

Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.

FOOD PREFERENCES AND FOOD CHOICES OF ELEVEN AND
TWELVE YEAR OLD CHILDREN AS THEY RELATE TO THEIR
TELEVISION VIEWING HABITS

A thesis submitted in partial fulfilment of requirements for the degree of
Master of Science (Nutritional Science) at Massey University, Albany,
New Zealand

Cushla Gordon
2004

ABSTRACT

The aim of this study was to examine the relationship between children's television viewing habits and their food preferences and food choices.

The study was divided into two parts. Part one was an analysis of the frequency and content of food advertisements aired during children's television. Part two involved interviews with children and their parents to examine their eating, television and physical activity habits. From this the relationship between what they were viewing in advertisements and their food preferences and choices could be established. The children, forty in total, were aged eleven or twelve and were chosen from two Auckland Intermediate schools. Comparisons were made between boys and girls.

The research showed that New Zealand children, through advertising, are constantly exposed to a variety of foods that fall within a very narrow range. These foods are predominantly individual servings of snacks or pre-prepared, pre-packaged foods that are high in saturated fat and/or sugar and/or salt. These foods are in direct contrast to the dietary recommendations provided by the Ministry of Health (1997) of eating a variety of foods from all the food groups and only eating treat foods now and then. Advertisers within New Zealand are not adhering to the Advertising Codes of Practice, particularly with regard to repetition and duration of advertisements. Thus, self-regulation within this industry does not appear to be effective.

From part two of the research it was possible to conclude that television food advertisements do have a significant influence on children. This is through creating a desire in the child to try the foods they have seen advertised and as a result of viewing the advertisement, asking their parents to purchase the food. This effect was most likely to be for the life of the advertisement rather than long-term. Children in the study were watching on average just under two hours of television a day and the more television they were watching, thus the more advertisements they were viewing, the more they wanted to try foods they had seen advertised. More of the children's time was spent viewing television than engaged in formal or informal physical activity. Many were overweight or at risk of overweight, however this was not correlated with television viewing.

Overall, television food advertisements influenced children through making the food look appealing and exciting and thus creating a desire to try the food. Children were also influenced by both the qualities of the food, such as taste and appearance, and the people and the environment around them. The research did support the finding in other studies that there is a correlation between children's food likes, dislikes and choices, however it is important to place the influence of advertising in the context of the numerous other influences on children's food choices.

ACKNOWLEDGEMENTS

I would like to thank the following people most sincerely:

Mrs Patsy Watson for the continued enthusiasm and encouragement she gave to me throughout this study.

Dr Carol Wham for her guidance and expertise.

The **families** and **teachers** who participated in this study for their enthusiasm and time.

My husband **Chris** for his patience and support.

Approval for this research was obtained from the Massey University Human Ethics Committee, Albany Campus.

TABLE OF CONTENTS

ABSTRACT	i
ACKNOWLEDGMENTS	ii
TABLE OF CONTENTS	iii
LIST OF TABLES	ix
LIST OF FIGURES	xi
INTRODUCTION	xii
 PART ONE	 1
Content analysis of television advertisements aired during children's television	
 1. LITERATURE REVIEW	 2
1.1 Introduction	2
1.2 Advertising and broadcasting guidelines in New Zealand	2
1.2.1 The advertising codes of practice (2002)	3
1.2.2 Getting it right for children's policy (2001)	3
1.3 Advertising during U.S. prime time television	4
1.4 Advertising during children's television	5
1.5 Advertising during Saturday morning television	6
1.6 Advertising on television in New Zealand	7
1.7 Food and food related behaviour within television programmes	8
1.8 Summary	8
 2. METHODOLOGY	 10
2.1 Introduction	10
2.2 Design and data collection	10

2.3 Data analysis	11
3. RESULTS	13
3.1 Number of advertisements	13
3.2 Types of foods advertised	14
3.3 Duration of advertisements	15
4. DISCUSSION	17
4.1 What are the children in this study viewing?	19
4.2 What sort of message are children getting from advertisements?	20
4.3 Are advertisers adhering to the Advertising Codes of Practice?	21
5. CONCLUSION	23
5.1 Suggestions for further study	24
PART TWO	25
Food and your child, food and you	
1.0 INTRODUCTION	26
2.0 LITERATURE REVIEW	27
2.1 Introduction	27
2.2 Models of food choice	27
2.2.1 The Theory of Planned Behaviour (T.P.B.)	27
2.2.1.1 Behavioural beliefs	29
2.2.1.2 Normative beliefs	29
2.2.1.3 Control beliefs	29
2.2.2 A conceptual model of the food choice process	31
2.2.2.1 Life course	32
2.2.2.2 Influences	32
2.3 Social influences	34
2.3.1 Culture	34
2.3.2 Ethnicity and religion	34

2.3.3	Value systems	35
2.3.4	Socio-economic status	36
2.3.5	Family	37
2.3.6	Friends	39
2.3.7	Child-care providers	39
2.3.8	Other socio-cultural influences	39
2.4	Other	40
2.4.1	Nutritional knowledge	40
2.4.2	Functional foods	41
2.4.3	Weight loss	42
2.4.4	Convenience	42
2.4.5	Price and variety	42
2.4.6	Gender	43
2.5	The physical environment	44
2.6	Food choices throughout the life cycle	44
2.6.1	Infancy and childhood	45
2.6.2	Adolescence	45
2.7	Biological factors relating to food choice	46
2.7.1	Hunger and appetite stimuli	46
2.7.2	Satiation	48
2.7.3	Satiety	48
2.7.4	Energy density of food	48
2.7.5	Sensory properties of the food	49
2.8	Psychological influences	50
2.9	Summary	51
2.10	Food and television	51
2.10.1	Advertising methods and strategies	52
2.10.2	Television advertising and children's food choices	54
2.10.2.1	Experimental settings	55
2.10.2.2	Qualitative studies	56
2.10.2.3	Perceptions of advertising	60
2.10.2.4	Other	60
2.10.3	Television and obesity	61
2.11	Summary	62
3.	METHODOLOGY	64
3.1	Introduction	64
3.2	Ethics committee application	64

3.3	Subjects	64
3.4	Questionnaire development	66
3.5	Anthropometric measurements	68
3.6	Data collection	69
3.7	Bias	69
3.8	Methods of analysis	70
3.9	Subject feedback	70
3.9.1	Subjects	70
3.9.2	Schools	70
4.	RESULTS	71
4.1	Description of the sample	71
4.1.1	People living in the home	71
4.1.2	Employment status and education level of parent/caregivers	72
4.2	Children's eating habits	73
4.2.1	Favourite foods	73
4.2.2	Least favourite foods	74
4.2.3	Number of servings of each food group	74
4.2.4	Takeaways	75
4.2.5	Snacks	76
4.2.6	Beverages	76
4.3	Children's eating habits at home	77
4.3.1	Number of days children were eating breakfast, lunch and dinner	77
4.3.2	Number of meals children had whilst watching or listening to television	78
4.3.3	Number of people who usually ate with child	78
4.4	Influences on the children's food choices	79
4.4.1	Importance of a number of factors when deciding what to eat	79
4.4.2	Level of influence	79
4.5	Television viewing habits	81
4.5.1	Television viewing weekday	81
4.5.2	Television viewing weekend	82
4.6	Physical activity	83
4.7	Television advertising	84
4.7.1	Parents' attitude towards television advertising	84
4.7.2	Discussion of advertisements	85
4.7.3	Concern about television food advertising	86
4.7.4	Influence of television food advertising	86
4.7.5	Children's desire to try foods after seeing advertised on television	87

4.7.5.1	Buying foods as a result of seeing advertisements	87
4.7.6	Favourite food or drink advertisement	88
4.7.6.1	Reasons for liking the advertisement	89
4.8	Shopping	89
4.8.1	Purchase of food or beverages by child	89
4.8.2	Purchase influencing attempts	90
4.8.3	Level of influence of child on household purchases	91
4.9	Food and health	91
4.9.1	Children's attitude to healthy foods	91
4.9.2	Parent's attitude to healthy foods	92
4.9.3	Parent's nutritional knowledge	93
4.10	Body mass index	93
5.	DISCUSSION	95
5.1	Demographics	95
5.2	Children's eating habits	95
5.2.1	Favourite and least favourite foods	97
5.2.2	Snacks	98
5.2.3	Takeaways	99
5.2.4	Beverages	100
5.3	Influences on children's food choices	101
5.4	Television viewing habits	103
5.5	Physical activity	104
5.6	Body mass index	105
5.7	Television advertising	107
5.7.1	Disapproval of advertisements	107
5.7.2	Discussion of advertisements	107
5.7.3	Concern about advertising	108
5.7.4	Influence of advertisements	108
5.7.5	Buying food after seeing advertisement	109
5.7.6	Favourite food or drink advertisement	111
5.8	Shopping	112
5.8.1	Purchase requests when shopping	112
5.8.2	Foods children would like to try after seeing advertisement	113
5.9	Nutrition knowledge and attitude to healthy foods	114
5.9.1	Children's attitude to healthy foods	115
5.9.2	Parents' attitude to healthy food	115
5.9.3	Parents' nutritional knowledge	115

5.10	Limitations of this study and suggestions for further study	116
6.0	CONCLUSION	118
6.1	Key findings from the research	120
7.0	REFERENCES	121

APPENDICES

Appendix A	Application to the Massey University Albany Campus Human Ethics Committee for approval of the study
Appendix B	Information pamphlet for children
Appendix C	Information letter for parents
Appendix D	Consent form
Appendix E	Contact details form
Appendix F	Confirmation letter to participants in the study
Appendix G	Parent's questionnaire – Food and Your Child
Appendix H	Children's questionnaire – Food and You
Appendix I	Letter of thanks for participating
Appendix J	Children's body measurements
Appendix K	Results for participants
Appendix L	Certificate of participation for children
Appendix M	Certificate of participation for schools
Appendix N	Body Mass Index –for-age percentiles: Boys, 2 to 20 years
Appendix O	Body Mass Index –for-age percentiles: Girls, 2 to 20 years

LIST OF TABLES

PART ONE

Table 3a	Average total number of advertisements on a typical weekday and weekend day for each channel	13
Table 3b	Average number of food advertisements on a typical weekday and weekend day for each channel	13
Table 3c	Average total number of food advertisements per week and food advertisements as a percentage of total advertisements	14
Table 3d	Average number of food advertisements broadcast on two television stations by category and time slot	15
Table 3e	Average types of foods advertised as a percentage of total food advertisements for each time slot	15
Table 3f	Average duration of food and total advertisements (min: sec) per time slot and food advertisement duration as a percentage of total advertising duration	16

PART TWO

Table 3.3	Children's age, gender and school	66
Table 4.1a	Children's age, sex and year in school and parent/caregiver's age	71
Table 4.1b	Child and caregiver's ethnicity	71
Table 4.1c	Number of people living in home	71
Table 4.1d	People living in the home	72
Table 4.1e	Employment status of parents/caregivers	72
Table 4.1f	Parents/caregivers level of education	72
Table 4.3	Number of people who usually eat with child at breakfast and the evening meal	78
Table 4.4a	Importance of a number of factors when deciding what to eat	79
Table 4.4b	Level of influence of a number of people	80
Table 4.5a	Number of minutes of television viewed by the children and when viewed on a typical school day	81
Table 4.5b	Number of minutes of television viewed by the children and when viewed on a typical weekend day	82
Table 4.6	Total physical activity per week both formal and informal (hours)	84
Table 4.7a	Issues discussed with child relating to advertisement	85

Table 4.7b	Parent's concerns about advertising	86
Table 4.7c	Way in which parents feel advertisement influences their child	87
Table 4.7d	Buy foods after seeing advertised on television	88
Table 4.7e	Buy foods just because like television advertisement for it	88
Table 4.7f	Children's favourite food or drink advertisement	88
Table 4.7g	Reason for liking advertisement	89
Table 4.8a	Number of children who buy food or drinks on way to/ from school	90
Table 4.8b	Frequency children asked parents to buy food/drink when shopping	90
Table 4.8c	Frequency of time children requested each category	91
Table 4.9a	Children's attitude to healthy foods	92
Table 4.9b	Parents' attitude to healthy foods	92
Table 4.9c	Parents' nutritional knowledge	93
Table 4.10	Children's Body Mass Index	94
Table 5.6a	Children in each BMI percentile	106
Table 5.6b	Children's weight distribution	106
Table 5.7	Parents' approval of television food advertisements	107

LIST OF FIGURES

PART TWO

Fig 2-1	The Theory of Planned Behaviour	28
Fig 2-2	A conceptual model of the food choice process	31
Fig 4-2a	Children's favourite foods	73
Fig 4-2b	Children's least favourite foods	74
Fig 4-2c	Percentage of children meeting the recommended number of servings of each food group	74
Fig 4-2d	Frequency of takeaway consumption	75
Fig 4-2e	Snacks eaten most often	76
Fig 4-2f	Mean volume of various beverages consumed by children each day	76
Fig 4-2g	Frequency of various drink consumption	77
Fig 4-3a	Number of days children having main meals	77
Fig 4-3b	Frequency of meals eaten whilst watching or listening to television	78
Fig 4-5a	With whom children were watching during the week	82
Fig 4.5b	With whom children were watching on the weekend	83
Fig 4-6	Time spent viewing television per week versus physical activity	84
Fig 4-7a	Parents' attitude towards television food advertising	85
Fig 4-7b	Foods children would like to try after seeing advertisement	87
Fig 4-7c	Children's favourite food advertisement by category	89
Fig 4-8a	Food children buy on way to/ from school	90
Fig 4-8b	Level of influence children have on purchases for the household	91
Fig 5-2	Cross tabulation of frequency of consumption of various food groups	96
Fig 5-7	Multivariate cluster diagram of children wanting to try foods after seeing them advertised on television	110
Fig 5-8	Multivariate cluster diagram of the level of influence child has on purchases for the household	114

INTRODUCTION

The recent focus on food advertising to children has come about as a result of the alarming rise in childhood and adult obesity and the belief held by many that advertising high fat, salt and sugar foods to children directly influences what they eat and how they feel about healthy and unhealthy foods. The government is coming under increasing pressure from lobby groups to address this situation and place a ban on food advertisements during children's television. This pressure has increased noticeably during the past year. This thesis will examine the relationship between television advertising and children's food choices.

The situation

The incidence of obesity is increasing in almost all countries both developed and developing (Swinburn, 2003; Brown, 2003; Rauvussin & Swinburn, 1992). There is in fact an obesity epidemic. In New Zealand from 1989 to 1997 there was a 55% increase in the incidence of adult obesity (Ministry Of Health, 2003¹). Today 35% of the population are overweight and 17% of adults are obese (O'Connor, 2003). A recent survey of over 2000 school children in Auckland found that 14% of the children aged between five and eleven years were obese (O'Connor, 2003). It is thought that there are many reasons for this rise in obesity including genetic factors, however the key factor is what is described as today's obesogenic environment. An obesogenic environment as described by Swinburn (2003) is one in which "the sum of influences of the surroundings, opportunities and conditions of life promote obesity in individuals or populations". This environment does not favour a balance between physical activity and food intake (Booth, Sallis, et al, 2001). Where once the human body adapted to defend against times of famine, there are strong biological mechanisms in place to encourage us to eat but no drive for the reverse in this era of food abundance and lack of physical activity (Pi-Sunyer, 2003; Hill, Wyatt, Reed & Peters, 2003).

People are living in an environment today where a variety of food is increasingly easy to come by and this encourages them to eat. Portion sizes have grown and at the same time there is less need to be physically active during the day (Booth et al, 2001). These bigger sizes are hard to resist. Food is also increasingly processed and much of it is energy-dense. The often low cost, convenience and enjoyable taste of high fat foods mean they are frequently chosen over their healthier low fat counterparts. Children are being driven to school because parents fear for their safety when making their own way. Many no longer visit parks on their own or walk to their friends' houses. There are more labour saving devices such as remote controls and lifts and increasingly more sedentary forms of entertainment such as computers and play

stations. Children are also getting increasing amounts of homework so fitting play in after school particularly during winter with less day-light is harder than it used to be.

Food is now sold almost anywhere (Spake & Brophy Marcus, 2002). Petrol stations are offering larger ranges and are now merging with fast food restaurants and supermarkets. Vending machines for convenience foods and soft drinks are found in schools, gymnasiums and outside shops. Instead of milk children are consuming more fizzy drinks and sports drinks that are intended for consumption by athletes not sedentary children (French, Story & Jeffery, 2001). There are increasingly fast food restaurants in food courts of shopping malls where once there would only have been one or two cafes. In America there has been an 89% increase in the number of commercial eating-places, and meals and snacks eaten at fast food restaurants have increased 200% over the last twenty years (French et al, 2001). Adults are working longer hours which for many families means increasing proportions of convenient, processed foods in their diet and less time to fit in regular physical activity (Ministry Of Health, 2002; O'Dea, 2003). Due to this struggle to fit everything in parents are finding less time to teach children the basic cooking skills needed to prepare a meal from scratch. Many children will believe that adding water or removing the plastic seal and putting the food in the microwave is cooking dinner. In many cases there is little motivation and support for change at an individual level particularly given that perceived rewards to change are low (O'Dea, 2003).

Obesity

There are defined periods during the growth cycle where there is an increased risk of obesity (Steinbeck, 2001). These are infancy and the adiposity rebound in pre-puberty and adolescence. Obesity in childhood is known to be an independent risk factor for obesity in adulthood (Campbell & Crawford, 2001). It has been found that older children (15 to 17 years) who are obese have a greater chance of becoming obese adults than younger (<3 years) children (Picciano, McBean & Stallings, 1999; Kennedy, 1996). If one parent is obese the chance of their child, obese or not, becoming obese doubles (Picciano et al, 1999; Maffeis, 2000; Dietz & Gortmaker, 2001). This is especially so if the child is younger than ten years old. No single gene has been found yet that is responsible for the obesity that affects the majority of the population however some people appear to be more susceptible when exposed to the current environment through genetic or biological mechanisms (W.H.O., 2003). Twin studies, adoption studies and studies of family trends do confirm that genetic makeup is a major contributor to obesity (Friedman, 2003).

The Ministry of Health reported in 1999 that more than one thousand people die annually in New Zealand from obesity-related health problems (Ministry Of Health, 2003²). Obesity is associated with coronary heart disease, hypertension, infertility, diabetes and certain cancers associated with the large bowel (Ministry Of Health, 2003¹; Brown, 2003). In childhood obese, commonly there is the presence of hypertension and hyperlipidaemia (Kiess et al, 2001). Obese children also suffer from social and

psychological problems, such as teasing and suffer from low self-esteem and social isolation (Picciano et al, 1999). The economic cost of obesity including diagnosis, treatment and management is massive. It is estimated in Western Countries that between 2-8% of the total health care costs can be attributed to obesity (Brown, 2003). In New Zealand the cost of obesity is estimated to be \$130 million annually which is based on the cost of ischaemic heart disease, type two diabetes, gallstones and some cancers (Ministry of Health, 2003²).

Physical activity

The 2003 Obesity Forum in Wellington, New Zealand it was reported that only 68% of New Zealand children participate in 2.5+ hours of physical activity per week. Thirty six percent of girls are inactive or participate in less than 2.5 hours per week and 27% of boys are inactive (O'Neill, 2003). Little physical activity means a low oxidation rate in muscle and a low fat oxidation rate results in a positive energy balance (Maffei, 2000). These statistics are alarming and this lack of physical activity is a great cause for concern given the role of physical activity in the prevention of obesity. The situation is the same worldwide. Studies in the U.S. are producing similar results. In one study it has been found that ten year old children are progressively becoming heavier with an increase of 1.36kg since the seventies (Kennedy, 1996). However, there is no change in their average height or energy intake suggesting a decrease in their physical activity being the major contributor to this trend.

The social and economic costs associated with this low level of physical activity are high. There is an increased burden on public health and morbidity and impaired functional capacity in the work place (Ministry Of Health, 2002). Following on from the statistics released showing how alarmingly inactive New Zealanders are, a joint policy statement by the Minister of Sport, Fitness and Leisure and the Minister of Health has been released encouraging government and non-government agencies to join together to promote physical activity. Their goals include increasing awareness of the benefits of physical activity, increasing participation in at least 30 minutes of physical activity a day and enhancing the physical and social environment to support the maintenance of physical activity.

What children are eating

It is recommended that children eat a variety of foods from the four food groups every day (Ministry of Health, 1997). These groups are 'fruit and vegetables', 'breads and cereals', 'milk and milk products' and 'lean meats, chicken, seafood and pulses'. High saturated fat and or high sugar foods such as potato chips, sweets and muesli bars should be considered 'treat foods' and only be consumed now and then. Children should eat plenty of snacks to ensure they are consuming enough food to support their high growth and activity levels. They should have plenty to drink, particularly water and milk.

With increasing concern at the rising level of obesity in New Zealand the Ministry of Health commissioned the Healthy Eating – Healthy Action paper (Ministry of Health, 2003¹). This was created through consultation with the public and an in depth literature review. Several key areas of concern were raised.

There is evidence that children are not consuming the recommended five servings of fruit and vegetables a day. In a New Zealand study (n=77) carried out as part of an iodine assessment of children aged 8-10 years 40% of subjects consumed no fruit, 20% two pieces and only 6% consumed three or more pieces of fruit a day. Eighty four percent of the subjects consumed at least one serving of vegetables, with 30% consuming one, 34% consuming two servings and 19% three or more on that day (Skeaff, Thomson & Gibson, 1997). Despite not meeting all the recommended number of servings these children were consuming three main meals as well as morning and afternoon tea. Once again these trends are reflected worldwide. A study carried out in New York with 1397 children to examine their food consumption patterns found children consumed fewer than the recommended number of daily servings of bread, fruit and vegetables but sufficient milk and meat (Melnik, Rhoades, Wales, Cowell & Wolfe, 1998). Skipping meals, and themselves or other children rather than an adult preparing meals was significantly associated with fewer fruit and vegetables consumed.

The actual pattern of food eaten is changing with snacks increasingly becoming a large source of daily energy and more food being consumed away from home. A study carried out by Brindson, George, Paulin & Aitken (1992) nation-wide to investigate the snacking patterns and nutrients obtained from the snacks of form one and two students (n=251) used a twenty-four hour food record kept for one weekday. It was found that almost one third of the children's daily energy intake and almost half of their daily sugar intake came from the snacks. The source of this sugar was cordial, milo powder, chocolate and soft drinks. A study in America to investigate changes in snacking patterns from 1977 to 1996 (n=21236) supported the findings that children are increasing the proportion of snacks in their diets (Jahns, Siega-Riz & Popkin, 2001). From 1977 to 1996 the number of snacking occasions increased at all ages from age two to eighteen.

The tradition of families eating main meals together is waning as children are increasingly eating meals away from home. A study in England (n=397) carried out with eleven and twelve year old children across various socio-economic groups found that children derived most (70%) of their energy at home, whilst away from home sources accounted for approximately 30% of their daily intake (Adamson, Rugg-Gunn, Butler & Appleton, 1996). Cafes and school meals contributed the most outside the home. An American study compared the intake of foods prepared away from the home in 1977-1978 to that in 1994-1996 (Guthrie, Lin & Frazao, 2002). Data was used from a nationwide survey carried out in the seventies and again in the nineties. Similar to the English study the percentage of daily caloric intake from foods consumed outside the home increased from 18% in 1977-1978 to 32% in 1994-1996. The

nutritional value of the foods consumed away from home were higher in total and saturated fat and contained less fibre, calcium and iron.

Summary

This is the setting in which this study was conducted. Eating habits are changing and not for the better, physical activity levels are declining and people claim there are more barriers to change than there used to be. Although there are numerous influences on children's food choices and many changes occurring simultaneously that are contributing to the obesity epidemic, many still hold food advertising to children responsible as a major contributor to the rise in obesity. This study will examine the influences on children's food choices, the relationship between these influences and food advertising and their television viewing and physical activity habits.

Aim

The overall aim of the research is to examine the relationship between children's television viewing habits and their food preferences and food choices.

The research will be divided into two parts. Part one will be an analysis of the frequency and content of food advertisements aired during children's television. Part two will include a look at the eating, television and physical activity habits of the children.

Objectives

Part One

The objective of part one of the study was to:

- **Analyse the frequency and content of television food advertisements aimed at children.**

Part Two

The objectives of part two of the study was to examine the following:

- **The child's eating habits and the parent/child's attitude to healthy foods and knowledge of nutrition.**
- **The level of influence the child has on food purchases for the household.**
- **The child's television viewing habits and the influence of television food advertisements on their food choice decisions.**
- **Parent and child's attitude towards television food advertisements.**
- **The relationship between the child's body mass index-for-age and their television viewing and physical activity habits.**

PART ONE

Content analysis of television advertisements aired
during children's television

1.0 LITERATURE REVIEW

1.1 Introduction

Within the last twelve months there has been a huge escalation in concern over the rise in childhood obesity in New Zealand and overseas and much of the blame for this can be appointed to our increasingly sedentary lifestyle. Certainly the concern has been there for a long time within the health sector however the profile of the issue has been heightened considerably in the media in recent times. One aspect of our lifestyles that has come under fire is that of television advertising aimed at children. It is mentioned consistently in the media that advertisements aimed at children are for high fat, high sugar products and furthermore these advertisements encourage children to make poor food choices and provide messages that contradict advice to eat a balanced diet with everything in moderation.

Several studies have been carried out in New Zealand, Australia and in other countries examining the number of advertisements shown within a specified time slot and analysing the content of these advertisements. Other studies focus on all television output including within programme content and advertisements. Although television is just one of many influences on children's food choices many choose to study television because of the large amount of time children spend watching television relative to other activities in their life.

This section will first examine the regulations and guidelines governing television advertising to children in New Zealand and then review some other studies carried out examining food advertisements aimed at children.

1.2 Advertising and Broadcasting Guidelines in New Zealand

In New Zealand free to air television has several policies and voluntary rules concerning advertising and children's television. There are several agencies involved in the regulation of television and advertising in New Zealand including the New Zealand Television Broadcasters Council (N.Z.T.B.C.), The Broadcasting Standards Authority (B.S.A.), The Association of New Zealand Advertisers (A.N.Z.A.), The Communications Agencies Association New Zealand (C.A.A.N.Z.), the Television Commercials Approval Bureau and The Advertising Standards Authority (A.S.A.).

The Advertising Standards Authority ensures that advertisers/advertising complies with the law and that all advertisements are truthful, not misleading or deceptive and are socially responsible. The Advertising Codes of Practice in New Zealand were formulated by all the agencies involved in advertising including advertisers, advertising agencies, television, radio, newspapers, cinemas and magazines. All of these groups voluntarily adhere to the Codes to ensure there is a high standard of social responsibility when

advertising to children. When the need arises for a review or update of the codes all of the above agencies are involved and where applicable the public and government are invited to provide input. If there are complaints about advertising these are referred to the Complaints Board who will accept comments from various parties and make a judgement.

1.2.1 The Advertising Codes of Practice (2002)

The codes of practice are broken down into different sections including the 'Code of Ethics', the 'Code for Advertising for Slimming or Weight Loss' and more. The codes relevant to the present study are the 'Code of Ethics', the 'Code for Advertising to Children' and the 'Code for Advertising of Food'. Only the latter two codes will be included here.

The 'Code for Advertising to Children' has been created to ensure that children are not misled or fooled by advertising matter. A 'child' is defined as any person under the age of 14. There are four principles in the code and these include the following points. Firstly, "advertisements should observe a high standard of social responsibility". Secondly, in advertisements children should not be encouraged to ask their parents to purchase the item. Advertisements should not make the child feel second rate if they do not have the product. Principle three is related to ensuring the advertisements are in a clear language so as not to confuse, mislead or abuse a child's trust or lack of knowledge. In particular they should be recognisable as an advertisement, and should take into account the viewer's level of maturity. Finally, principle four states, "advertisements should not encourage inappropriate purchase or excessive consumption".

In Principle Three of the 'Code for the Advertising of Food' the first guideline refers to the advertising of treat foods for children. It states the child should not be encouraged to "replace meals with the advertised food or eat them frequently throughout the day". No advertisement should lead the consumer to think that a single food should replace a balanced and varied diet. No children's television host should endorse, promote or sell products in advertisements screened within their programme.

1.2.2 Getting it Right for Children's Policy (2001)

This is a policy created in consultation with A.N.Z.A., C.A.A.N.Z., New Zealand on Air and the Children's Television Foundation in order to outline the responsibilities of television broadcasters when advertising to children. There are ten guidelines several of which are also included in the codes of practice. Children are defined as five to thirteen years old. The guidelines of particular relevance are listed below:

- No advertising on Sunday mornings by law until midday.
- No advertisements in pre-school television (approximately 8.30am to 9.30am weekdays).

- Advertising levels during children's programming are to be kept to a maximum of 10 minutes per hour and station promotions to two minutes per hour.
- Children's television is slightly different between channels but is between 6.30 – 8.30am and 3.30pm – 5pm weekdays and 6.00 – 9.30am Saturdays
- Advertisements will not be repeated excessively:
 - No advertisement may be played more than twice within an hour per channel per day.
 - No advertisement may be played more than three times within each specified children's programming time per channel per day.

1.3 Advertising during U.S. prime time television

As children do not limit their viewing to the morning several studies have been carried out analysing the content of advertisements aired during prime time television. In the U.S. this is 8pm to 11pm weekdays and Saturdays and 7pm to 11pm Sunday.

Story & Faulkner (1990) in their study on prime time American television both within programmes and during commercials found 35% of all advertisements were for food. Advertisements for fast food restaurants occurred at a higher rate than any other food category. Only 3 out of 91 or 3.3% of food advertisements were for fruit and there were none for vegetables. Within the programmes aired 60% of all references to food were for low nutrient drinks and sweets. This study was limited however in that it only included dramatic or situational comedies instead of all the programmes aired during the study duration within prime time when in fact food-related behaviours would occur in other programmes and this meant the advertisements within those other programmes were not included. The number of food advertisements aired is surprising given that the recordings started and finished after children's typical mealtime.

Another study was carried out in America to analyse advertisements shown in prime time shows viewed heavily by children aged 2 to 11 years (Byrd-Bredbenner, & Grasso, 2000¹). It was found that food and beverage advertisements accounted for 23% of all advertisements. The same researchers examined prime time advertisements in 1992 and 1998 and looked at the changes that occurred over the thirty years from 1971 to 1998 (Byrd-Bredbenner, & Grass; 2000²). They found the proportion of total advertisements that were for food remained unchanged throughout this time although total advertisement time increased significantly. In the 1970's there were very few advertisements for fast food restaurants. In the 1990's they were advertised more frequently than any other food category. Beverages were the next most frequently advertised category.

Although the current focus is on those advertisements aired during children's television, these studies indicated that children were exposed to many more food and beverage advertisements and these were also inconsistent with dietary guidelines.

1.4 Advertising during children's television

Several studies have examined the extent and nature of advertisements aired during children's television. Some have focused on Saturday morning television only whilst others have focused on both Saturday morning and weekday afternoon programming. The first two studies to be summarised were carried out at similar times to the present study so a more detailed review is included for comparison.

Morton (1984) in South Australia examined the frequency and nature of advertisements on three commercial channels across five days between the hours of 4pm and 6pm. It was found that there were a total of 120 advertisements across all three channels between 4pm and 6pm. The most commonly advertised food category was 'other foods and food services', followed by 'confectionery, biscuits and cakes' and breakfast cereals. This 'other foods and food services' category included 18 (15%) advertisements for pies and sausage rolls and 10 (8.3%) advertisements for fast food outlets. The results did not appear to be representative of typical advertising during these times as two channels aired far fewer advertisements than the other. One channel had no advertisements at all which was atypical for a commercial station. The researcher compared her results to a previous Australian study and showed that there were less advertisements per hour in her study than the previous. This appeared to contradict the trend of advertisements increasing in frequency over time. Despite this the results of this study do reflect those found in other studies with frequent advertising of sweet foods, breakfast cereals and fast foods.

A further study carried out in South Australia evaluated advertising between 4pm to 6pm and 7pm to 8pm (Morton, 1990). Food advertisements accounted for 48% of all advertisements. There were almost as many food advertisements in the 7pm to 8pm slot as there were in the two earlier slots however the proportion of total advertisements devoted to food advertisements was lower in this 7pm – 8pm slot. Chocolate and confectionery accounted for 21.3% of all food advertisements and were the most heavily advertised category between 4pm and 5pm whilst fast food services and restaurants were mostly advertised in the 5pm to 6pm slot.

A third study undertaken in Brisbane, Australia examined three commercial channels on four separate days in the morning and afternoon over a five-week period (Hill & Radimer, 1997). The focus of this study was to investigate advertising during programs aired for children under ten years of age. The exact times viewed were not recorded, so this study was not directly comparable to the present study. There were 239 food advertisements aired promoting 275 different foods and almost half of these foods were high in fat and/or sugar. 25% were for fast food restaurants and 25% for 'core' foods (includes cereals such as noodles, milk and fruit). Fast food restaurants were the single most common type of food advertisement. The authors concluded that advertisements aired during television shows aimed at children under ten years were mostly for foods high in fat and/or sugar and low in other nutrients.

Finally, in the U.S. a study carried out to assess the quantity and nutritional value of foods advertised on children's television found that food advertisements accounted for 47.8% of all commercials and 91% were for foods high in fat, sugar and/or salt (Taras, 1995).

1.5 Advertising during Saturday morning television

Due to the popularity of Saturday morning viewing for children, advertising during this period has also been examined in several studies. A study carried out in the U.S. examined Saturday morning television from 7am to 10.30am across five networks (Kotz & Story, 1994). Recordings were made on one morning per month across three different months and the foods were categorised in accordance with the U.S. Food Guide Pyramid. Five hundred and sixty four food advertisements were recorded of which 43.6% were made up of the 'fats, oils and sugars' group including candy, biscuits, chips; 37.5% comprised the 'bread, cereal, rice and pasta' group including high-sugar breakfast cereals. Fruit and vegetables were barely represented. The study provided a representation of the proportion that each food in a food pyramid was advertised. The pyramid was skewed heavily towards the fats, oils and sweets group followed by bread, rice, cereal and pasta with no fruits and vegetables and negligible milk, cheese and yoghurt. This is in direct contrast to the proportion one should eat from each part of the food pyramid.

Studies in the 1970's that investigated the content of advertisements during Saturday morning children's television showed similar results to more recent studies (Gussow, 1972; Gussow 1973). Of 388 commercials, 82% were for food, drink or vitamins. Gussow (1972, 1973) argued that advertisements do in fact offer nutritional messages. She believed that simply by not advertising fresh fruit and vegetables on television is a message in itself as to what foods children should get excited about. Gussow also believed that advertisements implied that only sweet things (or high fat) things taste good.

Gussow's results were supported by a Canadian study that looked at prime time weekday and Saturday morning television across five different channels (Ostbye, Pomerleau, White, Coolich & McWhinney, 1993). Advertisements for foods made up 24% to 35% of all advertisements. On Saturday morning over 50% of the food advertisements on both channels were for low nutrient foods, fast foods and high-sugar cereals.

A study carried out in the U.S. to examine food advertising on Saturday morning television included recordings from three channels from 7am to 11am (Cotunga, 1988). Of the 225 advertisements aired, 71% were for food products of which 80% were for foods judged by the researcher as being of 'low nutritional value'. Breakfast cereals made up the greatest proportion of food advertisements followed by the cookies/candy/gum/popcorn/snacks category. Once again these findings were consistent with other study findings.

1.6 Advertising on television in New Zealand

A New Zealand study recorded advertisements from two commercial channels during two separate weeks of the year between 7.30am and 9.30am Saturdays and 4pm and 5.30pm weekdays (McClean & Knowles, 1992). The times recorded did not cover the peak viewing times by children so it is unclear exactly which age group was examined. The purpose of the study was to examine the difference between advertisements during and after a national food promotion. In week two there was a total of 137 food advertisements for the two channels including morning and afternoon. This was 52.8% of all advertisements for channel two and 38.3% for channel three. The most commonly advertised food category was breakfast cereals followed by snack foods, fast foods, 'other' foods, beverages and confectionery/biscuit/cakes respectively. No comparisons were made with advertisements aired during the winter months so there may have been a seasonal bias introduced affecting the number of beverages advertised.

Another study conducted in New Zealand examined the nutritional quality of foods advertised during children's television and assessed the potential nutritional impact on children (Wilson, Quigley & Mansoor, 1999). Advertisements were taped on one channel only during two one week periods from 3.30pm to 6.30pm weekdays and 8am to 11am weekends. It was assumed a child would eat each of the foods in proportion to the amount the food was advertised. Two hundred and sixty nine advertisements or 29% of all advertisements recorded were for foods or food retailers. It was found that 63% were in the 'high fat and/or high sugar' category. Fast foods made up 14% of all advertisements. Snack foods were also highly advertised. This study revealed that if a hypothetical boy at different ages ate each item in proportion to the amount the food was advertised, he would consume calories in excess of his energy needs. He would also eat in excess of some nutrients such as saturated fat, protein, free sugars and sodium. It is not possible to determine if any seasonal bias was introduced or there were other factors such as a public holiday or school holidays that would affect results in this study which is a limitation. Another limitation of the study was that only one channel was recorded, however as seen later in the present study, channel two is fairly representative of both channels.

A further New Zealand study involved a content analysis of 88 advertisements and examined the extent and nature of televised food advertising (Hammond, Wyllie & Casswell, 1997¹). Advertisements were examined over a sample week on three commercial channels between 4pm to 6pm and 7pm to 8pm. Sweet snacks, fast food services and restaurants, drinks and breakfast cereals accounted for 84% of all food advertisements. Fast food restaurants were the most frequently advertised. The highest rate of food advertisements was during both the 4 to 5pm and the 5 to 6pm slots. Once again these results may not be representative of the whole year as they were carried out on only one week, however the results do concur with those of other studies.

1.7 Food and food related behaviour within television programmes

Advertising is just one part of television and some researchers believe that to really know the effect of advertising they need to be put advertisements into the context in which they appear – between programmes (Dickinson & Leader, 1996). Some countries such as England have commercial free television channels however food related behaviours such as consuming a snack do occur *during* programmes. Thus food-related behaviours occurring within programs have been examined along with those in advertisements.

Several studies have been carried out examining food related behaviours shown within television shows (Gerbner, Gross, Morgan & Signorielli, 1981; Way, 1983; Dickinson & Leader, 1996; Story & Faulkner, 1990; Radimer & Hill, 1996). The studies focus on the number of food-related behaviours, the situation or circumstances in which they occur (at home or away from home), the nutritional value of the food and who is eating what both within programs and advertisements. One study found that snacking makes up a large proportion of eating behaviours within television programmes and these are mostly non-nutritious snacks with little fruit included (Gerbner et al, 1981). Another showed equal amounts of ‘nutritious’ and ‘non-nutritious’ foods in related behaviours and a high proportion of foods eaten away from home reflecting trends in society today (Way, 1993). Yet another found that references to low nutrient beverages occur at a higher rate than any other category of food and over half the references to food were for low nutrient drinks and sweets (Story & Faulkner, 1990).

The foods and food-related behaviours occurring *within* programmes appear to be reflective of the types of foods being advertised to children. Characters in shows are eating food on the run and consuming a high proportion of snacks reflecting the increasing trend for pre-packaged individual serves that can be eaten on the move. They are consuming foods with a poor nutritional content and these are the foods most often advertised to children. Through the appearance of so many advertisements for these high energy/low nutrient foods children become very familiar with these foods and perhaps believe the amount they appear is the frequency with which they should be eaten. When they see the characters on their favourite programmes consuming these foods this only serves to reinforce the belief that this behaviour is acceptable.

1.8 Summary

Overall, the studies in New Zealand have yielded results very similar to other countries. Some of the studies are difficult to compare in that the way the foods are grouped differs between studies and details are not always included. Snack foods for example are not always specified and ‘high fat and/or sugar’ is used often but not defined. These studies are consistently showing that fruit and vegetables make up a very small proportion of advertisements across all countries, as do other ‘core’ foods such as cereals, meat and dairy products. Across all the countries the foods most frequently advertised to children are those high in fat and/or sugar and salt. These foods are not consistent with dietary recommendations, are

a very narrow group of foods and thus do not represent a good cross-section of foods available for children today.

2.0 METHODOLOGY

2.1 Introduction

At the time this study commenced relatively little research had been carried out in New Zealand examining the frequency and content of television food advertisements aired during children's television. With the current emphasis on childhood obesity in New Zealand and groups lobbying the government for a ban on food advertising to children because of the role many believe advertising has to play in the rising levels of obesity, it is important to examine exactly how often food advertisements appear on television and what food groups are being advertised. Concern over food advertising to children centres mainly around 'fast' and 'snack' foods high in fat and/or salt and/or sugar and high in energy as well as highly sugared fizzy drinks.

2.2 Design & Data Collection

This part of the study was designed to examine the food advertisements children of eleven and twelve years are exposed to during their typical viewing hours. According to the Television Broadcasting Standards of New Zealand 'Children's Television Policies' school-age children's television varies slightly between channels two and three but is as follows:

TV2: Monday to Friday 7:00 to 8:35am
Monday to Friday 3:30 to 5:00pm
Saturday 6:00 to 9:00am

TV3: Monday to Friday 6:30 to 8:30am
Monday to Friday 3:30 to 5:00pm
Saturday 6:30 to 9:30am

According to research carried out the most popular viewing times for children aged five to fourteen are 7 to 10am and 6:30 to 8:30pm weekends and during the week 7 to 8:30am and 3 to 7:30pm (A.C. Nielson, 2002). Thus the programming to be examined in the present study was slightly different but covered most of this peak time to enable comparisons to be made with other studies examining advertising of foods to children (Hammond et al, 1997; Morton, 1984, 1990; McClean et al, 1992). The two commercial television channels most commonly viewed by children were TV2 and TV3 (A.C.Nielson, 2002) so these channels only were included. It was decided to make recordings on two weekdays and one weekend day and average these results to capture a cross-section of a typical week of advertising. Finally, recordings were made during a week in both spring and autumn to ensure that no seasonal bias was introduced in the types of foods commonly advertised and no public holidays such as Easter were included. The recordings

were also made at a time to coincide with the interviews being carried out so that advertisements mentioned by the children would be recognisable to the researcher during interviews.

Simultaneous video recordings were made of channels two and three between the times below and the advertisements were extracted:

Spring	Monday 4pm to 6pm
	Thursday 4pm to 6pm
	Saturday 7:30am to 9:30am
Autumn	Monday 4pm to 6pm
	Thursday 4pm to 6pm
	Saturday 7:30am to 9:30am

Extraction of advertisements involved the researcher viewing the programmes recorded and timing each advertisement from start to end with a stopwatch. Lists were compiled of the food type advertised and the length of each advertisement. To confirm the researcher was ensuring that the main food advertised was recorded and not other foods incidentally appearing in the advertisement, three slots of advertisements were viewed both by an outsider and the researcher, and comparisons made. In each slot the main food recorded by both the researcher and outsider was identical. Food advertisements were classified as those for a food or restaurant and included sponsorship for a programme or event by a particular food product or restaurant. Channel promotions and programme previews were not included in the overall number of advertisements.

2.3 Data Analysis

For analysis advertisements were broken into two slots on weekdays 4 to 5pm and 5 to 6pm to compare with other studies.

For each advertising slot the following was recorded:

- Number and duration of advertisements
- Number and duration of food advertisements
- Description of the food or drink advertised

The food advertisements were placed into the following categories:

- Drinks (excluding milk)
- Milk
- Savoury snacks (crisps, crackers, etc)
- Sweet snacks (muesli bars, fruit bars, chocolate, confectionery, cookies etc)
- Breakfast cereal
- Dairy Products (yoghurt, cheese)

- Ice Cream/Ice blocks
- Fast food services and restaurants
- Other (meat, pasta, etc)
- Fruit & vegetables

The food categories used were similar to those chosen in other studies with a couple of exceptions. The foods that fell into the 'sweet snacks' category were the same with the exception of 'ice cream and ice blocks' being separated. This was due to the high frequency with which these items were advertised. Beverages were separated into 'milk' and 'drinks'. This was due to the current emphasis in New Zealand on the lack of milk in many children's diets and the replacement of milk with sports drinks and soft drinks. 'Savoury snacks' were similar to other studies as were 'breakfast cereals'. Finally the 'other' category including meat, bread etc used in various studies was broken into 'other', 'dairy products' and 'fruit and vegetables'.

For analysis the average total number of advertisements was determined by adding up the number of advertisements aired on each weekday and dividing by two. The same was done for each weekend day. This was carried out for spring and autumn. Results were added up and divided by two to obtain an average for the year. This was to ensure that any seasonal bias was accounted for and the number of advertisements was representative of the year. To determine the average number of advertisements per week, the weekday 'total advertisements' were multiplied by five. To determine an average weekend the weekend results were multiplied by two. The average duration of advertisements was calculated by adding up the duration of individual advertisements for each weekday and dividing by two. Spring and autumn figures were then added up and divided by two to obtain the yearly average. The weekend average was calculated by adding up figures for spring and autumn and dividing by two.

3.0 RESULTS

3.1 Number of advertisements

Table 3a below shows the average number of advertisements aired on both channels on an average weekday and weekend day. A child who views television between 4pm and 6pm on a weekday will typically be exposed to on average 59 advertisements depending on the channel viewed with more advertisements aired on TV3. This is an average of 2.5 advertisements per five minutes or 29.5 advertisements per hour. On the weekend between 7:30am and 9:30am a child will be exposed to between 49 and 50 advertisements or 25 per hour.

Table 3a. Average total number of advertisements on a typical weekday and weekend day for each channel

	Week Day			Weekend
	4-5pm	5-6pm	Total	7:30 - 9:30am
Channel Two	22	33	55	50
Channel Three	29	34	63	49
Average	25.5	33.5	59	49.5

Table 3b below shows the average number of food advertisements aired on any given weekday between 4pm and 6pm and on a typical weekend morning. In the two hours from 4pm to 6pm a child will view approximately 29 food advertisements depending on the channel. This is 1.2 food advertisements per 5 minutes or 14.5 per hour. On average more food advertisements are aired on TV3. On a typical Saturday morning a child will view 16 advertisements for food or 8 per hour.

Table 3b. Average number of food advertisements on a typical weekday and weekend day for each channel.

	Week Day			Weekend
	4-5pm	5-6pm	Total	7:30 - 9:30am
Channel Two	13	15	28	15
Channel Three	14	16	30	17
Average	13.5	15.5	29	16

Table 3c below shows the total number of food advertisements per week including five weekdays and two weekend days and the number of food advertisements as a percentage of the total number of advertisements aired. These results show that in 14 hours of children's programming on TV2 a total of 375-advertisements are aired of which 170 or 45% are for food. On TV3 over 14 hours of programming

413 advertisements are aired of which 184 or 45% are for food. On both channels on average 10 more food advertisements are aired in the 5pm to 6pm slot than the 4pm to 5pm slot.

Table 3c. Average total number of food advertisements per week and food advertisements as a percentage of total advertisements.

