to the un-endorsed packages (mean = 3.53 u. 3.16, $P < 0.001$). Participants described consumers purchasing the endorsed unhealthy foods as healthier, fitter and richer than those buying similar packages that were not endorsed. Those exposed to the celebrity endorsed products also expressed stronger purchase intentions than those exposed to the control (Dixon et al., 2011).

Nord and Peter (1980) refer to the purposeful design of environments intending to modify human behaviour as ecological design (Nord and Peter, 1980). Ecological design includes store design and layout, placement of specific displays in high traffic areas, in-store product information booths and the use of noises, odours or lights to bring consumers into visual or sensory contact

with brands. These techniques can be sequenced with other techniques such as operant or respondent conditioning to stimulate a purchase (Nord and Peter, 1980). Exclusive supply rights at sports stadia are a form of ecological manipulation. Consumers wishing to purchase, for example, a soft drink can purchase only the supplied brand of soft drink; exclusive supply contracts may induce trial by the consumer that results in ongoing purchase.

2.6.3 The Awareness-trial-reinforcement model

Ehrenberg (1974) proposed the awareness-trial-reinforcement (ATR) as a model explaining how communications influence consumers' behaviour. The ATR model regards advertising not as persuasive but as reinforcing (as an operant rather than a respondent stimulus) and emphasises behavioural variables such as trial and repeat purchase. The ATR model suggests most consumers are already aware of most brands, either because they already buy those brands or following peripheral exposure while shopping. Because this model views brand awareness among product category users as established, it focuses on trial purchase and the pivotal pattern of repeat purchase that must be established if a brand is to be successful. Advertising and sponsorship's task is to: maintain brand salience; create opportunities through trial via associated marketing support; and importantly to reinforce repeat purchasing by providing ongoing reminders of the brand's benefits (Ehrenberg, 1974; Hoek et al., 1999).

In a pilot study Hoek et al., (1997) tested empirically theoretical assumptions relating to the AIDA and ATR models. The study assessed differences between users and non-users of a brand following an advertising or sponsorship stimulus; and identified impact on unprompted brand recall, variation in attitudes and variation in purchase probability. A sample of marketing students was interviewed twice, with the first interview collecting data about

attitudes and behaviour with respect to snack foods. Four weeks later the students were shown sports footage including either advertising or sponsorship relating to snack foods and re-interviewed to identify purchase intentions and brands and sponsorship recall. This study found sponsorship generated more awareness among non-users of the brand than did advertising. Non-users exposed to sponsorship ascribed more attributes to the brand than non-users exposed solely to advertising. While sponsorship exposed non-users to a wider range of stimuli, neither sponsorship nor advertising stimulated non-users to purchase the product. These results support the view of advertising and sponsorship as reinforcing rather than persuasive and highlight the importance of integrating sponsorship with trial inducing activities (Ehrenberg, 1974; Hoek et al., 1997). However, as with Olson and Thjomoe's (2003) study, participants were university marketing students and more informed of marketing techniques and so may not reflect the wider public.

Ehrenberg (1974) suggests consumers notice advertising for brands they already purchase. Sponsorship reminds consumers these brands are largely equivalent to other brands in the category and maintains or improves the brand's position in the consumers' choice hierarchy. He argued that general brand advertising typically changes neither sales nor attitudes, but is important to maintain salience and defend market share. Established brands must continue to remind consumers of the benefits of their brand or risk a reduction in sales if salience declines and competing brand promotions induce trial and repeat purchase (Ehrenberg, 1974). Sponsorship has a reinforcing role. Through vicarious learning, ecological design, operant and respondent conditioning sponsorship reminds consumers about brands and creates associations between the sponsored event or person and the brand, reminding consumers of the

benefits of the brand, encouraging purchase and thereby retaining market share (Hoek et al., 1999).

2.6.4 Summary of behaviour modification theory

Over time, consumers have multiple experiences with brands; while direct usage will have the strongest influence on how consumers perceive those brands, sponsorship and advertising may promote pairings that shape perceptions. Rather than persuade people about a brand's attributes, behaviour modification theory suggests people come to associate attributes with brands as a result of pairing, reinforcement and environmental shaping (Nord and Peter, 1980). Ehrenberg, (1974) uses similar reasoning to suggest the importance of advertising as a reinforcer; he highlights the need for other marketing activities to stimulate trial. Because sponsorship is often supported by advertising and undertaken in conjunction with sales promotions, it may both encourage trial and reinforce repeat purchase (Ehrenberg, 1974). For these reasons, sport sponsorship represents a potentially powerful marketing tool, particularly given its integration with sporting events. This section described theoretical models which explain how sponsorship influences consumers. The next sections explore in more detail how sponsorship stimulates brand awareness (the "A" in the ATR model), trial and repeat purchasing.

2.7 How sponsorship increases brand awareness

Cognitive models emphasise brand awareness and brand attitude. Studies measuring how sponsorship influences brand awareness assume higher levels of brand awareness leads consumers to perceive sponsoring brands as superior and prompts purchase (Choi and Yoh, 2011). Because it is very difficult to measure how attitudes influence purchasing, many researchers measure brand recall to determine the influence of sport sponsorship on consumers (Choi and Yoh, 2011). However, this approach overlooks the likelihood that high levels of

brand awareness follow rather than precede existing brand use (Ehrenberg, 1974).

Studies investigating the recall of sports fans of sponsors' advertisements at sports events found higher levels of recall for brands consumers used at sports events. Two studies found most spectators noticed advertising at sports events. Cuneen and Harris (1993) found the brands most recognised by spectators surveyed at an LPGA golf tournament were those currently used by respondents. These brands included a grocery chain, soft drinks, beer and a quick service restaurant. The sponsors most frequently recalled by spectators had more event signage, exposing the brands more often than sponsors recalled less readily. For example, brand logos were visible on rubbish bins and flags. Most of these sponsors were food or beverage brands which had event concessions allowing spectators to purchase and trial their products (Cunneen and Harris, 1993). Another study of fans attending football and basketball games found most participants (70%) correctly recalled three quarters of the sponsors' advertising (Stotlar and Johnson, 1989). Similar to the study by Cunneen and Harris, (1993) recall was higher for food and beverage brands sold at event venues (Stotlar and Johnson, 1989). Both of these studies suggest that trial results in higher brand recall and therefore supports the concepts of the ATR model.

Studies have found the frequency of game attendance increases spectators' brand recall. Both Cornwell et al., (2000) and Turley and Shannon (2000) surveyed basketball fans finding recall of sponsors' brands was highest among those attending most frequently (Cornwell et al., 2000; Turley and Shannon, 2000). Although, Turley and Shannon (2000) found sponsor recall was relatively low with most participants recalling between two and five brands of the 45 stadia advertisements. Only 30 percent of participants correctly recalled more than four brands with almost half of all brands recalled by less than one

percent of participants. Cornwell et al., (2000) and Turley and Shannon (2000) do not report which brands were observed nor did they test whether participants used sponsoring brands. Ehrenberg (1974) suggests consumers mainly notice advertising for brands they already purchase and low levels of sponsor recall may be because these brands were not used by many participants.

Televised sports broadcasts provide opportunities for sponsors to reinforce brand awareness with spectators. Few studies investigate how exposure to sponsorship through televised sports broadcasts influences consumers' brand recall. Levin et al., (2001) compared consumers' recall following exposure to prominent branding on race cars during a motor sport event with recall following exposure to television advertising. This study found consumers' recall for on-car sponsors' branding was higher than recall for sponsor advertising. The highest brand recall was found when advertising was combined with on-car branding. Participants who were more familiar with, and knowledgeable about, motor-sport had much higher levels of sponsor recall for on-car brands, while recall for sponsor advertising was similar in all groups (Levin et al., 2001). The study did not test whether participants used these brands although as the brands included popular high use brands such as beer, tyres, sports goods, a quick service restaurant and a television network, it is likely some of the 81 participants did use these brands and this may have influenced the results of this study.

Studies measuring consumers' awareness of sponsors' brands found higher recall for brands consumers used (Stotlar and Johnson, 1989; Cunneen and Harris, 1993). Consumers regularly attending games or watching televised sports were more aware of sponsors' brands than less frequent attendees (Cornwell et al., 2000; Turley and Shannon, 2000). Frequent attendance or regular viewing of sport results in increased exposure to sponsors' messages

and better recall and recognition. None of these studies found an association between brand awareness and product purchase and so do not support cognitive models suggesting increasing brand awareness results in consumer purchase. Attendance at sports events exposes consumers to a range of sponsorship activities. For example attending a motor-sport event exposes fans to sampling, signage, and corporate hospitality (Kinney et al., 2008). While Cunneen and Harris, (1993) and Stotlar and Johnson, (1989) report brand recall is higher for brands consumers' sampled, neither they, nor the other studies discussed how consumers exposure to additional marketing activities at sports events influenced consumers. The associations resulting from respondent conditioning, vicarious learning or ecological design are not considered by the authors as an explanation for consumers' higher brand awareness.

2.8 How sponsorship influences brand attitudes

Cognitive theory assumes sponsorship enhances consumers' brand attitudes and influences purchasing by moving consumers through the stages of the AIDA model (Lavidge and Steiner, 1961). In cognitive models sponsorship persuades indirectly, creating links between brands and events which consumers process cognitively moving from brand awareness to interest, desire and finally purchase (Crimmins and Horn, 1996). Much sponsorship research has focussed on identifying how sponsorship influences consumers' attitudes toward and purchase intention for sponsoring brands. However, measurements of sponsorship effectiveness have found only weak relationships between consumers' attitudes towards sponsoring brands and purchase intention (Foxall et al., 2011).

Studies have explored how fans' involvement in their sport influences their attitudes towards sponsors. Cross-sectional studies exploring the direct and indirect effects of social identification with a sports team hypothesise that fans

who identify strongly with a sport or team, will have more favourable opinions of the sponsor's involvement, view its brand more favourably and be more likely to buy that brand. Five recent studies have explored the strength and favourability of sponsorship associations. Madrigal (2001) surveyed Ohio households, while Gwinner and Swanson (2003) and Smith et al., (2008) surveyed football spectators. Lacey et al., (2007) surveyed spectators attending a six-day cycle race and Tsiotsou and Alexandris (2009) surveyed basketball fans in Greece (Madrigal, 2001; Gwinner and Swanson, 2003; Smith et al., 2008; Lacey et al., 2007; Tsiotsou and Alexandris, 2009).

One study identified the sponsor as a popular car manufacturer but did not identify how many participants used this brand (Lacey et al., 2007). Four studies did not identify the sponsors nor did they test whether participants were existing brand users (Madrigal, 2001; Gwinner and Swanson 2003; Smith et al., 2008; Tsiotsou and Alexandris, 2009). It is unclear whether the sponsoring brands were well known frequently purchased brands, and therefore whether it was likely that some participants were existing users. Because participant brand use was not tested the strength of the associations found in these studies is unclear.

All five studies found that individuals identifying strongly with a team were more likely to purchase the sponsors' products than those identifying less strongly (Madrigal, 2001; Gwinner and Swanson 2003; Lacey et al., 2007; Smith et al., 2008; Tsiotsou and Alexandris, 2009). In addition Gwinner and Swanson (2003), Smith et al., (2008) and Tsiotsou and Alexandris (2009) reported highly identified fans were more aware of sponsors and had a more positive attitude towards sponsors than less identified fans (Tsiotsou and Alexandris, 2009). Lacey et al., (2007) reported that most participants approved of the sponsor's role in the event with frequent attendees viewing the sponsor most favourably. Despite this, only one-third of participants indicated they would buy the

sponsor's product, suggesting event sponsorship had little persuasive impact on product purchase (Lacey et al., 2007). However, without knowing whether participants were current brand users, it is difficult to identify whether the results show weak persuasion (a cognitive approach) or possible reinforcement of current brand users.

These studies viewed sponsorship from a cognitive perspective, describing how it acts as an indirect form of persuasion. However, the studies did not examine repeat purchase and so sponsorship may in fact have been acting as a reinforcer, reminding consumers about the brand's presence (Ehrenberg, 1974). These authors considered companies investing in sponsorship must support their investments with additional marketing activities, which they suggested would increase brand exposure moving consumers across the AIDA pathway towards desire and purchase (Madrigal, 2001; Gwinner and Swanson, 2003; Lacey et al., 2007; Tsiotsou and Alexandris, 2009).

All of these studies focussed on fan-event behaviour not fan-sponsorship behaviour and found regular attendance rather than identification with a club or sport influenced consumers' recall and attitudes. Fans regularly attending sports events are exposed to a range of marketing activities aimed at retaining brand salience with existing users and stimulating brand trial with new users. Consumers' choices are influenced by their previous product use with different stimuli reinforcing or rewarding repeat purchases. When consumers have enjoyed using a product, stimuli previously regarded as neutral increase in salience and prompt repurchase (Foxall, 2010). Regular brand users notice these stimuli and are reminded of the brand associations (Hoek et al., 1997).

Marketers draw on operant and respondent conditioning linking sponsorship directly to promotional activities. These activities generate sales from existing and new users and encourage continued brand use (Hoek, 1999). For example

promotions featuring collectable player's cards require continued purchase to collect a full team of players. Competitions usually require proof of purchase to enter and prizes are frequently tickets to high profile sports events associated with the sponsor's brand. 'Player of the day' awards get recipients and their families into the store encouraging trial among the entire family.

Measuring the effect of sponsorship is very difficult. Sales data are not public and findings from studies measuring brand awareness, brand preference and purchase intent are inconclusive. While most sponsorship research explains sponsorship through cognitive models relying on awareness and attitudes the behaviourist perspective explores how sponsorship influences trial and repeat purchase both of which can be measured directly (Hoek, 1999).

2.9 The importance of market share

Ehrenberg (1974) considers the "main difference between a leading and a small brand is that the leader has more buyers" (Ehrenberg, 1974. pp. 28). From a behavioural perspective bigger brands can be expected to have a greater influence on sponsor identification than smaller brands as more people know the brand and can recognise it. Two studies have found brand prominence influences consumers. In a small, cross sectional study Pham and Johar, (2001) explored how market prominence influences consumers' perceptions of sponsoring brands (Pham and Johar, 2001). In a larger study Roy and Cornwell, (2003) explored how market prominence influences consumers' perceptions of sponsor-event congruence (Roy and Cornwell, 2003). Both studies were undertaken in lab conditions with participants identifying sponsors following exposure to mock press releases announcing sponsorships relationships. Pham and Johar (2001) did not identify which brands were included in the press release while brands involved in Cornwell and Roy's (2003) study included cars, beer and computer brands. Neither study identified whether participants

were existing brand users and as Cornwell and Roy's (2003) study involved prominent brands the inability to separate out users from non-users makes it impossible to test the direction of relationships.

Pham and Johar, (2001) found participants more accurately recalled prominent brands sponsoring sport than less prominent brands (Pham and Johar, 2001). While Cornwell and Roy (2003) found participants considered prominent brands were more fitting sponsors of sports events than less prominent brands. These studies suggested sponsorship may be more useful for bigger brands as consumer recall of smaller brands is poor (Pham and Johar, 2001; Cornwell and Roy, 2003). However, neither study considered how exposure to additional marketing activities influences consumers and therefore further research is required to identify the benefits or limitations of sponsorship for smaller brands.

While many studies have explored how sports sponsorship influences consumers, surprisingly few have explored the influence on consumers of food and beverage company sponsorship. This relationship will be explored in the next section.

2.10 How food and beverage company sport sponsorship influences consumers

The few studies exploring how food and beverage company sponsorship influences food choices, focus on children. Research suggests that sports sponsorship influences children's attitudes and behaviour in relation to tobacco and alcohol. Sports sponsorship by tobacco companies increases children's brand recognition (Ledwith, 1984; Compton, 1993), and children who watch sport sponsored by tobacco companies are more likely to experiment with cigarettes (Valdya et al., 1996; Charlton et al., 1997). Similarly, alcohol advertising is associated with young people having more favourable attitudes,

increased brand knowledge and stronger intentions to drink alcohol but does not show advertising increases young peoples' alcohol consumption (Henriksen et al., 2008; Hastings et al., 2005). It may be that advertising is acting as a reinforcer, increasing brand awareness and an additional stimulus (e.g. sponsorship) is required to initiate trial. As yet, the impact of sports sponsorship by food companies on children's food choice and preference is less clear, but logic suggests it will be similar to that of alcohol and tobacco.

Two cross-sectional studies explore how food and beverage company sponsorship influences children's food choices. Kelly et al., (2011) identifies children's attitudes to food and beverage companies sponsoring sport, while Pettigrew et al., (2013) identifies the extent to which children associate sponsoring brands with sport. Kelly et al., (2011) interviewed children aged 10-14 years (n=103) who were sampled conveniently at their sports clubs. Pettigrew et al., (2013) used a projective technique requiring participants to interpret and respond to ambiguous stimuli. Projective techniques are useful with children because their reasoning and communication skills are less developed than adults (Pettigrew et al., 2013). Children aged five to 12 years (n=164) were given magnets with brands or health messages printed on them and placed their magnets on a board containing logos for eight sports and identify the sports, brands and messages they liked the most. The number of messages and brands placed in close proximity to each sport were analysed (Pettigrew et al., 2013).

Kelly et al., (2011) found children were highly aware of which companies sponsored their sports clubs (Kelly et al., 2011). Seventy-four percent of children could recall sports club sponsors, half of which were food and beverage companies. Most children reported liking these companies (70%) and most (86%) had received a voucher from one of them rewarding their sporting performance. Thirty percent of children reported liking the company more after

receiving the reward voucher. Eighty-five percent of children thought that companies sponsored sport to assist the sport and 59 percent said they purchased the sponsors' foods or beverages because of this. Younger children aged 10 to 11 years were more influenced by sponsorship than older children aged 12 to 14 years (Kelly et al., 2011). Younger children reported liking the rewards vouchers and companies providing vouchers more than older children. Younger children "were significantly more likely to agree that they thought about the sponsors when buying something to eat or drink compared to older children" (Kelly et al., 2011 pp. 4), they were more likely to choose sponsor's brands and "thought that sponsors were cool" (Kelly et al., 2011 pp. 4).

Pettigrew et al., (2013) found most children (76%) correctly assigned at least one sponsor to a sport. More than half of the children correctly associated an Australian Football League team with its long term sponsor, a fast food company. Most children also associated other fast food companies to the same team (Pettigrew et al., 2013). More children aged nine to 12 years correctly associated sponsors with sports than younger children aged five to eight years (Pettigrew et al., 2013).

The sample in the study by (Kelly et al., 2011) was small and non-random and may not be representative of all Australian children belonging to sports clubs. The extent to which children's sponsor recall was influenced by viewing sponsors' signage in their club is uncertain. In contrast Pettigrew et al., (2013) recruited a large sample from the Perth Royal Show. The study does not provide the sample demographics so it is unclear whether these results may be generalised.

Kelly et al., (2011) suggests food and beverage company sponsorship influences young consumers' brand preferences through respondent and operant

conditioning techniques. By associating their brands with the sports club and providing vouchers (operant and respondent conditioning) food and beverage companies attract children's attention, create an association between the brand and club and promote purchases. Pettigrew et al., (2013) concluded that because children associated several fast food brands with a sport sponsored by a fast food company, sponsorship may influence children's preference for all fast food companies rather than a specific sponsor (Pettigrew et al., 2013). However, the results from this study are difficult to interpret as the results are not fully described. An alternative interpretation of these findings is that children are aware that quick service restaurants sponsor some sports, but may not know exactly who the sponsor is and so they guessed, choosing from the available brands. These results may not demonstrate preference for fast foods, rather they suggest fast food companies' sponsorship of sport increases children's awareness of these brands. Because much food and beverage company sponsorship focuses on sports that are popular with children it is important to understand how marketing influences them. The next section discusses how food and beverage company marketing influences children's attitudes and food preferences.

2.11 Marketing food to children

Childhood obesity is a major public health issue. While few studies explore food and beverage company sponsorship in sport there is clear evidence that food marketing affects children's food choice, with numerous studies demonstrating that food marketing to children is effective in influencing children's food preferences and diet (Story and French, 2004; Schor and Ford, 2007; Harris et al., 2009). Children are exposed to marketing through television and the internet. They influence their parents' purchases and, as many also have their own income, they are a major market for a diverse set of goods and services including food and beverages (Schor and Ford, 2007). Estimates

suggest that one-third of children's expenditure is spent on sweets, snacks and beverages (Schor and Ford, 2007).

Global advertising expenditure increased from US\$216 billion to US\$512 billion between 1980 and 2004. The United States food industry is estimated to spend more than any other industry on advertising and in 2004 spent approximately US\$11.26 billion. A significant proportion of food advertising and promotion is targeted at children and youth with much of it promoting high-calorie, nutrient-poor foods and beverages (Hastings et al., 2003). In 2004, Mc Donald's spent \$528.8 billion on advertising with an estimated 40 percent of advertising targeting children. Coca Cola spent \$123.4 million on its Coke Classic brand and PepsiCo spent \$104 million on Pepsi-Cola (Schor and Ford, 2007). Marketers are well aware that children's television viewing is not confined to children's time slots as they watch both prime time and non age-segregated media and because of this it is difficult to calculate the full exposure of children to marketing (Schor and Ford, 2007). Forms of marketing other than traditional television advertising have grown rapidly in recent years (Harris et al., 2009). Half of all United States food company marketing expenditures targeting youth were spent on marketing techniques other than traditional media (television, radio and print) including the internet, product promotions, prizes, product placement in movies and sports sponsorship (Federal Trade Commission, 2008).

A systematic review undertaken by the United States Institute of Medicine in 2006 concluded that commercial marketing of food and beverages affects children and youth (less than 18 years of age) (Institute of Medicine (U.S.) Committee on Food Marketing and the Diets of Children and Youth, 2006). The Institute of Medicine (2006) review found that most studies focussed on television viewing and few were carefully designed. The reviewers noted that virtually no studies explored marketers' use of integrated marketing platforms

extending across new media or the impact of these new techniques (Institute of Medicine, 2006). Very little is known about the activities marketers use to trigger trial of a brand. Behaviour modification theory suggests brand associations created through sponsorships are likely to be reinforced by new media through on-line branded games and competitions stimulating brand purchase. Research is required to identify how sponsorship associated with integrated marketing platforms influences food choices.

The Institute of Medicine (2006) found strong evidence that television advertising influences food and beverage preferences, food purchasing requests and short term consumption of children aged two to 11 years. Moderate evidence was found suggesting television advertising influences usual dietary intake of children aged two to five years and weak evidence for children aged six to 11 years. However for teens aged 12 to 18 years, the Institute of Medicine (2006) found insufficient evidence that television advertising influences food preferences, food purchase requests, food beliefs, short term consumption or usual dietary intake (Institute of Medicine (U.S.) Committee on Food Marketing and the Diets of Children and Youth, 2006).

Overall, the Institute of Medicine (2006) did not find strong evidence to suggest advertising influences children's dietary intake. Advertising may act as a reinforcer, reminding children about brands and influencing younger children's brand preferences. Advertising influences the short term consumption of young children so may be persuasive enough to stimulate brand trial with this group but not repeat purchasing.

The evidence of an association between television advertising and adiposity was strong for all children aged from two to 18 years. This association remained strong even after taking into account alternative explanations, but did not rule them out. Therefore the Institute of Medicine (2006) considered the

current evidence was not sufficient to conclude a causal relationship exists between television advertising and adiposity (Institute of Medicine (U.S.) Committee on Food Marketing and the Diets of Children and Youth, 2006).

The Hastings Review (2003) is a systematic review of studies on the effects of food promotion to children, in which over 29 000 potentially relevant titles and abstracts were systematically reviewed (Hastings et al., 2003). Updated in 2006, the study included two reviews, the first identified the extent and nature of food promotion to children and the second identified the effects of food promotion on children's food knowledge, preferences and behaviour (Hastings et al., 2006). Using a systematic methodology, 63 studies on the extent and nature of food promotion to children and 70 on its effects were assessed against strict inclusion criteria and were reviewed (Hastings et al., 2006).

The results of the 2006 review confirm those of the 2003 report. These studies found television advertising dominated food marketing to children with indications suggesting this is likely to continue (Hastings et al., 2006). Breakfast cereals, confectionery, savoury snacks and soft drinks were advertised most. The extent of fast food outlets advertising to children had significantly increased over the 10 years between reviews. Children noticed and enjoyed food promotion and also food promotion influenced children's nutritional knowledge, food preferences, purchasing behaviour, food choices and health status (Hastings et al., 2006).

The authors concluded that "it was clear that food promotion influences children's food preferences, purchase behaviour and consumption and that these effects are significant, independent of other influences and operate at both brand and category level" (Hastings et al., 2006, pp. 37). This review likely underestimates the influence of marketing as it focuses on television advertising with little attention given to other forms of advertising or

marketing. Hastings et al., (2006) suggest that product development, distribution and pricing strategies may be as influential as advertising and are part of the marketing mix adopted by food manufacturers, yet little is known about how these factors influence children's food preferences or diet (Hastings et al., 2006).

Two major reviews (Institute of Medicine (U.S.) Committee on Food Marketing and the Diets of Children and Youth, 2006; Hastings et al., 2006) found evidence confirming food advertising influences children's food preferences, purchases and diet. Both reviews focussed on television advertising with most research adopting a cognitive approach to explain how advertising influences children's food preferences (Harris et al., 2009). Neither review explored how other forms of marketing such as sport sponsorship influences children's food choices and likely underestimates the impact that food marketing has on children. Advertising performs a defensive role (Ehrenberg, 1974) reminding children of food and beverage brands while other marketing activities, such as sports sponsorship, create brand associations stimulating trial and repeat purchase. Kelly et al., (2011) show how sports club sponsorship influences children's brand awareness and food preferences. No research explores how national team or international event sponsorship influences children's food choices. Sports stars are role models to many children. The impact of brand associations created using operant and respondent conditioning and vicarious learning may be amplified through the wide exposure of broadcast international sport and associated marketing activities. The impact of food and beverage company marketing on children is likely to be far greater than suggested by the Institute of Medicine, (2006) or Hastings et al., (2006).

2.12 Conclusion

This chapter outlines the growth of sports sponsorship. Regardless of their size, sports organisations are increasingly financially dependent on sponsorship revenue (Scherer et al., 2008) this provides opportunities for companies who can use sports sponsorship to market their products. Data is presented demonstrating significant investments in sponsorship by multinational corporations in global sports events such as the Olympic Games and the FIFA World Cup. In Australia it is estimated that \$600 million is spent annually on sports sponsorship (Jones 2010). No sports sponsorship data is available for New Zealand and the extent to which sports in New Zealand are sponsored by food and beverage companies is unknown.

Debate over how sponsorship works continues. To date, most research into sponsorship uses cognitive information processing theory to explore its effects. These studies have found evidence that sponsorship affects brand awareness and recognition however, few have examined behavioural outcomes. An alternative approach focuses on how sponsorship might influence consumers' environments to prompt and reinforce behaviour. This approach using behaviour modification theory recognises the role respondent and operant conditioning, vicarious learning and ecological design may have on consumers' choices (Nord and Peter, 1980). Rather than viewing sponsorship as persuasive, approaches using behaviour modification suggest it reinforces existing behaviour by maintaining brands' salience levels and triggers brand trials through associated marketing activities, such as competitions and supply arrangements. Given that many fast food sponsors already have high penetration, sponsorship could logically help maintain purchase levels while also encouraging lighter and non-users to trial the brand or purchase more frequently.

Although not often interpreted using a behaviour modification framework the literature nevertheless demonstrates how role models and respondent and operant conditioning are used in sports sponsorship to influence consumers. This influence extends to the many New Zealand children participating in sport. Studies suggest children are particularly influenced by the marketing of food and beverage companies (Institute of Medicine (U.S.) Committee on Food Marketing and the Diets of Children and Youth, 2006; Hastings et al., 2009). While several studies have explored how food and beverage company sponsorship influences children's brand awareness (Kelly et al., 2011; Pettigrew et al., 2013) none have investigated how sports sponsorship influences children's food and beverage preferences and consumption.

The next chapter describes the results of a systematic review identifying and critically appraising research on food environments in sports settings including research into the characteristics and extent of marketing by food and beverage companies in sports settings and the types of food and beverages available.

Chapter Three: Marketing and availability of food and beverages through sports settings

3.1 Introduction

Although many young people participate in sport, surprisingly little is known about food environments in sports settings. To my knowledge, no systematic reviews of this topic have been undertaken. This chapter describes a systematic review that aimed to identify and critically appraise research on food environments in sports settings including research into: the types of food and beverages available; the extent and impact of food and beverage sponsorship and marketing and influence on children's food choices; and views about food environments among key stakeholders including club officials, parents and children. A systematic review methodology was selected because it "aims to review all the available evidence on a carefully formulated research question while using clearly defined methodology to identify, select and critically assess the literature" (Aveyard, 2009 pp. 11-12). Combining data from several studies improves researchers' ability to assess the consistency of results and identify similar effects across different settings and designs, thereby providing evidence of robustness and enabling transferability of findings to other settings (Glasziou et al., 2001).

This chapter is based on the published paper; "Availability and marketing of food and beverages through sports settings: a systematic review" (Carter, et al., 2011) and has been updated and extended.

3.2 Methods

3.2.1 Inclusion criteria

This systematic review was restricted to studies and reviews published since 1985 in English, in peer reviewed journals or research reports. Food was defined as any food or non-alcoholic beverage and excluded food supplements, vitamins or sports supplements. Studies were included if they reported the findings of original research and explored: the nature of foods or beverages available in sports settings; sponsorship and marketing of foods and beverages in sports settings; the association between the marketing, sponsorship or availability of food and food choices in sports settings; and views about food environments in sports settings. Studies were excluded if they related to food and nutrition enhancing sporting performance or were located in schools or commercial gymnasiums. Broad inclusion criteria were applied to identify the range of studies of this topic. Because there were no previous reviews and few studies identified in this review, I included all studies and subsequently excluded none because of quality, though studies were critically appraised and key strengths and weaknesses summarised.

3.2.2 Search strategy

Academic databases provided the primary source of literature for this systematic review. Broad search terms were used to ensure all relevant articles were identified. The following databases were systematically searched: MEDLINE; Psyc INFO; CINAHL; Scopus; SPORT Discus; Cochrane Library; EMBASE; ProQuest; Nutrition and Food Sciences; Google Scholar. The reference lists of retrieved articles included in the review were also searched.

Details of all searches were carefully documented to provide a replicable record of the search process. Records include the date of the search, search terms or

phrases used, the field in which the term was used, the limits applied and details of the search outputs. The detailed search strategy is available in appendix one.

Titles likely to be relevant were identified from the search of databases and reference lists. I assessed abstracts from these titles against inclusion and exclusion criteria. Once an abstract had been reviewed against the inclusion criteria and identified as suitable, a full text copy of the article was obtained.

Data-base searches located 1288 titles. Thirty-four of these were determined to be relevant. The entire article or report was printed, reviewed and screened again using the inclusion and exclusion criteria. Searches of bibliographies of these titles identified a further three reports. Seventeen articles or reports were excluded because they did not meet inclusion criteria. The excluded articles or reports were reviewed by two of my supervisors (LS and RE) who agreed in each case that the article or report did not meet the inclusion criteria. Of these 17 articles, seven were excluded because they did not focus on nutrition or sponsorship by a food or beverage company (D'Arcy et al., 1997; Turley and Shannon, 2000; Lynch and Dunn, 2003; Kokko et al., 2006; Casey et al., 2009; Yancy et al., 2009; Eime et al., 2010), two editorials and two other articles were excluded because they did not report findings of primary studies (Colaguri and Caterson, 2008; Kelly et al., 2010f; Priest et al., 2008; Kelly et al., 2011d) and three reports were excluded because they provided few or no methodological details (Haig and Crabb, 2006; Haig and Crabb, 2007; Kidd and Noble, 2007). Data from a report by Kelly et al., (2010c) was published in two journal articles (Kelly et al., 2010; Kelly et al., 2010b) and two conference proceedings (Kelly et al., 2010d; Kelly et al., 2010e). To avoid repetition only the journal articles were appraised in this systematic review.

Twenty documents met the inclusion criteria and were summarised (and critically appraised). I extracted data from these documents and listed the data in tables under the following headings: research design, aims, methods, main findings, strengths and weaknesses (see appendix two for data extraction template). Articles and reports were classified according to their aims or findings using the four elements of the ANGELO framework (Swinburn et al., 1999) for identifying aspects of the food environment (outlined in chapter one). These are: the physical environment, which refers to what food is available and the extent and nature of marketing and sponsorship; the economic environment which refers to the costs related to food; the political environment which examines formal and informal rules or policies around food; and the socio-cultural environment which refers to people's beliefs and attitudes about food (Swinburn et al., 1999). Some studies explored factors contained within several aspects of the framework.

3.3 Characteristics of the included documents

Seventeen of the 20 documents included in the review were published as peer reviewed journal articles (Corti et al., 1995; Cousens and Slack, 1996; Crisp and Swerrison, 2003; Dobbinson et al., 2006; Maher et al., 2006; Eime et al., 2008; Kelly et al., 2008b; Sherriff et al., 2009; Ireland and Watkins, 2009; Danlychuk and MacIntosh, 2009; Kelly et al., 2010; Kelly et al., 2010b; Naylor et al., 2010; Kelly et al., 2011; Kelly et al., 2011b; Kelly et al., 2011c; Drygas et al., 2011; , and three were research reports (Dobbinson and Hayman, 2002; Mehta et al., 2010; Victoria Health Promotion Foundation, 2010) one of which was peer reviewed. More than half of the studies originated from Australia (n=14), with the remaining studies originating in the United Kingdom (n=2), New Zealand (n=1), the United States (n=1) and Canada (n=2). The characteristics of the documents are outlined in Table 3. The majority of studies were cross sectional surveys (n=11). One used mixed methods, three analysed the contents of

websites, one was an observational study of televised sport and four were qualitative or mixed methods investigations. Data collection methods included in-depth interviews (n=4), telephone surveys (n=4), face to face surveys (n=2), a web-based survey (n=1), postal questionnaire (n=2), website reviews (n=3), analysis of televised sports broadcast (n=1), focus groups (n=1), and two studies used mixed methods designs. Two articles (Kelly et al., 2010; Kelly et al., 2010b) report different aspects of one study. The study populations included parents of children, members of sports clubs, sports club officials and quick serve restaurant managers. Ten studies included food and nutrition among a range of health topics investigated.

Table 3: Summary of literature included in systematic review

Author	Design	Population	Sample	Data collection
Dobbinson and Hayman, (2002)	Cross-sectional survey	Sports clubs in Victoria, Australia	932 clubs	Telephone survey
Kelly et al., (2008a)	Cross-sectional survey	Parents in New South Wales	402 parents	Telephone survey
Victoria Health Promotion Foundation (2010)	Cross-sectional survey	Population of Victoria, Australia	1500 adults aged between 18 and 94	Telephone survey
Kelly et al., (2010)	Cross-sectional survey	Children's sports clubs	108 clubs	Telephone survey
Kelly et al., (2010b)	Cross-sectional survey	Children's sports clubs	108 clubs	Telephone survey
Dobbinson et al.,(2006)	Cross-sectional survey	Sports clubs in Victoria, Australia	640 clubs	Telephone interviews
Drygas et al., (2011)	Cross-sectional survey	European stadia and clubs	85 stadia	Postal survey
Corti et al., (1995)	Cross-sectional survey	Sports clubs and arts organisations in Western Australia	296 health sponsorship funded clubs and arts organisations	Postal survey
Kelly et al., (2011)	Cross-sectional survey	Children, members of New South Wales and Canberra clubs	103 Children	Survey
Kelly et al., (2011c)	Cross-sectional survey	Members of New South Wales and Canberra clubs	40 club and regional association officials and 200 parents	Survey
Eime et al., (2008)	Cross-sectional survey	Sporting organisations in Victoria, Australia	51 Health promotion-funded sporting organisations	Web-based survey

Naylor et al., (2010)	Cross sectional	British Columbia sports facilities	10 sports facilities	Mixed methods
Cousens and Slack (1996)	Qualitative study	North American quick service restaurants (QSR)	21 QSR employees	Interviews
Crisp and Swerisson (2003)	Qualitative study	Sporting organisations in Victoria, Australia	33 sports and funding organisations	Interviews
Ireland and Watkins (2009)	Qualitative study	Members of one football club	11 men and 13 women	Focus groups
Danylchuk and Macintosh (2009)	Qualitative mixed methods	Not identified	253 students, fitness club members and seniors	Written survey followed by focus groups
Sherriff et al., (2009)	Observational study	Australian cricket spectators	3 cricket games	Content analysis of televised games
Maher et al., (2006)	Website review	Sports played by NZ children	107 websites	Website analysis
Mehta et al., (2010)	Website reviews	Sporting organisations in South Australia	8 peak sports organisations and 48 clubs	Website analysis
Kelly et al., (2011b)	Website reviews	Australian national and state sporting organisations	55 websites of popular sports	Website analysis

3.4 The physical environment in sports settings

Ten studies covered aspects of the physical environment including food availability and the extent and nature of sponsorship and promotion related to food in sports settings. Four of the 11 food availability studies used a telephone survey to identify the types of foods sold in sports clubs (Dobbinson and Hayman, 2002; Kelly et al., 2008b; Kelly et al., 2010; Kelly et al., 2010b), and two used written questionnaires (Corti et al., 1995). Three studies reviewed sports organisation websites (Maher et al., 2006; Mehta et al., 2010; Kelly et al., 2011b), one observed televised sports coverage (Sherriff et al., 2009), one used mixed methods (Naylor et al., 2010).

Most studies documenting the food and beverages sold at sports clubs relied on knowledge of the respondents to identify frequently sold foods or practices used to sell healthy foods (Dobbinson et al., 2002; Kelly et al., 2008b; Kelly et al., 2010b). Kelly et al., (2008a) and Kelly et al., (2010b) collected data from different respondents. The findings were closely aligned. The top items reported as sold at clubs (sports drinks, confectionery, soft drinks, sausage sandwiches and pies and pastries) (Kelly et al., 2010b) were also the foods parents considered their children purchased at sports venues (Kelly et al., 2008b).

Kelly et al., (2010b) also considered aspects of the physical environment not reported elsewhere and found that 39 percent of clubs recommended foods and beverages to players to eat prior to competition or training, with most recommending players drink water. Twenty-eight percent provided players with foods or beverages, most frequently water. Most clubs engaged in fundraising that frequently involved food or beverages such as selling foods at events (sausage rolls, soft drinks and water) (Kelly et al., 2010b).

Five studies aimed to identify the extent of food and beverage sponsorship in sport (Maher et al., 2006; Sherriff et al., 2009; Kelly et al., 2010b; Mehta et al.,

2011; Kelly et al., 2011b). Three studies analysed websites to identify which food and beverage companies sponsored sport (Maher et al., 2006; Mehta et al., 2010; Kelly et al., 2011b). Sherriff et al., (2009) reviewed televised games of one sport to quantify the presence of a sponsor's logos, and Kelly et al., (2010b) surveyed club officials to identify the nature and extent of food and beverage sponsorship of children's sports clubs.

Corti et al., (1995) used a mail survey to estimate changes in food provision in sports clubs following the receipt of health sponsorship funding. They report this funding increased the healthy food choices available, however, the extent and nature of the changes are not reported and the impact on the wider food environment remains unknown (Corti et al., 1995). Naylor et al., (2011) used baseline and follow-up vending machine audits and found a 20 percent improvement in the types of foods and beverages sold in vending machines following introduction of a health promotion intervention (Naylor et al., 2011).

