The assessment of a new Community Dietetic Approach For Changing the Eating habits of Young adolescents Living in less affluent areas of Liverpool

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For Donna and Eve:

Who have lived with this thesis from inception to completion.

Acknowledgments

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Candidate's statement

The candidate conducted the majority of the work described in this thesis. The following statement details those elements of work that were accomplished with the assistance of colleagues and students. All published work conducted as part of this thesis includes full acknowledgments to all those who were involved.

Food Intake Questionnaire (Chapters 6, 7, 8, 14 and Appendix 2).

The dietary questionnaire described in this thesis was developed by the departments of Child Health and Medical Physics at the University of Newcastle (Hackett et al 1989). No studies of reliability, face validity or relative validity had been conducted prior to this project. The candidate conducted all of the validity and reliability work, with assistance from student dietitians and colleagues.

FIQ pilot survey (Chapter 6)

The fieldwork (data collection in schools) was assisted by A. Hackett (Liverpool John Moores University) and J. Moss (Community Dietitian North Mersey Community Trust). All data entry and analysis was conducted by the candidate (BJ). *Reference: Johnson & Hackett (1997)*

FIQ face validity study (Chapter 7)

This work was conducted with the assistance of student dietitians: J. Cross and A. Bibby, who helped with distribution and collection of questionnaires. *Reference: Johnson et al. (1999).*

FIQ validity study (Chapter 8)

The study was conducted by the candidate and A. Coufopoulos (Liverpool Hope College). M. Rouncefield and A. Hackett (Liverpool John Moores University) provided statistical advice (*Reference: Johnson et al. 2001*).

The Focus Group Studies (Chapter 10, 12)

The candidate designed all of the work in the pilot study and focus group study. The candidate facilitated the groups with the assistance of A. Coufopoulos (Liverpool Hope College) and L. Booker (dietitian) who took field notes.

Implementation study (Chapter 14)

The candidate conducted the whole of the combined BCQ questionnaire study with assistance from school staff, who helped with questionnaire distribution and collection. The candidate conducted all data entry and analysis. M. Rouncefield (Liverpool John Moores University) provided statistical advice.

Abstract

Liverpool has some of the highest rates of preventable disease in the UK. Obesity levels in young people are increasing and diet and decreased activity levels are implicated in its progression. The eating habits of young people are far from ideal and there is a need to develop initiatives that can bring about positive changes in lifestyle.

The aims of this research were firstly, to assess the eating habits, factors affecting food choice and the motivations for change in young people, and using the data collected, to design and pilot a questionnaire to facilitate the development of a nutrition intervention.

Studies assessed the validity and reliability of a self-administered Food Intake Questionnaire (FIQ). Results suggested that the FIQ had face validity and reliability, being able to detect a change in eating habits of ±10% in a sample of 100 children over a three-month period. A validity study showed that the FIQ had criterion validity for sugary ($r = .34$) and fatty foods ($r = .21$) intake, when compared to a three-day diary and interview method. Six hundred and ninety seven schoolchildren aged 11-13 years completed the FIQ and children with 'good' and 'poor' diets were selected to take part in separate focus group interviews. The focus group data described a food culture in which young people classified their foods as "junk" and "parental" foods as "proper" food. Definitions of dieting were elaborate, and including various strategies such as *"cutting down"* and *"going on a health week"*.

The data also suggested that health was a poor motivator of change and that school nutrition interventions based on physical activity and "well being" factors would be more effective in facilitating change than a medical, disease oriented approach. A combined questionnaire was designed to evaluate factors affecting intake (as identified by the focus groups). It was piloted in a separate school. The results showed the most frequently reported foods included sweets, crisps, fizzy drinks and chocolate. Discriminant analysis of the BCQ identified five factors able to separate diet groups at the extremes of the distribution (good and poor diets). These included: perception of health, influence of peers, and school activities.

In conclusion, two tools have been developed to enable the eating habits of children, and the influences upon them, to be evaluated. In addition using these tools to gain an understanding of the cultural influences that affect eating habits enabled a nutrition intervention more relevant to the cultural imperatives of adolescents to be planned.

Section 1 Introduction to Study

Chapter 1

1.1 Introduction

Good nutrition and food habits are important during adolescence from two points of view: the diet chosen must contain a balance of high quality nutrients, providing sufficient energy and protein to maintain growth and development and meet increased physiological requirements: food intake is also shaped by culture and so fulfils social and psychological needs (Dwyer 1995). Adolescence is also characterised by dramatic change, young people have increasing autonomy over their actions and health choices (Shepherd & Dennison 1996), family and parental influences diminish, increased awareness of body shape, self- image and relationships with peers become increasingly relevant and may impact on the food choices and types of food eaten by young people.

There is little age specific information on the eating habits of schoolchildren both nationally and locally in Liverpool. The collection of data on food intake is important when testing the relationship between diet and disease. However, "... *the most serious limitation to research in nutritional epidemiology has been the lack of practical methods to measure diet ... dietary assessment methods must not only be reasonably accurate, but also relatively inexpensive.*" Willett (1992). Few "tools" are available to assess current eating habits and monitor changes in eating habits over time, and in response to interventions. Information on eating habits can inform the process of change and contribute to the development of strategies.

Conducting dietary surveys in schools is time consuming and expensive. The cost and expertise required is prohibitive to most schools and dietetic departments. A method of dietary investigation that can collect serial data on the eating habits of schoolchildren, over long periods of time is desirable.

The factors driving food selection are many, involving interactions between biological, psychological, environmental socio-economic and cultural aspects (Shepherd 1990). What is less clear is how dietitians and health educators can use this understanding to develop meaningful intervention programmes in

schools. It is accepted that the eating habits of young people are far from ideal, and the nature of changes required is undisputed (Stockley 1993).

Bringing about changes in eating habits has proved difficult, despite an apparent increased awareness of positive nutritional messages. The translation of this awareness into action is more problematic. Nutrition interventions in school have traditionally focussed on disease prevention (Aggleton 1996), with little attention being given to the needs and motivations driving young people's behaviour. Health interventions using disease prevention as the vehicle to promote change in behaviour has been challenged. One recent review (HEA 1998), has suggested that interventions designed to bring about changes in eating habits and lifestyle of young people should be grounded in the understanding of young people. Developing nutrition education interventions based on such an understanding may offer a potential route to bring about change.

The aim of this thesis is to investigate the eating habits, factors affecting food choice and the motivations for change in young people, design and pilot a questionnaire that can be used to design a school based nutrition intervention.

1.2 Background to Study

The research described in this thesis was conceived within a community dietetic department and the perspective it takes is that of the community dietitian, although the results will be applicable to other health professionals working with young people. Community dietetics has developed over the last two decades to encompass both clinical and preventative work. Clinical imperatives and the demands of patient care vie with the need to develop preventative practice. Interventions must be designed, developed, and delivered as part of departmental service priorities, within budget and time constraints. Balancing the needs of research and development within the day-to-day demands of the service is the context in which the project developed.

1.3 Community Dietetics in Liverpool

One early report on the future of community dietetics stated: *" While dietitians of the future will still be involved with individual patients... a wider service is envisaged in a preventative as well as a therapeutic role"* (Bateman & Black 1975). The juxtaposition of community dietetics between health education, health promotion and public health envisaged in the mid seventies has been at the heart of community dietetics in Liverpool (Judd 1995; Johnson & Jones 1998).

The WHO Health for All (HFA) strategy (WHO 1981), and the Healthy Cities campaign (Davies & Kelly 1993; Ashton 1992) have shaped community dietetic activity in Liverpool. The ethos of the HFA and Healthy Cities initiatives, encompassing empowerment, inter agency working and collaboration with communities, culminated in Liverpool, in the SUPER Project (Vaandrager & Ashton 1992; Judd & Jones 1992). The SUPER Project was a pan-European, multi-city action plan, conducted within the Healthy Cities framework, to promote health using a nutrition focus to health promotion. Community dietitians in Liverpool were involved in schools, supermarkets and worked closely with local community groups (Vaandrager 1994; Johnson & Jones 1998). The Liverpool Nutrition Strategy (Judd 1995) has also provided the professional focus to the research described in this thesis. Collaboration with multidisciplinary teams of health professionals to deliver preventative care is explicit in the new NHS environment and pertinent to this discussion (DoH 1999; DoH 2000). Community dietitians have conducted joint initiatives with other health agencies including, public health, dental health and health promotion departments, Liverpool City Council's Sport & Leisure Directorate and academic institutions. New approaches used to deliver health care and health promotion must be research-based in line with current moves towards clinical governance and evidence-based practice (DoH 1999). Departmental practice has reflected the changes in emphasis that have occurred in community-focussed prevention initiatives, particularly with respect to school based nutrition. The need to develop appropriate tools to evaluate dietetic intervention is apparent. A major part of this thesis is concerned with the development of a Food Intake Questionnaire (FIQ) which can be used to measure and monitor the eating of young people and assist dietitians in evaluating practice.

1.4 Theoretical and contextual framework

No single theoretical model underpinned the development of this project, and two theoretical ideas; action research and empowerment, were influential in the early development of the research. "Action research", first described by Lewin (1947) has been used in the health field allowing professionals within the health system to change practice and allow the process of change to be evaluated (Hart & Bond 1995). Hart & Bond (1995) suggest that action research can be used within professional settings where *"problem solving and improvement are on the agenda"*. Vaandrager (1995) used an action research methodology to promote healthy eating in cities across Europe. The SUPER project developed from research conducted as part of the Healthy Cities initiative, aspects of which, were carried out in Liverpool by community dietitians. The relationship between action and research ingredients in this model involved different elements; research, multi- agency working and empowerment and were essential parts of the "action-process".

Self-empowerment, has been one theoretical basis for the development of health education in general (Tones et al. 1990) and in young people (Aggleton 1996). Empowerment has been advocated when developing interventions designed to improve the health of young people (Dockeral et al. 1998). This approach allows young people to raise personal concerns as a basis for health action. The researcher acts as the facilitator of change, by allowing young people to discuss and take control of their own situation. This is consistent with the understanding that health cannot be described in biomedical terms alone; health must be viewed broadly within the context of well-being (Moore 1998). Aggleton (1996) suggests that understanding how young people *"make sense of health related knowledge and resources..."* [what he calls *"cultures of health"]* is essential to targeting health promotion at young people. In the context of this thesis, young people were involved in the development stage of the intervention. The focus and content of activities and resources would be cognisant of young people's culture, concerns and well-being. Investigating how to successfully influence dietary change in young people is at the centre of this thesis.

One notion that has modelled thinking at government level and within the NHS is that of "individual informed choice". Giving knowledge is seen as the pre-requisite to behaviour change. This is laudable, however the context in which the information is presented, as will be posited in this thesis, is a key factor to successful dietary change. The interactions that affect food and dietary behaviour are both subtle and complex and research methods were required that allowed not only eating habits to be evaluated but also the "tacit processes and often hidden beliefs and values" (Marshall & Rossman 1994) of young people.

1.5 Thesis Aim

To assess the eating habits, factors affecting food choice and the motivations for change in young people, and using the data collected, to design a questionnaire to facilitate the development of a nutrition intervention.

1.6 Objectives

- To identify sub-groups of children with good and poor eating habits
- To investigate the factors affecting food choice and motivations for change in these groups.
- To design and evaluate a combined questionnaire to assist the design of nutrition intervention in schools.

1.7 Outline of thesis

The thesis describes how two methodological approaches were used to collect information on current eating habits, to classify young people in terms of their dietary habits, and to describe their perceptions and beliefs about food diet and their motivations for behaviour change. The data were used to aid the development of a community dietetic approach to school based nutrition intervention, and to further develop the FIQ as tool for describing eating habits

and monitoring change in a community setting. The overall design of the study is presented in diagram 1.1

Section one describes the literature on adolescent health behaviour: including dietary habits and nutritional lifestyle factors affecting young people. The factors affecting food choice will be described with reference to those areas key to adolescents (chapters 2-3). Section three will describe the methodology used (chapters 4-5). Quantitative methods were used for the development of the FIQ pilot studies, a cross sectional survey and studies of reliability and validity will be described (chapter 6-10). The qualitative methods used included a focus group study in order to design a questionnaire for use in the main study. Section three will conclude by giving an account of the development of the questionnaire, based on focus group data, to be used to monitor a nutrition intervention in school. Section four will provide the results from the main surveys using the FIQ and the focus group methodology. The final study in this section describes the use of the BCQ prior to initiating a nutrition intervention in school. Section five will discuss the implications of the results from the focus group interviews and the implementation survey, drawing conclusions in the context of community dietetics in Liverpool.

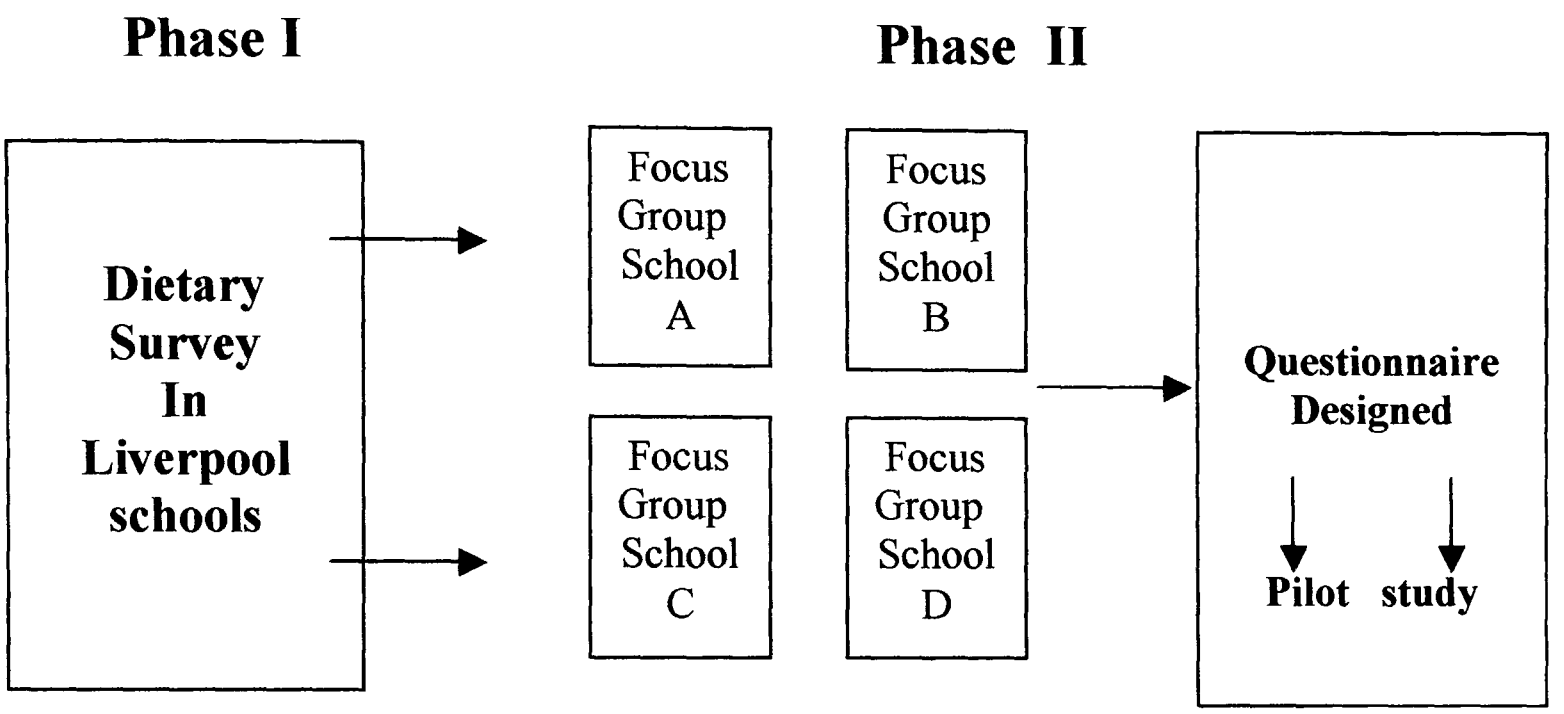
1.8 Study Design

A three phase study design (diagram 1.1) investigated the eating habits of young people, the factors that affect their dietary habits, and the development of the questionnaire. **Phase 1** involved a dietary screening survey. Children completed a Food Intake Questionnaire (FIQ) and two sub-groups of children: low food score and high food score were selected for phase II. The **Phase II** focus group study investigated the important influences on eating habits. The data were used to design a questionnaire to elicit information the salient factors influencing food habits and motivations for making changes to lifestyle and diet. **Phase III** describes an evaluation study of the questionnaire in two Liverpool secondary schools.