	Total number of food advertisements (5 week day/ 2 week end)				Total advertisements (5 week day/ 2 week end)				Food advertisements as a percentage of total advertisements			
	4-5pm	5-6pm	7:30-9:30am	Total	4-5pm	5-6pm	7:30-9:30am	Total	4-5pm	5-6pm	7:30-9:30am	Total
TV2	65	75	30	170	110	165	100	375	59%	45%	30%	45%
TV3	70	80	34	184	145	170	98	413	48%	47%	35%	45%
Total	135	155	64	354	255	335	198	788	53%	46%	32%	45%

3.2 Types of food advertised

As seen in tables 3d and 3e below in the 4pm to 5pm slot the two food categories most commonly advertised on both channels are ‘sweet snacks’ and ‘fast food services and restaurants’ equally. These categories each make up on average 26% of all food advertisements. An advertisement for a ‘sweet snack’ and a ‘fast food service and restaurant’ is aired approximately 3.5 times per hour. The categories aired the least frequently in this time slot are ‘fruit and vegetables’, ‘dairy products’ and ‘other’. There are no advertisements for these food groups on either channel during this slot. Breakfast cereals are commonly advertised on TV2 at 3 per hour but none appear on TV3.

On weekend mornings as with weekday evenings ‘sweet snacks’ and ‘fast food services and restaurants’ are the most frequently advertised food categories at 4 and 4.5 per hour respectively. These make up 25.5% and 28% of all food advertisements respectively. Breakfast cereals are not advertised at all on TV3 and on TV2 in this time slot they appear twice in two hours making up 13% of all food advertisements during this time.

Table 3d. Average number of food advertisements broadcast on two television stations by category and time slot.

Food Category	Weekdays 4-5pm			Weekdays 5-6pm			Weekend 7:30-9:30am		
	TV2	TV3	Average	TV2	TV3	Average	TV2	TV3	Average
Sweet Snacks (muesli & fruit bars, chocolate, confectionery)	3	4	3.5	2	2	2	4	4	4
Fast food services and restaurants	3	4	3.5	4	7	5.5	4	5	4.5
Drinks	0	1	0.5	1	2	1.5	0	1	0.5
Savoury Snacks (crisps, crackers)	1	1	1	2	1	1.5	1	1	1
Breakfast Cereal	3	0	1.5	2	0	1	2	0	1
Other (meat, bread etc)	0	0	0	2	1	1.5	0	1	0.5
Ice cream, ice block	2	2	2	0	1	0.5	1	2	1.5
Milk	1	2	1.5	1	1	1	2	2	2
Dairy products	0	0	0	1	0	0.5	0	0	0
Fruit & vegetables	0	0	0	0	1	0.5	1	1	1
TOTAL	13	14	13.5	15	16	15.5	15	17	16

Table 3e. Average types of foods advertised as a percentage of total food advertisements for each time slot.

Food Category	Time Slot					
	4-5pm		5-6pm		7:30-9:30am	
	TV2	TV3	TV2	TV3	TV2	TV3
Sweet Snacks (muesli & fruit bars, chocolate, confectionery)	23%	29%	13%	13%	27%	24%
Fast food services and restaurants	23%	29%	27%	44%	27%	29%
Drinks	0	7%	7%	13%	0	6%
Savoury Snacks (crisps, crackers)	8%	7%	13%	6%	7%	6%
Breakfast Cereal	23%	0	13%	0	13%	0
Other (meat, bread etc)	0	0	13%	6%	0	6%
Ice cream, ice block	15%	14%	0	6%	7%	12%
Milk	8%	14%	7%	6%	13%	12%
Dairy products	0	0	7%	0	0	0
Fruit & vegetables	0	0	0	6%	7%	6%
Total Number of Advertisements	13	14	15	16	15	17

3.3 Duration of advertisements

Table 3f below shows the average duration of advertisements. In the time between 4pm and 5pm in 60 minutes of programming there is on average 10:08 minutes of advertising on TV2 and a greater 11:08 minutes on TV3. Of these 10:08 minutes 6:30 or 64% of the time is allotted to food advertisements. On TV3 less time is devoted to food advertisements at 6:06 minutes or 55% of advertising airtime.

Between 5pm and 6pm TV2 has advertising time of 13:19 out of 60 minutes of programming of which 6:12 minutes is devoted to food advertisements. That is 47% of advertising time. Although the duration of advertisements is less than between 4pm and 5pm there are more individual advertisements shown in this time slot both overall and for food than the 4pm to 5pm slot. On TV3 less time is devoted in this time slot to total advertisements with 11:32 minutes per hour. Less time is devoted to food advertisements on TV3 than TV2 at 5:02 minutes or 44% of total advertising time. Once again, although the time devoted to advertisements is less in this time slot there are actually more advertisements overall and more food advertisements as seen in table 3c.

On Saturday mornings less time is devoted to advertisements at 18:18 minutes on TV2 and 17:48 on TV3 over a two-hour period compared to 23:27 minutes on TV2 between 4pm and 6pm and 22:40 on TV3. Considerably less advertising time is devoted to food advertisements with TV2 showing only 6:25 minutes of advertisements over 2 hours and 8:03 on TV3. That is only half that of the time allotted to food advertisements on TV2 and two thirds on TV3 during the 4pm to 6pm timeslot.

Table 3f. Average duration of food and total advertisements (min: sec) per time slot and food advertisement duration as a percentage of total advertising duration

	4-5pm			5-6pm			7:30-9:30		
	Food	Total	%	Food	Total	%	Food	Total	%
TV2	6:30	10:08	64%	6:12	13:19	47%	6:25	18:18	35%
TV3	6:06	11:08	55%	5:02	11:32	44%	8:03	17:48	45%

4.0 DISCUSSION

The results from this study on the two most frequently advertised food categories of 'sweet snacks' and 'fast food services and restaurants' are expected when making comparisons with other studies. Hammond et al (1997) found a total of 101 food advertisements were aired over three channels between 4pm and 5pm versus 135 in the present study and 100 between 5pm and 6pm versus 155. In both time slots in Hammond et al's (1997) study there were less advertisements than the present study and furthermore they recorded advertisements across TV1, TV2 **and** TV3 compared to the present study examining **only two** channels.

Comparing the results of the present study to a study in South Australia (Morton, 1984) there were almost twice as many advertisements aired on the New Zealand channels than on the three Australian channels combined. During the 4pm to 6pm timeslot there were 25, 63 and 32 food advertisements on channels ADS-9, NWS-9 and SAS-10 respectively over five days compared to the present study of 140 and 150 on TV2 and TV3 respectively. That is over double NWS-9 and over four times as many as the other channels.

In a more recent study carried out by Morton (1990) the results obtained were very similar to the present study. During the 4pm to 5pm time slot she recorded a total of 130 food advertisements versus the present 135 and in the 5pm to 6pm slot she recorded 156 versus 155 in the present. Morton (1990) found in the 4pm to 5pm slot food advertisements made up 76% of all advertisements and in the later slot 46% of all advertisements. The number in the earlier slot is considerably higher than the 45% obtained in the present study however in the 5pm to 6pm slot results are very similar at 46% compared to the present 45%.

It can be seen that across the three time slots in the present study food advertisements consistently make up 45% of all advertisements. These results are similar to those obtained by McClean et al (1992) in their study on food advertisements before and after a national food promotion. Food advertisements made up 40% of all advertising on TV2 and 47.4% on TV3 in the 1992 study. Thus in the six years since their study the number of advertisements overall has increased, the number of food advertisements has increased markedly but the percentage that food advertisements make up of all advertisements has remained relatively steady.

The results in the present study for the types of foods advertised are not directly comparable to McClean et al's (1992) study as the categories are slightly different however the category similar to the present study 'confectionery' was commonly advertised during their study as were 'beverages' and 'fast foods'. In Hammond et al's (1997) study once again the categories are slightly different however in this slot 'sweet snacks' were most common followed by 'drinks' and 'fast food'. Similar to the present study Hammond et al (1997) found advertisements for 'fruit and vegetables were very low.

In the 5pm to 6pm slot weekdays fast food services were the most commonly advertised category on both channels. They made up 27% of food advertisements on TV2 and 44% on TV3. The next category was 'sweet snacks' at on average 2 advertisements per hour followed by 'drinks' 'savory snacks' and 'other' at on average 1.5 advertisements in this category per hour. The least advertised categories in this time slot were 'fruit and vegetables', 'dairy products' and 'ice cream/ice blocks'. Once again comparing these results to Hammond et al's (1997) study 'sweet snacks' and 'fast food services and restaurants' were highest in both studies. Similar to the present study the least frequently advertised category in Hammond et al's (1997) study was pasta, bread, fruit and vegetables. There was one fruit advertisement and no vegetable advertisements in this time in the present study and no advertisements for bread. One difference between these results is 'breakfast cereals' which made up 6.5% of total food advertisements in this study and were towards the least frequently advertised category compared to 11% in their study at the third most commonly advertised category.

Thus in the time since Hammond et al (1997) and McClean et al (1992) conducted their examinations of foods commonly advertised to children the food categories most commonly advertised and of the greatest concern including 'sweet snacks' and 'fast food services and restaurants' have not changed greatly. Not surprisingly 'fruit and vegetables', the food category least frequently advertised has also stayed consistently low. In fact there were no advertisements for *fresh* fruit and vegetables aired at all during this study. The only fruit advertised was a pre-packaged tub of chopped fruit in natural juice and the other time fruit appeared was in an advertisement for 'Starbursts' in which "Starbursts" were suggested as a good idea "when its inappropriate to eat fruit".

When comparing these results to other studies the category that did differ was that of 'beverages' and this was lower than in other studies. There was an obvious seasonal difference in the current study in the number of advertisements for beverages however what stood out were the lack of highly sugared fizzy drinks. There were only two advertisements for aerated drinks one of which was in sponsorship of a music program and the other was diet ginger beer. The only other time soft drinks featured was as part of a fast food meal deal. Although concern over the frequency of soft drink advertising during this timeslot may be unjustified there were some drinks advertised that are inappropriate for children. These included advertisements for several different brands of coffee, two different energy drinks and also a sports drink marketed as a 'dietary supplement' that has over 30% sugar content and added vitamins. There were many advertisements for milk, both flavoured and plain. Plain Anchor Milk was in fact the beverage most frequently advertised during the spring period followed by Natures Energy flavoured milk. There were also advertisements for powders such as Nesquik and Milo to add to milk. The advertisement for milk was equally as appealing if not more appealing than other food advertisements with animation, a competition and a website to visit.

The type of advertising seen in the present study is important because the focus on childhood obesity has steadily increased in the last six months within New Zealand to the point where there are articles quoting statistics and pointing the blame at different groups for the rise in obesity almost every week. During this

time the focus on 'fast food' manufacturers has increased dramatically and they are constantly justifying their existence. In viewing the advertisements and noting seasonal differences it became apparent that the 'fast food services and restaurant' advertisements had changed in the six-month period since the public furor began. During the spring recordings McDonalds Restaurant on average advertised its 'Happy Meals', 'McSundaes', 'McBreakfasts' or 'McCombos' 2.25 times an hour between 4pm and 6pm and on Saturday mornings. Following the media hype about obesity, the frequency with which these meals were advertised was reduced considerably although not completely and replaced with the McDonalds 'Make it Click' campaign and the 'Ronald McDonald Dance'. Consumers were encouraged to "make it click" five times and "do do the Ronald" twice on one Saturday morning alone within the two hour timeslot. Thus the brand is still out there but no actual food is being advertised. At the same time there were no K.F.C. advertisements at all during autumn compared to on average one advertisement per hour between 4pm and 6pm and one per hour on Saturday mornings during spring.

There were many different themes and techniques used throughout the advertisements to appeal to children, not all of which will be mentioned here. What stood out however were the number of giveaways and competitions used. Giveaways included free toys, free stickers and free games. Competitions included toys and trips overseas and children were encouraged to enter by sending in tokens, sending a text for a number of a wrapper or commonly visiting a website and entering there. There were many advertisements that used animation, some of which went on for 45 to 60 seconds and appeared to be an actual cartoon until the voiceover came on at the end. Themes of appeal used included sex appeal to sell an ice cream, the use of cartoon characters such as Disney's Pooh Bear being affiliated with a product, people whom children would look up to having a great time eating a product and descriptions of the food as 'the one for fun' and "a snackadelic choice for the lunch box" rather than focusing on the nutritional benefits of eating the food.

4.1 What are the children in this study viewing?

In part two of this study it will be seen that the children interviewed watched on average 50 minutes of television after school and before dinner and 72.5 minutes on Saturday and/or Sunday before lunchtime. The following is a summary of what children are being exposed to during these 50 and 72.5 minutes. Note that this was only in the 4pm to 6pm slot. Children also reported watching television before school and after dinner on weekdays and in the evening and during the day on weekends.

Assuming that dinner is eaten at 6pm weekdays, in the 50minutes or so the average child in this study watches television after school and before dinner he or she will sit down to at the table each evening having just seen the following:

- 24.6 advertisements
- 12.1 food advertisements

Including:

- 3.8 advertisements for fast food services/restaurants
- 2.3 advertisements for sweet snacks
- 0.8 advertisements for drinks
- 1 advertisement for milk
- 1.3 advertisements for savoury snacks
- 1 advertisement for breakfast cereal
- 0.4 advertisements for dairy products
- 1 advertisement for ice cream/ice blocks
- 0.6 advertisements for other foods such as meat, pasta and rice
- 0.2 advertisements for fruit & vegetables

In the 72.5 or so minutes a child in this study watches television either before or during breakfast on an average Saturday or Sunday morning he or she will view:

- 29.9 advertisements
- 9.7 food advertisements

Including:

- 2.7 advertisements for fast food services/restaurants
- 2.4 advertisements for sweet snacks
- 0.3 advertisements for drinks
- 1.2 advertisements for milk
- 0.6 advertisements for savoury snacks
- 0.6 advertisements for breakfast cereal
- No advertisements for dairy products
- 0.9 advertisement for ice cream/ice blocks
- 0.3 advertisements for other foods such as meat, pasta and rice
- 0.6 advertisements for fruit & vegetables

4.2 What sort of message are children getting from advertisements?

The relationship between advertisements and children's food choices will be examined further in part two but for now, what sort of message children are receiving when they are bombarded with advertisements for a very narrow range of foods high in saturated fat, high in sugar, salt and high in energy? This very narrow range of foods is in direct contrast to the dietary recommendations provided by the Ministry of Health (1997) that children eat from a wide variety of foods daily including each of the main food groups. It is argued by advertisers that these advertisements do not suggest that they are the only foods a child should eat however nowhere in the majority of these advertisements for sweet snacks and fast foods is there mention of only eating these foods as a treat and part of a balanced diet. There are no advertisements for fresh fruit and vegetables and the only suggestion was negative, suggesting it is sometimes inappropriate to eat fresh fruit and more convenient to eat *fruit flavoured* foods such as confectionary. Viewing these advertisements for expensive pre-packaged processed "snackadelic" foods

to fill a child's lunch box it is clear that parents who send their child to school with only sandwiches and fruit are fighting a losing battle. The abundant advertisements for other types of food would suggest that sandwiches and fruit are the exception rather than the norm.

The 'sweet snacks' included in these recordings were predominantly of high saturated fat and/or high sugar muesli bars, seven types of chocolate bar, lollies and four different varieties of biscuits. These figures are similar to Morton's (1990) study in which there were eight different varieties of chocolate bar. Savoury snacks mostly included several different varieties of potato chips and crackers. Breakfast cereals advertised were mostly highly sugared with the exception of 'Ricies' and 'Weetbix'. Through these advertisements children are exposed to a wide variety of chocolate bars, potato chips and breakfast cereals but do they know how many different varieties of fruit and vegetables are available in New Zealand? Several varieties of milk were advertised regularly during both seasons although with so many advertisements for flavoured milk and powders to add flavour to milk a child could be forgiven for thinking plain milk is not tasty or that milk comes out of a cow yellow, pink or brown and flavoured like strawberries.

4.3 Are advertisers adhering to the Advertising Codes of Practice?

The simple answer to this overall is no.

The first example was an advertisement for 'Milo' that stated "...toast and banana is good for breakfast but try Milo". One of the guidelines under Principle three of the Code for Advertising of Food states "...advertisements for treat foods should not actively encourage the child to ...replace main meals with them." As a guideline this is fairly ambiguous. What constitutes a treat food? Does this advertisement suggest a child replace toast and bananas with Milo?

Number seven of the Children's Television Policies put out by the New Zealand Television Broadcasters' Council is about repetition of advertisements. It states "no advertisements should be played twice within an hour per channel per day" and "advertisements during children's programming will not be repeated excessively". Once again this principle is ambiguous. With the use of the word "excessively" it becomes a matter of judgement. This policy was broken consistently though out the recordings made in both seasons. Advertisements for breakfast cereals, fast food meals, lollies, muesli bars and flavoured milk as well as many more foods were repeated at least twice in an hour. Fast food restaurants got around this principle by advertising different meals available at the restaurant within the hour, but the restaurant brand itself was advertised up to six times within an hour. Some drinks were advertised twice in ten minutes. The question as to whether sponsorship of a program or time slot by food products or manufacturers constitutes an advertisement is also interesting. Pizza Haven sponsors the hour from 5pm to 6pm weekdays on TV3. At 5pm the viewer is welcomed to the Pizza Haven hour, "more than great pizza". They are informed that they are watching the Pizza Haven hour a further six times in the next hour and in case they have forgotten they are told just before 6pm that "you have been watching the Pizza Haven hour, more than great pizza". Surely this must be repetition of more than once in an hour!

Another guideline in the 'Getting it Right for Children Policy' states that advertising levels are to be kept to a maximum of ten minutes per hour 'and 'station promotions to two minutes per hour'. This guideline is also consistently broken on both channels. On average during the 5 to 6pm slot the duration of advertisements can be over 13 minutes and from 4 to 5pm on both channels over ten minutes. Station promotions do not exceed two minutes. Programme previews are mostly 30 seconds long and in most slots one and even two previews appear per advertisement break. This can add one minute onto the total advertisement duration meaning some advertisement breaks can be over 14 minutes long!

Studies carried out here and overseas question whether self-regulation is effective in the advertising industry. Clearly in many cases within New Zealand advertisers are successfully breaking and bending the rules and stretching boundaries that are made possible with ambiguous guidelines used at advertisers' discretion. Clearly the Advertising Standards Authority is not dedicating enough time to ensuring standards are maintained at all times.

5.0 CONCLUSION

New Zealand children, through advertising, are constantly exposed to a variety of foods that fall within a very narrow range. These foods are predominantly individual servings of snacks or pre-prepared, pre-packaged foods and are high in saturated fat and/or salt and/or sugar and high in energy. The results of this study are consistent with those found in the U.S., Canada, Australia and other studies in New Zealand (Morton, 1984, 1990; McClean et al, 1992; Hammond et al, 1997¹; Ostbye et al, 1993; Taras, 1995).

Advertisers are not always adhering to the Advertising Codes of Practice, thus more attention should be given to monitoring this self-regulated industry. It is important that advertisements aimed at children are monitored to ensure they are not misleading or false. Rather than solely concentrating on policing the airwaves and holding advertisers responsible for the rise in childhood obesity, advertisers, nutritionists and policy makers should be looking to introduce new, dynamic ways to introduce children to the wide variety of fresh foods available and empower them with knowledge to make healthy choices for themselves.

Advertisements inform children of different products and brands available. Suggestions have been made to collaborate with the food industry to encourage advertisers to create advertisements that provide more nutrition education or to devote equal advertising airtime to more positive nutrition messages (Wilson et al, 1999; Morton, 1990). These advertisements could emphasise the consumption of treat foods as part of a healthy, varied diet. Widening the range of foods advertised to children could fuel their interest in fruits, vegetables and other 'core' foods and make these exciting to them. The one barrier to fruit and vegetable producers advertising more is that it is hard to differentiate between individual brands of fruit. As a way to overcome this Morton (1990) suggests that these advertisements be subsidised. If the government were to conduct a national advertising campaign on behalf of fruit and vegetable producers or subsidise advertisements this would benefit both parties.

At the time of writing, advertisements sponsored by the Ministry of Health are appearing on television promoting the '5+ A Day Campaign'. These advertisements have catchy tunes, are brightly coloured and feature trendy young children and teenagers having fun with fruit and vegetables. The Anchor Milk advertisement featuring 'Anchorville' has been successful in increasing Anchor's market share and sales in a category that was declining (Champion, 2003). Bearing in mind national lifestyle changes such as people skipping breakfast and lowering their fat intake this advertisement was produced primarily targeting children as the consumers and secondary to this, parents as purchasers (Champion, 2003). The advertisement recently won gold at the 2003 Eefie advertising awards for 'Best in Show' and proves that advertisements for healthy foods can be interesting, fun, catchy and successful. Some believe advertisements are under-utilised as a tool for promoting healthy eating (Hammond, Wyllie & Casswell,

1997³). 'Anchorville' proves we should create more advertisements for other core foods. In this way children would be exposed to a variety of foods more aligned with the National Dietary Guidelines.

Finally, it is important to differentiate between children being exposed to an advertisement and actually being influenced by it or having the television on during advertisements versus actually watching the advertisements. Advertisements are not the only influence on children's food choices.

5.1 Suggestions for further study

As mentioned children in this study did not limit their viewing to 4pm to 6pm week days and weekend mornings. In fact many viewed after dinner and many watched television on Saturday and Sunday nights when children's movies are screened. Similar results were found in another New Zealand study in which many children watched television between 6pm and 10 pm (de Bruin, 2000). These times are not governed by the same regulations despite being viewed by children up to the age of fourteen years (children's programming according to the New Zealand Television Broadcasters' Council covers children age 5-13 years). Further analysis of advertisements should include the time from 6pm to 8pm. In the study carried out by Hammond et al (1997¹) there were still 75 advertisements for food aired between 7pm and 8pm and these were still predominantly for fast foods, sweet snacks and drinks. Similar results were seen in the 7pm to 8pm time slot in Morton's (1990) study. Food advertisements in this slot were almost as frequent as in the 4pm to 5pm slot.

Much research has been carried out examining the relationship between advertisements aimed at children for unhealthy snack foods, fast foods and drinks and the child's food choices and it is believed these effects would be the same if healthy foods were advertised. Future study should involve airing some more educational advertisements for fresh foods and core foods such as meat and dairy products and examining whether or not children are retaining any of the information. A campaign such as the current '5+ A Day' should be used in conjunction with schools to raise the profile of the advertising campaign and enhance the beneficial effects. Advertisements should also be produced that are directed at parents to reinforce the education that children are receiving in schools and to encourage discussions around the topic of healthy food and eating habits.

PART TWO

Food and your child

Food and you

1.0 INTRODUCTION

The types of foods advertised to children have been shown in part one and it appears that concern over advertisements is justified. Part two will examine the relationship between these advertisements and children's food choices. The relationship is examined through investigating children's food and television habits. This part will look at parent and child's attitude to advertisements and the level of influence they feel advertisements have on their food choices compared to other influences. It will also examine the child's body mass index-for-age and their physical activity levels and the relationship between these and their food choices and television viewing habits.

2.0 LITERATURE REVIEW

2.1 Introduction

There are a number of factors that influence our food choice decisions and these vary according to where we live, our culture, our health concerns, our socio-economic status our beliefs and more. With the alarming rise of obesity and other related diseases arising from our obesogenic environment, public health officials are looking to increase awareness of how to maintain a healthy lifestyle. We need to know the barriers that stand in the way of individuals making healthy decisions. The following section will review the literature on factors that influence food choice from biological to social and environmental. It will begin by examining food choice models that have been developed and move on to the actual influences.

2.2 Models of food choice

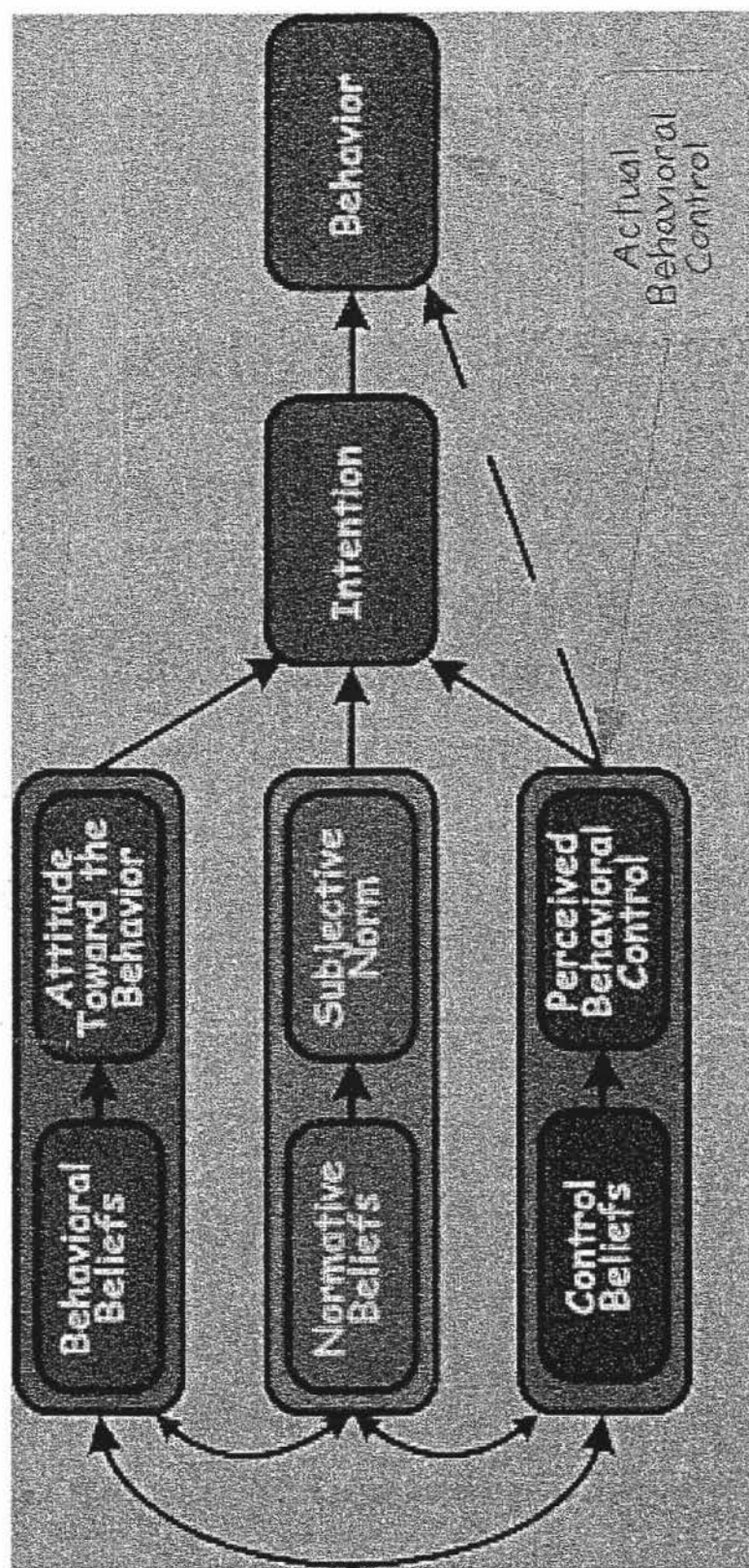
Over the years there have been several food choice models created in order to try and quantify these influences/barriers and determine how they interact with each other. Many of these models however really only provide lists of the influences and categorise them according to how they relate to the individual and the social and physical environment in which the choices are made (Shepherd & Raats, 1996).

Perhaps the most well known model used to provide a framework within which we can study food choice is the 'Theory of Reasoned Action', which was first developed and later revised by Icek Ajzen and Martin Fishbein during the 1960's and 1970's. The 'Theory of Reasoned Action' (furthermore known as the T.R.A.) originated in the area of social psychology for use in predicting and understanding behaviours and has repeatedly been proven useful in the study of food choice (Ajzen 2002; Shepherd, 1990). During one of the revisions mentioned above the 'Theory of Planned Behaviour' was developed which is essentially an extension of the T.R.A., with another variable included. The theory now considers the individual's perception of their control over a given behaviour.

2.2.1 The Theory of Planned Behaviour (T.P.B.)

This theory is based on the belief that when individuals carry out an activity (in this case the choice of a particular food) they do so in a considered manner and think about the consequences or outcomes of that behaviour (Ajzen & Fishbein, 1980). The behaviour will be guided by three considerations, behavioural, normative and control beliefs which can be seen in Figure 2-1 below.

Fig 2-1 The Theory of Planned Behaviour



Source: www-unix.oit.umass.edu/%7Eaizen/tpb.html

2.2.1.1. Behavioural Beliefs

These are the beliefs that underlie an individual's attitude toward a behaviour or their belief about the behaviour. Usually if these behavioural beliefs are positive then the person will intend to perform that behaviour (Ajzen et al, 1980).

2.2.1.2. Normative Beliefs

These are the beliefs an individual has about how people important to them will view them carrying out this behaviour (Ajzen et al, 1980). An example is how a child's mother would feel about them having a large snack before dinner – either positively or negatively. An aspect of normative beliefs is the individual's motivation to comply with/to the other person's expectations. In the above example a teenager may want to rebel against their parent so although they know their parent would not want them to have that snack, they have it anyway.

2.2.1.3. Control Beliefs

These are factors that will impede or facilitate the individual to perform a given behaviour depending on the importance an individual places on them (Ajzen, 2002). For example many people believe that eating more vegetables would enhance their health. They believe their 'important others' would approve of them eating more vegetables, however they are rarely at home for meals so are not able to cook vegetables as often as they would like. Thus, they believe they have little control over their ability to eat more vegetables.

As can be seen in Figure 2-1, a person's intention to perform a given behaviour is a function of the above three beliefs. Behavioural beliefs will lead to a positive or negative 'attitude towards the behaviour'. Normative beliefs lead to the individual feeling social pressure to perform or not to perform the behaviour that is termed the 'subjective norm'. Finally control beliefs will lead to the individual's perception of how much control they have over whether or not they perform the behaviour. These beliefs give rise to the individual's intention to perform the behaviour and if the sum of these beliefs is positive, they usually will intend to perform the behaviour. For application of the model an action (e.g. eating), a target and context (at friends/relative's home) and time (during the coming week) must be established.

There have been several studies in the food field where this theory has been a good predictor of behaviour. There are usually two parts to the studies. Firstly an interview will be carried out with a small number of participants to establish some beliefs and attitudes about a given food or food choice behaviour. For example Thompson, Haziris and Alekos (1994) in their study on establishing the attitudinal and normative factors associated with olive oil consumption first carried out semi-structured interviews with fifteen individuals to elicit some salient beliefs and referents to include in their main questionnaire. Thompson et al (1994) found that the T.R.A. showed good prediction of intention to use olive oil.

Another study conducted by Jas (1998) which examined beverage consumption in adolescents found that the T.P.B was useful in predicting beverage consumption in this teenage group and could account for variations in intentions to drink different beverages. Jas also carried out in depth interviews with a sub sample of her population to confirm that concepts and language used was appropriate in the main questionnaire used on 149 subjects. The T.P.B. was also applied in a study by Shepherd and Farleigh (1986) to examine "preferences, attitudes and personality as determinants of salt intake". The construction of the questionnaire was that recommended by (Ajzen and Fishbein, 1980) including using category scales to rate attitudes and beliefs. This study found that intention to consume salt was well predicted by the attitude to salt intake and the individual's subjective norm. Normative beliefs about salt intake were a good predictor for the individual's attitude to salt intake and the subjective norm. The T.P.B was also used accurately to predict a group of University students' intention to eat at a fast food restaurant (Axelson, Brinberg and Durand, 1983). Once again the study was in two parts with a sub sample of the population interviewed to collect information on their attitudes and beliefs about eating at a fast food restaurant. This information was used to construct questions to gain insight into normative and subjective beliefs and intentions. The questionnaire was given to 252 students and their attitude towards eating at a fast food restaurant "contributed significantly to the prediction of their intentions". There were limitations to this study however, in that the population was relatively small and homogenous so the result could not be applied to a larger cross-section of the population.

The T.P.B has been proven useful in predicting behaviours however there are certain limitations. It is a good predictor of how beliefs and attitudes can influence our food choice decisions but is not useful in eliciting why we feel this way and how these beliefs first developed (Axelson et al, 1983). Another limitation of the model is that external factors such as environmental, personality and demographic variables are not included (Ajzen 2002). Also, the model is based on the assumption that decisions are conscious, rational and systematic when in fact many decisions are impulsive particularly in food choice (Ajzen 2002). For example having a second helping of desert before thinking about how sick we will feel afterwards. Some believe the model should include an aspect of ethical or moral concerns (Shepherd et al, 1986; Shepherd, 1999). Moral or ethical concerns often have a great impact on behaviour regardless of a person's belief about the outcomes. For example although a person believes coffee will make them feel more energised they believe it is unethical to drink a certain brand of coffee because the beans originated from a third world country where workers are underpaid and overworked. Finally, another situation where morals are important is when making food choices on behalf of others. It has been found in studies that include moral obligations for a family's health, that there is a significant improvement in prediction of attitude for behaviours (Shepherd et al, 1986).

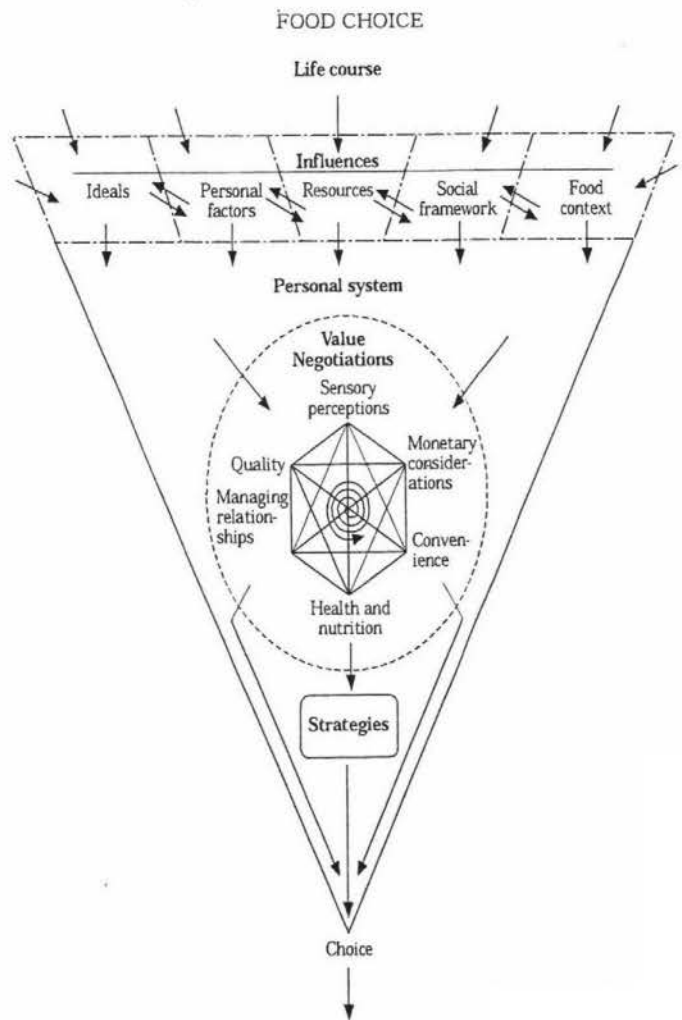
2.2.2 A conceptual model of the food choice process

One such model that includes factors such as demographics, personality and other external variables is that of Furst et al, (1996). It is simply called a conceptual model of the components in the food choice process. This model is an example of the type suggested by Shepherd et al, (1986) that is more of a list of influences on food choice decisions.

The model was created as a result of interviews examining influences on food choice. Initial in-depth interviews were conducted with seven individuals in their home and the results provided the basis for interview questions with a further twenty nine subjects. The interviews were primarily conducted in a grocery store and from the transcripts of these interviews a conceptual model of the food choice process was developed.

The model is seen below in Figure 2-2.

Fig 2-2. A Conceptual Model of the Food Choice Process



Source: Furst, Connors, Bisogni, Sobal & Falk, 1996

The model represents the types of factors involved in a single food choice decision. These factors are grouped into three major components; life course, influences and personal systems.

2.2.2.1 Life Course

The life course as described by Furst et al (1996) includes the social, cultural and physical environments to which a person has been exposed. These environments and experiences underlie many of the food choices we make and influence the importance we place on some aspects of food over others. 'Upbringing' is a word many of the individuals in the interviews carried out by Furst et al (1996) mentioned and they felt this had an influence on the way they used and regarded food. Different generations feel differently about food and this is particularly related to the period in history they were brought up. Some people brought up during the 1930's in New Zealand during 'The Depression' when food supplies were scarce due to a slumped economy still feel this influences how they feel about food today (Gordon 2003).

Part of the life course component of food choice is the associations we have between food and events. In other words the smell and taste of some foods encourage us to recall a fantastic time in our life when we ate this food. Associating the particular food with the good times enhances the enjoyment of the food and encourages us to choose it again. By the same token some foods will be associated with lower periods in our life that will put us off trying that food ever again. Various studies have been carried out examining the effect of life course influences on different aspects of food choice. An example is that carried out on fruit and vegetable consumption in New York (n=86), (Devine, Connors, Bisogni & Sobal, 1998). The results indicated that past experiences were strong influences on the individual's current fruit and vegetable intake. Often past experiences provided reference points for future consumption for example future bought vegetables were always compared to fresh vegetables from a family garden. Foods disliked in earlier life such as pea soup were not tried again or sought after in later life. Roles, food upbringing, health, well-being, ethnicity and cultural identity all shaped future food choices.

2.2.2.2 Influences

The second component of the model created by Furst et al (1996) is termed 'influences'. As seen in figure two, the influences have been divided up into five sections: ideals, personal factors, resources, social framework and food context and these are generated from an individual's life course.

a) Ideals

Ideals are a standard or principle to which people aspire. In this context they include an individuals beliefs, expectations and standards and provide a reference which an individual uses as a comparison. For example eating toast with butter melting off it is the way toast "should be". An individual's 'ideal' however often conflicts with the way things really are. For example a family cannot always sit down to eat together the way they ideally would like due to time constraints.

b) Resources

These are the resources available to an individual when making a food choice. They can be tangible such as money and space or intangible such as time and will provide a boundary within which a decision can be made.

c) Social Framework

The social framework is closely linked to the context of a food choice decision and includes areas such as the household, entertaining others or being entertained.

d) Food Context

The food context is the environment in which food choices are made. The context includes physical surroundings, food supply and the social context. Each of these will either limit or enhance possibilities.

e) Personal System

The personal system as defined by Furst et al (1996) is made up of two components, value negotiations and strategies. Value negotiations involve weighing up all the different considerations when making a food choice. The considerations include sensory perceptions, monetary considerations, convenience, health, well-being and more. The value of each of these factors is considered and compared each time a food choice is made. Strategies are long established habits or rules that have evolved over an individual's lifetime that are used to make a decision on what to eat. Strategies will vary according to the situation for example eating at home or on holiday.

As seen in Figure 2-2 a person's ideals, influences and personal system will all form part of a food choice decision. The model provides an overview of all the influences on food choices and how they interact with each other. Unlike the T.P.B. in which decisions are considered and relatively logical this model demonstrates that decisions can arise from long-term habits or simply impulses and can occur in all manner of settings.

Both of these models provide a picture of how very complex a food choice decision can be and the very large number of factors that influence our food preferences and choices. As mentioned they have been developed to provide a framework in which to try and understand why we choose the foods we do and how public policy can be introduced to improve our choices.

The following sections include a detailed description of all the influences on food choices. The sections are not divided into the same categories as the models above but encompass all the factors already mentioned.

2.3 Social Influences

2.3.1 Culture

Culture is defined as “ideas, customs and art of a particular society” (Collins, 2003). It is also described as “all that is learned, shared and transmitted among a group from generation to generation” (Mennell et al, 1994). Culture encompasses the content of a food as well as the context (Hertzler, Wenjam & Standal, 1982). Worldwide the variety of food eaten is highly varied but within a culture the types of food eaten are much more limited (Fieldhouse, 1995). Culture is not innate; rather it is something that is learned daily as we go about our lives, so can be modified. It encompasses many things, including what is acceptable as food and considered edible or inedible, what dishes are acceptable to serve together, in what order they are served, how they are prepared and where the food is consumed (Bell & Valentine, 1997; Nestle, Wing, Birch, et al, 1998; Capaldi, 1996). Culture can also influence the importance we place on food in our lives (Rozin, 1996). These cultural differences all affect our food choice decisions.

Food habits are acquired from birth and are usually life-long as they are difficult to change (Fieldhouse, 1995). Generally a newborn will start life consuming milk and by their first couple of years the diet will diverge depending on their culture (Birch, 1998). Habits are passed on from generation to generation through a process of socialisation. Socialisation teaches social, cultural and psychological meanings of food (Fieldhouse, 1995). The differences in food choice between two cultures are influenced by economic and environmental factors, symbolism and practicalities (Fieldhouse, 1995). Depending on where a country is located geographically they may be open to many cultural influences or isolated (Wright, Nancarrow & Kwok, 2001). For example China covers a vast area geographically and has great regional diversity.

2.3.2 Ethnicity and Religion

Ethnicity and religion are closely linked and have a great impact on an individual's food choice. Each ethnic group has a different set of ideals, identities and roles in life that influence their food choices (Devine, Sobal, Bisogni & Connors, 1999). Within a country there can be a very large variety of ethnic groups each with its own religion. In New Zealand for example there are Mormons, Seventh Day Adventists, Roman Catholics, Orthodox Jews, Hindus and the list goes on. Much of this variety is due to immigrants to a country who continue to carry out the laws of the religion they practice. Each religion has its own food ritual and ceremony. Orthodox Jewish people follow “kosher” – a set of restrictions placed on the selection and preparation of food. The restrictions include no milk and meat in the same meal, no pork, fish but no shellfish and more. Those belonging to the Mormon religion do not consume alcohol, coffee or tea. Seventh Day Adventists refrain from meat, eggs and milk and alcohol, coffee and tea.

There are various meat taboos throughout religions. Those of the Baha'i faith believe in abstaining altogether from meat, while Islamic people do not consume carnivorous animals. Others such as Judaism have rules about the preparation and slaughter of meat (Fieldhouse, 1995). Some such as the Northwest

Borneo people believe if they eat meat, they develop certain characteristics of the animal, for example become timid like a deer (Beardsworth & Keil, 1997). Others believe in reincarnation and so must protect the animal in case it contains the soul of a potential child or a deceased relative (Fieldhouse, 1995). In many religions fasting is promoted and valued. In almost all religions some type of fasting is carried out either in preparation of a big religious event or to repent (Fieldhouse, 1995). Some Roman Catholics do not eat meat on Fridays during lent in preparation for Easter. Seventh Day Adventists do not consume food prepared on the Sabbath. Some of the fasts are carried out every day while others are only on special occasions.

For many, adhering to these practices is a way of announcing to the world that they belong to this religion and are proud of it. The same applies to consuming certain ethnic foods. Through a group's eating habits they can differentiate themselves from the rest of society. This is particularly significant for those who have migrated to a new country. It has been found that following migration to another country it becomes harder to maintain ethnic heritage, with language and other customs gradually disappearing (McIntosh, 1996). Continuing to consume food of ethnic origins at least once a month is thought to be a very effective way to maintain self-identity (McIntosh, 1996).

Whatever the belief, religion, culture and ethnicity all play a major role in influencing or dictating food choice.

2.3.3 Value Systems

There are some minority groups in every culture who for whatever reason have different values from the dominant culture and therefore make different food choices. As seen with the Theory of Planned Behaviour these values and beliefs are very influential when making food choice decisions.

The first and main value that influences food choice is vegetarianism. As mentioned above there are several religions in which meat intake is nil or restricted, however people become vegetarians for other reasons too. The main personal reasons for adopting this lifestyle are medical, ecological or financial. The financial reason to choose the vegetarian option is that meat can be quite costly and for the very poor it is a luxury (Fieldhouse, 1995). Others choose vegetarianism to stand up for animal rights and protest against cruelty to animals. Battery hens for example are often subject to cruel conditions and treatment so some individuals choose only to eat free-range chicken. The ecological reasons for becoming a vegetarian are based mainly on the cost of getting meat to the market. Some individuals believe the grain used to feed cattle worldwide could be better used for feeding the starving as this grain could feed hundreds of millions of people (Wicks, 1999).

In New Zealand females aged fifteen to eighteen were more likely to be vegetarian or abstain from meat than any other group (Ministry of Health, 1999). There are three types of vegetarianism. These include vegans, lacto-ovo vegetarians and lacto-vegetarians. There is no typical vegetarian and no typical reason for choosing to become a vegetarian as seen above (Lawrence, 1993). Adolescents are attracted to this option for a number of reasons. The first may be the natural tendency of adolescents to adopt social

causes and different philosophies that can be expressed through vegetarian dietary practices (Rickert, 1996). The desire to lose weight is another very common reason to adopt a vegetarian diet. Female adolescents tend to eat fewer meats and dairy products because they believe both food groups are fattening. The medical reasons for abstaining from meat may involve situations such as not possessing the enzymes to break down protein or trying to reduce the quantity of saturated fat in the diet (Lawrence, 1993). Vegetarians are also at a lesser risk of developing some chronic diseases associated with high cholesterol and saturated fat intake, such as hypertension and coronary artery disease (Lawrence, 1993). The final reason for choosing the vegetarian option is for aesthetic reasons. The carving up of the carcass repulses some vegetarians. Often people view this as offensive and frequently meat is carved away from diners' sight.

2.3.4 Socio-economic status

There appear to be significant differences in the food choices made between those of high socio-economic status and low socio-economic status and some believe this gap is growing (Philip, Nelson, Ralph & Leather, 1997). Those of higher income groups are generally reported to consume a more varied diet (Mennell et al, 1994). In an annual survey of 7000 British households it was found that low-income groups consumed more milk, milk and meat products, fats, sugars, potatoes and cereals (Philip et al, 1997). These included full cream milk and high fat meat cuts. It has been found that probably due to the more varied diet consumed by high status groups, their diet is closer to the recommended daily allowances (Crotty, 1999).

This pattern of high fat and sugar intake in low-income groups can be seen across the literature (Mennell et al, 1994; Johansson, Thelle, Solvoll, Bjorneboe & Drevon, 1999). A study conducted in Australia on the differences in takeaway choices between different socio-economic groups found that those in higher brackets consumed more nutrient dense takeaways (Crotty, 1999). The high-income groups chose Indian and Japanese takeaway foods, while the lower socio-economic groups chose K.F.C. and hot chips. These energy dense takeaways are cheaper per head. Another study conducted in Australia to examine the socio-economic differences in food preferences and food purchases found that those subjects in the economically disadvantaged group made choices less consistent with recommended dietary guidelines than their counterparts (Turrell, 1998). Higher status groups have been found to consume more fruit, vegetables and fibre (Johansson et al, 1999). In the New Zealand National Nutrition Survey it was found that there were a higher proportion of males and females eating less than one serving of fruit and vegetables per day in the lower income bracket than the higher income bracket (Ministry of Health, 1999). The source of the food varies between socio-economic groups as well. For example a study carried out to examine socio-economic influences on children's fruit and vegetable intake found that children from low-income families consumed less exotic and less variety of fruit and vegetables (Kirby, Baranowski, Reynolds, Taylor & Binkley, 1995). More canned and frozen fruit and vegetables were consumed than fresh. This shows that it is not only the heavy advertising of these takeaways and low nutrient-dense foods that influences intake. These foods may be consumed more heavily by these groups partially because of advertising, but mainly because of other factors.