Three studies investigated the characteristics and extent of food sponsorship in sports, with all three finding high levels of sponsorship by unhealthy food manufacturers. Maher et al., (2006) reviewed websites of popular sports and found junior sport had significantly more unhealthy food sponsorship when compared to all other sponsorships of junior sport (Maher et al., 2006). Kelly et al., (2010a) found 17 percent of all children's sports club sponsors were food and beverage companies. The sponsoring companies were appraised on the healthiness of the range of foods they sold. Companies selling a higher proportion of healthy foods, in-line with nutrition recommendations for children, were classified as healthy. Half of the sponsoring food and beverage companies did not meet criteria classifying them as healthy sponsors (n=28) (Kelly et al., 2010). Mehta et al., (2011) found food and beverage companies sponsored 63 percent of South Australian children's sports clubs. Ninety-two

percent of sports organisations' sponsors and 84 percent of clubs' sponsors were classified as unhealthy (Mehta et al., 2011).

Sherriff et al., (2009) found, on average, a viewer was potentially exposed to a food sponsor's logo for half the duration of a cricket game (Sherriff et al., 2009). This study, although based on a small sample, nevertheless demonstrates the exposure that sponsors of high profile sports may achieve.

Maher et al., (2006), Kelly et al., (2011b), Mehta et al., (2011) and Sherriff and Griffiths (2009) used the presence of company logos as an indicator of sponsorship. However, as none identified the extent or type of sponsorship received, it was not clear whether sponsorship constituted product, financial contribution, uniforms or naming rights and the full extent of the sponsorship could not be determined. Maher et al., (2006) and Kelly et al., (2011b) used a conservative system to identify unhealthy sponsorship and noted this approach may have underestimated the actual presence of unhealthy sponsorship.

3.5 The economic environment in sports settings

The sole study that addressed the economic environment examined the nature and extent of sponsorship of children's sports clubs and the contribution sponsorship makes to club revenues (Kelly et al., 2010). Most sponsorships were minor with few providing direct funding. Sponsorship included provision of branded equipment, discounted or free food, product rebates, food vouchers and displaying club flyers in shop windows (Kelly et al., 2010). The most frequent benefits sponsors received were branding or signage on players' uniforms. Seventeen percent of all sponsors were food and beverage companies. Their contribution to club revenues was not identified; however, sponsorship from all sources contributed less than a quarter of the revenue for most clubs (Kelly et al., 2010).

3.6 The political environment in sports settings

Seven studies explored the political food environment. Of these, five were cross-sectional studies that explored the process and impact of healthy food policy implementation in sports club environments (Corti et al., 1995; Dobbinson and Hayman, 2002; Crisp and Swerisson, 2003; Dobbinson et al., 2006; Eime et al., 2008). One identified how food policies influenced stadia food environments (Drygas et al., 2011), while another identified the processes quick service restaurants use to make sponsorship decisions (Cousens and Slack, 1996).

All five studies investigating healthy food policy implementation in sports clubs examined food policies and environments as part of a wider study. Healthy food policy implementation aimed to improve the food environment by reducing foods and beverages low in nutritional value and increasing the availability of healthy options. All restricted their samples to clubs or sporting organisations that had received health promotion funding from health agencies. One study described the extent of change that occurred in sports clubs following health sponsorship funding (Corti et al., 1995), two quantified policy development in sports clubs (Dobbinson and Hayman, 2002; Dobbinson et al., 2006), one identified the processes required to implement structural changes in sporting settings (Crisp and Swerrison, 2003), and one examined whether key stakeholders believed creating healthy environments facilitated sports club membership (Eime et al., 2008). Three studies also aimed to identify barriers and supports for club policy development (Dobbinson and Hayman, 2002; Dobbinson et al., 2006; Crisp and Swerrison, 2003). Drygas et al., (2011) examined food policies as part of a wider study identifying the extent of policy development in stadia. This study found few stadia had food policies, and more than half of stadium respondents had little or no control over food outlets in the stadium as they were subcontractors (Drygas et al., 2011).

All the studies reported that health promoting food policies in sports clubs increased the availability of healthier food. However, there were some limitations to the evidence. In particular, all the studies relied on self reported data. Studies stated changes were achieved however, none identified the extent or nature of any changes thus the actual impact of a healthy food policy remains unknown (Corti et al., 1995; Dobbinson and Hayman, 2002; Dobbinson et al., 2006; Crisp and Swerrison, 2003; Eime et al., 2008). Critical success factors identified for successful policy implementation included external support to assist improvements to club catering and at least one supportive club member (Dobbinson and Hayman, 2002; Dobbinson et al., 2006; Crisp and Swerrison, 2003). The authors of these studies suggested changing the type of food provided was more difficult to implement than other health improvements, such as sun-smart or smoke-free policies but neither provided data to support this claim (Dobbinson and Hayman, 2002; Dobbinson et al., 2006; Crisp and Swerrison, 2003) and did not explain the difficulty they foresaw. For example, it is unclear whether there is resistance to change from club members, or caterers, or whether clubs find it difficult to prepare healthy foods in the available facilities. None of the studies identified how food was classified as healthy or unhealthy. All studies included only clubs or sporting organisations receiving health promotion funding, because of this attribute the results may not be generalisable.

The study that examined how quick service restaurants make sponsorship decisions explored sports sponsorship benefits from a marketing perspective (Cousens and Slack, 1996). The findings suggest quick service restaurants used sponsorship to increase foot traffic.

3.7 The socio-cultural food environment in sports settings

Five cross-sectional studies explored perceptions of the socio-cultural food environment in sports settings (Kelly et al., 2008b; Victoria Health Promotion Foundation, 2010; Ireland and Watkins, 2009; Danylchuk and MacIntosh, 2009; Naylor et al., 2010). Two studies investigated consumers' attitudes to food and non-alcoholic beverage companies as sponsors and to government regulation of fast food sponsorship of sport (Victoria Health Promotion Foundation, 2010; Danylchuk and MacIntosh, 2009). One study focussed on understanding perceptions among regular attendees of one stadium towards the food provided (Ireland and Watkins, 2009), and another identified parents' perceptions of the healthfulness of foods and beverages sold to children at community sporting venues and their attitudes towards government regulation of food availability in sport (Kelly et al., 2008b). Naylor et al., (2010) identified whether patrons' attitudes were influenced by providing and promoting healthier food in sports facilities (Naylor et al., 2010).

A study using single sex focus groups found consistent differences in attitudes between men and women regarding food provided at a stadium. Both genders considered the food available was poor quality yet, while men viewed stadium food as a treat, women were concerned about limited food choices and believed the stadium should provide healthier foods especially for children (Ireland and Watkins, 2009). In another study half of the parent participants considered foods sold at sporting venues were unhealthy, based on their assessments of the foods children purchased. Most agreed that government should restrict unhealthy food available in sports settings (Kelly et al., 2008b).

Two studies explored attitudes to food availability and sponsorship in sports settings (Victoria Health Promotion Foundation, 2010; Danylchuk and MacIntosh, 2009). Respondents in one study (students and fitness club

members), identified specific products (e.g. water, healthy snacks) as examples of appropriate potential food and beverage sponsors. This study found respondents who regularly consumed fast foods viewed sponsorship by fast food companies more favourably than those who consumed fast foods less frequently (Danylchuk and MacIntosh, 2009) although the study failed to define how fast food consumption was measured. Naylor et al., (2010) found patrons' food preferences were not influenced by the introduction of a health promotion intervention in sports facilities, although evaluation was completed shortly after programme implementation and this may have influenced findings (Naylor et al., 2010). The other study explored perceptions among the general public of foods available in their local sports clubs (Victoria Health Promotion Foundation, 2010); 51 percent of respondents believed there was not enough healthy food sold. Eighty-two percent believed local sports clubs should take responsibility for promoting healthy eating, but only 49 percent opposed community sports clubs relying on junk food sales to assist with club running costs. Eighty-one percent of respondents supported the removal of junk food sponsorship if the lost revenue was replaced (Victoria Health Promotion Foundation, 2010).

Four papers investigating the socio-cultural environment were affected by methodological problems. The majority of respondents in one study were mothers (78%) with post school education (77%) (Kelly et al., 2008) while most respondents to the second study were female, aged under 22 and as gym members, were likely to be more active than the general population (Danylchuk and MacIntosh, 2009). Neither sample can be generalised to their wider "parent" populations. The other two studies had very low response rates leaving them vulnerable to non-response error (Victoria Health Promotion Foundation, 2010; Ireland and Watkins, 2009).

3.8 Discussion of the literature on food environments in sports settings

This systematic review of research conducted on food environments in sports settings found the physical environment received the greatest research attention; specifically researchers highlighted the energy-dense and nutrient-poor foods and beverages provided at venues and sports clubs (Kelly et al., 2008b; Kelly et al., 2010; Kelly et al., 2010c; Victoria Health Promotion Foundation, 2010). Studies suggested health promotion initiatives such as funding and the introduction of healthy food policies resulted in improvements to the quality of food and beverages available (Corti et al., 1995; Dobbinson and Hayman, 2002; Dobbinson et al., 2006; Crisp and Swerrison, 2003; Eime et al., 2008). Further, sport provides sponsors with opportunities for extensive brand exposure through varied media including the internet and televised coverage (Maher et al., 2006; Sherriff et al., 2009; Mehta et al., 2011; Kelly et al., 2011b). Sponsorship of junior sport by food and beverage companies was dominated by unhealthy foods (Maher et al., 2006; Mehta et al., 2011; Kelly et al., 2010) and one study suggested food and beverage sponsorships cost companies little, as few companies provided direct funding to sports clubs (Kelly et al., 2010).

This review found a limited number of studies with most originating in one jurisdiction. The limited scope of the studies examined included few sports settings, and none investigated all levels of sport, or compared adult and children's sports settings. Many studies were related to health promotion initiatives and data from settings where such initiatives had not occurred was limited. The representativeness of such settings and ability to generalise from these may be questioned.

Most studies reviewed had methodological limitations and used a limited number of measures. Most were un-replicated cross-sectional studies and many relied on self-reported data and so may have been subject to measurement

error. No studies objectively observed foods and beverages available in either clubs or stadia, and therefore were unable to define the environment adequately or quantify their findings. Furthermore, few studies described using validity or reliability measures; only two studies described a method for classifying food as healthy or unhealthy, and neither of these provided sufficient detail to enable replication. Classification of sponsors used the proportion of food and beverage products sold across the product range classified as healthy or unhealthy. However, these papers did not consider the exact nature of product promotion (marketing and/or availability) in this setting i.e. whether it was predominantly healthy or unhealthy. Few studies estimated the impact of interventions and those that did had methodological limitations and short time periods for follow-up.

This systematic review highlighted significant gaps in the literature, including the type and quantity of sports sponsorship at national and regional levels. One study explored food and beverage company sponsorship at junior club level (Kelly et al., 2020) but none explored the extent of sponsorship or types of marketing used across individual sports at club, regional and national levels. Thus, it is unclear whether marketing promotions within junior sport are reinforced by promotions at regional or national levels. Nor did any studies determine which sports are sponsored, why, or how sponsorship arrangements influence the types of foods and beverages sold at clubs and stadia. One study was able to demonstrate how sponsorship may be used to dominate broadcast sport (Sherriff et al., 2009); however, the prevalence of this strategy and its wider effects remain unclear.

There were also gaps in the literature with regard to the political food environment in sports settings. No studies examined whether food and beverage policies included sponsorship of sport and links between sponsorship and the food supplied in sports settings. Some studies suggested health

funding initiatives that link funding provision to requirements for health improvement result in changes, such as the introduction of food policy and improved food choices (Corti et al., 1995; Dobbinson and Hayman, 2002; Dobbinson et al., 2006; Crisp and Swerrison, 2003). Such targeted funding holds promise for improving food environments in sports settings however, further research is required to identify “how” policy influences the food environment in sports settings at club, regional and national levels. No studies of the socio-cultural food environment explored attitudes to food and beverage sponsorship of clubs, regional or national teams, and the only study exploring perceptions of food available at stadia was limited to one stadium.

The economic impact of food and beverage sponsorship at a national level and its influence on regional and club level sponsorship agreements remains largely unknown. The only study exploring this aspect of the food environment found most food and beverage sponsors of junior clubs did not contribute direct funding, and suggested removal of food and beverage sponsors would have little impact on club revenues (Kelly et al., 2010). Further research is required to test this finding.

3.9 Strengths and limitations of the systematic review

This is the first systematic review of the literature of food environments in sports settings. There are several limitations to this review. To my knowledge all relevant articles have been included; however, the search methods and criteria may not have captured all of the relevant literature. For example, studies not reported in English were excluded from the review. Although a possible weakness is that data extraction was carried out solely by myself, the use of agreed inclusion and exclusion criteria, a standard template to guide data extraction, and the review of excluded papers by two of my supervisors should have limited problems due to this approach. The studies originated

from very few countries which raises questions of wider generalisability. The studies were not assessed for quality and several reports had little or no methodological information, limiting my ability to assess the validity of the results. The diverse aims, samples and methodologies created few opportunities for comparison between studies however, where possible, comparisons have been discussed.

3.10 Conclusions

Obesity presents a global health problem and food environments have been identified as a critical area that could be improved to reduce the growing obesity epidemic (World Health Organization, 2009). Research evaluating the effects of tobacco and alcohol marketing has demonstrated that sports settings provide many opportunities for marketing these products (Compton, 1993; Ledwith, 1984; Valdya et al., 1996; Charlton et al., 1997). However, while much is known about the impact of marketing tobacco and alcohol in sports settings, this systematic review demonstrates that little is known about the extent of food marketing in sports settings and how it affects food choices.

More comprehensive studies (including observational studies) are required in sports settings to identify the types of food and beverages available and their influence on the food choices of participants and spectators; the nature, extent and impact of food sponsorship and marketing on participants and spectators; the economic impact of food and beverage sponsorship; the impact of robustly designed health promotion initiatives in sports settings on food intake and health; and the views of children, parents, athletes, spectators and sports officials on food availability and food sponsorship and marketing in sports settings.

Based on these findings, this thesis explores the food and nutrition environment in sports settings and aims to identify whether energy-dense,

nutrient-poor food and beverages, commonly referred to as junk food, are promoted through sport. The objectives for this study are to assess the food environment in New Zealand sports settings by:

- Undertaking key informant interviews with stakeholders to identify their views on the food environment in sports settings.
- Analysing the websites of key sporting codes to assess the characteristics and extent of food and beverage company sponsorship in sport.
- Providing case studies of the food environment in New Zealand sport within two exemplar sports (rugby and netball) at national regional and local levels.
- Directly observing the marketing practices of foods and beverage manufacturers at New Zealand rugby and netball venues.
- Directly observing the characteristics and the extent of the foods and beverages available at New Zealand rugby and netball venues.
- Analysing the websites of national, regional and club rugby and netball organisations to assess the characteristics and extent of food and beverage company sponsorship.
- Analysing food and beverage company marketing observed on televised coverage of national and regional rugby and netball games.

Chapter four outlines the methodology and methods used in this two phase mixed methods study.

Chapter Four: Methodology

4.1 Introduction

This study analyses the food and nutrition environment (policy and practice) in sport and assesses whether energy-dense, nutrient-poor food (commonly referred to as junk food), is promoted through sport. This chapter outlines the methodology and methods used.

This case study was undertaken in two phases using a mixed methods approach. Phase One involved a systematic literature review (described in chapter three); interviews with key informants from national and regional sports organisations and organisations supporting the delivery of sport in New Zealand; and reviews of national and regional sports organisations' websites. Phase Two involved a study of two exemplar sports; rugby and netball. It included direct observations of food environments at rugby and netball games; key informant interviews; reviews of national and regional sports organisations, netball centres, rugby and netball clubs' websites. Data collection and analysis methods are described below.

4.2 Methodology

4.2.1 Mixed methods research methodology

A mixed methods approach combines the data collection methods and analysis of both qualitative and quantitative research methods (Tashakkori and Teddlie, 2010). Mixed methods were used in this study because of its complex research purpose, multiple research questions, and variety of data sources (Newman et al., 2003; Creswell and Clark, 2011). In addition, mixed methods provides a more detailed understanding of the research topic than separate use of either

qualitative or quantitative methods (Tashakkori and Teddlie, 2010; Bergman, 2008, Cresswell and Clark, 2011).

Quantitative methods address questions hypothesising relationships between variables, are usually measured numerically and are associated with ideas about objective social reality (O’Cathin and Thomas, 2006). Qualitative methods are often associated with interpretivism and address questions of socially constructed realities and their meaning (O’Cathin and Thomas, 2006). O’Cathin and Thomas (2006) highlight the debate between different theoretical positions discussing how many researchers consider qualitative and quantitative methods should not be combined in the same research project (O’Cathin and Thomas, 2006). However, others consider using different theoretical and methodological approaches in a study provides more insight than could be offered using a single research method (O’Cathin and Thomas, 2006). Bergman (2008) suggests that from a methodological perspective neither qualitative nor quantitative approaches are more or less valid than each other and the research purpose should determine ontological and epistemological constraints (Bergman, 2008). Fielding (2008) considers that dealing with the varied findings resulting from mixed methods studies produces more complex analyses and a more complete understanding of the topic of study (Fielding, 2008).

However, mixed methods may produce differing findings thus complicating research topics that may previously have been considered straightforward (Fielding, 2008). Creswell et al., (2008) suggest contradictory findings emerging from qualitative and quantitative results may result from data collection or analytical errors and resolving these may require further data collection. Alternatively, researchers may prioritise one data set over another, and give more weight to evidence thought to be more robust (Creswell et al., 2008). Favouring one data set over another is not ideal in resolving conflicting

findings and further examination of the data may be required to explain different findings (Bryman, 2008).

Data are integrated in mixed methods research through triangulation, a term from social science methodology originally referring to using different methods of data collection to confirm the validity of data from a single source (Hammersley, 2008; Erzberger and Kelle, 2003). This approach has been criticised as inadequate by many researchers who consider different research methods and different epistemological concepts relate to different empirical phenomena. These researchers consider validating results by comparing data from different methods may result in misinterpreted commonalities or disparities (Erzberger and Kelle, 2003). However, Hammersley (2008) questions whether different methods or data sources do have differing epistemological assumptions, and if so whether this makes them incompatible. He suggests that differences in fundamental assumptions are not axiomatic when researchers combine data elicited using quantitative and qualitative approaches, but are often at different places on a continuum (Hammersley, 2008). Further Hammersley (2008) contends that a researcher's selection of qualitative or quantitative methods is unlikely to indicate a commitment to an epistemological position (Hammersley, 2008).

The focus of triangulation has shifted from its original purpose of consolidating findings from varied sources; it is now used to develop a more comprehensive understanding of research topics (Hammersley, 2008). Triangulation can be compared with examining an object from two angles. Each angle provides different pictures of the object; these may not authenticate each other, but when combined, may provide more detailed understanding of the research topic (Hammersley, 2008). Using data from different sources can assist in identifying limits to information provided by each data source. Confidence about conclusions is strengthened when data obtained from different sources

confirms the original conclusion. Sources of bias in all data sources must be analysed and compared to ensure they are not biased in the same direction (Hammersley, 2008).

The mixed method model selected for this study was a two phase concurrent triangulation strategy because it provides a more complete picture of food environments in sports settings through increasing the scope and comprehensiveness of the study (Creswell et al., 2003). Different methods were used to collect data concurrently in each phase of the research (Creswell and Clark, 2011). Methods were prioritised equally and strands kept independent during analysis. It was not until the interpretation stage that the results were mixed. The use of qualitative and quantitative methods assisted in confirming and cross-validating different findings within the study (Cresswell et al., 2003).

4.2.2 Case study methodology

Yin (2003) defines a case study as “an empirical inquiry that investigates a contemporary phenomenon within its real-life context” (Yin, 2003 p13). As a research strategy, the case study is a comprehensive method including design logic, techniques for data collection, and data analysis (Yin, 2003). Case studies are an appropriate research strategy when the questions posed are exploratory and explanatory and the researcher has no influence over proceedings (Yin, 2003).

This study focused on understanding the contemporary phenomena of marketing and the availability of food and beverages within the real life context of New Zealand sports settings (Yin, 2003). The two phases of data collection and analysis were carefully planned to provide a comprehensive understanding of this topic. The study posed exploratory and explanatory questions to identify the foods and beverages that were marketed and available in sports settings, and the key factors influencing these choices.

An embedded case study design was chosen for this research. Embedded case study designs explore sub-units within a case providing opportunities for detailed analyses and more profound understandings of the case (Yin, 2003). The two embedded units in this case were studies of rugby and netball. Replication logic was used in selecting each unit so that they predicted similar findings, or when results contrasted, reasons for this were predictable and understood (Yin, 2003). Data collection and analyses were replicated for each embedded unit. The conclusions from each unit were triangulated to identify patterns replicated in each, identify differences and similarities, and explain the results (Yin, 2003).

Quality in case study designs can be achieved through construct validity, external validity and reliability (Yin, 2003). Construct validity is defined as “establishing correct operational measures for the concept under investigation” (Yin, 2003 pp. 34). The study must be examined carefully to be sure the measures selected fulfil the study objectives and provide valid measures of the concept studied (Yin, 2003; Bryman, 2008). Traditional psychometric terms may be applied to measuring food environments. These include inter-rater reliability, and test – re-test reliability (Lytle, 2009). Most published articles using environmental measures do not mention psychometric properties (McKinnon et al., 2009).

This study achieved construct validity through collecting data from many sources including key informant interviews and direct observations; using an established system to classify foods and beverages identified in the study as healthy or unhealthy; test-re-test procedures for analysing broadcast sport; and using two observers to collect observational data. External validity is concerned with whether the results of the study may be generalised beyond the study to the real world and is achieved by selecting a sample representing the population (Bryman, 2008). In this study, external validity was achieved by

selecting key informants and sports organisations from three areas in New Zealand including rural and urban areas, areas of differing deprivation and areas with high populations of Māori and Pacific people. Reliability is the extent to which another researcher could replicate the study and arrive at similar results and conclusions (Yin, 2003). Detailed documentation was used and reported on in this study to ensure it could be replicated by another researcher.

4.3 Researcher perspective

Research is influenced by the assumptions researchers bring to their own work (Cresswell et al., 2003). Reflexivity refers to how a researcher recognises his or her influence on the research process and acknowledges the impact of profession, social status, ethnicity and gender on decisions made during a study (Kuper et al., 2008). As a New Zealand European female with extensive experience as a practitioner in a range of public health nutrition roles, I have strong views about what comprises a healthy food environment. My employment with a Regional Sports Trust shaped my positive view of sports clubs and the role they play in providing opportunities for physical activity and connecting communities. I am passionate about sport and physical activity and spend much of my weekend in sports settings, as a spectator watching my children participate in a range of summer and winter sports, including rugby and netball. My prior learning and professional experiences could have influenced sample selection, data collection and analysis. The impact of my prior learning and experience was reduced by use of a standardised system for classifying foods and beverages as healthy and unhealthy; use of test-re-test procedures during content analysis; use of two researchers to collect data during observations and discussion with, and advice from, my supervisors regarding all aspects of this study.

I undertook test-re-test procedures during website reviews and content analysis of televised sports broadcasts, with assistance from two public health researchers. I was assisted by a public health researcher during Phase Two observations to ensure validity and reliability of data collection. An additional researcher assisted with key informant interviews due to the volume of data collected. Observations involved comprehensive cross checking between researchers to ensure consistent data recording. These researchers had no involvement in key decisions about the research methods and were not involved in data analysis. Therefore it is unlikely they had a significant impact on the results. .

4.4 Methods

4.4.1 Phase One: Key informant interviews and website content analysis

The first phase of this study aimed to investigate the overall food and nutrition environment in New Zealand sport using key informant interviews and content analyses of national and regional sports organisation websites. Specific research questions addressed by this phase were:

- What knowledge and experience do key stakeholders have of marketing and sponsorship of food and beverages in sport, and what are their attitudes towards this practice?
- What are the characteristics of food and beverages marketed and sponsored through sport, and what is the extent of food marketing and sponsorship in sport?
- What knowledge, attitudes and experience do key stakeholders have of food and beverage availability in sport?

- What are the characteristics of food and beverages available at sporting events and to what extent are these available?
- What policies govern the marketing and availability of foods and beverages in selected sporting codes?

4.4.2 Key informant interviews

Eighteen key informant interviews were conducted between August and November 2010. Key informants were purposely selected (Kuper et al., 2008; Malterud, 2001) from national and regional sports organisations (NSO/RSO) to represent a range of sports including those played in summer and winter, by both genders and across varied ethnicities. Senior managers from athletics, basketball, baseball, cricket, hockey, netball, soccer, swimming, tennis, touch rugby, rugby, and rugby league participated in interviews as did managers from key organisations supporting the delivery of all sports. These organisations included Sport and Recreation New Zealand (SPARC, now Sport New Zealand) (n=2), the Health Sponsorship Council (n=1) and Regional Sports Trusts (n=4). These informants were selected for their extensive knowledge across a range of New Zealand sports.

Potential informants were contacted by email to request their participation in the study. Where no response was received after four days, contacts were telephoned and asked to participate in the study. Three people contacted considered another staff member would be better able to provide the appropriate information, and this person was then approached to request their participation in the study. One person declined to be interviewed saying she was too busy. All others agreed to participate in key informant interviews. Once informants had agreed to participate in the study they were provided with an information sheet and asked to complete a consent form (appendix three).

A semi-structured interview was developed incorporating a cognitive response method asking informants to verbalise their thoughts when considering aspects of the sports environment that are influenced by the marketing or promotion of food and non-alcoholic beverages (Britten, 1995). The interview guide developed by a pilot study (Maher, 2007) was modified to meet the aims of this project and reviewed by my supervisors. Three participants were purposely selected to pilot the interview schedule because of their detailed knowledge of sports sponsorship and the sports sector. Participants were a regional sports trust CEO, who was also a board member of a national sports organisation, a senior manager of the New Zealand Health Sponsorship Council, and a manager of a regional sports trust. Two areas of concern were identified during pilot interviews; the interview was too long and the questions regarding sponsorship policy and food policy were repetitive. Following the pilot, the schedule was amended in light of this feedback. The final interview guide is attached as appendix four.

Most interviews were conducted in person, although I conducted two by phone because the key informants were located in another city. Interviews followed a semi-structured interview guide exploring participants' perceptions of the food and beverage companies sponsoring sport and the supporting marketing strategies used. Interviews took between 20 minutes and one hour to complete, were taped and the recordings transcribed. Transcripts were coded using the software NVivo8 and I conducted a thematic analysis of the interview transcripts to identify, analyse and report patterns within the transcripts (Braun and Clarke, 2006). Themes were identified inductively with the importance of the themes identified based on the relevance of what was said in relation to the overall research question and the extent to which it captured an important aspect of this study (Braun and Clarke, 2006; Green and Thorogood, 2004). I thoroughly read interview transcripts several times to identify themes and sub-

themes (Bryman, 2008). Identified themes were discussed with my supervisors prior to coding. The Ethics Administrator, Department of Public Health, University of Otago approved the study.

4.4.3 Content analysis of national and regional sports organisation websites

Using Sport and Recreation New Zealand data analysing New Zealanders' participation in sport (Sport and Recreation New Zealand, 2008), I identified 58 sports played in New Zealand (Sport and Recreation New Zealand, 2008). Google searches identified national and regional sporting organisations' (NSO/RSOs) websites for all 58 sports (n=308). A website was found for every NSO but no websites could be found for 131 RSOs.

4.4.4 Data collection and validation

Food related sponsors were defined as food or beverage companies or brands whose company or brand logo featured on the NSO/RSO website and which the sporting code formally identified as an official sponsor or partner, or that had naming rights of teams or tournaments (Maher et al., 2006). I examined all pages of each identified website between November and December 2010 for evidence of sponsorship.

Data collected included brand or company logos (counted if present) and their location on the website e.g. front page, sponsor's page. Data were then stored on an Excel spread sheet.

A test-re-test reliability study was used to assess inter-observer reliability. Another observer, independently examined a sample of 10 percent (n=30) of the total websites (n = 308) identifying sponsors' logos. The level of consistency between researchers was measured using Cohen's Kappa, which accounts for the level of agreement that may have occurred by chance (Potter and Levine-Donnerstein, 1999). An Intra Class Correlation Coefficient of 0.92 was

calculated, indicating a reasonable level of agreement between researchers (Streiner and Norman, 2008).

4.4.5 Classification of food and beverage sponsors

Food and beverage company sponsors were grouped into the following categories for analysis: food and beverage brands; food and beverage companies; quick service restaurants; bars or restaurants, and supermarkets. The New Zealand Food and Beverage Classification System (NZF&B) was used to classify individual foods or beverages (brands) and companies (Ministry of Health, 2007). This system was developed by independent nutrition experts for the New Zealand Ministry of Health to classify foods and beverages in school canteens. NZF&B was chosen for this study because it considers New Zealand nutrition guidelines, nutrient composition of New Zealand foods and could be used in both phases of the study to classify sponsors and foods and beverages observed as sports events. Using the classification ensured consistency in classifications in both phases of the study and minimised potential researcher bias in classifying foods or beverages as healthy or unhealthy.

Nutrient criteria assess energy, total fat, saturated fat, sodium and fibre with specific criteria for different product groups. Foods classified as healthy met all aspects of each criterion. Foods with nutrient content exceeding any aspect of the criteria were classified as unhealthy. Product lists were obtained from websites of companies identified as sponsors and all products were classified using NZF&B. Companies were considered healthy when at least half of their products met the NZF&B criteria for classification as healthy. For example 37 out of 54 food products listed on one company's website were classified as healthy and therefore this company was classified as healthy. Other companies not meeting these criteria were classified as manufacturing unhealthy food products. Only one of the 70 products manufactured by a small goods

company was classified as healthy and this company was classified as unhealthy. Similarly, only two of the 23 beverages listed on a beverage company were classified as healthy. This company was deemed unhealthy. Quick service restaurants (e.g. McDonalds, Burger King, KFC) and bakeries were classified as unhealthy because of the high proportion of energy-dense foods sold. Bars and restaurants were not classified because the extent and nature of food sold was unclear. Supermarkets were not classified recognising that they sell both healthy and unhealthy foods as well as a range of other products. Tea and coffee were not included in NZF&B and were therefore not classified.

4.4.6 Phase Two: Case study embedded units

Two embedded units were selected to study in detail, at national, regional and club levels during Phase Two of this study. This detailed investigation of the food environment added depth to the data collected during the first phase of the study. Data collection methods were repeated as much as possible so that data collection was consistent between the two phases of the study and results comparable. Methods used in Phase Two were direct observations of food environments in sports settings; interviews with rugby and netball key informants; reviews of regional rugby unions, regional netball associations, netball centres and rugby and netball clubs' websites; and analyses of televised national rugby and netball games. Figure 1 outlines the data collected from both phases of the study.

Netball and rugby were chosen as embedded case study units because they are high profile New Zealand sports, both locally and nationally, operate at all levels (junior, senior club, regional and national), have a large support base, high levels of attendance at events, and televised games attract large audiences. For example, when the national netball team, the Silver Ferns, played three

games against Australia between August and September 2010 the television audiences ranged from 390,260 to 573,350 (Regan, 2011). Similarly, just over half of all New Zealanders aged over five years (2.04 million) watched the All Blacks competing in the Rugby World Cup final (Iain, 2011). Both sports have high participation among young people, Māori and Pacific peoples. Of the 13,611 netball teams registered with netball New Zealand, 6194 were intermediate and primary school-aged children's teams and 3187 teams were secondary school-aged children's teams (Netball New Zealand, 2011). In 2010 the New Zealand Rugby Union had 146,893 registered players of which 74,334 were children aged under 13 (New Zealand Rugby Union, 2010).

Research questions in Phase Two address:

- What knowledge and experience do key stakeholders in **rugby and netball** have of marketing and sponsorship of food and beverages in sport, and what are their attitudes towards this practice?
- What are the characteristics of food and beverages marketed and sponsored through rugby and netball, and what is the extent of food marketing and sponsorship in **rugby and netball**?
- What knowledge, attitudes and experience do key stakeholders have of food and beverage availability in **rugby and netball**?
- What are the characteristics of food and beverages available **at rugby and netball events** and to what extent are these available?
- What policies govern the marketing and availability of foods and beverages in **rugby and netball**?

4.4.7 Observations

Direct observations were used to collect data on the types of foods and beverages available and the marketing practices at national, regional and club rugby and netball games.

Observational research involves systematically observing events to understand interactions occurring in natural settings. Because it takes place in natural not experimental settings it has been described as “*naturalistic research*” (Mays and Pope, 1995). Observational methods help identify differences between people’s perceptions of their environment and reality, and are useful for identifying aspects of which key informants may be unaware.

Observational sampling is usually strategic and aims to identify commonalities and differences between the settings observed (Mays and Pope, 1995). Data recording is selective and purposive to capture all relevant aspects of the object of investigation while excluding irrelevant data. Observational data must be recorded systematically as validity relies on the accuracy of data collection and analysis (Mays and Pope, 1995). Observations of 31 rugby venues and 20 netball venues were undertaken in three regions in New Zealand based on the areas covered by New Zealand’s 17 regional sports trusts; Counties Manukau, Wellington and Otago. The characteristics of these venues are outlined in chapter six. Time constraints and budget limited the study to three regions. These regions were purposively chosen because they have a mix of rural and urban areas, include areas with large Māori and Pacific populations, areas of substantial economic deprivation, and are geographically spread across the North and South Island providing a diverse range across New Zealand.

Each region’s rugby union and netball association website listed all rugby clubs and netball centres; these were used to select rugby clubs and netball centres for observations. A wide range of clubs and netball centres including large and

small, rural and urban from each sport were selected. Google maps were used to identify club locations and travel routes.

It was originally planned to use the NZ Dep 2006 Index of Deprivation (Salmond et al., 2007) in club selection ensuring inclusion of clubs and netball centres from areas with varying levels of socio-economic deprivation. However, it became apparent during sample selection that this was not a good measure of the deprivation level of members. For example, netball centres provide facilities for clubs from wide geographic areas, encompassing areas of differing levels of deprivation, thus the deprivation level of the immediate area where the centre is located may be a poor indicator of the socio-economic status of participants. Many netball clubs do not have club-rooms making it impossible to allocate a deprivation code for their locality. Even for rugby clubs, which are more locally based and usually have club-rooms and hence a clear location, the proportion of club members living within catchment areas for an assigned deprivation index is unknown.

Observations for each sport were completed at different times during the day to ensure they captured variations in food sales and marketing between morning and afternoon games. Morning games were played by children while afternoon games were played by adults. On two separate occasions, ground closures or transfers due to rain meant scheduled observations at Counties Manukau rugby clubs could not be undertaken and this resulted in fewer observations of rugby games in this region. Because the rugby season ended it was not possible to schedule further observations of rugby venues in Counties Manukau. There were no netball cancellations.

An observational data collection tool was developed using the aspects identified by Maher (2007) during a pilot project. That pilot study was based on a previous study observing the food environment around schools (Maher et al.,

2005). In the pilot, key informants were interviewed and asked to identify aspects of food and beverage marketing and availability in sports settings that were likely to be important when observing this setting. The pilot study identified key elements of the food environment in sports settings but did not develop or trial an observational data collection tool. Aspects identified included type and number of sponsors' signs or billboards; type of food preparation facilities; type and price of food and beverages sold at sports games (Maher, 2007).

The observational tool developed for this study was piloted at one regional netball event and one club rugby game in Wellington to test whether the tool captured all aspects of food and beverage company marketing and food sales, and could be easily used in sports settings. Following the pilot, the format for recording billboards or signs at matches was simplified. The final format was a field outline of a rugby field or netball court drawn on a single page. The researcher drew the scoreboard on the outline at each observation to orient data collection. All food and beverage signs or billboards observed were recorded on this page in the approximate location in which they were observed. Food and beverages commonly found in venues were listed on a separate page of the data collection tool, allowing the researcher to record product price and product size (where appropriate). If a product was not available at a venue, a line was drawn through the product on the form. Extra space was allowed for the researcher to add products, their size and price. Additional recording pages were available for large venues with multiple catering options. These pages were used at netball centres operating canteens and shops. A copy of the observational data collection tool may be found in Appendix Five.

Two researchers completed observations together. A standard protocol for observations was developed and discussed prior to data collection at each

venue to ensure consistency of data collection. Each researcher had a University of Otago photo identity card to establish they were bona fide researchers. At each venue, researchers walked the circumference of the ground/venue together to identify any evidence of food or beverage company marketing. The numbers of all advertising signs at each venue were recorded together with details of their location. The name and location of all food and beverage company signs, including billboards, corner flags or other forms of advertising or marketing were recorded.

The type and location of food outlets were recorded. All food and beverages, their price and package size that were observed as available for sale were recorded. Any special marketing techniques, such as price discounts for multiple purchases were documented. Food displays were noted and where possible photographed.

On several occasions rain prevented data being recorded on observation sheets. On these occasions data were recorded in a notebook and entered onto observation sheets immediately following data collection.

In 2011 New Zealand hosted the Rugby World Cup. Because of Rugby World Cup scheduling and demands for stadia for Rugby World Cup games, the New Zealand provincial rugby competition was played over a shorter time period with games played mid-week and Saturdays. All advertising belonging to companies other than Rugby World Cup sponsors was removed from stadia hosting Rugby World Cup games prior to the tournament. All observations, except one regional observation were completed at venues hosting Rugby World Cup games. This was considered when planning observations. As many observations as possible were scheduled for early in the season to avoid Rugby World Cup influence on signage and marketing at stadia. Observations of two national rugby games occurred later in the season, with one at a recently

refurbished venue. It is unclear what impact venue refurbishment and the Rugby World Cup may have had on companies choosing to advertise at this venue, but it is possible there were fewer advertising billboards because of this.

4.4.8 Classification of food and beverages

Food and beverages observed for sale at venues were recorded for analysis. Much of the food observed for sale was freshly prepared on site. For these unpackaged foods, the Concise New Zealand Food Composition Tables (New Zealand Institute for Plant and Food Research, 2009) were used to determine the energy, saturated fat, fibre and sodium content of these foods which were then classified as healthy or unhealthy using the classification system employed in Phase One (Ministry of Health, 2007). For packaged foods, the nutrition information was sourced from manufacturers' websites. When this was unavailable, products were sourced in supermarkets and the product's nutrition information panel was used to determine the nutrient content. Packaged foods were then classified as healthy or unhealthy using the classification system. All food items, their size, price and classification were recorded on an Excel spreadsheet.

4.4.9 Netball and rugby key informant interviews

Thirty-seven key informant interviews were conducted between June and August 2011. Key informants were purposely selected (Kuper et al., 2008; Malterud, 2001) to provide a range of perspectives from national, regional and club rugby and netball, rural and urban clubs, and clubs with a high proportion of Māori and Pacific members.

Key informant interviews used the methodology and interview schedule described in Phase One to allow consistency between each phase of the research. All regional organisation staff for both sports agreed to participate in

interviews. Two netball centre managers declined interviews. Rugby and netball club officials were volunteers. Interviews with these informants required flexibility and most were conducted in the evenings to suit informants. Five informants declined to be interviewed because they were too busy.

4.4.10 Review of netball and rugby websites

Reviews of netball and rugby websites used the methodology described in Phase One. I identified 70 rugby club websites from the complete list of rugby clubs on each regional rugby union website. Thirty-eight clubs had a website; 18 of the 19 Wellington clubs, nine of the 19 Counties Manukau clubs, and 11 of the 31 clubs in Otago. Similarly, 18 netball centre websites were identified from regional netball associations' websites. Netball centres were located in Counties Manukau (n=6), Wellington (n=6) and Otago (n=6). No netball centres listed all netball clubs. Fifty-two netball club websites were identified from weekly sports draws published on netball centre websites and located using Google searches. (Counties Manukau n=12, Wellington n=34 Otago n=6). No website was found for 95 clubs (Counties Manukau n=28, Wellington n=27, Otago n=40). Data were entered on Excel spreadsheets and analysed using simple statistics.