Only the programme of work up to the delivery of a nutrition intervention is described in this thesis. Preliminary results of a nutrition intervention, using the

questionnaire developed in this thesis, are described in appendix 1, allowing the reader to view the entire research cycle, which culminated in the intervention.

Diagram 1.1 Study Design



Section 2 Literature Review

Chapter 2 Literature Review

2.1 Adolescence: A key period of life

Adolescence is a critical period of the lifespan. It is a period of emotional as well as physiological change, characterised by the development of self-identity and the transition to the adult world. Puberty is the key event, in the process of physical development and growth of the child into an adult. Adolescence however can span the period both before puberty begins and after it is completed (Rees & Mahan 1988, Williams et al.1992). Dwyer (1993) suggests that for a discussion on the nutritional needs of adolescents it is useful to consider the age period 10 - 20 years, which covers two phases: pubescence (i.e. development of sexual maturity) and adolescence. This period not only covers the important physical changes taking place but also coincides with the time of psychological change and development of independent thought and self-identity (Fontana 1988; Elkind 1984). Adolescence is also characterised by increasing autonomy as family and parental influences diminish (Coleman & Hendry 1999), increased awareness of body shape, self- image and relationships with peers become increasingly relevant (Hill 1995) and may impact on the food choices and types of food eaten by young people. In the context of this thesis the age 11 - 14 years was selected as being a key point during adolescence corresponding to Key stage 3 of the National Curriculum.

2.2 Diet and lifestyle in adolescence

The health of schoolchildren today is "generally excellent" (Dwyer 1993) compared to 30 - 40 years ago: a majority of children are taller and reach menarche at an earlier age. However there are still social class differences between children. The Acherson Report (DoH 1999) reported that families living

on income support had intakes below the RNI for iron, calcium fibre and vitamin C. This suggests that inequalities in diet still exist, the same report stated that inequalities in nutrition had increased over the last fifteen years. Children from poorer families tend to be shorter (Rona et al. 1987) and may eat a diet that is of poorer nutritional quality (Gregory et al. 2000; Lang et al. 1986). The increasing levels of obesity in young children (Bundred 2000) is not particular to the UK and is becoming a global epidemic (Bellizzi & Dietz 1999). Adolescence is a key phase in the development of lifestyle habits (Coleman & Hendry 1999), and although Coronary Heart Disease and obesity are of particular concern in children from poorer homes, it is apparent that children from across the social divide would benefit from positive changes in lifestyle.

2.2.1 Coronary Heart Disease (CHD)

Coronary heart disease remains one of the biggest causes of premature death and disability in the UK. There is evidence to suggest that the precursors of Coronary Heart Disease have their origins in childhood (Wynder 1989; Cunnane 1993) supporting the possibility that cholesterol levels may "track" into adulthood so increasing the risk of CHD. The targets set out in Our Healthier Nation confirm the Government's concern regarding its prevention (DoH 1998). More recently the National Service Framework on CHD acknowledges that prevention of the disease is a key strategic aim (DoH 2000). The multi-factorial nature of CHD includes dietary factors that may impact during adolescence; intakes of saturated fat and refined sugars, remain high, and the intake of fruit and vegetables is less than the five portions a day, suggested as conferring health benefits (DoH 2000). The proposed diet changes are based on the COMA report (DoH 1994) and adopt the Balance of Good Health (Hunt et al. 1995) as an education tool. Physical activity is encouraged along with a reduction in obesity.

2.2.2 Obesity

The problem of obesity in the adult population (DoH 1995) is mirrored in children (BNF 1999). There appears to be a link between obesity in adolescence and obesity in adulthood, and is more likely to affect children from poorer homes than those from affluent families (Flynn et al. 1999; Braddon et al. 1986). Recent evidence also shows that obesity levels in younger children (aged 3-5 years) are

increasing (Bundred et al. 2001). The increased levels of obesity in children and adults is inextricably linked to declining activity levels (Armstrong & Welshman 1999). Changing patterns of leisure have been implicated in the increased levels of overweight and obesity (BNF 1999). In Liverpool Atkins et al. (1997) reported that young people were taking part in less active games. Cobin (1981) provided evidence that less fit children watch more TV. A report reviewing the impact of TV on adolescent nutritional status (Story 1990) recommended increased research on the relationship between TV viewing to obesity levels and Schlicker (1994) showed an association between increased TV viewing and obesity. The evidence suggesting that obesity in childhood and adolescence may track into adulthood (Goran & Gower 1999) is a major reason for tackling the problem in adolescence and in a schools setting.

2.2.3 Dental Disease

Diet is thought to be implicated in both caries formation and the progression of periodontal disease. There is little opposition to the causal relationship between the amount and frequency of intake of "sugars" (i.e. non milk extrinsic sugars) in the diet and the formation of dental caries (Rugg-Gunn 1993). Although the prevalence of caries has declined in the UK it may now be on the increase. Of more concern is dental erosion caused by the effect of acidic fizzy drinks, which can affect up to 30% of 13 year-olds (HEA 1996).

2.2.4 Iron Deficiency Anaemia

Requirements for iron are increased during adolescence, particularly in girls due to an increased menstrual loss (Rees & Mahan 1988). Iron deficiency anaemia can be common in teenage girls. Nelson et al. (1993) studied the prevalence of iron deficiency in 399 12 - 14 year old London schoolchildren, and found girls were more likely to be at risk of anaemia than boys. Iron intakes were significantly higher in boys than girls. Girls who were trying to lose weight and vegetarians had the lowest intakes of dietary iron. The National diet & Nutrition Survey [NDNS] (Gregory et al. 2000) reported mean intakes of total iron from food sources was 10.4mg for boys and significantly lower for girls 8.3mg ($p<0.01$). The proportion of girls with intakes below the Lower Reference Nutrient Intake also increased with age.

2.2.5 Calcium Intake

Calcium requirements peak during adolescence (DoH 1991) but an adequate intake of dietary calcium may prevent the onset of osteoporosis in women by increasing peak bone mass (Johnston et al. 1992). Intakes of calcium for boys and girls were reported by Gregory et al. (2000), mean intakes of calcium were higher in boys (784mg) than girls (625mg) ($p<0.01$). This is of concern since older girls were shown to have levels of dietary calcium below the Reference Nutrient Intake (Gregory et al. 2000).

2.2.6 Income and Health

The relationship between low income and poor health has been shown by numerous studies and has lately been acknowledged by the Government (DoH 1998). Townsend & Davidson (1982) in a seminal report demonstrated that mortality from diseases such as heart disease, high blood pressure and stroke, still births, and disease of the digestive system rose with falling social class. Whitehead (1992) also confirmed the inequality between social classes, with regard to health: "*most of the major and minor killer diseases now affect the poorest occupational classes more than the rich*". During the late nineties the UK government acknowledged that poverty and social exclusion are inextricably linked to poor health (DoH 1999), and targets for the eradication of child poverty were set. A nutritious diet is essential for health to maintain growth, and provide essential nutrients to enable optimum function of the body (Thomas 1994).

Children living in areas of social exclusion can be particularly vulnerable; lack of money and poor access, or availability, to a healthy diet are major barriers to a healthy lifestyle (Cole-Hamilton & Lang 1984; NCH 1992; DoH 1999). Social exclusion is synonymous with poor nutrition; in some large council estates an inability to afford or access "healthy" foods has seen the emergence of the concept of a "Food desert" (sic) within the food policy and poverty literature (Lang et al. 1999; Leather 1992). To some extent it has shaped government policy towards improving the diets of the worst off in society (DoH 1999). The recent proposal to reintroduce nutritional standards for school meals has to be

welcomed as long overdue (DfEE 1999). More recently the campaign to increase the amount of fruit available in primary schools is seen as beneficial. Whether these actions will inculcate a change in the consumption amongst poorer families remains to be seen.

2.3.1 The Dietary intake of young people

The marriage of technology and food science has transformed the type and the amount of foods available to eat (Pike 1972), and this development has had a profound effect on the diets of schoolchildren since the war. Research shows the diets of British children are far from ideal, and tend to be high in fat and sugar, low in "fibre" and other important micronutrients (Gregory et al. 2000; DHSS 1989; Bull 1988); children continue to prefer foods high in fat and eat fewer foods thought to be beneficial to health such as fruit and vegetables (Hackett and Howe 1997; Anderson et al. 1994).

The latest national survey conducted on 1701 children aged 4-18 years (Gregory et al. 2000) showed that eating habits remain a cause of concern, children were eating too much sugar, saturated fat and salt and intakes of fruit and vegetables were less than optimal. The most common foods, eaten by more than 80% of 11-14 year-olds included; white bread, savoury snacks, chips, biscuits chocolate confectionary, and potatoes (mashed, boiled and jacket). Fruit intake was exemplified by the popularity of apples and pears which were eaten by 48% of boys and 47% of girls. Salads were eaten by over fifty percent of boys and girls; girls also ate more green vegetables than boys in this age group. 85% of boys and 73% of girls consumed sugared fizzy drinks however; the numbers using low calorie alternatives was over 40%.

The DHSS study of 1983 (DHSS 1989) showed that popular foods in children aged 10/11 years included: chips, bread, cakes, breakfast cereals, and fizzy drink and fruit. Three quarters of children had a percentage energy from fat greater than thirty five percent and a quarter derived greater than forty percent of energy from fat. Crawley (Caroline Walker Trust 1992) studied the diets of adolescents aged 16 and 17 years. Their mean fat intake of 42% suggested little change in the proportion of energy from fat had occurred, as children become older

teenagers. The NDNS (Gregory et al. 2000) showed a decline in fat intakes. Percentage energy from fat was 35% for boys and 36% for girls which are close to those recommended for adults (COMA 1991). Intakes of saturated fat (14%) were however higher than the 11% suggested by the same report, illustrating that there is still need to improve the diets of young people.

Data from the NDNS (Gregory et al. 2000), collected from 7-day weighed intakes, details the changes in macronutrient intakes, eating patterns of teenagers however remain closely linked to snack foods and drinks. Adamson et al. (1992) compared the dietary habits of 379 schoolchildren attending the same schools in Northumberland with a similar study conducted 10 years earlier. Percentage intakes of energy, protein, fat and unavailable carbohydrate had changed very little over the ten year period, what is of particular interest to this discussion is which foods provided these nutrients. Chips, crisps and confectionery contributed over 25% of the total fat intake. Bread was shown to be a less important provider of energy over the ten-year period. Confectionery increased its contribution to energy, fat, and protein intake 1990 compared to 1980. Chips held their popular position in the diets of adolescents and milk continued to be a prominent source of energy. Social class differences were found; children from poorer homes were less likely to use low fat milk and polyunsaturated spreads but more consumed "other" margarines and whole milk. The original study (Hackett et al. 1988), with results presented as a mean of 15 days, also showed children from lower social class families had higher intakes of fat.

McNeil et al. (1991) derived the proportion of nutrients provided by different food groups in the diets of 12-year-old boys and girls living in Dundee. Values were similar for boys and girls, the proportion of energy derived from confectionery was comparable to Adamson et al. (1992), and also to a study conducted by Durnin et al. (1974). The authors acknowledged that actual nutrients derived are very different (McNeil 1991). Crawley (1992) found acceptable intakes of micronutrients with the exception of Vitamin B2 (Riboflavin) and iron. Girls who consumed less energy also had lower intakes of Vitamin A, riboflavin (B2), Vitamin B6, iron and calcium.

The DHSS survey (1989) showed 92% of 10-11 year olds ate confectionery, and 100% ate biscuits during the survey week, and chips were consumed by 89% of children. It is interesting to note that Widdowson's pre-war study of children's diet (1947) reported that only 90 children from a sample of over 1000, ate crisps. This is an important comparison to consider; the changes that have occurred in food habits, related to economic and industrial growth, suggest that a return to a "golden age" of dietary habits is unlikely to occur.

2.3.2 Snacking

Mintel (1999) suggested how confectionary and chocolate manufacturers would target the disposable income of young people. Mintel (1999) reported figures from the Walls pocket money survey, an annual survey conducted on a national sample of 1700 families with two or more children, that children's average income (derived from three sources: pocket money, money from earned income e.g. paper round, and hand-outs from relatives) rose by 28% in 1998 compared to the previous year. Boys received higher levels of income than girls. Boys in 1998 had an average weekly income of £6.65, compared to £4.66 for girls. The latest survey (Unilever 2001) reported that average pocket money in the UK was £3.19 this representing a 3% increase on the previous year.