Commonly, changes in household income brought about by job losses or the need to commence shift work bring about noticeable changes in diet. Those individuals holding down two jobs frequently eat alone or have less time available for meal preparation. With a drop in income typically less food is eaten out of the home, with less pre-prepared meals and 'luxury meals' consumed. A study carried out examining changes in food habits with changes in household income found that those with a drop in income ate less at restaurants, cafes and felt they had less variety in their meals (Anderson & Morris, 2000). For these subjects low self-esteem and depression brought about by a change in employment circumstances meant there was less motivation to focus on healthy eating or to alter dietary habits. Crotty, Rutishauser & Cahill (1992) however, in their study on food intake in low-income families found that there was a high value placed on health. As with subjects in other similar studies the participants in this study were extremely vigilant about the money spent on food and felt they had less variety in their meals and had to introduce various strategies such as careful planning to ensure meals were put on the table. Unlike other studies though, there was no difference in nutrient density in their diets compared with average households. It has been found that lower income households consistently spend a higher percentage of their disposable income on food than those in the high-income households (Beardsworth et al, 1997; McIntosh, 1996).

2.3.5 Family

What friends, parents and peers eat can greatly influence intake and preferences. Due to the close contact families have it follows that they would share similar food experiences and exposure, intakes, likes and dislikes (Borah-Giddens & Falciglia, 1993).

It is believed parents exert a great deal of influence over children's food choices by making certain food available to the child. An example is found in a study carried out by Robinson (2000) looking at children's perceptions of who controls their food (n=98). It was found that most often at breakfast and lunch meals children were asked to choose between several foods. At dinner, two thirds of the children said the adult chose the food. Over two thirds of the subjects felt that adults usually decided how much they were going to eat as well as what they ate and were frequently encouraged to finish everything off their plate. Overall the children felt their parents had a high level of control over both quality and quantity of meals.

Parents also exert an influence through their own food choices for themselves. One study carried out in the U.S. to demonstrate this effect examined the parent/child relationship in food intake, specifically nutrient intake (Oliveria, Ellsion, Moore, Gillman, Garrahe & Singer, 1992). The study was conducted with ninety one three to five year old children and their parents as part of the Framington Longitudinal Children's Study. It was found that there was a statistically significant relationship in nutrient intake between parents and children. The relationship between mother and child was stronger than that of father and child and for those families who ate more meals at home. Although the relationship was significant it was weak suggesting once again that the influence of the parents is still only one part of a wide variety of influences on the child's intake.

An in depth qualitative study carried out in New Zealand (n=20) with Pakeha families including 13-16 year olds found from discussions that family had a major influence on adolescents' food choices in several ways (Maskill, Jones, Wyllie & Casswell, 1996). These included the availability of foods, the preparation and cooking of certain foods, rules and guidelines about food and families, particularly mothers being a source of information about food. Another study carried out to examine the concordance of 118 young children's food preferences with those of their father, mother and siblings found a strong relationship between those of family members and the child (Skinner, Carruth, Moran III et al, 1998). The concordance of preferences was not stronger with one family member than another. There were limitations to the study including the mother reported the child's preferences which mightn't be accurate. This may have been because she simply did not know or to impress the researcher and this introduced bias straight away. In an overseas study, Stratton & Bromely (1999) carried out research with families to explore how family members described their processes for food choice. Discussions were unconstrained accounts given by each member to elicit how food choice decisions were made and viewed within the family context. The results of the study support previous findings in several ways. Firstly family members expressed a level of reliance on the mother in making food decisions and the mother in turn tuned her food choice decisions to her family. Another study carried out to examine the relationship between parents' and children's adiposity and eating style (n=70) found that the best predictor of a child's ability to self-regulate food intake was parental control in the eating situation (Johnson & Birch, 1994). In situations where parental control was greatest the children showed the least ability to self regulate their intake.

Children learn what is acceptable behaviour through their parents using food as a punishment or reward, or restricting some foods on the basis of health (Fieldhouse, 1995). For example a study carried out to examine the diet quality and eating environment of preschool children found that more than half of the parents interviewed used desserts or treats as a reward for eating a meal or as a reward or punishment for certain behaviour (Stanek, Abbott & Cramer, 1990). It has become evident in recent times that withholding certain foods does not inhibit consumption of these 'bad' foods but in fact works in the reverse making these foods more attractive to the child (Carper, Orlet Fisher & Birch, 2000). A study conducted with male and female college students (n=518) to examine the relationship between food intake as an adult and recollections of childhood eating experiences found that current food habits were related to the habits of childhood (Branen & Fletcher, 1999). Examples given were "cleaning one's plate", using food as an incentive and eating regularly scheduled meals. The study was limited in that the population was homogeneous and most of the subjects were from two parent families however it does support the belief that food habits and beliefs acquired during childhood are carried throughout life.

Eating for children is a social occasion so peers at school and preschool, siblings and other older children also influence their food choices as well as their observation of other people's eating behaviour (Birch et al, 1998; Booth, 1994).

2.3.6 Friends

Many studies have been carried out to examine resemblance in food choices within families but few have been carried out examining the influence of friends. One such study carried out in the Netherlands looked at the resemblance in fat and food intake within the social networks of 347 adolescents (Feunekes, Ceesa de Graaf, Meyboom & van Staveren, 1998). Interviews were conducted with the adolescents, their fathers, mothers and friends. In common with other studies a significant resemblance was found between the subjects' intake and that of their parents. There was no significant correlation in fat intake of friends but there were foods chosen that were common to both friends. Unsurprisingly most of these foods were classified as 'snack' foods.

Rather than a direct link in intake between friends it is likely that friends introduce novel foods to each other and a chance to try each other's meals. There may be an element of persuasion or encouragement to try a new food (Feunekes et al, 1998). It is difficult to ask an individual directly if they feel they are influenced by a friend as they may not be aware of this or may be embarrassed (Feunekes et al, 1998), so the best way is to examine foods choices in an observational way or in a natural setting.

2.3.7 Child-care providers

As more and more parents of young children re-enter the workforce it is important to remember the influence of child-care providers on children's food choices. With the increasing number of families in which both parents work full time childcare providers are filling in for parents by acting as role model, nutrition educator and food provider, thus they are influencing the children's food choices both directly and indirectly (Crockett & Sims, 1995).

2.3.8 Other socio-cultural influences

Where we eat, and with whom we eat both affect our food choice and according to Marshall (1995) may be as important in determining what we eat as the food itself. Food can be consumed in the home, at restaurants, in the car, in the park, on a plane, on a bus and the list goes on. Each place chosen will have an influence on the food consumed in that particular situation (Marshall, 1995).

The location of food within an environment is also important. Studies have found that if the effort to obtain food is high, fewer items will be chosen or different choices will be made (Marshall, 1995). For example if a product is on special and standing at the end of a row in a supermarket, many will choose that item rather than seek out alternative brands or flavours. Retailers take advantage of this by encouraging unplanned or impulsive purchases with foods displayed next to the check out.

For almost all societies eating is a very social occasion and occurs in the presence of others (Nestlé et al, 1998). Eating together can cement relationships, and a meal is the perfect occasion for families to get together to talk about their lives (Stephens, 1997). Few, if any cultures encourage eating alone as it is a

social occasion from the gathering to the eating (Germov & Williams, 1999). It has been found that the number and nature of people present when a meal is consumed is positively correlated with meal size (de Castro, 1997; de Castro & de Castro, 1989). The meal size may change with the way a companion looks (over/under/normal weight), the amount a companion will eat or the number of meal companions present. This effect could be due to the presence of others relaxing the individual, or could simply be due to meals going on for longer in the presence of others so more food is consumed (de Castro, 1997). In a study (n=49) carried out by de Castro et al, (1989) it was found that there was a clear association between the number of people present and the amount of energy ingested in the meal. The meals were 44% larger with other people around. This may not always be the case though. Some people will eat foods in private such as high fat and sweet foods because they are ashamed to eat these in front of other people.

2.4 Other

2.4.1 Nutritional knowledge

The direct relationship between nutrition knowledge and food choice as with other aspects of food choice is hard to prove and studies carried out to investigate the relationship are ambiguous. This is in part due to the difficulty of actually measuring the nutrition knowledge and the significance of the effect of knowledge varying (Axelson, Federline & Brinberg, 1985; Wardle, Parmenter & Waller, 2000).

A meta-analysis of the research on food behaviours and nutrition knowledge found that across nine studies there appeared to be a significant relationship between dietary intake and nutrition knowledge. (Axelson et al, 1985). The analysis was limited though in the small number of studies included. Another study (n=1040) carried out with the aim of examining the relationship between nutrition knowledge and fat, fruit and vegetable intake found that nutrition knowledge was significantly related to 'healthy' eating (Wardle et al, 2000). Those in the higher knowledge groups were predominantly women and had a higher education level and job status. These individuals were more likely to eat less fat and more fruit and vegetables. The effect of nutrition knowledge however was found to be independent of occupational status and education.

The relationship between nutrition knowledge and intake with young children is different again. Although they may have a degree of nutrition knowledge their food choices are mostly mediated through their parents and *their* nutrition knowledge. When they do have a degree of knowledge about some macronutrients they are often unsure what foods contain these nutrients and how to translate this knowledge into healthy food choices. A study was carried out with twelve-year old children to examine their food preferences and their knowledge of healthy eating (Douglas, 1998). It was found that the students had an idea of how to classify foods as healthy or unhealthy but little knowledge of actual nutrient content of the food. The general nutritional awareness was not reflected in the food choices made. The conclusion made from this study was that other factors have more of an influence on food choices than nutrition knowledge alone. A study carried out in the United Kingdom (n=900) with adolescents examined the relationship between the individual's knowledge or awareness of healthy eating and the food choices they were making (Brown, McIlveen & Strugnell, 2000). It was found that although

they were aware of healthy eating their food preferences did not reflect this. There were barriers to them implementing this knowledge including habits such as increasingly eating away from home and eating only the food they liked. Another barrier could be the lack of urgency adolescents feel when it comes to health issues (Hart, Bishop & Truby, 2002). Many adolescents feel diseases such as heart disease only affect adults and what they do today will not have an influence on their health later.

Several of these studies link nutrition knowledge, socio-economic status or education and food behaviours. One such study was carried out in Ohio with children aged eleven to thirteen using a Comprehensive Assessment of Nutrition Knowledge, Attitudes and Practices test (CANKAP) (Pirouznia, 2001). The study found that in one group the relationship between nutrition knowledge and eating behaviour was not significant whilst in the other two groups it was significant. The study was limited in that it was carried out in only a small group that was not representative of the population.

Large segments of consumers receive their nutrition education and knowledge at the point of purchase (Glanz, Basil, Maibach, Goldberg & Snyder, 1998). The recently introduced Australian New Zealand Food Standards Code (2002) mean nutrition panels are included on labels that provide information about the nutrient content of the food. Claims made on the labels can be useful in drawing in health conscious consumers and influencing their food purchases (Goldberg, 1992). Qualitative studies carried out in New Zealand show that many misunderstand the meaning of nutrient claims on food labels and tend to use the information to determine the level of only one nutrient so likely continue to make poor food choices (F.S.A.N.Z., 2003).

It seems that people appear to have a level of nutrition knowledge but are not motivated to overcome barriers to change their diet and don't seem particularly affected by what they know (Nestle et al, 1998; Shepherd, 1999).

2.4.2 Functional foods

In the last decade, the focus on food for some has changed with a new emphasis on food as medicine. Instead of viewing some foods as the cause of conditions such as cancer and obesity there is a belief that food can be used to relieve the symptoms of some diseases and aid in the prevention of others. This has led to the development of functional foods. Functional foods are described as any food or food ingredient that has a positive impact on an individual's health, physical performance or state of mind, in addition to its nutritive value (Sheehy & Morrissey, 1998). Growing groups of consumers are now making food choices based on the belief that there is a connection between food and health. With this renewed interest in health, there is an increase in demand for unprocessed foods and natural alternatives of the same foods. Consequently, the demand for organic products and food grown in family and shared gardens has risen and many people will choose these foods where possible.

2.4.3 Weight loss

Weight loss is a major factor in food choice. The desire or need to lose weight may result in the choice to become vegetarian or maybe to set out on a low calorie regime. Weight control is more of a concern for older adults and females of all ages (Glanz et al, 1998).

2.4.4 Convenience

Convenience is a major factor in food choice (Glanz et al, 1998; Neumark-Sztainer, Story, Penny & Casey, 1999). Increasingly we are seeing two parent families with both parents working or single parent families where the parent has to work to make ends meet. This is leading to increased consumption of foods that are readily accessible, quick and easy to prepare (Ministry Of Health, 2003¹). As a result there has been an increase in demand for single-serve packaging, home meal replacements (pre-prepared fresh products) and finger foods (Sloan, 1998). The demand for these products has increased with the greater involvement of women in the workforce who have less time to prepare meals (Beardsworth & et al, 1997; Crockett & Sims, 1995). Consequently, as seen in part one, there has been a rise over the years in the advertising of these types of convenience foods.

2.4.5 Price and variety

Price is obviously a major factor in food choice decisions. In some situations, a higher disposable income with more money to spend on food does not necessarily improve dietary quality (Nestlé et al, 1998; Ministry Of Health, 2003¹). As seen above, the lower the income, the less fresh fruit, vegetables, fishes and lean meat in the diet (Nestlé et al, 1998). In New Zealand lower income families struggle to consume adequate dairy products (Parnell, 1997).

In many situations the most desired foods are readily available because these foods will make suppliers a profit (Nestlé et al, 1998; Neumark-Sztainer et al, 1999). When food is abundant and there is plenty of variety people tend to eat more so they get a taste of everything in front of them and can meet their nutritional needs (Fieldhouse, 1995). Variety therefore leads to consumption of more food.

2.4.6 Gender

There are several differences between males and females in food choice and attitudes to food. There are also gender differences between cultures in food beliefs. From an early age in Western society, children are brought up according to cultural expectations of how males and females should behave. Females are meant to feed and care for their family while at the same time be slim, attractive and well attired (Beardsworth et al, 1997). Women tend to be more health and diet conscious and are more open to dietary change than men (Barker, Thompson & McClean, 1995). There is a huge emphasis in Western society on physical beauty and the “ideal” female body. The “ideal” varies across cultures but in Western societies it is not based on realistic proportions (Robbins, 1996). Over the last few decades the “perfect” figure has become thinner and more unrealistic, while in reality body weight for the average woman has increased

(Robbins, 1996). For many women this dissatisfaction with their body can lead to restrictive eating, chronic dieting and a fear of fat (Robbins, 1996; Beardsworth et al, 1997). Dieting can lead to weight cycling and have detrimental physiological and psychological consequences (Williams & Germov, 1999).

With the introduction of the 'Metrosexual' there is increasing material in the media and advertising for ways to improve men's bodies. The 'metrosexual' is the new modern man who is increasingly interested in trying new ways to make himself look good. Along with the ideal woman the ideal male is expected to be fat free (Bell et al, 1997). Thus food choices by both men and women are made based on improving physical appearance or avoiding detriment to appearance.

Another aspect of restrictive eating is an attempt by a person to gain some control of their lives and practice extreme self-control and denial (Caplan, 1994; Bell et al, 1997). This leads to the development of eating disorders including bulimia nervosa, anorexia nervosa and variations. Anorexia and bulimia nervosa are characterised by restrictive eating or bingeing and purging respectively. These eating disorders typically occur in adolescent girls or young women with obsessive/compulsive personalities and are more prevalent in industrialised societies than non-industrialised (Becker, Grinspoon, Klibanski & Herzog, 1999, Fat Files, 2003).

In most societies around the world, despite increasing numbers of mothers working full or part time, the female of the house is responsible for preparing and serving food. It has been found that more often than not men are favoured when it comes to serving size and order when food resources are plentiful *and* short (Caplan, 1994). Even in circumstances where a woman's energy needs are higher such as pregnancy, in developing countries the male will get first choice (Fieldhouse, 1995). It has also been found that a woman's shopping and food choices for a meal are dominated by their partner's food preferences (Caplan, 1994; Bell et al, 1997). Women tend to satisfy their partner and children's preferences above their own and often will often only cook a full meal including meat and vegetables if their partner is going to be home to eat it. If not they will not go to so much trouble for themselves and their children (Bell et al, 1997; Mennell et al, 1994).

Finally, women have been found to consume significantly more energy during the premenstrual cycle. Studies have found that a woman can consume between 90 and 500 kcal/day more during the luteal phase of her cycle than the follicular (Kurzer, 1997). There can also be premenstrual cravings for a particular food. This could be due to certain foods providing comfort and offering a feeling of well-being, or just that they taste good. An example is chocolate, but could be any foods high in sugar, salt or fat. The types of foods usually craved are carbohydrates and this is probably due to their ability to increase brain serotonin levels (Kurzer, 1997).

2.5 The physical environment

Our food choices are initially governed by what can be obtained from the environment. This means geography, climate, transport and distribution (Fieldhouse, 1995). Physical factors such as soil, water, weather and climate all affect the food that can be obtained from the environment and thus food choices (Spencer, 1991, van den Brul & Spindler, 1984).

Globalisation of the food supply means that foods once unavailable in a country due to impossible growth conditions are now taken for granted (Bell et al, 1997). Exotic fruits and some meats, for example can be imported that in earlier times were not available in New Zealand. Foods can be moved quickly from one part of the world to another. There is little seasonality in food supplies in Western cultures today (Caplan, 1994).

In industrialised countries, food production is well organised and efficient. The most successful is America due to technology that poorer countries do not have access to (Spencer, 1991). In these countries there is a much more varied diet than in other parts of the world, although due to cultural influences food choice still tends to be quite conservative.

There is another aspect of the physical environment that stimulates an increase in energy requirements. This is actual environmental temperature. In extreme cold or heat there can be an increase in basal metabolic requirements from 2 to 5% (Linder, 1991; Capaldi, 1996). In other words, more energy is needed to keep the body warm or cool. Some of this extra requirement is from wearing extra layers of clothing that makes the muscles work harder.

2.6 Food choices throughout the lifecycle

Age has an important influence on food choice decisions. The main focus of this section will be infants, children and adolescents as the factors affecting the general adult population are covered throughout this paper.

2.6.1 Infancy and Childhood

Once a child has ceased to be breast-fed the largest influence on their food choice is that of the parents. Parents essentially determine what, when and how much a child will eat by making certain foods available to the child and by acting as a model for appropriate food behaviours (Hursti, 1999; Nicklas, Baranowski, Baranowski, Cullen, La Troy Rittenberry & Olvers, 2001; Robinson, 2000).

Young children naturally prefer sweet and salty tastes. Humans are born with an innate preference for sweet and then salty foods and a dislike of bitter and sour foods (Fiddes, 1995; Birch, 2001). Children are also neophobic – they have a fear of new foods and prefer sweet, familiar foods. Repeated exposure

to allow the child to become familiar with the new food will increase the chance of their accepting the food particularly when they see an authority figure eating the food (Nicklas et al, 2001). If a child is breast-fed they may experience some of the different food flavours through the breast milk so this can increase their acceptability of some new foods (Birch, 2001; Birch & Fisher, 1997).

Initially the infant's preference is based on what happens when the food is ingested. If the consequences of ingestion are good, in that the food makes the child feel good they will eat and enjoy the food (Capaldi, 1996). If the consequences are negative, such as vomiting, the child will form an aversion to that food. It is believed that when a child moves from being breast-fed to a varied diet similar to an adult's they are able to regulate their own energy intake over a twenty-four hour period. However despite this, parents' influence often remains great because they disrupt this regulation of energy intake by altering the child's responses to the normal internal hunger cues (Nestlé et al, 1998; Birch & Fisher, 1998; Johnson & Birch, 1994).

2.6.2 Adolescence

Adolescence is the period of growth from the start of puberty until full maturity. This is a period when the individual is increasingly striving for independence and this is commonly reflected in their food choices (Brown, McIlveen & Strugnell, 2000). Teenage food choices are influenced less by their parents and more by increased health and dietary awareness, peer pressure, nutrition education and the media (Owen, 1997). The adolescent diet is characterised by skipping meals, a high incidence of snack and fast foods, different patterns between school days and weekends, fasting and restricted caloric intake (Rickert, 1996; Shepherd & Dennison, 1996; Post, Kemper & Storm-Van Essen, 1996; Rolls, 1988). Today adolescents have greater purchasing power and the freedom to make food choices that will directly affect their body shape and size (Thomas, 1991; Adamson, Rigg-Gunn, Butler & Appleton, 1996).

Due to the increased time spent away from home socialising or in after school activities, fast foods and convenience foods are a major source of energy (Lifshitz, Tarim & Smith, 1993; Neumark-Sztainer et al, 1999). Fast food outlets are a good place to meet friends and are often located conveniently so it is easy to meet up after school. Fast food outlets capitalise on many aspects desired by teens (Shepherd et al, 1996). They offer a brightly coloured environment where the food is reasonably priced and very familiar and the service is fast. In a study mentioned earlier carried out by Maskill et al (1996) in New Zealand with twenty Pakeha families the adolescents found that price was a major influence on their food choice. They tended to eat takeaways, sweets and potato chips because they were cheaper than other foods. Many adolescents tend to follow 'faddy', low calorie diets as they become more conscious of the energy value of various food items. They are also attracted to novel ways to lose weight, especially ways with rapid results, such as liquid diets (Rickert, 1996).

It has been found that there is a difference between food choices made by male and female adolescents. Boys tend to consume a lot more food than girls due to their size and larger energy needs. There are also differences between the sexes that seem to be related to beliefs about health. Girls are more health and weight conscious and this in some but not all cases is translated into healthier food choices (Rolls, 1988;

Neumark Sztainer et al, 1999). The desire of girls to be slim and boys to be bigger does have an influence on perception and selection of foods.

2.7 Biological factors relating to food choice

2.7.1 Hunger and appetite stimuli

Hunger is a physiological sensation that motivates the behaviour to seek and consume food (Capaldi, 1996). Of all the reasons that we eat, hunger is the most obvious, though as seen above it is not always the most influential. The stomach is designed to cope with periods of eating and restriction and for the average human these typically occur every four hours. Four hours after ingestion the food has left the stomach and has been absorbed (Capaldi, 1996).

The messages circulating around the body for satiation and hunger are controlled at a “centre” called the hypothalamus (Barker, 1982). Mediated by the cortex and the vagus nerve, signals are sent to the hypothalamus (Linder, 1991). The hypothalamus conveys messages between the brain, the mouth, the gastrointestinal tract and the liver. The signals arrive at different parts of the hypothalamus. The first region is the ventromedial hypothalamus that is the part associated with satiety and sometimes called the “satiety centre” (Barker, 1982; Linder, 1991; Widdowson & Williams, 1999). When the ventromedial hypothalamus (VMH) is stimulated, there is a decrease in food intake and activity of the lipolytic enzymes increases. The V.M.H. works via the sympathetic nervous system (Linder, 1991). The second region of the hypothalamus involved is the lateral hypothalamus. This is named the “feeding centre” by some (Widdowson et al, 1999). When the lateral hypothalamus (LH) is stimulated food ingestion occurs as well as fat storage. The L.H. works via the parasympathetic nervous system (Linder, 1991). The third region of the hypothalamus is the paraventricular hypothalamus. This region can alter the activity of the pituitary gland, which in turn releases hormones that will influence metabolism and satiety (Linder, 1991).

There are a variety of signals sent to the hypothalamus from around the body. The first are pre-absorptive signals from the stomach and the intestine. These signals are the hormones cholecystokinin, bombesin and neurotensin. An example of how these hormones work is when cholecystokinin is released from the gut wall in response to fat and carbohydrates entering the stomach. The release of cholecystokinin stimulates the vagus nerve that tells the V.M.H. to induce satiety (Garrow, 1993). The second signals are post-absorptive signals. Certain tissues around the body, for example the liver, send signals to the hypothalamus in response to the level of glycogen stores and glucose oxidation. These reach the V.M.H. and induce satiety (Linder, 1991). The level of nutrients in the blood determines the third signal to the hypothalamus. Following absorption, if the level of nutrients such as glucose in the blood is high, satiety is induced (Garrow, 1993; Widdowson et al, 1999). Finally, the level and turnover of glucose and tryptophan in the brain will influence satiety. If there is a high level of glucose oxidation, satiety will be induced (Linder, 1991).

The appearance, smell, texture and taste of the food arouse sensory systems when food is approached (Capaldi, 1996). The assessment of the food as positive or negative through the senses depends on the level of hunger and previous experiences with the food. If the body is energy deprived the food will appear more attractive and taste better than when energy needs are filled (Capaldi, 1996; Drewnowski, 1998¹). This is called the 'set point model'.

In the brain, certain neuropeptides participate in appetite control. The two most widely investigated are noradrenaline, which stimulates food intake and serotonin, which induces satiety (Widdowson et al, 1999). Neuropeptide Y (N.P.Y.), galanin and orexin are neuropeptides that inhibit feeding (Widdowson et al, 1999). Another neuropeptide, corticotropin releasing factor (C.R.F.) is thought to play a role in inhibiting food intake. It works via the paraventricular region in the hypothalamus (Widdowson et al, 1999). Some of these neuropeptides are specific to certain nutrients for example N.P.Y. is specific to carbohydrate cravings and galanin is responsible for fat cravings. Recently two other hormones have been discovered that influence short term feeding behaviour. These are Peptide YY (P.Y.Y.) and ghrelin. Ghrelin is a peptide released by the stomach in the same way as cholecystokinin and stimulates the appetite (Marx, 2003). P.Y.Y. is important in terminating a meal and is a member of the N.P.Y. family (Marx, 2003). The level of PYY rises during a meal and ghrelin levels rise 2-3 hours before a meal.

Leptin is a 167-amino acid plasma protein that is involved in the regulation of body weight (Friedman, 2003). It is produced in adipose tissue and circulates in the plasma, free or protein bound (Friedman, 1998). Leptin has been called the "circulating satiety factor". The receptors for the obese gene have been localised to the hypothalamus. Leptin functions in a negative feedback loop that regulates the amount of adipose tissue in the body through changes in appetite and metabolism (Friedman, 1998). Leptin sends a message to the hypothalamus that tells it to 'turn off the appetite'.

2.7.2 Satiation

Satiation is the feeling of fullness that occurs *during* a meal and stops a person eating. In other words, it is the size of an eating episode (Blundell & MacDiarmid, 1997). Satiation depends on the presence of food in the gastrointestinal tract and is linked to receptors in the stomach that stretch, thus causing discomfort and halting eating. The power of satiation depends on the energy density of the food and the palatability of the food, which are closely linked. In fact, taste and satiation seem to work against each other (Drewnowski, 1998¹).

2.7.3 Satiety

Satiety is the feeling of fullness *between* meals that inhibits another bout of eating and determines how much time passes between each meal (Garrow, 1993). It is the signal that tells us not to eat again for a while. This signal can be overridden. Satiety is measured in terms of fullness, a decline in hunger, and a decline in the intent or desire to consume the next meal (Drewnowski, 1998²).

'Sensory-specific satiety' is a term often used to describe a satiety that is partly specific to the foods eaten and greatly influences our food choices. It is a decrease in the pleasantness of a food after it is eaten and an enhanced intake if certain properties of the food are changed (Rolls, Rowe & Rolls, 1982). An example of sensory-specific satiety is demonstrated in a study carried out by Rolls, Rolls, Rowe & Sweeney (1980). Subjects were given eight different foods to try and rated how pleasant they found the taste. They were then given one of the foods for lunch and afterwards were again asked to rate the food for pleasantness. Liking of the foods consumed at lunch decreased more than any of the other foods they were asked to rate. In another study by Rolls et al (1982) subjects were given certain foods and asked to rate their pleasantness. Later the shape, and flavour of the foods were altered. In each circumstance these changes led to a decrease in the pleasantness in the shape/taste eaten and an increased acceptance of the other shaped and flavoured foods

There are certain other times that the satiety and satiation signals are overridden such as when a person has an eating disorder and will override hunger or fullness signals or when there are emotions involved such as stress or excitement which will enhance or dull an individual's appetite.

2.7.4 Energy density of food

The extent to which a person feels satiated and maintains satiety partially depends on the nutrient composition of a meal and its energy density. Energy density is the amount of energy available to be metabolised per unit weight or volume of food (Yao & Roberts, 2001). Protein is the most satiating macro-nutrient followed by carbohydrates then fat. High fat food is flavourful and energy dense with more kJ/g but offers little satiation during a meal (Poppitt & Prentice, 1996; Drewnowski, 1997).

Studies carried out indicate that consuming very energy dense foods may result in lower satiety when compared to low energy dense foods. For example a study carried out by Duncan, Bacon and Weinsier (1983) to compare the effects of a low energy-dense diet with a high energy-dense diet on satiety and energy intake found those who ate the low energy-dense diet to the point of satiety consumed half the amount of energy of the high energy-dense diet subjects.

The energy density of a food is related to palatability. If a food is energy dense, it will be highly palatable but not satiating (Drewnowski, 1998²; Schiffman, 1998). The opposite is also true – the lower the energy density, the less palatable, but the more satiating. Lower energy dense foods generally contain more water, more fibre and less fat (Drewnowski, 1998²). The satiety factor associated with energy density may also be related to the volume of food consumed. Consuming a meal that is made up of low energy dense foods with more water and fibre will lead to stomach distension that triggers a feeling of fullness. If the same amount of energy is consumed in a meal of high energy-dense foods the distension will not occur and thus the same level of satiety will not be reached (Yao et al, 2001; Poppitt et al, 1986).

When humans are faced with high-energy, more palatable foods that are less satiating over-consumption frequently occurs. Humans are drawn to fat as it provides the wonderful aroma and texture of foods.

However as fatty foods are less satiating, more will be consumed before fat-induced satiety signals start to operate (Blundell et al, 1997; Nasser, 2001). A study to evaluate the regulation of energy intake in humans found that when subjects were placed on a low fat diet the amount of energy consumed was significantly less than the medium density diet and those on the high fat diet consumed significantly more energy (Lisner, Levitsky & Strupp, 1987).

Lastly a final psychobiological reason for eating is that the signals sent to the brain to indicate thirst are often mistaken for hunger.

2.7.5 Sensory properties of the food

Another important factor in food choice closely linked to satiety and satiation are the sensory properties of the food, namely appearance, taste, odour and texture.

The first experience we have of a food that will influence whether or not we choose to eat it is the appearance. It has been found that the colour and appearance of a food affects an individual's perception of the quality of the food and subsequently whether or not they will try it. These perceptions will change depending on the situation in which the choice is made and depends on how the food is displayed (Imram, 1999). An example of the importance of the colour of food is demonstrated by Walsh, Toma, Tuveson and Sondhi (1990) in an experiment (n=120) with children aged between five and nine. The subjects displayed an obvious preference for red, green, orange and yellow foods. Another example is the introduction of green tomato sauce in New Zealand to try to appeal to young children and make eating more fun.

Taste is obviously important in deciding whether we find a food acceptable or not and is very individual (Raats, Dalliant-Spinnler, Deliza & MacFie, 1995). It is the sense that perceives particular qualities in the food including sweet, salty, sour, bitter and more recently umami. The sensation occurs in the taste buds located on the tongue when the food or drink comes into contact with them. The palatability of a food is effectively how we perceive that food, whether we enjoy the taste or dislike it and this affects whether or not we will chose to eat that food again. Our taste preferences and choices alter with age. As seen earlier we all start with a preference for sweet but from childhood to adulthood there is typically a decline in preference for sweet and an increased acceptance of the bitter taste (Drenowski, 2000). Taste aversions can develop throughout the lifespan often as a result of a bad experience with a particular food.

2.8 Psychological influences

There are several emotional factors that induce us to make particular food choices and these include the desire for a feeling of comfort and well being obtained from some foods and other reasons such as cravings.

As we have seen women tend to choose foods for reasons other than health and are more likely than men to have comfort foods (Somer, 1993). It has been found that many women use eating as a way to relax and others eat sweets when depressed or celebrating (Somer, 1993). A woman's comfort food is usually carbohydrate rich such as pasta, deserts and other sweet foods. This is not only for the appetising taste but there is a physiological response to the carbohydrate intake (Somer, 1993). Carbohydrate rich foods increase the amino acid formation of 5-OH tryptamine (serotonin) in the brain, which relieves depression, irritability and insomnia (induces drowsiness) (Somer, 1993; Linder, 1991). Following a high carbohydrate meal, blood levels of amino acids are reduced by insulin resulting in less competition for entry of tryptophan into the brain (Linder, 1991; Kurzer, 1997).

Many people from young children to adults eat because they are bored and opening the biscuit tin or the fridge gives them something to do. Others eat because they are lonely (Fieldhouse, 1995). This is often the case with troubled obese or overweight people. There may be a feeling that nobody loves them so it does not matter what they look like and whether they eat too much. This is often followed by bingeing and associated guilt. Anxiety also affects food intake and affects people in different ways. Some get an upset or churning stomach and cannot eat a thing. Others cannot eat a proper meal so have a chocolate bar or a different snack to provide comfort. Others still eat more when anxious or under stress. Food provides instant gratification. Many food choices are associated with guilt. Following a strict diet for a period of time is difficult and often people 'cheat' and then feel guilty. Giving food as a gift is also a way to relieve guilty feelings at perhaps having done something wrong and to get forgiveness. Finally, some people eat for security. In times of crisis and upheaval familiar foods are very valuable and can provide comfort and security.

2.9 Summary

As we have seen there are numerous physical, social, biological and psychological influences on food choice. Beliefs about the food, life experiences, values and ideals, resources and the context in which the food are eaten can be conscious or sub-conscious influences on what we eat and all interact and come into play at various stages in our life.

Although the main focus of this research is the influence of television food advertising on children's food choices it is important to highlight all these other influences in order to place the influence of advertising in context. No one of these influences acts alone and neither does television advertising. Many researchers try to find an independent causal relationship between advertising and food choices, which is

impossible as food choices are not made independently of other factors such as a person's culture and age.

So far this section has examined all the other influences on food choice and now studies carried out to examine the relationship between television advertising and food choice will be reviewed.

2.10 Food and television

The role of television and television advertising in shaping children's food choices and causing obesity is very controversial and although television is consistently implicated as a cause of the rising obesity levels the literature does not support this point of view. While the majority of studies find correlations between advertising and food choice they do not imply causality and if they do it is mostly an assumption. In spite of this the media consistently fail to differentiate between causality and correlation (Eagle, Bulmer & Hawkins, 2003). There have been relatively few studies carried out examining the relationship between television use and children's food intake and choices and the studies fall into four main categories. These are content analyses of all the advertisements shown during children's television, the effect of advertising on children's food choice behaviours, the role of television in childhood obesity (through displacing time spent participating in physical activity, lowering the resting metabolic rate during viewing and encouraging intake of high fat, high sugar food) (Woodward, 1993; Delmeny, 2003; Tonge, Bretherton, Jarman, Menaham & Sanson, 1994; Sylvester, Achterberg & Williams, 1995) and finally children's perceptions of advertising.

Television has a major role in our lives with 98% of homes in New Zealand having one or more televisions (A.C.Nielson, 2001). In a study in America it was found that 32% of two to seven year olds and 65% of eight to eighteen year olds have television sets in their bedroom (American Academy of Pediatrics, 2001). It has been said that television is a window into our culture and provides a variety of models and messages that can influence the way children feel about food and eating and what they view as acceptable (Birch & Fisher, 1997).

This section will begin with a brief overview of how advertising works, followed by a review of the literature on the impact of television advertising on children's eating behaviours, a look at children and parent's perception of advertising and lastly a review of the literature associating television viewing with overweight and obesity in children.

2.10.1 Advertising Methods and Strategies

There are two main areas of concern about food advertising during children's television. The first is that advertisements are predominantly for processed foods high in fat and sugar and this does not fit with the nutrition guidelines of consuming a healthy and varied diet. As seen later this has been found to be true for advertisements shown during children's television across the world. Secondly, some argue that advertising has a profound influence on what children choose to eat. This may be directly through

advertisements aimed at the child or indirectly through advertisements aimed at parents (Barwise, 1997). There are those who argue that advertising serves to increase children's awareness of brand names, fosters a more positive attitude to heavily advertised foods, changes beliefs about the value of advertised foods, encourages demands from parents of advertised foods and stimulates direct sales of advertised foods to children (Nestle et al, 1998).

Advertising does not work through unconcealed manipulation rather the aim of an advertisement is to influence and persuade the consumer to buy a particular product instead of any others (Calfee, 1998; Stanbrook, 1997). It is about providing information about a product and persuading the consumer to purchase a product within a particular category (Stephenson, 2001). Despite the aim of advertisers to persuade it is argued by some that despite common beliefs the persuasiveness of advertisements is not as strong as we might think, and that previous experiences of a product and scepticism towards advertising mean the advertisement influence is less strong than thought (Eagle & Rose, 2003). Others argue that the manoeuvrings of advertising are subtler than advertisers would openly admit. Advertisers consider a successful advertisement one that after viewing, the child has a high level of recall about the product. From an advertiser's point of view if an advertisement is too subtle or obscure it will ultimately fail. Advertisements are all about brands. According to advertising experts this is why there are few advertisements for fruit and vegetables, as they are commonly not branded. It has been found that advertising typically fails to increase total market size of a product rather it shifts brand shares (Calfee, 2003).

The most successful advertisements are ones that use a combination of enduring themes and accurate execution (Mathews, 1997). The enduring themes used to capture children play on the child's desire to be older, wanting to be accepted by friends, the desire to be in control, their concept of 'good versus bad' and their love of precious things (Mathews, 1997). Strategies used to appeal to children include bright packaging, intensely coloured and flavoured products, free gifts, competitions in conjunction with text messages and the internet, characters from popular films, associating the product with fun times, special actions like an interesting walk or dance, lots of action, catchy tunes and more (Hammond, Wyllie & Casswell, 1997; Dalmeny, Hanna & Lobstein, 2003). Often taste, fun and excitement are reasons to eat the food rather than to fulfil the body's needs (Reece, Riffon & Rodriguez, 1999; Dalmeny, 2003). It is argued that children should not be expected to be able to evaluate these advertisements and determine where the product fits in to a healthy diet (Dalmeny, 2003).

Children start off as viewing advertising as something to be enjoyed and like the high level of repetition. They are unable to discern the advertisement from other programming. They move on to understanding the purpose of advertising at age seven to nine years and can discern between a 'good' versus 'bad' advertisement (Mathews, 1997). At age ten to twelve children are very sensitive to how others see them, develop independent judgement and look for rational reasons why" (Mathews, 1997). At this age they are aware that the purpose of advertising is to sell a product and use advertising to find out more about the product. They are accepting of the concept of advertising and are increasingly discerning, judging the advertisements critically and are aware of 'cons' (Mathews, 1997; Roedder John, 1999). At the same time they are becoming more independent and looking to other sources for information. Studies have

found that there are higher levels of scepticism about advertisements in children from families that discuss advertisements and thus foster critical thinking compared to those children who greatly conform to peer group norms (Roedder John, 1999). This scepticism however does not necessarily mean that they are not 'taken in' by the advertisement and the product.

A study (n=74) carried out in New Zealand with five to eight year old children to determine how well they understand the selling intent of advertisers, supported this timeline of children's understanding of advertising (Bulmer, 2001). It was found that none of the children in the age group five to six year children understood the motivation of advertisers. By eight years almost all of the subjects understood that advertisers are profit driven and the methods used to persuade consumers. The younger children did not discuss advertisements with their peers whereas the seven and eight year olds did. Finally all the children felt that advertisements made them want to buy things and ask their parents for things and for the older children this was in spite of their knowledge about advertising techniques.

Many children today are financially independent to a certain extent, increasingly sophisticated and 'brand-savvy', and increasingly are the target of advertisements (Reyes, 2002; Howell, 2003; Champion, 2003). This is increasing with the number of solo parent families and households in which both parents work full time, where the child is increasingly influential on purchases for the household. There is a shift from trying to reach the child through the mother, to directing messages straight to the child (Reyes, 2002). Child versions of adult products and categories are being created in special flavours, colours and packaging such as green tomato sauce, as well as a dozen varieties of museli bars, fruit bars, potato chips and breakfast cereals. Licensed characters such as the Disney characters are appearing on packaging such as 'Kellogs Disney Museli Bars'.

Although foods advertised on television are frequently energy and sugar-dense, some argue that these products can safely be eaten as part of a varied and balanced diet. They believe that if advertisements are not misleading and dishonest advertisers should be free to promote their products (Barwise, 1997). Others however believe that the use of words such as "goodness" and "wholesome" that focus on a small part of a food that is of a poor nutritional quality is misleading (Dalmeny, 2003). Although many groups feel that foods advertised to children are seriously lacking in nutrients and can only be a bad influence, evidence has shown that advertising can be used to present the nutritional benefits of particular foods, or explain the role a particular food or nutrient plays (Stephenson, 2001). This was shown by the success of the Kellogs All Bran Campaign in 1984 that portrayed the importance of fibre in the diet. Recommendations made by the U.S. Surgeon General to increase the amount of fibre in the diet were relatively unheeded until the National Cancer Institute worked with the Kellogg Corporation to endorse All-Bran Cereal and the role of fibre in reducing the risk of some cancers (Calfee, 1998). The introduction of health-claim advertising and an increased awareness of health by consumers followed. This was supported by Woodward (1993) who believed the media were not "intrinsically antagonistic" to good nutrition and successful campaigns to promote healthy eating have been raised to the benefit of the community.

Another advantage put forward by Calfee (1998) is that any wild or original claims made in advertisements can be used to stimulate discussion about the topic that can provide more information. It is also a means to stimulate research to substantiate any claims made, and thus make discoveries of benefit to the public. Finally an advantage of advertising is to increase competition between manufacturers and thus keep prices down for the consumer (Calfee, 1998). In addition revenue from advertisements helps to make New Zealand made television programmes and a full ban on advertising would mean the end for these programmes (Eagle & de Bruin, 2000; Eagle, de Bruin & Bulmer, 2002).

2.10.2 Television Advertising and Children's Food Choices

In New Zealand approximately \$57.2 million was spent on advertising fast food in 2002 of which \$52.3 million was spent on television (Smith, 2003). Among the top ten advertisers was McDonalds at number seven who spent \$19.3 million on television advertising while KFC spent \$10.78 million and Pizza Restaurants \$5.07 million.

There have been several studies carried out examining the relationship between children's food choices and television advertising. These have been carried out by a number of disciplines including the advertising industry, the food industry and by social scientists. The results of these studies suggest a relationship between children viewing advertisements and preferring the foods viewed when given the choices between two foods. However these findings although suggesting a relationship, do not suggest causality.

To examine this relationship studies have been carried out in two main settings. The first is experimental settings and the second is qualitative studies including discussions and questionnaires carried out in the home or schools. The review of the literature in this area will begin by looking at results obtained from experimental studies and move on to look at qualitative studies.

2.10.2.1 Experimental Settings

Perhaps the most well-known and earliest study carried out examining the persuasive influence of television advertisements on children is by Galst and White (1976) carried out in the U.S. At this time advertisements made up one fifth of the television viewed by the children. The study (n=41) was carried out with children and their mothers and involved the child viewing a video of three popular children's programmes including commercials. At two-minute intervals the television would turn off and the child had to press a button to turn it on. The second part of the study involved the parent and child being accompanied to the supermarket and the number and type of requests the child made for an item (purchasing influence attempts) was recorded. A positive, significant relationship was found between the amount the child worked to keep the commercials on the monitor and the number of purchase influence attempts (P.I.A.'s) at the supermarket. The number of P.I.A.'s was also positively correlated with age. The number of hours the child normally spent watching television was estimated by the mother and the hours viewed was positively correlated with the number of P.I.A.'s made.

The results of the study did demonstrate a relationship between viewing advertisements and the child's consumer behaviour however there were several limitations to the study. Firstly the study was very small homogeneous group. Secondly the child requested foods at the supermarket such as fruit and vegetables that were not shown in the advertisements the child viewed and finally there was no control group that was not involved in the experimental viewing or did not watch television at all. As expected there was a significant relationship found between the advertisements and the children's consumer behaviour, but this did not demonstrate a fundamental causal relationship.

This type of study has been mirrored several times since. The first similar study was carried out in California with eighty upper middle class five or six year old children chosen for their "still developing eating habits" (Goldberg, Gorn & Gibson, 1978). In the first part of the study some children viewed a television program with nine advertisements for sugared snack and breakfast cereals, the second group viewed the advertisements above twice in the setting, the third group viewed programmes with public service announcements for wholesome snack and breakfast foods and the fourth group watched the public service announcements twice in the setting. The fifth was a control group not exposed to commercials. A significant difference was found between those who viewed the sugar food commercials and those who viewed the public service announcements. Those who viewed the sugar food commercials chose more sugared foods than those who were in the public service announcement group and the control group. The selections made were for sugar foods that were shown and *not shown* in the setting. Repeated exposure to the advertisement did not alter the child's preferences for the advertised food. Thus it was concluded that exposure to the advertisements for both types of foods shaped the children's food preferences. Once again this study was limited however in that the study was carried out on a homogenous group and most importantly because the foods were shown to the children immediately after their exposure to the advertisement. This would almost certainly affect their attitude towards the food merely by suggestion and exposure to the food, particularly as repeated exposure to the food did not increase their preference. Choices were made in the form of photographs which may not translate into actual foods eaten and the effect of the advertisement is hard to prove when they were choosing sweet foods not advertised. Exposure to the foods several days or weeks later may have produced different results.

A third study was carried out (n=46) in the U.S. with two to six year old children in an experimental setting where children viewed a video of a children's programme with (treatment group) or without (control group) advertisements included. They were then asked to choose between photographs of two similar products, one of which was advertised and one that wasn't (Borzekowski & Robinson, 2001). The children's parents were interviewed to determine their media exposure and demographics. The children interviewed came from households that were defined as "constant TV households" and often ate or drank while watching the television. Predictably it was found that the proportion of preferences for the advertised food was significantly higher in the treatment than the control group. This was not the case however, when choosing between two toys. Thus it was concluded that advertisements have an immediate effect on children's food preferences but may not immediately affect toy preferences (?). Once again the children were immediately exposed to the product and the context was not representative of the normal viewing environment of a child where advertisements are generally mediated through parents and other family members.

Similar types of studies have been carried out with children in experimental settings such as a summer camp (Gorn & Goldberg, 1982) and during the day at preschool (Galst, 1980). The children exposed to commercials for a food typically choose that food over the other demonstrating the immediate and significant influence of advertising and its role in informing the child and encouraging familiarity with the products. The experiments do not demonstrate causality or take into account the influence of other environmental and biological factors. It has been said that these isolation studies in fact artificially exaggerate the influence of advertising on an individual to measure its effects (Stratton & Bromley, 1999). In these settings a child may also feel pressure to watch the television more intently than they normally would (Sylvester et al, 1995). Young and Hetherington (1996) refer to the S-O-R paradigm in their review of the literature. These experimental studies presuppose a sequence of influence with a stimulus (S) affecting an organism (O) with a response being elicited (R). In this case the child (O) watching an advertisement (S) and making a food choice or developing an attitude or belief about that food (R). They also believe this type of study lacks context and is individualistic.

2.10.2.2 Qualitative Studies

The first type of qualitative study is one in which interviews are carried out examining the amount of television viewed by the subject and the types of foods consumed. Correlations are made between the types of food advertised and those eaten by the subjects.

A study carried out as part of a wider study in Australia (n=2082) looking at the factors affecting teenagers consumption of twenty-two different foods involved questions on the number of hours of commercial television watched per day by the subjects and the average frequency of consumption of the foods by themselves and perceived consumption of family and peers (Woodward, Cumming, Ball & Williams, 1992; Woodward, Cumming, Ball, Williams, Hornsby & Boon, 1997). The foods included samples from all the major food groups. It was found that the students watched on average three hours of television per day. There was a significant linear relationship ($P < 0.01$) between the number of hours viewed and frequency of consumption of eighteen of the twenty-two foods, even after adjustment for socio-demographic factors. A more frequent consumption of foods high in fat or sugar was associated with a greater level of television viewing. Analysis of the results used in another study found the frequency of consumption of the foods was also positively associated with their perceived family and friends' consumption of the foods. Although there were limitations in the study including a lack of specific detail about television viewing, only a limited number of foods included and the intake of friends and family being only the subjects' perception, the study does recognise that friends and family are confounding factors in the link between television and dietary choices.