As for Phase One, inter-observer reliability was assessed using a test-re-test reliability study. A randomly selected sample of 10 percent of the websites was independently examined by another researcher (Potter and Levine-Donnerstein, 1999). Cohens Kappa was used to measure the level of consistency between both researchers (Streiner and Norman, 2008). An intraclass correlation coefficient of 0.92 (confidence intervals 0.83 – 0.97) was calculated indicating high levels of agreement between researchers about the presence of absence of food and beverage company sponsorship.

4.4.10 Analysis of televised coverage

Two televised national rugby games and three televised national netball games were analysed to identify the characteristics and extent of food or beverage brand/company sponsorship during broadcast sports events by recording the appearance of food and beverage company logos. It was also initially planned to analyse broadcast coverage of three provincial rugby and netball championship games played during 2011. However, due to New Zealand hosting the Rugby World Cup the New Zealand provincial netball championships were not broadcast and these games could not be analysed. As a result, the extent of food and beverage sponsorship in regional netball and rugby may have been underestimated.

Analysis of broadcasts commenced with the start of play (excluding warm-ups and pre-game interviews) and ended when the final whistle signalled the end of the game. Analysis was divided into game time and advertisement breaks (Sherriff et al., 2010). Data were recorded on a DVD and a stopwatch was used to determine the time each logo was visible (McAllister, 2010). A coding form was developed and piloted by two researchers during one rugby and one netball game (appendix six). No changes were made following this pilot.

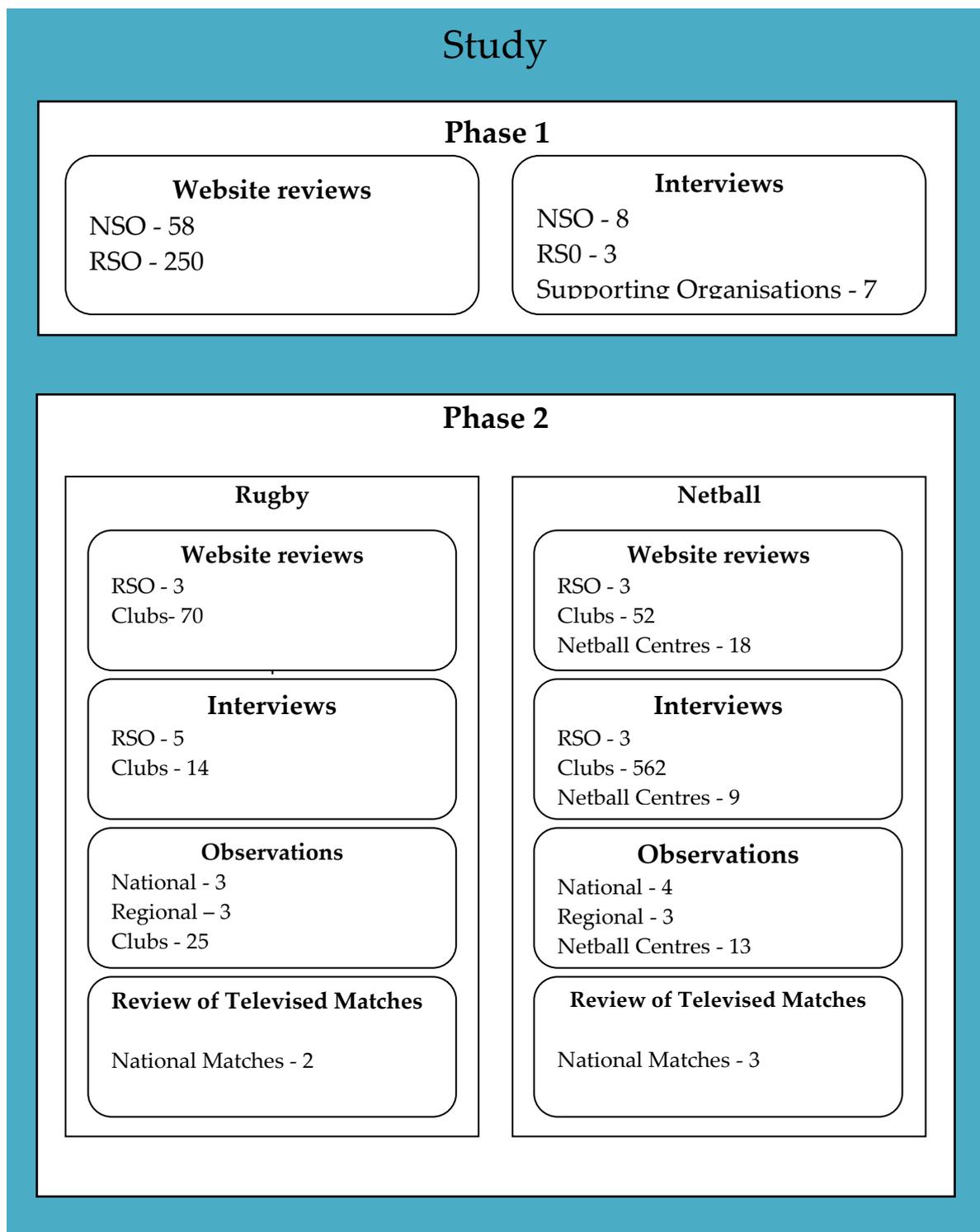
Each telecast was analysed for food and beverage brand/company sponsors' logos screened during the game including logos on advertising hoardings, players' uniforms, on-field sign-writing, goal posts, corner flags, and commercial graphics (Sherriff et al., 2010, McAllister, 2010). Game signage was recorded when at least half of a legible brand name was clearly visible for at least two seconds somewhere in the field or background of a shot, such as on a player, the stadium or goal posts (McAllister, 2010). The duration of clear images were recorded to the nearest second. Data were recorded on an Excel spreadsheet and analysed using simple statistics.

I examined all games to identify food and beverage brand/company logos. Another researcher independently observed the first half of the televised broadcast of one netball game (New Zealand versus England in Auckland) and one rugby game (New Zealand versus Australia in Auckland) to identify food and beverage company sponsorship and advertising visible. I observed food and beverage company logos for 79 percent (23 minutes and 39 seconds) of the 30 minute first half of the netball game. The other observer observed food and beverage company logos for 85 percent (25 minutes and 37 seconds) during the first half of the netball game. A difference of six percent (one minute 58 seconds) occurred between observers for the total time sponsors' logos were visible. I observed food and beverage company logos for two percent (58 seconds) of the 40 minute first half of the rugby game. The other observer observed food and beverage company logos for four percent (one minute 28 seconds) of the first half. A difference of 30 seconds occurred between observers for the total time sponsors' logos were visible. Because of the small sample size it was not possible to test this difference statistically.

4.5 Conclusion

This chapter outlines the mixed methods approach adopted for this study of food environments in sports settings. The research uses a two-phase case study approach. The first phase focuses on national and regional sports organisation and includes key informant interviews and reviews of national and regional sports organisations' websites. The second phase studies two embedded units (rugby and netball) with multiple data sources providing a detailed investigation of sport in New Zealand. Figure 1 shows the overall data collected and methods used in each phase of this study.

Figure 1: Data collection and methods for phase one and two



Results of Phase One are presented in chapter five and results of Phase Two are presented in chapter six. The results from each phase are triangulated in chapter six. Chapter seven discusses the success of these methods for

identifying whether energy-dense nutrient-poor food is marketed and available in sports settings and conclude this thesis.

Chapter Five: Marketing and Availability of Foods and Beverages in National and Regional Sports Organisations

5.1 Introduction

This chapter presents results from key informant interviews and reviews of National and Regional Sports Organisations (NSO/RSOs) websites about marketing and availability of foods and beverages. The chapter first describes key informants' perceptions of food and beverage company marketing in sport and factors influencing this. Findings from reviews of NSO/RSO websites, which identify which food and beverage companies sponsor sport, follow this. Key informants' knowledge, experiences and attitudes towards policies on food and beverage availability at sports are then outlined. Following this, informants' perceptions about policies and regulation governing the availability and marketing of foods and beverages in sport are described.

Data were collected between May and September 2010 to coincide with the winter sports season. Detailed information on Phase One data collection methods and analysis is presented in chapter four. A discussion of these results is presented in chapter seven.

5.2 Key informant classifications of sports organisations

Throughout the interviews informants discussed sport and sports organisations as belonging to differing levels: national, regional and clubs. National Sports Organisations (NSOs) are: national organisations that maintain the rules and organisation of a sporting code; work with regional levels of the same sporting code to support clubs; and manage national representative teams for their code (Ferkins, 2007). Regional Sports Organisations (RSOs) manage and develop regional representative teams and support clubs within a defined geographic region, which differ for each sport. Clubs are the "grassroots" organisations for

sport, they develop infrastructure and provide formal opportunities for individuals to play sport (Cordery and Baskerville, 2010).

5.3 Informant perceptions about marketing and sponsorship of foods and beverages

5.3.1 Extent of marketing and sponsorship by food and beverage companies in sport

Most informants considered there was limited marketing by food and beverage companies in New Zealand sport. Because of this they frequently discussed all marketing that occurred in sport, as well as food and beverage company marketing. Participants perceived the food and beverage marketing they felt did occur was sponsorship and was limited to a few high profile sports.

Informants were asked to identify ways that food and beverage companies were involved in sport. Over half of the NSO/RSO informants (n=6) stated their sport had no food or beverage sponsorship and none identified any other form of involvement by food or beverage companies in their sport. Some said they were seeking sponsorship, or would like to establish a relationship with a food or beverage company.

However, the informants described barriers to obtaining sponsorship. For example, they described lack of staff capacity as a constraint. Most were from organisations with few staff (although numbers of participants in the sport were often large), where sponsorship was usually not included in staff responsibilities and therefore not always a priority. As one informant said:

Our team here is only seven and that covering 20,000 odd people in a sport. So you don't always have the dedicated resource to go out and just keep pursuing sponsorship and that's what you need because sponsors need to be spoken to all the time and have that relationship. I don't think people put the time, or have the ability to

put the time towards building those relationships (Female, Athletics).

Of the remaining NSO/RSO informants, four described marketing by food or beverage companies in their sport as limited, such as providing breakfast cereals for the elite team following morning training and bottled water to tournaments. A few informants described fast food company sponsorship of 'player of the day' certificates for their junior club teams as a limited form of sponsorship. This was not considered a significant sponsorship from the NSO's perspective as it focussed on providing certificates to children at clubs, with little or no funds provided to the club and no additional product promotion at regional or national levels.

Three NSO/RSO informants identified sponsorships by food and beverage companies in their sports, which were supported by additional marketing. One sponsorship regarded as extremely successful was the MILO sponsorship of cricket's nationally delivered junior skills programme. Additional marketing included the provision of branded drink bottles, sports equipment, clothing and free samples to participating children. This informant considered the success of the junior skills programme and long term sponsor relationship had resulted in the programme becoming known by the sponsor's brand name: *"It's just morphed into the Milo programme. You know, no one refers to it as the entry level junior cricket programme. It's just the Milo programme"* (Male, Cricket). For this informant, the measure of sponsorship success was based on the sponsor's continuing financial investment. From a marketing perspective, the brand becoming the programme creates strong brand associations between Milo and cricket and gave it high visibility among children and their parents.

Another informant discussed how national sponsorship by the New World supermarket chain enabled netball to provide a weekly reward to volunteers at

every netball centre, while only providing financial support to the NSO. In addition New World provided prize hampers at events, vouchers to feed officials during tournaments and funded a national volunteer programme. These additional sponsorship activities supported the national sponsorship reminding club netball players of the New World brand. The other sponsorship identified by this informant was a supplier relationship with a water company, where the sponsor provided bottled water to teams rather than cash to the NSO.

Only one other informant described significant sponsorships by a food or beverage company in their sport (rugby) which were supported by additional marketing. These were long term sponsorships of the All Blacks (the national rugby team) by Coca Cola and Sanitarium Health Foods, which also sponsored some Super 14 and provincial representative rugby teams. Additional marketing included advertising the association between brands and players, using competitions linking brands and players, and including collectable cards with products to encourage purchase. Sponsorship relationships in rugby were described as multi-tiered, available at different levels and providing sponsors with differing opportunities depending on their level of investment.

This informant made particular mention of licensed promotions which are short term sponsorships that allow companies to use a team's name and image in a promotional campaign. This informant described in detail one previous licensed promotion involving a campaign where collector cards with Super 14 rugby players' images were included in chippie packets. While the informant described this sponsorship as extremely successful it had resulted in intervention by the New Zealand Ministry of Health, who were concerned about the promotion encouraging children to repeatedly purchase potato chips in order to collect a full set of cards. According to this informant, Ministry of Health intervention and the consequent negative publicity arising from the

promotion resulted in the sponsor cancelling the same kind of sponsorship across Australasia (and in other sports) because it was viewed as encouraging the consumption of unhealthy food by children. This informant described the impact of this episode thus:

the Ministry of Health made it very clear to us that we need to be very careful about what sort of products we associate with. Particularly in an environment where we are encouraging consumption or we're encouraging purchase that's related to the sports heroes that kids might have (Male, Rugby).

This informant discussed how two years later a licensed promotion with Sanitarium replicated the previous promotion, building on its success. However, because of the previous negative publicity, and Ministry of Health interventions, the sport had been careful to ensure they established the relationship only with a healthy food product.

Informants from supporting organisations (n=7) said food and beverage companies were involved in sport, however, apart from 'player of the day' certificates no food or beverage company was identified as sponsoring a specific sport or sponsor. Rather, the informants identified general examples of sponsorship including: naming rights; linking television advertising to sports events; providing clubs with branded sports equipment; associating athletes with products; providing free samples at sports events; selling foods for fundraising; and providing branded fridges to club rooms. One informant described how clubs had always sought sponsorship of food products from local food suppliers. The informant said:

I know from my own experience of being involved with events and things you always go to the local supermarket or the local butcher and you try and get, you scrounge whatever you can.... So

everyone's always done it, and then it's really McDonald's who saw hey, that's a really good niche for us because we can do it on a national basis (Female, Sport NZ).

This informant thought that fast food companies had identified this as an opportunity to be involved with clubs on a national basis.

5.3.2 Advertising and signage

Signage refers to the signs around the perimeter of sports grounds and sometimes on the field or court, while advertising refers to other forms of communication including pamphlets, newsletters, uniforms and websites. Over half the NSO/RSO informants noted that advertising was part of all of their sponsorship arrangements providing sponsors with brand exposure opportunities. They described how varied media were used to expose sponsors' brands, including social networks, newsletters, digital signage, the event programme and websites. One noted: *"we do everything we can to get them exposure. And so whether that's website, it's our monthly newsletter, and depending on the level of sponsorship it may even be on a jersey"* (Male, Rugby League). In relation to signage one informant stated:

Part of a sponsorship package will always include things like courtside signage, opportunities for sponsors to display in the foyers heading into arenas, banners can be hung. We really like to expose the brands we're working with. We see a lot of benefits for sponsors in that (Female, Basketball).

A rugby informant identified television as their main vehicle for sponsor advertising and described how they used light emitting diode (LED) screens and scrolling signage around the event to expose sponsors' brands to spectators attending the game and the television audience. This sport demanded a 'clean

stadium' to ensure sponsorship screened on TV was exclusive to their sport. A 'clean stadium' refers to removal of all advertising and signage from the stadium other than that of the sponsors. This informant described how an arc of the field or court and surrounding area is captured as part of a televised sports broadcast, and how this area was kept exclusive for the sponsors' advertising and signage. Ground sponsorship sold by the stadium was not within the televised arc. Hence it was not screened and therefore was not of concern to this informant.

By contrast, a few other informants described limited television coverage of their sport as one reason why it was difficult to attract sponsors or event advertising. For example, one informant while discussing televised coverage asserted:

Again, because we don't get television coverage there's not a lot of demand for companies coming in wanting to advertise. It's slightly different to a rugby, or a soccer or a netball court where there's lots of television. And a lot of the sponsorship comes back to what sort of coverage they're getting in the media on television. We don't get a lot (Male, Swimming).

Informants considered media coverage important for improving their sports' image, and providing exposure for sponsors. They identified a small number of sports they considered more advantaged in all categories of sponsorship because of their regular television coverage, with one informant suggesting these sports: *"hugely benefited from continuous mass media"*. Informants described how most sports must purchase television coverage and due to the expense seldom did so. This limited sponsor involvement because it restricted their brand exposure.

5.3.3 National and regional coordination of marketing relationships

Cricket and netball were the only identified sports where marketing relationships with food or beverage companies were co-ordinated between national and regional organisations.

All other informants said there was no co-ordination of marketing relationships between national and regional sports organisations or clubs. Some considered the structure of sport did not enable sponsorships to flow from national to regional organisations or clubs. Informants described how clubs are independent incorporated societies with their own constitutions and therefore largely independent bodies who are responsible for obtaining their own sponsorship. An informant stated:

See the problem with sport, the structure is such that the clubs are an independent body. They're an incorporated society, they're accountable to themselves to a large degree. And the regional body aren't [sic] even accountable to the national body. Because we've got our own constitution that says who we are. So it's not as easy as it seems. There's not that leveraging that you think (Male, Regional Sports Trust).

A few NSO/RSO informants said they tried to align sponsorship activities across the different levels of their sports. One informant described how lack of alignment between national and regional organisations resulted in regional groups seeking their own funding saying:

But in sport where things aren't so aligned and a little bit more disorganised you've probably got a lot of people in regional space biting off carrots because they need to, to survive. That's probably diluting the effect of a national body hooking into something a bit

larger (a national sponsorship) and feeding down the chain (Male, Football).

In the past this had not been an issue, in part, because their regional organisations had no sponsorship. As sports adopted a more professional approach informants considered this lack of alignment would be an issue that would increasingly need to be addressed.

5.3.4 Benefits of sponsorship

All informants identified the main benefit of sponsorship to sport as financial, increasing resources available for sports. One informant stated: *“Well clearly it puts more resources into the sport, number one and that’s the key benefit for us. We can do what we want to do easier” (Male, Softball)*. One informant described how sponsorship paid for a skilled national coaching programme and said this attracted children to the sport. Other benefits some informants identified included provision of equipment to clubs, or opportunities for clubs to provide something at no cost such as tickets to sponsored events or vouchers for player of the day. An added benefit for sports was leveraging off the sponsorship relationships to promote the sport. One informant suggested that: *“by promoting the competition or their association with it that adds media spend to promoting our brand at the same time” (Female, Netball)*.

Half the NSO/RSO informants described benefits from the sponsor’s perspective. They considered marketers wanted to be associated with successful sports. A range of marketing opportunities were available for sports sponsors. These included naming rights and opportunities to market their foods and beverages, including providing product samples and branded giveaways such as caps, drink bottles, and equipment to junior players.

5.3.5 Use of sponsorship funds

Informants were asked how funds from sponsorship were used by sports organisations. The majority described how sponsorship funding was usually incorporated into the general funds to assist with costs including the elite teams, travel and accommodation for teams, officials and referees, and administration staff. This was described in detail by one informant, who said:

It pays for the machine you see from the outside... It funds all levels of the game. Predominantly the sponsorship is generated by being associated with our high performance brands. But the money that is generated from these sponsorships goes all the way down from the provision of coachforce personnel working in regions and centres to resources, you name it (Female, Sport New Zealand).

A few informants talked about the type of sponsorship received and the level and suggested this may influence how funds were used. They described how clubs may seek sponsorship for specific items as well as to increase general funds. One informant described a range of ways sponsorship may be used by clubs saying:

Some will get sponsorship specifically for things like their premier team, and you know things like uniforms, because they get the sponsor's name on uniforms, some clubs will get sponsorship and put it into their general club funds (Female, Regional Sports Trust).

5.3.6 Sponsor fit

'Sponsor fit' was a theme that emerged from the interviews. Most NSO/RSO informants and several from supporting organisations described how sports would consider the appropriateness of potential sponsors, and appraise the possible positive and negative impacts from an association of the sport with the

sponsor, the 'sponsor fit'. Potential sponsors would be reviewed carefully to assess whether the sponsor's image, and the associated messages were appropriate for their sport. A good fit was identified as beneficial for both the sport and the sponsor. One informant described how sponsors may be vetoed if they had an image detrimental to their sport, saying:

I think if someone came to us from a fast food type of thing we would have to look at it on a case by case basis. But off the top of my head it's something that wouldn't sit comfortably with us. But that doesn't mean that we wouldn't. There is no set policy on the type of brands that we promote (Male, Swimming).

Another discussed the complications of conflicting nutrition messages between a healthy activity and sponsorship by a fast food company and considered that:

Where you have to be careful here is the cross over between food that is perceived to be healthy and beneficial for athletes versus a national sport trying to bring in revenue and run the game. So there's probably a little bit of a clash around some of those things sometimes (Male, Football9).

A few NSO/RSO, informants described situations where sports organisations had declined fast food company sponsorship following internal debate because they considered the relationship was not a good fit. One informant described this saying:

A fast food company came to us and offered some reasonable money and it was quite a good intellectual discussion, does it sit with our brand and what would this do to the brand when you're about healthy lifestyles, and all these other things when suddenly you

attach a fast food which has all these other connotations attached to it (Female, Athletics).

Other informants indicated that association with an unhealthy food sponsor may be less important than funding resulting from sponsorship. One informant contended:

I guess that we were looking for healthy foods, healthy sponsors, whatever that might look like. Now, that said, I'd be the first to say if somebody came to us with food that wasn't quite healthy but had a big cheque book I'd probably look at the cheque book in preference (Male, Softball).

An informant, from a supporting organisation commented that while sports organisations would consider sponsors in regards to their values and fit, he questioned the degree of influence of such issues for potentially lucrative sponsorships, saying: *"How many of them would turn down McDonald's? I don't think any of them would"* (Male, Regional Sports Trust).

5.3.7 Summary of informant perceptions about food and beverage marketing

Marketing by food and beverage companies in New Zealand sport was associated with regularly televised high profile sports. Participants believed these sports had a strong competitive advantage as their regular television coverage helped raise their profile, provided exposure for sponsors, and ultimately helped the sport attract more sponsorship. Informants identified six examples where food and beverage companies supported their sponsorship investment in New Zealand sports with additional marketing. Behaviour modification theory (Nord and Peter, 1980) suggests, through linking their brand with a sport, these sponsorships maintain brand salience, reinforcing consumers' purchasing behaviours and encouraging consumption.

All informants identified the main benefit of sponsorship to the sports as financial since the commercial investment enabled them to allocate more resources to their sport. The results from this study are consistent with a study finding officials in Australian sports clubs and regional associations also consider the main benefits of sponsorship are financial (Kelly et al., 2011c). Many informants reviewed potential sponsorships by considering the appropriateness of the sponsor, and any potential negative impacts an association might have. They aimed to ensure the brand, and associated messages aligned with their sport. These informants appeared to believe a good 'fit' benefited their sport as well as the sponsor. However, other informants indicated that any benefits of being associated with a healthy food sponsor (or the drawbacks of being involved with an unhealthy sponsor) received less weighting than the funding resulting from sponsorship income. No previously reported studies have explored sports administrators' perceptions of sponsor fit and impact of unhealthy sponsorship on sport.

5.4. Review of NSO/RSO websites

Websites of 58 national sporting organisations (NSOs) and 250 regional sporting organisations (RSOs) were located and searched for evidence of food or beverage company sponsorship. A total of 2854 sponsors' logos were identified. The logos of food or beverage company sponsors appeared 186 times (6.5% of all logos) on 74 websites (24 percent of websites accessed). The logos represented 131 individual food or beverage companies or brands. No logos appeared on 234 websites (76%). Of the websites sponsored by food and beverage companies, nine belonged to NSOs and 65 to RSOs.

Of the total of 186 logos that appeared on the websites, logos of bars and restaurants (n=63) appeared most often, followed by logos of unhealthy brands or companies manufacturing unhealthy food products (n=52) and healthy

brands/companies (n=38). Twenty-six were supermarkets' logos and seven logos were unclassified (Table 4). Quick service restaurants (QSR) and bakeries were classified as unhealthy and are counted in Table 4 with other companies and brands classified as unhealthy. Chapter four (methodology) provides full details of the methods used to classify brands and companies as healthy or unhealthy.

Table 4: Frequency of food and beverage sponsors' logos by group or classification

Sponsor group/category	n (%)
Bars and restaurants	63 (33.9)
Unhealthy brands/companies	52 (28.0)
Healthy brands/companies	38 (20.4)
Supermarkets	26 (13.9)
Other unclassified	7 (3.8)

The review identified logos from 36 individual food and beverage companies and most were classified (n=25) as healthy, 10 were classified as manufacturing unhealthy food products, one was not classified. The unclassified company was a large company, which manufactured many brands and did not provide a full product list on its website thus the full product range was not identified. All of the QSR and bakeries were classified as unhealthy. Seven of the 17 logos from individual food or beverage product brands were classified as unhealthy, four as healthy, and six were unclassified (Table 5).

Table 5: Food and beverage companies or brands sponsoring NSO/RSOs

Category	Number of sponsors		Classified healthy		Classified unhealthy		Unclassified	
	n	%	n	%	n	%	n	%
Bars/ restaurants	63	48	0	0	0	0	63	100
Food companies	36	27.5	25	69	10	28	1	3
Brands	17	12.9	4	24	7	41	6	35
QSR/bakeries	12	9.2	0	0	12	100	0	0
Supermarkets	3	2.4	0	0	0	0	3	100

Fifteen food or beverage companies/brands sponsored more than one sport. Four sponsored both NSOs and RSOs within the same sport. Eight of the 15 were classified as unhealthy brands or were companies manufacturing unhealthy food products. New World Supermarket's logo appeared on 15 websites sponsoring more sports than any other company, the majority being RSOs (Table 6). Other frequent sponsors included Pak n' Save supermarkets (n=9), McDonalds (n=9) and Coca Cola (n=8) (Table 6). Other than supermarkets only four frequent sponsors were classified as healthy. These were Hubbards (two sports), the Mad Butcher (three sports), Anchor (one sport) and Milo (one sport). Only one of these companies sponsored an NSO, the rest sponsored RSOs.

Table 6: Food and beverage companies sponsoring more than one NSO/RSO

Sponsor	Classification	Total sponsorships n =	NSOs n =	RSOs n =	Sports sponsored n =
New World	Unclassified	15	1	14	6
Pak n' Save	Unclassified	9	0	9	4
McDonalds	Unhealthy	9	2	7	4
Coca Cola	Unhealthy	8	1	7	4
Anchor	Healthy	6	0	6	1
Mad Butcher	Healthy	4	0	4	3
Subway	Unhealthy	4	0	4	4
Milo	Healthy	3	1	2	1
Powerade	Unhealthy	3	0	3	2
Mizone	Unhealthy	2	2	0	2
Heavens Bakery	Unhealthy	2	0	2	2
Hubbards	Healthy	2	0	2	2
Eta	Unhealthy	2	0	2	2
Cadbury	Unhealthy	2	0	2	2
Fresh Choices	Healthy	2	0	2	2

Rugby had more food and beverage sponsors' logos than other sports, representing almost half of all food and beverage logos. The majority of these were restaurants and bars (Table 7). Most food and beverage sponsors in rugby league and cricket were classified as healthy. Only two sports, touch rugby and badminton, had more unhealthy than healthy sponsors; however these sports had few sponsors overall.

Table 7: Number of food or beverage brand/company sponsors' logos by sports type

Sport	Total number of websites n= 216	Number of websites with any sponsors n =	All sponsors n= (%)		Food and beverage sponsors n= (%)	
Rugby	27	26	970	(38.2)	92	(49.8)
Hockey	27	20	251	(9.9)	5	(2.8)
Basketball	21	15	149	(5.9)	15	(7.6)
Tennis	17	12	151	(5.8)	6	(3.2)
Netball	13	13	140	(5.6)	9	(4.9)
Golf	14	11	151	(5.8)	10	(5.4)
Touch	13	11	71	(2.8)	7	(3.8)
Squash	11	10	121	(4.8)	5	(2.8)
Cricket	7	7	165	(6.5)	14	(7.6)
Football	8	7	85	(3.3)	3	(1.6)
Table tennis	14	7	52	(2.0)	1	(0.6)
Athletics	12	7	39	(1.5)	1	(0.6)
Volleyball	10	5	26	(1.0)	1	(0.6)
Rugby League	5	4	71	(2.8)	5	(2.1)
Badminton	4	3	39	(1.5)	4	(2.2)
Australian Football	6	3	17	(0.7)	1	(0.6)
BMX/FMX	1	1	14	(0.6)	1	(0.6)
Equestrian	1	1	12	(0.5)	1	(0.6)
Surf Ski	1	1	9	(0.4)	2	(1.0)
Water skiing	2	1	7	(0.3)	2	(1.0)
Gaelic Football	2	1	1	(0.1)	1	(0.6)

Table 8 shows the mean number of sponsors' logos per website by sports type. Rugby, with a mean of 37 had the highest mean number of sponsors' logos per website. Cricket with a mean of 24 and rugby league with a mean of 18 had the next highest mean for all sponsors. Rugby, with a mean of 3.5 had the highest mean food and beverage brand/company sponsors' logos per website, followed

by cricket with a mean of two. All other sports had a mean of less than two food and beverage brand/company sponsors' logos per website.

Table 8: Mean and number of sponsors and food and beverage sponsors' logos by sports type*

Sport	Number of websites with sponsors' logos n =	% of food and beverage sponsors' logos	Mean number of all sponsors' logos (Standard Deviation)	Mean number of food and beverage sponsors' logos (Standard Deviation)
Rugby	26	9.5	37 (43.6)	3.5 (1.9)
Cricket	7	8.5	24 (1.9)	2.0 (1.0)
Rugby League	4	7.0	18 (2.2)	1.2 (0.9)
Golf	11	6.6	14 (3.5)	0.9 (1.1)
Hockey	20	2.0	13 (3.6)	0.2 (0.6)
Tennis	12	4.0	13 (3.6)	0.5 (0.9)
Football	7	3.5	12 (2.4)	0.4 (0.8)
Squash	10	4.1	12 (2.6)	0.5 (0.9)
Badminton	3	10.2	13 (2.8)	1.3 (1.0)
Netball	13	6.4	10 (3.6)	0.6 (0.7)
Basketball	15	10.1	10 (3.0)	0.9 (1.1)
Table Tennis	7	1.9	7 (1.5)	1.0 (0.4)
Touch	11	9.8	6 (3.3)	0.6 (0.8)
Australian Football	3	5.9	6 (1.5)	0.3 (0.6)
Volleyball	5	3.8	4 (1.5)	0.2 (0.5)
Athletics	7	2.5	4 (1.1)	0.1 (0.4)

* Calculations include sports with at least three websites, sports with fewer than three websites have been omitted.

In summary, this analysis of NSO/RSO websites was successful in identifying and classifying food and beverage brand/company sponsors' logos' on New Zealand NSO/RSOs websites. Food and beverage brand/company sponsors' logos were a small percentage of total sponsors' logos identified, and both healthy and unhealthy food and beverage brands/companies sponsor sport in

New Zealand. Few brands/companies sponsored more than one sport or NSO/RSO, with supermarkets amongst the most frequent sponsors.

This website review found almost one third of food and beverage brand/company sponsors' logos could be classified as unhealthy. Most sports were sponsored by several categories of food and beverage brands/companies, with few sports sponsored solely by either unhealthy or healthy foods. Few studies have investigated the characteristics and extent of food and beverage company marketing in sport. While one study found food and beverage companies sponsored 17 percent of children's sports clubs (Kelly et al., 2010), another reported that 63 percent of children's clubs and sporting organisations received sponsorship from food and beverage companies (Mehta et al., 2011) and a third found food and beverage companies sponsored nine percent of national and state sporting organisations (Kelly et al., 2011b). While all found less than half of all food and beverage sponsors could be classified as healthy (Kelly et al., 2010; Mehta et al., 2011; Kelly et al., 2011b) only two studies reported significant differences. However, this website review only reveals which companies sponsor sport, it provides no details as to the size, extent or possible impact of the sponsorship. This will be discussed in more detail in chapter seven.

5.5 Stakeholder perceptions about the availability of foods and beverages in sport

5.5.1 Foods and beverages available at sports

All informants identified a similar variety of mostly unhealthy foods and beverages were available at sports events, with no distinction apparent between the type of sport or the level. These included foods high in fat and sugar such as cakes, potato chips, hot chips, pies, savouries, sausage rolls, snack bars and soft drinks. While informants considered there was still a

demand for this food, several had noticed changes to food supplied at sports events with a greater variety of healthier food available such as sandwiches and fruit. One informant described these changes saying: *“It does vary, I think it has changed a bit. I think there’s a greater awareness of providing a range of foods. For example at one of the venues, I’ve noticed a greater range of things like sushi being provided”* (Female, Netball). Coffee carts were mentioned by several informants as a feature of the food available and these were seen as very popular. One informant commented: *“But it’s the coffee carts, they just ring up and say can we come. And you actually will find that that’s got the longest queue”* (Male, Regional Sports Trust).

Informants from sports where they managed the provision of foods and beverages at events discussed how spectators’ changing demands influenced what was provided. These sports actively tried to provide more food choices and, as a result, they provided a wider range of foods and beverages and more healthy choices than had previously been provided at sports events. One informant believed: *“there is still a demand for chips and hotdogs. What we’ve tried to do here is reduce that demand somewhat and open up a wider food market”* (Male, Touch Rugby). Another described conflicting views about the food available at sports events saying:

We get two lots of feedback, one saying oh that’s completely inappropriate food for juniors. And then others are saying it’s really cool, they’ve played really hard all day and we’ll go and buy them hot dogs and chips as a treat at the end of the day (Male, Touch Rugby).

While spectators were purchasing newer choices, informants considered there was still a demand for foods traditionally provided (such as chips, burgers and sausage rolls) both from people who saw

attending an event as a treat, and those who wanted to eat the foods they were used to.

5.5.2 Organisation and management of the food supply

Decisions about foods and beverages provided at sports events were made by either the sport itself, by the venues independently of the sport, or by an event organiser, which in some sports was a regional association. When food was organised by the venue, almost all NSO/RSO informants said they had no influence over what was provided. This was determined by agreements between food vendors and the stadium or facility. Only two informants said their sport was able to influence what was provided and that was in relation to alcoholic beverages and soft drinks rather than food. These sponsors negotiated pourage, or the rights to be the sole supplier of event venue beverages as part of their sponsorship agreement. One informant illustrated this saying:

Now currently under the definitions of how the rights fall between us as the event organiser and the stadiums as the facility owner, when it gets to the food side the stadiums tend to control the food and we control the beverage As to whether the vendors themselves choose what brand of pie or chips to sell I don't really know, but where we're most concerned is around the pourage of the drinks because that's a benefit we've sold (Male, Rugby).

While no informants described any influence of marketing agreements on the provision of food, two NSO/RSO informants described how they ensured sponsors' products were used when hosting corporate clients saying, *"We're quite lucky because sometimes what's stocked inside the arenas in the kiosks won't matter to our partners, they will want them [the sponsors' products] in the hands of corporate consumers and we can offer them exclusivity at our corporate tables"* (Female, Basketball).

All informants from sports which managed the provision of food at their events discussed the importance of providing a range of foods including healthier options. Reasons for this stance were described in the previous section and are illustrated by one informant, who asserted:

We would probably go for the cheapest with some health considerations in and around it. Like for example, once we had a caravan that came and there were hotdogs and such. And I didn't want a bar of it. You know I said get out of here we're not into that space (Male, Regional Sports Trust).

A few informants discussed food organised by volunteers at events and clubs. In this situation, decisions about types of food provided were made by volunteers independently of the sport. Provision of food by volunteers at either events or clubs was viewed as a fundraiser and the selection of foods was based on ease of preparation which usually resulted in packaged foods and sausage sizzles. One informant described this saying:

Often it's just what's easy. The selling of them is done by volunteers and most of them will have packaged foods, the chippies and nuts. They usually go for what's easy to prepare and so you get the cheap nasty, you buy in bulk and you can hold it for a while. Just put it out and you make a little bit of extra money on it (Female, Sport NZ).

Another informant discussed how food provision could be investigated in regards to the image they wanted to promote as a sport but this was not a priority. This informant thought:

You know it's probably something we could start to work on if we had a certain image that we wanted to portray, but I think it's

something again that sports aren't that far down the path with. Sports are about breaking even and getting enough people into the ground rather than portraying certain messages at the game (Male, Softball).

In summary, informants were knowledgeable about the different elements of the environment described by the ANGELO framework (Swinburn et al., 1999). They considered most foods and beverages available at sports events were unhealthy. In most cases, foods and beverages were provided by caterers responding to spectators' demands, and the need to provide healthy foods and beverages was not a priority for these informants. The results of this study were consistent with literature findings. Participants in three earlier studies considered the food provided in sports settings was poor quality (Kelly et al., 2008; Ireland and Watkins, 2009; Victorian Health Promotion Foundation, 2010).

5.6 Informant views about policies governing the availability and marketing of foods and beverages

5.6.1 Description of policies on marketing and availability of food and beverage in informant organisations

Informants were asked whether their (or any other) sports organisation had policies around either the types of food or beverages marketed, or the types of food or beverages sold at sport. None were aware of national or regional sports organisations with a policy on marketing or provision of food. One informant from a supporting organisation discussed nutrition policies that some clubs had written as part of the 'Clubmark programme'. The informant described Clubmark as an Alcohol Advisory Council sponsored programme regional sports clubs had previously delivered to sports clubs. While the focus was on alcohol, clubs were required to develop food policies to receive their Clubmark.

This informant considered that a food policy was written to obtain a Clubmark and was unlikely to have been implemented. The informant described the Clubmark programme as:

Basically it was a tick list of things clubs had to have and one of these was a nutrition policy. And I think no clubs had them, so there's a standard one that if a club wanted we'd give it to them and the club would adopt it. But I doubt it really impacted. They would have just done it to tick the box for the programme (Female, Regional Sports Trust).

Another NSO/RSO informant described a pilot programme his sport had initiated aiming to improve the sports club environment that included a module on the provision of foods and beverages noting:

What we're trying to do is encourage real change, you know like we're not trying to get our clubs to start selling sushi. But in terms of how we provide chips we use the healthy chips guidelines, when they're doing a sausage sizzle to use a low fat sausage and brown bread instead of the alternative (Male, Rugby League).

Only one NSO/RSO informant described a sponsorship policy and this was not specific to food or beverages. The policy was recently written and proposed the NSO approved all RSO sponsors to ensure they were appropriate and there were no clashes. A non-food example of a sponsor related to the adult entertainment industry was used as an example to illustrate what would be considered inappropriate sponsorship within this policy. One NSO/RSO informant discussed guidelines their sport developed for the provision of food for officials and teams at tournaments and events. These aimed to ensure nutritional food was available for officials and competitors but did not extend to food sold to spectators. She said:

We have nutritional guidelines that we give the caterers and say this is the kind of food that we need. Because umpires are performing physically, bench officials have to be alert, that sort of thing. It's not always as easy with the catering provided to the public because very often the venue caterers have their own views on what they will provide (Female, Netball).

5.6.2 Regulation of food and beverage sponsorship in sport

When asked their views about regulating food and beverage company sponsorship in sport, informants were split between a minority who thought it was a positive concept and a slightly greater number viewing this idea negatively. Each group included a mix of those from NSO/RSOs and supporting organisations.