It is acknowledged that "adolescents are snackers" (Bull 1988), and are able buy snack food from shops, supermarkets on the way to school, and within schools from tuck shops and vending machines. Bilger-Doughten & Jenkins (1987) determined the frequency of teenage snacking and the contribution to nutrient intake in adolescents aged 11 – 18 years. 80% of their sample ate snacks; frequency of snacking occasions ranged from 1 - 7 times a day and provided a quarter to a third of energy intakes. Morning snacks, from school shops and vending machines tended to be high in fat, sugar, and salt. Bull (1988) reported that children aged 10 snacked most frequently followed by children aged 10-14 years old (Bull 1988). Anderson et al. (1994) demonstrated that 70% of their sample of Scottish 15 year olds ate crisps and 68% ate chocolates or sweets either every day or three to six times a week. The authors compared the eating habits of the 15 year olds with 35-year-old adults and the greatest difference between the two groups was the consumption of snack food. Nelson

(1991) reported that English schoolchildren obtained 10% of energy intake and 40% of sugars intake from soft drinks, confectionery and table sugar. One third of all energy intake and 56% of sugars intake came from snack type foods.

2.4 Physical Activity

Regular activity can have an important part to play in the prevention of coronary heart disease. Decreased activity is thought to be the major reason for the increasing obesity levels seen in children and adults in the UK (Atkins et al. 1997; Armstong 1995; Cale & Almond 1992). Decreasing activity (exercise) levels among the nation's children have been shown to "track" into adulthood (Armstrong 1995) and this is a major cause of concern as regular exercise in childhood can promote psychological well-being, and may help reduce obesity levels (HEA 1998). Boys have been shown to be more active than girls, and as girls grow older, their activity level declines (Armstrong & Welshman 1997; Riddoch & Boreham 1995). The Health Behaviour Survey (Balding 1994) reported similar data; girls were less active than boys and a relationship between reported activity and sedentary lifestyle activities was apparent. There was an inverse relationship between watching TV and self-reported exercise levels in girls: "children are fit but not active"; Balding (1994) suggested that children have acceptable levels of aerobic fitness but follow sedentary lifestyles. In Liverpool the Sportslinx project has been designed to encourage young people to take part in physical exercise (Sportslinx 1999). Children from schools across the city take part in fitness testing and can be guided into suitable sporting activities. In addition the FIQ has been used to assess dietary habits along with anthropometric data.

2.5 Summary

Health related behaviours developed during childhood and adolescence can track into adulthood. Diet is a causative factor in obesity, coronary heart disease and certain cancers (DoH 1999; Moore 1998). Much of the available evidence shows children to have similar eating patterns during the last ten years. Confectionery, crisps, and soft drinks remain the most popular foods eaten by schoolchildren (Gregory et al. 2000; Adamson 1992); foods often "vilified by health educators" (Nelson 1991). Percentage fat intakes have reduced according to the latest

research, but saturated fat intakes remain higher than that thought to be beneficial to long-term health, there remain differences in saturated fat intakes between the sexes.

The snacking habits of children are unique and play a key part in influencing their food choice (Watt & Shieham 1997; Chapman & McClean 1993) and the reliance children place on high sugar, high fat snack foods is an area of concern. A consensus of opinion argues for a movement away from high fat high sugar foods to a diet that contains more vegetables, high fibre starchy foods and less fat, particularly saturated fat. Nutrient intakes are important when forming nutrition related policies, but adolescents do not eat nutrients; they consume *foods* (Khan 1988). Using foods to present the diet will indicate changes in food consumption that are required and realistic targets to be suggested. The need for dietary changes is agreed; what is of major importance to nutrition educators is how to translate the adult language of positive nutrition into the dialect of the teenager.

There is agreement that increased physical activity can benefit long-term health; what is lacking is an understanding of the factors that may motivate children to participate in regular exercise as they progress through adolescence. Adopting positive dietary and physical activity behaviours can provide young people with short and long term health benefits. Health professionals and dietitians in particular, need to understand the motivations and cultural imperatives that drive health behaviour in young people; understanding such factors will enable interventions combining nutrition and physical activity to be developed. The next phase of the study will investigate these motivations, offering solutions, to assist health educators and dietitians working with adolescents, design realistic and relevant intervention.

Chapter 3 Food Choice and eating behaviour

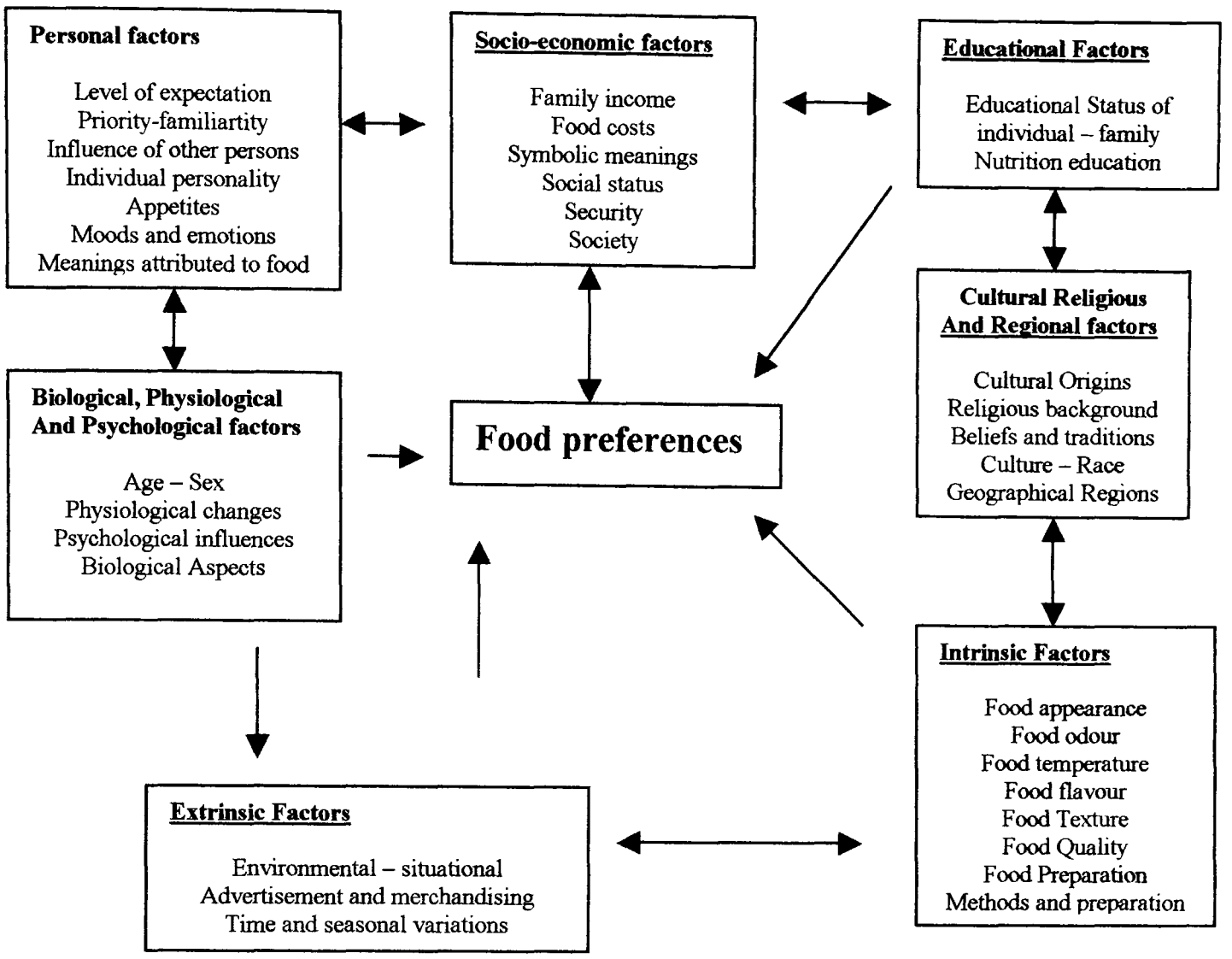
3.1 Introduction

The preceding chapter has shown that the eating habits of young people are still problematic. Eating habits do not occur in isolation and a multitude of many factors interact to affect dietary habits (Murcott 1998). No single theory can encompass nutrition behaviour or food choice (Hochbaum 1981), the factors influencing it cannot be divorced from an individual's social, personal and biological environment (Glanz & Rudd 1993), and as such it makes the study of food habits very difficult (Khan 1981) as food and dietary behaviour can become lost "within the culture of eating" (Fieldhouse 1986). The food selection paradigm (Fieldhouse 1986) suggested that "clusters of influence" will operate at different times and at different stages of the food selection process. Understanding this theoretical web is essential before initiating relevant, salient nutrition interventions aimed at improving food choice decisions.

3.2 General models that explain food choice.

Yudkin (1956) and Pilgrim (1957) were the first authors to describe models for food selection. Yudkin summarised the factors influencing choice into three broad groupings: factors of availability (physical), social, and physiological. Pilgrim's model of food acceptance (which he defined as: "consumption with pleasure") suggested that physiology, attitudes and sensation combine to influence food acceptance. Elements within the broad groups operate at different levels; within the individual e.g. hunger, appetite; and environmental influences e.g. learning. Pilgrim's work was developed by Krondle & Lau (1982), who proposed a cultural anthropological model of food choice identifying components that interact to influence choice. Perception takes account of sensory factors and beliefs. The exogenous determinants (external factors) address the social and physical environment within which food choice decisions are made. Endogenous determinants (internal factors) relate individual, biological and health factors to choice. They suggested that learned health beliefs of individuals, and the flavour of foods, were more important in determining food choice than convenience and price and prestige in adults. High correlations were found between food use and flavour perceptions in 43 out of 48 foods.

Diagram 3.1 Factors influencing food preferences (Khan 1981)



Khan (1981) presented a more detailed model of food preference. He listed the various influences and their inter-relationships (diagram 3.1) but made no attempt to measure their impact. The seven groups of factors combine to influence food preference.

Shepherd (1985) presented food choice as being influenced by three interrelating components dependent on the food, the person and the economic environment. Chemical and physical properties of the food combine via physiological effects, e.g. appetite, to influence choice. The sensory attributes of the food, including taste and appearance, combine with social and cultural factors to influence attitude to particular properties of the food. The net effect of these interactions shapes food choice and intake.

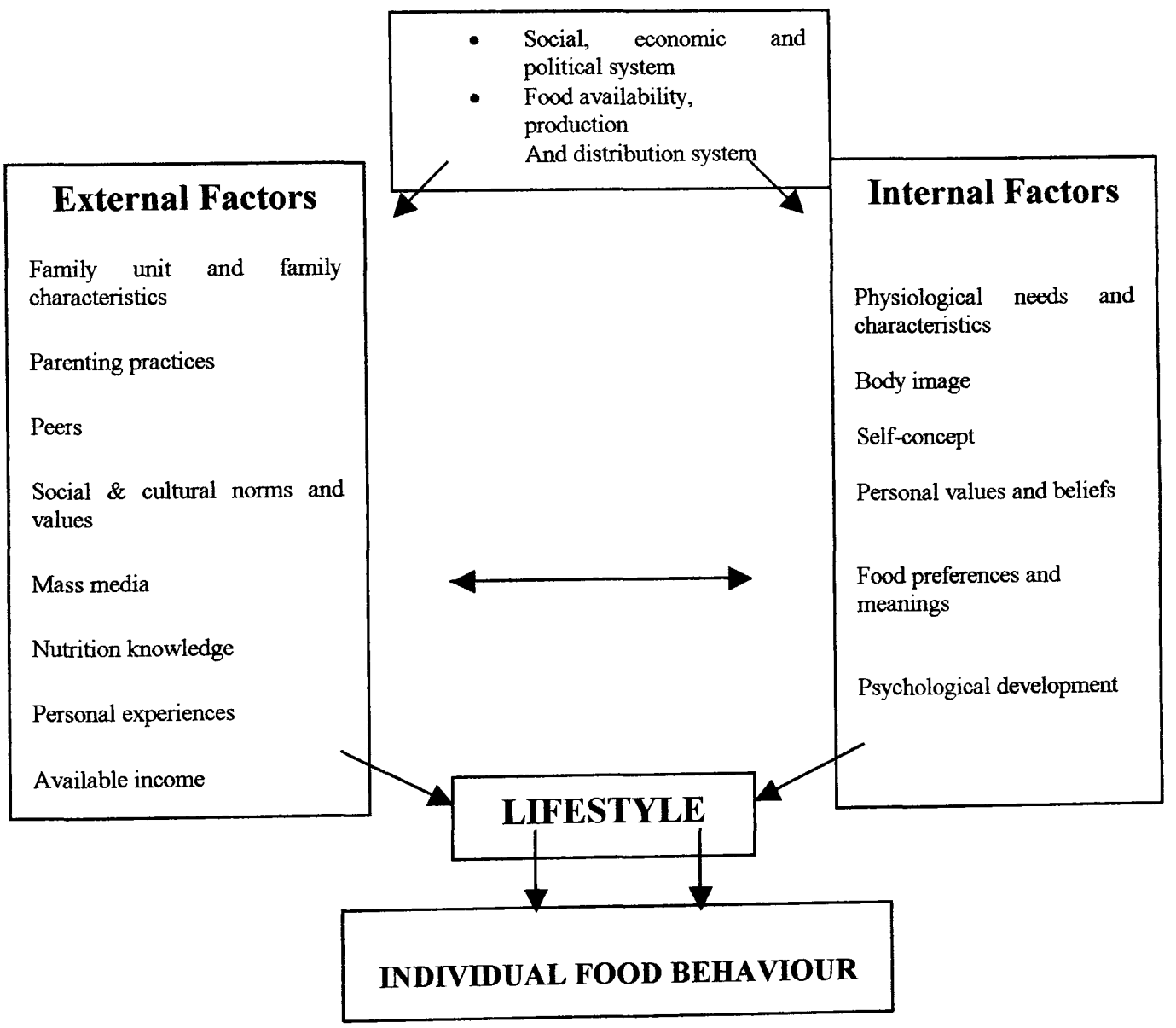
Wheeler (1992) focused on an element thought to be lacking in other models; the factors that constrain or place limitations on food choice. The "hierarchy of constraints" predicts that certain limitations on food choice will always be apparent and some will take priority over others. The first level of constraint will

be cultural: how food is defined as edible. Culture works via rules of acceptance or inclusion, reinforcing family norms and enhancing difference between groups within the population, e.g. teenagers.

Rees and Mahan (1988) described a model of food choice in adolescents (diagram 3.2). The growing autonomy associated with adolescence and changes in the social life and self image in particular can have a "decided impact on what they eat".

Diagram 3.2

Factors affecting adolescent eating behaviour (Rees & Mahan 1988)



Many of the factors are common to other models. However, they have particular relevance to the discussion of adolescent eating habits. This influences lifestyle by the interaction of two groups of factors: "internal"; which relate to biological and psychological needs, and "external"; which include social and cultural factors, e.g. family, peers, and learning.

The economic and environmental situation is still pivotal in influencing individual food behaviour. The early models of food choice described the multitude of factors that influence food selection but offered no solutions on how each may impact on choice directly.