A second study (n=44) was carried out with nine to eleven year olds in the United Kingdom in which the children were asked to recall television food advertisements they had seen recently, and correlations were made between the foods seen, frequency of consumption of these foods and frequency of requests for the purchase of these foods (Hitchings & Moynihan, 1998). The focus was on high fat and sugar products and predominantly snack foods. It was found that the strongest relationship between advertisements seen and foods subsequently consumed was for soft drinks, then crisps and savoury snacks. The results once

again suggest a relationship between the advertisement and the foods eaten, however these foods may have been consumed whether or not the child ever saw advertising for the product and there was no control group to demonstrate this. The study was very small and only focused on a small group of foods.

Several studies have focused on the role of television in consumer socialisation or the development of consumer behaviour. One such study (n=244) was carried out with a group of adolescents in the U.S. (Moschis & Moore, 1982) to examine the effects of television on the development of some consumer orientations in the short and long term. Unlike other studies the authors highlighted the need to differentiate between time spent viewing television and time spent viewing actual advertising. They therefore measured the frequency as well as motivations for watching advertisements. Amongst other things the study addressed the role of family and friends as mediators of television advertising, and found that the influence of television advertising was only statistically significant among families with a low level of communication about consumption of the products seen. The influence of friends in mediating the advertisements was relatively low.

The importance of focusing on *viewing* television versus *time spent with* the television has also been highlighted by Grube & Wallack (1994) in their study on television beer advertising and children intentions, beliefs and knowledge about alcohol. They emphasised that for there to be any influence, there has to be an awareness of the advertising not simply exposure to it. Similarly to those who already drink beer, people who already eat from the high saturated fat and high sugar groups frequently advertised may choose to eat these foods regardless of advertising and may actively seek out information about varieties of these foods and thus be more attentive to the advertisements.

Another study of interest was carried out as part of a three-year Ministry of Agriculture Food and Fisheries (U.K.) research project on the role of television in the food choices of young people (Dickinson & Leader, 1996; Dickinson, 2000; Dickinson & Leader, 1997). The study was carried out with 223 eleven to eighteen year olds through questionnaires and in-depth interviews and had two main areas of investigation. The first was a content analysis of the extent and nature of food-related content on British television as a whole – not just advertising (more about this is mentioned later) and the second part examined the way this content was perceived by the subjects. Specifically the research was concerned with television's message about food, the role television plays in the formation of youngster's food choices, how powerful the influence is and the role of television relative to other influences.

Dickinson and Leader acknowledged that "television does not have a direct causal effect on viewers", and that rather than taken in isolation the influence needs to be placed in context with the many other influences on food choices mentioned in the earlier sections. They found that family life was often scheduled around television and other media in that the major events of the day such as meals, going to work and going to bed were interposed around viewing television. They found no direct link between what the subjects saw on television and what they ate, however food events on television did serve several purposes as follows:

"The data suggest that television can be understood as offering a kind of repertoire of different ways of thinking about and talking about food, different meal types, eating patterns, foods, ideas and prescriptions about food use which work as reference points, helping to give shape to patterns of food consumption."

It was found that on occasion, eating events and advertising on television acted as a mediating force between family members by offering arguments or justifications for eating a particular food, or even ideas on what to eat. Overall Dickinson and Leader concluded that the resources television offers mentioned above will have different meaning and significance for different family types, social classes and individual family members depending on their role in the family, status, preferences and tastes. They also referred to 'active' as opposed to 'passive' viewing whereby the subjects were able to make their own interpretations of what they saw on television rather than just being totally influenced by everything they saw. This supports the findings of Matthews (1999) where children aged 10-12 are aware that advertising is there to sell a product and they use the advertisements to find out more about the product.

Two studies were carried out by Clancy-Hepburn, Hickey and Nevill (1974) in the U.S. as part of a research project on the media and different groups' food habits. The first study involved 50 children aged eight to thirteen and their mothers. The children were interviewed while at camp. The second study was carried out through a school with 55 children with the average age being 10.3 years. Questions included 'demographic variables' (age, education level of mother, family size etc), 'media variables' (amount of time children and mother spent viewing television, magazines and newspapers alone or together, response to nutritional claims in advertisements and mother's ability to recall child's favourite advertisement), 'food variables' (food purchased by child, snacking habits of child, shopping practices of mother and purchase influence attempts by child) and finally 'dependent variables' (attitude towards advertisements and preference for advertised food).

It was found that across both studies children watched television on average 4 and 3.2 hours per weekday and 2.8 hours per Saturday morning. Mothers watched on average 2.6 hours per day. Mother's who had a greater knowledge of the nutritional value of food watched less television and their children had a lower preference for advertised foods and consumed less of them. Children who watched more television made more purchase influencing attempts when grocery shopping. This would more likely be due to seeing all the products in the store and asking for them than the result of seeing advertisements before going out. Finally preference for certain foods did not correlate with the amount of exposure time to any advertising medium. This study once again did not find a direct link between advertising and food preferences. However despite being carried out with a small number of homogeneous subjects it demonstrated that advertising provided a source of information to the children and that the child's response and attitude towards advertisements was influenced by a number of variables particularly parent/child interaction around the television.

A qualitative study was carried out in New Zealand with groups of 11 to 12 and 14 to 15 year olds (Hammond, Wyllie & Casswell, 1997³). Subjects were presented with five food and drink advertisements screened at a time this age group were likely to be watching. The advertisements served several

purposes. Firstly they were a source of information to the young people. In some cases the advertisements would prompt them to try new products or remind them of products they had tried before. They would also consult peers about new products and whether they were worth trying. The subjects were aware of the techniques used to try to sell the product such as catchy descriptions, special effects, perceiving the characters in the advertisements as 'cool' and the characters having fun. They felt these characteristics of the advertisement grabbed their attention and helped them to remember the product and they also expressed a desire to try the product. This study demonstrated the success of the techniques used to appeal to children and adolescents in an attempt to draw them to purchase the product. Subjects viewed advertisements and consequently held positive attitudes towards the product and an immediate desire to try the product. However it did not demonstrate a clear relationship between viewing the advertisement and translating this into an actual food choice decision long-term. The study was carried out with a small number of subjects and a small population.

Lastly in the study carried out with adolescents and their families by Maskill et al (1996) the subjects were asked about the influence of advertising on their food choices. Some of the adolescents felt their parents were influenced by the television advertisements through themselves or other family members seeing the advertisement on television and requesting the parent buy the food. Some of the adults felt that advertising had a limited influence through increasing their awareness of products and providing nutrition information. Some of the children also felt that advertisements raised their awareness of products, and the authors felt that the familiarity and language with which the children referred to the advertisements, meant the advertisements were having more of an influence than the children thought.

2.10.2.3 Perceptions of Advertising

With a huge focus on the ill effects of advertising aimed at children it is interesting to examine parent and children's feelings about advertisements and their influence.

A study carried out in New Zealand with the intention of informing debate about restrictions to advertising was carried out with parents of 5-12 year old children to gauge their perspectives (among other things) on advertising aimed at children (de Bruin & Eagle, 2000). The majority of parents agreed with the statement that television encourages children to want products they do not need, and that there are too many advertisements shown during children's television. Surprisingly though, parents did not feel strongly that advertisements were an important cause of unhealthy eating habits, or that there was too much sugar, fat and additives in these advertisements. Parents appeared to support creation of an improved television environment via regulation undertaken by those not involved in the industry, as is currently the case. The authors concluded that there was no strong support for a ban on advertising to children. This study was conducted with a small, homogeneous sample of parents and provides an indication of some parents' attitudes to advertising.

2.10.2.4 Other

An investigation overseas using data collected from a study with 262 two to eleven year old children was carried out using a structural equation model (Bolton, 1983). The aims of the study were to identify whether television food advertising affected the children's diets in the long-term after controlling for other factors; what the impact of the parents' was on the children's diets, how this compared with the impact of advertising on their diets, and to identify the characteristics of the children associated with significant differences in their diet.

It was found that exposure to television food advertising had a small, significant long-term affect on the children's nutritional status. The most important influence on children's eating behaviour was the parents' behaviour. The child's age, exposure to advertisements and snacking frequency were all of secondary importance. Children's advertising exposure increased with parent's exposure and decreased when there was more parental supervision present. As the child was exposed to more advertising, snacking increased and nutrient efficiency decreased.

The measurement model was assessed and found to fit well enough for valuable information to be obtained from the data however some of the constructs were weak. Therefore the study was limited though useful for providing an insight into the relationship between advertising and children's diets.

2.10.3 Television and Obesity

A number of studies have been carried out looking at the relationship between television watching and children's physical activity, weight, body composition and the incidence of obesity.

Dietz & Gortmaker (1985) using data from two U.S. National Health Examination Surveys found that 6 to 11 year olds (n=6965) children who viewed more television experienced a greater level of obesity than those who watched less. For 12 to 17 year olds (n=6671) those who watched more television were significantly more obese. This relationship existed even when controlled for prior obesity and other environmental variables. These results were supported by another study carried out by the same authors in the U.S. that found a strong dose-response relationship between the number of hours of television viewed by children and the presence of overweight (Gortmaker, Must, Sobol, Peterson, Colditz & Dietz, 1996). The chance of being overweight was 4.6 times greater for those subjects who watched five or more hours of television per day than for those who watched zero to two hours per day. This study did not take into account other lifestyle factors such as the amount and type of food eaten and physical activity levels.

Klesges, Shelton and Klesges (1993) found in their study with 31 girls aged 8 to 12 years that resting metabolic rate was acutely lowered in both obese and non-obese subjects when watching television. This was a small homogeneous study carried out in an artificial setting that did not take into account the differing effects of watching more exciting or violent programmes however it did provide information on the levels of television viewing.

In an observational study (n=91) carried out with three and four year old children to examine television viewing, physical activity and body composition, it was found that children who watched more television were less likely to engage in physical activity (DuRant, Baranowski, Johnson & Thompson, 1994). Children who watched more television were not however likely to have greater body fat composition. These results are in concordance with the belief that children are watching television at the expense of other activities that require greater energy expenditure. However this study was once again small, and with young children who have smaller attention spans and it did not take into account seasonal differences that would affect activity levels. According to the authors at least 6.3 days of observation per child would have been needed to get reliable estimates of usual habits.

Another study (Robinson, Hammer, Killen, Kraemer, Wilson, Hayward & Taylor, 1993) carried out to examine the relationship between physical activity, body composition and television did not support the findings of DuRant et al (1994) above. The study (n=931) carried out with sixth and seventh grade girls found no significant association between television viewing and body mass index (BMI), triceps skin-fold thickness or level of physical activity. A statistically significant relationship was found between baseline physical activity levels and hours of television viewed although this was very weak. Another study relating body fatness, television viewing time and caloric intake found similar trends (Shannon, Peacock & Brown, 1991). The authors found a relationship in only the less affluent schools and hypothesised that television viewing was related to body fatness only when it was mediated through energy expenditure rather than energy intake.

Studies to date directly relating television viewing to physical activity, obesity and body fatness have produced mixed results and thus are quite inconclusive. It is clear that television viewing does have a potential role in overweight and obesity through taking up a good deal of children's time that can be better spent participating in physical activity, however it is one of many contributing environmental factors. It has been suggested that the amount of television viewed by a child may be useful as a screening marker in conjunction with other indicators for the aetiology of overweight, obesity or other related diseases such as hypercholesterolaemia (Wong, Hei, Qaquadah, Davidson, Bassin & Gold, 1992; Woodward, 1993).

2.11 Summary

Having reviewed the studies carried out with children and adolescents to determine the effect of television food advertising on children's food choices it is possible to conclude the following. It is unrealistic and inaccurate to believe that children view advertisements and as a direct cause of the advertisement turn off the television and go straight out and buy that food. Food advertisements may have an immediate and short-term positive effect on the young person's attitude towards a food and their desire to try it. The potential effect of advertising however, is mediated and negotiated through the context in which the advertisement is viewed, particularly the social and physical environment. The extent to which a child understands the intent of advertising will influence the way they interpret and are influenced by the advertisement. Thus it is impossible to demonstrate a clear causal effect of advertising

on young people's food choices. Reviewing the literature it appears that banning advertising would be short-sighted particularly as one study found that in areas where advertising has been restricted in the past, there has been an obvious shift of advertisements into other media forms that children are exposed to (Eagle et al, 2000). These conclusions are supported by those found in a systematic review carried out in the U.K. of the current research evidence on the effect of advertising on children's behaviour, knowledge and preferences (Hastings, Stead, McDermott, Forsyth, MacKintosh, Rayner, Godfrey, Caraher & Angus, 2003). The researchers concluded that although research suggests that food advertising influences children in several ways, this does not amount to proof.

Studies on children's food choice need to be carried out in a normal environment in which the complex interplay of influences on children's food intake is taken into account. In their research on children's television and radio use in New Zealand, Walters and Zwaga (2001) discuss the way children are sometimes considered "passive, invisible and irrational" rather than "a heterogeneous group with valid and meaningful life experiences that must be analysed within specific cultural contexts". In other words some credit should be given to the children who when given free reign, would most likely *not* go out and eat takeaways every night.

3.0 METHODOLOGY

3.1 Introduction

At the time this study commenced there were relatively few studies carried out examining the relationship between children's food choices and television. The majority were dated and aimed to measure the *direct* influence of television advertisements on what the children ate without taking into account any of the numerous other influences on their food choices, in particular the child's parents. There was very little in the New Zealand media about the influence of advertising and since commencing this study there has been an explosion of information and discourse on the topic.

3.2 Ethics Committee Application

Following completion of the questionnaires, the information letters, the consent and contact details forms, and an application for approval of the study was forwarded to the Massey University Albany Campus Human Ethics Committee in June 2002 (See Appendix A). The initial application was provisionally approved on the 28th of June subject to the following revisions being made:

- The committee disagreed with the researcher's contention that there were no cultural concerns with the project
- It was suggested that the researcher be accompanied on visits to private homes
- Extra care and sensitivity was to be exercised when feeding back information to the subjects
- The term 'parent' be changed to 'caregiver' on all forms used
- The last section of the child's information sheet was to be amended to read '...totally confidential within the family'
- To give subjects a specific date up to which they could withdraw
- All information be held for five years

The recommended amendments to wording were made. It was felt that it would not be necessary to have another person accompany the researcher on visits to the homes, however, a cell phone was carried at all times on visits and a list of addresses was given to the researcher's partner to ensure he knew which houses were to be visited each day. The protocol was formally approved on the 6th of August 2002.

3.3 Subjects

Forty children and their caregivers were chosen from two metropolitan Auckland Public Intermediate Schools both with a decile rating of ten. New Zealand schools are classified from decile one to ten with decile one being associated with a low socio-economic population and ten higher socio-economic. Subjects were aged between eleven and twelve and were in various year seven and eight classes. Initially

subjects were to be aged eight to ten years however following a review of the literature on children's comprehension of advertising and other studies on food and television it was decided to interview eleven and twelve year olds. Most importantly, children of this age are becoming more independent of their parents in their opinions and their spending power, therefore they making more food decisions and food purchases for themselves. The distribution of eleven and twelve year olds did not have to be even, however equal numbers of boys and girls were chosen.

Initial contact was made in October 2002 to the Principals of two Auckland schools. Both schools were unable to participate due to the approaching end of term. Two more schools were approached in early November 2002 and permission for conducting the study was then obtained from the Principals and the Schools' Boards of Trustees. The schools involved were Remuera and Ponsonby Intermediate. Further contact with the schools was made through the Health Co-ordinator at Ponsonby Intermediate and the Food Technology Teacher at Remuera Intermediate.

The initial design of the study was to interview children and parents at a high decile rating school and a low decile rating school and compare the results. In October 2002 at the time the high-decile schools were contacted the Principal of a decile two school in West Auckland was approached. Although the Principal was willing to participate he did have some reservations. The school had recently sent some surveys home with children on behalf of the Education Review Office (E.R.O.) and the return rate had been very poor. He felt that the amount of follow up work they had to do within the school for the E.R.O. survey and the still very poor response rate despite their hard work, would make it impossible for the researcher to recruit families for the present study. Certainly, if not impossible to find volunteers, the time commitment involved following up on replies would make it impossible to complete data collection within the allotted time frame. It was also pointed out by others who had carried out research at low-decile schools that even when appointments with families had been made the families were frequently not at home when the researcher visited at the arranged time. Although this is a generalisation and would not be the situation for all families, it was decided that given the time constraints of a thesis, subjects would be limited to those attending high-decile schools.

At this point a total of thirty packs at each school were sent home with the children. The packs included an information pamphlet for children (see Appendix B) and an information letter for parents (see Appendix C) inviting them to participate and briefly outlining the study. A consent form (see Appendix D) and contact details form (see Appendix E) was included and a stamped addressed envelope for them to return these to the researcher. It was stressed that inclusion in the study was voluntary and all subjects would remain confidential. After consent forms came back via the school, and the post, letters were sent out inviting participants to ask any questions they might have before the study commenced, and informing them that the researcher would contact them shortly (see Appendix F). Response was poor at this time due to many of the families being too busy to interview with end of year commitments, and many of the older students getting ready to leave school. Shortly after, interviews were set up and conducted throughout November and December while the subjects were still attending school before breaking up for the Summer Holidays.

The response rate at Ponsonby Intermediate was especially poor so the Food Technology Teacher at Remuera Intermediate was contacted again at the beginning of the first term in 2003 and a further thirty packs were sent home with students. It was thought that with children starting the term they would be more enthusiastic about participating, and most of the year seven students at this time were eleven. Eight participants did not attend either of the schools approached but were neighbours, family and friends of the initial interviewees that attended high decile Auckland schools. Overall ninety packs were given out to children through the schools with thirty-four agreeing to participate, thus the response rate was 38%.

The age/gender/school stratification is shown below in Table 3.1

Table 3.3 Children's age, gender and school

	Ponsonby Intermediate	Remuera Intermediate	Other Schools	Total
Girls aged 11	0	12	2	14
Boys aged 11	1	14	4	19
Girls aged 12	2	3	1	6
Boys aged 12	0	0	1	1
				40

3.4 Questionnaire Development

Once objectives for the study were established, the first part of the questionnaire development involved allocating questions to each objective and trying to keep the number of questions overall to less than forty. After consulting the literature on conducting interviews and developing questionnaires there were several factors that shaped the questionnaire design. Firstly, both open-ended questions and multi-choice questions were to be included as the caregiver's opinions and feelings were being sought as well as quantitative data. The objectives involved examining parent and children's attitudes to food and television and it was important at this point to word the questions on attitudes so as not to be leading. Face-to-face interviews rather than answering the questions by phone or post were decided on as the best method to use as the children's body measurements were to be taken and for accuracy and consistency this needed to be done by the researcher. The language used needed to be clear, friendly and clearly comprehensible for subjects. The advantage of face-to-face interviews was if there was confusion over questions the researcher could be consulted at the time to resolve it. So as not to impose too much on the volunteers and given their young age, the whole interview including body measurements was to be kept to a maximum of one hour so the questionnaires could not be too long.

With the objectives of the study in mind the researcher developed a set of questions to be used in a discussion group that was set up with volunteers at an Auckland Primary School. The aim of the discussion was to determine the level of comprehension the children had and to find out the types of foods the children were eating and favoured to ensure these were included in the final questionnaire.

The following topics were discussed:

- Favourite foods and snacks
- How much television the children were watching and when
- What the children thought of advertisements and why we have them
- The number of servings of each food group they should eat and serving sizes.

The discussion was carried out with six children in the school library in an informal manner and the researcher recorded the discussion. The children involved in the discussion group were aged between eight and ten years. Food advertisements aimed at children were viewed at this time and visits to supermarket websites to ensure the researcher was aware of all the different types of snacks available for children.

Following the discussion the two questionnaires (one for care-givers, one for children) were then prepared, revised several times and pre-tested. After deciding on the objectives of the study and reviewing the literature on the types of questions included in other similar studies it was decided to create two questionnaires one for the children and one for the parents. The children would fill in their questionnaire independently of the parents to eliminate any bias created by the child's desire to provide answers that their parent would approve of, rather than honest answers. Revision involved removing unnecessary questions that were interesting but were not useful in meeting the objectives, and ensuring there was no repetition throughout each questionnaire. Some questions were too broad and these were made more precise. The questionnaires were divided up into sections that met the objectives. Care was taken with the order of questions and separating sections, to prevent leading the subjects to make the link between the food questions, television and advertising. All the food questions were kept together as were all the television questions.

The questionnaires were divided into the following sections:

Parent Questionnaire

Food and your child
Television and your child
Advertising, how you feel
Food and health
Shopping
About you

Child Questionnaire

Food and you
Food and health
Television and you
Television advertisements – what you think
About you

Pre-testing was carried out with seven families known to the researcher to ensure the questions were:

- clear of ambiguity and confusing terms
- as short as possible
- in a logical sequence
- economical in response time required

- in appropriate language for the children.

The parents and children provided feedback on the length and clarity of the questionnaire. Following this the number and content of questions was kept the same, however some wording was changed to make the questions more clear. Dr Carol Wham reviewed the final drafts of the questionnaires and once the demographics section was moved to the end of the questionnaires they were both approved.

The parent's questionnaire (see Appendix G) involved a total of 32 questions including 16 multiple-choice and 16 open-ended questions. The children's questionnaire (see Appendix H) involved 27 questions including 24 multiple choice and 3 other questions.

3.5 Anthropometric Measurements

One of the objectives of the study was to examine the relationship between the child's body-mass-index for age in relation to television viewing and physical activity, thus in the second half of the interview the child's height and weight were measured. Both height and weight measurements were carried out on a hard, flat surface such as kitchen tiles. Height was measured according to the guidelines laid out by Gibson (1990). The child removed his/her shoes, standing straight against the wall with knees straight, and heels, buttocks and shoulder blades in contact with the wall. Arms hung loosely at the child's side with palms facing inwards and gentle, upward pressure was applied to the mastoid (bone behind the ears). Subjects were asked to stand straight and tall and the right angle headboard was lowered until it touched the child's crown. The child was asked to step away and with the aid of the parent a non-stretchable tape measure was used to measure height to the nearest millimetre. This was done three times and an average obtained. Where the height fell between two values the lower value was recorded.

To measure the child's weight calibrated electric scales were used. The scales were placed on a flat, hard surface and the child was asked to remove his/her shoes and step onto the scales. The measurement in kilograms was taken three times and an average obtained.

From these measurements the child's body mass index for age has been calculated.

3.6 Data Collection

As mentioned the interviews were undertaken at two different periods. The first group at the end of 2002 and the second group in the first school term of 2003. The interviews involved one visit to each household during which both parts of the interviews were carried out as follows:

- Both child and caregiver filled out their respective questionnaires simultaneously and without consulting each other.

- After the child completed their questionnaire they were weighed three times and their height was measured three times.
- An opportunity was given at the end of the interview to discuss how each member of the family had answered their questions and for the researcher to answer any questions.

The questionnaires were coded and responses categorised by the researcher.

3.7 Bias

It was felt bias might be introduced if the children and caregivers were interviewed together, as the children through not wanting to disappoint their caregivers, or seeking the approval of the researcher may not answer all questions honestly. This was hopefully overcome by the answers being written rather than spoken, and at the start of the questionnaire there were instructions to answer questions honestly. The researcher reiterated this verbally before the subjects commenced.

The children's questionnaire involved the section 'Food and You' in which the child was asked to indicate how many helpings of foods from each of several food and drinks they had each day. The aim of the food frequency questionnaire was to assess the frequency with which certain food groups were consumed over a period of time (Gibson, 1990). It was used in this situation as it provides less pressure on the children than a 24 hour recall, makes questionnaires less time consuming, and to categorise the subjects into groups based on their intake of certain food groups. These results were used as a guide of the child's nutritional status. The limitation of the food frequency questionnaire was that the child may haphazardly indicate how many times they eat the food rather than thinking about it. There was also a possibility that the child may indicate how often they would *like* to eat that food or how many times they *feel they should* eat from that food group, rather than the *actual* value. To limit this, the children were counselled to think of a typical day when answering, to take their time answering and to try to answer honestly.

Another bias was created with the poor response rate. It was impossible to determine the characteristics of those who declined to participate versus those who agreed. The people who participated may have been more enthusiastic about food and or television or may have been lacking in education about food and saw this as an opportunity to find out more. Those who refused to participate may have had poor diets and did not want this highlighted, or perhaps they knew enough about food already. Perhaps a more obvious difference between 'yes' and 'no' was that those who declined may not have watched a lot of television. Without asking those who declined it is only possible to speculate, however the different characteristics create a bias. Finally, the sample being small and from a relatively homogenous population it was not representative of the Auckland population at large. However, the results will contribute to the debate over the advertising of food to children and where advertising fits into children's food choices.

3.8 Methods of Analysis

All open-ended questions were categorised and summarised. Discrete variables were entered into an Excel spreadsheet and analysed using Microsoft Excel Mac 2001 and Minitab standard statistical package version 12. The child and adults questionnaires were analysed separately. All data once entered into the spreadsheet, was checked by another party for any 'outliers' to ensure transfer of results from questionnaires to the spreadsheet was accurate.

3.9 Subject Feedback

3.9.1 Subjects

Following final analysis of results a letter was sent to all participants thanking them again for their participation (see Appendix I). Accompanying this letter was a pamphlet entitled 'Food Fantastic – Eating for Healthy Children Aged 2-12 Years' that provides guidelines on what children should be eating each day. The child's body measurements were included with a guideline on what percentile the child fell into (see Appendix J). A brief report was included outlining some results the families might find interesting from the television advertising content analysis, and the questionnaires (see Appendix K). Finally all children who participated in the study were presented with a Certificate of Participation (see Appendix L).

3.9.2 Schools

Each school received a Certificate of Participation (see Appendix M) for the classroom, and earlier in the study Remuera Intermediate received a summary of the frequency and content of advertisements, to be used for education purposes during their Food Technology classes.

4.0 RESULTS

4.1 Description of the Sample

The sample was made up of forty children and one of their parents/caregivers. Tables 4.1a and 4.1b show the main demographic characteristics of the sample broken into boys, girls and the overall sample.

Table 4.1a Children's Age, Sex and Year in School and Parent/Caregiver's age (n=40)

	Girls	Boys	Total
Children			
Eleven	12	17	29
Twelve	8	3	11
Year Seven	12	16	28
Year Eight	8	4	12
Parent/Caregivers			
30 & under	-	-	0
31-39	9	3	12
40-49	10	5	15
50+	1	12	13

Table 4.1b Child & Caregiver's Ethnicity

	Girls	Boys	Overall	Parents of girls	Parents of boys	Overall
NZ European/Pakeha	16	10	65%	17	10	67.5%
NZ Maori	1	-	2.5%	-	1	2.5%
Chinese	-	1	2.5%	-	3	7.5%
Indian	-	3	7.5%	-	1	2.5%
Other	3	6	22.5%	3	5	20%

4.1.1 People living in the home

Tables 4.1c and 4.1d show the number of people living in the home and the makeup of each household.

Table 4.1c Number of people living in home

	Girls	Boys	Total	Percentage
Two	1	-	1	2.5
Three	2	3	5	12.5
Four	8	6	14	35
Five	9	7	16	40
Six	-	2	2	5
Seven	-	2	2	5

Table 4.1d People living in the home

	Girls		Boys		Total	
Two parents & one child	-	-	3	15%	3	7.5%
Two parents/caregivers & two or more children	16	80%	14	70%	30	75%
One parent and two or more children	1	5%	1	5%	2	5%
One parent & one child	1	5%	-	-	1	2.5%
One parent, two children, two students	-	-	1	5%	1	2.5%
One parent, one child, one student	1	5%	-	-	1	2.5%
Two parent, one child and one extended family	-	-	1	5%	1	2.5%
Two parents, two children, one extended family	1	5%	-	-	1	2.5%

4.1.2 Employment status and education level of parent/caregivers

Tables 4.1e and 4.1f show the employment status of parents/caregivers and their level of education.

Table 4.1e Employment status of parents/caregivers

	Boys' Parents		Girls' Parents		Total	
		%		%		%
One Parent Employed Full Time One At Home	4	20%	3	15%	7	17.5%
Both Parents Employed Full Time	6	30%	3	15%	9	22.5%
Single Parent Family Employed Full Time	1	5%	1	5%	2	5%
One Parent Employed Full Time with Other Part Time	7	35%	11	55%	18	45%
Single Parent Family Employed Part Time	1	5%	2	10%	3	7.5%
Both Parents employed Part Time	1	5%	-	-	1	2.5%
Total	20	100	20	100	20	100

Table 4.1f Parents/caregiver's level of education

	Parents of Boys		Parents of Girls		Total	
		%		%		%
Level of education reached						
Form 5	3	15%	1	5%	4	10%
Form 6	-	-	1	5%	1	2.5%
Form 7	1	5%	1	5%	2	5%
Tertiary	16	80%	17	85%	33	82.5%
Highest Qualification						
Certificate	5	25%	3	15%	8	20%
Diploma	2	10%	7	35%	9	22.5%
Degree	12	60%	8	40%	20	50%
Masterate	-	-	2	10%	2	25%
Doctorate	1	5%	-	-	1	2.5%

The majority of parents interviewed were mothers (82.5%) with two fathers of girls and five fathers of boys participating. The children were mostly (72.5%) aged eleven and the majority (70%) were in year eleven. The children came from various ethnic backgrounds with most European/Pakeha (65%) followed by 'Other' (22.5%) and Indian (7.5%). There were no parents aged 30 and under with most falling into the 40-49 year category followed by the 31-39 category. As with the children the majority were European/ Pakeha (67.5%) followed by 'Other' (20%). In most (40%) households there were five people living there followed by four (35%) however the range was five and the median 4.5 people. These

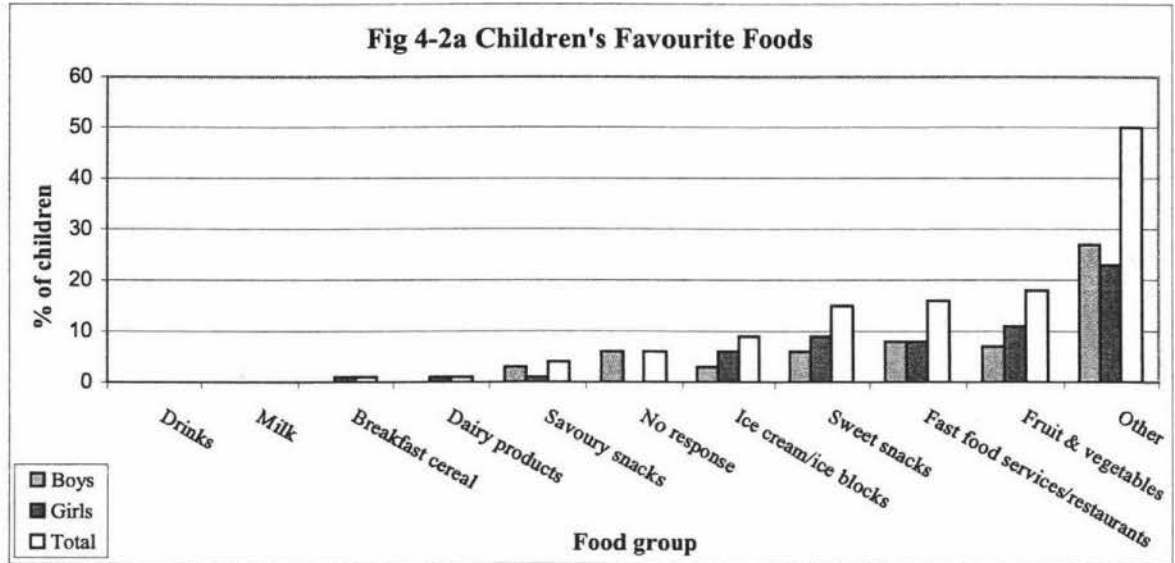
household members included parent/caregivers, children, extended family and students. Eighty percent of the households were made up of two parents and two or more children with 12.5% of the households made up of one-parent families.

4.2 Children’s eating habits

The children and their parents were asked a range of questions about their favourite foods, the snacks they ate most often and the number of servings from each food group they ate per day.

4.2.1 Favourite Foods

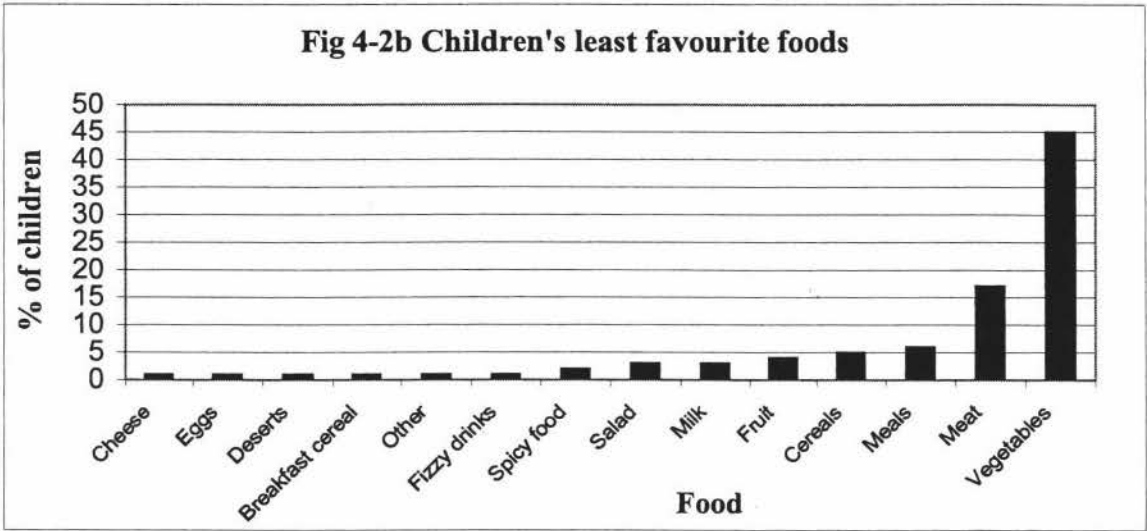
Fig 4-2a shows the children’s three favourite foods as they answered. The foods have been grouped according to the categories used in part one. Both parents and children were asked about the child’s three favourite foods.



The most favourite category for both boys and girls was ‘other’. This included meat/chicken/fish, favourite meals and bread, pasta, rice. The largest part of this category was made up of meals for example spaghetti bolognaise, secondly was pasta, rice and noodles. Pasta, noodles and rice were mentioned frequently just as, not as part of a meal. Meat, chicken or fish were mentioned more frequently by boys than girls as being a favourite, however the other food groups were similar. The second favourite food category was fruit and vegetables. The children answered this question by naming specific fruit or vegetables rather than just the category. The number of boys and girls who answered fruit was equal however twice as many girls as boys answered vegetables. The third favourite category was ‘fast food services and restaurants’ followed closely ‘sweet snacks’. Once again equal numbers of boys and girls answered fast foods as one of their three favourite foods and this was mostly pizza, Subway and McDonalds.

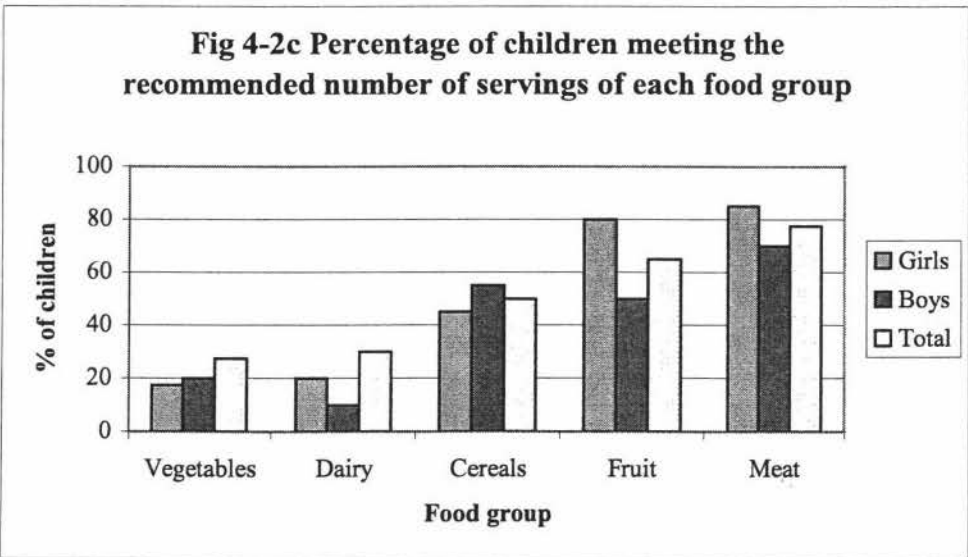
4.2.2 Least favourite foods

Parents were asked what they thought their child's three least favourite foods were. The children were not asked about their least favourite foods.



4.2.3 Number of servings of each food group

As an indication of the quality of their overall eating habits children were asked to indicate the number of servings they have each day of 'meat/chicken/vegetables', 'fruit', 'vegetables', breakfast cereal, 'bread, toast, pita', 'milk, milk products' and 'noodles, pasta, rice'. Fig 4-2c shows the proportion of children meeting the recommended number of servings per day for each food group.



- *Fruit*

Of those who eat fruit 30% more girls are getting the recommended 2+ servings per day. Four boys said they eat less than one serving however all girls ate at least one serving per day.

- *Vegetables*

For vegetables only 17.5% of girls and 20% of boys are eating the recommended 3+ servings per day. The majority of children (65%) are eating one or two helpings of vegetables per day. No child said they did not eat vegetables at all.

- *Cereals*

Cereals include breakfast cereal, bread/rolls and pasta/rice groups combined. Forty five percent of girls and 55% of boys are eating the recommended 5+ servings a day of cereals. The majority of girls (50%) are consuming between three and five servings a day and 30% of boys are consuming this amount. Only one child recorded consuming less than two servings of cereals per day.

- *Milk and Milk Products*

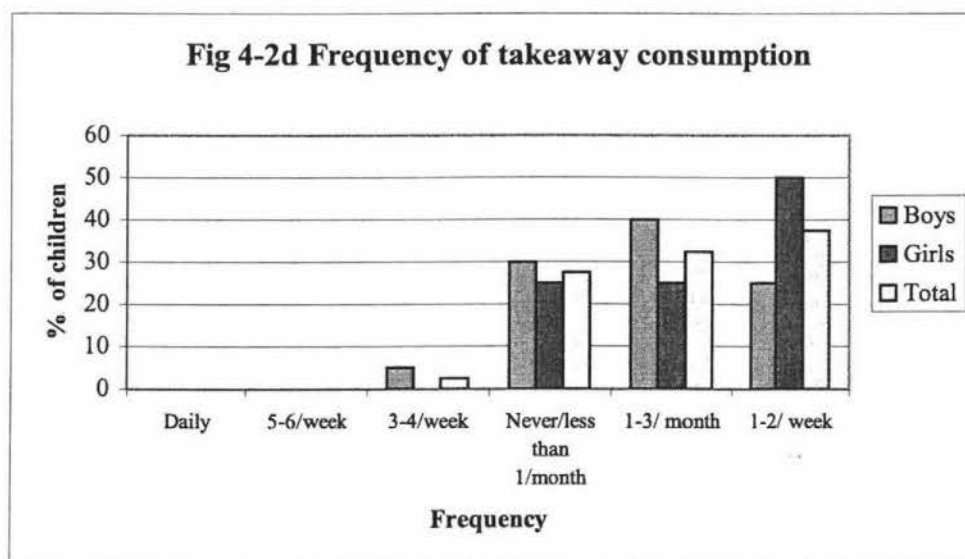
For milk and milk products only 20% of girls and 10% of boys are consuming at least two servings of milk or milk products per day. Five boys and four girls said they had less than one serving per day with the majority of children (47.5%) having only one serving per day which was mostly milk on breakfast cereal.

- *Meat/chicken/fish*

85% of girls and 70% of boys consumed at least one serving of meat/chicken/fish per day. This is a total of 72.5% of children overall meeting their daily requirements. 22.5% of the children consumed less than one helping per day with no children consuming no meat/chicken/fish at all.

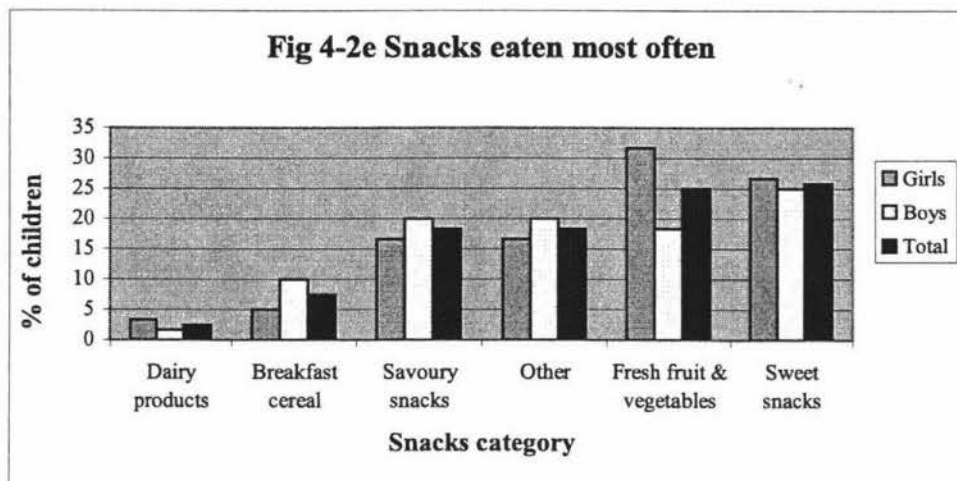
4.2.4 Takeaways

Fig 4-2d shows the frequency with which the boys and girls in the study ate takeaways. Most of the girls (40%) ate takeaways one to three times a month or less. Most boys ate takeaways one to two times/month.



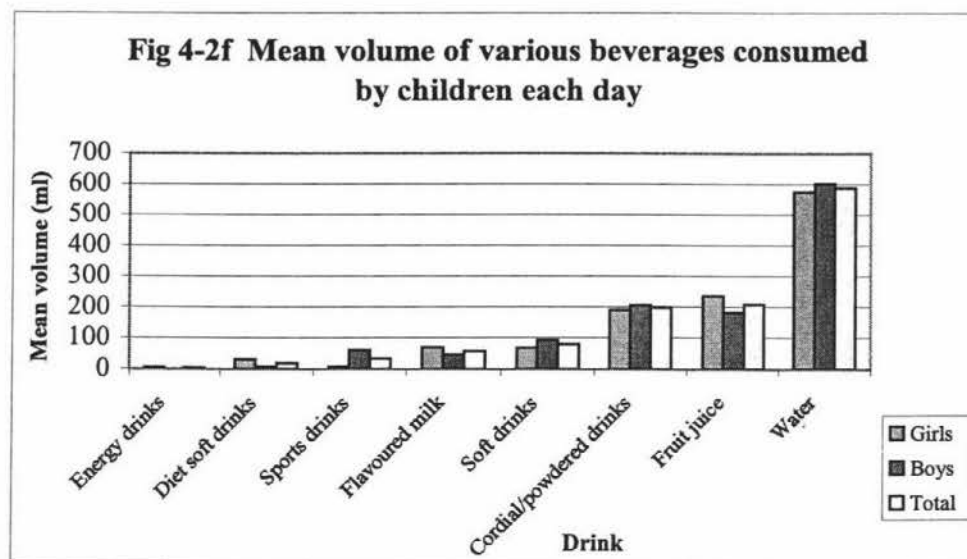
4.2.5 Snacks

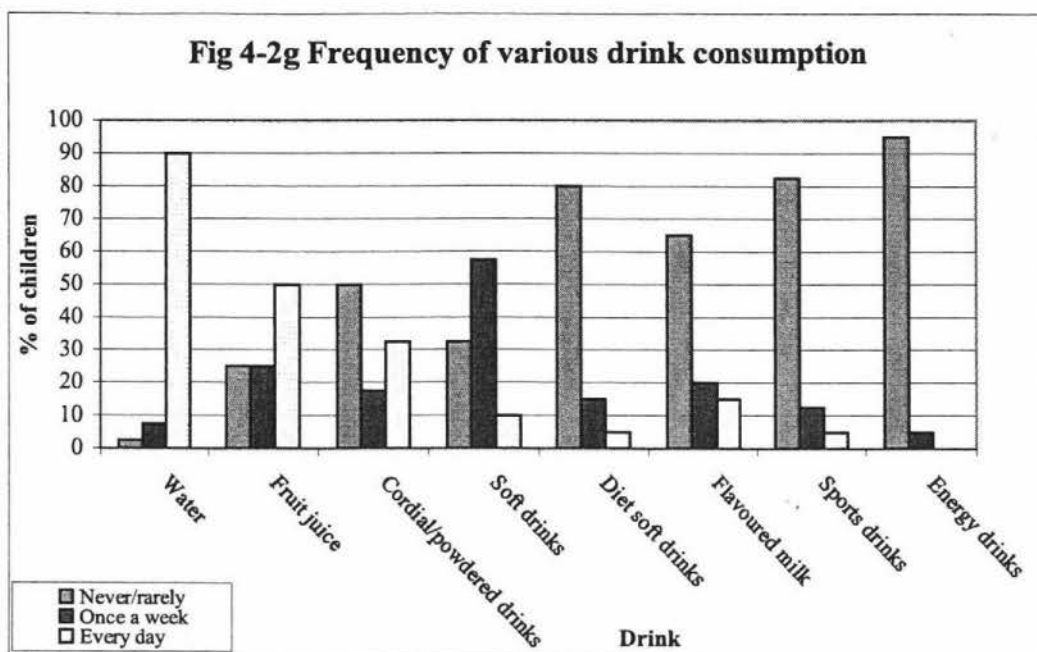
Fig 4-2e shows the snacks the children often ate. Most (26%) children ate sweet snacks. This included museli and fruit bars, biscuits, cakes and slices. Fresh fruit and vegetables (25%) closely followed this category. The third most common category was 'other' that included most commonly sandwiches, nuts and seeds, sausage in bread, popcorn and toast. The most common snack that girls were eating was fresh fruit and vegetables (32%) followed by sweet snacks (27%). Most (25%) of the boys were consuming sweet snacks followed by savoury snacks and 'other'.



4.2.6 Beverages

The children were asked to indicate the typical volume of each beverage they consumed and the frequency of consumption. The results are shown in Figs 4-2f and 4-2g.