Those who viewed regulation positively saw the potential to limit unhealthy food marketing while enabling the promotion of healthy foods via sport. Informants suggested an approach where healthy foods and beverages were approved as suitable sponsors while unhealthy foods and beverages were restricted from sponsoring sport. They thought this approach had additional benefits because it could influence the marketplace, where companies with healthier products would achieve a competitive advantage and companies with less healthy products would have to reformulate their products to benefit from these opportunities. These informants saw regulation potentially influencing all levels of sport from NSOs through to clubs. While these informants viewed regulation positively they recognised there would be challenges related to funding. One NSO informant considered that:

While I can see the benefits to society of regulating something there would be huge challenges for a lot of sports because that money isn't easy to find and you would be cutting back on staff, you're cutting

back on programme, you're doing whatever it is to ensure there is still a game (Female, Basketball).

Informants who viewed regulation negatively considered it would directly impact on sport by reducing income and, hence what could be provided to participants. One thought that: *"There's no profit buffer, so anything that cuts revenue when you are on a breakeven basis, you have to go back and cut activity to compensate"* (Male, Rugby). While another expressed their concerns saying:

"I guess one of the things I am concerned about are [sic] the avenues that keep getting shut down, but everybody goes [sic] sport's so important for the culture of New Zealand. But, nobody seems to want to pay for it" (Male, Football).

Some informants from both NSO/RSOs and supporting organisations who were opposed to such regulation considered that people should take responsibility for their own food choices. Others described difficulties in obtaining sponsorship income and considered regulation would further reduce their options. Several informants believed regulation could increase the burdens on volunteers as they would have to find alternative sources of income. This would then have an ongoing impact on sport as fewer people would choose to be involved. An informant illustrated their opinion saying:

You know you've got to understand the actual environment that sport is played in at the moment and it's getting so difficult too. It's just [that] to keep sports running it takes so much time and effort out of people and there's less and less people putting their hands up. So the more difficult we actually make it for people the more we probably take it away from the opportunity for New Zealanders to be active (Female, Athletics).

5.6.3 Impact of removing sponsorship by food and beverage companies

While almost half of the informants were opposed to regulation, they provided contradictory responses when asked about the impact of removing food and beverage sponsorship. Most informants said there would be little or no impact on sport as a result of removing food and beverage company sponsorship. Any impact that occurred would be financial but food and beverage company sponsorship was not perceived to be a major source of income. Informants from the two sports currently receiving sponsorship in the form of 'Player of the Day' certificates were among these informants, neither saw this sponsorship as providing their sport with major financial support. One informant suggested:

If we didn't have a food sponsor I don't think it would make a huge difference to us..... outside a little bit of money for us in terms of the general coffers. What we are striving to try and find is that big national sponsor that's going to give us a fair amount of cash, that's going to allow us to promote ourselves better. It will just allow us to do something out there in the market and we are struggling to do that (Male, Touch).

Several informants talked about the impact at club level as likely to be much less than at national or regional level with informants describing the impact as relative to the size of the organisation. One informant said:

In reality it's the big few (sports) where the dough is. Like my rugby club or my daughter's little soccer club, they're not going to notice the difference, wouldn't know. But further up the chain at the regional level, the big successful, like rugby, cricket, netball at a regional level and at a national level, those three plus rugby league, they would notice it (Male, Regional Sports Trust).

Only a few informants saw the potential impact of removing food and beverage company sponsorship as significant. These informants were from sports sponsored by food or beverage companies. They saw the impact as a reduction on total funds influencing all levels of the game. One informant suggested it may result in an increase in funding from players' fees. Another stated:

We would take a significant cash hit which would flow right through the professional game to the amateur games and clubs and that sort of stuff. We're like an addict, we're hooked on sponsors' cash. And any reduction in that has a material impact (Male, Rugby).

A few informants considered food and beverage company sponsorship was: *"probably a bit of a missed opportunity at the moment"* as they saw opportunities to combine messages promoting healthy food with activity messages.

Informants from sports not sponsored by food and beverage companies did not respond to questions about where else they would seek sponsorship. However, they discussed how difficult it was to access any funding in an environment where the funding pool was quite small. Several informants discussed the size of the market in New Zealand and considered there are only a small number of businesses able to afford to sponsor sport at a significant level. Those businesses were described as having significant cash turnover and expected to achieve a return for their investment. One informant thought that:

We've got a mass of very small businesses that just can't afford to be in at the level that those guys (significant sponsors) are spending which is millions. For anybody who's investing millions, you need to have a platform that delivers you significant revenue at the back end (Male, Rugby).

In summary, informants held mixed views about regulation, with no dominant view. While most informants did not consider food and beverage company sponsorship was a major source of income they were still concerned about any potential loss of income that may result from any form of regulation.

5.7 Conclusion

This chapter presents the results of interviews with 18 key informants from NSO/RSOs and organisations supporting sport in New Zealand, and the results of NSO/RSO website reviews to identify and classify food and beverage brand/company sponsors and identify whether junk food is promoted through sport.

Interviews with key informants suggested food and beverage sponsorship was not extensive in New Zealand sport. Data from reviews of NSO/RSO websites supported this, finding more than three-quarters (75.9%) had no overt links with food or beverage companies.

Informants identified six examples where food and beverage companies supported their sponsorship by integrating it with other marketing activities. These companies associate their brands with sports and shape consumers choices by influencing the environment to prompt and reinforce behaviour (Foxall, 1993). These sponsorships use respondent conditioning, operant conditioning, vicarious learning and ecological design to influence consumers' choices (Nord and Peter, 1980). They reinforce existing behaviour by maintaining brands' salience levels and trigger brand trials through associated marketing activities, such as competitions.

Informants identified the main benefits of sponsorship as financial and this funding was incorporated into the general pool to help cover all expenses of the sport. While financial considerations were important informants felt sports

would not always prioritise money if they felt the sponsor would be detrimental to the image of their sports.

No NSO/RSOs had developed a food policy and key informants suggested foods available at sport in New Zealand were dominated by energy-dense, nutrient-poor foods and beverages. Studies suggest that health promoting food policies in sports clubs can increase the availability of healthier food, but are very difficult to implement (Corti et al., 1995; Dobbinson and Hayman, 2002; Dobbinson et al., 2006; Crisp and Swerrison, 2003; Eime et al., 2008). They may hold promise as an avenue to influence food environments in sports settings, but will need careful consideration to ensure they are relevant to sports administrators who do not consider themselves responsible for food provision.

Informants had mixed views regarding regulation of food and beverage environments in sports settings with some considering this could positively influence sport and others seeing this negatively, largely because of the resulting reduction in revenue from food and beverage companies. Three studies found little support from sports administrators or the public for government regulation of food sponsorship in sport (Kelly et al., 2008; Danylchuk and MacIntosh, 2009; Victorian Health Promotion Foundation, 2010).

The following chapter explores these issues in more depth by reporting the results of embedded case studies of rugby and netball.

Chapter Six: Marketing and availability of food and beverages in netball and rugby

6.1 Introduction

This chapter presents findings from a detailed investigation of two exemplar sports, netball and rugby. For each sport the chapter presents first the sample characteristics for the observations and key informant interviews. Then key informants' perceptions of food and beverage company marketing in sport, factors influencing this, and their views on regulation and food policies are described. Following this, the characteristics and extent of food and beverage company marketing are outlined with data obtained from direct observations at games, reviews of club and netball centres' websites and analysis of broadcast games. Knowledge, experiences and attitudes of key informants towards food and beverage availability at sports are examined. The section for each sport concludes by describing the foods and beverages observed at games. The chapter closes by triangulating the findings from each phase of the research.

Phase Two data were collected between March and September 2011 to coincide with the winter sports season. Detailed information on Phase Two data collection methods and analysis is presented in chapter four. A discussion of these results is presented in chapter seven.

6.2 Sample characteristics

6.2.1 Netball sample

Twenty observations were completed at venues hosting four national and three regional netball games and 13 netball centres (Table 9). As defined in chapter

four, netball centres are sports venues that manage the playing facilities and organise club netball competitions. Observations were completed at five Counties Manukau netball centres, four Wellington netball centres, and four Otago netball centres. As the Counties Manukau region did not host national or regional games during the observation timeframe, these regional and national observations were completed at two Auckland venues (Trusts Stadium and Vector Arena).

Venues hosting all national and regional netball games were located in cities. Nine netball centres were located in cities and four in rural towns. Ten were purpose built netball centres while three netball centres were based at schools (two in Otago and one in Wellington). The netball centres based in Otago schools were small compared to other netball centres.

Eighteen key informant interviews were conducted between May and September 2011. Participants included managers from regional netball organisations (RNOs) (Counties Manukau n=1, Wellington n=1, Otago n=1), netball centre administrators (Counties Manukau n=3, Wellington n=4, Otago n=2), and netball club administrators (Counties Manukau n=2, Wellington n= 2, Otago n=2).

Table 9: Summary of netball observations

Level	Event	Venue	Region	Rural/ urban
National	NZ vs Australia	Vector Arena	Auckland	Urban
National	Trans-Tasman Schools	Te Rauparaha Event Centre,	Wellington	Urban
National	NZ Under 17s	Hamilton City Netball Centre	Waikato	Urban
National	NZ Under 21s	Te Rauparaha Event Centre	Wellington	Urban
Regional	ANZ Championships	Trusts Stadium	Auckland	Urban
Regional	ANZ Championships	TSB Arena	Wellington	Urban
Regional	ANZ Championships	Edgar Centre	Otago	Urban
Club	Club competition	Waiuku Netball Centre	Counties	Rural
Club	Club competition	Mangere Netball Centre	Counties	Urban
Club	Club competition	Manurewa Netball Centre	Counties	Urban
Club	Club competition	Papakura Netball Centre	Counties	Urban
Club	Club competition	Pukekohe Netball Centre	Counties	Rural
Club	Club competition	Porirua Netball Centre	Wellington	Urban
Club	Club competition	Motu Kairangi Netball Centre	Wellington	Urban
Club	Club competition	Haitaitai Netball Centre	Wellington	Urban
Club	Club competition	Hutt Netball Centre	Wellington	Urban
Club	Club competition	Edgar Centre	Otago	Urban
Club	Club competition	Taieri Netball Centre	Otago	Urban
Club	Club competition	Wanaka Netball Centre	Otago	Rural
Club	Club competition	Alexandra Netball Centre	Otago	Rural

6.2.2 Rugby sample

Thirty-one observations were completed at 29 venues: three national, three regional venues hosting rugby games and 25 rugby clubs (observations occurred twice at two venues where regional and national games were played) (Table 10). The Counties Manukau region did not host any national or regional

games during the observation timeframe. These observations were instead completed at venues in Auckland and Waikato. Observations were completed at seven Counties Manukau rugby clubs, 11 Wellington venues (nine rugby clubs, one national and one regional game), and 10 Otago venues (nine rugby clubs and one regional game).

All observations of national and regional games were conducted in cities. Four Counties Manukau rugby club observations were conducted in urban clubs and three were rural. All observations in Wellington were conducted in urban clubs as no rural clubs were located in this region. Seven Otago rugby club observations were conducted in urban clubs and two were rural.

Nineteen key informant interviews were conducted between May and September 2011. Participants included managers and staff from regional rugby unions (RRU) (Counties Manukau n=1, Wellington n=2, Otago n=2), and rugby club administrators (Counties Manukau n=5, Wellington n=5, Otago n=4). RRUs were larger organisations than RNOs with more staff in a range of roles. RRU informants were selected from different roles to provide a range of perspectives and included marketing managers (n=2), club liaison officers (n=2) and a club development officer (n=1).

Table 10: Summary of rugby observations

Level	Event	Venue	Region	Rural/ urban
National	NZ v South Africa	Westpac Stadium	Wellington	Urban
National	NZ v Australia	Eden Park	Auckland	Urban
National	Under 17s	St Pauls College	Waikato	Urban
Regional	Super 14	Eden Park	Auckland	Urban
Regional	Super 14	Westpac Stadium	Wellington	Urban
Regional	Super 14	Carisbrook	Otago	Urban
Club	Club	Manurewa Rugby park	Counties	Urban
Club	Club	Waiuku Rugby park	Counties	Rural
Club	Club	Ardmore Rugby Club	Counties	Urban
Club	Club	Weymouth Rugby Club	Counties	Urban
Club	Club	Tuakau Rugby Club	Counties	Rural
Club	Club	Karaka Rugby Club	Counties	Rural
Club	Club	Papakura Rugby Club	Counties	Urban
Club	Club	Te Whaea Park	Wellington	Urban
Club	Club	Kilbirnie Park	Wellington	Urban
Club	Club	Rongotai Ories Rugby Club	Wellington	Urban
Club	Club	Ian Galloway Park	Wellington	Urban
Club	Club	Porirua Park	Wellington	Urban
Club	Club	Tawa Rugby Club	Wellington	Urban
Club	Club	Johnsonville Rugby Club	Wellington	Urban
Club	Club	Petone Rugby Club	Wellington	Urban
Club	Club	Wellington Rugby Club	Wellington	Urban
Club	Club	The Oval	Otago	Urban
Club	Club	Logan Park	Otago	Urban
Club	Club	Alhambra Rugby Club	Otago	Urban
Club	Club	Southern Rugby Club	Otago	Urban
Club	Club	Taieri Rugby Club	Otago	Urban
Club	Club	Sharks Rugby Club	Otago	Urban
Club	Club	Pirates Rugby Club	Otago	Urban
Club	Club	Wanaka Rugby Club	Otago	Rural
Club	Club	Alexandra Rugby Club	Otago	Rural

6.3 Stakeholder views of food and beverage company sponsorship

Key informants were asked to identify food and beverage companies' involvement or sponsorship in netball or rugby. All informants considered this was limited. However, the extent of association differed between sports and level of sport e.g. a regional organisation, netball centre or club.

New World supermarket's sponsorship was the only sponsorship all netball informants identified. Few other food and beverage company sponsorships were identified. One RNO informant identified two food companies (San Remo Pasta and Mother Earth), sponsoring franchise netball teams in a trans-Tasman competition.

RRU informants considered sponsorship was associated with professional teams and several described how Super rugby franchise teams had relationships with the soft drink company sponsoring the national team. Most other RRU sponsors mentioned were unhealthy and included quick service restaurants, snack food companies, a bread company, a dairy company and a confectionery company.

One RRU informant described how youth rugby tournaments were not sponsored and companies were asked for products for giveaways or prizes. Companies provided branded giveaways such as water bottles and T shirts but were not interested in further brand promotion on billboards at youth rugby tournaments. The informant considered products given to children at rugby tournaments were usually unhealthy choices, but were easier to obtain than healthy foods or beverages. The informant described this saying:

I try to get the healthier options, but it always seems a lot harder, and we don't ask for a lot, just like anything you can offer in

regards to giveaways or sport prizes to make it more worthwhile for these children's participation (Male, Rugby).

Few netball centre informants said they received sponsorship from food and beverage companies. Two netball centre informants described relationships with beverage companies (Frucor and Coca Cola) that provided branded refrigerators, and rebates on beverages sold. Both informants identified these sponsorships as important with one emphasising "*we don't jeopardise that (the sponsorship) because there is a money contribution*" (13). While one centre sold the sponsor's full beverage range, the other sold juice, water and sports drinks, but no soft drinks.

One netball centre informant described a sponsorship from a bagel company. This sponsor ran the centre cafe during the winter season, sponsored competitions, and provided competition prizes. Other sponsorships identified by individual informants included quick service restaurants providing 'player of the day' awards and sponsoring a junior competition, and a butcher and baker providing one centre with bread and meat for fund-raising barbecues. This informant from a rural netball centre described how the sponsored bread and sausages allowed teams to fundraise for tournament travel costs.

No netball club informants identified any involvement by food or beverage companies in their clubs. In contrast, all Otago rugby club informants, several Wellington and one Counties Manukau rugby club informant described food and beverage company sponsorship of their clubs. Rugby informants discussed how sponsorship was sourced from local businesses, and many sponsors were members supporting their club. One rugby informant questioned whether club sponsors saw any benefits from sponsorship or whether they perceived it as a donation. The informant noted:

Obviously a lot of them are involved in the club, but a lot of them are local business people that I think see it almost as a donation (Male, Rugby).

Club sponsors included a quick service restaurant providing food platters after senior games, a restaurant providing 'player of the day vouchers' at one club, while a quick service restaurant provided them at another. Most were unhealthy. A beverage company supplied one club with a refrigerator providing its brands were sold. One informant described a relationship with a pizza chain, where club members could purchase cheaper pizzas; however the sponsor provided the club with no funding. Another informant identified the same pizza chain as sponsor of a junior club. Two supermarkets and one food wholesaler were identified as sponsors, but informants were unclear how their clubs benefited from these sponsorships. One informant described how a supermarket chain provided fresh fruit to junior teams, calling this sponsorship. In summary, key informants from each sport identified few food and beverage companies that sponsored national and regional rugby and netball teams. Most sponsors were unhealthy. New World supermarket's national netball sponsorship was promoted to club players at netball centres. Food and beverage company sponsorship was identified by a few netball centres and some rugby club informants. No netball club informants identified any food or beverage companies sponsoring their clubs.

6.4 Informant views of sponsorship benefits

All informants identified the main benefit of sponsorship as the financial support provided to regional sports organisations, netball centres, and netball or rugby clubs. Income from sponsorship helped fund organisational expenses including transport, power, and insurance. Regional sports organisation informants considered additional benefits resulted from associating with

brands they thought were respected. These informants described their regional teams as brands, and considered they were able to leverage off sponsor- spending to promote their own brands and increase their profile. One informant described this saying:

Traditionally these big sort of player promotions cost upwards of about a million dollars, and that's a lot of money for people to be putting in to help promote our brands, our company (Male, Rugby).

Most RNO, RRU and netball centre informants said cash sponsorships were used to reduce their expenses. These sponsorships were difficult to obtain as sponsors usually wished to provide products, which informants did not always find useful. One informant described this saying:

Well our big problem is we only want sponsorship if it's in the form of money and everybody wants to offer products, and so we've got to make sure the product is something of value. But we really want the money. So what we get from anyone, we need to be able to convert it into cash, or it has to be something that we would normally use, that we would have to pay for. So if they gave us stuff that we couldn't sell it wouldn't really be beneficial for us to do that (Female, Netball).

RRU and RNO informants described how they used food products provided via sponsorships to feed representative teams and volunteers thus reducing organisational expenses. Food products were also provided as giveaways to children: *"to enhance their experience"* (1) One RNO informant described giving children attending holiday programmes snack size confectionary bars provided as sponsorship. The informant saw this as a benefit to the RNO because it provided children with *"another positive experience with netball"* (Female, Netball).

Both RNO and netball centre informants considered they received no direct benefits from the national New World sponsorship. This sponsorship supplied vouchers for volunteers, but no financial support to netball centres or regional organisations. Indeed, a few informants considered the national relationship was detrimental to netball centres, as established relationships with local supermarkets, had terminated due to the establishment of the national sponsorship. One informant said;

Lots of centres didn't really see anything at grass roots level, but it actually mucked up existing sponsorships we had with other retailers (Female, Netball).

Another described how his centre was deciding whether to implement the New World sponsorship this season. He saw little benefit for his netball centre as the New World sponsorship provided no income. He would rather promote sponsors who invested in his netball centre. He described this saying:

If we were to then do all the marketing that goes with that, and give out the vouchers, there wouldn't be any benefit for us in doing that, and it would be to the detriment of our other sponsors (Male, Netball).

Informants preferred cash sponsorship with the income generated considered the main sponsorship benefit. Product sponsorships were often unhealthy foods or beverages and were given to children attending tournaments as prizes or rewards. Some key informants saw providing these unhealthy foods as positive for the sport. Club sponsorships may not provide opportunities for sponsors to create brand associations as described in chapter two and may explain why they were not as easy for sports administrators to obtain.

6.5 Food and beverage company marketing at netball and rugby venues

Food and beverage company marketing was visible at all national and regional netball venues, and eight of the 13 netball centres (Counties Manukau, n=3; Wellington, n=2; Otago, n=3) (Table 11). Food or beverage company marketing such as advertising hoardings, signs or banners were observed at 11 out of 29 rugby venues (38%) (Table 12). A quarter (n=120) of the company marketing observed at netball venues promoted foods or beverages. Nine percent (n=23) of the company marketing at rugby venues promoted foods or beverages. These were observed at all national and regional venues and seven rugby clubs (Counties Manukau n=3; Wellington n=3; Otago n=1).

Table 11: Food and beverage company sponsors at netball venues

Venue	Total signs n =	Food/ beverage signs n =	Healthy food and beverage signs n =	Unhealthy food and beverage signs n =	Supermarket signs n=	Bars/ Restaurant signs n=
National/regional						
Vector Arena	91	77	2	1	74	0
Trusts Stadium	66	1	1	0	0	0
TSB Arena	53	1	1	0	0	0
Edgar Centre	47	1	1	0	0	0
NZ vs Australia Schools	28	5	0	0	5	0
NZ vs Australia U21s	24	4	0	0	4	0
NZ U17s	20	5	2	1	2	0
Netball centres						
Waiuku	47	2	0	0	1	1
Pukekohe	45	5	3	2	0	0
Edgar Centre (Club)	39	4	1	2	1	0
Manurewa	10	10	1	0	9	0
Haitaitai	5	3	0	0	3	0
Hutt	3	1	0	1	0	0
Wanaka	1	1	0	1	0	0
Alexandra	1	0	0	0	0	0
Total (%)	480	120	12 (10.0)	8 (6.7)	99 (82.5)	1 (0.8)

Table 12: Food and beverage company sponsors at rugby venues

Venue	Total signs n =	Food/ beverage signs n =	Healthy food and beverage signs n =	Unhealthy food and beverage signs n =	Supermarket signs n=	Bars/ restaurant signs n=	Unclassified n=
National/regional							
Westpac Stadium	51	9	0	7	0	0	2
Eden Park	49	4	1	3	0	0	0
Carisbrook	41	4	1	3	0	0	0
St Pauls	2	0	0	0	0	0	0
Club							
Waiuku	26	1	0	0	1	0	0
Alexandra	26	1	0	0	1	0	0
Petone	23	2	2	0	0	0	0
Karaka	19	0	0	0	0	0	0
Ardmore	9	0	0	0	0	0	0
Kilbirnie park	3	0	0	0	0	0	0
Johnsonville	2	2	0	0	0	2	0
Total (%)	250	23	4 (17.3)	13 (56.6)	2 (8.7)	2 (8.7)	2 (8.7)

Supermarkets (83%, n=99) were the main food and beverage sponsor at netball venues, followed by food and beverage companies/brands classified as healthy (n=12, 10%), those classified as unhealthy (n=8, 6.7%) and bars and restaurants (n=1, 0.8%) (Table 11).

Of the 23 advertising hoardings observed at rugby venues, 13 were classified as unhealthy and four were classified as healthy (Table 12). Two hoardings were unclassified, two advertised supermarkets and two advertised a bar and restaurant. Sponsors classified as healthy included a pasta company, butchers and water company. Those classified as unhealthy were a soft drink company, quick service restaurants (n=8), and a confectionery company. The method used for classifying sponsors' advertising hoardings or signs as healthy or unhealthy is described in chapter four (methodology).

There were more food and beverage company advertising hoardings or signs at seven national and regional netball games (n= 94, 78.3%) than at eight netball centres. However, most of these (n=77) were identified at one national event (Vector Arena), and 74 of these were New World supermarket signs. Seventeen food and beverage company signs were identified at the remaining national and regional venues and 26 at netball centres.

Sponsors used additional marketing techniques to promote their brands at national and regional netball games. The uniforms of ball kids were branded by food sponsors (classified as healthy). At regional games, the announcer welcomed the ball kids using the food sponsor's name. The uniforms of all New Zealand national teams were branded by their national sponsor, New World supermarket. At all national tournaments the sponsor's logo was associated with New Zealand netball on banners placed at the event entrance. New World supermarket's logo was visible on branded clappers given to spectators, officials' uniforms and photographers' identity card lanyards. In

addition the sponsor was promoted at half-time competition when spectators were invited to participate in a competition using New World-branded baskets.

At national rugby and netball games and regional rugby games LED screens were placed courtside or around the perimeter of the game with scrolling signage promoting sponsors. At each national rugby game the sponsors' soft drink logo was screened with other sponsors, at each end of the sign, approximately 31 times for 10 second intervals, and displayed across the whole screen eight times for 10 seconds. No food or beverage company advertising was observed on LED signage at regional rugby games.

At one venue, hosting regional and national rugby games the scoreboard advertised foods sold at the stadia canteens. An advertisement for a pie, chips and drink "combo" screened across the base of the scoreboard 38 times for 30 second intervals during the game. This venue used flat screen televisions located around the concourse to advertise food and beverages and price discounts on multi-item food purchases.

Fridges branded by beverage companies classified as unhealthy were observed at two venues hosting national and regional rugby games, were. Fridges at one of these venues were branded by two different companies. One company classified as unhealthy, branded soft drinks fridges, while the coffee vendors' fridges were branded by a milk company (classified as healthy). Soft drinks advertisements were located on the sides of mobile vans providing catering at a regional game.

At two netball centres, two companies provided free breakfasts to players and spectators to promote their breakfast cereals, both were classified as healthy. Fridges branded by beverage companies (classified as unhealthy) were observed at one regional venue and two netball centres.

In summary, food and beverage company marketing was observed at 25 percent of netball venues. Most marketing was observed at national and regional netball games (94 out of 120 signs) and most promoted New World supermarkets (88.2%). Marketing observed at netball games reinforced the brand associations created by the national sponsorships (Nord and Peter, 1980). Seven percent of food and beverage company signs at netball centres were classified as unhealthy. Nine percent of advertising at rugby venues promoted food or beverage companies (n=23). Most promoted unhealthy foods or beverages and most were observed at national and regional rugby games. Eight percent of marketing observed at rugby clubs were food or beverage companies and most of these were bars or restaurants (38%, n=17) followed by brands or companies classified as unhealthy (27%, n=12). These findings reinforce those from website reviews which suggest food and beverage companies sponsor national and regional sports organisations rather than clubs and netball centres. No studies have examined the contribution food and beverage sponsorship makes to NSO/RSOs' income. One study found food and beverage company sponsorship makes a small contribution to Australian sports club revenues with few sponsors providing direct funding (Kelly et al., 2010).

6.6 Sponsorship observed during televised sport

Televised broadcasts of three national netball games and two national rugby games were analysed to identify the characteristics and extent of food and beverage sponsorship and advertising visible during televised games.

6.6.1 Sponsorship observed during televised netball

Televised coverage of New Zealand playing Australia in Manawatu, New Zealand versus England in Auckland, and New Zealand versus England in Southland were analysed. The same sponsors' logos were observed at each

game; New World (supermarket), Xtra chewing gum (unclassified), Pump water (classified healthy) and San Remo Pasta (classified healthy).

New World's logo was observed during most of each netball game (Table 13), as branded signage was placed along all sides of the court, on the court, around seating areas, on goal post protectors and on players' uniforms. Spectators held New World branded clappers and New World logos moved across the screen as coverage followed the game, with several logos often visible at once.

An LED scrolling banner was placed along the length of one side of the court. Advertising from different companies was screened on this banner, rotating throughout games. Pump, San Remo and Xtra logos were identified on this LED scrolling banner and interspersed with other sponsors (Table 13). Food and beverage company sponsorship and advertising was observed for 78 percent of the game against Australia in Manawatu (47 minutes two seconds), 79 percent of the game against England in Auckland (47 minutes 24 seconds) and 80 percent of the game against England in Southland (48 minutes seven seconds).

Both New World and San Remo supported their sponsorships by advertising during quarter and half-time game breaks (Table 14). Other food and beverage companies advertising during the half-time break of two games were quick serve restaurants (classified as unhealthy).

Table 13: Sponsors observed during televised netball

Sponsor	Logo location and format	Event		
		NZ v Australia Manawatu Time observed	NZ v England, Auckland Time observed	NZ v England, Southland Time observed
New World	Printed centre court Printed full length goal ends Full court length LED scrolling banner Courtside signs and banners Goal wraps NZ Team uniforms Audience clappers	43 min 17 sec	41 min 57 sec	42 min 31 sec
Xtra	Full court length LED scrolling banner	1 min 49 sec	1 min 17 sec	1 min 40 sec
Pump	Full court length LED scrolling banner	1 min 56 sec	1 min 57 sec	2 min 3 sec
San Remo	Full court length LED scrolling banner		2 min 13 sec	1 min 53 sec
Total time any sponsor observed during the game (% sponsors observed)		47 min 2 sec (78)	47 min 24 sec (79)	48 min 7 sec (80)

Table 14: Food and beverage advertisements during televised netball

Event	1 st ¼ Advertisers	Half time advertisers	3 rd ¼ Advertisers
NZ v Australia Manawatu	New World San Remo Pasta	KFC San Remo Pasta	New World San Remo Pasta
NZ v England, Auckland	New World San Remo Pasta	New World	Nil
NZ v England, Southland	New World San Remo Pasta	New World San Remo Pasta Pizza Hutt Burger King	Nil

6.6.2 Sponsorship observed during televised national rugby

Televised broadcast of New Zealand versus South Africa in Wellington, and New Zealand versus Australia in Auckland were analysed. Two food and beverage company logos were identified, one was a low calorie soft drink and the other was a fast food company. Food and beverage company logos were observed for one minute and 16 seconds when New Zealand played South Africa in Wellington and for one minute 25 seconds when New Zealand played Australia in Auckland (Table 15). There were no food or beverage company advertisements at half-time.

Table 15: Food and beverage sponsors observed during televised national rugby

Sponsor	Logo format and location	NZ v South Africa Wellington (90mins) time observed	NZ v Australia Auckland (90mins) time observed
Coke Zero	LED scrolling banner covering full field and both ends	38 seconds	1 min 19 seconds
McDonalds	Sign above seating, goal post end of field	38 seconds	6 seconds
Total time any sponsor observed (% sponsor observed)		1 minute 16 seconds (0.01)	1 minute 25 seconds (0.01)

6.7 Food and beverage company sponsorship of netball centres, netball and rugby clubs identified on websites

Nearly half (46%, n=7) of netball centre websites had no sponsorship of any type. Of those that did 127 sponsors' logos were identified. Only 8.6% (n=11) of those sponsors were food or beverage companies, six of which were classified as unhealthy, two were classified as healthy, two were supermarkets and one was not classified. No bars or restaurants' logos were identified. Unhealthy sponsors were quick service restaurants and a beverage company (Table 16).

Table 16: Food and beverage companies sponsoring netball centres

Netball Centres	Food and beverage n=	Healthy food and beverage n=	Unhealthy food and beverage n=	Unclassified n=	Supermarkets n=
Pukekohe	6	1	4	0	1
Hutt	2	0	1	0	1
Waiuku	1	0	0	1	0
Wellington	1	1	0	0	0
Dunedin	1	0	1	0	0
Totals	11	2	6	1	2

Four netball clubs were sponsored by food or beverage companies. Bars and restaurants were the sole food or beverage company sponsor for three netball clubs. One netball club was sponsored by two different supermarkets (Table 17).

Table 17: Food and beverage companies sponsoring netball clubs

Netball Clubs	Food and beverage n=	Bar/ restaurant n=	Supermarkets n=
Eastern Bays	2	0	2
Monteiths	1	1	0
St Marys Old Girls	1	1	0
Naenae Collegians	1	1	0
Total	5	3	2

A review of club websites found that 26 rugby clubs (37%) were sponsored by food or beverage companies. A total of 547 sponsors' logos were identified of which 45 (8.2%) were food and beverage brand/company logos (Table 18).

Table 18: Food and beverage companies sponsoring rugby clubs

Category	Sponsors n	Classified healthy		Classified Unhealthy		Unclassified	
		n	%	n	%	n	%
Bars/restaurants	17	0	0	0	0	17	100
Food companies	10	9	90	1	10	0	0
Brands	2	1	50	1	50	0	0
QSR/bakeries	10	0	0	10	100	0	0
Supermarkets	6	0	0	0	0	6	10
Total	45	10	22.2	12	26.7	23	51.1

Seventeen were bars or restaurants, 10 were food companies, two were brands, 10 quick service restaurants and six were supermarkets. Twelve sponsors were classified as unhealthy (26.7% of total food and beverage company sponsors) and 10 were classified as healthy (22.2%) (Table: 19).

Table 19: Frequency of sponsors' logos by classification as healthy or unhealthy

Sponsor classification	n (%)
Bars/restaurants	17 (37.8)
Unhealthy brands/companies	12 (26.7)
Healthy brands/companies	10 (22.2)
Supermarkets	6 (13.3)

6.8 Rugby and netball food policies

Informants were asked whether their regional sports organisation, netball centre, netball or rugby club had policies around either the food or beverages marketed or sold at rugby or netball. None were aware of any sports organisations with a policy on marketing or provision of food.

All RRU informants noted they were careful about which food and beverage companies they formed relationships with, and said they would judge each opportunity on its merits. They indicated that they considered the nutrient content of the food and nature of the promotion in decision making. Most RNO informants said that, despite the absence of a formal policy, they understood the importance of healthy food and would not promote unhealthy food, with one informant saying:

There's nothing actually written, we've always been drilled in [sic] you have water and you eat a good meal before or after a game... and there's no way we would be out promoting the local pie or chip shop. That's one area we sort of stay away from. It's got to be healthy, it's got to be fresh, it's got to be all that kind of branding. You know we stay away from the mince pies and the chips (Female, Netball).

In contrast, one RNO informant stated that while they would not promote alcohol, they were unconcerned about food noting: *"if it was a food brand or anything like that we wouldn't be too concerned"*.

When asked why clubs did not have policies one regional informant suggested that clubs were: *"a little bit policy averse"* (10). This informant considered that the volunteer nature of club administration was a barrier to policy implementation as policy development was time consuming. He thought food policies were unlikely to be viewed as relevant by club officials who were interested in sport. The informant considered clubs would think that:

I've got enough things to do now without worrying about your policy which doesn't make sense to me (Female, Netball).

6.9 Regulation

Informants had mixed views about regulating food and beverage sponsorship in netball and rugby with no dominant view apparent. Some informants regarded regulation positively and thought it would not affect their organisation, centre or club since they had little or no food and beverage company sponsorship. One informant described this saying:

Well it wouldn't affect us at all. We would just carry on. We are not making money from the food sponsorship, it's only player of the day. If we don't get that [voucher] we will make one player of the day anyway (Male, Rugby).

These informants viewed regulation as positive for the community as it would help promote consistent messages about physical activity and healthy eating. One informant stated:

I know there has always been the concern about, you know, the amount of kids who are consuming all the fizzy drinks and all the bad foods. You know down here on a Saturday morning it's all the lollies and all that kind of thing. But personally I think if there was more regulation put in that would be beneficial for the community. I don't think it would affect us too much if we didn't sell those types of foods here, because the only other option is to buy more of the healthy option, which is beneficial for the kids (Female, Netball).

However, others did not support regulation and saw food choices as a personal responsibility. They regarded sponsorship as difficult to obtain and saw little benefit in removing another funding avenue as one noted: *"sponsorship is so hard to come by that to regulate against it I think would destroy some areas of sport"* (Female, Netball).

Some informants were uncertain whether they viewed regulation positively or negatively, and wanted further information. For example, some informants questioned which foods would be classified as junk foods and how regulation might affect them. One stated: *“well I guess that depends on what they classify as junk food”*(Female, Netball). Another, who was uncertain, considered there were positive and negative aspects to sponsorship and said: *“it’s a tough one, because most of those are companies that give back to the community as well”* (Female, Netball).

Irrespective of how they viewed regulation, most netball informants considered that since netball had few food and beverage sponsorships their RNO netball centre or club would notice little impact if these were no longer available. However, some minority voices emerged; one RNO informant considered regulation would reduce the cash income of Netball New Zealand and netball centres. Another informant, from a rural netball centre thought because sponsorship was difficult to obtain in rural areas, the removal of food and beverage sponsorship would result in increased costs for players saying:

If we didn’t get sponsorship each year for the bread that we run for the sausage sizzles and stuff [sic], I think we would struggle. It means it becomes more of really a user pays type thing for our kids. It costs them more each year if we don’t get our fundraising and sponsorship from organisations and businesses (Female, Netball).

All RRU informants considered that removing food and beverage sponsorship would impact significantly on rugby. They described how any reduction in income was significant for sports organisations who worked on a break-even basis. Product sponsorships used to feed players and officials would need to be purchased. Foods used as prizes or giveaways could be replaced; however, informants suggested it was difficult to find suitable alternatives.

Several informants suggested regulating food sponsorship would be hard to justify because sports aligned with both healthy and unhealthy companies. These informants did not consider food and beverage sponsorship promoted sales of unhealthy food products. One informant described this saying:

Our food and beverage sponsorship, it's not about promoting junk food you know, we're aligned with Pump water, we're aligned with Powerade, and these are the products that highly paid professional athletes drink. So it's not as if we're directly promoting sugary drinks that are going to rot your teeth. We're talking about things here that are important for athletic performance (Male, Rugby).

Another informant described how food companies provided branded water bottles or T-shirts, rather than food products and as a result, this informant did not consider companies promoted unhealthy foods.

On balance, informants were relatively evenly split about whether they viewed the regulation of food and beverage sponsorship in sport positively or negatively. However, all netball informants considered regulation would have little impact on netball as few clubs or regional organisations were sponsored by food or beverage companies. In contrast, most rugby informants considered that because it would reduce income, regulation would have a significant impact on rugby.

6.10 Summary of netball and rugby marketing and sponsorship

This section described the characteristics and extent of food and beverage company marketing in rugby and netball. Key informants considered food and beverage company marketing was limited. Netball informants identified few sponsors other than New World's sponsorship of New Zealand netball. Rugby informants identified mostly unhealthy food companies sponsoring national

and regional rugby organisations. All informants identified few food and beverage companies sponsoring netball centres or rugby clubs and these were mostly unhealthy. No informants identified any food or beverage companies sponsoring netball clubs. No previously reported studies have explored sports administrators' perceptions of the extent of food and beverage sponsorship in sport.

Observations and website reviews supported informants' perceptions that few food and beverage companies sponsored regional netball organisations, rugby clubs or netball centres. Only 8.6 percent of netball centre sponsors (n=11) and 8.2 percent of rugby club sponsors (n=45) were food or beverage companies. The majority of netball centres food and beverage company sponsors were classified as unhealthy, while the majority of rugby club sponsors were bars and restaurants.

Food or beverage company marketing was observed at all national and regional netball venues and most netball centres, most of these signs belonged to one sponsor, New World supermarkets. Food and beverage company marketing was observed at 38 percent of rugby venues, and just over half of the signs were classified as unhealthy (n=13). Few sports clubs or netball centres were sponsored by food or beverage companies, and in most cases these were local businesses which may have considered their sponsorship a donation (Zinger and O'Reilly, 2010). Studies suggest frequent attendance at sports games increases consumers' brand awareness, with highest awareness for brands with most venue advertising (Stotlar and Johnson, 1989; Cunneen and Harris, 1993). Clubs provide marketers few opportunities to increase brand awareness. This may explain sponsors' preference for national and regional sports organisations.

Food and beverage company brands were observed throughout most of each televised broadcast of national netball games but for less than two minutes during broadcast national rugby games. Regular television coverage provides frequent opportunities for marketers to strengthen and reinforce brand associations through repeated brand exposure (Sherriff et al., 2009; McAllister, 2010).

No netball or rugby organisation had food and beverage marketing policies. Informants had mixed views about regulation and how this might impact on rugby and netball. The next section describes food and beverage availability at netball and rugby venues.