More recently research has attempted to measure specific components of choice and amend theories in light of empirical evidence and a number of studies have resonance with the objectives outlined in this thesis (Bisogni et al. 2002; Booth et al. 2001; Wetter et al. 2001; Reynolds et al. 1999; Shepherd 1999; Connor 1998; Murcott 1998).

For example, Connor (1998) and Shepherd (1999) extended the framework of the theory of planned behaviour (TPB) to include ambivalence, suggesting that an individual's attitudes may not be "*clear-cut*" and may show a certain degree ambivalence to making dietary changes (having both positive and negative attitudes about a behaviour). Shepherd (1999) also describes *"optimistic bias"* (where an individual underestimates the risk of a given behaviour relative to other people, i.e. "it won't happen to me"). Ambivalence and optimistic bias may have an impact in young people. There is evidence (Frank 1998), to suggest that young people may be unconcerned about their current health perceiving their personal risk to be low. In this context, ambivalence or optimistic bias could explain why positive changes in eating habits have made only slow progress during the nineties despite increased awareness of healthy eating messages. Wardle & Huon (2000) also reported that children rated drinks labelled "a new health drink" as less pleasant than a drink labelled " a new drink" implying that if healthy foods give a negative hedonic message, it may be prudent not to promote foods as overtly healthful to some children. If young people perceive changing their diet as irrelevant, and have negative outcome expectancies (i.e. will have little effect on their future health, foods may taste bad or make them appear different to peers), practitioners must devise interventions that will engage young people, to perceive positive outcomes in making changes to diet behaviour.

Reynolds et al. (1999) proposed a model to explain vegetable and fruit consumption in children which included elements developed from social cognitive theory (Bandura 1986). The model contains predictors of consumption

based on the environment, the person and behaviour. Three environmental constructs are listed: *availability, modeling and nutrition education*: two person constructs, *knowledge and motivation* and one behaviour construct, *consumption.* The model was tested empirically and results suggested that availability and motivation constructs were significant predictors of fruit and vegetable consumption. The level of variance explained by the components of the model was low which suggested that further development of the model is required. Although the results are tentative, they indicate that interventions that address outcome expectancies, self efficacy, and preferences may offer another route to bring about change.

Bisogni et al. (2002) investigated how self identity concerning foods may impact on behaviour, proposing a psychosocial model of food choice focussing on how "identities," the self-image people have of themselves regarding food, might affect eating habits. The study used a grounded theory approach and devised a conceptual model to describe how identities relate to eating habits. The conceptual model linked developing identities through the life course, which were influenced by personal and group preferences, cultural and social categories and eating habits. The model explains how identities to eating are formed, enacted, evaluated and re-evaluated by individuals as a result of their experiences and relationships. The identities individuals created were directly shaped and influenced not only by group and personal characteristics, interpersonal relationships, and social factors but also by preferences and personal food choice itself. This small scale study used a purposive sample of mainly middle class adults in the US and although it is difficult to generalize to the UK, it emphasises how an individual's self perception about their eating is derived from interactions between their own eating habits and social and group characteristics. Self-identity, and self image are important aspects of youth culture, particularly for girls and this work provides a glimpse of how an individual's own feelings and concepts about his/her eating impact on what he/she will choose to eat.

Understanding the prevailing food culture of young people involves understanding young people's language, concepts and beliefs about food and diet. Changing an individual's constructs and beliefs about food is one factor to

encourage change (Wahlqvist 2000). The need to understand the consumer has been an important part of introducing new food products to the market place.

Worsley (2000) describes a food lifestyle model (Grunert et al. 1996). The model suggests that seven groups of variables influence the consumer's food lifestyle: ***shop*ing scripts** (the ways in which people shop), **meal preparation scripts,** (how products are converted into meals), **high order product attributes** (e.g. "healthy", "natural"), **concrete attributes** (price, packaging), **consequences** (that follow from buying the product), and **values** (personal values of the buyer). The personal values people hold influence their decisions about whether a food should be eaten or not. Values also influence individual belief systems. Worsley suggests that beliefs about foods are likely to be extensive because consumers may have a variety of different concerns about food, not only health beliefs. This poses health professionals, attempting to modify eating behaviour to benefit health, with some difficulties. Health professionals need to be responsive to the consumer's "world view" understanding that not all consumers will be inclined to change behaviour for purely health reasons.

The "Nation's Diet", a major research programme conducted during the nineties in the UK (Murcott 1998) provided a multidisciplinary, social science perspective on food choice, bringing together a diverse range of social scientists to examine basic, rather than applied, research questions in the realm of food choice. The diversity within the programme resulted in a range of methodological approaches being used; quantitative, qualitative, experimental and anthropological, and provided a long overdue review of social science research within the area. In relation to changing the eating behaviour of schoolchildren, one series of studies (Horne 1995; Lowe et al. 1998) used a psychological experimental approach to investigate changing the eating preferences of primary school children. Lowe's thesis ; *"any child can learn to eat almost any food"* was tested using peer modelling and reward strategies to bring about changes in food preference in schoolchildren aged 5-7 years. The studies used video-based characters, as positive role models (the "Food Dudes"), along with rewards (caps, badges etc) for consuming more fruit and vegetables. The studies found that using such approaches did bring about changes to behaviour after 2 and 6 monthly follow up. Of the approaches used a video alone

had little long-term effect on eating habits. A reward approach alone did have some effect on eating habits, however the most effective intervention included both the video and reward strategies. Interventions based on an understanding of cultural and peer model may provide alternative avenues for intervention strategy for adolescents.

The previous series of studies have shown how specific factors in the food choice area have been investigated and knowledge expanded. However the goal of early research, to develop a paradigm capable of influencing practice, has been difficult to achieve. One major review in the field, The Partnership for Healthy eating and Active Living (O'Hill, Goldberg & Pate 2001) discussed how the myriad of factors affecting food and activity related behaviour could be used, by a diverse and sometimes disparate research community, to bring about a coordinated approach to the design and implementation of interventions and policies designed to effect change. The partnership was set up in the United States to address how to change eating and activity patterns in the American population in response to the worrying increase in obesity levels. The increase in obesity coupled with the generally poor success of interventions designed to effect changes in individual behaviour was the context to the summit.

Three working groups, comprised of experts from multidisciplinary fields; policy, education, health and exercise and nutrition sciences, were convened to develop a heuristic framework to identify the key factors affecting eating and exercise, how the environment affects choices, and what lessons and positive results can be learned from research to facilitate change in behaviour. The summit was seen as the first step in bringing about a paradigm shift in public health nutrition, and towards its goal to reduce the epidemic of obesity that affects the US.

Booth et al. (2001) proposed part of the framework to explain how environmental and social factors affect food choice and physical activity from outside the individual. The framework proposes behavioural settings, primary and secondary leverage points where change may be influenced. The primary leaverage points are those with the greatest influence on the individual, e.g. to increase the consumption of fruit and vegetables in schools, the school will be the primary leverage point: fruit must be available to sustain any change in

behaviour. The distal leverage point will be the local shopping environment and the availability of fruit and vegetables locally. Working group one (Wetter et al. 2001) proposed a framework to: "*identify the determinants and influences on eating and activity behaviour*" . At its centre are the factors intrinsic to the individual: physiological, genetic and self identities and motivations. Cultural and social determinants are located outside the central core, as are the determinants that are close to the decision making process. The next layer represents the boundary between the environment and the individual's behaviour (described as lifestyle). The interface represents the impact between the inner levels of the model and the challenges posed by the environment. The model promotes multidisciplinary approaches allowing those who use it to consider design options in terms of intervention settings and likely partners for collaboration. In terms of school-based intervention the framework acknowledges the importance of a range of determinants, core values and self identities, culture and lifestyle factors and how these may interact with each other, and the environment, to assist design of interventions. The authors recognize that the framework has limitations and that research is required to develop fully, and if necessary change, the framework in light of empirical work.

3.3 Factors affecting food intake in adolescents

Children learn, through the process of socialisation, the cultural and societal norms expected of them as individuals (Giddens 1994). The family plays a pivotal role by giving the infant and young child its first images of the society he/she lives in. Values and cultural norms are passed down from parents to children, explicitly by teaching family "rules" and implicitly by observation of parents by children. In the realm of food, cultural patterns of food behaviour will be learned: what constitutes food to be eaten, when certain foods can or cannot be eaten will be culturally determined and transmitted via the family unit (Rozin 1990, De-Garne 1972, Fieldhouse 1988). "Junk" food belongs to the culture of the teenager, and cultural constraints on eating will influence the ability of an individual to change to a healthier diet:

> *"if everyone else is drinking cola and eating burgers it is a strong minded teenager who chooses milk and salad"*
>
> (Fieldhouse 1986).

Birch (1987) studied the early learning experiences with food, which do not occur in isolation but in a social context. Children may learn that fatty foods are "bad for us", but the positive social context that often accompanies their experiences with the food, i.e. having high fat foods as rewards or treats, can increase their preference (Birch 1992). This could have implications for nutrition education with health professionals attempting to modify food choice which may conflict with socially and culturally accepted preferences.

The family has been proposed as one of the key influences on food choice. Lewin's "channel theory" (Lewin 1947) proposed the influential (gatekeeper) role of women in the food economy of the household. In the UK Charles and Kerr (1988) and Murcott (1992) have described the socially derived role of the wife and mother in the household economy; although women make the decisions about what foods to buy and when and where to shop: meals are prepared with due reference to their husband's and children's likes and dislikes. One study (Gillon et al. 1993) showed that as the family structure changes and more women work full time, their historical role as "gatekeepers" of the family's health is being blurred by the increasing importance of their "provider" role in the household economy. Borah-Giddens & Faciglia (1993) indicated that the similarity between children and their parents appears to be a poor predictor of the child's food preferences. Foxcroft and Lowe (1992) described research examining the use of illicit drugs which was higher in children from families who were more "authoritarian" and "neglecting" towards their children. This suggestion, that differences in family style may be important in the development of health behaviours in adolescents, requires further investigation, but would seem pertinent to any discussion of food choice. As more women work full time there may be less opportunity to cook and prepare traditional meals leading to an increase in convenience food use and loss of practical cooking skills. This idea has been the focus of recent debate (Lang et al. 1999). Lang suggests that the continuing decline in cooking skills in the home and within the school curriculum may result in a future culinary culture based on convenience foods. Charles & Kerr (1988) also suggested that because of the traditional women-centred approach to food, nutrition education should target men, and that boys should learn about nutrition in school. This becomes equally important for both

sexes as both girls and boys lose the opportunity to develop food preparation skills.

Television is an omnipresent source of information and influence conveying implicit and explicit messages about food and health related behaviour (Story 1990). There is little doubt that TV advertising directed at children "works" for the advertiser by increasing produce sales (Tucker 1986; Liebert & Sprafkin 1986). A high percentage of advertisements directed at children are for sweetened cereals, chocolate and fizzy drinks (Diel & Daum 1984; Donkin et al. 1992; Dibb 1993). The results of competing commercial advertising and health related promotion of food, not surprisingly, is a confused public. One study (Rudat 1992) showed that 71% of the public agreed with the statement "experts never agree what foods are good for you". A common argument used by advertisers is that advertising helps only to increase brand loyalty and promote the choice of Brand A over Brand B. If advertising is powerful enough to influence the choice of Brand A over Brand B then it is reasonable to suggest that advertising could influence choice of one particular food over another, e.g. sweets and coke in preference to milk and fruit. Thomas (1991) suggests that children could be especially susceptible to advertisements since they are strongly influenced by adults. This may be less important in teenagers as they become more independent and autonomous regarding their food and other lifestyle decisions (Trusswell & Darnton-Hill 1979; Coleman & Hendry 1999).

The incidence of obesity amongst young people is increasing in the UK. Concern with body shape and body image is common in adolescence (Hill 1996). Some adolescents can become dissatisfied with their rapidly changing body shape which can have nutritional consequences as some girls adapt eating habits to conform to stereotyped images in the media (Rees & Mahan 1988; Hill 1992). One study found that 23% of adolescent girls admitted to being on a diet and 52% said they had, at some time, been on a diet (HEA 1992). Physical appearance is a key cultural factor in western societies and young girls can manifest this ideal by dieting at very young ages (Wardle & Marsland 1990; Hill & Silver 1995). A study of Liverpool school children (LHA 1995) showed that only 38% of girls and 54% of boys were happy with their present weight. The

perception of body weight may be more problematical in girls; the 55% questioned would like to lose weight. Thus intake is constrained by perception of ideal body weight and shape.

Macfarlane (1993) suggested that knowledge alone will not change behaviour and pointed to the complexity of the motivations driving children's behaviour. The inextricable link between social and economic conditions and health related behaviours in children requires an understanding of the child's perceptions and awareness of health problems and equally importantly, the will of professionals and central Government to acknowledge their role in health promotion. Knowledge has also been shown to be a poor predictor of change in dietary behaviour. Young (1993) investigated the effect of a healthy eating promotion on knowledge and behaviour. Children attending the three schools in Lothian had similar levels of knowledge of healthy eating, but showed significant differences in eating behaviour. Nash (1992) described the difference between "perceived" and "correct" knowledge. Perceived knowledge is when what a person says conflicts with expert opinion; correct knowledge is when what a person says agrees with expert opinion. Wheeler (1992) suggested that "perceived" knowledge is culturally defined: "it is what everybody knows", and suggests perceived knowledge is far more important to the individual than correct knowledge. Young people have been shown to understand the key concepts of healthy eating (HEA 1992), however there is still confusion in what constitutes a healthy diet. In a study by Watt & Shieham (1997) they presented a quote as an example of good understanding of nutritional concepts, however the description was inconsistent. One young girl summing up the features of a healthy diet stated: "... *baked beans have got protein in them and I know that pasta has a lot of starch in it and can be quite fattening...*" This shows that perceived knowledge can still challenge correct knowledge; the idea that starchy foods are fattening is not consistent with the current consensus within nutrition: where an increase in starchy carbohydrates as part of a healthy diet is advocated. Such inconsistencies should alert professionals to look beneath the surface of nutrition awareness.

Health interventions have been criticised because they have neglected to take account of "Lay" perceptions and beliefs held by young people (Aggleton et al.

1998). Lay perceptions of health at different times of life can influence behaviour, Backett & Davidson (1992) argue that at different stages of life health priorities will differ. Adolescents claimed that it was boring to worry about changing lifestyle. Eating "junk" food, drinking alcohol and smoking were acceptable as long as present health did not suffer. Their concerns about having a fit, healthy body were related to maintaining relationships with peers and sexual attractiveness.