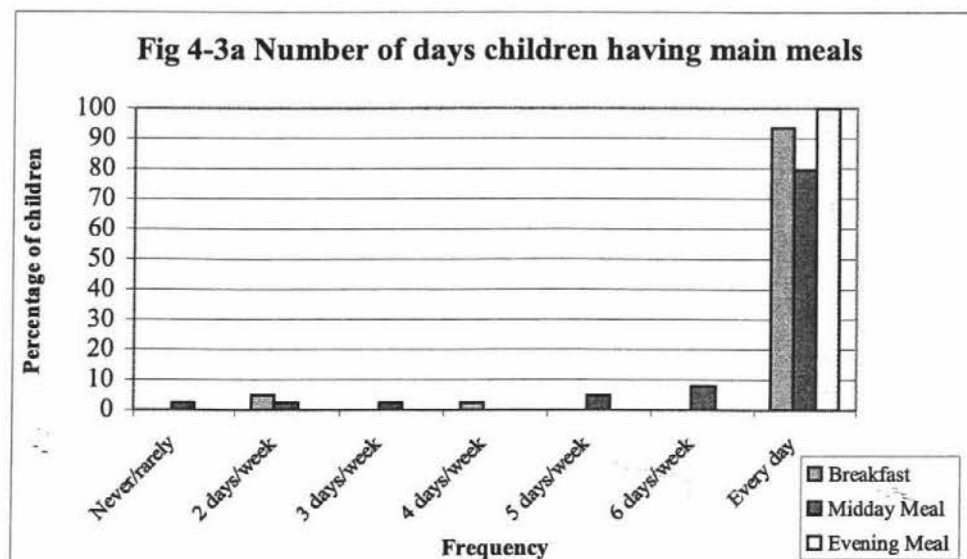


Children consumed water in the greatest quantity and most were having this every day. The mean volume consumed was 588ml overall but some children were consuming up to 1.5L per day. Fruit juice follows this (average 209ml per day) and then cordial/powdered drinks such as 'Refresh'.

4.3 Children's eating habits at home

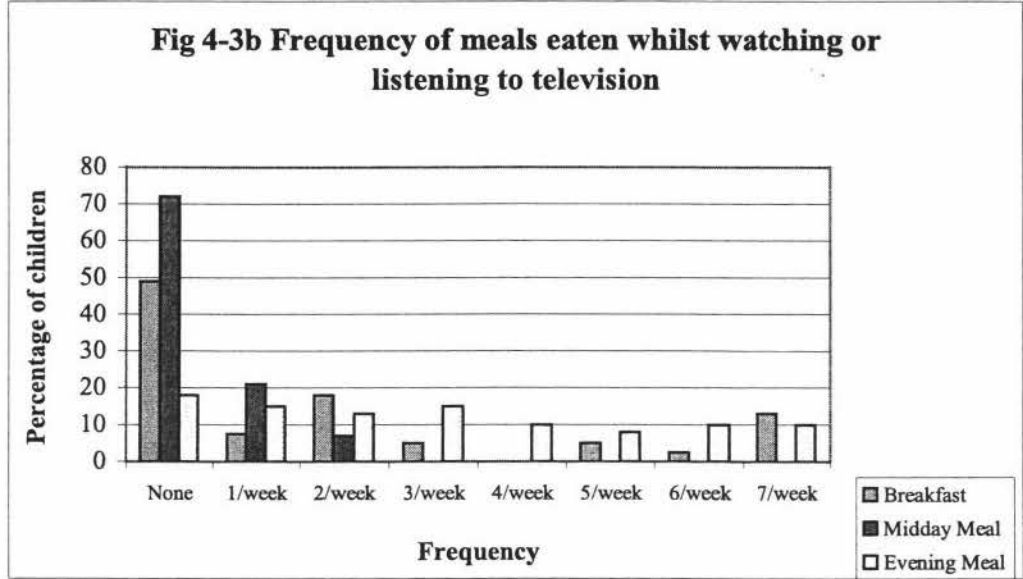
4.3.1 Number of days children are eating breakfast, lunch and dinner

Fig 4-3a shows the proportion of children who were consuming breakfast, lunch and dinner and how often. Over 90% of the children ate breakfast and lunch every day and 100% had an evening meal every night. There were one or two exceptional answers with some children having breakfast one, two or four days a week. The subjects were not questioned on the reasons for missing meals. There were no real differences between boys and girls for any of the meals.



4.3.2 Numbers of meals children have whilst watching or listening to television

Fig 4-3b shows meals eaten whilst watching or listening to the television. Forty nine percent of the children did not eat their breakfast in front of the television whilst 13% ate in front of the television every day. Overall the frequency with which children were eating their evening meal in front of the television varied. Most commonly 18% did not ever eat their evening meal in front of the television however there was a fairly even distribution across the once a week to seven days a week distribution, with 10% watching television whilst they ate their evening meal every night.



4.3.3 Number of people who usually ate with child

Table 4.3 shows the number of people who usually ate with the child at breakfast and the evening meal. Twenty percent of the children ate breakfast on their own whilst 80% ate with one or more other people including siblings and adults. None of the children were eating dinner alone.

Table 4.3 Number of people who usually eat with child at breakfast and the evening meal

No. of other people	Breakfast		Dinner	
	Number	Percentage	Number	Percentage
0	8	20	0	-
1	12	30	2	5
2	7	17.5	6	15
3	7	17.5	15	37.5
4	6	15	12	30
5	0	-	3	7.5
6	0	-	2	5
Total	40	100	40	100

4.4 Influences on the children's food choices

4.4.1 Importance of a number of factors when deciding what to eat

Table 4.4a shows factors the importance of a number of factors when deciding what to eat. The first part of this question involves the factors that children find very important when deciding what to eat. The two factors that most children found very important were 'it tastes nice' (55%) and 'it fills me up' (55%). Both boys and girls found these factors very important. This was closely followed by 'it makes me feel good' of which 55% of the children found very important. Twice as many boys as girls felt it was very important that 'my parents/caregivers like me to eat it' and this was chosen by 30% of children overall.

Factors that were a little bit important were mostly 'its good for me' (65%) followed by 'it looks and smells nice' (55%) and then 'my parents/caregivers like me to eat it' (52.5%). These were chosen fairly equally between boys and girls. Finally there were the factors that children do not find important when deciding what to eat. The most children (72.5% overall) found 'I've seen it advertised on t.v.' as being of no importance to them. Once again this was fairly equal between boys and girls. The most notable difference between boys and girls was in considering if their friends like to eat the food. Ninety percent of girls compared to 25% of the boys did not think it was important with the rest of the boys believing it was either a little bit or was very important. Boys and girls agreed that a food being 'quick and easy' was not important at 42.5% overall.

Table 4.4a Importance of a number of factors when deciding what to eat

	I'm not sure		Not important		A little bit important		Very important	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
It tastes nice	-	-	-	-	12	6	8	14
It looks and smells nice	-	-	5	3	11	11	4	6
My friends like to eat it	-	-	5	18	11	2	4	-
Its good for me	-	-	2	-	11	15	7	5
My parents/ caregivers like me to eat it	-	1	1	5	11	10	8	4
I've seen it advertised on t.v.	2	1	15	14	2	5	1	-
Its quick and easy	1	-	9	8	7	9	3	3
It fills me up	-	-	2	1	9	6	9	13
It makes me feel good	2	1	4	4	5	4	9	11

4.4.2 Level of influence

Parents were asked to rate the level of influence they felt certain groups had over what their child ate. The options given ranged from no influence to a lot of influence and included the option of 'I'm not sure'. Results are shown in Table 4.4b below.

Table 4.4b Level of influence of a number of people

	A lot of influence %		Some influence %		No influence %		I'm not sure %	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Parent/Caregiver	47	65	53	30	0	5	0	0
Siblings	6	0	69	53	25	42	0	5
Friends	5	10	42	75	16	5	37	10
Other household members	11	5	72	60	17	30	0	5
Teachers	5	0	16	40	37	25	42	35
Magazines/newspapers	5	0	47	35	32	35	16	30

- *Parents/caregivers*

All the boys' parents felt they had some or even a lot of influence (47%) over what their child ate. Parents of girls seemed to feel they had more influence than those of boys. One girls' parent felt she had no influence at all over what her child ate.

- *Siblings*

Where siblings were present in the household 25% of boys and 42% of girls' parents felt they had no influence on their child's food choices. Seventy five percent of boys' and 53% of girls' parents felt their siblings had some if not a lot of influence. It was not specified if the siblings were older or younger than the subjects.

- *Friends*

For girls 85% of their parents felt that their friends had some if not a lot of influence over their food choices. Boys were much lower at 47%. Three times as many parents of boys than girls felt their friends had no influence on their food choices.

- *Other household members*

These included other parents, grandparents, uncles and students. Thirty percent of the girls' and 17% of the boys' parents felt that other household members had no influence. The greatest difference between boys and girls was seen here where 83% of parents of boys felt that other household members had either some or a lot of influence on their food choices versus 65% of girls.

- *Teachers*

Only 40% of boys' parents and 21% of girls' parents felt that their teacher had an influence over what their child liked to eat.

- *Magazines/Newspapers*

Forty seven percent of boys' parents and 65% of girls' either were not sure or felt that magazines had no influence on their child's food choices.

4.5 Television viewing habits

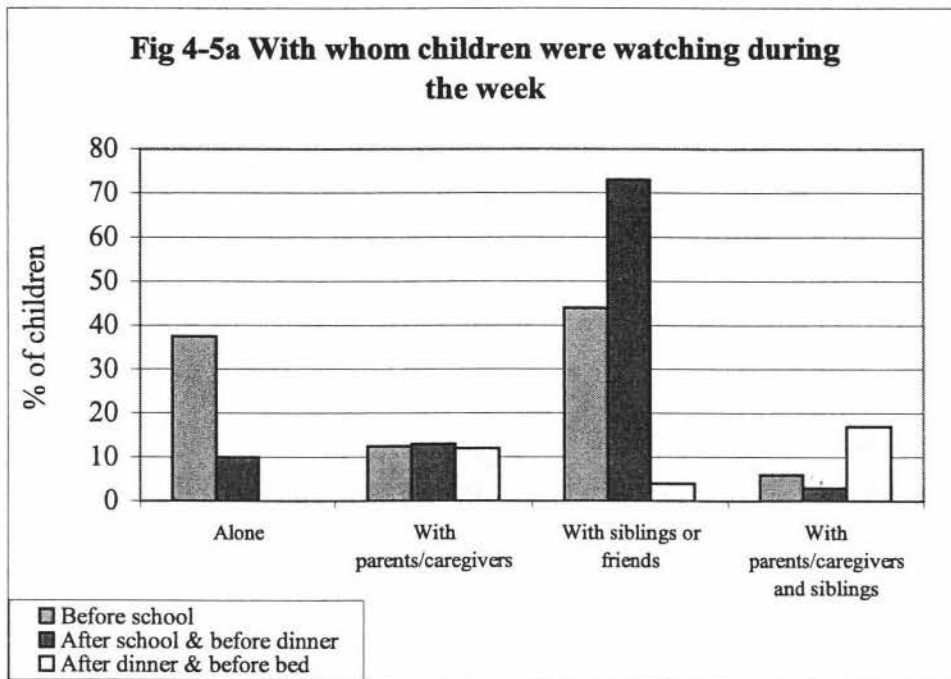
4.5.1 Television viewing weekday

Table 4.5a and Figure 4-5a show the amount of television the children were viewing on a typical school day and with whom they were viewing.

Table 4.5a Number of minutes of television viewed by the children and when viewed on a typical school day

No. of mins	Before School	Percentage of children	After school & before dinner	Percentage of children	After dinner & before bed	Percentage of children
0-15	30	75	10	25	7	17.5
16-30	7	17.5	5	12.5	7	17.5
31-45	0	-	0	-	0	-
46-60	2	5	14	35	14	35
61-75	0	-	1	2.5	0	-
76-90	0	-	9	22.5	5	12.5
91-105	0	-	0	-	0	-
106-120	1	2.5	1	2.5	7	17.5
	40	100	40	100	40	100

Fig 4-5a below shows the mean viewing time overall was 12.9 minutes before school, 52.5 minutes after school and before dinner and 52.5 minutes after dinner and before bed. The mean viewing time for girls on a typical weekday was 1.9 hours with a median of 2 hours (standard deviation 1.5). The range for girls was 5 hours with some children not viewing at all and another viewing for 5 hours. This involved 2 hours before school, 2 hours after school and 1 hour after dinner and before bed! For boys during the week the mean viewing time on an average weekday is 1.9 hours with a median of 2.1 hours (standard deviation 1.2). During the week after school, children were typically viewing with siblings or parents or alone and after dinner with parents and siblings.



4.5.2 Television viewing weekend

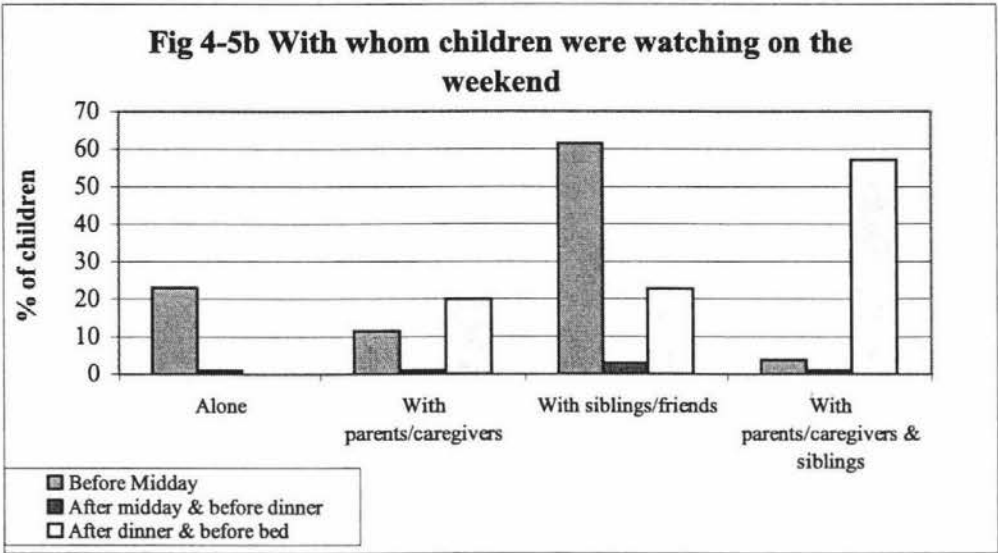
Table 4.5b and Figure 4-5b show the amount of television the children were viewing on a typical weekend day and with whom they were viewing.

Table 4.5b Number of minutes of television viewed by the children and when viewed on a typical weekend day

No. of mins	Before School	Percentage of children	After school & before dinner	Percentage of children	After dinner & before bed	Percentage of children
0	12	30	34	85	5	12.5
1 to 30	1	2.5	1	2.5	1	2.5
31-60	8	20	3	7.5	3	7.5
61-90	7	17.5	0	0	5	12.5
91-120	8	20	2	5	7	17.5
121-150	0	0	0	0	4	10
151-180	1	2.5	0	0	11	27.5
181-210	2	5	0	0	0	0
211-240	1	2.5	0	0	2	5
241-270	0	0	0	0	0	0
271-300	0	0	0	0	1	2.5
301-330	0	0	0	0	0	0
331-360	0	0	0	0	1	2.5
	40	100	40	100	40	100

Figure 4-5b below shows the mean viewing time on the weekend for girls was 3.4 hours, mode 1 hour, median 3 hours and standard deviation 2.5. The range for girls' weekend viewing was 8 hours. This involved viewing for 4 hours before lunch, and 4 hours after dinner! For boys the mean viewing time on the weekend was 3.7 hours, mode 4 hours, median 3.7 hours and standard deviation 2.0. The range for boys was 6.25 hours, which involved one boy watching for 2.75 hours in the morning, 1 hour after lunch

and 2.5 hours in the evening. On the weekend children were typically viewing with siblings and/or friends or alone before lunch, and with the whole family in the evening.



4.6 Physical activity

Fig 4-6 below shows the number of hours children were participating in formal and informal combined physical activity each week compared to television viewing. The results supplied for weekdays have been multiplied by five to obtain a total and one day has been used for the weekend. This was due to each weekend being so different and children routinely watching television on Saturdays but not necessarily Sundays. These results do not include any physical activity the child may be partaking in during school hours.

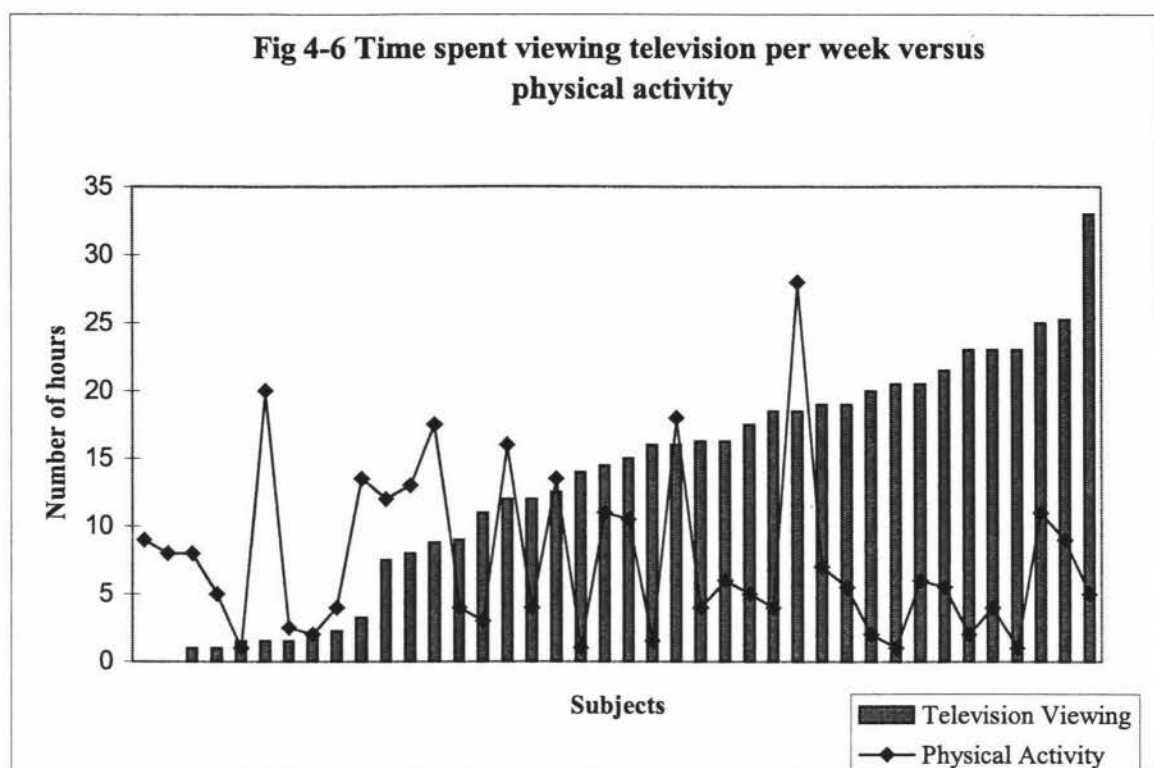


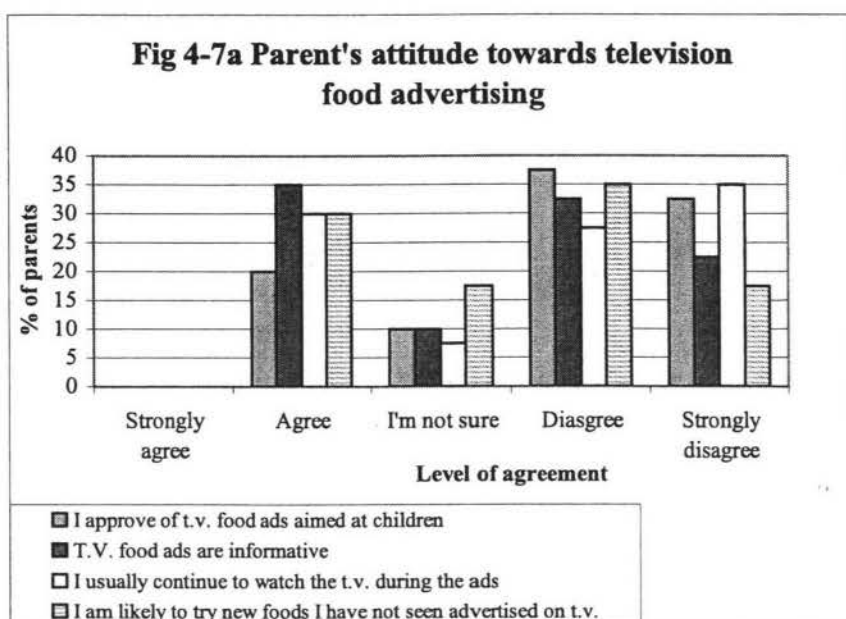
Table 4.6 Total Physical Activity Per Week Both Formal & Informal (hours)

	Girls	Boys
Sum	125	179
Minimum	1	1
Maximum	20	28
Range	19	27
Mean	6.25	8.95
Median	5	7
Mode	5	4
Standard deviation	4.95108	6.98476
	n=20	n=20

4.7 Television advertising

4.7.1 Parents' attitude towards television advertising

Fig 4-7a below shows parents' response to questions about television food advertisements. Of all the parents, 70% did not approve of television food advertisements aimed at children. Sixty five percent of parents felt that television food advertisements were not informative and 70% were not likely to try new foods they had seen advertised on television. Sixty two and a half percent do not *usually* continually watch the advertisements on television.



4.7.2 Discussion of advertisements

Of those questioned 40% of parents did not discuss the content of advertisements with their child and 60% did. Table 4.7a shows the issues that were typically discussed and the percentage of families who discussed each issue. Most commonly parents and children talked about whether the food being advertised was healthy or not and if it contained a lot of fat or not. Secondly they discussed if the food looked nice and whether they would try it.

Table 4.7a Issues discussed with child relating to advertisement

Issue discussed	No.	%
If the food is good for you/healthy or not - if contains a lot of fat	13	29
If something looks like it tastes nice or horrible - or whether we would like to try it	8	18
If we would/are allowed to try it	4	9
Qualities of the food - what we know about it - what we like about it	4	9
The qualities of the advertisement - if the ad is effective or not - if the ad is entertaining or not	3	7
If it looks better/different than it would in real life	2	4.5
If the claims are accurate	2	4.5
If the advertising is false	1	2
What the aim of the advertisement is	1	2
How often it is o.k. to eat a particular food we have seen in an ad	1	2
We don't eat that	1	2
If it is good value for money	1	2
If food would taste very processed	1	2
Yes discuss but no comment provided	1	2
The harmful effects of unhealthy foods	1	2
What we could eat instead of the food advertised	1	2

4.7.3 Concern about television food advertising

Parents were asked if they were concerned about the types of foods advertised to children. Seventy percent were concerned, with 15% not concerned and 15% unsure. Table 4.7b below shows the types of concerns the parents had. Most parents were concerned that advertisements were for processed foods high in fat, colouring, and sugar and the advertisements were misleading children.

Table 4.7b Parent's concerns about advertising

Concern	Number	Percentage
The advertising of fast food - too many fast food ads	8	15
Try to make kids believe food is healthy & good for child when parents believe this claim is false -exaggerated nutritional benefits - misinformation	7	13
The advertising of foods high in fat/colouring/processing & sugar that are made to look appealing to children	7	13
Not enough information for children on whether food is healthy & level of preservatives/fat/colouring contained	5	9
The promotion of unhealthy foods	4	7
The foods are expensive	4	7
Lack of advertisements for healthy foods/bias towards unhealthy foods	4	7
Too many snack foods advertised	3	5
Too many foods advertised that can be "eaten on your knee" or "quick & easy meals"	2	4
Too many high sugar cereals and foods rather than healthier versions	2	4
Make unhealthy foods appear "o.k." "cool" and "exciting"	2	4
Glamorises the food and actions of the child in the ad	1	2
Try to convince kids they'll be cool if they eat it resulting in peer pressure	1	2
There are no vegetables or fruit advertised	1	2
Not enough emphasis on healthy sandwiches	1	2
Exaggerated language used	1	2
Portrayal of poor eating habits that set a bad example to children e.g. being too lazy to cook	1	2

4.7.4 Influence of television food advertising

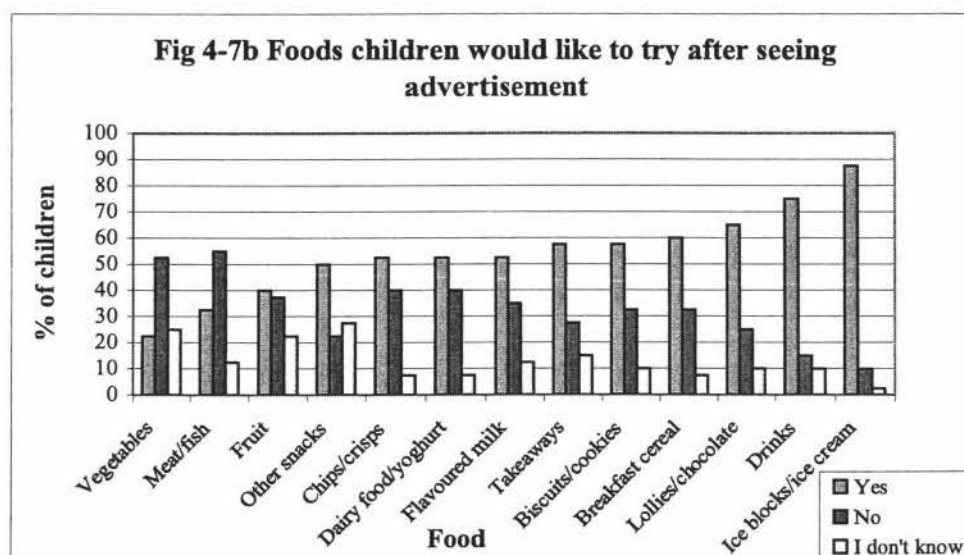
Parents were asked if they felt television food advertisements influence their child. Fifty five percent felt there was an influence with 25% feeling advertisements did not influence their child and 20% unsure. Table 4.7c below shows the ways in which parents felt food advertisements influenced their child. Most felt the advertisement influenced their child through making the food appear more exciting or appealing than it really was and thus their child wanted to try the food.

Table 4.7c Way in which parents feel advertisement influences their child

Way advertisements influence child	Number	Percentage
Make food look appealing/ exciting & child wants to try it	7	29
If see ad for a new food they want to try it	6	25
Child demands/asks parent to buy the food	4	17
After seeing ad child has chosen to eat new foods they probably normally wouldn't have tried	2	8
Child believes if the food has been on television then the claims about the food must be true & factual	2	8
Peer pressure to try fast foods brought about by advertising	1	4
Child believes if characters in ad are doing wonderful, exciting things because of the food then they can do the same	1	4
Influences the brand of product the child wants	1	4

4.7.5 Children's desire to try foods after seeing advertised on television

The children were asked if they ever wanted to try foods after seeing them advertised on television. The results are shown in Fig 4-7b below. The foods children would most like to try after seeing them advertised were ice creams/ice blocks, followed by drinks and lollies/chocolate. The foods most of the children were not sure about were 'other snacks', 'vegetables' and 'fruit'.



4.7.5.1 Buying foods as a result of seeing advertisements

The children were asked how often they bought foods after seeing them advertised on television and how often they bought a food item just because they liked the advertisement for it. The results are shown in Tables 4.7d and 4.7e below.

Table 4.7d Buy foods after seeing advertised on television

	Boys	%	Girls	%	Total	%
Never/rarely	9	45%	7	35%	16	40%
Sometimes	10	50%	13	65%	23	57.5%
All the time	1	5%	-	-	1	2.5%
I'm not sure	-	-	-	-	-	-

Table 4.7e Buy foods just because like television advertisement for it

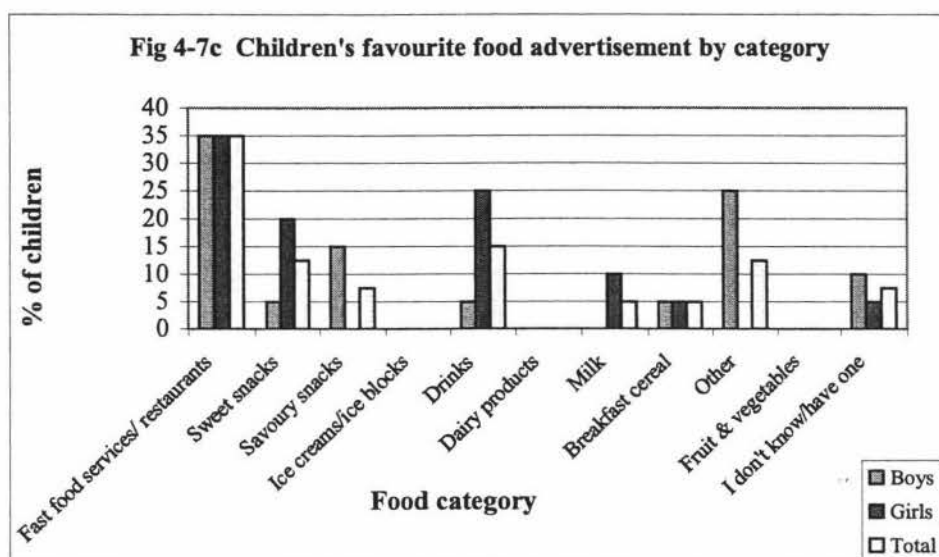
	Boys	%	Girls	%	Total	%
Never/rarely	15	75%	16	80%	31	77.5%
Sometimes	3	15%	3	15%	4	10%
All the time	1	5%	-	-	1	2.5%
I'm not sure	1	5%	1	5%	2	5%

4.7.6 Favourite food or drink advertisement

The children were asked to name their favourite food or drink advertisement and their reason for liking the advertisement. The advertisements can be seen in Table 4.7f below. Fig 4-7c shows the favourite advertisements broken down into the same categories as the advertisements in part one. The children's favourite advertisements were most commonly for fast food services and restaurants, drinks, sweet snacks and other. None of the children's favourite advertisement was for ice cream/ice blocks, dairy products (other than milk) or fruit and vegetables. Five of the advertisements chosen were not aired during 'children's television' such as Speights Beer.

Table 4.7f Children's favourite food or drink advertisement

Advertisement	Girls	Boys	Advertisement	Girls	Boys
I don't know/don't have one	1	2	H2Go Water	1	
McDonalds McFloat		1	Mizone Water	1	
McDonalds McFlurry	1		Just Juice	1	
McDonalds New Taste Menu	1		Coca Cola		1
McDonalds	1		Natures Energy Flavoured Milk	2	
KFC	1	2	Ribena Squeeze Drink	1	
Pizza Hut	1	1	Speights Beer	1	
Subway	2	2	Uncle Tobys Le Snak		1
Burger King		1	Uncle Tobys Fruit Museli Bar	1	
Watties		1	Tiny Teddies	1	
Watties Food In A Minute		1	Kellogs Cocoa Pops	1	
Fish sticks		1	Mars Bar	1	
Oven baked pies		1	New World Supermarket		1
Fruit Jelly	1		Burger Rings		1
Starbursts		1	Eta Ripples Potato Chips		1
Weetbix		1			



4.7.6.1 Reasons for liking the advertisement

The children were asked the reasons they liked their favourite advertisement. The results are shown in Table 4.7g below.

Table 4.7g Reason for liking advertisement

Reason for liking advertisement	% of children who responded
It grabs my attention	24.4
It is colourful & fun	15.1
It is interesting	10.5
The activity they are doing is cool	10.5
The food looks yum	10.5
I like the music	5.8
Other – it is funny	5.8
The people in it are cool	4.7
It is a cartoon	4.7
It has good special effects	3.5
Other – it is different	2.3
Other -it makes me feel hungry as it is always on just before dinner	1.2
Other – it is my favourite takeaway	1.2

4.8 Shopping

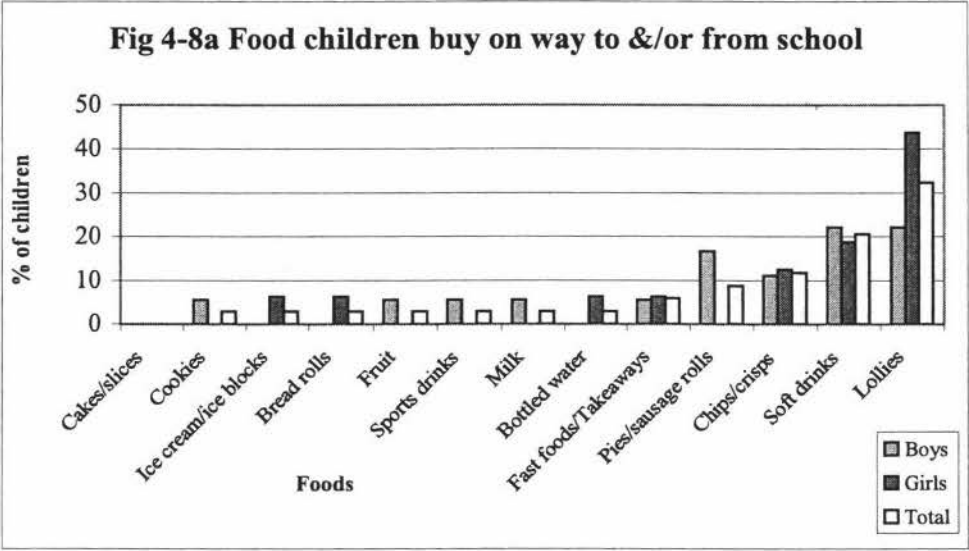
4.8.1 Purchase of food or beverages by child

The children were asked if they ever purchased food or drink on the way to or from school. These results are shown in Table 4.8a. If they answered yes, they were asked to name the food or drink they most often bought. The foods and drinks have been broken into categories and are shown in Fig 4-8a.

Table 4.8a Number of children who buy food or drinks on the way to/from school

	Girls		Boys		Overall	
	No.	%	No.	%	No	%
Yes	8	40	8	40	16	40
No	12	60	12	60	24	60

Girls most commonly bought lollies and soft drinks whilst boys most commonly bought pies/sausage rolls.



4.8.2 Purchase influencing attempts

The parents/caregivers were asked how often their child asked them to buy food or drinks when shopping. These results are shown in Table 4.8b below. They were also asked the types of food requested. These foods have been broken into categories and Table 4.8c shows the frequency for each category.

Table 4.8b Frequency children asked parents to buy food/drink when shopping

	Never/Rarely		Sometimes		Usually/Always		I'm not sure	
	No.	%	No.	%	No.	%	No.	%
Boys	0	-	13	60%	7	35%	0	-
Girls	1	25%	13	45%	6	30%	0	-
Total	1	2.5%	26	65%	13	32.5%	0	-

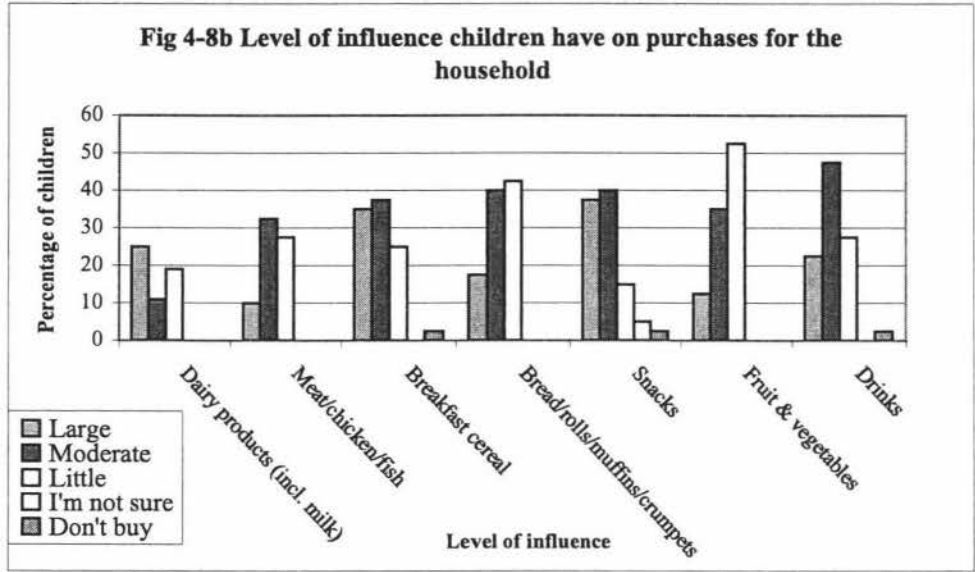
Both boys and girls made a 'purchasing influence attempt' sometimes if not every time their parent shopped. Only one girl never asked her parent to buy her food/drink when shopping. These results included purchase influence attempts when the child was shopping with the parent and requests when the child was elsewhere while parent shopped alone.

Table 4.8c Frequency of time children requesting each category

Chocolate/lollies/gum	22.98%	Breakfast cereal	8.98%
Drinks	16.15%	Breads/rolls/muffins	5.47%
Dairy products	12.59%	Fruit & vegetables	5.37%
Sweet Snacks	12.02%	Other	2.71%
Savoury snacks	11.83%	Meat/chicken/fish	1.90%

4.8.3 Level of influence of child on household purchases

Parents were asked to rate how much influence they felt their child had on what they bought for the household. The results are shown in Fig 4-8b below.



The category in which children had a large influence was snacks and breakfast cereal. The categories in which children had little influence were fruit and vegetables, bread/rolls etc and drinks. Interestingly although for breakfast cereal in many households children had little influence, in others almost equal that number of children had a large influence. This was the same with beverages and dairy products. In other words in some households parents took their child into consideration a lot when purchasing dairy products, beverages and breakfast cereal whereas in others they did not consider the child at all. The other categories were more consistent in the groups that children have an influence over.

4.9 Food and health

4.9.1 Children's attitude to healthy foods

The children were asked whether they agreed or disagreed with a series of statements to determine their attitude to healthy foods. The results are shown in Table 4.9a below with each question and their answers.

Table 4.9a Children's attitude to healthy foods

I feel good after I have eaten fruit or vegetables						
	<i>Girls (No.)</i>	<i>Percentage</i>	<i>Boys (No.)</i>	<i>Percentage</i>	<i>Total(No.)</i>	<i>Percentage</i>
<i>Agree</i>	11	55	13	65	24	60
<i>Disagree</i>	1	5	1	5	2	5
<i>I'm not sure</i>	8	40	6	30	14	35
I would eat takeaways everyday if my parents/caregivers let me						
	<i>Girls (No.)</i>	<i>Percentage</i>	<i>Boys (No.)</i>	<i>Percentage</i>	<i>Total(No.)</i>	<i>Percentage</i>
<i>Agree</i>	1	5	2	10	3	7.5
<i>Disagree</i>	17	85	14	70	31	77.5
<i>I'm not sure</i>	2	10	4	20	6	15
Milk is great to drink any time of the day						
	<i>Girls (No.)</i>	<i>Percentage</i>	<i>Boys (No.)</i>	<i>Percentage</i>	<i>Total(No.)</i>	<i>Percentage</i>
<i>Agree</i>	9	45	11	55	20	50
<i>Disagree</i>	5	25	3	15	8	20
<i>I'm not sure</i>	6	30	6	30	12	30
Only adults need to think about eating healthy food						
	<i>Girls (No.)</i>	<i>Percentage</i>	<i>Boys (No.)</i>	<i>Percentage</i>	<i>Total(No.)</i>	<i>Percentage</i>
<i>Agree</i>	0	-	1	5	1	2.5
<i>Disagree</i>	19	95	19	95	38	95
<i>I'm not sure</i>	1	5	0	-	1	2.5

Most children agreed that they felt good after eating fruit and vegetables and that milk was great to drink any time of the day. Most children would not eat takeaways everyday if their parent's let them and felt that it was not just adults that needed to think about healthy eating.

4.9.2 Parents' attitude to healthy food

To determine their attitude to healthy foods parents were asked whether they agree or disagree with a series of statements. The results are shown in Table 4.9b below.

Table 4.9b Parents' attitude to healthy foods

	Agree		Disagree		I don't know	
	<i>Number</i>	<i>Percentage</i>	<i>Number</i>	<i>Percentage</i>	<i>Number</i>	<i>Percentage</i>
Fruit makes a great snack for me AND my child	39	97.5%	0	-	1	2.5%
I would prefer to eat actual food than take vitamin and mineral supplements	39	97.5%	0	-	1	2.5%
I try to avoid foods containing too much fat	37	92.5%	2	5%	1	2.5%
I would like to increase the amount of fruit and vegetables I eat	33	82.5%	7	17.5%	0	-
Eating a variety of foods is important to me	39	97.5%	0	-	1	2.5%

4.9.3 Parent’s nutritional knowledge

To determine their nutritional knowledge parents were asked whether they agreed or disagreed with a series of statements. The results are shown in Table 4.9c below.

Table 4.9c Parents’ nutritional knowledge

	Agree		Disagree		I don’t know	
	<i>Number</i>	<i>Percentage</i>	<i>Number</i>	<i>Percentage</i>	<i>Number</i>	<i>Percentage</i>
Only foods that are greasy are high in fat	2	5%	37	92.5%	1	2.5%
Iron can only be found in meat	1	2.5%	38	95%	1	2.5%
If I drink more milk I’ll get more calcium	29	72.5%	11	27.5%	0	-
Grilling food is healthier than frying food	38	95%	0	-	2	5%
Whole grains, fruit, vegetables & bread are all good sources of fibre	40	100%	0	-	0	-

Most parents answered the nutrition questions correctly. They were mostly unsure about whether grilling or frying food was healthier and whether drinking more milk would give them more calcium.

4.10 Body Mass Index $\frac{\text{wt (kg)}}{(\text{ht})^2}$

The children’s weight and height were measured three times and an average of each variable was calculated. The body mass index was calculated using these average measurements. Results are shown in Table 4.9d below.

Table 4.10 Children's Body Mass Index

	Girls		Boys		Total
	<i>Number</i>	<i>Percentage</i>	<i>Number</i>	<i>Percentage</i>	<i>Percentage</i>
14	0	0	1	5%	2.5%
15	1	5%	1	5%	5%
16	4	20%	3	15%	17.5%
17	3	15%	4	20%	17.5%
18	3	15%	1	5%	10%
19	3	15%	1	5%	10%
20	3	15%	1	5%	10%
21	1	5%	1	5%	5%
22	2	10%	2	10%	10%
23	0	-	1	5%	2.5%
24	0	-	1	5%	2.5%
25	0	-	2	10%	5%
26	0	-	0	-	-
27	0	-	0	-	-
28	0	-	0	-	-
29	0	-	0	-	-
30	0	-	1	5%	2.5%
Total	20	100%	20	100%	100%

5.0 DISCUSSION

5.1 Demographics

This study captures a small, homogeneous population from high decile Central Auckland schools. The subjects are predominantly NZ European/Pakeha but are also Indian, Chinese, Maori, Scottish and more. It was thought that the difference in children aged eleven and twelve with respect to making food choices was not great enough to make comparisons between the two ages so the group was split between boys and girls. Most of the subjects were eleven and in year seven at school. The family size of the subjects varied with one girl living just with her father to a family with five children. Five of the children were from solo parent families and students lived with two of these families to bring in extra money. Of the parents interviewed 33 were mothers and seven fathers. The employment status of the parents in this study reflect the changes in New Zealand today with more and more families in which both parents work. In this study only 17.5% of the families had one parent at home full time. In the majority one parent was employed full time with the other part time.

5.2 Children's eating habits

To examine the potential influences on children's food choices it was necessary to establish what choices they were making in a typical day. The majority of children in the study were meeting the recommended number of servings per day for 'cereals' and 'meat/chicken/fish'. They were not meeting the recommended number of servings of 'milk and milk products', 'fruit' and 'vegetables'. This means they may be lacking in some essential vitamins and minerals to support their growth. The children themselves answered the food frequency questions however, which despite them understanding the concept of serving sizes may influence the results. These results were similar to those of the National Children's Nutrition Survey 2002, in which the majority of children were not meeting the recommended daily intake for fruit and vegetables (Ministry of Health, 2003³).

An analysis of the results was carried out to examine any correlations between the frequencies of consumption of each group with interesting results. This is seen in Fig 5-2 below.

Fig 5-2 Cross Tabulation of frequency of consumption of various food groups

	Fruit	Vegetables	Cereals	Breakfast Cereal	Bread	Milk	Meat/chicken/fish
Vegetables	0.351 0.026*						
Cereals	0.195 0.228	0.094 0.563					
Breakfast cereal	-0.086 0.598	-0.411 0.008**	-0.000 1.000				
Bread	0.455 0.003**	-0.035 0.828	-0.223 0.167	0.156 0.336			
Milk	0.460 0.003**	0.005** 0.977	0.462 0.003**	0.095 0.561	0.319 0.045*		
Meat/ Chicken/ Fish	0.274 0.087	0.373 0.018*	0.240 0.136	-0.038 0.815	0.151 0.354	0.197 0.222	
Takeaways	-0.166 0.305	0.222 0.168	-0.373 0.018	-0.257 0.110	0.039 0.810	-0.088 0.591	-0.062 0.703

Cell Contents: Pearson correlation

P-Value *significant **highly significant

The number of servings of fruit eaten each day by the children was significantly positively associated with the servings of vegetables ($p=0.026$), milk products ($p=0.003$) and breads/rolls ($p=0.003$) and negatively associated with servings of breakfast cereal although this was not significant. Servings of vegetables was significantly positively associated with meat ($p=0.018$) and significantly negatively associated with cereals (0.008). The number of servings of cereal (pasta etc) was positively associated with milk ($p=0.003$) and negatively associated with takeaways (0.018). Servings of bread are positively associated with servings of milk products ($p=0.045$). These results indicate that the children eating the core foods such as fruit, vegetables, meat and bread were eating a variety of foods however not enough each day. The association between meat and vegetables may indicate these were being consumed in the same meal. The negative association between the consumption of cereals and takeaways was harder to explain, as was that between meat and cereals.

The children in the study did not appear to have any food security issues. Over 90% of them were consuming at least three main meals a day. Where the children were skipping meals this was down to choice rather than necessity. These results were logical given that the children interviewed were in a high-decile school. It is likely that food security would not be as high in lower decile schools. Given the change in family circumstances today it was positive to note that the majority of these children were eating meals with at least one other person and for the minority eating alone usually occurred at breakfast time. It has been found that family do have an influence over children's food choices and the sharing of

meals provides the perfect opportunity to discuss the foods being eaten and for parents to put in place some guidelines about food and instil some nutrition knowledge (Maskill et al, 1996).

In most of the families the television was not on while breakfast and dinner was being eaten. In houses where the television was on every day the meal most commonly eaten meal in front of it was breakfast. There was no relationship between meals eaten in front of the television and the total amount of television viewed. There was however a significant positive relationship between the number of times children ate their dinner in front of the television and parents feeling that advertisements influenced what their child liked to eat ($p=0.035$). This relationship was not present for eating breakfast or lunch in front of the television. Eating meals in front of the television allows the opportunity for children to see food advertisements and eating situations on television and to find out about new foods so it was interesting that parents felt the more their child ate meals in front of the television the more they were influenced by the advertisements. This may be due to the child paying more attention to the food in the advertisement because they were eating at the time or they may be making comparisons with the food they were eating.

5.2.1 Favourite and Least Favourite Foods


The children and parents were asked about the three favourite and least favourite foods. Rather than just be limited to a food item the children could choose a meal or a drink or a category such as lollies. The parents were asked as well as the child for two reasons. The first was to enable a comparison to be made between the parent and child's answer. This meant that children were encouraged not to discuss their answers with their parent so the rest of the answers would be as honest as possible, without the child wanting to please the parent. It also allowed comparisons to be made at the end of the interview that provided a source of entertainment for the subjects, and encouraged further discussion about food and advertising. The second reason was to encourage the parents to really think about what their child ate on a daily basis and perhaps act on this aroused interest to make positive changes in the child's diet where necessary.

The category chosen most often by the children for their favourite food was 'other'. This mostly included meals such as spaghetti bolognese and often 'meat and rice' or 'pasta'. The second most popular category and somewhat surprising was 'fruit and vegetables' and thirdly 'fast food services and restaurants'. Often the choice was brand-specific such as 'Subway' but also included the generic 'pizza' (homemade versus takeaway was specified). Examination of the correlation between the answers provided and the frequency with which these foods were advertised showed no relationship. As seen in part one the most frequently advertised categories are 'sweet snacks' and 'fast food services/restaurants'. Other than fast food services/restaurants the categories most commonly chosen here were among the three least frequently advertised foods aired during children's television. Certainly there were few advertisements for meals such as chicken and rice, and these were for the pre-packaged single-serving variety not home made.