6.11 Stakeholder views of food and beverage availability and determinants of availability.

This section explores stakeholders' views about availability of foods and beverages at netball and rugby games and the influences on that availability. According to most informants unhealthy foods such as cakes, pies, burgers, hotdogs, chips, fizzy drinks, and lollies were among the main types of foods and beverages provided at netball and rugby venues. Many informants described these foods as normal or usual. One informant expressed this saying;

I mean it's your typical food, which I suppose you get at any netball courts or rugby place. It's hot chips, hot dogs. You know, things like that (14).

Informants mentioned several factors that they felt influenced and determined food and beverage availability. Firstly, all regional netball and rugby informants noted that the venue's contracted caterers usually organised catering at regional games. These caterers operated as a business and were motivated by profit. As one informant commented:

Facilities and venues are trying to make money. They have caterers who are independent and at the end of the day they have a bottom line. They know what they need to make and what sells (2).

Informants from netball centres with canteens also noted that contracted caterers ran the kitchen and typically decided which food and beverages to sell. All rugby club informants said their kitchens were leased to caterers, and clubs made no profit from food sales. Most rugby informants said food was sold at rugby clubs, from either a canteen at games or a kitchen during the evenings. Foods sold at stadia were of little concern to RRU informants as food sales provided the RRU with no income. However RRUs were able to ensure non-alcoholic beverages sold at rugby venues were their sponsors' products.

Another influence mentioned was consumer demand. One informant described how netball venues providing unhealthy foods were responding to demand saying:

When they come to a game they want to eat it straight away, and it might perhaps be hot chips and unfortunately that's what kids want, and that's what kids seem to expect when they come to a game (10).

Another informant considered healthy food sold at centres was expensive and so parents choose cheaper, less healthy options for their children such as pies or chips saying:

You're rushed as I am on a Saturday and you haven't had any lunch. I know I'm going to have to dish out \$15 to buy them something healthy so I think you can just have that pottle of chips (10).

Netball informants also discussed how each netball centre was an incorporated society with its own structure and board and each made its own decisions about what foods to provide. RNOs had no input into food management at netball centres. When describing foods provided at netball centres, RNO informants considered there was more healthy food available than had previously been offered, but unhealthy options still dominated menus. One informant described how cafeterias were the main source of income for some netball centres, and they sold foods such as lollies to increase their profits. This informant asserted:

Some centres make a killing from their cafeteria. That's their main source of income, and you'd be surprised at the amount of lollies they sell. Well you wouldn't be surprised actually. The amount of money, I'm absolutely gobsmacked (2).

A few netball centres increased their income by running a small shop (as well as a canteen), staffed by volunteers selling snack foods such as lollies, potato chips, ice-blocks and drinks. An informant described this saying:

It's a fundraising thing and you name it, it's there. Coke's our main sponsor for the tuck-shop, but we do have bars in there like Crunchie, Moro, chips, Cookie Time biscuits, ice-blocks, a good range of ice-blocks. What else is there? We've got loose lollies of course, bags of lollies (11).

Several informants from netball centres without canteens described how a coffee cart provided hot drinks and some small food items. Most of these netball centres provided teams with opportunities to fundraise by selling barbecued sausages and drinks. Several rugby informants discussed using food for club fundraising including sausage sizzles, with informants saying these occurred once or twice a year. Another rugby informant described how clubs

fundraised by providing catering at children's tournaments. This informant described the food as: *"the same old food you know, it's like pies and chips and stuff like that"* (2).

One RNO informant discussed how venue facilities restricted food and beverage provision when organising tournament catering. This informant described an example where; a tournament venue had no cooking facilities; and provided foods that required no cooking such as: *"meat and rolls and fillings and things, because that's pretty simple, fruit juice, some sort of cake, slice, muesli bars"*(2). The informant also described linking with a supermarket chain for sponsorship of food and drinks for other tournaments. While this arrangement reduced costs, they had no control over the food provided and the sponsor provided foods such as lollies and chips which they would not usually offer. One informant from a netball centre with no canteen described how she tried to have a drinks machine installed at her netball centre, but because she wanted water, and no juice or soft drinks no company would provide one.

Only a few rugby club informants had reviewed their caterers' menus as part of their contractual arrangements and none indicated any dissatisfaction with menus or had requested healthier foods were introduced. One informant suggested there was much variability between rugby clubs in what was provided, and this was dependent on the volunteer base, administrative strength, and the financial viability of each club.

Several Wellington rugby informants described how they were unable to sell food at their club games because the council granted licences to private food vendors to sell foods and beverages at grounds that were council venues. Vendors sold similar foods and beverages to those available from clubs, such as hot chips and coffee, and had the sole rights to provide food, preventing clubs from fundraising with food.

However, in the face of all these constraints, some informants did describe efforts to provide a healthier range of foods and beverages. Several netball informants described how they approved their caterer's menu, but only a few informants described concerns about types of foods or beverages provided. One netball informant said she asked the cafeteria not to sell energy drinks such as "V" or "Mothers" and another described how his netball centre decided to provide healthy food and restricted the contracted caterer from selling fried foods. A few rugby informants were concerned about the types of food available at rugby games. One rugby club informant described how his club tried to increase the range of food, making more healthy options available but considered that demand and profitability limited what was provided saying:

We've tried healthier food and even in our shop people still demand burgers and chips and things like that. Because they're quick and easy to make they're profitable for the person making them (5).

A few netball informants described how, despite having no written policy they had some rules about types of food available. Several centres had rules against selling soft drinks because of the high sugar content and its impact on health. One informant described how the centre's executive committee decided to promote healthy eating and had not sold fried food for two years. The informant considered this decision remained an area of discussion for many people using this netball centre who still wished these foods were available. Another informant described how soft drinks were not sold at her netball centre because: *"we have the rubberised surface on our courts and the fizzy drinks eat into that so they're not allowed"* (13).

6.11.1 Post rugby match meals

Most rugby informants discussed how rugby clubs provided meals to players, visiting teams, referees and officials after the senior afternoon rugby game.

Most informants described a wider variety of food provided at these meals than was sold in rugby clubs. However, they said serving meals was costly and what was provided was influenced by finances. One informant said they limited their meals to sausages, chips and bread to reduce costs while others said meals included pasta, rice, mince, stews, roast meats, mashed potatoes and lasagne. Meals were provided only to players, food such as burgers, chips and toasted sandwiches were available for purchase by non-players. Two themes emerged when club administrators discussed why they provided meals and both emphasised the importance of a 'good meal'. In one theme 'good meals' were described as playing a role in club culture as part of traditional club hospitality. Informants universally described caring for guests by providing a 'good meal'. One informant illustrated this saying;

I guess it's a little bit like you invite guests to your house, you serve them a meal and that's traditional (5).

In the other theme the purpose of the 'good meal' was to refuel athletes, replacing nutrients lost from participating in sport.

One informant discussed how they specified their new caterer's contract so that it considered the types of foods sold to spectators and provided for players' meals. This contract allowed the provision of some high fat foods but required players meals to include low-fat, high carbohydrate foods and some green vegetables. When asked why they had decided to introduce these changes the informant said:

We've also listened to what the players want to eat and we've also looked at the cost. We've just decided that we need to make sure that what we serve our people is reasonably healthy (5).

Another club provided all junior players with a meal of sausages and chips after their Saturday game. Meals were partially funded by a sponsor (a local transport company). This informant described how the meal was a highlight: *“especially for the little guys”* (4).

In summary, informants considered it was normal that sports venues provided mostly energy-dense, nutrient-poor foods. No studies have explored sports administrators’ perceptions of the foods available in sports settings. Contracted caterers were responsible for the types of foods and beverages available and these were provided to meet consumers’ demands. Findings that sports administrators feel they have little control over foods because they are contracted are consistent with findings from a study of European stadia (Drygas et al., 2011). Foods and beverages were usually provided to generate income, either for caterers, or sometimes for clubs. An exception to this was the meals which rugby clubs provided as hospitality for visiting teams. These included healthier foods than were sold at venues and generated no revenue.

6.12 Observations of foods and beverages available at netball and rugby venues

Foods and beverages were sold at 95 percent of netball venues (19 out of 20 venues) and 45 percent of rugby venues (13 out of 29) visited. Nearly 50 percent of netball venues sold foods and beverages from a canteen (nine out of 20, regional, n=3, national n=1, netball centres n=5). Three of the 13 netball centres sold food from two locations; a canteen and a shop that sold soft drinks, snack foods, ice cream and confectionery. Two netball centres sold food from a free-standing barbecue while a shop sold soft drinks, snack foods, and confectionery. Two netball centres sold food from a free-standing barbecue while a coffee cart sold hot and cold drinks. A café, which was open every day, was located in a council-owned multi-sport venue where one netball centre

was based, providing food and beverages to all venue users. This venue had separate event catering facilities for national and regional games. Another venue hosting national netball games, sold food and beverages from mobile food stands located at the event entrance.

Nine of the rugby venues sold food and beverages from a canteen. One rugby club sold drinks, confectionery and sausages from a barbecue additional to the canteen. Of the remaining three rugby venues selling food, one sold food from a barbecue, at another, a mobile van not associated with the rugby club sold coffee, drinks and ice-creams, and one venue hosting regional and national rugby games sold foods and beverages from mobile vans located around the stadium concourse.

All of the netball centres in Counties Manukau (n=5), were large, and all but one sold food and beverages from a canteen. Four netball centres had no canteen (Wellington n=2, Otago n=2), three of these were small centres located on school grounds (Wellington n=1, Otago n=2), and sold food from barbecues and coffee carts with the Wellington netball centre also selling sweets, snack foods and drinks from a small shop. Of the centres located in rural towns, three had purpose built canteens and one was based in a school selling barbecued sausages and beverages from a coffee cart. More rugby clubs in Counties Manukau (n=5) sold food and beverages than in Wellington (n=1) or Otago (n=3). Six of the rugby clubs selling food and beverages were located in urban areas and three were rural.

6.13 Classification of food and beverages at netball and rugby venues

The number of food and beverages sold at netball venues ranged from five to 34 items (Table 20). The median number of items sold at national and regional netball games was 18.5, and at netball centres the median was 20 items. When netball centres were compared by region, Counties Manukau sold a greater

range of food and beverages (median = 28), than Wellington (median = 15.5), or Otago (median = 10.5). The median number of items available in urban netball centres was 20 and in rural netball centres the median was 24.5.

Foods were grouped for analysis using the product groups of the NZF&B classification system (Ministry of Health, 2007). Most venues for both sports provided more unhealthy, than healthy food and beverages. More than 70 percent of food and beverages available at nine of the 19 netball venues were classified as unhealthy. At a further seven netball venues, over 50 percent of food and beverages available were classified as unhealthy (Table 20). Sixty-eight percent of all items sold were unhealthy.

A greater range of food and beverages were available at national and regional rugby games than at rugby clubs (Table 21). The median number of items sold at national and regional rugby venues was 21, and the median number of items sold at rugby clubs was 10. The median number of items sold in Counties Manukau and Otago clubs was 10. The one Wellington club venue selling food or beverages sold eight items (Table 21).

Table 20: Frequency of healthy and unhealthy foods available at netball games

Venue	Items n=	Healthy Items		Unhealthy Items		Un- classified	
		n=	%	n=	%	n=	%
<i>National and regional games</i>							
Vector Arena	23	6	26.1	16	69.6	1	4.3
TSB Arena	22	6	27.3	15	68.2	1	4.5
Trusts Stadium	19	4	21.1	14	73.7	1	5.2
Te Rauparaha Event Centre	18	3	18.7	15	81.3	0	0
Edgar Centre (regional event)	17	5	29.4	11	64.7	1	5.9
Under 17s	14	2	14.3	11	78.6	1	7.1
<i>Netball centres</i>							
Counties Manukau							
Papakura Netball Centre	43	10	23.3	32	74.4	1	2.3
Waiuku Netball Centre	34	6	17.6	26	76.5	2	5.9
Pukekohe Netball Centre	28	8	28.6	18	64.3	2	7.1
Manurewa Netball Centre	26	10	38.5	16	61.5	0	0
Mangere Netball Centre	20	4	20	16	80	0	0
Wellington							
Hutt Netball Centre	25	7	28	16	64	2	34
Haitaitai Netball Centre	20	13	65	5	25	2	10
Porirua Netball Centre	11	3	27.3	6	54.5	2	18.2
Motu Kairangi Netball Centre	11	1	9.1	10	90.9	0	0
Otago							
Alexandra Netball Centre	21	3	14.3	16	76.2	2	5.5
Edgar Centre (Netball centre)	15	3	20	10	66.7	2	13.3
Taieri Netball Centre	6	2	33.3	3	50	1	16.7
Wanaka Netball Centre	5	1	20	2	40	2	40
Total	378	97	26	258	68	23	6

Table 21: Frequency of healthy and unhealthy foods sold at rugby venues

Venue	Items n=	Healthy Items		Unhealthy Items		Un- classified	
		n=	%	n=	%	n=	%
<i>National/regional venues</i>							
Eden Park	29	12	41.4	15	51.7	2	6.9
Westpac Stadium	22	8	27.5	12	54.5	2	18
Under 17s	20	4	20	14	70	2	10
Carisbrook	14	1	7.2	13	92.8	0	0
<i>Club venues</i>							
Manurewa Rugby Park	23	15	65.2	7	30.4	1	4.3
Alexandra Rugby Club	12	4	33.3	6	50	2	16.7
Karaka Rugby Club	11	2	18.2	9	81.8	0	0
Pirates Rugby Club	10	2	20	7	70	1	10
Waiuku Rugby Park	10	0		9	90	1	10
Papakura Rugby Club	8	2	25	6	75	0	0
Ian Galloway Park	8	2	25	4	50	2	25
Wanaka Rugby Club	8	1	12.8	5	62.5	2	25
Ardmore Rugby Club	6	0	0	6	100	0	0
Total	181	53	29	113	62	15	9

Sixty-two percent of all food and beverages sold at rugby games was classified as unhealthy. Over 70 percent of the items available at seven of the 13 rugby venues were classified as unhealthy (Table 21). Over half the foods and beverages at all rugby venues hosting national and regional rugby games were classified as unhealthy.

Less than 50 percent of foods and beverages at three netball centres were classified as unhealthy. Two were small netball centres, located in schools with limited menus; the other was a large urban netball centre selling no fried foods

and one choice of confectionery. Only one netball centre and one rugby club sold more healthy foods and beverages than unhealthy.

More unhealthy food items were sold at national and regional netball games (median n=14.5: range 11-16) than at national and regional rugby games (median n=12.5: range 3-12) There was a greater choice of unhealthy food items at netball centres (median n=16; range 2-32) than at rugby clubs (median unhealthy, n=6; median healthy, n=2).

When comparing rural and urban netball centres the median number of unhealthy food items in urban netball centres was 10 and in rural netball centres it was 17, indicating a wider range of unhealthy items were available in rural netball centres (Table 20). Both rural and urban rugby clubs, sold a smaller range of unhealthy foods and beverages (median n=6) than netball centres.

All netball venues sold at least one healthy food or beverage. Two rugby venues sold no healthy foods and beverages, and two sold only one healthy item (water). The median number of healthy food items sold at national and regional netball games was 4.5 and at netball centres it was four. The median number of healthy food items sold at national and regional venues was 6.2. The median number of healthy food items sold by Counties Manukau netball centres was eight, in Wellington it was five, and in Otago it was 2.5. When comparing rural and urban netball centres the median number of healthy food items in urban centres was four and in rural centres it was five (Table 20). The median number of healthy food items sold by Counties Manukau rugby clubs was 3.4 and in Otago rugby clubs it was 2.3.

6.14 Frequency of types of food and beverages available at netball and rugby venues

Chocolate bars (n=16 venues), water (n=15), soft drinks (n=15), coffee and tea (n=15 venues) were the foods and beverages most frequently available at netball venues. Cakes, cookies and donuts (n=13 venues), pies and savouries (n=12 venues), sandwiches and filled rolls (n=12 venues), savoury snacks, potato chips and lollies (n=12 venues), chips and fried food (n=11 venues) were sold at more than half the netball venues (Tables: 22; 23; 24). Water (n=15 venues) and sandwiches (n=12 venues) were the only foods or beverages classified as healthy and sold at more than 10 venues. All other foods classified as healthy were sold at six or less venues.

Table 22: Unhealthy food and beverages sold at netball venues

Food/beverage	Venues selling		Median price	Price range
	n	%		
Meal items				
Pies/savouries/pastry products	12	63.1	3.25	1.00 – 9.20
Deep fried foods/chips	11	57.9	4.00	3.00 – 9.20
Burgers/hotdogs/toasted sandwiches	7	36.8	4.00	3.00 – 7.75
BBQ Sausages	5	26.3	1.50	1.00 – 2.00
Snacks				
Chocolate bars	16	84.2	2.30	2.00 – 3.99
Cakes/cookies/donuts	13	68.4	2.50	1.00 – 3.50
Savoury snacks/potato chips	12	63.1	1.75	1.20 – 5.00
Lollies	12	63.1	1.50	0.20 – 5.60
Ice creams	7	36.8	3.00	2.00 – 6.00
Beverages				
Soft drinks	15	78.0	3.60	1.70 – 5.75
Sports drinks	7	36.8	4.00	3.50 – 5.00
Energy drinks	6	31.6	4.00	3.80 – 5.00

Table 23: Healthy food and beverages sold at netball venues

Food/beverage	Venues selling		Median price	Price range
	n	%		
Meal items				
Sandwiches/ filled rolls	12	63.1	4.50	0.50 – 9.00
Soup	5	26.3	2.00	1.50 – 5.00
Snacks				
Muffins/scones	6	31.5	2.75	1.00 – 3.50
Fruit/fruit Salad	3	15.8	2.75	1.00 – 5.00
Beverages				
Water	15	78.0	3.50	2.80 – 6.45

Table 24: Unclassified food and beverages sold at netball centres

Food/beverage	Venues selling		Median price	Price range
	n	%		
Coffee/tea	15	78.9	3.50	1.00 – 4.50
Other drinks	6	4.20	3.80	2.00 – 6.00

Soft drinks (n=11 venues), coffee and tea (n=9 venues), chocolate bars (n=9 venues), burgers, hotdogs and toasted sandwiches (n=8 venues) were the foods and beverages most frequently available for sale at rugby venues (Tables: 25; 26; 27). Chips and fried foods (n=7 venues), water (n=7 venues), and other drinks including hot chocolate and milkshakes (n=7 venues) were available at more than half the rugby venues. Water was the only food or beverage classified as healthy and sold at more than half the rugby venues. All other food and beverages classified as healthy were sold at fewer than three venues.

Table 25: Unhealthy foods sold at rugby venues

Food	Venues selling n	%	Median Price	Price Range
Meal items				
Burgers/hotdogs/toasted Sandwiches	8	61.5	6.00	3.50 – 8.00
Deep fried foods/chips	7	53.8	3.50	1.00 – 9.00
Pies/sausage rolls/pastry products	6	46.1	3.50	3.00 – 5.50
Sausages	2	15.4	3.50	1.50 – 2.00
Snacks				
Chocolate bars	9	69.2	2.00	1.50 – 3.00
Cakes/cookies/donuts	5	38.5	2.00	1.80 – 5.00
Savoury snacks/potato chips	5	38.5	1.80	1.50 – 6.00
Lollies	5	38.5	1.25	0.50 – 5.00
Ice creams	2	15.4	4.00	2.50 – 6.00
Beverages				
Soft drinks	11	84.6	3.00	1.00 – 4.80
Energy drinks	4	30.8	3.80	3.00 – 4.00
Sports drinks	3	23.1	4.00	3.80 - 4.50

Table 26: Healthy foods sold at rugby venues

Food	Venues selling n=	%	Median Price	Price Range
Meal items				
Mixed meal dishes	3	23.1	7.50	5.00 – 8.50
Mixed meal dishes	3	23.1	7.50	5.00 – 8.50
Sandwiches/ filled rolls	2	15.4	4.00	6.50 – 4.00
Soup	1	7.7	2.00	
Snacks				
Muffins/scones	1	7.4	1.50	
Fruit/fruit salad	1	15.4	6.00	2.00 – 6.00
Beverages				
Water	7	53.8	3.00	2.00 – 4.50

Table 27: Unclassified beverages sold at rugby venues

Food	Venues selling		Median Price	Price Range
	n	%		
Coffee/Tea	9	69.2	3.75	2.00 – 4.50
Fruit Juice	3	23.1	3.75	3.50 – 5.00
Other drinks	7	53.8	4.00	2.00 – 5.00

6.15 Prices of food and beverages available at netball and rugby venues

Mixed results were found when comparing prices to determine whether unhealthy foods were cheaper than healthy foods.

When comparing meal items, at netball venues sandwiches and filled rolls (median price = \$4.50) were the most expensive foods followed by burgers and deep fried foods (median price = \$4.00), pies (median price = \$3.25), and soup (median price = \$2.00) (Tables 22; 23). At rugby venues mixed meal dishes such as lasagne and sushi were the most expensive food items (median price = \$7.50), followed by burgers (median price = \$6.00), sandwiches (median price = \$4.00), deep fried foods, pies and sausages (median price = \$3.50) (Tables 25; 26). The cheapest food at netball centres was barbecued sausages (median price = \$1.50) while at rugby venues it was soup (median price = \$2.00).

When comparing snack foods at netball venues, unhealthy foods such as cakes and cookies (median price = \$2.50) and savoury snacks (median price = \$1.75) were cheaper than the healthier choices of muffins and scones or fruit salad (median price = \$2.75) (Tables 22; 23). At rugby venues, snack foods classified as healthy were the cheapest and the most expensive food items. Muffins and scones (median price = \$1.50) were the cheapest items, while fruit salad (median price = \$6.00) was the most expensive followed by cakes, cookies (median price = \$2.00) and savoury snacks (median price = \$1.80) (Tables 25; 26).

Sports and energy drinks (median price = \$4.00) were the most expensive beverages at netball and rugby. At netball this was followed by energy drinks (median price = \$3.80), soft drinks (median price = \$3.60) and water (median price = \$3.50). Fruit juice was the cheapest beverage available at netball (median price = \$3.00) (Table 24). Classification of fruit juice was based on volume. A volume of less than 350ml was classified as healthy and more than 350ml classified as unhealthy. Venues sold juice in a range of sizes (both healthy and unhealthy). At rugby water and soft drinks (median price = 3.00) were the cheapest beverages (Table 27).

6.16 Summary of foods and beverages available at netball and rugby games

Most netball venues but only half of rugby venues sold foods and beverages at games. Almost half of all venues sold food from purpose built canteens while the other venues sold food from mobile vans, coffee carts and temporary barbecues. Similar numbers of items were sold at national and regional netball games and netball centres, while a smaller range of foods and beverages were sold at rugby clubs than at national or regional rugby games. At all but two venues more unhealthy foods and beverages were available than healthy. The results of this study were consistent with the literature described in chapter three which found food and beverages sold in sports clubs were predominantly energy-dense and nutrient-poor (Kelly et al., 2008; Kelly et al., 2010b).

There were some differences in popular foods sold at rugby and netball venues. Cakes, cookies and donuts were commonly available at netball centres but not rugby, while burgers, hotdogs and toasted sandwiches were commonly available at rugby venues but not netball.

Mixed results were found when comparing prices between rugby and netball venues, with both healthy and unhealthy foods among the most and least expensive foods and beverages in their categories.

6.17 Triangulation of data from phase one and phase two

This section describes the results from triangulating the data from Phases One and Two of this case study. It outlines the characteristics and extent of food and beverage marketing and availability in sports settings.

6.17.1 Food and beverage company sponsorship in sports settings

This study found the characteristics and extent of food and beverage company sponsorship in New Zealand sport differed between sports and within different levels of sports. Twenty-four percent of national and regional sports organisations (n=74) were sponsored by food and beverage companies. Almost half of these (n=35) were national or regional organisations of the popular, televised sports, identified by informants as more favoured by sponsors.

Rugby informants considered sponsorship was associated with professional teams and identified more food and beverage companies sponsored regional teams than the national team. The few food sponsors rugby club informants identified were local businesses and club members. Although, some sponsors were locally-owned quick service restaurant franchises providing vouchers or food platters. All netball informants believed food and beverage companies had limited involvement in netball other than New World supermarkets and food companies sponsoring franchise teams in a trans-Tasman competition.

Findings from observations and website reviews supported key informants' perceptions that marketing by food and beverage companies at all levels of New Zealand sport was limited. Seven percent of all logos identified on 308 NSO/RSO websites were food and beverage companies. Eight percent of all

logos identified on 26 rugby club websites were food and beverage company logos. Five out of 18 netball centres and five out of 147 netball clubs showed evidence of food and beverage company sponsorship. While New Zealand netball was sponsored by New World supermarkets no regional netball organisation received any food or beverage company sponsorship. Differences in the extent of sponsorship between sports are illustrated by rugby and hockey with each having more NSO/RSO websites (n=27) than other sports. While almost half the sponsors identified on rugby websites (49.8%) were food and beverage companies, only a few food and beverage companies sponsored hockey (2.8%) and none sponsored national hockey teams.

Almost a third of food and beverage companies sponsoring NSO/RSOs and rugby clubs were classified as unhealthy. Although few companies sponsored netball centres more companies/brands classified as unhealthy (n=6) sponsored netball centres than those classified as healthy (n=2). Twenty percent of NSO/RSO sponsors and 22 percent of rugby sponsors were classified as healthy. Only one netball club had food sponsors other than a bar, and they were supermarkets.

Differences were observed between the amount of advertising observed at rugby and netball venues. Food and beverage company signs were observed at all national and regional games for both sports. More signs were observed at netball centres (club level) than at rugby clubs, with food and beverage company signage observed at over half of the netball centres and a quarter of the rugby clubs. Twenty-five percent of all signs observed at netball were food or beverage company signs, most belonged to New World supermarkets. In comparison, nine percent of all signs at rugby venues belonged to food or beverage companies. Most were classified as unhealthy.

Analysis of food and beverage sponsorship screened during televised coverage of national games of each sport differed. Both rugby and netball used LED signage at national events to promote sponsors. New World signage was visible for most of each netball game, while logos of food and beverage companies sponsoring rugby were visible for only just over one minute.

NSO/RSO informants identified six examples out of 186 sponsorships which were supported with additional marketing that drew on behaviour modification techniques. Most were associated with NSO/RSOs. Four targeted children through provision of food vouchers, branded equipment, product samples, or collectables. Embedded case studies found no further examples where manufacturers supported their sponsorships with additional marketing. Netball and rugby RSOs used product sponsorships to reward children attending games or holiday programmes. Informants were aware these foods provided to children were usually unhealthy, but viewed this as less important than enhancing the children's experience with sport by giving them a reward for participation.

All informants identified financial assistance as the main benefit of food and beverage company sponsorship with no differences identified between NSO/RSO, netball or rugby informants. All found sponsorship income was difficult to obtain with sponsors frequently providing products rather than cash. Cash sponsorships were preferred by all informants and used to fund organisational expenses.

Benefits from national sponsorships were not shared with regional organisations, rugby or netball clubs or netball centres. Each organisation was responsible for negotiating their sponsorships. NSO/RSOs, clubs and netball centres acted independently of each other with only one sponsorship promoted

nationally through netball centres to club members. This provided no financial benefits to netball centres.

Some NSO/RSO informants expressed concerns about sponsor suitability and considered appropriate sponsors were food and beverage companies manufacturing healthy products that aligned with sports nutrition guidelines. They described these companies as having a good 'fit' with their sport. These NSO/RSO informants suggested they would not accept sponsorship from companies which did not 'fit'. Sponsor 'fit' was not described by netball or rugby club informants. Few club informants considered wider implications of associating sports clubs with unhealthy food and beverage companies.

Informants expressed different and opposing views about regulating food and beverage marketing and availability in sport. Similar results were found between NSO/RSO, rugby and netball informants. Those viewing regulation positively saw potential to limit unhealthy food marketing and promote healthy foods through sport. Those viewing regulation negatively were concerned about potential reductions in sponsorship revenue, and impact on delivery of sport. Because food and beverage company sponsorship was not considered a major source of income most informants considered there would be little or no impact on sport at all levels as a result of regulation. Only informants from sports sponsored by food or beverage companies considered there would be a major loss of income if food or beverage sponsorships were no longer available.

No informants identified any sports organisation or club with a formal policy about marketing or availability of food. Many NSO/RSO, regional rugby and netball informants said they were careful about which companies they formed relationships with and would not promote unhealthy foods or beverages.

Questions regarding food policies generated little discussion with club informants suggesting they had not considered this.

Triangulation of data from both phases of this study exploring food and beverage company sponsorship largely supported each other. Food and beverage company sponsorship comprised a small proportion of total sports sponsors at all levels. As popular sports, attracting wide audiences, netball and rugby provided opportunities for brand promotion. National netball and rugby organisations and regional rugby organisations were more sponsored than other sports. It is likely these findings may be generalised to popular sports in similar jurisdictions. However, many popular New Zealand sports are not popular globally, and with a population of just over four million people, New Zealand is a small market. Because of this, New Zealand sports may attract fewer food and beverage company sports than popular sports in other jurisdictions.

Embedded case studies found few food and beverage companies sponsored sports clubs even though rugby and netball are more popular than many other New Zealand sports. Sponsorship was commonly associated with local businesses and club members and it is likely these results may be generalised to other New Zealand sports clubs. Most New Zealand sports clubs are small organisations, managed by community volunteers, how these compare to clubs in other jurisdictions is unclear and therefore whether these results may be generalised to other jurisdictions is also unclear.

6.17.2 Food availability in sports settings

All informants identified energy-dense, nutrient-poor foods such as potato chips, hot chips, savouries and snack bars were available at sports games and made no distinction between the type of sport or level (national, regional or club). Rugby informants described a small range of unhealthy foods that were

sold at games, while netball informants identified more choices of unhealthy and healthy foods. Informants described these as the 'normal' or usual foods provided at sports events. Informants' perceptions were supported by observations which found most venues provided more unhealthy food and beverages than healthy. Food was sold at all national and regional netball and rugby venues. Almost all netball centres but less than half the rugby clubs sold food or beverages. Many informants considered there had been some improvement in the availability of healthier foods sold at venues however, spectators and players still demanded unhealthy foods.

Most NSO/RSO, netball and rugby informants at all levels considered their sport had no influence over the food provided at venues. They were aware the majority of food available in sports settings were energy-dense, nutrient poor but in almost all cases did not consider improving food provision was their responsibility. Most considered caterers were responsible for menus and entitled to profit from food sales which they believed was achievable only through selling energy-dense nutrient-poor foods and beverages. Sports had no input into stadia food provision however, regional rugby unions were able to ensure their sponsors' beverages were provided at games. Several netball and rugby club informants described reviewing caterer's menus, a few discussed concerns about the nutritional quality of the foods and beverages sold, but only one described taking action to improve the quality of the foods and beverages sold. Many rugby clubs sold food during the evening, and provided meals to senior players. Informants described healthier foods were provided for players' meals than foods sold to non-players during the evenings.

The median number of food and beverage items sold at national and regional rugby and netball games was similar with a median of 21 at rugby and 18.5 at netball. A smaller range of foods and beverages were sold at rugby clubs than

netball centres. The median number of food and beverage items available at rugby clubs was 10 and at netball centres it was 20.

Most venues for both sports provided more unhealthy foods and beverages than healthy, confirming informants' perceptions. The median number of unhealthy foods and beverages at national and regional rugby events was 12.5 and at national and regional netball venues it was 14.5. The median number of unhealthy foods and beverages at rugby clubs was six and at netball centres it was 16. The median number of healthy foods and beverages at national and regional rugby events was six and at netball venues it was 4.5. The median number of healthy foods and beverages at rugby clubs was two, and at netball centres was four.

For both sports, soft drinks, coffee, tea and chocolate bars were among the most frequently available foods and beverages. These low cost and non-perishable items can be sold from canteens, shops and fundraising barbecues and require no preparation or refrigeration. Chips and fried foods were available at over half the venues of both sports. All stadia provided a similar range of foods with deep frying the dominant cooking method and most foods requiring limited preparation. Water was the only food classified as healthy and available at more than half the venues of both sports. Foods sold frequently at rugby venues of all levels, but not netball, were burgers, hotdogs and toasted sandwiches. Foods sold frequently at netball venues but not rugby included cakes, cookies, donuts, savoury snacks, potato chips and lollies. Sandwiches were the only healthy food sold at more than half the netball venues, but were sold at only two rugby venues.

Prices varied between venues with all food and beverages sold at national and regional netball and rugby venues more expensive than the same items sold at rugby clubs or netball centres. This study was unable to determine whether

unhealthy foods and beverages were cheaper than healthy foods and beverages at sports venues. Mixed results were found when comparing prices between categories of food and beverages. In some categories healthy foods were the cheapest option (e.g. soup) and in others unhealthy foods were cheapest (e.g. savoury snacks). Foods requiring more complex preparation such as lasagne and sushi, were more expensive than those requiring little preparation such as hot dogs or chips. Sports drinks and energy drinks were the most expensive beverages at all venues, while fruit juice was the cheapest beverage at netball venues. Water and soft drinks were the cheapest beverages at rugby venues.

Triangulation of data from both phases of this study exploring food and beverage availability consistently supported each other. Mostly energy-dense, nutrient-poor foods and beverages were observed at almost all rugby and netball venues confirming informants' perceptions. Observations of embedded case studies provided detailed data about which foods and beverages were available at sports events, adding depth to the data collected in Phase One. While more variety of foods and beverages were available at netball centres the quality was similar across almost all venues. Where differences were observed (i.e. the venues with more healthy foods), they were explained by key informants. It is therefore likely these findings about food and beverage availability may be generalised to sports in jurisdictions with eating patterns similar to New Zealand.

6.18 Conclusion

This chapter presents the findings from in-depth examination of two embedded units of this case study of the food environment; rugby and netball. Phase Two of the study aimed to identify the characteristics and extent of food and beverages marketed and available at national, regional and club levels of each sport. These results reveal how marketers influence consumers by using

additional marketing activities that cue and reinforce behaviour and support sponsorships (Nord and Peter, 1980) in New Zealand sports settings. This chapter concluded by triangulating findings from different data sources from each phase. The findings from this study are discussed in chapter seven which considers whether junk food is promoted in sport.

Chapter Seven Discussion

7.1 Introduction

Obesity imposes financial burdens on health care systems and social burdens on individuals and communities (Ministry of Health, 2009; Whitehouse Task Force on Childhood Obesity, 2010). As discussed in chapter two, obesity rates are rapidly increasing in developed countries with the World Health Organization estimating that by 2015 over 2.3 billion adults will be overweight, and over 700 million worldwide will be obese (World Health Organization, 2006). The proportion of obese New Zealand adults has increased rapidly during the past two decades, with Māori and Pacific people more likely to be obese than the general population (Ministry of Health, 2012).

Childhood obesity is particularly concerning due to its long term effects on mortality, morbidity and quality of life (Wang and Lobstein, 2006; U.S. Department of Health and Human Services, 2010). Data suggests the prevalence of childhood obesity is also increasing (Wang and Lobstein, 2006; Ogden et al., 2010). In New Zealand one child in 10 is obese (Ministry of Health, 2012b).

Obesity results from interactions between individuals and their environment (Green et al., 200). This New Zealand case study analyses whether energy-dense, nutrient-poor food is promoted and available in sport, a setting which has received little attention (Carter et al., 2011). The objectives for this study, as outlined in chapter four are to assess the food environment in New Zealand sports settings by:

- Undertaking key informant interviews with stakeholders to identify their views on the food environment in sports settings.

- Analysing the websites of key sporting codes to assess the characteristics and extent of food and beverage company sponsorship in sport.
- Providing case studies of the food environment in New Zealand sport within two exemplar sports (rugby and netball) at national regional and local levels.
- Directly observing the marketing practices of foods and beverage manufacturers at New Zealand rugby and netball venues.
- Directly observing the characteristics and the extent of the foods and beverages available at New Zealand rugby and netball venues.
- Analysing the websites of national, regional and club rugby and netball organisations to assess the characteristics and extent of food and beverage company sponsorship.
- Analysing food and beverage company marketing observed on televised coverage of national and regional rugby and netball games.

Phase One explored the marketing and availability of food and beverages in regional and national sporting organisations (NSO/RSOs) and Phase Two examined the food environment at all levels of two exemplar sports: rugby and netball. This chapter concludes this thesis. First it synthesises and discusses how the findings relate to previous research, the public health implications and theoretical models. The strengths and weaknesses of this study are discussed before the chapter concludes by outlining recommendations for further research.

7.2 Is junk food marketed through sport?

7.2.1 Strengthening brand associations

This study suggests that food and beverage company sponsorship of New Zealand sports is limited and largely associated with national and regional levels of regularly televised, popular New Zealand sports (rugby, cricket, basketball, netball and golf). These sports attract large television audiences and high levels of attendance at games (Netball New Zealand, 2011; New Zealand Rugby Union, 2011,) which provide opportunities for marketers to develop associations with their brands (Nord and Peter, 1980). Repeated brand exposure resulting from regular television coverage (Sherriff et al., 2009; McAllister, 2010,) may explain why televised sports are more favoured by sponsors. For example, by sponsoring New Zealand netball, New World supermarkets reminds consumers' of their brand association with netball throughout televised games, with the New World brand visible on team uniforms, goal posts, the court and advertising hoardings. The presence of players in proximity to the sponsors' brand draws attention to the brand creating associations (Hoek et al., 1997) which likely influences both children's and adults' brand preference.

Many of the sporting organisations sponsored by food and beverage companies at national and regional levels were larger organisations employing commercial managers with the marketing skills and dedicated time to manage sponsorship relationships. Even with commercial expertise, few sports had multiple food and beverage company sponsors. Managing sponsor relationships was an additional task for staff in many smaller sports organisations. These informants believed organisational capacity limited sponsorship as they did not have the time to build and maintain sponsorship relationships. These sports were not televised and provided sponsors with

fewer opportunities to create brand associations. They may have had difficulty attracting sponsors even with more staff capacity. No previously reported studies have explored sports officials' perceptions of the extent of food and beverage company sponsorship in sport. It is therefore difficult to comment on why food and beverage companies do not sponsor smaller New Zealand sports organisations.

At a more local level few netball or rugby clubs were sponsored by food or beverage companies, and in most cases these were local businesses which may have considered their sponsorship a donation (Zinger and O'Reilly, 2010). Results from this study contrast with findings from three Australian studies (discussed in chapter three), that found children's sports clubs received more food and beverage company sponsorship than did national and state sporting organisations (Kelly et al., 2010; Mehta et al., 2011; Kelly et al., 2011b). These studies classified most food and beverage company sponsors as unhealthy, however, only two of the Australian studies reported significantly more unhealthy food and beverage company sponsorship of children's sports clubs (Kelly et al., 2010; Mehta et al., 2011; Kelly et al., 2011b). While mostly unhealthy food and beverage companies sponsored New Zealand rugby clubs and netball centres, there were too few sponsors to analyse this statistically. Differences in club structure and size may be a factor in the differing levels of sponsorship identified between the two countries. Without further detail it is difficult to compare these findings although it appears that in both countries sports clubs attract mainly unhealthy food and beverage sponsorship.