Contento & Murphy (1990) investigated the psycho-social factors differentiating people who reported changing their diets positively from those who did not. Factors identified as significant included: the perception of personal susceptibility to diet related disease; the perception of the benefit from taking preventative health action and their overall health concern. Whether these motivations will influence teenagers to change behaviour is questionable. Aggleton (1996) suggested that understanding how young people make sense of health and various health behaviours will allow health services to be targeted effectively. The Health Education Authority (1992) showed that a quarter of respondents admitted not being concerned whether the food they eat is healthy or not, and just eat the food they like. The image of healthy food can be unappealing to many adolescents: Chapman & McClean (1993) examined the meanings of foods to adolescent females aged 11-18 years by looking at how the young women classified and use foods. Two groups emerged "junk" food and "health" food. Junk foods were associated with pleasure, friends, being away from home and independence. Healthy foods were associated with parents and being at home. Although the family was still very important to these teenage girls, food behaviour was a way of demonstrating independence from their family and increasing relationships with peers. More recently Watt & Shieham (1997), using a methodology based on Chapman & Mclean's study (1993), explored young people's perceptions of food. Young people conceptualised foods into two groups; "healthy" or "fast" foods. Ross (1995) described a similar dichotomy. Food choice of children in her sample (mean age 11 years) was not determined by the health attributes of food, rather they were linked to preferences, socialisation, and play. The traditional (adult) concept of healthy food was seen as a "proper meal" and foods made at home. This suggests that

educators must be cognisant of young people's beliefs and knowledge about diet and health to develop health promotion interventions.

Backett (1990) studied the concepts of health in middle class families. She was able to show how children were able to classify foods as "keeping you healthy or not healthy", however they were more aware of the negative consequences of eating unhealthy foods rather than the positive effects of healthy foods. Providing young people with information on the positive benefits of healthy eating, that may be more in tune with their values meanings towards food, might be more successful in delivering changes in eating habits.

3.4 Social psychological models of behaviour change

Sociologists and social psychologists have attempted to explain and classify the cultural and symbolic dimensions shaping food habits (Alexson 1986; McIntosh & Zey 1989). Social psychological models have been developed to examine individual motivations influencing health.

3.4.1 The Health Belief Model

The health belief model has been used widely in health education. First described by Rosenstock (1966) and Becker (1974) the model includes the concept of self efficacy (Bandura 1977) and predicts that behaviour is determined by an individual's perception of the benefits of making a change and the costs to them personally. He/she must believe that the benefits of changing behaviour are more favourable than the consequences resulting from taking no action. The model can be criticised because it assumes that individual decisions are always rational, in addition it sees health as a highly valued goal (Thompson 2000). Young people who do not value health as an important benefit may not make the appropriate changes.

3.4.2 Social Learning Theory

Social Learning theory (SLT) postulates that an individual's behaviour is influenced or guided by the perception of the expected outcomes of that behaviour (Bandura 1977). Behaviour is seen as having a purpose and striving towards goals and is a consequence of the choices individuals make from a variety of possible behaviours available to them. It has been used as a theoretical

basis for food and nutrition education (HEA 1998; Contento et al. 1992). SLT suggests that an individual can learn new behaviours and their outcomes from the observation of others (vicarious learning). Bandura developed SLT which he renamed social cognitive theory (Contento et al. 1992). One element of the model, self efficacy, is the conviction that the individual perceives that he/she can make successful changes to behaviour. One bias within the model is that an individual may have faulty beliefs about the consequences of a particular behaviour .

3.4.3 The Theory of Reasoned action /Planned Behaviour

The theory of reasoned action (Fishbein & Ajzen 1975) was developed to predict a wide range of behaviours under intentional control. The theory was developed further into the Theory of Planned Behaviour (TPB) (Ajzen 1985), and has been used widely in the nutrition field to assess the role of attitudes in the food choice of adolescents (Shepherd & Dennison 1996; Shepherd 1992). The TPB can be used to assess behaviours that are not under volitional control. The theory has been successfully used as part of a study investigating changing to a low fat diet (Lloyd et al. 1993). The model proposes that behaviour is dependent upon a conscious intention to perform the behaviour. Intention is predicted by: attitudes to the behaviour (which can be positive or negative), social pressure, and perceptions of control over the behaviour (Shepherd & Dennison 1996). The theory presupposes that behaviour is rational or reasoned. In the realm of food choice, sociologists and anthropologists would disagree, suggesting that food related behaviour is more than a function of attitudes and intentions, (Fieldhouse 1986; Gofton 1994).

3.4.4 Stages of Change

The Stages of Change model, described by Prochaska & DiClemente (1984), derived from their work in addictive behaviours, has been proposed as a theoretical basis for dietary behaviour change (Glanz 1993; Hunt 1996). The model proposes that the process of change moves through stages: pre-contemplation; contemplation; ready for action; action/maintenance. Emphasis is placed on the individual being aware of what changes he/she needs to make. People can move through the cycle in different directions; acting on their

awareness and motivations to proceed to making a change and then maintaining the new behaviour. Individuals can "relapse" and this is not seen as failure. The model has been used in nutrition education (Glanz 1993) and has been the theoretical underpinning for motivating individuals to increase exercise levels (Thompson 2000). Kearney et al. (1997) also applied the theory for identifying people who were ready to make changes to their diet.

3.5 Health promotion and health education

The growth of health promotion and health education has been related to the soaring cost of health care (Peersman, Oakley & Oliver 1999; Haw, Degeling & Hall 1993). McKinley (1989) suggested that "upstream activities" (including health promotion) would be required as demand for treatment within the NHS increased. Ashton & Seymour (1992) reiterated this view. The demand led environment within the NHS however, continues to place emphasis on the development of effective treatments for established diseases such as coronary heart disease even though the prevention of CHD is an important aspect of policy (DoH 2000).

Health promotion and health education developed out of the public health movement of the nineteenth century, and recently the new public health movement (Ashton & Seymour 1992). The Lalonde Report (1974) saw the emergence of preventative medicine, ten years later the World Health Organisation (WHO) Ottawa Charter (1986) defined health promotion as: *"the process of enabling people to increase control over their health"*. This evolution has seen numerous definitions and models of what health promotion and health education are (MacDonald 1996). Tannahill (1985) described the *"semantic mess"*, within the literature of the eighties when attempting to define health promotion and criticised the WHO definition as "*too vague for practical purposes*". During the nineties health promotion has developed into an umbrella term that includes not only health education and disease prevention but also acknowledges the political, fiscal, and social factors that affect health and disease (Tannahill 1985; Tones et al. 1990; Naidoo & Wills 1996). Health education is seen an integral aspect of health promotion (Tannahill 1985; Nutbeam, Smith & Catford 1989), although they are not interchangeable (Naidoo & Wills 1996). The WHO view of health education suggests that promoting health is concerned

with empowering individuals to make "informed choices". This concept has been, and remains, a key to the Government's health strategy as interest in prevention and public health have developed (DoH 1992; DoH 1999).

Nutrition interventions in school, focussing on disease prevention as a key motivator to bring about change, has been challenged (Green 1992). Dockerel (1998) suggests that developing interventions that are grounded in the understanding of young people may offer a potential route to bring about change. Balding (1994) also acknowledges that one task for a health educator when promoting physical activity is to be aware of the attitudes of the adolescents. Seaman & Kirk (1995) used a marketing approach to promote healthy food habits in primary school children. The research involved using top sportsmen (swimmers) as positive role models to promote healthy food habits as part of a collaborative intervention involving classroom education, swimming activities and tasting sessions. This development of a holistic approach to positive lifestyle change in younger schoolchildren offers a model for use in older children. In schools across England, School Nutrition Action Groups (SNAGS) have been set up to foster an approach to school based health promotion (Harvey 1999) by giving young people a voice in the development of school based health promotion. Adolescents may benefit from a similar program of intervention, based on a firm understanding of their attitudes and cultural beliefs about activity, self-identity and lifestyle. In Liverpool, one project (Sportslinx 1999), has influenced the development of this project where promoting physical activity is seen as part of a broader strategy to improve eating habits. It is however important that any school based intervention is based on the requirements of the national curriculum.

3.6 The National Curriculum

The National Curriculum (1988), applies to all pupils in England and is organised into four key stages. Key Stage 3 includes the age range of the young people surveyed in this study (ages 11-14 years). Food and nutrition education occurs within science, design & technology and health education as a cross curricular theme (Coulson et al. 1998). There is some concern that the use of industry sponsored educational materials is covert advertising (Sharp 1991) and

consequently there is a need for materials to be developed for use in schools that are unbiased.

Some of the Key Stage 3 concepts young people should be aware of that are relevant to this discussion are presented in figure 3.1. The practical task within design and technology "designing a snack bar" implicitly reinforces the importance of snack bars in the diet of young people, and seen in the context of the removal of other practical cooking skill based lessons has lead to some critics to argue for a reintroduction of basic cooking within the curriculum (Lang et al. 1999). Coulson et al. (1998) suggest that theoretical education on food should be backed up by practical sessions to bring about greater understanding and integration between rhetoric and practice. Such debates, about the importance of food skills, and diet and health, however can be academic: nutrition in the health education curriculum is seldom seen as a priority subject and must compete with other health topics such as drugs or smoking for valuable teaching time.

Figure 3.1 Examples of food and nutrition concepts taught at Key Stage 3

Science	At this stage children should understand the process of digestion and assimilation. How the functioning of the healthy body can be affected by diet and lifestyle.
Design & Technology	Children should use food in their practical tasks e.g. designing a snack bar.
Health Education	The importance of a varied diet and the relationship between diet and health, fitness and the circulatory system. The influence of the media on attitudes towards health should be examined.

3.7 Summary

The nature of food choice describes eating behaviour as being strands of a complex, dynamic web; some choice models stress individual motivational factors and others concentrate on wider social and cultural forces. The multiplicity of factors influencing adolescent food choice would strongly suggest that a utilitarian model explaining why such choices are made is unlikely to emerge. The models discussed in this section place their emphasis on different aspects of choice: from Yudkin's broad classification of the person, the food, and the environment; to Khan's detailed exposition of factors into seven groups. Common threads exist between the models; culture is seen as being an important determinant of choice; economic and social factors cannot be divorced from any discussion of this subject and physiological factors must be taken into account. Krondle & Lau's work was influenced by social anthropology and so culture plays a major part in their discussion. Shepherd's model, utilising the broad categories of: the food, the person, and the economic, examines the sensory aspect of choice combined with an attitudinal elements. Rees & Mahan's model of the factors important in understanding food selection in adolescents shows the

importance placed on self-identity and change: two major facets of the adolescent period of physical and emotional change.

Recent research has placed emphasis on attempting to measure the impact of specific psychological determinants of choice. There is also a need to investigate the wider domains of cultural and social dimensions of choice. Some of the more recent models have investigated the values and self identities individuals hold towards food and eating. This avenue of research may have potential in the food choice of adolescents, self image and identity are key aspects of youth culture. If practitioners can understand the adolescent's "world view" regarding food and diet it may assist them in designing more relevant interventions.

The health education and health promotion role of the community dietitian is becoming increasingly important in response to government reports such as the Health of the Nation and Our Healthier Nation (DoH 1992; DoH 1998). More recently Saving lives (DoH 1999) and the National Service Framework for CHD (DoH 2000) suggest that prevention of diet related disease is a key strategic aim. Practicing dietitians must translate the theoretical models of food choice into interventions and policies using language clients can understand. Many of the theories and factors contained within the models remain esoteric and of academic interest only. What is required is an understanding of how these factors can be utilised in a realistic, practical way to develop education strategies.

Interventions designed for changing eating habits should be multidisciplinary (Booth 2000) and the framework proposed by Wetter et al. (2000) will allow researchers and health professionals from disparate disciplines to develop coordinated activities to enable change in eating behaviour and physical activity. The framework proposed is untested empirically, and as such will need to be evaluated in practice. The authors acknowledge this, suggesting that it should evolve and develop as research evidence is tested and reviewed by practitioners. The potential of the framework to create *synergistic collaboration* between and within disciplines is a paradigm shift for public health nutrition. The second phase of this thesis will use a combined methodology to assess current eating habits and a range of factors that may influence diet and motivate change. It is

concerned with the interpretation of these ideas as they apply practically to dietitians promoting health in adolescents.

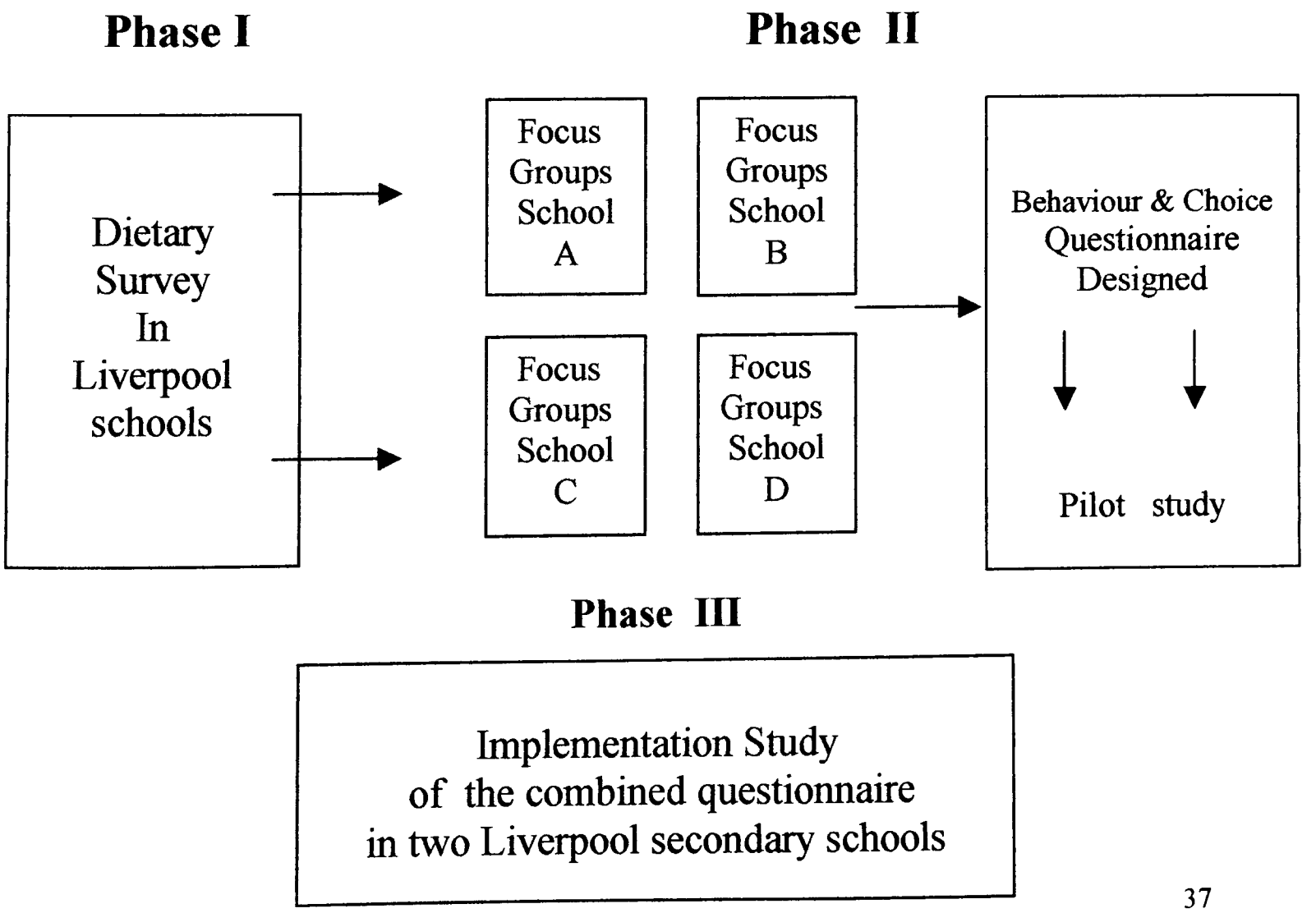
Section 3 Methodology

Chapter 4 Quantitative methods: Dietary survey methods

4.1 Overview of study design

The study design incorporated both quantitative and qualitative methods, to collect data on the eating habits of young people and also information on how they think about food and health. A dietary screening survey was conducted in Phase I of the study using the FIQ. This allowed young people with "good" and "poor" eating habits to be identified. Young people from both groups were then randomly selected and invited to take part in Phase II, which involved eight focus group interviews in four Liverpool secondary schools. The data from focus group interviews was used to design a questionnaire which could be administered in schools to allow a nutrition intervention to be developed. Phase II of the study describes the implementation of the questionnaire in two separate school populations.