The relationship between exposure to television each week and favourite foods was examined. Favourite foods were divided up into the same categories as used in Part One. These were drinks; milk; breakfast cereal; dairy products; savoury snacks; ice cream/ice blocks; sweet snacks; fast food services and restaurants; fruit and vegetables; and other. There was no relationship between the total number of hours viewed and the category of favourite food. These results were similar to those in another study in which preference for certain foods did not correlate with the amount of exposure time to any advertising medium (Clancy-Hepburn et al, 1974). Woodward et al, (1992) found that the more television viewed the more the children consumed foods high in fat and sugar. The different categories chosen by boys and girls were also examined and due to the small numbers it was impossible to find a significant difference between boys and girls for each category.

When asked the children's least favourite foods the parents struggled to make three choices and often they said their child "eats everything". The category chosen most often was vegetables, followed by various meats and then particular meals. Sometimes a particular vegetable was chosen such as 'pumpkin' but often the generic 'vegetables' was answered. Traditionally children are renowned for not liking vegetables and this may be the reason for the high frequency of vegetables. Certainly the child may not like certain vegetables but it is possible that this category was chosen because the parent was struggling to think of anything else to write. The meat/fish answered were specific such as 'chops' and often fish, and meals were specific such as 'fish pie'. The least favourite foods chosen did correspond to the least advertised products during children's television however it was not possible to say that because they were not advertised children do not like them when in fact they may not be advertised *because* children do not like them. As mentioned in Part One there is also little motivation for fruit and vegetable producers to advertise due to brand obscurity.

5.2.2 Snacks

The children were asked to describe the snacks they eat the most often. Once again due to the small numbers in each category no significant difference was found between boys and girls. Overall it can be seen that the children were favouring sweet and savoury snack foods that are high in saturated fat, sugar and salt and these foods were those most frequently advertised to children. These results differed again from those in the National Nutrition Survey 2002. In the national survey the most commonly eaten snack was noodles (Ministry of Health, 2003³). The difference in results was likely related to the difference in the socio-economic status of children interviewed. Those in the national survey were from a broader population of which some were low socio-economic status and may not have been able to afford to consume the wide range of snacks available to those in the present study. The relationship between the number of hours viewed and the category of favourite snack was examined to determine if more exposure to television and thus advertisements for high-energy snacks means children favour these types of foods. There was no relationship between the two as demonstrated by the fact that these children were also favouring fruit and vegetables that are hardly advertised at all. Once again were these snacks the children's favourite because they are advertised so frequently, was it because of the children and adults' 

propensity for energy dense foods that they were advertised frequently? Certainly children were bombarded with advertisements for these foods and this makes it almost impossible for parents to ignore their child's pleas for the products. These children are being exposed to these pre-packaged, processed foods at a very young age. Stories abound about children starting preschool with sandwiches and fruit only to be exposed to these products by other children and thus eating their friend's lunches because those energy dense snacks are so much better on the palette. Finding a child in the playground today without one of these snacks is the exception not the rule. Once again it is impossible to tell if these foods are the children's favourite because they are heavily advertised, or if they are heavily advertised because they are the children's favourite. It would appear that children are so familiar with mini packets of potato chips, muesli bars, etc the only difference the advertisement is making is whether they are Uncle Toby's or Nice and Natural's.

5.2.3 Takeaways

Children were asked about their takeaway consumption. The highest frequency with which these children were eating takeaways was one boy at three to four times a week. Of all subjects, 37.5% were consuming takeaways one to two times a week. It was a limitation of this study that it was not specified whether it was once or twice as there is a significant difference between a family having takeaways every Friday night and having them twice a week. Thirty-two and a half percent of subjects were having takeaways one to three times a month or almost once a week and 27.5% never or rarely had takeaways. There was no significant difference between boys and girls which was expected as most of the consumption of takeaways was in the family situation and thus it was more to do with the choice of the parents to get takeaways than the gender of the child. There was no relationship between the child saying they would like to eat takeaways every day if they were allowed and the number of times they were eating takeaways. One can assume from this that when the children were asked the number of servings of takeaways they ate they were answering accurately, not with the frequency they *would like* to eat them.

There was a significant relationship between the frequency of takeaway consumption and the number of hours children were viewing television during the week ($p=0.009$) with the more takeaways the more television. These results are similar to those of Woodward et al, (1992) in which subjects who viewed more television consumed more foods high in fat or sugar. This relationship between takeaway consumption and television viewing was logical when considering the frequency of fast food advertising during the week (3.5/hr 4pm to 5pm and 5.5/hour 5pm to 6pm). It was important to note however, that not all takeaways are advertised on television such as the nationwide favourite 'fish n chips' and Chinese takeaways. If these and other types of takeaways were advertised would the consumption of takeaways go up even further? It could be that advertising itself was unrelated to the consumption of fast food and that watching more television per se increases takeaway consumption or takeaway consumption causes more television viewing. In other words there may be other lifestyle factors that the children consuming more takeaways share, that cause them to watch more television. It was impossible to distinguish this from the information available.

The relationship between the child's BMI and the frequency of takeaway consumption was examined, however no correlation was found, which was not surprising given that most children were consuming takeaways less than once a week and energy balance was affected by so many other factors than just one type of food. There was also no relationship between physical activity levels and takeaway consumption.

5.2.4 Beverages

In the U.S. soft drink consumption is associated with low consumption of milk and juice consumption and this is becoming a concern in New Zealand with children frequently consuming sweetened drinks (Ministry Of Health, 2003²). Dental caries are also a problem in New Zealand and this is linked to the acid in food and drinks (Ministry Of Health, 2003²). There was no relationship between the consumption of soft drinks and either the number of hours of television viewed by the children or their BMI. This meant a direct connection could not be made between the rise in soft drink consumption and television advertising to children. Particularly as soft drink television advertising was not aired during children's television and thus not directly aimed at these children. This rise was more likely to be related to the reduced cost (50 cents over ten year period) of soft drinks making them more accessible to children and adults (Ministry Of Health, 2003²).

Concern about the consumption of sports and high caffeine energy drinks is rising in New Zealand. Recently a sugar free energy drink was launched onto the market demonstrating the food industries interest in reformulating products where possible. However the caffeine and amino acid content was still a concern. A high 95% of children never or rarely consume energy drinks and only two girls consumed a drink once a week. Two subjects was still 5% of the study population and these sports and energy drinks are advertised during children's television, albeit infrequently. Perhaps the manufacturers of these drinks could take on more social responsibility! Sports drinks can contain upwards of 30% sugar, however fortunately in this study 82.5% of children never or rarely consume sports drinks with 12.5% consuming one bottle a week. Parents felt that with their child's sporting energy demands, sports drinks were a good answer with 'energy' plastered all over the bottle. There appears to be an opportunity here for educating parents on the high sugar content of these drinks and informing them that the best way to get energy is through food itself and not filling up on giant sized sugary drinks. Although most children here are drinking water every day they were also choosing from the myriad of juices, sports and energy drinks available. Thus concern about the consumption of these sugary soft and sports drinks was justified. It is important to remember that the major concern over dental health was for children in poorer households, where due to the cheap cost of soft drinks and less exposure to nutrition education, consumption will be even higher. Thus if the consumption is 5-10% of this small, middle to upper class study group were drinking soft and sports drinks every day this could translate to alarming numbers in the poorer sectors of our society.

5.3 Influences on children's food choices

First of all children were asked the importance of a number of factors when deciding what to eat. They appeared to find the qualities of the food such as taste and appearance the most important when choosing a food. Studies have found that taste is important in deciding whether we find a food acceptable or not (Raats et al, 1995; Reece et al, 1999), and this was the most important factor in this study followed by how filling the food was. This was followed by the food making the child feel good. There were no significant differences here between boys and girls however there was a trend towards a difference between the sexes in the importance of the food tasting nice ($p=0.057$). The influence of other people was also examined. Forty percent of boys and 20% of girls considered their parents 'liking them to eat the food' very important, with 52.5% of children overall finding this a little bit important. Most of the children (57.5%) do not consider their friends liking the same food important with 3.6 times as many girls as boys finding this unimportant. Other factors that stood out as being unimportant to children were whether the food was quick and easy to prepare and 72.5% of the children found seeing the food advertised on television unimportant. The rest either were not sure or found it a little bit important.

There are many of themes of appeal used in the television advertisements viewed, particularly portraying the food or those eating it as being 'cool', 'fun' or 'hip'. This was similar to other findings where taste and fun were marketed as reasons to eat the food not nutrition (Reece et al, 1999). The child may not necessarily feel inferior for not trying that food, but if they *do* eat the food they will be that much cooler. With 72.5% of children feeling that seeing the food advertised on television was not important it would seem that they were not taking these messages to heart and did not feel that the advertisement was critical to their perception of the food. Other than boys finding it more important that their friends liked the food they were eating, there was no significant difference between boys and girls. These results emphasise that there was no one outstanding factor that children find important when deciding what to eat, rather there were a number of factors all working together. Choosing a food was often impulsive thus placing more emphasis on the quality of the food, rather than who else was eating it or where they had seen it before.

Parents were also asked about whom they think influenced their child's food choices. Overall 56% of parents felt they had a lot of influence over what their child ate. This indicated parents can influence the children through actually dictating what they eat, through making certain foods available or through example (Maskill et al, 1996; Skinner et al, 1996). Forty one percent of parents felt they had some influence over what their child ate and one parent felt they had no influence at all. These results were similar to those in other studies in which parents were asked about their own influence on their child's food choices (Robinson, 2000; Stratton et al, 1999). It was important to note that the question was about influencing the child not controlling their eating. For girls 53% of parents felt siblings had some or a lot of influence over what their daughter ate and 75% of parents felt siblings had some or a lot of influence over what their son ate. It was not specified if the sibling was older or younger. If older the influence may be through introducing their sibling to new foods or the child wanting to emulate what their older

sibling eats. It may also just be easier to have what the sibling is having. The child with a younger sibling may want to appear grown up and introduce their younger sibling to new foods. Forty-two percent of girls and 25% of boys' parents felt siblings did not influence their child's food choices.

Parents were also asked about friends influencing their child's choices and their feelings were quite different to those of the children. The majority (85%) of girls' parents felt that friends had some to a lot of influence, whereas 90% of girls thought their friend liking the food was not important at all. For boys 47% of parents felt that friends have some to a lot of influence over what their son ate whereas 75% of boys felt their friends liking the food was a little bit to very important. There was a significant difference between parents of boys and girls in the level of influence they felt friends have ($p=0.048$). The options given were 'a lot of influence', 'some influence', 'no influence' and 'I'm not sure'. The difference between parents and children may be that although children may or may not consciously feel their friend liking the food was important, friends can influence their child by introducing them to new foods or encouraging them to eat different quantities (Feunekes et al, 1998). Parents may also notice similarities between what their child and his/her friends like to eat and the child may not be aware of the similarities. More parents of boys than girls were not sure of the influence of their friends.

Finally parents were asked how much influence they thought other household members, teachers and magazines/newspapers had on their child's food choices. Most parents felt that other household members (such as other parent or extended family) had some to a lot of influence over their child's food choices. Recently some schools such as West School in the South Island have introduced policies banning the inclusion of foods such as soft drinks in school tuck shops. This, together with nutrition education in Home Economic and Food Technology classes, are the way in which teachers can directly or indirectly influence children's choices. The majority of parents either were not sure (38%) or felt that teachers had no influence (31%) on what their child ate. Parents may not be aware of the level of nutrition education in schools today, so may not be aware of the effect of nutrition education on their child's food choices. Finally most of the parents felt that magazines and newspapers had some influence on their child's food choices. More parents of boys (47%) than girls (35%) felt magazines and newspapers were an influence. This was surprising due to the large number of magazines aimed at females that include articles on food and nutrition, however boys may be exposed to these magazines, or articles in newspapers, particularly with the explosion of articles in the media about childhood obesity and advertising.

Overall no one factor stood out that parents' felt had a really strong influence on the foods their child liked to eat. Rather all the family and other adults in the child's life seem to have both a direct influence on what the child ate (such as making food available) or indirectly (such as the child observing others eating) (Birch et al, 1998; Booth, 1994).

5.4 Television Viewing Habits

Parents and children were asked about the child's television viewing habits including hours per week and with whom they watched television. The results represented a 'typical' school and weekend day. Obviously weekends were different and viewing would be different from summer to winter and in school holidays. Thus to obtain a total per week weekday results were multiplied by five and one weekend day was used. Thus total weekly hours were underestimated slightly as only one weekend day was included.

On a typical school day children were watching on average approximately 118 minutes, or just under two hours. This is less than those children in studies carried out in Australia and America where children were watching three to four hours per day (Woodward et al, 1992; Woodward et al, 1997; Clancy-Hepburn et al, 1974). These results were very similar to those of the National Children's Nutrition Survey 2002, in which 73% of children watched less than two hours of television per day (Ministry of Health, 2003³). However the national survey included video viewing and the present study did not as the focus was on television with advertising, so the present mean viewing may have been higher. During the week there was no difference in average viewing for boys versus girls. The average total per week was 9.83 hours. Approximately one third of the children were watching television before school and this was at the most for one hour. Most of the viewing occurred after school and before dinner, as well as after dinner. Assuming children are eating dinner around 6pm at night this means they are not only exposed to advertisements aired during 'children's television' but also those aired after 6pm at night when an extensive number of advertisements are still shown (Hammond et al, 1997¹). On a typical weekend day children were viewing on average 3.6 hours a day. Once again there was no significant difference between boys and girls. Very few children watch television between midday and dinnertime on the weekend. It was thought that 'only children' may view more television as they did not have siblings to play with, however there was no relationship found.

In total children were watching approximately 13 hours of television a week and if both weekend days were included this could be up to 16 hours per week. Thirteen hours of television is like sitting down for a day and a half solid watching television instead of going to work. Not only is that number in itself shocking, it does not include time spent working or playing on the computer, time spent watching videos and D.V.D.s or playing 'Play Station'. Although this was a very small study it does provide an indication of the number of hours children are watching television. It was found in another small study with children, that the metabolic rate was lower while watching television than it was at rest (Klesges et al, 1993). Even if this was not always the case we know for certain that it was at least as low as it is at rest. This lowered metabolic rate, together with the subsequent sacrifice of time spent participating in physical activity could be a contributor to the increasing incidence of obesity in New Zealand. Time spent participating in physical activity is discussed later however the evidence in this study of television viewing alone does go some way to support these assertions.

Studies have shown that the effect of advertising is mediated through the situation in which it is viewed. In particular viewing the advertisements with other people allows the opportunity for discussion about the advertisement, and in those families that do discuss advertisements the children have more scepticism and view the advertisements more critically (Roedder John, 1999). For example one study on television advertising and children addressed the role of family and friends as mediators of television advertising and found that in the long run the influence of television advertising was only statistically significant among families with a low level of communication about consumption of the products seen (Moschis et al, 1982). Thus parents were asked with whom their child viewed television. On a typical weekday morning children that were watching television were mostly viewing alone or with siblings. After school and before dinner they were once again mostly viewing with siblings or parents or alone. After dinner they were mostly viewing with the whole family including siblings or just with their parents. Viewing with siblings would allow the opportunity to discuss the foods advertised and if with older siblings perhaps the legitimacy of claims made might be discussed. On the weekend children were mostly watching alone or with siblings in the morning and after dinner they were watching with parents and or siblings but not alone. Thus most of the television viewing other than on weekday mornings was with other people and this allowed an opportunity for discourse on the food advertisements they were watching and any food events within programming.

5.5 Physical Activity

Parents were asked about the number of hours each week their child participated in formal physical activity such as dancing or soccer and informal physical activity such as riding their bike and playing outside. These results did not include any physical activity within school time and once again were approximate, as physical activity will vary between summer and winter, holidays etc.

On average children were spending 4.85 hours participating in play and casual physical activity and 2.75 hours in formal physical activity each week. Girls were participating in less informal activity and much less formal activity ($p=0.087$) than boys. In the present study physical activity was not separated between weekend and weekday so the results were not directly comparable to those of the National Children's Nutrition Survey 2002. Similar to the present study in which girls were less active than boys, in the national survey the highest proportion of children not participating in any physical activity on the weekend were girls of this age and more boys than girls were in the high activity quartile (Ministry of Health, 2003³). Overall then the mean physical activity level was 7.6 hours per week. This was half the amount of time spent watching television and perhaps a third or more of the time spent in sedentary activity once videos and computers are accounted for! It was thought that those children participating in a lot of physical activity would be watching less television however no correlation was found between the two. It has been found in the recent National Nutrition Survey carried out that 10% of adults and 9% of children are sedentary (Ministry Of Health, 2003²). Sedentary is described as the situation where no physical activity has been carried out in the previous seven days. In the present study 10% of boys participate in less than one hour of formal and informal activity per week thus they are sedentary. Twenty

five percent of girls participate in less than one hour of formal activity each week and 15% participate in less than one hour of play each week. There are some barriers to exercise, such as parent's increasing concern for their child's safety when playing outside or walking to school and the cost of fees when attending formal activity.

The key messages put out by the Ministry of Health (2003) in New Zealand are as follows:

- Be active every day for at least 30 minutes each day in as many ways as possible.
- Add some vigorous exercise for extra benefit and fitness.

Examining the number of children who were physically active for 3.5 hours per week or at least thirty minutes a day was disturbing. Twenty-five percent of the children were active for less than 3.5 hours per week. Although at this age physical education is compulsory in school so these children will be getting some other exercise, it is still a concern because the children are not establishing good habits that will carry them through to adulthood. With the upheaval of moving to new secondary schools on the near horizon for these children, and given that physical education is not compulsory throughout secondary school this is an issue. It has also been found that physical activity declines when children leave school (Ministry Of Health, 2003²). Many of the parents were concerned at the hour or more of homework these children were being given at this age, however this is only going to increase as they grow older so fitting in physical activity around school commitments and all that television will become even harder.

5.6 Body Mass Index

The weight and height of the children was recorded and from this their body mass index (BMI) was calculated. Children's body fatness changes as they grow and interpretation of their BMI depends on their age. Body fat distribution also differs between boys and girls so BMI also depends on their gender. Thus we can use the BMI -for-age measurement. BM.-for-age and sex charts have been designed that have specific percentile curves showing the pattern of growth for boys (see Appendix N) and girls (see Appendix O). Established cut off points have been established to identify those under or overweight or at risk of overweight.

Underweight	BMI-for -age <5 th percentile
At risk of overweight	BMI-for-age for >85 th percentile
Overweight	BMI-for-age >= 95 th percentile

Table 5.6a below shows where the number of children in the present study in each bracket.

Table 5.6a Children in each BMI percentile

	Girls	Boys
Underweight	5%	5%
Normal	85%	55%
At risk of overweight	10%	25%
Overweight	0	15%

If considering weight and height alone and excluding age and gender the normal BMI range is 18.5-24.9, overweight 25.0-29.9 and obese >30. The following table 5.6b shows the number of children that would fall into each category.

Table 5.6b Children's weight distribution

	Underweight	Normal	Overweight	Obese
Boys	7	9	2	1
Girls	11	9	0	0

BMI can be used to predict overweight and obesity in adulthood as well as risk factors for medical conditions later in life and research has found that overweight children are likely to be overweight adults (Ministry Of Health, 2003²). The results for overweight or obese children differed from those of the National Children's Nutrition Survey 2002. In the national survey 31% of children were overweight or obese (Ministry of Health (2003³). The difference was most likely due to the greater percentage of Pacific Island and Maori children participating in the national survey compared to the present study, as they had higher levels of overweight and obese compared to Europeans. There was no significant correlation found between the children's body-mass-index and the number of hours of television watched or physical activity each week, which supports the findings of Robinson et al (1993). These results do not concur with other studies investigating the relationship between television viewing and obesity in which there was a dose-response relationship between television viewing and the presence of overweight (Gortmaker et al, 1996; Dietz et al, 1985; Lowry, Wechsler, Galuska, Fulton & Kann, 2002; Robinson et al, 1993). They also do not concur with studies investigating television viewing and physical activity levels in which the more television viewed the less physical activity undertaken (DuRant et al, 1994). Studies carried out investigating body weight and television viewing were quite inconclusive so this lack of correlation between BMI, television viewing and physical activity was to be expected. This was because so many other factors affect children's weight including food consumed and time spent with other forms of sedentary entertainment, both of which were not accounted for here.

These results did support findings in New Zealand that many children were overweight and inactive. If this middle to upper class sample is demonstrating poor habits the situation is likely to be even worse in the under privileged, at risk sector of the population.

5.7 **Television advertising**

A number of questions were asked to try and gauge parents' attitude towards advertising. The numbers of positive and negative answers were summed and the parents' overall attitude towards advertising was established.

Table 5.7 Parents' approval of television food advertisements

Strongly approve	Approve	Ambivalent	Disapprove	Strongly disapprove
0	9	4	14	13
-	22.5%	10%	35%	32.5%

As seen in Table 5.7 above the majority (67%) have a negative attitude towards food advertisements aimed at children, and 22.5% having an overall positive attitude towards advertisements. Thus a significant proportion of the group did not fundamentally disapprove of food advertisements. These findings did not confirm those found in the study by de Bruin et al (2000) in which parents did not have very negative feelings towards food advertising to children.

5.7.1 Disapproval of Advertisements

Overall 70% of parents disapproved of advertisements aimed at children. However 35% of parents felt television food advertisements were informative and 30% continued to watch the television during the advertisements. When asked if they were likely to try out new foods they had seen advertised on television, 30% answered yes. It was thought that if parental concern was high this might have affected the number of hours of television that children were watching however this was not the case and there was no relationship between the two. The relationship between parents saying they were likely to try out new foods they had seen on television and the children trying foods after seeing an advertisement for it was also examined. There was no correlation so children were not more open to trying foods seen on television because their parent was.

5.7.2 Discussion of Advertisements

Parents were asked whether they discussed advertisements with their children, whether television food advertisements influence what their child likes to eat and what concerns they had about advertising. Firstly 60% of parents discussed advertisements with their child. This has been found to mediate the effects of advertising and aid in the child's consumer socialisation , however there was no correlation between those families that did not discuss advertisements and the child being more influenced by advertisements. There were a variety of aspects of the advertisement discussed, mostly concerning the quality of the food including the health value and the appeal of the food. Qualities of the advertisement were also discussed including the entertainment value and effectiveness of the advertisement and if the

claims were accurate. Parent and child viewing advertisements together creates an opportunity for discussion about the product being advertised and the purpose of advertising in general. In this study some of the parents were using the advertisements effectively to talk about nutrition related issues, such as how often certain foods should be eaten, the harmful effects of eating certain foods and alternatives to eating a particular food.

5.7.3 Concern about advertising

Parents were asked if there was anything about food advertisements aimed at children that concerned them and 70% felt there was. The overwhelming concern was that too many fast foods were advertised. This was followed by concern that so many foods advertised were high in fat, sugar and colouring and these foods were mostly processed. Parents also believed that advertisements made false claims about foods or exaggerated the nutritional benefits of the food. Some parents felt that the foods advertised were too expensive and that not enough information was given on the nutritional quality of the food. What stood out was some parent's concern that advertisements portray poor eating habits to children, and encourage them to think that all foods are easy to prepare and don't require more effort than opening a packet or turning on the microwave. Parents believed too many convenience foods were appearing on television with one describing them as 'eat on your knee' foods as opposed to the kind where a family sits down together to eat food they have prepared from scratch. These parents were justified in their concerns as there is a distinct trend towards consumption of these types of foods in New Zealand (Ministry Of Health, 2003¹).

Parents' feelings in this study were in contrast to those of parents in a study carried out in another metropolitan Auckland school (de Bruin et al, 2000). In their study on parental and child's perception of advertisements, parents' did not feel strongly that there was too much sugar, fat and additives in food products advertised during children's television. Unlike the present study television did not generate a lot of discussion between parents and children. The change in parent's attitudes since that study was carried out could be due to the perception in the media over the last 18 months that advertising was at the root of childhood obesity.

5.7.4 Influence of advertisements

Parents in the present study were also asked if and in what way advertisements influenced their child's eating habits. Fifty five percent of parents felt that advertisements influenced what their child liked to eat. There was no relationship between a parent feeling advertisements influenced their child and the number of hours the child was exposed to television and thus advertising. The way most parents feel advertisements influence their child is through making the food look appealing and exciting so the child wants to try it. In fact in most of the answers to this question parents felt that through different means such as characters doing exciting things after eating the food, or making claims about the food, advertisements simply make the child want to try the food, particularly new foods that they haven't tried

before. Parents also felt that advertisements made the child ask their parent's to buy the food. These feelings were similar to those in two qualitative New Zealand studies in which children felt they wanted to try out foods they had seen on advertisements and asked their parents to buy things they had seen (Bulmer, 2001; Maskill et al, 1996). Of concern were the parents who felt that their child believed that if a claim was made in a food advertisement it must be true, or that advertisements influenced their child through peer pressure. As seen on Part One, advertisements do infer that a child will be cooler if they try a food, however direct peer pressure generated by an advertisement would be hard to prove. These results support those found in a research project carried out examining responses of young people to advertising (Hammond et al, 1997³). In their study after watching several food advertisements and interpreting them the children said that seeing the advertisement prompted the desire to try both new products and those they had already tried. Interestingly several parents interviewed in the present study felt that advertisements influenced their younger child (under eight years old) more than their older one.

Both children and parents were asked about the influence of advertising on their food choices, and so the correlation between parents feeling advertisements influenced their child, and child feeling the same was examined. There was a correlation between the parent and child's answer however this was not significant ($p=0.057$).

Overall parents' concern appear to be similar to those concerns currently aired in the media relating to the foods advertised to children, in that they are highly processed, contain a lot of fat, sugar and additives. It is difficult to say whether encouraging the children to ask their parents to buy a food, or to want to try a food, is actually influencing a child's food choice, as many other factors come into play in between seeing an advertisement for a food and actually purchasing a food. These include point of sale marketing within the shopping environment.

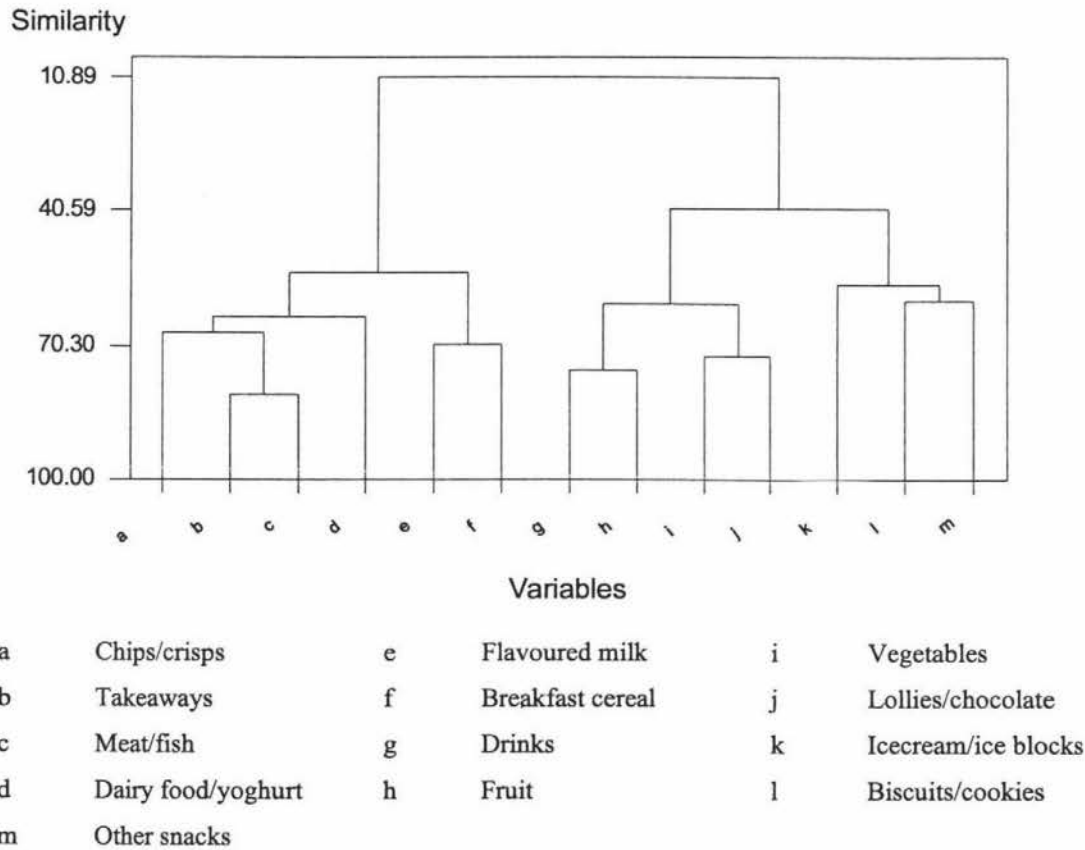
5.7.5 Buying food after seeing advertisement

Children were asked how often they bought a food after seeing an advertisement for it on television. Of boys 45% and girls 35% never or rarely bought foods after seeing them advertised. Fifty-seven and a half percent overall occasionally do and only one child regularly does. This question does infer a conscious connection between seeing the advertisement and buying the food however, which may not be there. The child may buy the food because they are familiar with it without making the connection to the advertisement. Children were also asked how often they bought a food just because they liked the advertisement for it. This implied a more direct, conscious link between seeing the advertisement and buying the food or drink. Overall 77.5% of children never or rarely did this however there were still 10% that were sometimes affected or even influenced by the advertisement.

After many parents feeling that advertisements made their child want to try a particular food, children were asked if this was really the case and did they want to try foods after seeing them advertised. The children answered 'yes' to many of the categories but the greatest percentage were for ice cream/ice

blocks, drinks, takeaways and lollies/chocolates. Over half of the children were keen to try crisps/chips, breakfast cereals, biscuits/cookies, flavoured milk, yoghurt and other snacks that they see advertised. In other words, half the children at one time or another would like to try everything they had seen advertised on television! This was supported by the foods that most of the children said ‘no’ or “I don’t know” to; meat/fish, vegetables and fruit. These foods were rarely advertised on television. In fact as seen in Part One, these are the foods *least frequently* advertised. Figure 5-7 shows the similarity in answers for each of the food types.

Fig 5-7 Multivariate cluster diagram of children wanting to try foods after seeing them advertised on television



There were two distinct groups. Children answered in a similar way for breakfast cereal, takeaways, lollies/chocolate, dairy food, ice cream/ice blocks and biscuits and most wanted to try these foods. Interestingly these foods grouped together were frequently advertised during children’s television. Children also answered similarly for meat/fish, fruit, vegetables, flavoured milk and breakfast cereal. Other than flavoured milk and breakfast cereal, these were not frequently advertised on television. These results confirm those in another New Zealand study in which after viewing advertisements, the subjects held a positive attitude towards the food and expressed a desire to try the food (Hammond et al, 1997³).

It was hypothesised that the more television viewed, thus the more times the food advertisements seen, the more the children would want to try the food. For each type of food in question twenty one of the children's questionnaire, the relationship between the answer and the amount of television viewed was examined. There was no relationship between *total weekly* television viewing and the food tried, however a significant, positive relationship was found between the children wanting to try chips/crisps and the number of hours of television they viewed *during the week* ($p=0.014$) and on the weekend ($p=0.003$) separately. There was also a significant relationship when the child's sex was examined along with television viewing and chips/crisps ($p=0.03$). The correlation between the children's answer for wanting to try takeaways and chips/crisps was analysed and a significant relationship found ($p=0.006$). As seen in Part One these foods were in the most frequently advertised categories on both channels during the week. There was no significant relationship between television viewing and children wanting to try the other types of foods. The relationship between children wanting to try foods they had seen advertised and their BMI was examined, and a significant positive relationship was found between children wanting to try ice cream/ice blocks and their BMI ($p=0.038$). There was no relationship between BMI and wanting to try any other foods. The significant relationship for only one food group was not easily explained. There was no relationship with television viewed so it could not be due to the child watching a lot of television and seeing the frequently advertised ice creams/ice blocks.

5.7.6 Favourite food or drink advertisement

Finally, children were asked their favourite food or drink advertisement. The favourite advertisements have been divided up into the same categories as those in Part One. Three children could not think of a food advertisement while the rest most commonly favoured advertisements for fast foods, sweet snacks and 'other' including a supermarket and a brand of pies. There was a correlation between the frequency advertisements were aired and the favourite advertisements for some categories, but not all. Fruit and vegetables and dairy products were not chosen at all by the children which is logical, as they are not commonly advertised. Conversely ice cream/ice blocks that were frequently advertised were not chosen by any of the children. The children appeared to favour advertisements for their qualities as well as the product. One chose the advertisement because they enjoyed eating the particular food and 10.5% chose it because "the food looks yum". A further 1% chose the advertisement because the food advertised was their favourite food and one astute child chose it because the advertisement was always played just before dinner and made him feel hungry. The advertisement grabbing the child's attention was the most common reason for liking it, followed by it being colourful and fun. Other reasons included humour, the music and the 'cool' people in it. These qualities are similar to those mentioned in the qualitative study mentioned earlier (Hammond et al, 1997³). In that study the children talked about finding the music, taste fun and cool characters used in the advertisements appealing.

It is important to point out that although they eventually came up with an answer, many children could not think of a food advertisement off the top of their head. This reinforces the belief that the effect of advertisements is immediate. Whether a person likes an advertisement or not must be influenced by how

they are feeling at the time – in other words they may like the advertisement because they feel like the food and thus they will ask their parent for it. Another time such as straight after a meal the same advertisement may have no immediate impact on the child. There was no correlation between favourite foods and favourite advertisements due to the small numbers in each category once they were divided up. It does follow though that if a child could not think of an advertisement immediately they would think of their favourite food and associate a liking for the food with the advertisement. This was in fact the case with some of the children liking an advertisement because they like the food.

5.8 Shopping

Many studies that examined television advertising and food choice examined the influence children had over shopping for the household and in particular how often they asked their parents to buy particular foods, especially those advertised, when shopping. As mentioned children aged eleven and twelve are starting to exhibit a degree of independence in their food choices and have a level of 'purchasing power'. This is more common nowadays with both parents working (Reyes, 2002). Researchers have tried to establish the relationship between food advertising and children's own purchases thus the children in the study were asked about food purchases on the way to and from school.

Equal numbers of boys and girls (40%) bought foods on the way to and/or from school. There were no significant differences in the responses of girls and boys. If they answered 'yes' the children were asked the three items they most commonly bought. The most common item bought was lollies (69% of the children). Soft drinks, crisps/chips and pies or sausage rolls followed this. Only boys were purchasing pies or sausage rolls and girls were buying lollies more often than boys. There was no consistent relationship between the foods the children were purchasing and the appearance of these foods in advertisements. Sweet snacks including lollies were advertised very frequently during children's television however as seen in Part One, soft drinks, fruit, and pies/sausage rolls are very rarely advertised. Children are frequently being driven to school now so there is less opportunity to make purchases. In addition, as well as competing with each other, food manufacturers are now competing with cell phone companies and other items such as 'Pokemon' cards for their cut of children's casual spending, which may be reflected above.

5.8.1 Purchase requests when shopping

There have been several studies carried out such as those by Galst & White (1976) and Goldberg, Gorn and Gibson (1978) that attempt to directly link the foods children were seeing advertised and the foods they ask for when shopping. Positive relationships have been found however a direct causal link cannot be proven. Parents in this study were asked how often children made 'purchasing influence attempts' for a food or drink when shopping. Only 2.5% of children overall never or rarely asked their parents to buy something. Sixty-five percent did occasionally and 32.5% of children regularly asked their parents to buy a particular food. The most common category of food requested was chocolate/lollies/gum. Drinks, dairy

products and sweet snacks followed this. A significant positive relationship was found between the frequency with which these children made food purchase requests and the number of hours of television they were watching each week ($p=0.045$). These findings support those in other studies in which a link between the amount of television viewed and the number of purchase influencing attempts has been found (Clancy-Hepburn et al, 1974).

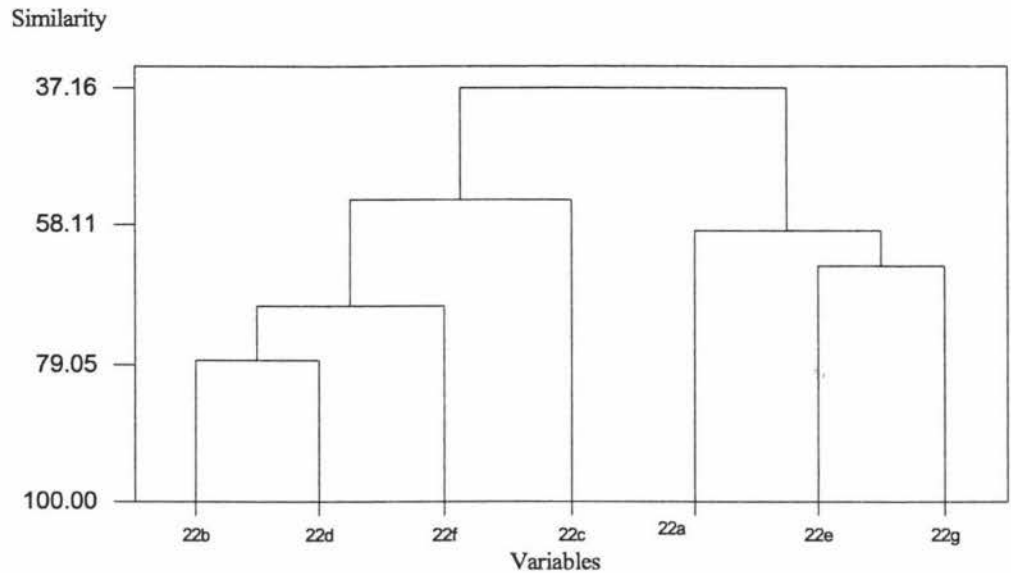
There does appear to be a relationship between foods frequently advertised to children and those they are requesting most such as sweets, drinks and sweet snacks. Once again however the relationship was not consistent with all the food groups. Dairy products other than milk, fruit, vegetables and bread were rarely advertised and children were requesting these foods too. Whether it is the 'point of sale' marketing, advertising or the careful placement of the foods in the market that impel the children to ask their parents it is impossible to say. Most likely the children were influenced by a combination of these factors as a number of factors interplay to influence what the child chooses.

5.8.2 Foods children would like to try after seeing advertisement

As a way of ascertaining whether these purchase-influencing attempts by the children were actually going to work, parents were asked how much influence children had on purchases of food for the household. For dairy products, meat/chicken/fish, bread/rolls/crumpets/muffins, fruit and vegetables the greatest proportion of parents felt their child had little influence. For breakfast cereal, snacks and drinks the children had a moderate to large influence. Figure 5-8 below shows the correlation in the way parents answered each part of the question.

There are two distinct clusters present. Parents answered in a similar way for meat/chicken/fish, bread etc, and fruit, vegetables and breakfast cereal. For the first three of these food groups as mentioned parents felt their child had little influence. The other cluster included dairy products, snacks and drinks and children have a lot of influence over these groups. The influence of boys versus girls on the purchase of foods was examined and the only significant difference between the two was in the purchase of drinks ($p=0.037$). Boys had greater influence over the purchase of drinks than girls. This was an interesting result, however the parents did not provide the reason behind this.

Fig 5-8 Multivariate cluster diagram of the level of influence child has on purchases for the household



- | | | | | | |
|---|-------------------|---|------------------------------|---|--------|
| a | Dairy products | d | Bread/rolls/crumpets/muffins | g | Drinks |
| b | Meat/chicken/fish | e | Snacks | | |
| c | Breakfast cereal | f | Fruit & vegetables | | |

It was not specified in what way the children influenced the purchase of these foods. Parents could buy specific brands or varieties of food for the child or they could be buy a whole category that they may not normally buy, such as snack foods or breakfast cereal. The foods that children were having the most influence over were also the most frequently advertised. Marketers are obviously aware of the level of influence children have over the purchase of certain foods, thus aim their marketing at children, and screen advertisements for these foods during adult viewing also. Advertisements for snack foods aired during adult television appealed to a parent's sense of duty to provide their children with the best food possible so talked more about the nutritional quality of the food than those aired during children's television. Foods such as meat and bread were foods that were going to be in most households, and parents were be buying them for adults as well as the child, thus the child may not have influence over these types of foods.

5.9 Nutrition Knowledge and Attitude to Healthy Foods

Studies have been carried out to examine the level of parent and child's nutritional knowledge and how this affected the amount of television being watched and children's food preferences (Clancy-Hepburn et al, 1974). These studies found that mothers with a greater knowledge of nutritional value of food watched less television and their children had a lower preference for heavily advertised foods and

consumed less of them. Establishing attitudes was difficult without leading the subject and with children it was particularly difficult to aim the questions at a level that can elicit information without being too difficult for them to understand. Another limitation was supplying an "I don't know" option as many children used it!

5.9.1 Children's attitude to healthy foods

Children were asked four simple questions to indicate how they felt about healthy food. The majority of children had a positive attitude to healthy foods and most of the uncertainty was in whether milk was good to drink anytime of the day and whether the child felt good after eating fruit and vegetables. The children agreed that it wasn't only adults that need to think about eating healthy foods. It was thought that if children had a better attitude to healthy foods this might influence their intake and impact on their BMI.

Mealtimes provided an opportunity for parents and children to discuss food related issues so the number of people eating with the child at meal times and their attitude to food was examined. It was thought that if the child was eating alone frequently, or with siblings only, that their attitude might be poorer than those regularly eating with other people. There was no correlation found between numbers at either breakfast or dinner and attitude. The correlation at dinner however was closer than at breakfast.

5.9.2 Parents' attitude to healthy foods

Parents were asked five basic questions to elicit the way they felt about healthy foods. Most parents agreed that eating a variety of foods was important and that food itself was preferable to vitamin and mineral consumption. The greatest discrepancy was in the question relating to increasing the amount of vegetables consumed. In hindsight this question was rather ambiguous, as some parents may have disagreed because they already get the right amount of fruit and vegetables in their diet. Each positive answer was given a mark of one and each negative zero and a score was compiled for each parent. It was thought that if a parent had a positive attitude to healthy foods that this may be passed on to the child, however there was no significant relationship found between children's attitude to healthy food and either parent's attitude or nutritional knowledge.

5.9.3 Parents' nutritional knowledge

Parents were also asked questions to determine their nutritional knowledge. Parents in this group had a good basic grasp of the nutrients that are contained in foods, such as hidden fats in food, and iron not only being found in meat. The greatest discrepancy in answers was in the question relating to drinking more milk to increase calcium intake with 27.5% disagreeing. It was not possible to determine the reason for parents disagreeing. One parent who had been diagnosed with osteoporosis and had read a lot on the subject was adamant that this would not increase her intake. Others may feel the same way or may

simply not be aware that milk contains calcium, although this was unlikely given their correct answers to other questions. It is likely that this was related to mis-conceptions about the absorption of calcium from milk and the amount of calcium contained in milk. The amount of television the parents were watching was not asked so results could not be compared to previous studies relating their own viewing with nutritional knowledge. However, the relationship between parent's nutritional knowledge and the number of hours their child watched television was examined and there was no correlation.

Parent's nutritional knowledge can come from many sources including *their* parents, print and other media, school, etc and different generations will be exposed to different levels. Thus out of interest the relationship between the parent's age and their nutritional knowledge was examined. Older parents answered more questions correctly and this was not just due to chance. A significant relationship was found between parent's age and nutritional knowledge ($p=0.030$). Parent's sources of nutrition education were not examined so there was no way to tell if the increased knowledge was due to experience, or changes in nutrition education in schools over time. There was no relationship between nutritional knowledge and parent's education level or sex, although with the low numbers of fathers participating in the study, the latter was to be expected. These results differ from those in another study in which those parents with a higher education level and job status had greater nutritional knowledge (Wardle et al, 2000).

5.10 Limitations of this study and suggestions for further study

The major limitation of this study was the homogenous, small population. Future studies should be of a larger sample in order to obtain more results that are statistically significant, and include subjects from a wide variety of socio-economic backgrounds to determine if the effects of advertising are different in other groups in society. Another limitation of this study was the lack of a control group. It is recommended that a study with a control group that does not watch television should be carried out. In this way comparisons can be made between the motivations behind food choices in both groups. It would be expected that as the control group do not see television advertisements their desire to try these types of foods and the frequency of consumption of heavily advertised foods might be lower. If this was not the case however, the study could determine where the children are learning about these foods. It may be possible that those who don't watch television very often may be more influenced as they see advertisements so infrequently, that when they do watch them they pay more attention than other children.

One more limitation of this study is that frequency of food intake is self-reported by the children which may have created a bias. This was necessary to keep the parent's questionnaire to a reasonable length. Any bias was minimised by giving examples of serving sizes on the questionnaire and reinforcing this verbally. It has been found however that at times children report the amount food they would *like* to eat rather than the *actual* amount they are eating. In further studies it may be beneficial to put these

questions to the parent. However this also may create a bias whereby parents report the amount their child *should* eat rather than *actually* eats.

It was difficult to make a direct link between seeing an advertisement and buying an advertised food because of the time lapse in between exposure to the advertisement and purchase. Thus it would be beneficial to actually be present when children were making the food choice so their motivations at the time could be established. This should be conducted in the setting where the choice is usually made. The National Children's Nutrition Survey 2002 released recently will provide a further indication as to what Kiwi children are eating however not what is influencing their choice. Without knowing more about the influences on their choices it is difficult to put programmes and initiatives in place to try to encourage them to make changes.

More catchy advertisements for healthy foods and nutrition education advertisements and infomercials should be designed and aired and a study carried out to determine the influence of these advertisements on children's food choices. The more television the children view, the more they might ask for these healthier foods.

6.0 CONCLUSION

The aim of this part of the research was to examine the relationship between television food advertising and children's food choices. Television food advertising is not the only influence on children's choices so other influences were examined to place the influence of advertising in context.

From the research it was possible to conclude that television food advertisements do have a significant influence on children. Advertisements influence children through creating a desire to try the foods they see advertised and thus children were asking their parents to buy the food. This effect was most likely short term - for the life of the advertisement.

It was not possible to conclude that advertisements were actually influencing a child's preferences i.e. altering their preference for a food category as there was no relationship between viewing television and their preference or consumption of a particular kind of food. There was also no consistent relationship between their favourite foods and snacks and the number of times they appeared during children's television. The relationship between the number of hours of television viewed and consumption of a food category was limited to takeaways and this was among the most frequently advertised food category on children's television. However it was not possible to conclude that watching television and thus viewing more advertisements was causing these children to eat more fast foods as other lifestyle factors may also be at play. This research does support the finding in other studies that there is a correlation between food advertising and children's food likes, dislikes and choices. However it is important to emphasise the distinction between correlation and causation. It was not possible to state that viewing advertisements was directly causing children to choose foods high in fat/salt/sugar/energy because as seen in this and other studies, it is important to place any influence of advertising in the context of the numerous other influences on the children's food choices. Both parents and children felt that family, friends, teachers and peers were part of the food choice decision in some way, as were the qualities of the food such as taste and appearance. No one of these factors stood out as having the greatest influence, except perhaps taste, rather they all interacted depending on the situation in which the food choice was made.