Studies suggest frequent attendance at sports games increases consumers' brand awareness, with the highest awareness for brands with the most venue advertising (Stotlar and Johnson, 1989; Cunneen and Harris, 1993). Rugby and netball clubs currently provide marketers with few opportunities to increase brand awareness, most simply acknowledge sponsors on their websites and on

a single advertising hoarding. Netball is played at netball centres, and many netball clubs, have no club-rooms to display sponsor advertising. Similarly, rugby is played at council venues where clubrooms are not always located. Establishing and maintaining relationships with multiple clubs managed by volunteers may be labour intensive and of little interest to marketers seeking to make a financial return on sponsorship investments. This, and the limited opportunities to create brand associations, may explain the absence of netball and rugby club sponsorship by large companies and the differences in levels of food and beverage company sponsorship between New Zealand and Australian sports clubs.

7.2.2 Trial and repeat purchase

A small proportion of sponsorships identified in this study were supported by additional marketing drawing on behaviour modification techniques. Behavioural modification techniques used in marketing include operant and respondent conditioning, vicarious learning and ecological design to reward and reinforce consumers and stimulate trial and repeat purchase (Nord and Peter, 1980; Foxall, 2010).

Few studies have explored food and beverage company marketing techniques supporting sports sponsorship or its impact on food choices. Systematic reviews, described in chapter two, found children's food preferences and diet are influenced by food marketing (Institute of Medicine, 2006; Hastings et al., 2006). These studies used cognitive models to identify the effect of advertising on children's food choice and do not include the impact of sponsorship or marketing using behaviour modification techniques. It is likely that food marketing that supports sponsorship using behaviour modification techniques has greater impact on children's food preferences than suggested by these reports.

Sponsors in this study built associations between their brand and a sport by rewarding children participating in sponsored programmes with branded sports equipment, hats, drink bottles, product samples and vouchers. Branded giveaways such as sports equipment can be utilised on multiple occasions reminding children about the association between the brand and the sport. Product samples given to the children initiate trial and discount vouchers encourage both trial and repeat purchase (Hoek et al., 1999). Collectable cards with player images stimulate repeat purchases in order to collect a complete set of cards (Hoek et al., 1999).

'Player of the day' vouchers awarded to children, associate sporting success with brands and stimulate brand trial with children and their families as vouchers are redeemed. Children are reminded about sponsoring brands every week as the 'player of the day' is rewarded with a voucher. One NSO informant described a quick service restaurant chain's sponsorship of 'player of the day' vouchers as small, an assessment that belies the value a small financial investment generated. The impact of providing vouchers is clear with a study finding 30 percent of children reported liking food or beverage company sponsors more following receipt of branded vouchers (Kelly et al., 2011). Providing 'player of the day' certificates is a low-cost marketing strategy quick service restaurants use to increase foot traffic and sales (Cousens and Slack, 1996). Sports clubs in this study appeared to receive no financial benefits for providing this free marketing service for quick service restaurant chains.

New World supermarkets used respondent and operant conditioning techniques at netball centres to reinforce the brand associations created through the national netball team sponsorship. Advertising hoardings and goal wraps feature the New World logo at most netball centres, and weekly vouchers given to volunteers stimulate trial as they are redeemed through purchases at New World stores.

One sponsor (Coca Cola) has supplier status at national games (and some regional games) for all its products. As discussed in chapter two, exclusive supply agreements are a form of ecological design. Consumers attending these events not only sample the sponsor's product, but brand purchase is reinforced through respondent conditioning when they see players consuming the brand, and/or the brand is featured in prominent game signage and on team uniforms.

7.2.3 Do sports benefit from junk food marketing?

Regardless of their size, all sporting organisations valued their sponsorship income and identified this as the main benefit of food and beverage company sponsorship. Sponsorship income reduced operational expenses of clubs and NSO/RSOs. Findings from this study are consistent with a study finding officials in sports clubs and regional sport associations consider the main benefits of sponsorship are financial (Kelly et al., 2011c). No sports divulged the amount received from food or beverage company sponsorship, but most sports indicated this was not a significant source of income. Cordery and Baskerville (2009) found sports clubs main income was sourced from gaming and philanthropic trusts (Cordery and Baskerville, 2009). No studies have examined the contribution food and beverage company sponsorship makes to NSO/RSOs' income. One study found food and beverage company sponsorship makes a small contribution to Australian sports club revenues with few sponsors providing direct funding (Kelly et al., 2010). This suggests it costs food companies very little to create brand associations and influence consumers' food preferences. With a continued need for income, and few current sponsors, sports organisations provide numerous opportunities for food and beverage company marketing. Results from this study suggest the food industry has yet to exploit these opportunities in New Zealand sports clubs. There is potential for food marketing to increase and action may be needed to prevent this.

Sponsorships supported by additional marketing were associated with financial investment in the sports organisation. These sponsorships were highly valued by informants who viewed them as building organisational capacity because they increased available funds. In most cases it was used to cover existing expenses rather than funding new programmes or activities. Only one of these informants discussed the implications of associating their sport with food and beverage companies that employed marketing techniques to increase brand awareness, purchase and ultimately consumption. While aware that unhealthy food sponsorship may be detrimental to children participating in the sport, this informant described how his sport prioritised the additional income resulting from sponsorship over any potential health impacts resulting from influencing children's food preferences.

Large sporting organisations with commercial managers and professional teams were enthusiastic about sponsors' advertising that associated brands with their team. They considered this was an additional sponsorship benefit, describing it as free team advertising. Few commercial managers were concerned about associating their sport with unhealthy food or beverage companies, rather they prioritised sponsorship income.

NSO/RSO informants with a utilitarian approach to sponsorship contended that any reduction in sponsorship income would reduce their capacity to provide existing services and result in increased player fees. Informants considered higher fees, would reduce affordability and therefore participation, especially for children from low-income families. Some sports used this to justify viewing any potential food and beverage company sponsorship as acceptable and did not distinguish between healthy and unhealthy food and beverages. Even when they may be uneasy about sponsors' products, they believed unhealthy sponsorship relationships were warranted because the consequences of reduced income were worse than the consequences of

associating with unhealthy food and beverage company sponsors. They viewed the negative consequences of encouraging unhealthy food consumption as less important than the benefits of maintaining participation levels in their sport.

Other NSO/RSO informants took a deontological approach to sponsorship, expressing concerns about sponsor suitability. These informants considered appropriate sponsors were food and beverage companies manufacturing healthy foods and beverages that aligned with sports nutrition guidelines. They described these companies as having a good 'fit' with the sport in contrast to companies manufacturing unhealthy foods. Unhealthy foods and beverages were perceived negatively as they provided no health benefits and did not contribute to athletic performance. Associations with these brands were viewed as undermining their sport's image. These informants suggested they would not accept sponsorship from companies which did not 'fit'.

All informants discussing 'fit' consistently described unhealthy foods as high-fat, high-sugar foods and fast foods. None used a standard or classification system to assess the nutrient content of foods and beverages, when determining 'fit'. Informants used instinctive judgements to categorise food and beverages as unhealthy. While informants were confident they make good sponsorship decisions, not assessing sponsors against nutrient criteria may result in sports receiving sponsorship from unhealthy food and beverage companies. As a result, these sports could accept sponsorship from food or beverage companies that they might not have accepted if they had assessed them against nutrient criteria.

One informant described how a negative response from consumers and health agencies to a licence allowing a snack food company to include collectable cards with player images in chippie packets made the sport review their position on 'fit'. This sponsorship was cancelled because of negative publicity

detrimental to the sport's image. This incident prompted the sport to review potential sponsorships ensuring they did not promote children's consumption of unhealthy foods. The response to this incident suggests the sport's priority was restoring its image with promoting children's health a fortunate by-product. Without negative publicity it seems unlikely this licence would have been cancelled.

This sport continues to be sponsored by a beverage company classified as unhealthy, although the brands associated with the sport are a low-energy soft drink and a sports drink. These brands are not explicitly marketed to children and have not received the negative publicity of the snack food sponsorship. Yet, many children are avid rugby fans and learn vicariously when they see their favourite players associated with and using these brands.

Sponsor 'fit' was not described by club rugby or club netball informants. Concepts such as sponsor 'fit' were probably not considered by club informants who had little or no experience with food or beverage company sponsors. No studies have explored sports administrators' perceptions of appropriate sport sponsors. Two studies exploring consumers' perceptions of appropriate sports sponsors found participants did not consider snack foods, fast foods and confectionery appropriate sports sponsors (Danylchuck and Macintosh, 2009; Kelly et al., 2011c). Without assessing club members' perceptions of appropriate sponsors, club administrators may accept sponsorship from food and beverage companies that their members consider inappropriate. Studies have yet to identify consumers' perceptions of unhealthy food and beverage brand sponsorship of international sports events.

Marketing that supports sponsorship of international sports events such as the FIFA Football World Cup and the Olympic Games impacts on New Zealand food environments and was not captured by this study. Sponsorship of

international sports events requires significant investment with reports suggesting McDonald's and Coca Cola paid US\$100 million to sponsor the Olympic Games (The Guardian, 2012). These sponsorships were supported in New Zealand by marketing employing respondent and operant conditioning. Advertising associated the McDonald's brand with Olympic symbols such as the Olympic rings and the Olympic torch. Competitions, prize draws and special "limited edition" Olympic products were promoted to consumers. Marketing ensured associations between the McDonald's brand and the event were explicit and implied event sponsorship supported New Zealand teams.

Sports sponsorship provides food and beverage companies with a setting in which they can create brand associations and encourage consumer trial and repeat purchase. Although data on actual financial investments was not shared in this research, informants suggested food company sponsorship does not provide substantial income to most sports organisations. However, investment by food and beverage companies in associated marketing promoting their sponsorship is likely to be substantial. Benefits of this investment are returned directly to the company as it influences consumers' preferences and generates sales.

7.2.4 Public health implications

Obesity and overweight are widespread in New Zealand as outlined in chapter one (Finucane et al., 2011; Ministry of Health, 2012). Food marketing is a key factor contributing to obesogenic environments (French et al., 2002; World Health Organization, 2009). This section discusses regulation of advertising and marketing of food and beverages in sports settings. Section 7.3.3 discusses food policy.

This study found one third of food and beverage companies and brands sponsoring sport were unhealthy. While few companies used additional

marketing activities to support their sponsorships, those who did focused on building strong brand associations and most marketed directly to children. Sponsorship associating unhealthy food and beverages with sport undermines and contradicts public health messages and fosters consumption of unhealthy foods and beverages.

Informants in this study were almost evenly divided in their views about regulating food and beverage company sponsorship. These results contrasted with the few previous studies in this arena which found little support from sports administrators or the public for government regulation of food sponsorship in sport (Kelly et al., 2008; Danylchuk and MacIntosh, 2009; Victorian Health Promotion Foundation, 2010).

Most informants in this study considered there would be little, or no impact on sport at all levels as a result of regulation because food and beverage company sponsorship was not a major source of income. However, even informants from sports with no food or beverage sponsorship were still concerned about any loss of funding which might result from the introduction of regulations. They considered regulation would increase competition between sports for other non-food or beverage sponsors.

While the current extent of food and beverage company sponsorship may not appear to warrant regulation, sports sponsorship has proved effective for marketing other unhealthy products. Sports sponsorship was used to obscure the health consequences of smoking and provided an alternative marketing route for tobacco when regulation prohibited traditional tobacco advertising (Compton, 1993; Charlton et al., 1997). Tobacco manufacturers moved quickly to lobby policy-makers when regulations were proposed in New Zealand during the 1990s (Thomson and Wilson, 2000). Any proposed regulatory approach addressing food and beverage company sponsorship is likely to

receive a similar response from the food industry to that of tobacco sponsorship.

The food and beverage companies that support their sponsorships with marketing activities are all big brands, most are sold internationally, and have significant marketing budgets. Food and beverage manufacturers can evade regulated media by sponsoring sports and creating associations between their brand and a sport or athlete. As discussed in chapter two, these techniques modify food environments, stimulate repeat purchases and thereby influence individual's diets. Food and beverage company sponsorship requires monitoring to ensure the food industry does not adopt the approaches used by the tobacco industry. Regular audits comparing the extent of sponsorship against the baseline measure provided by this study could measure changes in the extent of food and beverage company sponsorship.

Sport is global, and addressing unhealthy food and beverage sponsorship requires global solutions. Addressing food and beverage company sponsorship of New Zealand sporting organisations is unlikely to be effective when multi-national companies sponsor televised international sports events and support these with extensive marketing campaigns.

Treating food and beverage company sponsorship as analogous to tobacco sponsorship provides a framework to explore how marketers use sport to increase sales of foods and beverages. While, evidence clearly demonstrates tobacco's harm, food is complicated by determining which foods, which nutrients and what quantities are deemed unhealthy. Establishing consensus even within a small country like New Zealand is difficult. Achieving international support is likely to be even more difficult and require international political will and a strong evidence base. Rather than regulating against all food and beverage company sponsorship, sports could be harnessed

to promote healthy foods and beverages and enhance public health messages. Even without regulation, sports organisations could exercise power in the market place, giving preference to sponsors manufacturing healthy food and beverages and demonstrate social responsibility in the marketing they employ, particularly when targeting children.

As discussed in chapter three, very little evidence documents food and beverage company marketing in sport (Carter et al., 2011), and this study found seemingly few sponsors. It is therefore likely to be difficult to attract interest from policy makers. Lobbying government to increase their support of organised sport could both prevent promotion of unhealthy food and increase participation in sport. The few companies using sports sponsorship to market their products can influence consumers' food choices by associating their (often unhealthy) brands with a healthy activity – sports. These associations mislead consumers by implying athletes consume these brands thereby promoting consumption (Hoek et al., 1997).

7. 3 Is junk food available in sport?

This study found most foods and beverages available at New Zealand sports events were energy-dense and nutrient-poor. The results of this study were consistent with studies described in chapter three (Kelly et al., 2008; Kelly et al., 2010b). In this study when healthier items were available there were very few of them and they were often more expensive than less healthy options. Higher prices may have reduced demand for healthier options As discussed in chapter two, price is influential in food choice (Story et al., 2002; Glanz and Sallis, 2005; Drewnowski, 2004) and simple strategies such as price reductions of healthy foods can influence food purchases (Ni Mhurchu et al., 2010; Carter and Swinburn, 1999). While not tested in sports settings these strategies may be effective in influencing food and beverage sales.

There appeared to be three key factors that maintained the dominance of unhealthy food and beverage availability in sports settings. These factors were caterer's control over food provision, socio-cultural attitudes which viewed unhealthy foods and beverages as normal and a dominant profit motive.

Many informants considered they had no influence over the types of foods and beverages provided at sports venues. This seemed true for informants hiring stadia for sports events, because the venue authorities contracted catering services. Most sports administrators in a study of European stadia considered they had little control over foods sold because food outlets were sub-contracted (Drygas et al., 2011). Although, one sport (rugby) ensured their sponsor's beverages were sold and that suggests there may be opportunities for sports to influence the types of foods and beverages provided at stadia. For this to occur, sports would need to be aware of the issue, consider it of concern and that they had a role in it. Further work would involve reviewing their attitudes towards foods and beverages and that they ultimately take responsibility for creating a healthy food environment in the sports setting.

Informants normalised the types of foods and beverages available in sports settings, describing them as '*the usual foods*' for sports events. These 'usual foods' contradicted the healthy foods and beverages recommended for enhancing sporting performance (Australian Institute of Sport, 2011), yet few informants' were concerned about this. People engage in multiple settings every day, and are frequently exposed to food and beverage marketing which influences their attitudes and food preferences. Foods and beverages available in sports settings replicate the foods and beverages predominately available in other settings such as cafes, airports, shopping malls, movie theatres. Constant exposure to energy-dense, nutrient-poor foods across multiple settings and at most sports events may have reinforced informants' perceptions that the foods and beverages provided at stadia, rugby clubs and netball centres are normal.

This may explain why many rugby club and netball centre informants did not check caterers' menus. Caterers are providing the expected, or normal, foods and beverages.

Caterers, not sports, profit from food sales at most sports events. Therefore, there is no financial disadvantage for sports in restricting the caterers' provision of unhealthy foods at sports clubs or events. Raising awareness and generating debate with sports administrators about the importance of food environments in sports settings may provide a strategy for change. This could be supported by providing caterers with training, information, recipes and suggestions to improve their menus. Educating caterers about healthy food choices and preparation techniques was a key element in achieving positive change in the school based intervention described by Carter and Swinburn (1999) and similar approaches may be effective in sports settings.

The nutrition transition, described in chapter one affects how we eat, where food is made, how we buy it, where food is consumed and what we consider are normal eating behaviours (Caraher et al., 2005; Fabiosa, 2011). Increasingly, people consume more food away from home (Stewart, 2011) and the foods and beverages consumed are more energy-dense than those prepared at home (Cummins and MacIntyre 2006; Fabiosa, 2011). Provision of foods and beverages at sports grounds reflects these changing patterns of food consumption. Mostly processed foods, high in fat, salt and/or sugar were provided. Informants may have considered it normal to provide spectators and players with opportunities to eat, reflecting a culture where it is normal to sell foods and beverages in the locations people gather.

Most informants had not considered whether providing a healthy food environment was part of their role, how that might be achieved, or whether it would be acceptable to sports participants and spectators. Caterers' profits

were the primary consideration for informants who considered caterers' *'rights'* to profit from their business justified their failure to restrict the types of food and beverages sold. In their view, profits could only be achieved by meeting spectators' demands for energy-dense, nutrient-poor food and beverages.

More healthy food than unhealthy food was available in two venues where the informants had prioritised provision of healthy food. Profit was not a concern for these informants and the contracted caterers were prohibited from selling deep-fried foods. Although not discussed by the informants, the caterers were able to operate their business by selling mostly healthy foods and beverages. These venues show how sports can positively influence food environments in sports settings. A key individual, providing leadership in each organisation was responsible for these changes. Three studies also found a supportive club member was critical in improving food choices in sports clubs (Dobbinson and Hayman, 2002; Dobbinson et al., 2006; Crisp and Swerrison, 2003). Whether these changes would be sustained should personnel change is uncertain. Without this leadership each of these venues may revert from the "normal" unhealthy canteen from the "abnormal" healthier canteen.

Some rugby clubs provided meals for senior players following afternoon games. This was the only example identified in this study where generating income was not the purpose of food provision. Rather food was provided as a gesture of hospitality. Meal provision was limited by finances and varied between clubs however, in all cases informants suggested that a wider range of healthy foods were provided in post-match meals than were sold in clubs. Informants illustrated a 'good meal' by listing foods typical of New Zealand meal patterns including a meat dish, pasta or potato and vegetables.

The example of post-match meals suggests that, within rugby clubs differing values are placed on different types of food and eating occasions. Healthy,

nutrient-dense foods are valued when food has a cultural role (e.g. hospitality) or is used to nourish athletes. When food is used to generate income, usually for contracted caterers and sometimes for netball centres and sports teams, energy-dense, nutrient-poor foods such as potato chips, hot dogs and soft drinks are valued for their ability to maximise income.

7.3.1 Public health implications

The food environment in many sports settings may be described as obesogenic, providing individuals with few choices other than energy-dense, nutrient-poor food and beverages. As outlined in chapter one, obesogenic environments play a key role in the obesity epidemic (Lobstein et al., 2004; Khan et al., 2009). Interventions addressing food environments are potentially more effective and sustainable than those targeting individuals because they involve communities including socio-economically disadvantaged populations (Bauer et al., 2004; Sacks et al., 2008). High levels of participation in New Zealand sport suggest improving the food environment in sports settings should benefit many communities.

New Zealand has a food culture in sports settings where unhealthy food and beverage choices are consistently replicated across sports events. Such that sports spectators may expect to be offered deep fried food, snacks and fizzy drinks at club, regional and national sports events. Messages associating unhealthy foods and beverages with sport participation are reinforced for New Zealanders as they move between different sports. These associations undermine public health nutrition messages linking healthy eating with regular physical activity.

Sports settings have the potential to promote and reinforce healthy eating messages by creating a supportive environment where food and beverages offered for sale reflect nutrition messages and are nutrient-dense. Yet food

provision is not a priority for most sports administrators who abdicate menu decisions to caterers who seek to maximise profit margins. Even informants expressing concerns about associating unhealthy food and beverage sponsors with their sport were unconcerned about the types of food and beverages sold at games. No club informants had considered whether it was necessary to sell food and beverages when games are of relatively short duration and food sales provide few clubs with financial benefits.

Questions regarding food policies generated little discussion with informants suggesting this was not a priority. There appeared to be no New Zealand health promotion initiatives promoting sports club food policies and therefore these findings are unsurprising. No studies explored policy implementation in clubs not receiving health promotion funding, although studies have found nutrition policies in sports clubs receiving health promotion funding increased the availability of healthy food (Corti et al., 1995; Dobbinson et al., 2002; Crisp and Swerisson, 2003; Dobbinson et al., 2006; Eime et al., 2008). External support was key to successful policy implementation (Crisp and Swerisson, 2003; Dobbinson et al., 2006; Eime et al., 2008). Wide adoption of food policies across the sports sector would require support from health agencies and leadership from NSO/RSOs. The benefits of policy implementation would need to be explicit so that sports organisations and clubs can see their relevance and how sports benefit from healthier communities. NSO/RSOs provide leadership to their sports and seemingly could act as role models, encouraging clubs to consider issues such as food and beverage marketing and availability. However, key informant interviews suggested this potential may be limited as each club is an independent organisation not governed by the NSO/RSO.

Sports organisations are both community organisations and workplaces and have a responsibility *'to promote the health and well-being of their employees, their families and communities'* (World Health Organization, 2005, p. 5) through

providing and promoting a healthy food environment. Most informants in this study delineated their role to delivering sport, allocating responsibilities for food provision to contracted caterers. Comprehensive health promotion strategies using frameworks such as the Ottawa Charter (World Health Organization, 1987) have proved successful in settings such as schools, and workplaces (World Health Organization, 1997) and could be used to influence food environments in sports settings.

Health promotion efforts in sports settings are unlikely to be sustained without participation of sport administrators, athletes and spectators (World Health Organization, 1997). Initial health promotion efforts should focus on challenging established assumptions about the types of foods and beverages that are provided in sports settings. Social marketing programmes explicitly promoting the benefits of healthy food environments and the role of sports organisations in creating them may provide a mechanism for raising awareness and creating change. Assistance from health agencies may be required to empower sports administrators to improve food environments. As discussed previously, health agencies may need to provide caterers with the skills to prepare healthy food while operating a profitable business.

Generating income is prioritised by NSO/RSOs and is the primary reason why sports organisations establish sponsorship relationships. There is no doubt funding is important for sports organisations at all levels. Health sponsorship funding could provide an alternative income source motivating sports organisations to develop and implement food policies that address marketing and availability of foods and beverages. The introduction of health sponsorship initiatives would require careful monitoring to ensure policy development in sports organisations results in sustainable improvements to food environments.

Food environments in sports settings are part of a larger global food supply chain. Major changes in food production have resulted in increased global consumption of processed convenience foods and soft drinks (Jensen, 2011). These are commonly available in sports settings. No regulations prevent the marketing of high-fat or high-sugar food in New Zealand. This allows food manufacturers to drive consumer demand through the range of foods and beverages manufactured, and how they are distributed, priced and promoted to caterers and consumers. As a result energy-dense, nutrient-poor foods are widely available across food environments and considered normal.

Health promotion initiatives addressing food environments in sports settings are more difficult to implement when they are counter to prevailing norms. Addressing the obesogenic environment requires action at the macro-environmental level as well as at the micro-level. This may include regulatory measures addressing the marketing and distribution of energy-dense, nutrient-poor foods and beverages in New Zealand. Regulation could address fat and sugar content of foods and beverages, number and locations of food outlets (including in sports settings), portion sizes of unhealthy foods and beverages and restrict sales of deep fried foods at community venues.

Health promotion approaches focusing on sports settings address inequalities as adults, children and families are involved, sports settings are not defined by deprivation level, and they traverse socio-economic groups. Findings from this thesis give some insight into using health promotion in sports settings. Although, it is difficult to comment on how successful these might be, this research and previous studies (Corti et al., 1995; Dobbinson et al., 2002; Crisp and Swerisson, 2003; Dobbinson et al., 2006; Eime et al., 2008) suggest there are likely to be some benefits such as increasing the availability of healthy foods and beverages.

7.4 Theoretical models

This thesis adopted an ecological approach which considers that the environment influences behaviour, and modifying the environment results in behaviour changes (Green et al., 2000). This study found food environments in sports settings are obesogenic. Most of the foods and beverages available were energy-dense and nutrient-poor and, because of this, individuals purchasing foods and beverages were usually unable to make healthy choices. In some settings, food and beverage marketing stimulated and reinforced unhealthy food and beverage purchases. Both behaviour modification theory (Nord and Peter, 1980) and the ANGELO framework explore how environments influence individuals. The next sections discuss the implications of using these theories to explore food environments in sports settings.

7.4.1 Behaviour modification theory

Behaviour modification approaches described in chapter three were used to analyse food and beverage marketing in sports settings. Behaviour modification theory suggests analysing internal processes resulting from marketing is not always necessary to explain consumers' responses. Instead, marketers use environmental stimuli to influence consumers' settings and thus the behaviours they display within these (Nord and Peter, 1980).

Few studies have used behaviour modification theory to explore how marketing influences consumers. Few studies have investigated food and beverage sponsorship and none describe how marketers leverage sponsorship with other marketing activities. Using behaviour modification theory, this study looked beyond a simple analysis of which food and beverage companies sponsored sport to explore in-depth the strategies marketers used to influence consumers' food and beverage preferences and purchases.

Few sponsorships were supported by marketing campaigns. Each used combinations of operant and respondent conditioning and vicarious learning and applied these in different ways, to influence consumers. For example New World supermarkets created associations between the national netball team and rewarded volunteers at netball centres with vouchers. Sanitarium also associated their Weet-bix brand with a national sports team, the All Blacks, but encouraged product purchase by including collectable cards with Weet-bix packets stimulating children to purchase more packets in order to collect a full set of cards. Because of the different mix and range of strategies marketers use, it is difficult to identify which strategy or combination of strategies has the most influence on consumers' awareness or food and beverage preferences. Similarly the extent to which behaviour modification influences consumers has not been tested in the literature. Sales data which would provide this evidence is not publicly available. However, logic suggests these approaches are indeed effective in maintaining brand salience. Food and beverage companies are not philanthropic organisations and investments in behaviour modification techniques are substantial for example, providing branded equipment, vouchers, and prizes free of charge. It seems unlikely that food and beverage companies would continue this investment if these marketing techniques did not influence consumers' preferences and increase sales.

Analysing sponsorship through behaviour modification theory provided richer data than would have been obtained through other methods. For example, other studies of food and beverage sponsorship in sports settings estimated the extent of sponsorship by counting sponsors' logos on websites (Maher et al., 2006; Mehta et al., 2010; Kelly et al., 2011b) or counted the frequency with which logos appeared on televised sports events (Sherriff et al., 2009). These studies did not explore how sponsors supported their sponsorships with

additional marketing and so may not have determined the full extent of marketing in sports settings.

7.4.2 The ANGELO framework

This study used the ANGELO (analysis grid for environments linked to obesity) framework described in chapter one to identify whether the food environment in sports settings contributes to the obesogenic environment (Swinburn et al., 1999). ANGELO “*provides a conceptual construct for dissecting obesogenic environments*” (Swinburn et al., 1999, p.569). The four elements of the ANGELO grid (physical, economic, political and socio-cultural) were used to analyse literature in a systematic review exploring marketing and availability of food and beverages through sports settings (chapter four). ANGELO provided a useful framework to analyse literature with diverse aims, samples and methodologies and highlighted significant gaps in the literature.

Food environments in sports settings are complex. The simplicity of the ANGELO grid ensured this study design captured relevant physical, economic, political and socio-cultural aspects of this food environment. However, ANGELO is a descriptive model, weak on theoretical application and provided no guidance on the relative importance, or role, the different aspects play in structuring micro-food environments. The authors suggest researchers rate and score identified environmental aspects according to their validity, relevance, and changeability. There is no information to guide how each element should be ranked or scored, instead researchers must themselves determine how to prioritise their findings.

This study found that socio-cultural and economic aspects play important roles in determining the physical aspect (what is available). Socio-cultural influences on food environments in sports settings have not been explored in the literature (Carter et al., 2011) yet, informants’ attitudes, beliefs and values determined the

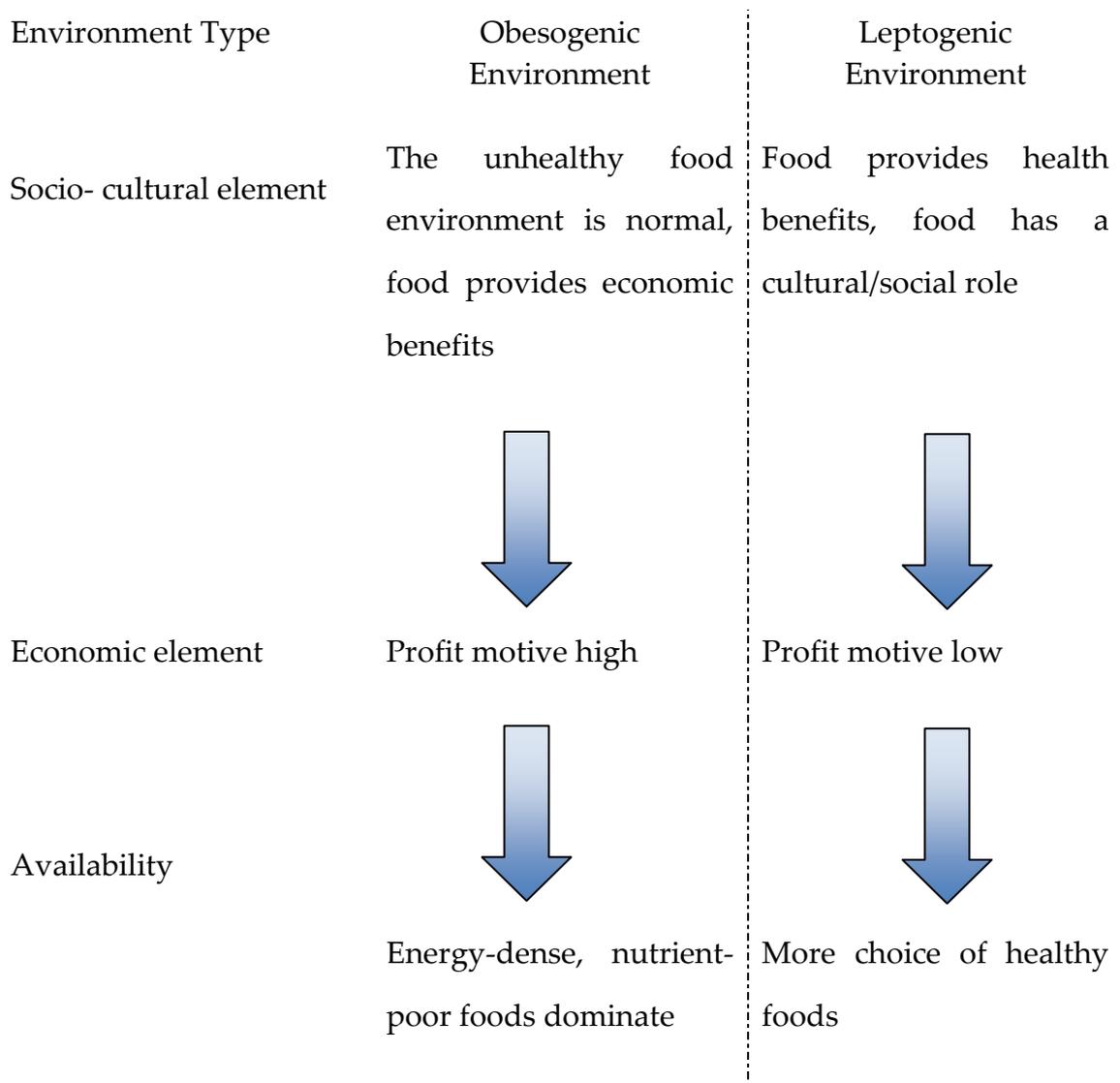
structure of food environments, shaped the economic context and influenced the characteristics and extent of foods and beverages available and marketed in sports settings (Figure: 7.1).

Sports administrators mostly normalised the unhealthy food environment and prioritised the economic benefits of foods and beverages in their organisation. Profiting from food and beverage sales and sponsorship was normal and unquestioned. In these environments, food provision was dominated by energy-dense, nutrient-poor foods and beverages. These foods had high profit margins, required little preparation, used cheap cooking methods such as frying or grilling or were packaged snack-foods. Sponsorship from any food or beverage company was deemed acceptable and informants did not consider 'fit' or the impact of messages associated with unhealthy food or beverage company sponsorship.

In contrast, when sports administrators valued food for its role in enhancing athletic performance, the healthy, nutrient-dense foods and beverages requiring more complex food preparation were available. Sports considered sponsor 'fit' and their values prevented them from promoting unhealthy foods and beverages. These sports considered generating income through associations with unhealthy food and beverage companies was less important than the impact of the association. For a few informants this extended to the provision of foods and beverages to spectators, and players through the canteen. While a few unhealthy foods were available the majority of foods were healthy. These administrators were unconcerned about the profit motive and required their caterers to find solutions which aligned with their values. Similarly, when food was provided as hospitality reflecting club culture, healthier foods including casseroles, pasta and vegetables were offered in post-match meals to ensure guests felt welcomed. Economic aspects still played a

role but were not dominant, relating to affordability rather than income generation. This is outlined in Figure 2 below.

Figure 2: Determinants of food environments in sports settings



Policy did not play a role in sports organisations in this study. The availability of healthy foods increased in Australian sports clubs which introduced food policies (Corti et al., 1995; Dobbinson and Hayman, 2002; Dobbinson et al., 2006). Food policies have been used successfully to limit sales of unhealthy foods and beverages in New Zealand schools (Cushman, 2012). While not tested in New Zealand sports settings it is likely that food policies could

influence food environments in sports settings by defining which foods and beverages are acceptable to market and sell.

Focussing on the tobacco analogy steers solutions towards a regulatory approach restricting sponsorship. Unlike tobacco, food and beverage company sponsorship provides opportunities to promote healthy and unhealthy products. Some informants had different attitudes and values towards different aspects of the physical environment. For example, many of the informants who thought unhealthy food sponsorship was unacceptable because of the negative impact on their organisation were aware foods and beverages available at their sport were mostly unhealthy. While they may not have liked this, they described it as normal and made no attempt to improve the types of foods available. They justified their inaction by suggesting others were responsible for food provision. This constant play and contest between attitudes, beliefs and values suggests interventions that demonstrate how the availability of unhealthy food negatively impacts on sport may influence sports administrators to take responsibility for improving the types of food and beverages sold in sports settings

In summary, this study explored the micro-environment of sports settings. The ANGELO grid was found to be useful for analysing the literature and planning data collection to ensure all relevant environmental aspects were covered. ANGELO provided little guidance in analysing the data. Results from this study suggest a hierarchy among the environmental aspects explains how food environments are structured at the micro-level. The prevailing socio-cultural attitudes determine the economic aspect and what foods and beverages are marketed and available in settings. Policy may be influential but is untested in sports settings. The next section discusses the strengths and limitations of this research.

7.5 Strengths and limitations

This study is one of the first to investigate the characteristics and extent of food and beverage company marketing and availability at national, regional and club levels of sport. The systematic review described in chapter three (Carter et al., 2011) found food environments in sports settings have received little attention. No studies have undertaken direct observations of marketing or availability of foods and beverages in sports settings and none have explored sports policies in sports organisations and clubs that do not receive health promotion funding. No studies have captured sports administrators' perceptions of food and beverage company marketing, availability and regulation.

This study was informed by a pilot study which identified marketing practices and types of foods available in sports settings (Maher, 2007). This formative research helped to identify the relevant aspects of food environments in sports settings and used them to develop an observational data collection tool which was specific to sports settings. The interview schedule developed from the pilot study (Maher, 2007) was adopted for this study, piloted and refined during formative stages of the research (Gittleston and Sharma, 2009), ensuring it captured the relevant physical, economic, political and socio-cultural aspects of sports settings.

This study met the conditions Yin (2003) cites as favouring the use of a case study. The questions posed by this study were both exploratory (seeking to identify the characteristics and extent of food and beverage marketing and availability) and explanatory (seeking to understand knowledge, attitudes and experiences of sports administrators). This study had no influence over food and beverage marketing or provision in sports venues and the study focused on a contemporary issue (Yin, 2003).

Including two embedded units (rugby and netball) provided more insight into the phenomena than would have been achieved without these. Phase One provided detailed data at national, regional and club levels of each sport. Data from the study of embedded units confirmed findings from the wider case study. For example, all of the informants considered the majority of food and beverages available at sport were energy-dense, nutrient-poor. These perceptions were confirmed by observations of national, regional and club rugby and netball which provided detailed data on actual food and beverages sold in these sports. Similarly, NSO/RSO informants considered sponsorship was associated with national and regional levels of a few popular sports. A study of embedded units confirmed informants' perceptions as well as finding differences in sponsorship between NSO/RSOs, netball centres, rugby and netball clubs.

This study used a mixed methods research design providing rich data that could not have been obtained using solely qualitative or quantitative methods (Tashakkori and Teddlie, 2010). Data was obtained from multiple sources including key informant interviews, observations of food sales and marketing at sports venues, website reviews and analysis of televised sports broadcasts. Key informant interviews achieved saturation in both phases of the study and were useful for understanding results from observations, website reviews and analysis of televised sports broadcasts. For example, informants explained why some netball centres operated a shop and a canteen, and why marketing relationships were not shared between organisations belonging to the same sport. Informant interviews provided explanatory data not available by using other research methods. This included data about key informants' attitudes towards food and beverage marketing and availability.

When results were triangulated, findings from the different data sources supported each other (Erzberger and Kelle, 2003; Hammersley, 2008).

Informants' perceptions that mostly energy-dense, nutrient-poor food and beverages were available in sports settings were confirmed by observations, with some variations between sports. For example, foods sold frequently at all rugby venues, but not netball, were burgers, hotdogs and toasted sandwiches. Foods sold frequently at netball venues but not rugby included cakes, cookies, donuts, savoury snacks, potato chips and lollies. Likewise, website reviews confirmed informants' perceptions that most food and beverage company sponsorship was limited to popular high profile sports. Website reviews found fewer than a quarter of NSO/RSOs (n=74), 37 percent of rugby clubs, 27 percent of netball centres and five out of 147 netball clubs (0.03%) were sponsored by food and beverage companies. Observations found few food and beverage companies sponsored club rugby or netball centres, while analysis of televised sport found national rugby and netball teams were sponsored by food and beverage companies.

This mixed methods approach identified both the food and beverage companies sponsoring sport and how the marketers leverage these sponsorship activities to enhance and reinforce brand associations with sport. Key informant interviews provided detailed information identifying both sponsors and marketing activities leveraging sponsorships. Website reviews demonstrated the scope of companies and brands sponsoring sport. As a result, this study provided a better estimation of the characteristics and extent of food and beverage company marketing in sport than studies described in chapter three, which relied on numerical counts of sponsors' logos on websites. Counting website logos may provide misleading results as they do not capture sponsorships supported by marketing campaigns which may have greater impact on consumers than unsupported sponsorships.

There were some limitations resulting from using sporting organisation websites to identify sponsors. Google searches could not locate websites for 30

percent of NSO/RSOs (n= 131), 46 percent of rugby clubs (n= 32), 65 percent of netball clubs (n=95) and one netball centre. These sporting organisations may not have websites and the extent of food and beverage sponsorship of them is unclear, they may be sponsored by food and beverage companies but communicate this through other media. When undertaking website reviews it was assumed websites accurately listed all current sponsors. The degree of accuracy of website data is unknown and is a potential source of data error. It is possible that more food and beverage companies sponsor sport than was captured by these website reviews. Undertaking further website reviews over successive years may identify more food and beverage companies sponsoring sport and may be more accurate.