Diagram 4.1 Overview of study design



4.2 Quantitative methods: Dietary Methods

A quantitative method was required for the dietary surveys. The study required a dietary survey method that could be used on large numbers of young people, be able to detect differences between "good" and "poor" diet groups, and be relatively simple for young people to complete. There was no need for the collection of nutrient data and this allowed a questionnaire method to be considered, rather than a more detailed weighed or diary method. The choice of a suitable method of dietary assessment was made after reviewing the literature and the needs of the study.

The methods available to describe an individual's diet include retrospective and prospective methods. Each method is liable to different errors and the selection of any method for use in a study will take into account the possible advantages and disadvantages associated with it. Table 4.1 shows the sources of error inherent in different methods (Bingham 1988).

Retrospective methods include:

24-hour recall
Diet history methods
Food frequency questionnaires

Prospective methods include:

Weighed Records
Estimated Records
Observed weighed records
Records combined with dietary assessments

Table 4. 1 Sources of error in dietary surveys

Source of Error	Record with weights	Records with estimate weights	Daily Recalls	Diet history & questionnaires
Food tables	+	+	+	+
Coding errors	+	+	+	+
Wrong weight of food	-	+	+	+
Reporting error	-	-	+	+
Variation with time	+	+	+	-
Frequency of consumption	-	-	-	-
Change in diet	±	±	-	-
Response bias	±	±	±	±
Sampling bias	+	+	+	+

\+ error known to be present
\- error not present
± error may be present

Source: Bingham 1988

A major part of this thesis was the development of a dietary survey method for use in evaluating dietetic intervention. A Food Intake Questionnaire (FIQ) was developed for this purpose. The FIQ, which is an adapted 24-hour recall method, was selected after consideration of the literature, and because nutrient intake data were not required for this study.

4. 2.1 Uses of 24-hour recall

The 24-hr recall is the most widely used dietary assessment method (Witschi 1990). It has advantages over other methods; it is quick and simple to conduct and requires little effort from the subject (Bingham 1988). The method attempts to "define" and quantify food intake on a specific day (Witschi 1990) before the interview, giving estimates of mean intake (Bingham et al. 1988). The method can predict average intakes of groups (Block 1982), and Witschi (1990) suggests it may also be applicable to dietary intervention studies that involve comparing the means of two groups but not individuals. Young et al. (1952) suggested that the 24-hour recall is an acceptable method for studying a group greater than 50. Block (1982), reviewing the validation of dietary assessment methods, has shown the utility of using a 24-hour recall to measure mean intake of groups. Madden

(1976) stated that a 24-hour recall is "a valid one" when attempting to describe "trends" in dietary patterns from large population groups.

4.2.2 Limitations of the 24-hour Recall

The 24-hour recall method has certain limitations which are common to other methods of dietary assessment. Any retrospective method relies on the subject's memory, an inability recall the foods eaten or to describe foods and portions accurately can decrease its validity and hence reliability. The method cannot account for intra individual day-to-day variation (Bingham et al. 1988) although this limitation can be reduced if surveys are repeated (Hackett et al. 1984).

4.3.1 Memory in Dietary investigation

Emmons and Hayes (1973) conducted a study to determine the accuracy of recall in children aged 6-12 years. Their study showed the ability to recall foods eaten improved with age; grade 4 children recalled 81% of the foods in their school lunch compared to 61% of grade 1 children. Meredith et al. (1951) compared recall of foods in children aged 9-18 years (63% of children were aged 9-12 years). Intakes from children's recalled food items were compared to observed intakes. As the number of foods increased there was a tendency for children to under-report food items: sixteen children out of twenty correctly recalled six items; whilst only two children out of thirteen correctly recalled nine items. Baranowski et al. (1986) reported the accuracy of children's self reports of diet (Grades 3-6). There was an 83% agreement between observers and self-reports by children across all foods studied over a two-day period. The authors suggested this "acceptably high" agreement could have been influenced because of the small sample size and because children knew they were being observed. This shows the limit to what can be achieved when recalling foods without prompts or the use of a checklist. Using a checklist or similar questions can help "jog" the memory.

4.3.2 Improving Recall

The quality of information provided by the 24-hour recall can be enhanced if attention is paid to improving memory. In children, focusing on the previous days activities can act as an aide-memoir (Krall et al. 1988). Frank et al. (1977) used an adapted 24-hour recall in children and included questions asking about locations and situations to help recall easily forgotten foods. Children in their study were also given notebooks to recall snacks. Krall et al. (1988) suggested using brand names might be appropriate instead of generic names of products as modifications to help memory.

4.4 Collecting data on children: accuracy of reports

The reactive (Hawthorn) effect has been described in research (Murray et al. 1988). The research process itself may influence participants taking part in studies, giving responses they think the researcher is expecting thus decreasing the validity of the data collected. Some studies (Livingstone et al. 1991, cited in DoH 1991) have shown that the observed energy intakes of adolescents when measured using a 7-day weighed intake were different from estimates of energy expenditure using a doubly-labelled water technique. This reflects patterns of under-reporting seen in obese or "weight conscious" adults (Black et al. 1995). To some extent, all retrospective dietary research is open to this potential bias, because the information collected is dependent on the subject's honesty and memory. Longitudinal studies can be open to the reactive effect as participants become "conditioned" to the research study (Bowling 1997). The potential bias of the Hawthorn effect will be minimised in this study by not using the same schools in the pilot, validity, or main dietary studies.

4.5 Development of the Food Intake Questionnaire

Asking simple questions about diet, serially, has been shown to be useful when monitoring trends. The use of a screening survey has much to offer teachers and health educators working with schoolchildren. The Health Behaviour Questionnaire (Balding 1997) continues to collect data about the eating habits and lifestyle of young people, from many thousands of children each year, providing educators and health professionals with a consistent source to monitor trends and investigate the relationship between diet and health. The dietary

information collected in the survey however is both qualitative and limited in nature; the dietary questions do not allow for any detailed analysis of eating habits. To evaluate community dietetic interventions, dietitians require information on eating habits that will describe the diet in terms of key positive and negative foods which reflect advice as it is given. Such information will allow the development of strategies and campaigns and enable changes in diet to be evaluated. The FIQ was developed from the Health Behaviour Survey (HBS) (Balding 1987), to allow more meaningful analysis of the dietary habits of schoolchildren to be assessed and to explore it's utility in evaluating community dietetic practice (Hackett, Jarvis & Matthews et al. 1990).

The diet questions in HBS (Balding 1987) were modified to include foods known to be key sources of fat, sugars, "fibre" and salt (Hackett, Jarvis & Matthews 1990). Specific foods are included in the questionnaire including: chips, confectionery, breakfast cereals and fruit and vegetables, sugared breakfast cereals and drinks (see appendix). These foods are representative of foods which play a large part in the eating habits of schoolchildren (Bull 1988: Nelson 1991; Adamson 1992) but also reflect foods forming the basis of advice promoting a healthy diet (HEA/MAFF 1997; MAFF 1997; HEA 1995). The foods listed in the FIQ even if they have little effect on overall nutrient intake would also indicate choices being made e.g. changing to low fat milk, using low sugar alternatives. The face validity of the foods included in the FIQ has been evaluated (Johnson et al. 1999).

The FIQ was designed to:

A. Assess current eating habits

B. Monitor changes in diet over time

C. Evaluate nutrition related campaigns

D. Give impetus to school based nutrition activity

The FIQ is an adapted recall method asked questions concerning the consumption of specific foods eaten on the previous day, (not the previous 24 hours), and relates only to the school week Monday to Thursday. The questionnaire does not attempt to estimate nutrient intake and records only

whether or not specific foods were consumed. It does not distinguish between meals and snacks, what time of day or the number of occasions during the day when foods were consumed. The FIQ asks children a basic stem question: " Did you at any time yesterday, eat any amount of ..." the question is followed by a list of food related items.

The diet records can be analyzed by aggregating foods with similar characteristics e.g. the number of sugary foods claimed to have been eaten. By counting the number of foods in each group a score was obtained for each child and hence mean scores calculated. The following aggregated groups were derived: fatty (n=10), sugary (n=13), fibrous (n=10), low sugar foods (n=3), salty foods (n=7) snack foods (n=10) and alternative fats (n=5). These groups were then combined to produce two larger groups of marker foods; positive markers (n=20) and negative markers (n=24) describing foods that dietitians would advise young people to eat more of or less of (Johnson & Hackett 1997). Any one food could appear in more than one group if its contribution to diet warranted inclusion: for example, crisps contribute to fat intake but are also an important snack food. However, in each large marker food group (negative and positive) foods are only counted once. Aggregating foods into specific groups for analysis, will allow dietitians and health educators or class teachers to focus education interventions on the whole diet or specific components of it e.g. targeting fatty or sugary foods.

The main outcome variables were the proportion of children who answered each question *Yes* and *No* thus enabling the proportion of replies that agreed to be calculated (i.e. YY, NN). In the early stages of development the FIQ was presented as an interactive computer program. Staff in the department of Child Health and Medical Physics in the University of Newcastle Upon Tyne wrote the computer software. For the initial pilot survey for this study the program was adapted for IBM compatible machines. The questionnaire was designed as a method for investigating the dietary habits of a large number of subjects in schools to give staff and health educators a means of monitoring changes in diet over a given time period. The computerised questionnaire has been piloted in paper and computer format (Hackett, Jarvis & Matthews 1990; Bakker 1992) and found to be user friendly in school (Hackett, Jarvis & Flanaghan 1989).

4.6 Selection of sub-groups for focus group study

The numbers of negative and positive marker foods consumed by each individual was used to classify young people at the extremes of the distribution into *"good" or "poor"* diet group. The terms, do not indicate that the diets of each group are nutritionally adequate or inadequate but indicate that children included in the good diet group are consuming foods likely to be low in fats and sugars and high in fibre. Conversely, children included in the poor diet group are likely to be eating foods that are high in fats, sugars and low in fibre. Other terms could be used to classify this dichotomy, *" healthy"/ "less healthy"* or *"more healthful"/ "less healthful"*, however these classifications in themselves would be semantic preference and prone to the same subjective assessment of diet. The terms *"good"* and *"poor"* are acknowledged to be subjective. However the table of macro nutrient intakes (page 75) suggests that the diets of children in each group were significantly different from each other to allow the classification to be used.

Subjects identified in both the upper quartile of the positive foods group and the lower quartile of the negative foods group were included in the good diet group i.e. subjects who ate the least number of negative foods and the highest number of positive foods. Conversely, subjects identified in both the upper quartile of the negative foods group and the lower quartile of the positive foods group were included in the poor diet group. This method eliminated any arbitrary decision for the numbers of negative and positive foods which should be used to classify children into groups. It follows that the cut off points for negative and positive marker groups may be different for different studies using the FIQ.

4.7 Reliability and Validity

In research, reliability and validity are specific terms used when describing the value of measurements and each has a precise definition. Validity describes how a dietary method measures what it intends to measure (Margetts & Nelson 1994). The reliability of a method describes "the extent to which it produces the

same results" when carried out repeatedly on the same subjects (Willett 1990; Cameron 1988).

4.7.1 Validity

"Validity has several aspects including face validity, content validity, criterion validity and construct validity" (Kemm & Booth 1992). The validity of a new dietary assessment method is often assessed against an established method of "indisputable quality", giving an estimate of the new method's relative or criterion validity. Relative or criterion validity is the chosen term because there is no universally accepted method of dietary assessment that can be used as an absolute "gold standard" for comparison (Bingham 1987; Kemm & Booth 1992). The face validity of a method describes the extent to which the questions asked conform to current expert opinion relating to what the instrument is intending to measure (Kemm & Booth 1992). Face validity is based "on an intuitive judgement" of experts and the technique has importance when the judgement is made by informed individuals (Stevens et al. 1993). Assessing face validity is therefore a necessary step in measuring the overall validity of any new dietary questionnaire.

One recent paper (Contento et al. 2002) reviewed the types of evaluation methods employed in nutrition education interventions. The comprehensive review identified 265 studies, conducted during the 1980's and 1990's, summarising the types of evaluation measures used. The majority of these studies had used dietary intake measures as part of the evaluation. In terms of the studies related to school aged children, a variety of dietary measures were described, based on 24-hour recalls, 3-day and 7-day food records, frequency questionnaires, coded to assess nutrient intake measurement, for food intake, and food groups. Other studies combined dietary intake measures, using foods specifically targeted in the interventions, with eating behaviours, e.g. self-reported lunches, and food salting.

The paper raises important issues for the effective evaluation of nutrition education. The dietary measure used should be *"appropriate to the purpose, duration and power of the intervention"* (p12), and studies should acknowledge eating as a *behaviour event* and use measures that allow data to be coded in

terms of food intake or choice (described as diet quality measures). The benefit of using diet quality measures in interventions is valid because eating behaviour and eating patterns, rather than specific nutrient intakes, can be amenable to change using nutrition education intervention. The authors stress that any intervention requires "*considerable preliminary work*" to design and test evaluation tools before the intervention is delivered.