The more television the child was exposed to, the more food advertisements they saw, the more they wanted to try certain products and this translated into increased purchase influence attempts. Advertisers were using techniques to attract children's attention and make the food look irresistible and these techniques were working. Although children were seeing food advertisements and wanting to try the food, this did not mean they were necessarily eating the food because of the advertisement. Most of the children in this study did not make a conscious direct link to trying a food just because they liked the advertisement. The advertisements were directly causing children to ask their parents for these products and ultimately it was up to the parent as to whether or not they gave in to this 'pester power'. The present study did not investigate whether parents were giving in and purchasing these foods as a result of the child's purchase request, just that the children were asking. If parents were buying the foods then it

would be possible to conclude that advertisements were indirectly influencing children's actual food choices through the mediation of their parents. More research would have to be carried out to prove this.

Children in the study were watching on average just under two hours of television per day and were spending more time in front of the television than engaged in formal or informal physical activity. Many were overweight or at risk of overweight, although this was not correlated to television viewing. These findings support those presented in the Healthy Action: Healthy Eating Report published by the Ministry of Health in 2003 that a disturbing number of our children are increasingly inactive and overweight to obese.

We have seen that advertising was responsible for informing both children and adults of foods available and children's food purchase requests were directly linked to the number of hours of television they viewed and thus advertisements exposed to. Part One shows that most of these advertisements were for foods high in fat/sugar/salt/energy thus parent's concern about the types of food advertised to children was justified. However, contrary to the judgment voiced in the media, advertisements alone are not responsible for the increasing levels of physical inactivity and overweight and obese children. Rather the rise in obesity has come about at a time when convenient, pre-packaged energy dense food was increasingly available, a change in the family dynamic had occurred and there were many excuses not to exercise.

Numerous suggestions have been made to try and help at risk children and adults reduce their weight now and prevent others becoming overweight in the future. These include strategies to reduce energy intake and enhance energy output through the involvement of family, school, work, government and changes to the environment. These suggestions will not be looked at here, however the potential to use the medium of television advertising to educate and inform children and parents about healthy foods can be inferred from these results. Part One shows that the use of television to advertise fruit and vegetables and other healthy core foods had not been investigated widely. The results in Part Two prove that advertising informs children about available foods, and children do want to try these foods after seeing them advertised. This should provide further incentive to take advantage of the role of television in our lives. Children in this study were enthusiastic about food and nutrition and not cynical about advertising, and thus at this age and younger were an ideal target to instil good eating and physical activity habits and provide education to arm them for the future. This could be achieved through speaking to the children in a language they understood and making the education lively and entertaining. Strategies such as 'Five Plus a Day' that are uncomplicated, easy to understand and supported by schools and with advertising campaigns would be most successful. Resources could be made available to parents to allow them to educate their children as well as increase their own nutrition knowledge. Most families were eating their evening meal together and watching television together in the evening so this would be the ideal time to air advertisements that stimulated discussion about food and nutrition and provide an opportunity for parents and children to share their knowledge.

Ultimately the presence of unhealthy, energy dense snacks foods in households and the level of television children are viewing is up to the parents. Parents should ensure where possible that a wide variety of

food is available to the child and that children are aware of the consequences of eating different types of food so they can begin to make healthy choices that will stand them in good stead as they become increasingly independent in adolescence.

6.1 Key findings from the research

- Children were not consuming sufficient fruit, vegetables and dairy products
- There was a significant relationship between the amount of television viewed and the consumption of takeaways/fast foods
- There was a significant relationship between the number of hours of television viewed and children wanting to try particular food categories
- The more television children were watching, the more they asked their parents to buy foods they had seen advertised
- Television food advertisements influenced children through making the food look appealing and exciting and thus creating a desire to try the foods advertised
- The foods advertised were predominantly high in energy/fat/salt/sugar and advertisers were not adhering to guidelines limiting the repetition and duration of advertisements
- Children's food choices were influenced by both the qualities of the food and the people and environment around them. The level of influence each had would depend on the situation in which the food choice was made
- Many children were spending more time viewing television than they were participating in physical activity outside school hours

7.0 REFERENCES

1. A.C. Nielson (2001). Media Usage Statistics from A.C. Nielson Statistics.
<http://www.acnielson.co.nz>
2. Adamson, A.J., Rugg-Gunn, A.J., Butler, T.J., Appleton, D.R. (1996). The contribution of foods from outside the home to the nutrient intake of young adolescents. Journal of Human Nutrition and Dietetics 9: 55-68.
3. Advertising Codes of Practice (2002). Advertising Standards Authority Inc. Advertising Standards Complaints Board.
4. Ajzen, I. (2002). Constructing a TpB Questionnaire: Conceptual and Methodological Considerations
<http://www.unix.oit.umass.edu/%7eaizen/tpb.html>.
5. Ajzen, I. (2003). Theory of Reasoned Action/Theory of Planned Behavior. University of South Florida Department of Community and Family Health. <http://www.hsc.usf.edu/~kmbrown/TRA-TPB.htm>.
6. Ajzen, I., Fishbein, M. (1980). Understanding Attitudes and Predicting Behavior. Prentice-Hall Inc, New Jersey.
7. American Academy of Pediatrics. (2001). Committee on Public Education. Children, Adolescents, and Television. Pediatrics 107 (2) 123-425.
8. Anderson, A.S., Morris, S.E. (2000). Changing fortunes: changing food choices. Nutrition and Food Science 30 (1) 12-15.
9. Anonymous. (2003). The Elephant in the Room: Evolution, Behavioralism, and Counteradvertising in the Coming War Against Obesity. Harvard Law Review 116: 1161-1184.
10. Axelson, M.L., Brinberg, D., Durand, J.H. (1983). Eating at a Fast-food Restaurant - A Social-Psychological Analysis. Journal of Nutrition Education 15 (3) 94-98.
11. Axelson, M.L., Federline, T.L., Brinberg, D. (1985). A Meta-Analysis of Food-and Nutrition-Related Research. Journal of Nutrition Education 17 (2) 51-54.

12. Barker, L. ed. (1982). The Psychobiology of Human Food Selection. Ellis Horwood Ltd Publishers, England.
13. Barker, M.E., Thompson, K.A., McClean, S.I. (1995). Attitudinal dimensions of food choice and nutrient intake. British Journal of Nutrition 74: 649-659.
14. Barwise, T.P. (1997). How much does food and drink advertising influence children's diet? In: Children's Food Marketing and Innovation. Smith, G. ed. Blackie Academic & Professional, London.
15. Beardsworth, A., Keil, T. (1997). Sociology on the Menu – An Invitation to the Study of Food and Society. Routledge, New York.
16. Becker, A., Grinspoon, S., Klibanski, A., Herzog, D. (1999). Current Concepts: Eating Disorders. The New England Journal of Medicine 340 (14) 1092-1098.
17. Bell, D., Valentine, G. (1997). Consuming Geographies – we are where we eat Routledge, London.
18. Birch, L. (1998). Children's food acceptance patterns. Annales Nestlé 56 (1) 11-18.
19. Birch, L.L., Fisher, J.O. (1998). Development of Eating Behaviors Among Children and Adolescents. Pediatrics 101: S539-S549.
20. Birch, L.L. (2001). The Sweet Tooth. Notes from a presentation in Auckland, New Zealand October 2001.
21. Blundell, J., MacDiarmid, J. (1997). Fat as a risk factor for overconsumption: Satiation, satiety, and patterns of eating. Journal of the American Dietetic Association 97 (7) S63-S69.
22. Bolton, R.N. (1983). Modelling the Impact of Television Food Advertising on Children's Diets. Current Issues and Research in Advertising 6 (1) 173-199.
23. Booth, D. (1994). Psychology of Nutrition. Taylor and Francis Ltd.
24. Booth, S.L., Sallis, J.F., Ritenbaugh, C., Hill, J.O., Birch, L.L., Frank, L.D., Glanz, K., Himmelgreen, D.A., Mudd, M., Popkin, B.M., Rickard, K.A., St Jeor, S., Hays, N.P. (2001). Environmental and Societal Factors Affect Food Choice and Physical Activity: Rationale, Influences, and Leverage Points. Nutrition Reviews 59 (3) S21-S39.
25. Borah-Giddens, J., Falciglia, G.A. (1993). A Meta-Analysis of the Relationship in Food Preferences Between Parents and Children. Journal of Nutrition Education 25 (3) 102-107.

26. Borzekowski, D.L.G., Robinson, T.N. (2001). The 30-second effect: An experiment revealing the impact of television commercials on food preferences of preschoolers. Journal of the American Dietetic Association 101 (1) 42-46.
27. Brindson, S.C., George, J.H., Paulin, J.M., Aitken, E.F. (1992). What do snack foods contribute to the diets of Form one children? Proceedings of the Nutrition Society of New Zealand 17: 105-109.
28. Brown, D.B. (2003). About Obesity. International Obesity Task Force.
<http://www.obesite.chaire.ulaval.ca/iotf.htm>.
29. Brown, K., McIlveen, H., Strugnall, C. (2000). Nutritional awareness and food preferences of young consumers. Nutrition and Food Science 30 (5) 230-235.
30. Bulmer, S. (2001). Children's perceptions of advertising. Massey University Albany, Department of Commerce, College of Business. Working Paper Series No. 01.05, May.
31. Byrd-Bredbenner, C., Grasso, D. (2000¹). Trends in US prime-time television food advertising across three decades. Nutrition and Food Science 30 (2) 59-66.
32. Byrd-Bredbenner, C., Grasso, D. (2000²). What Is Television Trying to Make Children Swallow?: Content Analysis of the Nutrition Information in Prime-time Advertisements. Journal of Nutrition Education 32 (4) 187-195.
33. Calfee, J. (1998). How advertising informs to our benefit. Consumers' Research Magazine 81 (4) 13-19.
34. Calfee, J. (2003). Advertising bans, restrictions, and controls – do they work? Speech notes from The 2003 Food Symposium Wellington, New Zealand 05.03.03. Advertising Standards Authority Inc.
http://www.asa.co.nz/food_symposium/jack_calfee.htm
35. Campbell, K., Crawford, D. (2001). Family food environments as determinants of preschool-aged children's eating behaviours: implications for obesity prevention policy. A review. Australian Journal of Nutrition and Dietetics 58 (1) 19-25.
36. Capaldi, E. (1996). Why We Eat What We Eat - The Psychology of Eating American Psychological Association. Washington D.C.
37. Caplan, P. (1994). Feasts, Fasts, Famine - Food For Thought Berg Publishers Ltd.

38. Carper, J.L., Orlet Fisher, J., Birch, L.L. (2000). Young girls' emerging dietary restraint and disinhibition are related to parental control in child feeding. Appetite 00: 1-10.
39. Champion, M. (2003). Celebrating Results - Effie Awards 2003. The Independent New Zealand's Business Weekly October 1 2003.
40. Clancy-Hepburn, K., Hickey, A.A., Nevill, G. (1974). Children's Behavior Responses to TV Food Advertisements. Journal of Nutrition Education 6 (3) 93-96.
41. Collins Pocket English Dictionary (2003). Harper Collins Publishers, England.
42. Cotunga, N. (1988). TV Ads on Saturday Morning Children's Programming – What's New? Journal of Nutrition Education 20 (3) 125-127.
43. Crockett, S.J., Sims, L.S. (1995). Environmental Influences on Children's Eating. Journal of Nutrition Education 27 (5) 235-247.
44. Crotty, P.A., Rutishauser, I.H.E., Cahill, M. (1992). Food in low-income families. Australian Journal of Public Health 16 (2) 168-174.
45. Crotty, P. (1999). Food and Class. In: A Sociology of Food and Nutrition – The Social Appetite. Germov, J., Williams, L. eds. Oxford University Press, Australia.
46. Dalmeny, K. (2003). Food marketing: the role of advertising in child health. Consumer Policy Review 13 (1) 2-7.
47. Dalmeny, K., Hanna, E., Lobstein, T. (2003). Broadcasting bad health. Why food marketing to children needs to be controlled. The International Association of Consumer Food Organisations (IAFCO). London, England.
48. De Bruin, A., Eagle, L. (2000). Children, the Medium and the Message: Parental Perceptions of Children Directed Advertising Issues and Regulation. Massey University Albany, Department of Commerce, College of Business. Working Paper Series No. 00.14, May.
49. de Castro, J.M., de Castro, E.S. (1989). Spontaneous meal patterns of humans: influence of the presence of other people. American Journal of Clinical Nutrition 50: 237-47.
50. de Castro, J.M. (1997). Socio-cultural determinants of meal size and frequency. British Journal of Nutrition 77 (Suppl 1): S39-S55.

51. Devine, C.M., Connors, M., Bisogni, C.A., Sobal, J. (1998). Life-Course Influences on Fruit and Vegetable Trajectories: Qualitative Analysis of Food Choices. Journal of Nutrition Education 30: 361-370.
52. Devine, C.M., Sobal, J., Bisogni, C.A., Connors, M. (1999). Food Choices in Three Ethnic Groups: Interaction of Ideals, Identities and Roles. Journal of Nutrition Education 31 (2): 86-93.
53. Dickinson, R., Leader, S. (1996). The role of television in the food choices of 11-18 year olds. Nutrition and Food Science 96 (5) 9-14.
54. Dickinson, R., Leader, S. (1996). The role of television in the food choices of 11-18 year olds. British Food Journal 99 (9) 346-351.
55. Dickinson, R. (2000). Food and eating on television: impacts and influences. Nutrition and Food Science 30 (1) 24-29.
56. Dietz, W.H., Gortmaker, S.L. (1985). Do We Fatten Our Children at the Television Set? Obesity and Television Viewing in Children and Adolescents. Pediatrics 75 (5) 807-812.
57. Dietz, W.H., Gortmaker, S.L. (2001). Preventing Obesity in Children and Adolescents. Annual Reviews of Public Health 22:337-353.
58. Douglas, L. (1998). Children's food choice. Nutrition and Food Science 1: 14-18.
59. Drewnowski, A. (1997). Why do we like fat? Journal of the American Dietetic Association 97 (7) S58-S61
60. Drewnowski, A. (1998¹). Palatability and satiety: models and measures. Annales Nestlé 56 (1) 32-42.
61. Drewnowski, A. (1998²). Energy Density, Palatability, and Satiety: Implications for Weight Control. Nutrition Reviews 56 (12) 347-353.
62. Drewnowski, A. (2000). Sensory control of energy density at different life stages. The Proceedings of the Nutrition Society 59 (2) 239-244.
63. Duncan, K.H., Bacon, J.A., Weinsier, R.L. (1983). The effects of high and low energy density diets on satiety, energy intake, and eating time of obese and nonobese subjects. The American Journal of Clinical Nutrition 37: 763-767.

64. DuRant, R.H., Baranowski, T., Johnson, M., Thompson, W. (1994). The Relationship Among Television Watching, Physical Activity, and Body Composition of Young Children. Pediatrics 94 (4) 449-455.
65. Eagle, L., de Bruin, A. (2000). Advertising Restrictions: Protection of the Young and Vulnerable? Massey University Albany, Department of Commerce, College of Business. Working Paper Series No. 00.06, February.
66. Eagle, L., de Bruin, A., Bulmer, S. (2002). The Children-Nutrition-Marketing Ethics Conundrum: Identifying the Issues. Massey University Albany, Department of Commerce, College of Business. Working Paper Series No. 02.16, November.
67. Eagle, L., Bulmer, S., Hawkins, J. (2003). The 'Obesity Epidemic': Complex Causes, Controversial Cures – Implications for Marketing Communication. Draft Technical Report, Department of Commerce, Massey University, Auckland.
68. Eagle, L., Rose, L. (2003). Advertising in Mature Markets: Potentially Persuasive or Repurchase Reminder. Draft 4. Department of Commerce, Massey University Albany.
69. Fat Files (2003). Television programme aired on Prime Television 22/04/03.
70. Feunekes, G.I.J., Cees deGraaf, Meyboom, S., van Staveren, W.A. (1998). Food Choice and Fat Intake of Adolescents and Adults: Associations of Intakes within Social Networks. Preventative Medicine 27: 645-656.
71. Fiddes, N. (1995). The omnivore's paradox. In: Food Choice And The Consumer. Ed. Marshall, D.W. Blackie Academic and Professional, Glasgow.
72. Fieldhouse, P. (1995). Food and Nutrition – Customs and Culture Chapman and Hall, London.
73. Friedman, J. (1998). Leptin, Leptin Receptors, and the Control of Body Weight. Nutrition Reviews 56 (2) S38-S45.
74. Friedman, J.M. (2003). A War on Obesity, Not the Obese. Science 299: 856-858.
75. French, S.A., Story, M., Jeffery, R.W. (2001). Environmental Influences on Eating and Physical Activity. Annual Reviews of Public Health 22:309-335.

76. Food Standards Australia New Zealand (2003). Food Labelling Issues: Quantitative research with consumers. Part One Summary Report.
<http://www.foodstandards.gov.au/mediareleasespublications/publications/foodlabelling>.
77. Furst, T., Connors, M., Bisogni, C.A., Sobal, J., Falk, L.W. (1996). Food Choice: A Conceptual Model of the Process. Appetite 26: 247-266.
78. Galst, J.P., White, M.A., (1976). The Unhealthy Persuader: The Reinforcing Value of Television and Children's Purchase-Influencing Attempts at the Supermarket. Child Development 47: 1089-1096.
79. Galst, J.P. (1980). Television Food Commercials and Pro-Nutritional Public Service Announcements as Determinants of Young Children's Snack Choices. Child Development 51: 935-938.
80. Garrow, J. (1993). Energy Balance and Weight Regulation. In: Garrow, J., James, W. eds. Human Nutrition and Dietetics - 9th edition. Edinburgh, New York: Churchill Livingstone.
81. Gerbner, G., Gross, L., Morgan, M., Signorielli, N. (1981). Special Report. Health and Medicine on Television. The New England Journal of Medicine 305 (16) 901-904.
82. Germov, J., Williams, L. eds. (1999). A Sociology of Food and Nutrition – The Social Appetite. Oxford University Press, Australia.
83. New Zealand Television Broadcasters' Council (2001). Advertising on Television. Getting It Right For Children. [http:// www.nztbtc.co.nz](http://www.nztbtc.co.nz).
84. Gibson, R.S. (1990). Principles of Nutritional Assessment. Oxford University Press, New York.
85. Glanz, K., Basil, M., Maibach, E., Goldberg, J., Snyder, D. (1998). Why Americans eat what they do: Taste, nutrition, cost, convenience, and weight control concerns as influences on food consumption. Journal of the American Dietetic Association 98 (10) 1118-1126.
86. Goldberg, M.E., Gorn, G.J., Gibson, W. (1978). TV Messages for Snack and Breakfast Foods: Do They Influence Children's Preferences? Journal of Consumer Research 5: 73-81.
87. Goldberg, J.P. (1992). Nutrition and Health Communication: The Message and the Media Over Half a Century. Nutrition Reviews 50 (3) 71-77.
88. Gordon, J. (2003). Interview conducted 18 August 2003.

89. Gorn, G.J., Goldberg, M.E. (1982). Behavioral Evidence of the Effects of Televised Food Messages on Children. Journal of Consumer Research 9: 200-205.
90. Gortmaker, S.L., Must, A., Sobol, A.M., Peterson, K., Colditz, G.A., Dietz, W.H. (1996). Television Viewing as a Cause of Increasing Obesity Among Children in the United States, 1986-1990. Archives of Pediatrics and Adolescent Medicine 150: 356-362.
91. Grube, J.W., Wallack, L. (1994). Television Beer Advertising and Drinking Knowledge, Beliefs and Intentions Among Schoolchildren. American Journal of Public Health 84 (2) 254-259.
92. Gussow, J. (1972). Counternutritional Messages of TV Ads Aimed at Children. Journal of Nutrition Education 4: 48-52.
93. Gussow, J. (1973). It Makes Even Milk a Dessert, A Report on the Counternutritional Messages of Children's Television Advertising. Clinical Pediatrics 12 (2) 68-71.
94. Guthrie, J.F., Lin, B., Frazao, E. (2002). Role of food prepared away from home in the American diet, 1977-78 versus 1994-96: changes and consequences. Journal of Nutrition Education and Behavior 34 (3) 150-150.
95. Hammond, K.M., Wyllie, A., Casswell, S. (1997¹). The Extent and Nature of Televised Food Advertising in New Zealand. Alcohol and Public Health Research Unit, University of Auckland. ISBN 0 908970 88 9, May.
96. Hammond, K.M., Wyllie, A., Casswell, S. (1997²). Responses of Young People to Television Food Advertisements. Alcohol and Public Health Research Unit, University of Auckland. ISBN 0 0908970 86 2, May.
97. Hammond, K.M., Wyllie, A., Casswell, S. (1997³). Content Analysis of Television Food Advertisements. Alcohol and Public Health Research Unit, University of Auckland. ISBN 0 0908870 870, May.
98. Hastings, G., Stead, M., McDermott, L., Forsyth, A., MacKintosh, A., Rayner, M., Godfrey, C., Caraher, M., Angus, K. (2003). Review of research on the effects of food promotion to children. Final Report. University of Strathclyde. Centre for Social Marketing, Glasgow, Scotland.
99. Hertzler, A.A., Wenkam, N., Standal, B. (1982). Classifying cultural food habits and meanings. Journal of the American Dietetic Association 80: 421-425.

100. Hill, J.M., Radimer, K.L. (1997). A content analysis of food advertisements in television for Australian children. Australian Journal of Nutrition and Dietetics 54 (4) 174-181.
101. Hill, J.O., Wyatt, H.R., Reed, G.W., Peters, J.C. (2003). Obesity and the Environment: Where Do We Go from Here? Science 299: 853-855.
102. Hitchings, E., Moynihan, P.J. (1998). The relationship between television food advertisements recalled and actual foods consumed by children. Journal of Human Nutrition and Dietetics 11: 511-517.
103. Howell, D. (2003). Wacky colors, unconventional flavours appeal to the savvy youngster set. DSN Retailing Today Food and Consumables. May.
104. Hursti, U. (1999). Factors influencing children's food choice. Annals of Medicine 31 (Suppl 1): 26-32.
105. Imram, N. (1999). The role of visual cues in consumer perception and acceptance of a food product. Nutrition and Food Science 99 (5) 224-230.
106. Jahns, L., Siega-Riz, A.M., Popkin, B.M. (2001). The increasing prevalence of snacking among US children from 1977 to 1996. The Journal of Pediatrics 138 (4) 493-498.
107. James, W. (1993). Historical Perspective. In: Garrow, J., James, W. eds. Human Nutrition and Dietetics 9th edition.
108. Jas, P. (1998). Aspects of food choice behaviour in adolescents. Nutrition and Food Science 98 (3): 163-165.
109. Johansson, L., Thelle, D., Solvoll, K., Bjorneboe, G., Drevon, C. (1999). Healthy dietary habits in relation to social determinants and lifestyle factors. British Journal of Nutrition 81: 211-220.
110. Johnson, S.L., Birch, L.L. (1994). Parents' and children's adiposity and eating style. Pediatrics 94 (5): 653-661.
111. Kennedy, E. (1996). Healthy Meals, Healthy Food Choices, Healthy Children: USDA's Team Nutrition. Preventative Medicine 25: 56-60.
112. Kiess, W., Galler, A., Reich, A., Muller, G., Kapellen, T., Deutscher, J., Raile, K., Kratzsch, J. (2001). Clinical aspects of obesity in childhood and adolescence. Obesity Reviews 2: 29-36.

113. Kirby, S.D., Baranowski, T., Reynolds, K.D., Taylor, G., Binkley, D. (1995). Children's Fruit and Vegetable Intake: Socioeconomic, Adult-Child, Regional, and Urban-Rural Influences. Journal of Nutrition Education 27: 261-171.
114. Klesges, R.C., Shelton, M.L., Klesges, L.M. (1993). Effects of Television on Metabolic Rate: Potential Implications for Childhood Obesity. Pediatrics 91 (2) 281-286.
115. Kotz, K., Story, M. (1994). Food advertisements during children's Saturday morning television programming: Are they consistent with dietary recommendations? Journal of the American Dietetic Association 94 (11) 1296-1300.
116. Kurzer, M.S. (1997). Women, Food, and Mood. Nutrition Reviews 55 (7) 268-276.
117. Lawrence, V. (1993). Is Vegetarianism a Diet or an Ideology? Canadian Medical Association Journal 148 (60) 998-1000.
118. Lifshitz F., Tarim, O., Smith, M.M. (1993). Nutrition in Adolescence. Endocrinology and Metabolism Clinics of North America 22: 673-683.
119. Linder, M. (1991). Energy Metabolism, Intake, and Expenditure. In: Nutritional Biochemistry and Metabolism. Ed. Linder, M. 2nd ed. Appleton & Lange, Connecticut.
120. Lissner, L., Levitsky, D.A., Strupp, B.J., Kalkwarf, H.J., Roe, D.A. (1987). Dietary fat and the regulation of energy intake in human subjects. American Journal of Clinical Nutrition 46: 886-892.
121. Lowry, R., Wechsler, H., Galuska, D.A., Kann, J.E. (2002). Television Viewing and its Associations with Overweight, Sedentary Lifestyle, and Insufficient Consumption of Fruits and Vegetables Among US High School Students: Differences by Race, Ethnicity and G. Journal of School Health 72 (10) 413-421.
122. Maffeis, C. (2000). Aetiology of overweight and obesity in children and adolescents. European Journal of Pediatrics 159 (Suppl 1) S35-S44.
123. Marshall, D. (1995). Eating at home: Meals and food choice. In: Food Choice And The Consumer. Ed. Marshall, D.W. Blackie Academic and Professional, Glasgow.
124. Marx, J. (2003). Cellular warriors at the Battle of the Bulge. Science 299: 846-849.

125. Maskill, C., Jones, S., Wyllie, A., Casswell, S. (1996). Influences on the Eating Patterns and Food Choice of New Zealand Pakeha Adolescents: An Overview. Alcohol and Public Health Research Unit Report, June 1996, ISBN 0 908970 81 1.
126. Mathews, J. (1997). How to make effective advertising aimed at children. In: Children's Food Marketing and Innovation. Smith, G. ed. Blackie Academic & Professional, London.
127. McClean, H., Knowles, S. (1992). Television Advertising of Foods to Children in New Zealand. Journal of the New Zealand Dietetic Association 46 (1) 11-13.
128. McIntosh, W. (1996). Sociologies of Food and Nutrition. Plenum Press, New York and London.
129. Melnik, T.A., Rhoades, S.J., Wales, K.R., Cowell, C., Wolfe, W.S. (1998). Food consumption patterns of elementary schoolchildren in New York City. Journal of the American Dietetic Association 98 (92) 159-164.
130. Mennell, S., Murcott, A., van Otterloo, A. (1994). The Sociology of Food, Eating, Diet and Culture. SAGE Publications, London.
131. Ministry of Health (1997). Food Fantastic. Ngakai tino pai rawa. Eating for Healthy Children (2-12 Years). Ministry of Health, Wellington, New Zealand.
132. Ministry of Health (1999). NZ Food: NZ People. Key Results of the 1997 National Nutrition Survey. Ministry of Health, Wellington, New Zealand.
133. Ministry of Health (2002). Healthy Eating – Healthy Action Oranga Kai – Oranga Pumau. Towards an Integrated Approach to Physical Activity, Nutrition and Healthy Weight for New Zealanders. Ministry of Health, Wellington, New Zealand.
134. Ministry of Health (2003¹). Healthy Eating – Healthy Action Oranga Kai – Oranga Pumau: A Background. Ministry of Health, Wellington, New Zealand.
135. Ministry of Health (2003²). Nutrition and the Burden of Disease New Zealand 1997-2011. Public Health Intelligence Occasional Bulletin Number 17. Ministry of Health, Wellington, New Zealand.
136. Ministry of Health (2003³). NZ Food: NZ Children. Key Results of the 2002 National Children's Nutrition Survey. Wellington, New Zealand.
137. Morton, H. (1984). The television advertising of foods to children: a South Australian study. Journal of Food and Nutrition 41 (4) 170-175.

138. Morton, H. (1990). Television Food Advertising: A Challenge for the New Public Health in Australia. Community Health Studies XIV (2) 153-161.
139. Moschis, G.P., Moore, R.L. (1982). A Longitudinal Study of Television Advertising Effects. Journal of Consumer Research 9: 279-286.
140. Nasser, J. (2001). Taste, food intake and obesity. Obesity Reviews 2 (4) 213-218.
141. National Center for Disease Control and Prevention (2000). CDC Growth Charts: United States <http://www.cdc.gov/growthcharts>.
142. Neumark-Sztainer, D., Story, M., Perry, C., Casey, M.A. (1999). Factors influencing food choices of adolescents: Findings from focus-group discussions with adolescents. Journal of the American Dietetic Association 99 (8): 929-934, 937.
143. Nestle, M., Wing, R., Birch, L., Di Sogra, L., Drewnowski, A., Arbor, A., Middleton, S., Sigman-Grant, M., Sobal, J., Winston, M., Economos, C. (1998). Behavioral and Social Influences on Food Choice. Nutrition Reviews 56 (5) (Suppl 11) S50-S74.
144. Nicklas, T.A., Baranowski, T., Baranowski, J.C., Cullen K., Rittenberry, L.T., Olvera, N. (2001). Family and Child-Care Provider Influences on Preschool Children's Fruit, Juice, and Vegetable Consumption. Nutrition Reviews 59 (7) 224-231.
145. O'Connor, D. (2003). Obesity and Children – Possible Causes, Possible Solutions. Speech notes from The 2003 Food Symposium Wellington, New Zealand 05.03.03. Advertising Standards Authority Inc. http://www.asa.co.nz/food_symposium/damien_o_connor.htm.
146. O'Dea, J.A. (2003). Why do kids eat healthful food? Perceived barriers of and barriers to healthful eating and physical activity among children and adolescents. Journal of the American Dietetic Association 103 (4) 497-499.
147. Oliveria, S.A., Ellison, R.C., Moore, L.L., Gillman, M.W., Garrahie, E.J., Singer, M.R. (1992). Parent-child relationships in nutrient intake: the Framingham Children's Study. American Journal of Clinical Nutrition 56: 593-598.
148. O'Neill, D. (2003). Active New Zealand Kids. Speech notes from The 2003 Food Symposium Wellington, New Zealand 05.03.03. Advertising Standards Authority Inc. http://www.asa.co.nz/food_symposium/diana_oneill.htm.

149. Ostbye, T., Pomerleau, J., White, M., Coolich, M., McWhinney, J. (1993). Food and Nutrition in Canadian "Prime Time" Television Commercials. Canadian Journal of Public Health November-December.
150. Owen, S. (1997). Food choice: how to assess attitudes of pre-adolescent children. British Food Journal 99 (4) 148-153.
151. Parnell, W. (1997). Socio-economic disadvantage and nutritional status in New Zealand. In: Poverty and Food in Welfare Societies. Kohler, B.M., Feichtinger, E., Barlosius, E. et al eds. Sigma, Berlin.
152. Philip, J., Nelson, M., Ralph, A., Leather, S. (1997). Socioeconomic determinants of health: The contribution of nutrition to inequalities in health. British Medical Journal 314 (7093) 1545-1549.
153. Picciano, M.F., McBean, L.D., Stallings, V.A. (1999). Nutrition and the Life Cycle How To Grow A Healthy Child: A Conference Report. Nutrition Today 34 (1) 6-13.
154. Pirouznia, M. (2001). The influence of nutrition knowledge on eating behaviour – the role of grade level. Nutrition and Food Science 31 (2) 62-67.
155. Pi-Sunyer, X. (2003). A Clinical View of the Obesity Problem. Science 299: 859-860.
156. Poppitt, S.D., Prentice, A.M. (1996). Energy Density and its Role in the Control of Food Intake: Evidence from Metabolic and Community Studies. Appetite 26: 153-174.
157. Post, B., Kemper, H., Storm-Van Essen, L. (1996) Longitudinal changes in nutritional habits of teenagers: Differences in intake between schooldays and weekend days. British Journal of Nutrition 57: 161-176.
158. Raats, M., Dailliant-Spinnler, Deliza, R., McFie, H. (1995). Are sensory properties relevant to consumer food choice? In: Food Choice And The Consumer. Ed. Marshall, D.W. Blackie Academic and Professional, Glasgow.
159. Radimer, K.L., Hill, J.M. (1996). Nutrition messages on Australian television shows. Australian Journal of Nutrition and Dietetics 53 (3) 115-121.
160. Reece, B.B., Rifon, N.J., Rodriguez, K. (1999). Selling Food to Children: Is Fun Part of a Balanced Breakfast? In: Advertising to Children Concepts and Controversies. Macklin, M.C., Carlson, L. eds. American Academy of Advertising, Sage Publishing, California.

161. Reyes, S. (2002). Into the Mouths of Babes. Brandweek 43 (18) 26-30.
162. Rickert, V.I. (1996). Adolescent Nutrition Assessment and Management. Chapman and Hall, London.
163. Robbins, S. (1996). Women's Self-Conception of Nutrition: Societal Influences on Eating Behaviour. In: Nutritional Concerns of Women. Wolinsky, I., Klimis-Tavantzis, D. eds. CRC Press, New York.
164. Robinson, S. (2000). Children's perceptions of who controls their food. Journal of Human Nutrition and Dietetics 13: 163-171.
165. Robinson, T.N., Hammer, L.D., Killen, J.D., Kraemer, H.C., Wilson, D.M., Hayward, C., Taylor, C.B. (1993). Does Television Viewing Increase Obesity and Reduce Physical Activity? Cross-sectional and Longitudinal Analyses Among Adolescent Girls. Pediatrics 91 (2) 273-280.
166. Roedder John, D. (1999). Through the Eyes of a Child: Children's Knowledge and Understanding of Advertising. In: Advertising to Children Concepts and Controversies. Macklin, M.C., Carlson, L. eds. American Academy of Advertising, Sage Publishing, California.
167. Rolls, B.J. (1988). Food beliefs and food choices in adolescents. The Medical Journal of Australia (148) Feb 1, S9-S13.
168. Rolls, B.J., Rowe, E.A., Rolls, E.T. (1982). How Sensory Properties of Foods Affect Human Feeding Behavior. Physiology and Behavior 29: 409-417.
169. Rolls, B.J., Rolls, E.T., Rowe, E.A., Sweeney, K. (1980). Sensory Specific Satiety in Man. Physiology and Behavior 27: 137-142.
170. Rozin, P. (1996). The socio-cultural context of eating and food choice. In: Food Choice, Acceptance and Consumption. Meiselman, H.L., MacFie, H.J.H. eds. Blackie Academic & Professional, London.
171. Schiffman, S. (1998). Physiology of Taste. Annales of Nestle 56 (1) 1-10.
172. Shannon, B., Peacock, J., Brown, M.J. (1991). Body Fatness, Television Viewing and Calorie-Intake of a Sample of Pennsylvania Sixth Grade Children. Journal of Nutrition Education 23 (6) 262-268.
173. Sheehy, T., Morrissey, P. (1998). Functional Foods: prospects and perspectives. In: Nutritional Aspects of Food Processing and Ingredients. Henry, C., Heppell, N. eds. Chapman & Hall, Oxford.

174. Shepherd, R., Farleigh, C.A. (1986). Preferences, Attitudes and Personality as Determinants of Salt Intake. Human Nutrition: Applied Nutrition 40A: 195-208.
175. Shepherd, R., Dennison, C.M. (1996). Influences on adolescent food choice. Proceedings of the Nutrition Society 55 (1B), 345-357.
176. Shepherd, R. (1999). Social determinants of food choice. Proceedings of the Nutrition Society 58: 807-812.
177. Skeaff, S.A., Thomson, C.D., Gibson, R.S. (1997). Food patterns of a random sample of Dunedin school children aged 8-10 years. Proceedings of the Nutrition Society of New Zealand 22: 98-101.
178. Skinner, J., Carruth, B.R., Moran III, J., Houck, K., Schmidhammer, J., Reed, A., Coletta, F., Cotter, R., Ott, D. (1998). Toddlers' Food Preferences: Concordance with Family Members' Preferences. Journal of Nutrition Education 30: 17-22.
179. Sloan, A. (1998). Food Industry Forecast: Consumer Trends to 2020 and Beyond. Food Technology 52, (1) 37-44.
180. Smith, P. (2003). Fat Chance. Marketers chew the fat on obesity. N.Z. Marketing Magazine, 22 (2) 8-13.
181. Somer, E. (1993). Nutrition for Women –The Complete Guide. Henry Holt and Company, Inc.
182. Spake, A., Brophy Marcus, M. (2002). A Fat Nation. U.S. News & World Report 133 (7) 40-48.
183. Spencer, W. (1991). The Challenge of World Hunger. Enslow Publishers Inc.
184. Stanbrook, L. (1997). The politics of advertising to children. In: Children's Food Marketing and Innovation. Smith, G. ed. Blackie Academic & Professional, London.
185. Stanek, K., Abbott, D., Cramer, S. (1990). Diet quality and the eating environment of preschool children. Journal of the American Dietetic Association 90: 1582-1584.
186. Steinbeck, K.S. (2001). The importance of physical activity in the prevention of overweight and obesity in childhood: a review and an opinion. Obesity Reviews 2: 117-130.
187. Stephens, A. (1997). 11th Constance Shearer Memorial Lecture 1997 Food, Diet, and Gender in the 21st Century. Journal of the New Zealand Dietetic Association 51 (2) 51-56.

188. Stephenson, G. (2001). Nutrient intakes from commonly advertised foods. British Nutrition Foundation Nutrition Bulletin 26: 153-157.
189. Story, M., Faulkner, P. (1980). The Prime Time Diet: A Content Analysis of Eating Behavior and Food Messages in Television Program Content and Commercials. American Journal of Public Health 80 (6) 738-740.
190. Stratton, P., Bromley, K. (1999). Families' Accounts of the Causal Processes in Food Choice. Appetite 33: 89-108.
191. Swinburn, B. (2003). Influencing obesogenic environments. Perspectives, Nutrition News and Views. Issue 16, April 2003: 6-7.
192. Sylvester, G.P., Achterberg, C., Williams, J. (1995). Children's Television and Nutrition: Friends or Foes? Nutrition Today 30 (1) 6-15.
193. Taras, H.L. (1995). Advertised Foods on Children's Television. Archives of Pediatrics and Adolescent Medicine 149 (6) 649-652.
194. Thomas, J. (1991). Food choice and preferences of schoolchildren. Proceedings of the Nutrition Society 50: 49-57.
195. Thompson, K.E., Haziris, N., Alekos, P.J. (1994). Attitudes and Food Choice Behaviour. British Food Journal 96 (11) 9-13.
196. Turrell, G. (1998). Socioeconomic differences in food preference and their influence on healthy food purchasing choices. Journal of Human Nutrition and Dietetics 11 (2) 135-149.
197. Tonge, B.J., Bretherton, D., Jarman, F., Menahem, S., Sanson, A. (1994). The Australian College of Paediatrics Policy Statement Children's Television. Journal of Paediatric Child Health 30: 6-8.
198. van den Brul, C., Spindler, S. (1984). Tomorrow's World Food. The British Broadcasting Corporation.
199. Walsh, L.M., Toma, R.B., Tuveson, R.V., Sondhi, L. (1990). Color, preference and food choice among children. The Journal of Psychology 124 (6) 645-653.
200. Walters, R., Zwaga, W. (2001). The Younger Audience. Children and Broadcasting in New Zealand. Dunmore Press Ltd in association with The Broadcasting Standards Authority, Palmerston North, New Zealand.

201. Wardle, J., Parmenter, K., Waller, J. (2000). Nutrition knowledge and food intake. Appetite 34: 269-275.
202. Way, W. (1983). Food-Related Behaviors on Prime-Time Television. Journal of Nutrition Education 15 (3) 105-109.
203. Wicks, D. (1999). Humans, Food, and Other Animals: The Vegetarian Option. In: A Sociology of Food and Nutrition – The Social Appetite. Germov, J., Williams, L. eds. Oxford University Press, Australia.
204. Widdowson, P., Williams, G. (1999). Regulation of Appetite. The Diabetes Annual 12, 211-227.
205. Williams, L., Germov, J. (1999). The Thin Ideal: Women, Food and Dieting. In: A Sociology of Food and Nutrition – The Social Appetite. Germov, J., Williams, L. eds. Oxford University Press, Australia.
206. Wilson, N., Quigley, R., Mansoor, O. (1999). Food ads on TV: a health hazard for children? Australian and New Zealand Journal of Public Health 23 (6) 647-650.
207. Wong, N.D., Hei, T.K., Qaundah, P.Y., Davidson, D.M., Bassin, S.L., Gold, K.V. (1992). Television Viewing and Pediatric Hypercholesterolemia. Pediatrics 90 (1) 75-79.
208. Woodward, D.R. (1993). The media's influence on teenagers' nutrition. Proceedings of the Nutrition Society of New Zealand 18: 38-45.
209. Woodward, D.R., Cumming, F.J., Ball, P.J., Williams, H.M. (1992). Does Television Affect Teenagers' Diets? Proceedings of the Nutrition Society of Australia 17: 48.
210. Woodward, D.R., Cumming, F.J., Ball, P.J., Williams, H.M., Hornsby, H., Boon, J.A. (1997). Does television affect teenagers' food choices? Journal of Human Nutrition and Dietetics 10: 229-235.
211. World Health Organisation. (2003). Controlling the global obesity epidemic.
<http://www.who.int/nut/obs.htm>.
212. Yao, M., Roberts, S.B. (2001). Dietary Energy Density and Weight Regulation. Nutrition Reviews 59 (8) 247-258.
213. Young, B., Hetherington, M. (1996). The literature on advertising and children's food choice. Nutrition and Food Science 96 (5) 15-18.

APPENDIX A

Application to the Massey University Albany Campus Human Ethics Committee for approval of the study

(Revised 3 July 2001)

AKL/PN/WGTN Protocol

MASSEY UNIVERSITY HUMAN ETHICS COMMITTEE

To: Secretary
Human Ethics Committee
Principal's Office
Albany, Auckland

OR Secretary
Human Ethics Committee
Old Main Building
Turitea, Palmerston North

OR Secretary
Human Ethics Committee
Block 5
Wellington

Please send/deliver this original (1) application plus eleven (11) copies

**APPLICATION FOR APPROVAL OF PROPOSED TEACHING/RESEARCH
PROCEDURES INVOLVING HUMAN SUBJECTS**

APPLICANT(S): Name: Patsy Watson for Cushla Gordon

Department: Institute of Food Nutrition and Human Health, Albany Campus

Contact Email/Number: p.watson@massey.ac.nz

Status: Programme Leader in Human Nutrition
(e.g. lecturer, PhD/masterate student)

Name of Employer: Massey University

PROJECT: Title: Food preferences and food choices of eleven and twelve year old children as they relate to television viewing habits

Status: Masterate
(e.g. staff research, doctorate/masterate)

Funding Source: Not applicable

Clinical Trial Status: yes ☐ no ☐ ***

ATTACHMENTS:

(e.g. Information Sheet(s), Consent Form(s), Questionnaire, etc)

Letters, Information sheets, Consent form, Data collection sheets,
Questionnaires, Feedback forms, Participation certificates.

SUPERVISOR(S): Name: Patsy Watson

Department: Institute of Food Nutrition and Human Health, Albany Campus

SIGNATURE(S): Applicant(s): Cushla J Gordon

Supervisor(s): P J Watson, Carol Wham

(required for all projects involving student research, implies satisfaction with application)

DATE: 12 June, 2002

OFFICE USE ONLY

Received:

Decision:

Application Content

1. DESCRIPTION

1.1 Justification

Children in the eleven to twelve year age group watch on average approximately three hours of television a day and are most exposed to advertisements for confectionary, fast food services and soft drinks. With increasing levels of childhood obesity and the recognition that we in New Zealand are currently facing an obesity epidemic, this is of real concern. It is thought that food advertising during children's television has a great influence on their food attitudes, beliefs and habits. This research will examine the relationship between children's television viewing habits and their food choices and food preferences. The results should provide insight into the way children feel about advertising and food and how they make decisions relating to each. This information can then be used in nutrition education aimed at children

1.2 Objectives

- + To investigate the child's eating habits and examine the parent / child's attitude to healthy foods.
- + To determine the level of influence the child has on food purchases for the household.
- + To investigate the child's television viewing habits and examine the influence of television food advertisements on the child's food purchase decisions.
- + To investigate mother and child's attitude to television food advertisements.
- + To assess the mother's nutritional knowledge.
- + To examine the relationship between the child's body mass index for age and their attitude to food and television.
- + To analyse the frequency and content of television food advertisements aimed at children.

1.3 Procedures for Recruiting Participants and Obtaining informed Consent

The participants of this study will be selected from two Auckland schools. There will be one upper and one lower decile school. A letter will be sent to Principals asking them if their school would be interested in participating (See page 1). From there permission will be obtained from the school Board of Trustees (See page 2). If approval is obtained information letters will be sent home via the school to potential families inviting them to participate and including a brief description of the study (See page 3). Children will receive an information pamphlet (See pages 4- 9) and consent form (page 10). Once the families agree to participate and consent forms have been sent back in the stamped, addressed envelope provided, the researcher will send each consenting family via a letter inviting them to ask any questions they might have before the study commences and informing them that the researcher will contact them for their interview (See page 11).

1.4 Procedures in which Research Participants will be involved

This study is in two parts. The first part involves the applicant only. Here she will analyse the content of advertisements recorded on seven days of television played during children's viewing hours on all appropriate channels. The second part involves the participants.

At the participants' home in an interview of approximately one hour's duration the researcher will:

- + administer a questionnaire to both parent and child (See pages 12 – 34)
- + measure the height and weight of the child. (See page 35)

1.5 Procedures for handling information and material produced in the course of the research including raw data and final research report(s)

All volunteers will be given a code number. A separate master file will be kept linking subject name and address to code number. This master file will be kept under lock and key and stored in a separate location to the data. Data collection forms will be identified by code number only. When organising interviews the researcher will place removable name and address labels on each subject's data collection forms. These labels will be removed and destroyed once the interview is complete or the data collected. All data entered in the computer will be identified by code number only. Electronic data will be stored on the researcher's hard drive or personal H; drive on the network and will be accessible by password only, by the researcher or her supervisors. The password will be changed regularly to maintain security. All completed data collection forms will be stored in locked filing cabinets in the nutrition research data storage room at the Albany Campus, which is locked and alarmed when no researcher is present.

No subject will be identified either by name or by code number in the final research report, or in any conference presentations or scientific papers that may result from this work.

1.6 Procedures for sharing information with Research Participants

At the completion of the study each subject will receive a summary of their personal results and body measurements, a summary of the overall results (See page 36-41) and a Participation Certificate (See page 42). Schools that participated will receive a Participation Certificate (See page 43 and a summary of relevant results (See page 44-45).

1.7 Arrangements for storage and security, return, disposal or destruction of data

The hard copy of all data will be kept in a locked data storage room, in a building fitted with a burglar alarm. Only authorized personnel have access to this room. The file connecting the subjects' name, address and phone number will be kept under lock and key by Patsy Watson, Programme Leader in Human Nutrition. The subjects' identity will not be revealed in any results, thesis or research papers that result from this work.

2. ETHICAL CONCERNS

2.1 Access to Participants

Two Auckland Intermediate Schools will be approached to provide volunteers for this study. . A letter will be sent to Principals asking them if their school would be interested in participating (See page 1). From there permission will be obtained from the school Board of Trustees (See page 2). If approval is obtained the study will proceed in that school. The participants of the study will be chosen according to their appropriate age and sex. A letter from the researcher will be sent home with children asking families if they would like to participate (See page 3) along with a detailed information sheet, a pamphlet for children, a contact details form and a consent form (See page 4-10). Once the families agree to participate and consent forms have been sent back in the stamped, addressed envelope provided, the researcher will send each consenting family via a letter inviting them to ask any questions they might have before the study commences and informing them that the researcher will contact them for their interview (See page 11) at a time and location chosen by the subject e.g. at home.