External validity (the extent to which the results of the study may be generalised beyond the populations and settings included in the study) was maximised by purposively selecting key informants (Mays and Pope, 1995), sports organisations, netball centres and rugby clubs from three regions in New Zealand to capture the geographic, ethnic and socio-cultural diversity of sports participants and spectators. Venues were selected strategically including urban and rural venues, areas with large Māori and Pacific populations and areas of substantial economic deprivation. Results from observations and key informant interviews were similar for each sport and suggest these results may be generalised to all New Zealand rugby and netball centres. Sampling was constrained by travel times and distance so observations were not undertaken at rugby clubs and netball centres located furthest from airports. Key informant interview data were consistent with observational data, so it is unlikely the exclusion of distant rugby clubs and netball centres resulted in bias. While this observational data may be generalised to New Zealand rugby clubs and netball centres, it may not be applicable to all sports clubs. Clubs from only two sports

were included in this study and little is known about the structure and organisation of clubs in other sports.

Construct validity was established through using two researchers to collect observational data. Discussion between researchers during observations was a strength of this study. Observations in stadia and some netball centres were undertaken amongst crowds of spectators who at times obstructed the view of food and beverage sales and marketing. Using two researchers we were able to confirm and validate observations, ensuring all relevant aspects of the study were recorded consistently. Using two researchers also ensured the safety of personnel while collecting data at sports events.

The weather played a role in observational data collection in this study. Poor weather resulted in cancellation of rugby matches during two planned observations in one region. While fewer observations were completed in this region than were originally planned, enough observations were completed to enable comparisons and the results are unlikely to have been affected by this.

Data was collected during an exceptional year for New Zealand rugby which hosted the Rugby World Cup (RWC) in 2011. Because of the RWC the New Zealand rugby club season and provincial rugby championships were played over a shorter than usual timeframe. This was considered when planning observations to ensure they were completed during the playing season. All but one of the stadia where rugby observations were undertaken hosted RWC games. Stadia hosting RWC games were required to remove all advertising prior to the tournament. To avoid any impact from this, observations in these stadia were completed as early in the season as possible. Observations of both national rugby games occurred later in the rugby season. At each of these venues a regional observation had previously been completed and permanent advertising hoardings were unchanged from the earlier observation,

suggesting the RWC had not influenced sponsor advertising at these venues at the time of this study.

There was no televised coverage of New Zealand netball championships during 2011 because of RWC coverage. The planned analysis of televised provincial netball games could not be undertaken and is a limitation of this study. Television coverage was identified by key informants as important for attracting sponsors. The extent of food and beverage company marketing associated with televised regional netball competitions could not be identified. While events such as the RWC may interfere with research, they are also part of sport and need to be considered during planning research in this area.

Thematic coding and analysis of key informant interview data were undertaken by one researcher (the author) and is a limitation of this study. Using the same researcher to code and analyse interviews in both phases of the study ensured a uniform approach however, another researcher may have interpreted the data differently. Inaccuracies were minimised by following interview methods described in chapter five. This included carefully reviewing coding decisions and discussing identified themes with University of Otago colleagues.

Using the New Zealand Food and Beverage Classification System (Ministry of Health, 2007) as described in chapter four to classify food and beverages reduced the potential for researcher bias. This classification system was developed in New Zealand by nutrition experts to classify foods commonly sold in school canteens. The criteria were developed considering the nutrient content of food and beverages, New Zealand Food and Nutrition Guidelines and foods typically eaten in New Zealand. There are no other New Zealand classification systems that consider food and beverages typically sold in canteens. While developed for school canteens, all food and beverages,

identified in sports settings, except tea and coffee, could be classified as healthy or unhealthy using this classification system. Foods were classified using detailed assessments. Because of the classification system's strict criteria it is unlikely any unhealthy foods were classified as healthy.

Many sponsors were food companies and were classified conservatively. Companies were classified as healthy when half of the foods or beverages they manufacture could be classified as healthy. This may have resulted in imprecise classifications for some companies. All of the companies classified as healthy sold some foods or beverages that were energy-dense and nutrient-poor. These companies were a company manufacturing frozen vegetable and seafood products, two breakfast cereal companies, three dairy companies, a manufacturer of dried fruit, nuts and snack bars, and a company manufacturing pre-prepared meals. In comparison some companies classified as unhealthy sold no healthy foods or beverages. Company sales data rather than product listings could strengthen classification of food and beverage companies in future research. Companies could be classified as healthy when the majority of foods or beverages sold are healthy regardless of the range of foods and beverages manufactured. This approach has not been explored and it is unclear whether sufficient sales data would be available to enable use of this method. Additionally, companies may not be prepared to release this information if it was likely to result in an unhealthy classification for their company.

At times it appeared informants held inaccurate views about what food or beverages were healthy. Analysis of key informant interviews assumed that unless otherwise stated, informants' knowledge and beliefs about healthy foods aligned with classifications used. All informants provided examples of foods and beverages illustrating their perceptions, and in almost all cases these examples of healthy and unhealthy foods aligned with classifications used in

this study. However, some informants' examples contradicted classifications. For example, several informants believed sports drinks were healthy and therefore appropriate sponsors. Most of these examples were easy to identify and therefore unlikely to bias the study results.

While this study was comprehensive it still missed sponsorship of teams or events not associated with NSO/RSOs. One example is the Weet-bix TRYathlon for children which attracts large numbers of children to venues throughout New Zealand. A number of New Zealand club teams participate in Australian basketball, football, and rugby league competitions. Website reviews and key informant interviews did not obtain data on food and beverage companies sponsoring these teams. Due to their televised coverage in larger Australian competitions they may attract more food and beverage company sponsors than New Zealand teams affiliated with NSO/RSOs.

While popular in New Zealand, rugby and netball are less popular worldwide than other sports and may attract fewer sponsors. If resourcing had allowed it would have been valuable to undertake a wider study. International sporting events such as the Football World Cup, the Olympic Games, and the American Football League final are televised in New Zealand attracting large audiences. As discussed in chapter two, these events are sponsored by multinational food and beverage companies and supported by extensive marketing campaigns. This study did not capture these marketing strategies and may underestimate the extent of food and beverage company marketing promoted through sport in New Zealand.

This section has discussed the strengths and limitations of this research. The next section discusses implications for further research to improve our understanding of how food environments in sports settings may contribute to obesity.

7.6 Implications for further research

The research conducted for this thesis was limited to New Zealand national and regional sporting organisations and clubs from two sports (rugby and netball). As described in chapter two, multi-national food and beverage companies sponsor international sports events and support these with global marketing campaigns. Analysis of televised broadcast sport in this study was limited to national teams of two sports. Televised sports broadcasts attract large audiences and further research is required to analyse a wider range of sports broadcasts. Further research should include club teams playing in Australian competitions (e.g. the Australian National Basketball League; National Rugby League). The Australian population is much larger than New Zealand and sponsorship of teams playing in Australian competitions may be preferred by food and beverage companies as they may attract a wider audience in a common food market and warrants investigation. Analysis of sports broadcasts should adopt the techniques used in this study. This study relied on researchers to assess the proportion of logos visible and times were calculated using a stop-watch. This technique could be improved by using higher quality recording equipment with in-built timing mechanisms providing more precise recording than was achieved using a domestic digital television recorder and a stop-watch. This was beyond the budget of this study.

This study did not explore sponsorship of individual athletes by food and beverage companies or marketing techniques associated with these sponsorships. Many sponsored athletes participate in high profile sports events around the globe (e.g. the Tour de France cycle race, or the Australian Open tennis tournament in Melbourne). At each event the sponsors' brands are promoted on clothing or through the use of products during the competition. As discussed in chapter two, behaviour modification theory (Nord and Peter, 1980) suggests respondent conditioning and vicarious learning may stimulate

consumers. The extent of food and beverage sponsorship of individual athletes, the characteristics of the marketing strategies associated with these sponsorships and their influence on consumers' purchasing warrant further investigation.

Sports organisations in this study consistently described how food and beverage company sponsorship made an important contribution to their income. Sports organisations' annual reports document total income received from sponsorship, but none document individual sponsor's contributions. Because of this, the extent of food and beverage companies' financial contribution to sporting organisations is unclear and therefore it is unclear whether food and beverage company sponsorship is necessary to ensure the financial viability of sports organisations. Further research should investigate potential funding mechanisms that might ensure the financial viability of sports organisations without reliance on unhealthy sponsorships. These mechanisms could include health sponsorship funding similar to that used to support health improvements in Australian sports clubs (Corti et al., 1995; Dobbinson and Hayman, 2006; Eime et al., 2008). Research should determine the long term sustainability of these approaches and its acceptability to sports organisations, sports clubs and potential funders.

Food pricing is an important factor in food decisions (Story et al., 2002; Glanz et al., 2005) and pricing strategies have been found to influence consumers' food purchasing in New Zealand supermarkets (Ni Mhurchu et al., 2010). Similar strategies may influence consumers in sports grounds and further research could explore this potential.

Caterers are fundamental to food provision. Almost every informant in this study described how caterers determined the menus at sports clubs, netball centres and stadia. Yet little was known about their attitudes towards healthy

foods and beverages, how they select what products they sell or what influences their menu planning? Do they select products in response to consumers' demands? Or, are these foods and beverages those that they consider most appropriate to sell in sports settings? Do they select foods which maximise profit? This study has identified techniques food manufacturers use to influence consumers' brand awareness, however it did not explore the marketing strategies influencing caterers. Identifying caterers' motivations and influences on these would allow health promoters to target their interventions towards areas with the greatest potential for health improvement. Further research should explore caterers' perceptions about food and beverage provision in sports settings and barriers preventing provision of healthy foods and beverages in this context.

Most informants in this study viewed the food environment in sports settings as "normal". In this normal environment, it was acceptable to provide and profit from sales of unhealthy foods and beverages. Similarly, accepting sponsorship from, and promoting unhealthy foods and beverages was normal and acceptable practice for many sporting organisations. Few informants challenged the "normal" environment with most describing how it resulted from consumer demand. Further study should investigate the up-stream drivers of consumer demand to explore the role of the food industry in creating this prevailing socio-cultural attitude. This research should consider settings wider than sports settings to identify how the food industry influences the food supply in communities. The types of foods manufactured and marketed? How they are distributed and priced?

This section has discussed the implications for further research resulting from this study and identified avenues for further research that will strengthen our understanding of food and beverage environments in sports settings. The next section concludes this thesis.

7.7 Conclusion

The fundamental cause of obesity is an energy imbalance resulting in an accumulation of excess fat. Internationally the prevalence of obesity is growing accompanied by increased financial burdens on health care systems and the community. Like other Western countries New Zealand has seen substantial increases in the prevalence of obesity (Ministry of Health, 2012a). The large and growing numbers of overweight children are predicted to have severe consequences on health care systems in future generations, with the burden of obesity higher for Māori and Pacific children (Ministry of Health, 2008).

Sports settings are important globally as large numbers of people play or watch sport yet little research has investigated food environments in sports settings (Carter et al., 2011). Sport provides food and beverage companies with an unregulated setting in which to market junk food and beverages. This New Zealand case study found food and beverage company sponsorship is associated with high profile televised teams and events which attract international audiences. The marketing campaigns supporting these sponsorships likely influence food preferences and purchases. While most companies did not link sponsorship to other marketing, those that did created repeat exposure for their brands, many of which targeted children. The findings suggest policies that restrict sponsorship of sports by unhealthy food and beverage manufacturers may help limit exposure to unhealthy food marketing within New Zealand sports settings.

Food environments in sport settings provide frequent opportunities to purchase and consume energy-dense, nutrient-poor foods and beverages and few opportunities to make a healthy choice. This wide availability of junk food is considered normal and appropriate by sports administrators. Achieving

sustainable healthy change in sports settings is unlikely when the prevailing attitude normalises the unhealthy environment.

Junk food is promoted through sport in New Zealand. Action is required to address this important issue. New Zealand is a small country where the popular sports differ from those in other countries. Nevertheless these findings may be relevant elsewhere. Given the extent of the obesity epidemic, the international nature of the food industry and of sport, these findings may assist other countries to better understand the issue in their own contexts and to consider appropriate interventions.

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Appendix One: Systematic Search Strategy

Medline, 29 June 2010

	Search	Result	Type
1	exp sports/	1455063	Advanced
2	exp food/	913189	Advanced
3	exp diet/ or exp eating/	197275	Advanced
4	(Marketing or Advertising or promotion).sh.	419	Advanced
5	1 and 2	31893	Advanced
6	4 and 5	23	Advanced
	Number of articles meeting inclusion criteria	0	

Medline, 29 June 2010

	Search	Result	Type
1	e exp sports/	1873819	Advanced
2	exp food habits/ or exp food preferences/	21706	Advanced
3	((Marketing or Advertising or promotion).sh	438	Advanced
4	1 and 2 and 3	7	Advanced
	Number of articles meeting inclusion criteria	0	

Medline, 29 June 2010

	Search	Result	Type
1	exp sports/	1952546	Advanced
2	exp food industry/ or exp food supply/	79260	Advanced
3	exp attitude/ or exp behavior/ or exp food habits/ or exp food preferences/	1083567	Advanced
4	exp food/	913189	Advanced
5	exp population characteristics/ or exp health promotion/	1135894	Advanced
6	1 and 2 and 3 and 4 and 5	495	Advanced
7	limit 6 to (english language and humans and yr="1985 -Current")	372	Advanced
	Number of articles meeting inclusion criteria	2	

EMBASE, 30 June 2010

	Search	Result	Type
1	exp sport/	69286	Advanced
2	exp food/	1240569	Advanced
3	exp food intake/ or exp eating/ or exp energy consumption/ or exp portion size	123432	Advanced
4	1 and 2 and 3	854	Advanced
5	(Marketing or Promotion or Advertising).sh.	11790	Advanced
6	4 and 5	3	Advanced
	Number of articles meeting inclusion criteria	1	

EMBASE, 30 June 2010

	Search	Result	Type
1	exp sport/	69286	Advanced
2	exp food/	363673	Advanced
3	exp food intake/ or exp nutrition/ or exp drinking/ or exp eating/ or exp energy consumption/ or exp portion size	1240569	Advanced
4	exp health program/ or exp health promotion/ or exp health education/	146721	Advanced
5	1 and 2 and 3 and 4	67	Advanced
	Number of articles meeting inclusion criteria	2	

Psych INFO, 30 June 2010

	Search	Result	Type
1	exp sports/	22291	Advanced
2	sports spectators/ or exp audiences/ or exp sports/ or exp "sports (attitudes toward)"/	12673	Advanced
3	exp food/ or exp diets/ or exp food intake/ or exp food preferences/ or exp nutrition/	23919	Advanced
4	food preferences/ or exp preferences/ or exp diets/ or exp eating attitudes/	28988	Advanced
5	exp ingestion/ or exp eating behavior/ or food/ or exp weight control	28679	Advanced
6	(Marketing or Promotion or Advertising).sh.	3649	Advanced
7	1 and 2 and 3 and 6	0	Advanced

8	1 and 2 and 3 and 4 and 5	17	Advanced
9	1 and 2 and 4 and 5 and 6	0	Advanced
	Number of articles meeting inclusion criteria	0	

Psych INFO, 30 June 2010

	Search	Result	Type
1	exp sports/	22473	Advanced
2	exp food/ or exp diets/ or exp food intake/ or exp food preferences/ or exp nutrition/	23919	Advanced
3	exp food intake/ or exp ingestion/ or exp eating behavior/ or exp weight control/ or exp food preferences/	30225	Advanced
4	exp health promotion/	69428	Advanced
5	1 and 2 and 3 and 4	7	Advanced
	Number of articles meeting inclusion criteria	0	

CINAHL, 30 June 2010

	Search	Result	Type
1	(MH "Sports") Search modes - Boolean/Phrase	26828	Advanced
2	(MH "Food and Beverages+") Search modes - Boolean/Phrase	78840	Advanced
3	TX (marketing OR promotion OR advertising) Search modes - Boolean/Phrase	5990	Advanced
4	S1 and S2 and S3	5	Advanced
	Number of articles meeting inclusion criteria	1	

CINAHL, 30 June 2010

	Search	Result	Type
1	(MH "Sports+") Search modes - Boolean/Phrase	31872	Advanced
2	(MH "Food and Beverages+") Search modes - Boolean/Phrase	78840	Advanced
3	("health promotion") or (MH "Health Promotion") or (MH "Health Promotion (Saba CCC)") or (MH "Health Promoting Behavior (Iowa NOC)") or (MH	624798	Advanced

	"Royal Society for the Promotion of Health") or (MH "Adolescent Health") or (MH "Allied Health Literature") or (MH "American Public Health Association") or (MH "American School Health Association") or (MH "Association of Community Health Nursing Educators") or (MH "Attitude to Health") or (MH "Child Health") or (MH "Child Health Services") or (MH "Community Health Centers") or (MH "Cumulative Index to Nursing & Allied Health Literature Print Index") or (MH "Databases, Health+") or (MH "Domain IV: Health-Related Behaviors Domain (Omaha)+") or (MH "Education, Allied Health+") or (MH "Education, Health Sciences+") or (MH "Full-Text Databases, Health") or (MH "Health Behavior+") or (MH "Health Behavior Component (Saba CCC)+") or (MH "Health Beliefs") or (MH "Health Food+") or (MH "Health Policy+") or (MH "Health Sciences Indexes+") or (MH "National Health Programs+") or (MH "Public Health Nutrition") or (MH "United States Public Health Service+") or (MH "World Health") or (MH "World Health Organization+") or (MH "American Association for Health Education") or (MH "Environment and Public Health (Non-Cinahl)+") or (MH "Exercise Promotion (Iowa NIC)") or (MH "Health Behavior (Iowa NOC) (Non-Cinahl)+") (MH "Health Promotion")		
4	S1 and S2 and S3	549	Advanced
	Number of articles meeting inclusion criteria	4	

SPORTDiscus 1 July 2010

	Search	Result	Type
1	sport Limiters - Published Date: 19850101-20100731; Language: English	432258	Advanced
2	TX food Limiters - Published Date: 19850101-20100731; Language: English Search modes - Boolean/Phrase	24802	Advanced
3	TX (marketing OR promotion OR advertising) Limiters - Published Date: 19850101-20100731; Language: English	2671	Advanced

4	S2 and S3 Search modes - Boolean/Phrase	74	Advanced
	Number of articles meeting inclusion criteria	0	

Pro Quest 5000, 1 July 2010

	Search	Result	Type
1	Sport AND food AND marketing OR promotion OR advertising	79	
2	Sport AND marketing OR sponsorship AND food availability	1	
	Number of articles meeting inclusion criteria	0	

Cochrane, 1 July 2010

	Search	Result	Type
1	Sport and food and marketing or promotion or advertising	0	
2	Sport and food	47	
	Number of articles meeting inclusion criteria	1	

Scopus 2, July 2010

	Search	Result	Type
1	sport AND food AND marketing OR advertising OR promotion	151	
2	Sport AND marketing OR sponsorship AND food availability	0	
3	Sport AND marketing AND food	46	
	Number of articles meeting inclusion criteria	6	

Google Scholar, 2 July 2010

	Search	Result	Type
1	sport AND food AND marketing OR advertising OR promotion	531	
2	Sport AND marketing OR sponsorship AND food	3900	

	availability		
	Number of articles meeting inclusion criteria	0	

ProQuest Dissertations and Theses, 3 July 2010

	Search	Result	Type
1	sport AND food AND marketing OR advertising OR promotion	6	
2	Sport AND marketing OR sponsorship AND food availability	0	
3	Sport AND marketing OR sponsorship AND food	4	
	Number of articles meeting inclusion criteria	0	

Social Science Research Network, 3 July 2010

	Search	Result	Type
1	sport AND food AND marketing OR advertising OR promotion	0	
2	Sport AND marketing OR sponsorship AND food availability	0	
3	Sport AND marketing OR sponsorship AND food	0	
	Number of articles meeting inclusion criteria	0	

Nutrition and Food Sciences 3 July 2010

	Search	Result	Type
1	Sport AND food AND marketing OR advertising	28	
2	Sport AND marketing OR sponsorship AND food availability	19	
3	Sport AND marketing OR sponsorship AND food	164	
	Number of articles meeting inclusion criteria	0	

EBSCO 3 July 2010

	Search	Result	Type
1	Sport	10736734	

2	Food or diet	3330301	
3	Marketing OR Advertising Or Promotion	4610335	
4	1 and 2 and 3 (limited to 1885 publication date)	6050	
	Number of articles meeting inclusion criteria	2	

Websites Searched

Organisation Name	Website Address	Document Identified
Healthy Eating Healthy Action now Weight Management	http://weightmanagement.hiirc.org.nz	0
Sport and Recreation Council of New Zealand	http://www.sparc.org.nz/	0
Health Promotion Forum of New Zealand	http://www.hpforum.org.nz/	0
Public Health Association (NZ)	http://www.pha.org.nz	0
Public Health Association Australia	http://www.phaa.net.au/	0
Australian Health Promotion Association	http://www.healthpromotion.org.au	0
Canadian Public Health Association	http://www.cpha.ca/en/default.aspx	0
American Public Health Association	http://www.apha.org/	0
European Public Health Association	http://www.eupha.org/	0
Centers for Disease Control	http://www.cdc.gov/	0
World Health Organization	http://www.who.int/	0
Alberta Centre for Active Living	http://www.centre4activeliving.ca	0
Sport Marketing Association	http://www.sportmarketingassociation.com/index.htm	0
Victorian Health Promotion Foundation	http://www.vichealth.vic.gov.au	1
National and Health and Medical Research Council Australia	http://www.nhmrc.gov.au	0
The Campbell Collaboration	http://www.campbellcollaboration.org	0
The EPPI Centre	http://eppi.ioe.ac.uk/cms/	0
Healthway	http://www.healthway.wa.gov.au	0
Canadian Institute of Health	http://www.cihr-irsc.gc.ca	0

Research		
The Health Evidence Bulletins Wales	http://hebwc.ac.uk/	0
The Effective Public Health Practice Project	http://www.ehpp.ca/systematicreviews.html	0
The Community Guide	http://www.thecommunityguide.org/index.html	0

Symposium or Conference Abstracts Reviewed

Organisation Name	Conference /symposium Programmes/Proceedings reviewed	Document Identified
Health Promotion Forum of New Zealand	Programmes 2009, 2008, 2007	0
Public Health Association NZ	Programmes 2009, 2008, 2007, 2006	0
Public Health Association Australia	Programme 2009	0
Canadian Public Health Assoc Conf	Programme 2010, 2009	0
European Public Health Assoc Conf	Programme proceedings 2009,2008, 2007, 2006	0
Sport Marketing Association	Proceedings SNA 7	0

Total documents identified:

18 journal articles

1 document from website search

3 website documents - from review of bibliographies

1 document as a result of a database alert

Total found = 23 documents

New Systematic Search Dec 2010

Medline, 22 Dec 2010

	Search	Result	Type
1	exp sport/	922016	Advanced
2	exp food/	541319	Advanced
3	exp diet/	258261	Advanced
4	(Marketing or Promotion or Advertising) sh.	488602	Advanced
5	1 and 2 and 3 and 4 and 5	256	Advanced
	Number of articles meeting inclusion criteria	0	

Medline , 22 Dec 2010

	Search	Result	Type
1	exp sport/	614613	Advanced
2	(food industry or food supply).sh.	55347	Advanced
3	exp beverages/ or food/ seeds/ or vegetables/	630732	Advanced
4	health promotion.sh	142474	Advanced
5	1 and 2 and 3 and 4	13	Advanced
	Number of articles meeting inclusion criteria	1	

EMBASE, 22 December 2010

	Search	Result	Type
1	exp sport/	80510	Advanced
2	exp food/	728786	Advanced
3	(Health promotion or health education or health education).sh	131741	Advanced
4	1 and 2 and 3	68	Advanced
	Number of articles meeting inclusion criteria	5	

EMBASE, 22 December 2010

	Search	Result	Type
1	exp sport/	107065	Advanced
2	exp food /	734607	Advanced
3	(marketing or promotion or advertising).sh.	136850	Advanced
4	1 and 2 and 3	9	Advanced
	Number of articles meeting inclusion criteria	3	

Pysch Info, 22 December 2010

	Search	Result	Type
1	exp sports/	193330	Advanced
2	exp food/ or exp diets/ or exp food intake/ or exp food preferences/ or exp nutrition/	1566099	Advanced
3	food preferences/ or exp preferences/ or exp eating attitudes/	18372	Advanced
4	exp ingestion/ or exp eating behavior/ or exp weight control	237569	Advanced
5	(Marketing or Promotion or Advertising) sh.	372597	Advanced
6	1 and 2 and 3 and 5	1	Advanced
7	1 and 2 and 4 and 5	16	Advanced
	Number of articles meeting inclusion criteria	0	

Pysch Info ,22 December 2010

	Search	Result	Type
1	exp sports/	193330	Advanced
2	exp food/	1566099	Advanced
3	exp food preferences/	18372	Advanced
4	food intake/ or exp ingestion/ or exp eating behavior/ or food/ or exp weight control	237569	Advanced
5	health promotion.sh.	142474	Advanced
6	1 and 2 and 3 and 4 and 8	0	Advanced
	Number of articles meeting inclusion criteria	0	

CINAHL, 22 December 2010

	Search	Result	Type
1	(MH "Sporting Events+") (MH "Team Sports+")	26387	Advanced
2	(MH "Food and Beverages+")	57215	Advanced
3	TX (marketing OR advertising OR promotion)	3154	Advanced
4	S1 and S2 and S3	4	Advanced
	Number of articles meeting inclusion criteria	0	

Sports Discuss, December 23 2010

	Search	Result	Type
1	Sport: Limiters - Published Date: 19850101-20101231; Language: English. Search modes - Boolean/Phrase	447897	Advanced
2	Food: Limiters - Published Date: 19850101- 20101231;Search modes - Boolean/Phrase	26534	Advanced
3	marketing OR advertising OR promotion: Published Date: 19850101-20101231	37775	Advanced
4	S1 and S2 and S3	150	Advanced
	Number of articles meeting inclusion criteria	3	

PRO Quest 5000, 24 December 2010

	Search	Result	Type
1	Sport AND Food) AND (Marketing OR Advertising OR promotion) OR (Advertising) AND PDN(>1/1/1985	47	Advanced
	Number of articles meeting inclusion criteria	4	

Cochrane Database, 24 December 2010

	Search	Result	Type
1	Sport AND food AND marketing	0	
2	Sport and Food	2	
	Number of articles meeting inclusion criteria	1	

Scopus 24 December 2010

	Search	Result	Type
1	Sport AND food AND marketing OR advertising OR promotion. Limited 1885 to current	155	
	Number of articles meeting inclusion criteria	0	

Google Scholar 24 December 2010

	Search	Result	Type
1	Sport AND food AND sponsorship. Date limit 1985	16100	Advanced
2	Sport AND food OR Marketing OR Advertising OR sponsorship. Date limit 1985	266	Advanced
	Number of articles meeting inclusion criteria	1	

Proquest Dissertations and Theses 24 December 2010

	Search	Result	Type
1	Sport AND food AND marketing OR advertising OR promotion	10	
2	Sport AND marketing OR sponsorship AND food availability	0	
3	Sport AND marketing OR sponsorship AND food	4	
	Number of articles meeting inclusion criteria	0	

Social Science Research Network, 24 December 2010

	Search	Result	Type
1	Sport AND food AND marketing OR advertising OR promotion	0	
2	Sport AND marketing OR sponsorship AND food availability	0	
3	Sport AND marketing OR sponsorship AND food	0	
	Number of articles meeting inclusion criteria	0	

Nutrition and Food Sciences, 24 December 2010

	Search	Result	Type
1	(sport AND food) AND title:(Marketing OR advertising OR sponsorship) AND yr:[1985 TO 2010]	67	Advanced
	Number of articles meeting inclusion criteria	1	

New Search August 2012

Medline, 13 August 2012

	Search	Result	Type
1	exp Sport/	99505	Advanced
2	limit 1 to (English Language and yr=2011 -current)	8600	Advanced
3	exp food/	972246	Advanced
4	limit 3 to (English Language and yr=2011 -current)	57985	Advanced
5	(marketing or advertising or promotion).mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease supplementary concept, unique identifier]	38618	Advanced
6	limit 5 to (english language and yr="2011 -Current")	2350	Advanced
7	2 and 4 and 6	2	Advanced
	Number of articles meeting inclusion criteria	1	

Medline, 13 August 2012

	Search	Result	Type
1	exp human activities/ or exp sports/	287785	Advanced
2	limit 1 to (english language and yr="2011 -Current")	23039	Advanced
3	exp food habits/ or exp food preferences/	25644	Advanced
4	limit 3 to (english language and yr="2011 -Current")	2386	Advanced
5	(marketing or advertising or promotion).mp. [mp=title, abstract, original title, name of substance word, subject heading word, protocol supplementary concept, rare disease	115435	Advanced

	supplementary concept, unique identifier]		
6	limit 5 to (english language and yr="2011 -Current")	9566	Advanced
7	2 and 4 and 6	46	Advanced
	Number of articles meeting inclusion criteria	1	

Medline Search 3, 13 August 2012

	Search	Result	Type
1	exp human activities/ or exp sports/	287785	Advanced
2	limit 1 to (english language and yr="2011 -Current")	23039	Advanced
3	exp food industry/ or exp food supply/	90356	Advanced
4	limit 3 to (english language and yr="2011 -Current")	6548	Advanced
5	exp attitude/ or exp behavior/	1259354	Advanced
6	limit 5 to (english language and yr="2011 -Current")	93867	Advanced
7	exp food/	972246	Advanced
8	limit 7 to (english language and yr="2011 -Current")	57985	Advanced
9	exp health promotion/	46787	Advanced
10	limit 9 to (english language and yr="2011 -Current")	4678	Advanced
11	2 and 4 and 6 and 8 and 10	2	Advanced
	Number of articles meeting inclusion criteria	0	

EMBASE, 13 August 2012

	Search	Result	Type
1	exp sport/ or exp "sports and sport related phenomena"/	119680	Advanced
2	limit 1 to (english language and yr="2011 -Current")	8853	Advanced
3	exp food/	651209	Advanced
4	limit 3 to (english language and yr="2011 -Current")	60127	Advanced
	exp food intake/ or exp eating/ or exp energy consumption/ or exp portion size	7111	Advanced
5	exp nutrition/	1413601	Advanced
6	limit 5 to (english language and yr="2011 -Current")	132970	Advanced
7	(marketing or advertising or promotion).mp. [mp=title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	159222	Advanced
8	limit 7 to (english language and yr="2011 -Current")	14365	Advanced
9	2 and 4 and 6 and 8	3	Advanced

	Number of articles meeting inclusion criteria	1	
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EMBASE, 13 August 2012

	Search	Result	Type
1	exp sport/ or exp "sports and sport related phenomena"/	119680	Advanced
2	limit 1 to (english language and yr="2011 -Current")	8853	Advanced
3	exp food/	651209	Advanced
4	limit 3 to (english language and yr="2011 -Current")	60127	Advanced
5	exp food intake/	200213	Advanced
6	limit 5 to (english language and yr="2011 -Current")	21246	Advanced
7	exp health program/	61821	Advanced
8	limit 7 to (english language and yr="2011 -Current")	5063	Advanced
9	2 and 4 and 6 and 8	3	Advanced
	Number of articles meeting inclusion criteria	0	

Psych INFO 13 August 2012

	Search	Result	Type
1	exp sports/ / or exp "sports (attitudes toward)"/	9058	Advanced
2	limit 1 to (english language and yr="2011 -Current")	1494	Advanced
3	exp food/	5433	Advanced
4	limit 3 to (english language and yr="2011 -Current")	1093	Advanced
5	Exp health promotion	9094	Advanced
6	limit 5 to (english language and yr="2011 -Current")	1669	Advanced
7	2 and 4 and 6	1	Advanced
	Number of articles meeting inclusion criteria	1	

Psych INFO, 13 August 2012

	Search	Result	Type
1	exp sports/ or or exp "sports (attitudes toward)"/	9058	Advanced
2	limit 1 to (english language and yr="2011 -Current")	1494	Advanced
3	exp sports spectators	366	Advanced
4	limit 3 to (english language and yr="2011 -Current")	60	Advanced
5	exp food intake/	4179	Advanced

6	limit 5 to (english language and yr="2011 -Current")	714	Advanced
7	exp Food/	5433	Advanced
8	limit 7 to (english language and yr="2011 -Current")	1093	Advanced
9	exp Food Preferences/	1297	Advanced
10	limit 9 to (english language and yr="2011 -Current")	279	Advanced
11	2 and 4 and 6 and 8 and 10	0	Advanced
	Number of articles meeting inclusion criteria	0	

CINAHL 13 August 2012, Limits January 2011 - current

	Search	Result	Type
1	(MH "sports"+) Search modes - Boolean/Phrase	31308	Advanced
2	(MH "Food and Beverages+") Search modes - Boolean/Phrase	25138	Advanced
3	TI (marketing OR promotion OR advertising) and TX (marketing OR promotion OR advertising) Search modes - Boolean/Phrase	9320	Advanced
4	S1 and S2 and S3	0	Advanced
	Number of articles meeting inclusion criteria	0	

CINAHL, 13 August 2012, Limits January 2011 - current

	Search	Result	Type
1	(MH "Sports+") Search modes - Boolean/Phrase	31308	Advanced
2	(MH "Food and Beverages+") Search modes - Boolean/Phrase	25138	Advanced
3	("health promotion") or (MH "Health Promotion") or (MH "Health Promotion (Saba CCC)") or (MH "Health Promoting Behavior (Iowa NOC)") or (MH "Royal Society for the Promotion of Health") or (MH "Adolescent Health") or (MH "Allied Health Literature") or (MH "American Public Health Association") or (MH "American School Health Association") or (MH "Association of Community Health Nursing Educators") or (MH "Attitude to Health") or (MH "Child Health") or (MH "Child Health Services") or (MH "Community Health Centers") or (MH "Cumulative Index to Nursing & Allied Health Literature Print Index") or (MH	25138	Advanced

	"Databases, Health+") or (MH "Domain IV: Health-Related Behaviors Domain (Omaha)+") or (MH "Education, Allied Health+") or (MH "Education, Health Sciences+") or (MH "Full-Text Databases, Health") or (MH "Health Behavior+") or (MH "Health Behavior Component (Saba CCC)+") or (MH "Health Beliefs") or (MH "Health Food+") or (MH "Health Policy+") or (MH "Health Sciences Indexes+") or (MH "National Health Programs+") or (MH "Public Health Nutrition") or (MH "United States Public Health Service+") or (MH "World Health") or (MH "World Health Organization+") or (MH "American Association for Health Education") or (MH "Environment and Public Health (Non-Cinahl)+") or (MH "Exercise Promotion (Iowa NIC)") or (MH "Health Behavior (Iowa NOC) (Non-Cinahl)+") (MH "Health Promotion") Search modes - Boolean/Phrase		
4	S1 and S2 and S3	0	Advanced
	Number of articles meeting inclusion criteria	0	

SPORTDiscus

	Search	Result	Type
1	sport Limiters - Published Date: 20110101-20120831; Language: English. Search modes - Boolean/Phrase	48543	Advanced
2	TX food Limiters - Published Date: 20110101-20120831; Language: English Search modes - Boolean/Phrase	3646	Advanced
3	TX (marketing OR promotion OR advertising) and TI (marketing OR promotion OR advertising) Limiters - Published Date: 20110101-20120831; Language: English	376	Advanced
4	S1 and S2 and S3 Search modes - Boolean/Phrase	0	Advanced
	Number of articles meeting inclusion criteria	0	

Pro Quest 5000, 14 August 2012

	Search	Result	Type
1	ab(Sport) AND ab(food) AND ab(marketing OR promotion OR advertising). Limits after 1 January 2011, English language.	191	
2	ab (Sport) AND ab(marketing OR sponsorship) AND ab(food). Limits after 1 January 2011, English language.	148	
	Number of articles meeting inclusion criteria	2	

Cochrane, 14 August 2012

	Search	Result	Type
1	Sport and food and marketing or promotion or advertising	3	
2	Sport and food	3	
	Number of articles meeting inclusion criteria	0	

Scopus, 14 August 2012

	Search	Result	Type
1	sport AND food AND marketing OR advertising OR promotion. Limits since January 2011	4	
2	Sport AND marketing OR sponsorship AND "food availability". Limits since January 2011	0	
3	Sport AND marketing AND food. Limits since January 2011	2	
	Number of articles meeting inclusion criteria	0	

ProQuest Dissertations and Theses, 14 August 2012.

	Search	Result	Type
1	sport AND food AND marketing OR sponsorship. Limit 1 January 2011 –	45	Advanced

	Number of articles meeting inclusion criteria	0	
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Social Science Research Network, 14 August 2012.

	Search	Result	Type
1	Sport AND food AND marketing OR advertising OR promotion. Limit last 2 years.	0	
2	Sport AND marketing OR sponsorship AND food availability. Limit last 2 years.	0	
3	Sport AND marketing OR sponsorship AND food. Limit last 2 years.	0	
	Number of articles meeting inclusion criteria	0	

Nutrition and Food Sciences, 14 August 2012.