4.7.2 Reliability

Reliability is concerned with the consistency or precision of the measurement made when repeated under the "same conditions." assuming that no real change has taken place (Willett 1992; Cameron 1988). Willett (1992) stresses the need to repeat measurements over a number of intervals of time in order to separate time changes in diet from learning effects. The repeated measures are likely to be collected on different days or time periods making the notion of "the same conditions" almost impossible to achieve in field surveys (Burema et al. 1988). In practice therefore, reliability has two components: genuine variation from one occasion to another and apparent variation (or difference) due to uncertainty (error) inherent in the measure used. The reliability of a method is also influenced by the within-subject variability (Marr 1971). If this variability is low the reliability of the measurement will increase (Cameron 1988). The within-subject variation is important when considering the power of given sample size needed likely to detect differences between groups (Bingham 1987) also, wide day-to-day variations in intake will lead to imprecision of the method.

A poor degree of reliability indicates poor validity, however high reliability does not necessarily suggest high validity (due to systematic error). Reliability studies should be used in evaluating a new dietary method but cannot replace a study on validity. A reliability study should be conducted on the same individuals using repeated measures.

4.7.3 Summary of FIQ method

The FIQ has been used in the community to describe the eating habits of schoolchildren; to monitor the implementation of a healthy eating campaign (Hackett et al. 1990) and to assess the diets of a national sample of schoolchildren (Hackett et al. 1997). The FIQ has been used over the last decade

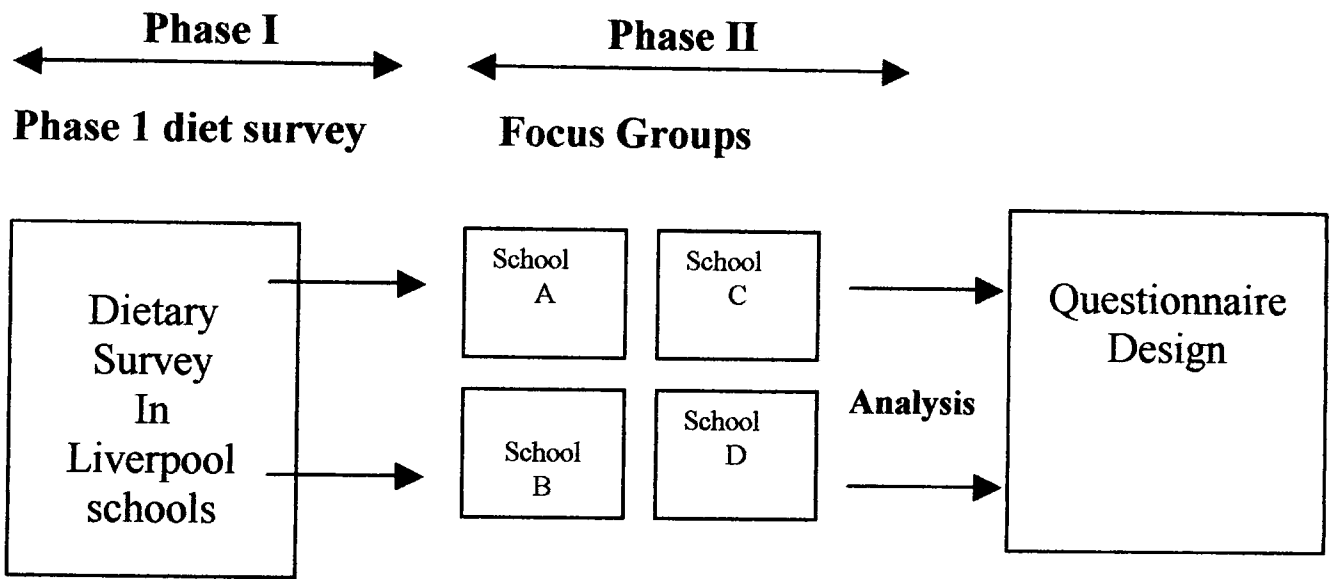
in studies conducted in Liverpool schools to describe differences between poor and affluent areas of the city (Bakker 1992). More recently the FIQ has been used as part of a city wide Sportslinx initiative (Sportslinx 1998), enabling the eating habits of a very large sample of schoolchildren (n=3000) to be monitored, over a two year period. The foods included in the FIQ are known to be consistent with the foods consumed by adolescents reflecting advice on what foods to eat more and less of. Development of the FIQ in the context of the research described in this thesis began with a pilot survey, which was conducted to assess the feasibility of using the computerised version of the FIQ for the collection of dietary data. In addition, separate studies were also conducted to assess the face validity of the items included in the FIQ and relative validity.

Chapter 5 Qualitative methods: focus groups

5.1 Introduction

The following section describes the rationale for selecting the focus group method for the qualitative stage of the study. The second stage of the study was qualitative in nature, and the focus group study was conducted to investigate the factors that young people thought were important influences on dietary intake and health. The data were specifically used to develop items for the questionnaire used in the main intervention study. Diagram 5.1 presents the focus group study in the design of the project

Diagram 5.1 Focus group study



5.2 Focus Groups

Stockdale (1998) suggested that interventions designed to bring about changes in the health behaviour of young people should be "grounded in children's understanding". This second phase of the study required a method not only able to elicit the qualitative information required to assist the design of the a combined questionnaire, but also providing a supportive, open environment for young people to discuss health and nutrition issues. A qualitative method is able to explore the personal and cultural issues that may underpin eating behaviour.

"Focus groups are a form of group interview that capitalises on communication between research participants" (Kitzinger 1995). Over the last decade the technique has been widely used in marketing to investigate consumer attitudes to new products, by media researchers to assess audience views, and more recently in social science and health research (Morgan 1997). The method has been used to explore specific issues in health research, to investigate attitudes and feelings, to evaluate health interventions and to "pre-test" educational materials (Kitzinger 1994; Murphy et al. 1992). Morgan (1997) also suggests that focus groups can be used as a self-contained research tool when exploring, a new field of research, to generate hypotheses, and to develop interview schedules or questionnaires.

5.3 Use of focus groups with children

Kitzinger (1995) suggests that the qualitative method, and focus groups in particular can be used for exploring health behaviours. Focus groups have been used to research children's understanding of dieting (Neumark-Sztainer & Story 1998), to investigate children's ideas about the fat content of the diet (Turner, Zimvrakaki & Athanasiou 1998), and to investigate how young people interpret nutrition messages (Lytle et al. 1997). Ross (1995) also used focus groups to explore food choice and preferences in young people

After reviewing the available literature and discussing the study aims with experienced researchers and teachers, the focus group method was selected for the second phase of the study. The method would allow young people to share their views with their friends, peers and the researcher, without being intimidated by the research process itself. This was important particularly because the young people did not know the researcher. For this reason, individual in-depth interviews were rejected as a suitable method because of the difficulties involved in building a relationship with young people in the time available. In order to make the group sessions less intimidating for young people a card sorting game was designed to act as a "trigger" to stimulate discussion.

5.4 Focus group schedule

The focus group schedule was designed after discussions with researchers, teachers youth workers and other health professionals working with young people; comments suggested that an activity should be used to help stimulate discussion, particularly because the group did not know the research team. Focus group facilitators have used group exercises to help stimulate discussion and Kitzinger (1996) described using statements on cards to act as a stimulus for discussion. A card sorting game was developed to act as an icebreaker and to stimulate and focus discussion on the research agenda. Using a card game to stimulate discussion has been described by investigators exploring the cultural beliefs and attitudes of young people concerning food and health (Chapman & McClean 1993; Watt & Shieham 1997; Turner, Zimvrakaki & Athanasiou 1998).

5.5 The card game

The card game was adapted from the method used by Chapman & McClean (1993). In their study young people were presented with twenty five cards, each containing the name of a food or drink. Young people were asked to sort the cards into groups that linked the foods together and were free to create as many groups as the liked.

The method was adapted to suit the needs of this study. Young people in each group were presented with thirty cards containing phrases, food group names and statements that would influence food choice decisions (appendix 6). The phrases and statements were derived from the literature on adolescent food choice, selecting factors known to influence food habits and after discussions with university staff and class teachers. Fifteen minutes were allocated for the card sorting allowing a further 30 minutes for discussion. Cards acted as "triggers" to stimulate discussion between group members. Each focus group was asked to sort the cards into two groups: factors that were important influences on eating habits; and factors that were not important influences on their eating habits. The open discussion that followed allowed themes to be explored: cultural and personal significance of the various factors that influence eating habits, and the

associations, feelings and thoughts of young people regarding food and health. In addition, questions were asked about their motivations to make changes and the types of interventions that would facilitate a change in eating habits. The precise sorting and analysis of the cards was less important than allowing the discussion to take place (Kitzinger 1996).

5.6 Analysis of focus group data

Many qualitative researchers use inductive analysis to generate theory from emerging themes within their data, thereby "grounding" the data and the theory generated into the social activity of the participants (Streubert & Carpenter 1999; Miles & Huberman 1994). Two main approaches have been described for the analysis of focus group data (Kreuger 1998; Morgan 1997). Qualitative analysis using quotes from the data to illustrate key areas, and a second approach using systematic content analysis of the data. The analysis of the focus group data used an adapted form of the qualitative stages proposed by Kreuger (1998) in the analysis continuum. The final stage of the continuum described by Krueger involves making recommendations, in this study the final stage was the development of the questionnaire items.

The stages used are set out below:

Raw data ------> Description ------> Interpretation ------> Recommendations
[transcripts] *[Questionnaire design]*

Interviews were recorded on standard audio cassette and transcribed verbatim for analysis. A preliminary analysis of the transcriptions was conducted and the raw data (transcripts from focus sessions) were coded (without the aid of electronic analysis software) and organised into key areas. This followed the elements described by Krueger (1997): cutting, sorting and arranging. Text was sorted and indexed into theme headings and text related to each theme was colour coded. Specific quotes were then grouped together under each derived theme as key examples of the discussion. The codes derived from the preliminary analysis were grouped into broader subject headings (chapter 12). In qualitative research the reduction, coding and organising of data can be described as "thick description" or theoretical description . The next stage of analysis involved interpretation of what had been said and an understanding of the context in which

young people described health and diet. Based on this understanding a questionnaire was developed for use in the main study.

5.7 Assuring data quality

At all stages during the design, development and action stages of this project quality assurance have been paramount. The nature of the study was discussed with experienced academics and teachers to ensure the methods used were suitable for use in young people. As described above, the focus group methodology and interviews were fully piloted, on young people of a similar age to the target population. The same schedule was used for each focus session in each school. The sessions were facilitated by one researcher; a second person was present and took notes. During the data analysis process a selection of transcripts were given to two experienced lecturers/researchers in public health and sociology to compare coding and themes generated by the data. The data derived from the focus group was also considered in relation to a review of the literature on food and health of adolescents. Some researchers have used this approach to assess validity within qualitative research (Cavanagh 1997). However, in common with other qualitative studies, the data collected will relate only to the schoolchildren who took part in the study and cannot be generalized to other young people in different parts of the country.

Chapter 6 Food Intake Questionnaire Pilot Study

This study has previously been reported (Johnson & Hackett 1997)

6.1 Aims of the pilot study

- To assess the diets of a large sample of schoolchildren using the FIQ.
- To evaluate the feasibility of the computerised version of the FIQ
- To describe the eating habits of the target population

6.2 Sample

The study focused on two districts of the city (Speke & Anfield) where the social and economic conditions prevailing indicate a high prevalence of both deprivation and poor health. Three secondary schools were chosen for the study: school A in Anfield which is typical of an inner city ward, and schools B & C in Speke which reflect a large outer housing estate. The schools chosen constituted a "purposive sample", and were selected subjectively as being representative of schools in areas of social and health deprivation.

6.3 Definition of social and health deprivation

The districts selected have above average levels of premature death from preventable diseases, high levels of unemployment and take up of social benefits. The precise definition of deprivation is polemic, for the purpose of this study, unemployment levels, (calculated as those persons unemployed and claiming benefit), and entitlement to Free school meals (FSM) were used. Being in receipt of State benefit, particularly income support is a less contentious indicator suggesting a family or individual is living on a very low income. Standard Mortality Ratios (SMR) (Liverpool Health Authority) and receipt of free school meal were used to indicate health and social deprivation. The SMR for ischaemic heart disease is 131 and 160, and the level of unemployment is 21% and 27% for Anfield and Speke respectively. Between 36 and 58% of children attending the three schools were entitled to FSM which confirms that both areas have a large number of children from families living on very low incomes. (Tables 6.1 -6.2).

Table 6.1 Unemployment rate and SMR for the study areas

Area	SMR (IHD)	Percentage
	Male and Female*	unemployment**
Anfield	131	22
Speke	160	27
Liverpool Average	116	10

Source: Liverpool Health Authority (1993)

** Source: Employment Department (1993)

Table 6.2 Entitlement and take up of free school meals (FSM) at schools taking part in the study

School	Children taking FSM*	Entitlement to FSM (%) at each school
A	182	36
B	179	50
C	148	58
Mean for England**	---	13

* Source Liverpool City Council (1994)

** Hackett et al. (1997)

Head teachers of the schools were contacted and their permission sought to contact all parents of children in school years 7, 8 and 9, (11-14 years) to obtain written consent to allow their children to take part. Children in the appropriate school years received letters at school which were taken home to obtain parental approval.

6.4 Sample size: considerations

Children taking part in a city-wide survey (Sportslinx 1998) were eligible to take part. Young people from primary and secondary schools across Liverpool

completed the FIQ. Children attending primary schools were excluded from the analysis which left a sample of 1000.

6.5 Data collection

The timetable for data collection was determined largely by the schools for their convenience. In School A, data was collected on a class by class basis over a 3-day period. Data was collected in schools B and C between March and July. All responses to questions were entered directly into the computer and stored on floppy discs. Raw data were downloaded into a mainframe computer and cleaned prior to analysis.

6.6 Statistical Analysis

The data were analysed using the Statistical Package for the Social Science (SPSS inc.). Unpaired t-test and analysis of variance (ANOVA) were conducted to compare differences in mean scores between boys and girls in schools. Chi-square was carried out to compare proportions of children responding to questions.

6.7.1 Results

6.7.2 Response

Of those who were eligible to take part 707 children completed the survey from the three schools, a response rate of 70%. Two children were absent from school on the day prior to the computer survey and were eliminated from the analysis. The small numbers completing the survey in school C (n=107) reflected a falling school roll. A higher proportion of boys than girls completed the study (Table 6.3) and more children were in the 12 and 13-year old age group (Table 6.4)

Table 6.3 Sex distribution for schools taking part in screening survey

School	n	Boys	Girls
A	390	239	151
B	210	106	104
C	107	56	51
Total	707	401	306

Table 6.4 Age distribution of children

Age (years)	Number	Boy	%	Girl	%
11	126	77	61	49	39
12	250	149	60	101	40
13	209	107	51	102	49
14	122	68	54	54	46
Total	707	401	57	306	43

6.7.3 Comparison with other surveys

The data collected for this study were compared with the results from two previous studies (Hackett, Jarvis & Flanaghan 1989; Bakker 1991), which used the same computerised questionnaire in Northumberland and Liverpool schools respectively (table 6.5). Snack foods such as crisps, chocolates, and sweets were very popular with schoolchildren in all studies but suggests a number of trends: the proportion of children admitting to drinking low fat milk is higher than previously reported and fewer children reported adding sugar to food and drinks compared to the two previous surveys. There was little change however in the number of children reporting eating sweets and chocolate in this study. It was encouraging to note that the level of fruit consumption was stable across all three studies which, nevertheless falls short of the target of 100%, but disappointing to see children in this study reporting eating less high fibre breakfast cereal compared to the other studies. The reported consumption of' brown' bread was

also much lower than Bakker's study conducted in Liverpool but comparable to Hackett et al.'s study in Newcastle.