2.2 Informed Consent

All volunteers will be given the information sheet describing the purpose of the study and what will be required of them (See page 4-9). It explains the rights of the volunteers, including the right to decline to take part in all or any part of the study at any time. Assurance of confidentiality is clearly stated. Volunteers will have the opportunity to ask questions of the researcher or supervisors at any time before or after they sign the consent form.

2.3 Anonymity and Confidentiality

The measures taken in 1.5 and 1.7 will be used to ensure the anonymity and confidentiality of the volunteers.

2.4 Potential Harm to Participants

There is no possible harm that can befall volunteers for this study. All participants have the right to decline to take part in any aspect of the study they feel uneasy with.

2.5 Potential Harm to the Researcher

The study methodology involves no possible harm to the researcher. If she feels threatened at any time she will leave the premises immediately. She will carry a mobile phone with her at all times she is in the field.

2.6 Potential Harm to the University

This study can bring no harm to the University. The strict anonymity, confidentiality and professional attitude applied during collection and handling of data should avoid any potential embarrassment to the University.

2.7 Participant's Right to Decline to take Part

The information sheet and consent form clearly state that the volunteer can decline to take part in the study, can decline to take part in any section of the study e.g. body measurements, can decline to answer any question, or can withdraw from the study at any time. This message will be repeated verbally during the home visit.

2.8 Uses of the Information

The information obtained from the study will be analysed and written up as a research report (thesis). The results will be presented at an appropriate conference and if suitable written up as a paper for a refereed journal. The results will also be of use to health authorities when devising nutrition education programmes for this age group. Each volunteer will receive a brief outline of his or her results and a summary of overall results (See page 36-41) and a participation certificate (See page 42).

2.9 Conflict of Interest/Conflict of Roles

This study involves no conflict of interest for either the researcher or the supervisors.

2.10 Other Ethical Concerns

If during the course of her research the researcher encounters a serious social, family or health problem, after listening attentively she will suggest the subject contact a suitable counsellor, social agency or their family doctor, whichever is appropriate. If she encounters a financial problem she will suggest the subject contact WINZ.

3. LEGAL CONCERNS

3.1 Legislation

Intellectual Property Legislation e.g. Copyright Act 1994

Any scientific material will be appropriately referenced. The data collected will belong to Massey University.

3.1.1 Human Rights Act 1993

The questions and procedures involved in the study were carefully designed to contain no verbal or physical abuse, and contain no insulting or derogatory remarks directed at any section of the community.

3.1.2 Privacy Act 1993

The information required will be collected directly from the subjects and recorded as hard copy. No video or audio records will be used. Measures to ensure confidentiality for volunteers are detailed in section 1.5 and 1.7. These confidentiality measures will also cover those who choose to withdraw from the study at any time. The information collected will only be used for the purposes outlined in the information sheet. Publications will contain none of the participant's names or any information that may identify them. Massey University is clearly identified as the body responsible for the study.

3.1.3 Health and Safety in Employment Act 1992

No potential hazards are foreseen.

3.1.4 Accident Rehabilitation Compensation Insurance Act 1992

The researcher and her subjects are covered under this legislation.

3.1.5 Employment Contracts Act 1991

Not applicable.

3.1.6 Other Legal Issues

Not applicable.

4. CULTURAL CONCERNS

Not applicable

5. OTHER ETHICAL BODIES RELEVANT TO THIS RESEARCH

5.1 Professional Codes

Not applicable

6. OTHER RELEVANT ISSUES

None that we perceive at this time.

XtraMSN Home

Hotmail

Web Search

People & Chat

Shopping

xtramsn

Visit

xtramsn

Hotmail

Home

Inbox

Compose

Contacts

Options Help

gordonandgwin@hotmail.com

Save Address(es) Block

[Previous](#) [Next](#) | [G](#)**From:** "Turner, Merle" <M.L.Turner@massey.ac.nz>**To:** gordonandgwin@hotmail.com**CC:** "Watson, Patsy" <P.Watson@massey.ac.nz>, "Wham, Carol" <C.A.Wham@massey.ac.nz>**Subject:** HUMAN ETHICS APPROVAL APPLICATION: MUAHEC 02/048**Date:** Fri, 28 Jun 2002 15:37:42 +1200

Reply Reply All Forward Delete Put in Folder...

[Printer Friendly Vers](#)

"Food Preferences and Food Choices of Eleven and Twelve Year Old
they relate to Television Viewing Habits"

Cushla Gordon

Department:

Institute of Food Nutrition and Human Health

Supervisor:

Patsy Watson, Carol Wham

Thank you for the above protocol which was received and considered by the Massey University, Albany Campus, Human Ethics Committee at its meeting held on 27 June 2002.

The Committee would like to commend you on the Participation Certificate and Thank You letter you have devised for participants.

Your protocol is provisionally approved, subject to some revisions being made.

1. The Committee disagrees with your contention that there are no cultural concerns with your project, and feels that you should reconsider this issue.
2. For your safety, is suggested that you be accompanied when you visit private homes, and you may wish to reconsider providing your home phone number.
3. The Committee recommends that you exercise particular care and sensitivity when you feed back information.
4. We suggest you use the term "parent or caregiver" on all the forms you are using.
5. The Committee suggests you amend the last section of the Child's Information Sheet to read: "...totally confidential within the family"
6. It is not possible for participants to withdraw at any time from the study. We suggest that participants be given a specific time up to which they may withdraw, and this should be stated on both the Information Sheet and the Consent Form.
7. Please note that University Research Policy requires you to hold information for five years.

Once you have provided us with the revisions, your protocol can be formally approved.

Please note that from 2002, the Committee is requiring that the following statement be included at the bottom of Information Sheets:

" This project has been reviewed and approved by the Massey University Regional Human Ethics Committee, Albany Campus, Protocol MUAHEC 02/048. If you have any concerns about the conduct of this research, please contact Associate-Professor Kerry Chamberlain, Chair, Massey University Regional Human Ethics Committee, Albany, telephone 09 443 9799, email K.Chamberlain@massey.ac.nz <<mailto:K.Chamberlain@massey.ac.nz>>." "

Yours sincerely

Dr Brian Murphy, Deputy Chair
 Massey University Regional Human Ethics Committee: Albany
 Merle Turner
 Secretary
 Massey University Human Ethics Committee, Albany
 Study Centre, Massey University at Albany
 ph (09) 443 9799, extn 9539
 Fax (09) 414 0814, internal 9414
 email M.L.Turner@massey.ac.nz
www.massey.ac.nz/~muhec

Reply Reply All Forward Delete Put in Folder...

Previous Next | Close

xtramsn More Useful Everyday

XtraMSN Home

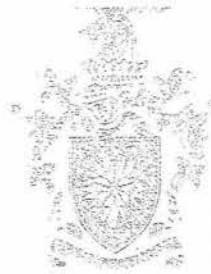
Hotmail

Web Search

People & Chat

Shopping

© 2002 Microsoft Corporation. All rights reserved. TERMS OF USE TRUSTe Approved Privacy Statement



Office of the Principal
Massey University
Albany Campus
Private Bag 102 904,
North Shore MSC,
Auckland, New Zealand
Principal: 64 9 443 9700 ext 9517
Regional Registrar: 64 9 443 9700
ext 9516
Facsimile: 64 9 414 0814

6 August 2002

Cushla Gordon
C/o Patsy Watson
Institute of Food Nutrition and Human Health
Massey University
Albany

Dear Cushla

HUMAN ETHICS APPROVAL APPLICATION – MUAHEC 01/048
"Food Preferences and Food Choices of Eleven and Twelve Year Old Children as they relate to Television Viewing Habits"

Thank you for your application. It has been fully considered, and approved by the Massey University, Albany Campus, Human Ethics Committee.

If you make any significant departure from the Application as approved then you should return this project to the Human Ethics Committee, Albany Campus, for further consideration and approval.

Yours sincerely



Associate-Professor Kerry Chamberlain
Chairperson,
Human Ethics Committee
Albany Campus

CC Patsy Watson
Institute of Food Nutrition and Human Health,
Massey University, Albany



APPENDIX B

Information pamphlet for children

.....If you have any questions?

If you have any questions about this project, please feel free to call any time.

Contact numbers

Cushla Gordon – 09 827 3569
Mobile – 021 701 197

*This study has been reviewed and approved by the
Massey University Regional Human Ethics
Committee, Albany Campus, Protocol MUAHEC
02/048.*

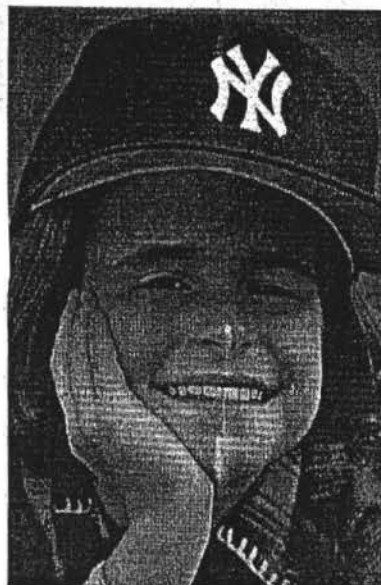
*If you have any concerns about the conduct of this
research, please contact:*


*Associate- Professor Kerry Chamberlain, Chair,
Massey University Regional Human Ethics
Committee*

telephone (09) 443 9799

email K.Chamberlain@massey.ac.nz

<<mailto:K.Chamberlain@massey.ac.nz>>.>



 **Massey University**

*"The food preferences and food
choices of eleven and twelve year old
children as they relate to their
television viewing habits"*

Information sheet for children
aged 11-12 years

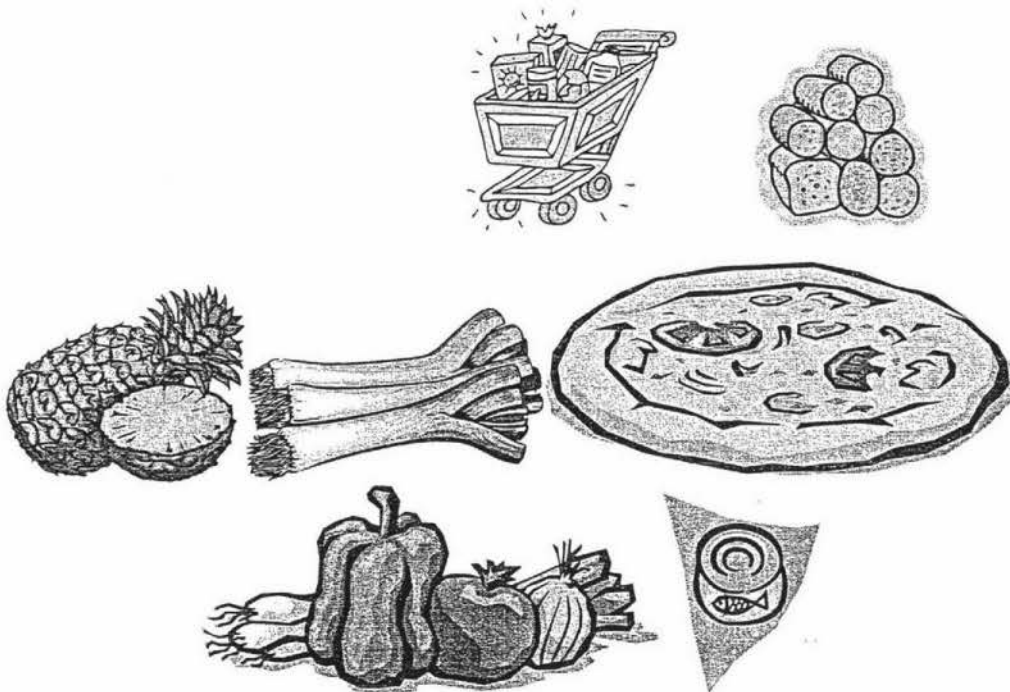
APPENDIX C

Information letter for parents

INSTITUTE OF FOOD, NUTRITION AND HUMAN HEALTH
ALBANY CAMPUS

'THE FOOD PREFERNCES AND FOOD CHOICES OF ELEVEN AND TWELVE
YEAR OLD CHILDREN AS THEY RELATE TO THEIR TELEVISION VIEWING
HABITS'

PARTICIPANT INFORMATION SHEET



RESEARCHER BACKGROUND

This study is being conducted by Cushla Gordon for her MSc in Nutritional Science. Cushla first began studying Nutrition at Massey University in 1998. After going travelling overseas for eighteen months she has returned to New Zealand to complete her studies. Cushla is currently working for a Dairy Company in Auckland and is completing her studies in her spare time. Her Supervisor is Dr Carol Wham who is a Senior Lecturer in Human Nutrition at Massey University, North Shore, Auckland.

STUDY OUTLINE

There is currently a lot of concern in New Zealand and overseas about the increasing levels of obesity. This is known as the 'Obesity Epidemic'. It is not only adults who are getting fatter but our children too. There are a number of factors that contribute to the development of obesity, but mainly it is due to eating too many high fat and high sugar foods, and not enough fruit and vegetables.

Our children's food likes and dislikes are influenced by a number of factors including peers, siblings, parents and advertising. Studies carried out overseas have found a link between what is advertised during children's television and the foods children prefer to eat. They have found that foods advertised to children are predominantly those high in fat, salt and sugar. With the increasing levels of obesity in children these advertisements have become the focus of much concern and criticism.

The objective of this study is to look at the relationship between what children eat and prefer to eat and their T.V. viewing habits. Parents/caregivers will be involved to find out how they feel about certain foods and advertisements and what they think influences their child's eating.

The study is in two parts and participants will only be involved in part one. The second part is a content analysis of television food advertisements. This involves the researcher looking at the advertisements aired during children's television and analysing the types of foods advertised and the frequency of food advertisements.

The first part is a visit with eleven and twelve year old children and their parents/caregivers. This visit will be of approximately one hour's duration.

WHAT WILL BE ASKED OF YOU AS A PARTICIPANT?

The researcher will measure your child's height and weight. From this their Body Mass Index – for – age can be calculated to see if he or she falls into a healthy weight range for their age and sex.

Secondly both you and your child will be asked to complete a short questionnaire each.

WHAT WILL YOU GET OUT OF TAKING PART?

- ☺ You will receive the results of your child's weight and height measurements and how they fit in on the 'Height and Weight Charts for 2-20 Year Olds'.
- ☺ You will receive all the data on the number of servings of each food group your child usually eats each day and how these compare to the 'Food & Nutrition Guidelines for Healthy Children Aged 2-12 Years'.
- ☺ You will receive written advice on the nutrients found in each food group and why we need these.
- ☺ Your child will receive a Certificate of Participation to put in their C.V.
- ☺ You will receive a "Food Fantastic" pamphlet, "Eating for Healthy Children (2-12 years)".

RIGHTS OF PARTICIPANTS

Any participant:

- ☺ receiving this information sheet may decline to take part in the study
- ☺ may refuse to answer any questions or stop the interview at any time
- ☺ may refuse to have body measurements taken

All participants:

- ☺ can withdraw from the study at any time
- ☺ have the right to ask questions about the study at any time
- ☺ provide information on the understanding that their name will not be used
- ☺ will be given a summary of findings at completion of the study

If you have any queries regarding your rights as a participant in this research, please contact Cushla Gordon, phone (09) 827-3569.

CONFIDENTIALITY

The results of this study will be totally confidential. Each participant will be identified by code only, not by name, in the analysis of all information. All data collected will be filed in a locked cabinet in a locked and alarmed room. A master list of the names, address and code numbers of the participants will be kept under lock and key in a separate location. All data will be kept for five years.

PUBLICATION OF RESULTS

All information you provide will be analysed and written up as part of a written report (thesis).

If you and your child are interested in taking part in this study and we hope you will be, please fill in the enclosed contact details form and return it to school with your child.

For further information on the study please contact:

Cushla Gordon
Phone: (09) 827-3569
Mobile Phone: (021) 701-197
E-mail: gordonandgwin@hotmail.com

This project has been reviewed and approved by the Massey University Regional Human Ethics Committee, Albany Campus, Protocol MUAHEC 02/048. If you have any concerns about the conduct of this research, please contact Associate-Professor Kerry Chamberlain, Chair, Massey University Regional Human Ethics Committee, Albany, telephone (09) 443 9799, email K.Chamberlain@massey.ac.nz <mail to K.Chamberlain@massey.ac.nz>.

If you do not have any further questions and you would still like to become part of this study, please read and complete the enclosed "Consent Form" and return it in the envelope provided with the "Contact Details" form.

APPENDIX D

Consent form

INSTITUTE OF FOOD, NUTRITION AND HUMAN HEALTH
ALBANY CAMPUS

'The food preferences and food choices of eleven and twelve year old children as they relate to television viewing habits'

CONSENT FORM

- I have read and understood the information sheet for volunteers taking part in the study I have been asked to participate in.
- I have had the opportunity to ask questions and have them answered, and I understand that I can continue to do so throughout the study.
- I have been assured that my identity, and that of my family, is strictly confidential and in no way will be revealed in relation to the results obtained from me.
- I have read and I understand my rights as a participant in this study, being able to decline not to answer any question or to cease participation at any time.
- I have had time to consider whether to take part. I know who to contact if I have any questions about the study.

I hereby freely give my consent for my child _____ (full name) to be a participant in the study conducted under the approval of the Massey University Human Ethics Committee, Albany Campus, Auckland, New Zealand.

PARENT SIGNATURE: _____ DATE: _____

(where the participant is a child the consent of the child in addition to the signature of the parent should be obtained)

I _____ (full name) hereby consent to take part in this study)

CHILD'S SIGNATURE _____ DATE: _____

I hereby freely give my consent to be a participant in the study conducted under the approval of the Massey University Human Ethics Committee, Albany Campus, Auckland, New Zealand.

PARENT SIGNATURE: _____ DATE: _____

Full Name: _____

APPENDIX E

Contact details form



INSTITUTE OF FOOD, NUTRITION AND HUMAN HEALTH
ALBANY CAMPUS

CONTACT DETAILS

YES, I am interested in taking part in this study and here are my contact details!

Today's Date: _____/_____/2002

Name: _____

Child's Name: _____

Home Address: _____

Phone Number (Day): _____

(Night): _____

Mobile Number: _____

E-Mail Address: _____

Child's Class: _____

Child's Age: _____

APPENDIX F

Confirmation letter to participants in the study

Date

Parent & Child's Name

Street

Suburb

Auckland

Dear

'The food preferences and food choices of eleven and twelve year old children as they relate to their television viewing habits'.

Thank you both for agreeing to take part in this study. Finding out how you feel about television food advertisements and things to do with food and eating is really important and I am very grateful both of you have agreed to give me your time.

I will be in touch with you soon to arrange the interview at a time that suits you both.

Should you have any questions please do not hesitate to phone me on 827-3569.

I look forward to working with you both.

Yours sincerely

Cushla Gordon

APPENDIX G

Parent's questionnaire – Food and Your Child



Massey University

INSTITUTE OF FOOD, NUTRITION AND HUMAN HEALTH
ALBANY CAMPUS

FOOD AND YOUR CHILD

A questionnaire for parents of eleven and twelve year old students

☺ A few points before you begin ☺

- ☺ We would like to know your child's usual t.v. viewing habits, daily food choices and what you think influences these choices.
- ☺ We would like you to tick or write down whatever comes into your mind.
- ☺ Remember, **there is no right or wrong answer, everyone is different!**
- ☺ Anything that you write on this questionnaire today is completely confidential.
- ☺ Thank you for taking the time to participate in this study.
- ☺ For each question unless otherwise instructed please tick one box for the answer you think best fits how you feel.

Subject CODE Number: _____

Time of interview: _____

(am = 1, pm = 2)

Coding: _____

Date of interview: _____

5. How many other people usually eat with your child at...

a. Breakfast

b. Evening meal

5. No. eat with child

a

b

6. Please rate how much influence you think each of the following has on what your child eats.

6. Influences

⁹ I am not sure

¹ No influence

² Some influence

³ A lot of influence

a. Yourself

☐
☐
☐
☐

a

b. Siblings

☐
☐
☐
☐

b

c. Friends

☐
☐
☐
☐

c

d. Other household members

☐
☐
☐
☐

d

e. Teachers

☐
☐
☐
☐

e

f. Magazines/newspapers

☐
☐
☐
☐

f

8. On a typical weekend day, what time and with who does your child usually watch T.V.?

(Leave blank if your child does not watch T.V. at this time)

e.g. Before midday From 7:45 To 10:30 With Siblings ☐ Parents/caregiver ☐ Friends ☐ Alone ☐

a. Before midday From _____ To _____ With ¹ Siblings ☐ ² Parents/caregiver ☐ ³ Friends ☐ ⁴ Alone ☐

b. After midday & before dinner From _____ To _____ With ¹ Siblings ☐ ² Parents/caregiver ☐ ³ Friends ☐ ⁴ Alone ☐

c. After dinner & before bed From _____ To _____ With ¹ Siblings ☐ ² Parents/caregiver ☐ ³ Friends ☐ ⁴ Alone ☐

8. T.V. viewing weekend day

a (i) Hours

.

a (ii) With

- 1=1
- 2=2
- 3=3
- 4=4
- 5=1&2
- 6=1&3
- 7=2&3
- 8=1&2&3

b (i) Hours

.

b (ii) With

- 1=1
- 2=2
- 3=3
- 4=4
- 5=1&2
- 6=1&3
- 7=2&3
- 8=1&2&3

c (i) Hours

.

c (ii) With

- 1=1
- 2=2
- 3=3
- 4=4
- 5=1&2
- 6=1&3
- 7=2&3
- 8=1&2&3

10. Do you and your child ever discuss the content of television food ads?

¹ Yes ☐ ² No ☐

11. If yes, what do you discuss?

12. Is there anything about the types of foods that are advertised to children which concerns you?

¹ Yes ☐ ² No ☐ ⁹ I don't know ☐

13. If yes, please describe in brief what these concerns are.

14. Do you think the food ads have an influence on what your child likes to eat?

¹ Yes ☐ ² No ☐ ⁹ I don't know ☐

15. If yes, in what way?

10. Discuss ads

☐

12. Concerns about ads

☐

14. Influence of ads

☐

SHOPPING

18. How often does your child usually ask that you buy food/drinks for him/her when you go shopping?

- ¹ Never/rarely ☐ ² Sometimes ☐ ³ Usually/always ☐ ⁹ I'm not sure ☐

18. P.I.A.'s

☐

19. Please indicate what type of foods your child most often asks you to buy?
(You may choose up to three options)

- | | | | |
|---|--|--|--|
| ¹ Breads/rolls/muffins <input type="checkbox"/> | ² Breakfast cereal <input type="checkbox"/> | ³ Drinks <input type="checkbox"/> | ⁴ Fruit <input type="checkbox"/> |
| ⁵ Vegetables <input type="checkbox"/> | ⁶ Chocolate/ lollies/gum <input type="checkbox"/> | ⁷ Meat/ chicken/fish <input type="checkbox"/> | ⁸ Savoury snacks e.g. crackers <input type="checkbox"/> |
| ⁹ Sweet snacks e.g. museli bars <input type="checkbox"/> | ¹⁰ Dairy products <input type="checkbox"/> | ¹¹ Other <input type="checkbox"/> | |

19. Type of food req

☐☐☐

20. Of the three items you chose above, which do they most often ask for?

- a. Most often ask for:
b. Next often ask for:
c. Least often ask for:

20. Most req food item

a ☐

b ☐

c ☐

ABOUT YOU

22. Please indicate which age bracket you fall into.

¹ 30 & under ☐ ² 31-39 ☐ ³ 40-49 ☐ ⁴ 50+ ☐

22. Age

☐

23. Please indicate which ethnic group you belong to.

- ¹ NZ European/Pakeha ☐
² NZ Maori ☐
³ Samoan ☐
⁴ Cook Island Maori ☐
⁵ Tongan ☐
⁶ Niuean ☐
⁷ Tokelauan ☐
⁸ Fijian ☐
⁹ Other Pacific ☐
¹⁰ Indian ☐
¹¹ Chinese ☐
¹² Other (Please specify) _____

23. Ethnic group

☐

24. How many people usually live in your home?

Write answer(s) in table 1, column I.

24. No. people in h/hold

1 person = 1
2 people = 2
3 people = 3 etc
Total person(s)

☐

25. Who are the people that live in your home?

Write answer in table 1, column II.

25. People in h/hold

Husband/wife = 1
Female partner = 2
Male partner = 3
Mother = 4
Father = 5
Child = 6
Sibling = 7
Grandparent = 10
Other relative = 11
Friends/flatmates = 12

26. Do you do any paid work either at home or outside the home?

Write answer in table 1, column III

If No, go to question 28.

26. Paid work subject

Yes = 1
No = 2

☐

[illegible]

APPENDIX H

Children’s questionnaire – Food and You

FOOD AND YOU

A questionnaire for eleven and twelve year old students

😊 A few points before you begin 😊

- 😊 We would like to know your thoughts and feelings about different types of food and things to do with food and eating.
- 😊 We would like you to tick or write down whatever comes into you mind.
- 😊 Remember, **there is no right or wrong answer, everyone is different!**
- 😊 Anything that you write on this questionnaire today is completely confidential.
- 😊 Thank you for taking the time to participate in this study.
- 😊 For each question unless otherwise instructed please tick one box for the answer you think best fits how you feel.

Subject CODE Number: _____

Time of interview:
(am = 1, pm = 2)

Coding:

Date of interview:

5. How many helpings of vegetables do you eat each day?

(Veges can be fresh, frozen or canned) (A helping is the amount of veges that will fit into the palm of your hand)

- ¹ I don't eat vegetables ☐
- ² Less than one helping a day ☐
- ³ One helping a day ☐
- ⁴ Two helpings a day ☐
- ⁵ Three helpings a day ☐
- ⁶ Four or more helpings a day ☐

5. Vegetables

☐

6. How many helpings of noodles, pasta or rice do you usually eat each day?

(One helping of cereals = 1 cup cooked rice/pasta/noodles)

- ¹ I don't eat cereals ☐
- ² Less than one helping a day ☐
- ³ One helping a day ☐
- ⁴ Two helpings a day ☐
- ⁵ Three helpings a day ☐
- ⁶ Four or more helpings a day ☐

6. Cereals

☐

7. How many helpings of breakfast cereal do you usually eat each day?

(One helping of breakfast cereal = 1 cup cereal or 2 weet-bix)

- ¹ I don't eat breakfast cereal ☐
- ² Less than one helping a day ☐
- ³ 1-2 helpings a day ☐
- ⁴ 3-4 helpings a day ☐
- ⁵ 5-6 helpings a day ☐
- ⁶ 7 or more helpings a day ☐

7. B/fast cereal

☐

8. How many slices, or rolls, of bread (or toast or pita) do you usually eat each day?

(One helping of bread = 1 medium slice of bread or 1 roll or 1 small pita bread)

- ¹ I don't eat bread ☐
- ² Less than one helping a day ☐
- ³ 1-2 helpings a day ☐
- ⁴ 3-4 helpings a day ☐
- ⁵ 5-6 helpings a day ☐
- ⁶ 7 or more helpings a day ☐

8. Bread

☐

12. How often and how much would you usually drink the following?

	¹ Never/ rarely	² Once a week	³ Every day	⁴ Twice a day	⁵ 3 or more times a day	Amount e.g. a can, a 500ml bottle, a 250 ml glass
a. Water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
b. Fruit juice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
c. Cordial/ powdered drinks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
d. Flavoured milk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
e. Soft drinks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
f. Diet soft drinks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
g. Sports drinks e.g. Powerade	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
h. Energy drinks e.g. Red Bull	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

12. Drinks

a	Vol (ml)				
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
b	Vol (ml)				
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
c	Vol (ml)				
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
d	Vol (ml)				
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
e	Vol (ml)				
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
f	Vol (ml)				
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
g	Vol (ml)				
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
h	Vol (ml)				
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

14. Do you ever buy things on the way to or from school?

¹ Yes ☐ ² No ☐

15. If yes, please pick the three from below you buy the most often.

- ¹ Lollies ☐
- ² Takeaways ☐
- ³ Cakes/slices ☐
- ⁴ Pies/sausage rolls ☐
- ⁵ Chips/crisps ☐
- ⁶ Soft drinks ☐
- ⁷ Milk ☐
- ⁸ Other (please specify) ☐

14. Buy food before/after school

☐

15. Usually buy

☐☐☐

FOOD AND HEALTH

16. Please indicate whether you agree or disagree with the following statements

¹ Agree ² Disagree ⁹ I'm not sure

- a. I feel good after I have eaten fruit or vegetables ☐ ☐ ☐
- b. I would eat takeaways every day if my parents/caregivers let me ☐ ☐ ☐
- c. Milk is great to drink any time of the day ☐ ☐ ☐
- d. Only adults need to think about eating healthy food ☐ ☐ ☐

16. Food and health

a ☐

b ☐

c ☐

d ☐

21. Do you ever see foods advertised on T.V. and think "I'd like to try that"?

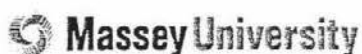
	¹ Yes	² No	⁹ I don't know
a. Chips/crisps	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Takeaways	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Meat/fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Dairy food/yoghurt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Flavoured milk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Breakfast cereal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Drinks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Fruit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Vegetables	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Lollies/chocolate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k. Ice blocks/icecream	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l. Biscuits/cookies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m. Other snacks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

21. Try foods off T.V.

a	<input type="checkbox"/>
b	<input type="checkbox"/>
c	<input type="checkbox"/>
d	<input type="checkbox"/>
e	<input type="checkbox"/>
f	<input type="checkbox"/>
g	<input type="checkbox"/>
h	<input type="checkbox"/>
i	<input type="checkbox"/>
j	<input type="checkbox"/>
k	<input type="checkbox"/>
l	<input type="checkbox"/>
m	<input type="checkbox"/>

APPENDIX I

Letter of thanks for participating



INSTITUTE OF FOOD, NUTRITION AND HUMAN HEALTH
ALBANY CAMPUS

Date
Parent Name
Street
Suburb
Auckland

Dear

THE FOOD PREFERENCES AND FOOD CHOICES OF ELEVEN AND TWELVE YEAR OLD
CHILDREN AS THEY RELATE TO THEIR TELEVISION VIEWING HABITS

The interviews and final analysis for this study have now been completed.

I would like to convey my utmost appreciation and gratitude to you for your time and enthusiasm while participating in this study. I could have not carried it out without you. I hope that the questionnaire really got you thinking about how you and your child feel about food and advertising and that you learned as much as I have about the influences on your child's eating decisions.

As a token of my appreciation I have enclosed a copy of your child's body measurements and what they mean. I have also enclosed a copy of "Food Fantastic – Eating for Healthy Children aged 2-12 years". This pamphlet has some really helpful guidelines on what and how much your child should be eating each day and has some information on who to contact if you would like to know more. Finally, I have given you a copy of some of the study results I thought you would find interesting and a certificate of participation for your child.

Once again, I would like to thank you very much for your time and patience.

Yours sincerely

Cushla Gordon
Researcher

Dr Carol Wham
Project Supervisor

APPENDIX J

Children's body measurements

INSTITUTE OF FOOD, NUTRITION AND HUMAN HEALTH
ALBANY CAMPUS

"The food preferences and food choices of eleven and twelve year old children as they relate to their television viewing habits"

BODY MEASUREMENTS

Subject CODE Number: _____ Gender: (F=1, M=2) _____ Time of Interview (am=1, pm=2) _____ Date of Interview: _____	Coding: <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; width: 40px; height: 40px;"></div> <div style="border: 1px solid black; width: 40px; height: 40px;"></div> <div style="border: 1px solid black; width: 40px; height: 40px;"></div> </div>
--	---

BEFORE COMMENCING WITH THE MEASUREMENTS

SAY: The first part of my visit involves taking some body measurements. These measurements are your height and your weight. If you do not want me to take a certain measurement, please let me know.

1. Weight:

(i) _____ kg

(ii) _____ kg

(iii) _____ kg

Weight: _____ kg

2. Height:

(i) _____ cm

(ii) _____ cm

(iii) _____ cm

Height: _____ cm

APPENDIX K

Results for participants

INSTITUTE OF FOOD, NUTRITION AND HUMAN HEALTH
ALBANY CAMPUS

Dear Parent and Child

Thank you so much for taking part in my study entitled "The Food choices and Food Preferences of Eleven and Twelve Year Old Children as Related to Their Television Viewing Habits."

Here is a brief report of some of the results that I thought you and your child might find interesting:

- * Your child's body measurements
- * Your child's usual daily intake of the four food groups
- * A summary of some of the influences on children's food choices
- * A summary of some of the children's favourite food ads and favourite foods

FOOD AND YOU

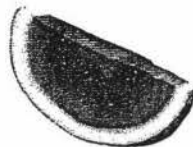
This table shows the number of helpings of each food group your child usually eats and the number recommended in the National Food and Nutrition Guidelines for New Zealanders.

Food Group	No. of helpings your child usually has	Recommended Number of Helpings
Fruit		At least 2 helpings a day e.g. a helping is the amount that can fit into the palm of your hand or 1 apple or 1 cup of fruit juice or ½ a cup of stewed fruit
Vegetables		At least 3 helpings a day e.g. a helping is the amount that can fit into the palm of your hand or 1 tomato or ½ a cup of cooked vegetables or 1 medium potato
Noodles, pasta, rice, bread – slices, rolls, toast, pita		At least four helpings a day e.g. a helping is 1 roll or 1 med slice of bread or 1 cup of cornflakes or 1 cup of cooked pasta/rice
Milk and milk products		At least two to three helpings a day e.g. a helping is 1 pottle of yoghurt, or 2 slices of cheese, or 250ml glass of milk
Meat, chicken, fish		At least one helping every day e.g. 1 med fillet of fish or 2 slices of cooked meat or 2 chicken drumsticks



Normal healthy children in this age should be enjoying a variety of meals including plenty of fruit and vegetables. Children have healthy appetites and if they are having plenty of exercise they will be starting to eat as much as an adult to support this activity and rapid growth.

You will find more information on serving size examples and ideas for snacks and meals in the enclosed pamphlet "Food Fantastic, Eating for Healthy Children (2-12 years)."



Many of these guidelines such as eating a variety of foods and drinking plenty are relevant for adults as well as children!

* All the children involved in the study were asked some questions on what foods they liked and what they thought about when deciding what food to eat. Parents were asked about influences on their child's food choices and here are the results.

FAVOURITE FOODS

Your child's three favourite foods were:

- 1.
- 2.
- 3.

Across all seventy children interviewed the most common favourite foods were:

- 1.
- 2.
- 3.

DECIDING WHAT TO EAT

The three most important things children think of when deciding what to eat are:

- 1.
- 2.
- 3.

INFLUENCES ON WHAT CHILDREN LIKE TO EAT

Overall parents felt the three things that influenced what their child likes to eat the most are:

- 1.
- 2.
- 3.

ADVERTISEMENTS

Out of all the children interviewed the three most common favourite food ads were:

- 1.
- 2.
- 3.

TELEVISION CONTENT ANALYSIS



As mentioned in my introduction letter, interviewing you both was only one part of my study. The second part was an analysis of a week of advertisements played during children's T.V. viewing hours.

Here are some of the results I found that I thought you might find interesting:

- * I viewed a total of X hours of television during the week dated XX to XX. This included two weekend mornings and five weekday morning and afternoons.
- * Your child is most exposed to advertisements for X (food).
- * Other food categories accounting for high proportions of the food advertisements were for X, Y and Z.
- * Most of the drink ads were for X.
- * There was minimal exposure to advertising for X, Y and Z.
- * There were X ads for fast food services and these were most commonly screened on weekdays/weekends between the hours of X and Y.
- * Overall there were X number of advertisements screened during the seven days of recording and of these X were for food.
- * *Small summary of content analysis results*

I hope that the information here has been of some interest to you and also of some use to you. If there is anything else you feel you would like to know about the study results please feel free to contact me. For further information about healthy eating you will find this in the 'Food Fantastic' Pamphlet provided.

*Once again I would like to thank you both for your enthusiasm and interest during this study.
I could not have done it without you!*

INSTITUTE OF FOOD, NUTRITION AND HUMAN HEALTH
ALBANY CAMPUS

"The food preferences and food choices of eleven and twelve year old children as they relate to their television viewing habits"

SUMMARY OF RESULTS FOR:

Below are the results of your child's body measurements taken during the study.

BODY MASS INDEX FOR AGE:

Weight _____ kg

Height _____ cm or _____ m

Body Mass Index- for -Age (BMI) _____

The Body Mass Index gives a guideline based on weight and height to determine whether your child is underweight, overweight or just right. As children grow their body fatness changes over the years. A child's BMI-for-age depends on their age and sex as boys and girls differ in their body fatness as they mature. Therefore, we plot the BMI-for-age according to sex-specific charts.

The classification of BMI is important because overweight children are at risk of serious health and life style consequences. It is important to identify children who are overweight now so steps can be taken to reach a healthy weight and thus prevent obesity in the future.

Your child's BMI-for-age as seen above is _____.

Underweight	BMI-for-age < 5 th percentile
At risk of overweight	BMI-for-age > 85 th percentile
Overweight	BMI-for-age > 95 th percentile

Your child is in the _____ percentile.



JUST RIGHT?

Keep up the good work!

UNDERWEIGHT?

There are a variety of reasons why children can be underweight including food aversions and genetics. It is important that your child has enough food to support their high energy requirements for growth and physical activity.

For the best advice on ways to increase your child's energy consumption and encourage healthy weight gain contact your local dietitian or nutritionist. They can be found in the yellow pages or ask your doctor.

OVERWEIGHT?

Achieving a healthy body weight and composition is important in preventing disease and promoting well-being.

There is increasing evidence of a link between childhood and adult obesity. Morbidly overweight children will likely grow up to be obese adults. Therefore, efforts to achieve a healthy body weight should begin now!

Tip for preventing overweight

- ◆ Family has a big influence in the food and activity habits of children so the adoption of a good diet by the whole family is a good start.
- ◆ Increase physical activity.
 - Physical activity should be part of your child's routine and encouraged in everyday life – at school and at home
 - At least 30 minutes of moderate to high intensity exercise
- ◆ Decrease portion sizes
- ◆ Cut back on very high fat and sugar foods such as chippies, chocolate and fizzy drinks and replace with snacks such as yoghurt and fresh fruit.
- ◆ Takeaways should be kept for special occasions only.
- ◆ Eat a variety of foods from all the food groups. Make sure water is your child's drink of choice as it is a great thirst quencher and it is cheap!
- ◆ Do not mention the word diet to your child. It is important to take action early on in as relaxed a way as possible.
- ◆ For further advice contact your local dietitian or nutritionist. They can be found in the yellow pages, or ask your doctor.



APPENDIX L

Certificate of participation for children

THE FOOD PREFERENCES AND FOOD CHOICES OF ELEVEN AND TWELVE YEAR OLD CHILDREN
AS THEY RELATE TO THEIR TELEVISION VIEWING HABITS

This certificate is in appreciation of the time and commitment

Has given in participating in this important research.

Cushla Gordon
Researcher

Dr Carol Wham
Project Supervisor



APPENDIX M

Certificate of participation for schools

**THE FOOD PREFERENCES AND FOOD CHOICES OF ELEVEN AND TWELVE YEAR OLD CHILDREN
AS THEY RELATE TO THEIR TELEVISION VIEWING HABITS**

This certificate is in appreciation of the time and commitment

Has given in participating in this important research.

Cushla Gordon
Researcher

Dr Carol Wham
Project Supervisor



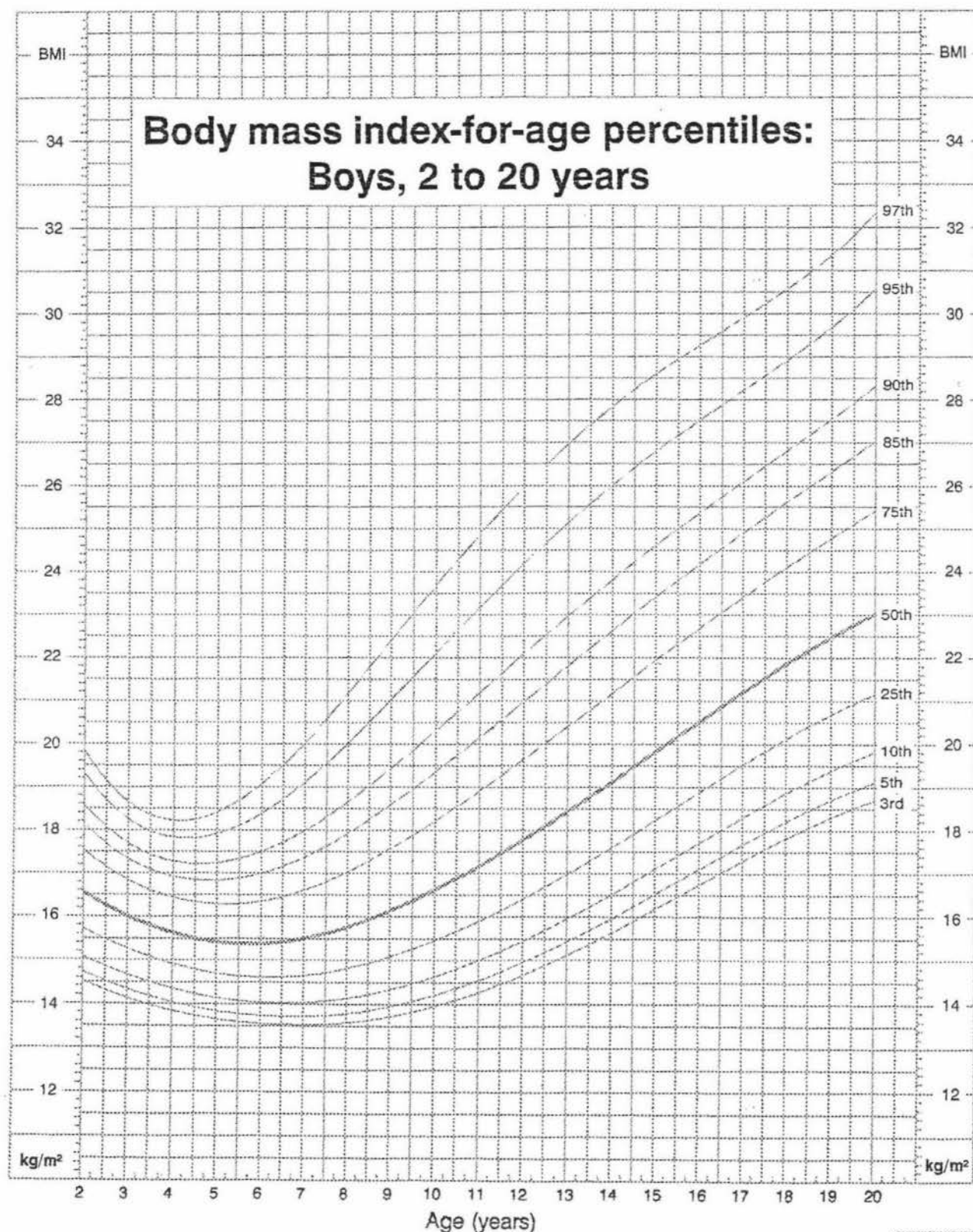
APPENDIX N

Body mass index-for-age percentiles: Boys, 2 to 20 years

100

90

CDC Growth Charts: United States



Published May 30, 2000.

SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).



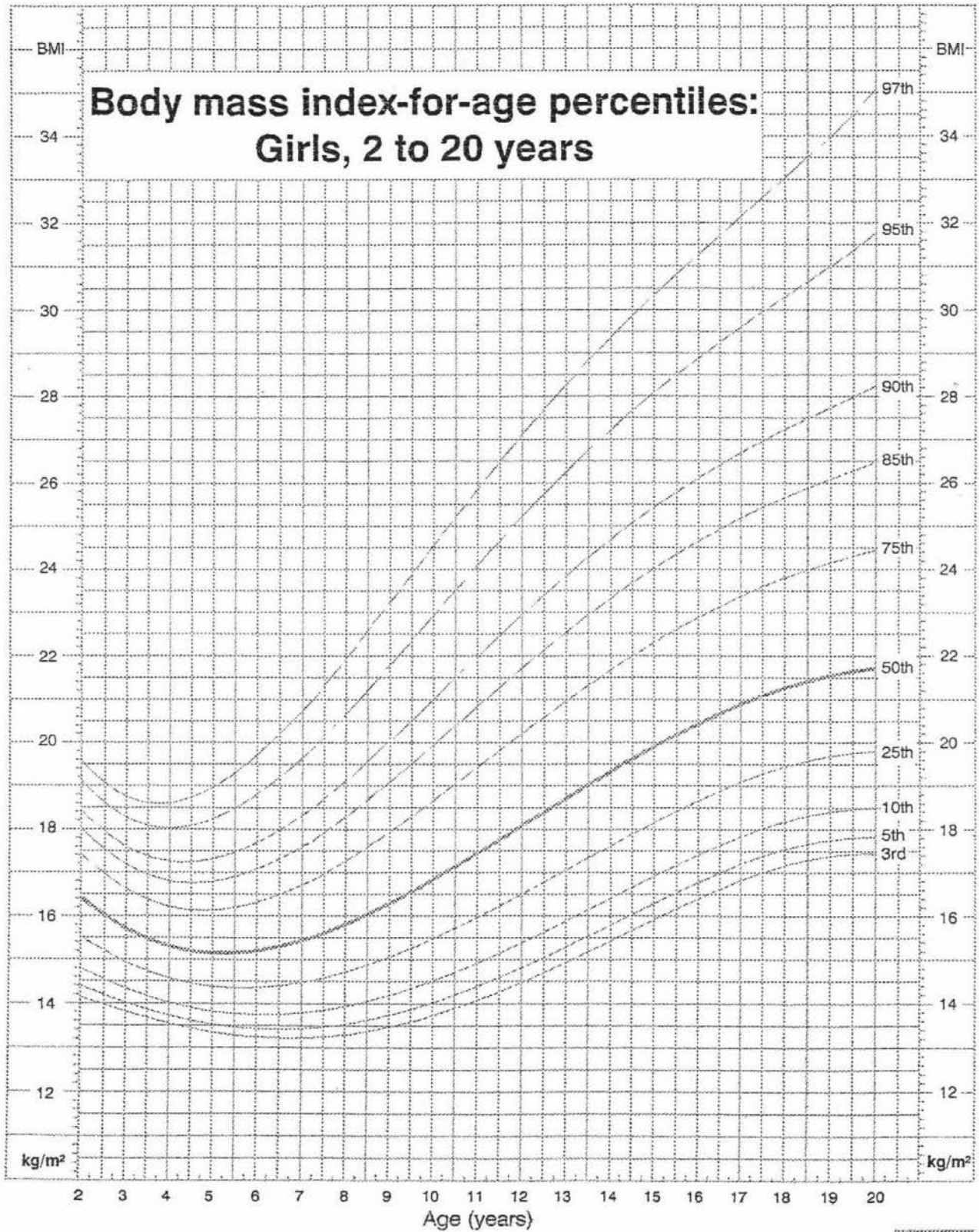
SAFER • HEALTHIER • PEOPLE

APPENDIX O

Body mass index-for-age percentiles: Girls, 2 to 20 years



CDC Growth Charts: United States



Published May 30, 2000.

SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).



DATA FROM THE NATIONAL CENTER FOR HEALTH STATISTICS