	Search	Result	Type
1	Sport AND food AND marketing OR advertising	48	
2	Sport AND marketing OR sponsorship AND food	48	
	Number of articles meeting inclusion criteria	0	

EBSCO

	Search	Result	Type
1	Sport. Limits Published Date from: 20110101-20120831; Language:	2152106	Advanced
2	Food or diet. Published Date from: 20110101-20120831; Language:	610764	Advanced
3	Marketing OR Advertising Or Promotion. Published Date from: 20110101-20120831; Language:	402758	Advanced
4	1 and 2 and 3	686	Advanced
	Number of articles meeting inclusion criteria	6	

Appendix Two: Data extracted in the systematic literature review

Author/Study Name	Design	Methods	Main Findings	Strengths and Weaknesses
Studies investigating the physical environment				
<p>Maher, A., Wilson, N., Signal, L., Thomson, G. (2006)</p> <p>Patterns of sports sponsorship by gambling, alcohol and food companies: an Internet survey.</p>	<p>Type: Cross-Sectional.</p> <p>Aim: To examine the extent and nature of healthy and unhealthy sponsorship of popular New Zealand sports.</p> <p>Population: Sports organisations in the greater Wellington region.</p> <p>Sample: The 8 most popular sports for children</p>	<p>Website content of national, regional and club sporting organisations were examined. Websites were located using a Google search. All pages and publications of 107 websites were searched for sponsors or funding. Data collected included brand, company type, product or service, location on website, presence of a logo or a link to sponsors website.</p> <p>Data was entered into an Excel spread sheet and analysed using EpiInfo software. Ten percent of websites were independently examined by another researcher achieving 95% inter-rater reliability for number of</p>	<p>73% of clubs had information on sponsorship. Touch rugby had significantly more unhealthy food sponsors compared to other sports (RR=6.54: 95% CI =2.07, 20.09; p= 0.001). Within junior sport there was significantly more unhealthy food sponsorship when compared to all other sponsorship (RR=14.72, 95% CI = 6.22, 34.8; p<0.001). Of the 24 sponsors with naming rights only one of these was for food.</p>	<p>Strengths: Methodology well described and able to be replicated. Inter-rater reliability measure used. Study design was able to detect temporal patterns.</p> <p>Weaknesses: Sample restricted to one region. Classification system was conservative, may have underestimated full extent of sponsorship. Only considers website</p>

	aged 5 – 17 were selected from SPARC participation figures.	sponsors and 100% inter-rater reliability for further classification and categorisation.		sponsorship not all possible sponsorship.
Sherriff, J., Griffiths, D., Daube, M. (2009) Cricket: notching up runs for food and alcohol companies?	<p>Type: Cross-sectional.</p> <p>Aim: To quantify the proportion of time the main sponsor's logo was seen during three cricket broadcasts in 2008.</p> <p>Population: Australian cricket spectators.</p> <p>Sample: Two KFC Twenty20 cricket matches and one XXXX Gold beach cricket.</p>	<p>Games were videotaped and analysed for: main sponsor's logo screen time during the game, paid advertisement breaks – type, frequency and duration, venue advertisements for food or beverages.</p> <p>Content analysis commenced with the start of play until the final wicket including advertising time and breaks.</p> <p>Data were DVD recorded.</p> <p>Only visual data was collected.</p> <p>No statistical tests reported.</p>	<p>Sponsors logo was identified 44% - 74% of game time. On average viewers could identify logos for about half the game time.</p> <p>75 seconds was the longest continuous exposure for an advertisement.</p> <p>Paid advertising ranged from 3% to 20% of the telecast.</p> <p>Permanent advertising at Twenty20 games included a wide range of advertisements for fast food, beverages and alcohol.</p>	<p>Strengths</p> <p>Methodology well described and able to be replicated.</p> <p>Study was able to quantify presence of sponsor's logo on a televised sports match.</p> <p>Weaknesses:</p> <p>Small sample size.</p> <p>No reliability measures.</p> <p>Did not collect data on all food and beverage sponsorship, only named sponsors.</p>

<p>Kelly, B., Baur, L., Bauman, A., King, L., Chapman, K., Smith, B. (2010b)</p> <p>Examining opportunities for promotion of healthy eating at children's sports clubs</p> <p>Data also referenced as a poster presentation Obesity Reviews 11(S11):461, and included in Examining Opportunities for Health promotion in Children's Sport:</p>	<p>Type: Cross sectional.</p> <p>Aim: To examine the extent of practices promoting healthy eating within junior community level sports clubs in one state and territory in Australia including foods sold, provided and promoted by clubs.</p> <p>Population: Community level children's sports clubs of the nine most popular children's sports in one Australian state and territory.</p>	<p>Data were collected using a semi-structured telephone questionnaire.</p> <p>The questionnaire was piloted with a convenience sample of 8 people.</p> <p>Interviews with club officials lasted 20 minutes.</p> <p>Survey included questions on sports clubs characteristics, most frequently sold food and beverages, food sold in vending machines, foods and nutrition information given to players, healthy food policies and fundraising.</p> <p>Data were analysed using SPSS for windows version 17.0.</p> <p>Descriptive analyses were used to describe demographic characteristics, food policies and frequency of food and beverage sales and promotions. Pearson's Chi square test was used to identify significant differences.</p>	<p>71 sports clubs had a canteen. The most frequently sold food or beverage was water. The top five items sold were sports drinks, chocolate and confectionery, soft drinks, sausage sandwiches, and pies and pastries. 20% of clubs actively promoted healthy food and beverages. 15% of clubs had vending machines stocking soft drinks, water and sports drinks.</p> <p>39% of clubs recommended food or beverages to players, mostly related to bringing water to games. 28% of clubs provided some food and drink to players. Water was provided by coaches at 53% of these clubs, chocolate (40%) and fruit (33%).</p> <p>Few clubs had written</p>	<p>Strengths:</p> <p>Strong study design.</p> <p>Sample was stratified using ABS Socio-Economic Index for Areas of Advantage/Disadvantage.</p> <p>Questionnaire was piloted.</p> <p>High response rate.</p> <p>Considers a range of aspects related to the food environment and not reported in other papers.</p> <p>Weaknesses:</p> <p>Cross sectional data</p> <p>Self reported data from sports club officials to determine extent of food and beverage sales.</p> <p>No description of system used to classify</p>
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<p>a Survey of Sports Club Officials 2010. Kelly et al., (2010e)</p>	<p>Sample: : A stratified sample of 108 sports clubs were selected from New South Wales and the Australian Capital Territory.</p>		<p>policies on healthy eating, Food and beverage companies contributed to fundraising through chocolate drives and butchers through provision of free or discounted meat for barbecues. Other activities included food stalls, and raffle prizes.</p>	<p>foods as healthy or unhealthy.</p>
<p>Mehta, K., Banytis, F., Covenet, J., Ward, P., Handsley, E. (2010)</p> <p>Food and Beverage Sponsorship of Children's Sport in South Australia: A Pilot Study</p>	<p>Type: Cross-sectional.</p> <p>Aim: To identify food and beverage marketing in 8 popular children's sports in South Australia.</p> <p>Population: Sporting organisations in South Australia.</p> <p>Sample: 8 peak</p>	<p>Websites located using Google and searched for evidence of food and beverage marketing. Data was recorded on word tables and analysed descriptively. Sponsors were analysed using established nutrient criteria.</p>	<p>Food and beverage companies sponsored the majority (65%) of popular sports in South Australia. 92% of food and beverage sponsors of peak state organisations, 84% of club sponsors and 83% of development programme sponsors were classified unhealthy.</p>	<p>Strengths: Provided data on a region not studied elsewhere.</p> <p>Weaknesses: Methods and results not clearly summarised. No inter-rater reliability measures used. Classification system not well described. Only considers website sponsorship not all possible sponsorship.</p>

	sports organisations and 48 clubs in South Australia.			
Kelly, B., Baur, L., Bauman, A., Smith, B., Saleh, S., King, L., Chapman, A. (2011b) Role modelling unhealthy behaviours: food and drink sponsorship of peak sporting organisations	<p>Type: Cross-sectional.</p> <p>Aim: Website audit of national and state sporting organisations to identify types of sponsorship and sponsorship policies.</p> <p>Population: National and state sporting organisations in Australia.</p> <p>Sample: 55 websites of sporting organisations for</p>	Popular sports in 4 states were identified from membership numbers. Websites of sporting organisations of +these sports were searched using a coding tool to collect data including sponsors, their product, promotions used and any policies. Sponsors were classified as healthy or unhealthy using a Delphi survey. Data were collected by one researcher. Data were entered into SPSS, descriptive analyses were used for sponsorships. Policies were analysed thematically.	443 sponsors identified, 9% were food companies. ¼ of all athletic sponsors were food companies. 63% of all food sponsors did not meet criteria to classify them healthy. All sponsors for netball, swimming and martial arts met criteria. Two organisations had sponsorship policies, but no criteria for sponsor selection.	<p>Strengths: Methodology well described and able to be replicated. Delphi survey to classify sponsors Sample included four states and territories</p> <p>Weaknesses: Considers only website sponsorship not all possible sponsorship. Only surveyed popular sports, not all sports.</p>

	popular children's sports.			
Studies investigating the political environment				
Cousens, L., and Slack, T. (1996) Using Sport Sponsorship to Penetrate Local Markets: The Case of the Fast Food Industry	<p>Type: Cross-sectional.</p> <p>Aim: To examine how fast food restaurants enhance their image in local markets using sports.</p> <p>Population: North American fast food restaurants.</p> <p>Sample: 16 individuals representing 11 fast food companies, 4 regional representatives and 1 national representative.</p>	<p>Semi-structured interviews were conducted and additional data were obtained from corporate documents, newspaper articles and trade literature.</p> <p>Interviews lasted between 25 and 60 minutes. All interviews were recorded and transcribed.</p> <p>Participants were purposely selected to represent most fast food chains in a North American city.</p> <p>Data were grouped into themes and analysed.</p>	<p>Three approaches were identified. The independent approach where the franchisee has total control of sponsorship decisions. This was seen as effective in increasing in store traffic through the use of coupons or discounts to sports teams. Building respect and trust and created a sustained competitive advantage over other restaurants. The communal approach involved joint decision making by all franchisees on city-wide events with sponsorship requests screened by a group. The third approach was described as centralised with all sponsorship decisions made by the head</p>	<p>Strengths Provides insight into complex organisational structures of fast food franchises and sponsorship decision making.</p> <p>Weaknesses Cross-sectional data. Small sample size. No outcomes were described for the communal and centralised approach so did not enable comparisons between the three approaches.</p>

<p>Crisp, B., and Swerissen, H. (2003)</p> <p>Critical processes for creating health-promoting sporting environments in Australia</p>	<p>Type: Cross-sectional.</p> <p>Aim: To identify the processes required to implement structural changes in sporting settings along with the factors that either facilitate this or create barriers.</p> <p>Population: Sporting organisations in Victoria, Australia.</p> <p>Sample: 33 interviews 13 organisations receiving health promotion sponsorship</p>	<p>Semi-structured interviews were conducted with a purposively selected sample of officials from organisations involved in implementing healthy sporting environments.</p> <p>Programme documentation was obtained and reviewed.</p> <p>Face to face interviews were conducted where possible. Due to distance 3 participant interviews were conducted by phone.</p> <p>Interviews lasted between 30 minutes and 1 hour.</p> <p>An analysis framework examined the key processes adopted. Structural change was viewed as a continuum. Data were analysed according to each of the dimensions.</p>	<p>office.</p> <p>The document review found contracts between health agencies and sporting organisations had limited documented requirements for structural change by sports clubs. Contracts were short term and stipulated a wide range of change that may have been unrealistic in the time frames.</p> <p>Change was not well supported, and clubs lacked practical support to improve catering.</p> <p>Monitoring and evaluation failed to identify processes clubs used to implement change.</p> <p>Change was largely due to individual club members. Sporting organisations had little influence on affiliated clubs. Changes in clubs were dependent on</p>	<p>Strengths:</p> <p>Sample included staff from clubs as well as supporting organisations.</p> <p>Interviews supported by document review.</p> <p>Included rural and urban representation.</p> <p>Able to identify barriers and enablers to change in clubs.</p> <p>Catering changes were harder to implement.</p> <p>Weaknesses:</p> <p>Cross-sectional data.</p> <p>Sample was limited to organisations with health sponsorship contracts.</p> <p>Discusses changes to catering but details are not provided so unable to evaluate the extent of</p>
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	<p>funding, Vic Health staff (n=3) health agency staff (n=7). Respondents from each organisation nominated two affiliated clubs (n=10).</p>		<p>sponsorship requirements. Changes to healthy catering were implemented less than smokefree and sun smart changes and were seen as harder to introduce.</p>	<p>change or potential impact on food availability.</p>
<p>Dobbinson, S., Hayman, J., and Livingston, P. (2006)</p> <p>Prevalence of health promotion policies in sports clubs in Victoria, Australia</p>	<p>Type: Cross sectional.</p> <p>Aim: To quantify policies and practices at the club level of 11 sports in Victoria, Australia assisted by health sponsorship; to identify barriers and supports for club policy development in five areas including healthy food choice.</p>	<p>Interviews were conducted with a randomly selected sample of sports clubs with larger membership. Club characteristics were collected including, membership, competition season, social activities and club income. Club practices were measured and barriers to establishing policy as well as supports were explored. Interviews took 20 minutes to complete. Simple descriptive statistics were used. Factors associated with policy development were explored using bivariate</p>	<p>Larger clubs were better resourced. Most clubs (91%) undertook policy development by committee. The prevalence of written policies varied widely. 75% of clubs with catering facilities reported they had no plans for development of food policy. Clubs with a policy were significantly more likely to provide at least one healthy food choice compared to clubs with no policy. Clubs stated lack of support from health agencies in the form of</p>	<p>Strengths: Large sample included rural and urban clubs.</p> <p>Weaknesses: Cross sectional data. The definition of a larger club is not stated. Data collection limited to clubs receiving health promotion funding. Methodology for assessing food sales and categorising as healthy or unhealthy not provided. Cannot</p>

	<p>Population: Sports clubs in Victoria, Australia.</p> <p>Sample: 378 clubs from Melbourne city and 262 clubs from regional Victoria.</p>	<p>statistics.</p>	<p>training or advice was a barrier to policy development..</p>	<p>identify extent of change to foods provided because of lack of detail. Distribution of clubs included in the study uneven with higher proportions of football, cricket and tennis included.</p>
<p>Eime, R., Payne, W., Harvey, J. (2008)</p> <p>Making sporting clubs healthy and welcoming environments: a strategy to increase participation</p>	<p>Type: Cross sectional.</p> <p>Aim: To identify whether key stakeholders believe creation of a healthy environments will facilitate sports club membership, and to determine factors that enhance or are barriers to the</p>	<p>Web based survey. Data was downloaded onto an excel spreadsheet and analysed using SPSS software. Data from open ended questions were classified into themes using content analysis.</p>	<p>97% of SSO's considered healthy welcoming environments would act as a facilitator to increasing membership. Club level response was variable. Healthy eating was seen as a difficult area to implement. The cost of healthy food and shelf life of fresh food were seen as barriers. Limited capacity of clubs and lack of support from SSAs were common barriers</p>	<p>Strengths Good response rate. Able to identify some barriers to provision of healthy food in sports clubs.</p> <p>Weaknesses: Cross sectional data. Methodology not well described. Focus on clubs receiving health promotion funding. Specific details on</p>

	<p>creation of that environment.</p> <p>Population: State Sporting Organisations (SSO) and sports clubs in Victoria, Australia.</p> <p>Sample: 51 Victoria Health Promotion Foundation (Vic health) funded State Sporting Associations (SSAs).</p>		<p>to policy development. SSOs estimated healthy eating policies had been developed in 8.9% of clubs with 35.7% of clubs estimated to be providing healthy options.</p>	<p>changes to provision of food not provided.</p>
<p>Drygas, W., Ruszkowska, J., Philpott, M., Bjorkstrom, O., Parker, M., Ireland R., Roncarolo, F., Tenconi, M. (2011).</p>	<p>Type: Cross-sectional.</p> <p>Aim: to examine policies promoting health at European stadia.</p> <p>Population:</p>	<p>A questionnaire was developed from website and literature reviews. Co-ordinators distributed the questionnaire within each country to stadia they considered likely to respond. The programme steering group developed inclusion and exclusion criteria</p>	<p>88 stadia returned questionnaires. The majority of responses were from England and Georgia. 16 stadia had developed a food policy. 25% had a designated person to deal with food issues. Because food outlets were</p>	<p>Strengths: Data obtained from stadia in 10 countries. Stadia represented a range of sports and were of varying sizes.</p> <p>Weaknesses: Number of non-</p>

<p>Good practices and health policy analysis in European sports stadia: results from the 'Healthy Stadia' project.</p>	<p>European stadia and sports clubs. Sample: 88 stadia from 10 European countries.</p>	<p>to identify good practice. Qualitative data were analysed using content analysis and quantitative data was analysed statistically. Food was investigated as one of a range of topics studied.</p>	<p>subcontracted 56% considered they had little or no control on foods sold. 77% considered they had low influence on food or beverages sold in the areas surrounding the stadia.</p>	<p>responding stadia not identified. Not a random sample. Unequal representation of stadia from different countries. Self reported data. No details of policy content provided.</p>
<p>Studies investigating the socio-cultural food environment</p>				
<p>Danylchuk, K., and MacIntosh, E. (2009) Food and Non-Alcoholic Beverage Sponsorship of Sporting Events: The Link to the Obesity Issue</p>	<p>Type: Cross – sectional. Aim: To investigate opinions of consumers towards use of food and non-alcoholic beverage sponsors of sporting events. Population: Residents of Ottawa. Sample: 253</p>	<p>A mixed method explanatory sequential design. Part 1: written survey using Likert scales and open ended questions. Surveys were distributed to students at the end of class. Fitness club members and seniors at an activity centre were surveyed following their workout. Surveys were assessed for frequencies, percentages, means and standard deviation. Factorial analyses of variance (ANOVA) and multivariate analysis of variance (MANOVA) were used to test differences.</p>	<p>100% response rate. Water companies (M=4.29), sport drink companies (M=4.27), healthy snack companies (M=4.22) and juice companies (M=2.15) were identified as the most appropriate food or beverage sponsors. Participants who were big consumers of fast foods had more favourable attitudes towards fast food sponsorship Females, older people and those better educated had less</p>	<p>Strengths Large sample size. Focus groups used to discuss survey outcomes in more depth. Weaknesses Cross sectional data. Method of sample selection not described. Sample was highly educated, female and young and more physically active than the general population.</p>

	<p>participants: students (55%), fitness club members (22%) and seniors (23%). Focus groups had 12 purposively selected participants (marketing, health and sport professionals).</p>	<p>Part 2 consisted of 2 focus group discussions. Focus groups were analysed according to frequency comparison and themes were identified.</p>	<p>favourable attitudes to all forms of sponsorship. Respondents were not in favour of government regulation of sponsorship. Focus groups considered corporate social responsibility important for sponsors and did not view legislation of sponsorship as acceptable.</p>	<p>Most of the sample was from one university. Method of survey collection i.e. at the end of class and workouts was questionable.</p>
<p>Ireland, R., and Watkins, F. (2009)</p> <p>Football fans and food: a case study of a football club in the English Premier League</p>	<p>Type: Cross-sectional.</p> <p>Aim: To explore the perceptions of football supporters of the food provided at their home stadium.</p> <p>Population: Members of Citygrene football club.</p>	<p>A qualitative study using focus groups. 559 invitation letters and 146 phone calls resulted in two focus groups. Focus group discussions used a semi-structured questionnaire. Discussions were transcribed and data was analysed using thematic analysis.</p>	<p>There was a consistent difference between the views of the men and women. Men viewed attending a game as a treat and did not expect to eat healthy food at a football ground. The type of food available was more important to women. Both men and women considered the food sold was poor quality. Women were concerned about the quality</p>	<p>Strengths Good qualitative design.</p> <p>Weaknesses: Cross-sectional data. Very low response rate. Very small sample. Population consisted of one football club; however the authors do not suggest the results are transferable.</p>

	Sample: 11 men and 13 women.		of food available for children. Differences were seen between younger and older participants. Older male participants were beginning to be concerned about what they ate.	
Victorian Health Promotion Foundation (2010) Community Attitudes Survey: Healthy sporting environments (2010)	Type: Cross-sectional. Aim: To identify the extent to which the Victorian community supports the dependency of local sports clubs on food sponsorship by and sales of junk food. Population: Population of Victoria Australia. Sample: A random	Data was collected through a computer assisted telephone survey using a random digit dialling sampling technique. To maximise response repeated call backs were used. Interviews were only in English with a maximum length of 17 minutes. Data is reported with confidence intervals however the data analysis methodology is not reported.	Response rate of 47%. Junk food was initially identified by 6% of respondents as an unhealthy aspect of their sports club. When asked specifically about junk food 51% believed there was not enough healthy food sold at sports clubs, 82% agreed it is the responsibility of sports clubs to promote healthy eating, 85% considered sale of junk food should be reduced in the interests of children's health. 75% considered sale of junk food should be reduced in the interests of	Strengths: Strong design with the survey sample weighted by age and sex to ensure alignment with the Victorian residential population. Weaknesses: Cross sectional data. Telephone survey, excluded those without a phone. Non-English speakers excluded. Questions were closed and may have influenced the response as few participants

	sample of 1500 Victorian adults aged between 18 and 94 years. 2/3s lived in Melbourne and the remainder were residents of the rest of Victoria.		adult health. 49% opposed sports clubs relying on junk food sales to help with costs. 53% opposed clubs receiving sponsorship from companies selling junk food. 81% would support removal of junk food sponsorship if lost revenue was replaced. Most indicated reducing junk food sales would not impact on their participation in the club.	originally considered junk food an unhealthy aspect of the club. Data analysis methodology not reported.
Kelly, B., Baur, L., Bauman, A., King, L., Chapman, A. Smith, B. (2011). "Food company sponsors are kind, generous and cool": (Mis)conceptions of junior sports	Type: Cross-sectional. Aim: To assess children's knowledge of club sponsors and identify their attitudes and purchase intentions resulting from sponsorship.	Clubs were randomly sampled from a list of all clubs in Sydney, Illawarra and Canberra regions. Questionnaire, piloted with 5 children. Questionnaire explored recall and attitudes to club and elite sports sponsors, value of sponsors and attitudes to activities i.e. vouchers. Likert scales used to identify agreement with statements. Recalled sponsors were reviewed to	95% response rate. 74% of children recalled 119 club sponsors. 51% were food or beverage companies. 70% of children reported they liked these companies. 86% had received a reward voucher from one of these companies. 85% liked receiving these. 76% had received a certificate from a food sponsor. 85%	Strengths Research conducted with children in their setting. High response rate. Detailed description of results which identified children's knowledge of club and elite sponsors. Weaknesses

<p>players.</p>	<p>Population: Children belonging to sports clubs in New South Wales and Canberra.</p> <p>Sample: 103 children.</p>	<p>identify accuracy. Five children at 20 sports clubs were convenience sampled. Data were entered onto SPSS and analysed.</p>	<p>considered companies sponsored sport to help the sport and 69% thought this was cool, 59% bought their products because of this. Most children did not recall food or beverage sponsors of elite teams.</p>	<p>Cross-sectional data Convenience sample of popular sports. Data based on self-reported data, so actual impact on consumption unclear.</p>
<p>Kelly, B., Baur, L., Bauman, A., King, L., Chapman, K., Smith, B. (2011c). Restricting unhealthy food sponsorship: Attitudes of the sporting community.</p>	<p>Type: Cross-sectional.</p> <p>Aim: To identify parents and officials attitudes to sponsorship and support for regulation.</p> <p>Population: Members of sports clubs and sports organisations in New South Wales and Canberra.</p>	<p>Clubs randomly sampled from a list of all clubs in Sydney, Illawarra and Canberra regions, representing the most popular sports for children. Selected clubs were known to have food and beverage sponsors from earlier research. 10 parents per club were selected, and each corresponding regional associations. Separate questionnaires were developed for parents and officials. Participants were asked their views on sponsorship benefits, whether sponsorship influenced children, support for policy</p>	<p>95% response rate. Main sponsorship benefits identified were reducing cost of sport participation. Sports officials thought unhealthy sponsorship may have a negative effect on children. Most parents did not perceive any negative effects. Most appropriate sponsors were thought to be sporting goods. Snack food, fast food and confectionery companies were considered inappropriate. Respondents thought children more likely to be influenced by</p>	<p>Strengths: Well described methodology. Research with parents conducted in sports setting. High response rate 95% for clubs and 100% for regional associations. Included range of socioeconomic areas.</p> <p>Weaknesses: Participants were from a small number of clubs, in one region. Respondents mostly</p>

	Sample: 40 clubs and regional association officials and 200 parents	interventions.	elite team sponsors than club. Around 20% or respondents supported restrictions on unhealthy sponsorship. Over half thought sponsorship restrictions would impact financially on sports clubs.	women, and may not be representative.
Studies investigating more than one element of the food environment				
Corti, B., D'Arcy, C., Holman, J., Donovan, J., Frizzell, S., Carroll, A. (1995) Using sponsorship to create healthy environments for sport, racing and arts venues in Western Australia	Type: Cross-sectional. Aim: To describe the extent of change in sports clubs and arts organisations occurring as a result of health sponsorship funding in Western Australia. Population: Sports clubs and arts organisations in	Postal questionnaires sent to nominated contact people. Follow-up phone calls were made to non-responders. A response rate for sports clubs of 80.7% was achieved. The questionnaire included 118 questions on seven areas including food choice. Data were analysed using a statistical package for social sciences.	Sports organisations reported a significant increase in provision of healthy food choices since commencement of health promotion funding (25.3% increase). Almost half of the organisations surveyed had been asked to make healthy food choices available at their sponsored event as part of their funding grant. This figure was not separated by type of organisation e.g. arts compared with sports clubs.	Strengths: Able to identify some change as a result of health sponsorship funding. Weaknesses: Cross-sectional data. Self reported data. The extent or nature of the changes to food choices as a result of health sponsorship is unknown. No data identifying the impact of health promotion funding on

	<p>Western Australia.</p> <p>Sample: 296 sports clubs and arts organisations receiving health sponsorship funding in Western Australia.</p>			<p>implementation of food policies.</p>
<p>Dobbinson, S., and Hayman, J. (2002)</p> <p>Vic Health Healthy Sports Clubs Study: A survey of Structures, Policy and Practice</p>	<p>Type: Cross-sectional.</p> <p>Aim: To quantify the extent of policy development and practices in sports clubs for five areas including healthy eating.</p> <p>Population: Sports clubs in Victoria, Australia.</p> <p>Sample: 932 clubs in Victoria</p>	<p>A computer assisted telephone interview conducted with sports club contacts. Interviews were approximately 20 minutes long and collected information about club characteristics. Clubs were asked about food policies and provision of food in canteens. Simple descriptive statistics were reported for club environments, policy development and practices promoting health.</p>	<p>69% response rate. Policy was only measured for clubs with catering facilities (n=561). 14% of clubs with catering facilities had a food policy. Provision of healthy food in clubs included fresh fruit and vegetables (53%), wholemeal or multi grain bread or rolls (41%), and low fat dairy products (19%). 94% of clubs had water available either for sale or free. Clubs with a written food policy were significantly more likely to offer at least one healthy</p>	<p>Strengths:</p> <p>Large sample size. Identified healthier foods offered by clubs, and also influence of written food policy on foods offered.</p> <p>Weaknesses:</p> <p>Cross sectional Self reported data. Does not identify unhealthy food offered or proportions of healthy versus unhealthy food available so influence</p>

	Australia.		food choice (73% cf 52% p,.05).	on environment unknown.
<p>Kelly, B., Chapman, K., King, L., Hardy, L., Farrell, L. (2008)</p> <p>Double standards for community sports: promoting active lifestyles but unhealthy diets</p>	<p>Type: Cross-sectional.</p> <p>Aim: To identify the nature of food and beverages purchased by children at community sporting venues.</p> <p>Population: Parents of children aged 5 -17 years, living in New South Wales.</p> <p>Sample: 402 parents participated in the survey.</p>	<p>Computer assisted telephone interviewing using closed questions. Numbers were randomly selected from a research company database. Average survey length was 15 minutes.</p> <p>Data were analysed using SPSS version 14.0 for windows. A Pearson Chi square test was applied to determine significant differences in food and beverage purchases between younger (5 - 12 years) and older (13 -17) children.</p>	<p>Older children were significantly more likely to purchase soft drinks and sports drinks (63% adolescents vs 40% young children, p<0.01) and pies and pastries than younger children (38% vs 23%, p<0.0001). Younger children were more likely to purchase fruit juice, ice cream and iced confections than adolescents (51% vs 32%, p< 0.05) and snack foods (45% vs 30%, p =0.05). Parents reported the majority of sports fields (67%) and pools (94%) sold food. 53% considered venues sold mostly unhealthy food. Most participants agreed with government restrictions on the types of food and</p>	<p>Strengths Provides an indication of parents perceptions about food available at sporting venues.</p> <p>Weaknesses: Cross sectional data. Low response rate of 26%. The majority of respondents mothers (78%) with post school education (77%). No description of system used to classify foods as healthy or unhealthy. Data relies on parent's perception and knowledge of foods children purchase.</p>

			beverages sold at sporting venues.	
<p>Kelly B., Baur, L., Bauman, A., King, L., Chapman, K., Smith, B. (2010)</p> <p>Food and drink sponsorship of children's sport: who pays?</p> <p>Data also: referenced as a poster presentation Obesity Reviews 11(S1):449, and included in Examining Opportunities for Health promotion in Children's Sport:</p>	<p>Type: Cross sectional.</p> <p>Aim: To identify the nature and extent of sponsorship of children's sports clubs with a focus on food and beverage sponsorships and to identify the contribution sponsorship makes to club revenues.</p> <p>Population: Community level children's sports clubs of the nine most popular children's sports in one Australian</p>	<p>Data collected using a semi-structured telephone questionnaire and included questions on sports clubs' characteristics and the nature of sponsorship arrangements. Interviews lasted 20 minutes. Interviews were initially piloted with a convenience sample of 8. Sponsors were defined as either a food or non-food company. Food and beverage company sponsors were defined using a Delphi survey with three stages used to reach consensus as to whether they were healthy or unhealthy. Data were analysed using SPSS. Pearson's Chi-square test was used to identify significant differences.</p>	<p>Response rate was 99%. 347 sponsors were identified. 17% of all sponsors were food or beverage companies. Food and beverage company sponsorship was higher for clubs with predominantly younger membership. The majority of food and beverage sponsors were minor sponsors. 50% of food and beverage sponsors did not meet criteria classifying them as appropriate. The main benefit for sponsors was logos printed on players uniforms. Few sponsors provided direct funding to clubs. Sponsorship included vouchers, discounted or free food, water bottles and use of premises. Main sponsors</p>	<p>Strengths: Strong study design. Sample was stratified using ABS Socio-Economic Index for Areas of Advantage/Disadvantage. Questionnaire was piloted. High response rate. Classification of healthy or unhealthy food sponsors was developed through consultation with a range of experts.</p> <p>Weaknesses: Cross sectional data. Description of classification system is broad. Unclear what cut-offs</p>

<p>a Survey of Sports Club Officials 2010.</p>	<p>state and territory.</p> <p>Sample: A stratified sample of 108 sports clubs selected from New South Wales and the Australian Capital Territory.</p>		<p>were more likely to provide direct funding to clubs than minor sponsors. 30% of clubs had a sponsorship policy. 67% of clubs reported less than a quarter of their income came from sponsorship. 40% of food and beverage sponsors were affiliated with the regional association and provided no club funding.</p>	<p>were used to classify sponsors as healthy or unhealthy. Unclear how nutritional quality was determined.</p>
<p>Naylor, P., Vander Wekken, S., Trill, D., Kirbyson, A. (2010).</p> <p>Facilitating Healthier Food Environments in Public Recreation Facilities: Results of a Pilot Project in British</p>	<p>Type: Cross-sectional.</p> <p>Aim: To identify environmental changes enabling healthy choices in sports and recreation centres and patrons perceptions of these.</p> <p>Population:</p>	<p>Mixed methods concurrent triangulation design evaluating changes in sales resulting from introducing a healthy food sales project. Quantitative data included baseline and follow-up audits of facilities and vending machines and review of structured project reports. Measures completed as self assessments. Qualitative interviews with patrons at baseline and follow-up were completed by recreation staff,</p>	<p>8 local governments completed assessments with a significant positive change in the overall environment including planning, supportive environments, communication and education. A 20% increase in healthy food available achieved across all facilities. 5 facilities changed vending contracts. 561 people completed surveys. Lack of choice and cost were main</p>	<p>Strengths Data collected at baseline and follow-up. Project able to measure actual change.</p> <p>Weaknesses: Small sample. Quantitative data relied on self report. Short time frame to measure changes, sustainability is unknown.</p>

<p>Columbia, Canada.</p>	<p>Recreation facilities in British Columbia, Canada.</p> <p>Sample: Sports facilities in 10 local government area</p>	<p>identifying purchasing patterns and changes occurring with project implementation. Quantitative data analysed using SPSS. Qualitative data analysed thematically.</p>	<p>barriers to choosing healthy foods. The majority reported the project had not influenced their food choices. Facility staff identified support from managers, a toolkit, funding and meetings with other facilities as factors enabling project implementation. Barriers were revenue concerns, staffing and support from decision makers.</p>	<p>The facilities selected to study were identified as those most likely to change, data may not be generalised. Pre- and post test qualitative interview sample differed and reliability only assessed once.</p>
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Appendix Three: Participant Information Sheet

Thank you for showing an interest in this study. Please read this information sheet carefully before deciding whether or not to participate. If you decide to participate we thank you. If you decide not to take part there will be no disadvantage to you of any kind and we thank you for considering our request.

Who is doing this study?

This study is being led by researchers at the University of Otago and is funded by the Health Research Council.

What are the aims of the study?

This study aims to understand the extent to which sports settings in New Zealand encourage unhealthy eating through the marketing and availability of different food types, particularly junk food.

What does this interview involve?

The interview is intended to gather information about sport and food. The interview will either be done in person or by phone. It will take no more than one hour. We would like to tape record the interview with your consent. If you do not wish the interview to be taped we would only take notes. You may withdraw from participation in this project at any time and without any disadvantage to yourself of any kind.

The results of the project may be published but your anonymity will be maintained. You are most welcome to request a copy of the results of the project should you wish.

The data collected will be securely stored at the University of Otago, Wellington. At the end of the project any personal information will be destroyed immediately except that (as required by the University's research policy) any copies of the interview on which the results of the project depend will be kept in secure storage for five years, after which they will be destroyed.

This project involves an open-questioning technique where the precise nature of the questions which will be asked have not been determined in advance, but will depend on the way in which the interview develops. In the event that the line of questioning develops in such a way that you feel hesitant or uncomfortable, you may decline to answer any particular question(s) and/or may withdraw from the project without any disadvantage of any kind.

If you have any questions about the research please contact:

Louise Signal, Ph (04) 385-5541 x6477, University of Otago, Wellington, Mein Street, Newtown, Wellington, email louise.signal@otago.ac.nz

This research has been approved by the Ethics Committee of the Department of Public Health, University of Otago. If you have any concerns about any aspect of the research please contact the Head of Department, Professor Richard Edwards Ph (04) 385-5541 x 6040, University of Otago, Wellington, Mein Street, Newtown, Wellington, email richard.edwards@otago.ac.nz



Food and Sport Research

KEY INFORMANT CONSENT FORM

I have read and understood the information sheet explaining this research.

- I have had the opportunity to talk about the research and ask questions. I am satisfied with the answers I have been given.
- I understand that my participation is voluntary and that I can withdraw from this research at any time.
- I understand that my participation is confidential and that no comments that could identify me will be used in any way for this research.
- I know whom to contact if I have any questions about this research.
- I agree to take part in this research. (Please circle the option that applies to you)

YES

NO

- I agree to allow the meeting to be tape-recorded. (Please circle the option that applies to you)

YES

NO

- The data collected will be securely stored. At the end of the project any personal information will be destroyed immediately except that (as required by the University's research policy) any typed copies of the interview on which the results of the project depend will be retained in secure storage for five years, after which it will be destroyed.

The results of the project may be published but my anonymity will be maintained.

Name: _____

Signature: _____ **Date:** _____

I would like a copy of the findings of the research to be sent to me after the research is completed. (Please circle the option that applies to you)

YES NO

In order to send you a copy of the research could you please record your details below.

Name: _____

Address: _____

Email: _____

Signature: _____ **Date:** _____

This research is being led by researchers the University of Otago.

If you have any questions about the research please contact:

Louise Signal, (Ph 04-385-5541 x 6477), University of Otago, Wellington, Mein Street, Newtown, Wellington

This research has been approved by the Ethics Committee of the Department of Public Health, University of Otago. If you have any concerns about any aspect of the research please contact the Head of Department, Professor Richard Edwards Ph (04) 385-5541 x 6040, University of Otago, Wellington, Mein Street, Newtown, Wellington, email richard.edwards@otago.ac.nz

Appendix Four: Key Informant Interview Schedule

Hello, my name is Mary-Ann Carter and I am working on a research project with the Department of Public Health at the Wellington School of Medicine. This study is exploring the policies and practice around the marketing and availability of food and beverages in sports settings. In this study we are only interested in non-alcoholic beverages. This interview is intended to gather information about sport and food and should take less than an hour to complete. We would like to tape the interview with your consent. If you do not wish the interview to be taped we would only take notes. You may withdraw from participation in this project at any time and without any disadvantage to yourself of any kind.

The results of the project may be published but your anonymity will be maintained. You are most welcome to request a copy of the results of the project should you wish.

The data collected will be securely stored at the University of Otago, Wellington. At the end of the project any personal information will be destroyed immediately except that (as required by the University's research policy) any copies of the interview on which the results of the project depend will be kept in secure storage for five years, after which they will be destroyed.

This project involves an open-questioning technique where the precise nature of the questions which will be asked have not been determined in advance, but will depend on the way in which the interview develops. In the event that the line of questioning develops in such a way that you feel hesitant or uncomfortable, you may decline to answer any particular question(s) and/or may withdraw from the project without any disadvantage of any kind.

All of the information that you provide will remain confidential to the research team and your replies will not be attributed to you in any way.

Coding

Title:

Sport/organisation:

National/Regional representation:

Date:

Thinking generally, when I ask you about marketing in sport, what comes to mind?

1. Can you describe the types of marketing that are used in sport? What brands are involved? Are there any examples that come to mind? What are the main types of food and beverages that are marketed?

Now thinking about you own sport,

2. Are food or beverage companies involved in this at all?
 - In what ways are they involved? e.g. player of the day certificates, signage, corner flags, uniforms, subsidised product, event sponsorship etc.

Now, thinking about the national and regional organisation of your sport

3. What kinds of marketing links do you have with food or beverage companies at a national level? How are these links co-ordinated?
4. What kinds of marketing links do the regional organisations have with food or beverage companies? How are these links co-ordinated? How are these links managed at club level?
5. How does your sport benefit from food or beverage sponsorship?

Now I would like to talk to you about policies

6. Does your sport have any policies about the types of food and beverages that are marketed?
7. How effective are these policies?
8. Why were these policies introduced? How were they developed? Who was involved? Who managed the process?
9. What support or (opposition) was there to these policies? How did you manage to accommodate the different perspectives?

10. Do these policies apply throughout the country?

- Are regions and clubs able to alter these to fit their own requirements?
- What discretion do they have?
- Are there variations across different regions and how did these come about?

Now, thinking about advertising/signage at events?

11. To what extent is their signage or advertising at events? How is this managed? What policies/procedures do you have regarding advertising at events?

Now, thinking about the food and beverages that are sold at in sport in New Zealand/your region

12. Who makes decisions about what types of food and beverages are sold at national or regional games?

13. What if any input do you have into the food and beverages that are available?

14. How much influence do your sponsorship or marketing agreements have on the types of food or beverages that are sold at venues?

15. Does your sport have any policies or guidelines controlling the types of food or beverages to be sold?

16. How effective are these policies?

17. Why were these policies introduced? How were they developed? Who was involved? Who managed the process?

18. What support or (opposition) was there to these policies? How did you manage to accommodate the different perspectives?

19. Do these policies apply throughout the country?

- Are regions and clubs able to alter these to fit their own requirements?
- What discretion do they have?
- Are there variations across different regions and how did these come about?

Could you comment on food and beverages at club level?

20. What types of food and beverages policies do clubs have?

21. What differences are there between policies for junior and senior levels?

22. How well do you think these policies are working?

23. What responses have you received?

24. How important is sponsorship from food and beverages companies to your sport?
- If you could put a value on this, what would it be?
25. How are the funds from sponsorship used?
26. If that sponsorship was no longer available how would that affect your sport at national level? At regional levels? At club levels?
27. Where else would you seek sponsorship?
-
28. Some people say government should remove sponsorship of fast food and that or other nutritionally poor food and drinks companies but others disagree with this idea. What do you think?
- What would be the advantages and disadvantages?
 - How would your sport adjust if this happened?
-
29. Do you have any final comments or questions?

Thank you for your time today.

Sport: Rugby Netball

Date:

Type: Club/ National/ Regional/ Other _____

Venue:

Location

Canteen/shop/cafe: opening hours:

Location:

Product Advertising and Signage:

Product	Advertising: Format and Quantity (fridge banners, posters, other)

Food Displayed

Products on Counter:

Products displayed under counter:

Products displayed behind counter:

Other:

Sport: Rugby/netball

Date:

Type: Club/ National/ Regional/ Other _____

Venue:

Location

Signage and advertising

Field/Court Signage: Logos: Name and Placement



Sport: Rugby **Date:**

Type: Club/ National/ Regional/ Other _____

Venue: **Location**

Signage/advertising – other

Other evidence of food or beverage advertising - describe:

Giveaways

Flags or banners

Branded sports clothing:

Other