Table 6.5 Proportion of children eating each food "yesterday" (%)

	Hackett et al. 1989	Bakker 1991	Present study 1993	TREND*
	Newcastle	Liverpool 1	Liverpool 2	
Food				
Brown bread	15	33	15	<
Jacket potatoes	12	15	13	
Chips	69	65	64	
Low-fat milk	31	41	50	>
High fibre cereals	63	47	21	<
Fizzy drinks (sugar)	60	77	67	
Baked beans	29	23	23	
Added salt	42	54	47	
Crisps	68	66	68	
Sweets/chocolate	54	60	62	
Added sugar	63	50	25	<
Diet fizzy drinks	28	38	35	
Fruit	70	65	68	
N	**240**	**487****	**707**	

** The mean is used. The numbers of children answering each question differs.

< suggests an increase in consumption

> suggest a decrease in consumption

Table 6.6 Differences between boys and girls eating specific foods

	BOYS		GIRLS		
FOOD	**n (%)**		**n (%)**	**Chi-square***	**p-value**
Low fat milk	180 (53)		40 (46)	3.09	NS
Added sugar	148 (37)		98 (32)	1.95	NS
Brown Bread	67 (17)		40 (13)	1.81	NS
HF cereals	84 (21)		71 (23)	0.44	NS
Chips	271 (68)		177 (58)	7.56	0.0059
Fruit	268 (67)		215 (70)	0.77	NS

* DF = 1

The proportions of boys and girls who reported eating specific foods on the previous day were compared (Table 6.6). The differences between boys and girls were not significant for any of the foods selected except for more boys claiming to eat chips.

Table 6.7 Proportion of subjects eating breakfast and type of Lunch by survey

	Newcastle 1989	Liverpool. 1991	Liverpool. 1993
Breakfast	81	84	80
School Lunch	62	63	48
Packed lunch	20	18	20
Go home	5	14	25

A large number of children (20%) in all three surveys were leaving home for school without having anything to eat or drink (Table 6.7). But younger girls were more likely to "skip" breakfast than older girls and boys (Table 6.8). 44% of 11 year old girls were not having breakfast on the day of the survey. The results also suggested that fewer children were having school lunch; compared with Hackett et al. and Bakker's (1991) studies.

Table 6.8 Proportion (%) of children who reported not eating breakfast

Age/years	Boys	Girls
11	35	44
12	18	16
13	17	24
14	14	10

Table 6.9 Comparison of mean scores of marker foods consumed by boys and girls according to food group

	No of foods	Boys (n=400)		Girls (n=307)		Two-tailed
	in group	Mean	(SE)	Mean	(SE)	probability
Marker group						
Sugary	13	6.29	(0.17)	5.54	(0.22)	0.007
Fatty	10	3.69	(0.11)	3.24	(0.10)	0.006
Fibre	10	2.45	(0.07)	2.27	(0.09)	0.032
Snacks	10	5.86	(0.14)	5.30	(0.17)	0.011
Alternative fats	5	1.45	(0.67)	1.24	(0.76)	0.006
Low sugar	3	0.90	(0.06)	1.80	(0.07)	NS*
Negative marker	23	10.02	(0.24)	8.89	(0.34)	0.009
Positive marker	20	5.73	(0.24)	4.39	(0.26)	0.025

*NS = not significant

Table 6.9 shows the comparison between mean scores for different food groups between boys and girls. There were statistically significant differences between boys and girls, however the differences, being small, were of little practical value. The mean intake of negative marker foods per day was 10.2 and 8.89 for boys and girls respectively. On average boys and girls claimed to eat over five 'snack' foods on the day of the survey.

6.7.4 Analysis of variance

One-way analysis of variance was carried out with aggregated food groups to compare differences between schools. Results showed no significant differences between schools.

6.7.5 Previous days activities

In addition to the diet questions children were also asked about their activities on the previous day (Table 6.10). More boys of all ages claimed to take part in

physical exercise than girls. Fewer younger girls and boys (aged 11 years) reported physical activity than their older peers. Eleven year old girls reported being the least active

Table 6.10 Proportion (%) of children reporting some form of physical activity, watched TV & videos, or played with computers.

Age in Years	Physical Activity		Watch TV play with computer	
	Boys	Girls	Boys	Girls
11	57	34	72	90
12	61	41	87	82
13	64	50	91	81
14	62	48	87	82

6.8.1 Discussion

This study reviewed choice of foods and not nutrient intakes. The survey method is based on recall of the previous day's intake and does not reflect day-to-day variation and idiosyncrasies in the food intake of individuals. A large sample size, and data collection over a period of days can minimise these errors (improving reliability) enabling groups to be compared. The computer questionnaire asked about a large number of foods known to either contribute to the intake of key nutrients e.g. fat; to feature in healthy eating advice, or to represent change in dietary habits e.g. the use of low fat products. To allow comparison with two studies which used the same instrument, only a selection of foods are discussed, thus eliminating problems with inconsistency in methodology (Bull 1988).

Children from these schools in Liverpool claimed to be eating foods associated with a poor quality diet. They were consuming foods which can increase their fat and sugars intake and need to eat more fruit, wholemeal bread, jacket potatoes and pulses. Such observations are a disappointing but consistent finding: there seems to have been little change in eating habits over the previous decade (Adamson et al. 1992; DHSS 1989). The percentage of children reporting eating fruit (68%) might appear to be acceptable, however because the FIQ asks only if

a food was consumed on the previous day and not how many, a response of 100% should required in order to feel confident that the current guidelines of five portions of fruit and vegetables per day (WHO 1990) were being achieved.

The snacking habits reported for boys and girls in this paper (mean score 5 snack foods in a day) was similar to Australian schoolchildren (Dugdale, Townsend and Rigsby 1998), and exemplifies the importance of snack foods in the adolescent diet (Bull 1988). Anderson et al. (1994) also confirmed the importance of snacking in the adolescent diet and one of the major differences between the diet of adolescents and adults (age 35 years) was the frequency of consumption of snack foods. The unique place of snacking in the social culture of the schoolchild is a powerful influence on food selection. Foods in the "snack" food group were selected as being representative of foods mainly eaten between-meals although at what time they were eaten was not recorded. The pilot study suggested that snack foods remain very popular with schoolchildren. The popularity of snack foods is reflected in the "buoyant" market: crisps, confectionery, soft drinks and flavoured milks alone produce sales of £3.5 billion every year (Dibb 1993). This in turn is reflected in the items sold (and the profit made) by school tuck shops. Television and other media advertising for snack foods and fizzy drinks is strongly directed at school children (Dibb 1993). An implicit belief of marketing is that consumer choice can be influenced and vast sums are spent advertising food to increase "brand share" and "brand loyalty" (Swalwell 1990). If children's dietary habits are to improve the snack culture of schoolchildren must be accepted and the adult language of positive nutrition translated into the dialects of the schoolchild and adolescent.

The measurement of physical activity is even more problematical than assessing dietary intake. Armstrong & Welsman (1994) showed that the physical activity of boys is greater than girls during adolescence. This study showed a similar trend, supporting the contention that using simple questions to probe lifestyle habits can provide meaningful information. Decreased activity contributes to the risk of obesity (White et al. 1993). Adolescent girls are often concerned with body weight and perception of weight and dissatisfaction with body shape influences their diets (Hill 1993). Lynd-Evans (1994) also reported that more girls than boys skipped breakfast especially if dieting (Hill 1993). Girls of all

ages in this sample were more likely not to have breakfast than boys and skipping breakfast may be seen by girls as an acceptable strategy for dealing with weight gain associated with decreased physical activity. Provision of breakfasts in school may be one helpful solution to this problem but few schools have taken such a step.

Several trends were identified in this study. The increased use of low fat milk and the decreased reporting of adding sugar to foods were encouraging. Such changes may have occurred because suitable alternatives to full fat milk and sugar are readily available and so changes did not disrupt current habits. Results also suggested that children were eating fewer high fibre foods such as wholemeal bread, high fibre breakfast cereals and beans. A previous study (Bakker 1991), showed large differences in eating habits between children living in affluent and less affluent areas and confirmed similar trends reported by other researchers (Rigley 1993; Nelson 1994). ANOVA showed no differences between eating habits from different schools and overall the results suggest that children living in less affluent areas need to improve their eating and other lifestyle habits such as physical activity. The schools were situated in parts of the city where previous surveys conducted by the local community dietetic service (unpublished) found that having access to healthy food is a major issue when the nearest large superstores are a bus ride away (Mooney 1991; Illing 1992.) A trans-European research project conducted in this area of Liverpool (Vaandrager & Koelen 1994) also highlighted the problems associated with a poor shopping environment.

6.8.2 Assessment of the computerised questionnaire

The collection of dietary data by computer is not new, however published studies evaluating the use and development of such programs in both adults and particularly young people are few (Slattery et al. 1994). This study was unique in collecting dietary related information from schoolchildren using computers. One aim of the pilot study was to assess the feasibility of using the computerized method in the large scale screening survey in phase I of this project. Significant problems were encountered when using the software in the field. The original program was written for the BBC micro-computer, at the time of the survey many schools were reducing the number of BBC machines for routine school use, and replacing them with PC or Apple ™ machines. To accommodate this a second version of the questionnaire was written for PC compatible machines (the survey items were identical in both versions of the software). This necessitated having to use separate versions of the software for both computer systems in the pilot survey. In practice this resulted in some schools having insufficient numbers of computers (of either type) for use in the survey, this increased the data collection stage in some schools considerably. The schools in the less affluent areas of the city had the fewest PC computers available. It was apparent that in the time-scale set out for the project, the hardware problems encountered in schools would not be resolved sufficiently to use the computerized method in the main study.

6.8.3 Summary of main findings: pilot study

* Popular reported foods included fizzy drinks, sweets and chocolates, chips and crisps.

* 75% of all young people reported eating fruit on the previous day

* Comparisons with previous studies using the same questionnaire showed a decrease in the reported consumption of low fat milk and an increase in the use of added salt.

* There were also increases in the reported intake of brown bread, high fibre cereals and baked beans in the main study compared to previous studies.

* 20% of boys and 26% of girls reported that they skipped breakfast on the previous day before going to school.

* Boys claimed to be eating more negative marker foods and snacks than girls.

* Girls reported eating more baked potatoes and baked beans than boys.

* There were no significant differences in the mean intake of marker food groups between schools who took part in the survey.

****

The pilot survey suggested that the FIQ would be appropriate for the dietary study in Phase I of this project. The results confirmed the poor choice of foods of children in less affluent areas, despite the apparent increase in public awareness of a 'healthy diet'. It also supports the notion that overall, little progress has been made towards improving the diets of adolescents in the last fifteen years. The areas of progress seem to be related to areas of the diet where change could be effected easily, such as using sugar free fizzy drinks or low fat milk. The results indicated that the FIQ could reflect the eating habits of young people in deprived areas of Liverpool. The hardware difficulties associated with using the computer delivered questionnaire in schools strongly indicated that only a paper format of the questionnaire would be feasible for the main study.

Chapter 7 Food Intake Questionnaire Face Validity Study

This study has previously been reported (Johnson et al. 1999)

7.1 Aim:

- To assess the face validity of the Food Intake Questionnaire (FIQ) by comparison to current dietetic practice exemplified by State Registered Dietitians (SRD) working in the North West of England.

7.2 Methods

This study was conducted to assess the face validity of the items in the FIQ. The foods included in the FIQ were selected as being representative of the general advice given by dietitians, in terms of the foods to eat more of, or less of, to achieve a healthier diet. The items also represent decisions being taken concerning perceived "healthier" choices e.g. using low fat milk and low fat spreads. Inevitably the inclusion and exclusion of food items on the FIQ are fairly arbitrary. A total 168 named foods are included in the questionnaire's 77 food related -items. This study was specifically designed to evaluate the face validity by comparison of the FIQ items with the opinions of state SRDs.

7.2.1 Study Questionnaire

A postal questionnaire was designed (appendix 2) divided into four sections; each relating to one target for healthy eating:

- Lowering sugars intake
- Lowering fat intake
- Lowering salt intake
- Increasing "fibre" intake

Each dietitian was asked to name foods he/she considered the most important when advising clients on these four aspects of healthy eating. Respondents were asked to list up to ten foods they would advise clients to eat more of, and ten foods to eat less of, when advising on each of the aspects of healthy eating. Foods were ranked 1-10 (1 most important). The questionnaire gave no prompts

for any food or the level of detail to be included i.e. distinguishing between generic terms or brand names. Subjects were free to name any number of foods, identified in their own words, up to a total of ten; including brand name if they thought it relevant.

7.2.2 Sample

228 questionnaires were posted to 38 dietetic departments in the North West & North Wales branch of the British Dietetic Association. The departments encompassed a cross section of dietetic practice: district general hospitals, university teaching hospitals and community services. No information on grading or speciality of the dietitians was collected: state registration in dietetics was the only inclusion criteria.

7.2.3. Statistical Analysis

Data from questionnaires were analysed using SPSS (SPSS inc). The 10 foods most often selected by dietitians for each category were ranked in order: 1 representing the food selected most often and 10 for foods chosen least often. If a FIQ food item appeared in the list of ranked foods and was mentioned by more than 50% of dietitians it was considered that its inclusion in the FIQ was valid; reflecting a consensus of opinion from experts in the field. A full listing of foods mentioned for each category can be seen in appendix 3.

7.3.1 Results

124 questionnaires were returned. 10 questionnaires were returned uncompleted, 6 from one specialist dietetic department. This provided 114 completed questionnaires a response rate of 48%.

Table 7.1 shows the total number of foods mentioned for each aspect of healthy eating. For example, 57 foods to eat more of and 63 foods to eat less of were mentioned by dietitians when considering how to lower fat intake. Table 7.1 also details the number of foods ranked 1-10 by dietitians which appeared in the FIQ. For example, of the foods ranked 1-10 to lower fat intake 9 were included in the FIQ.

Table 7.1 Total number of foods mentioned by dietitians and number of FIQ items mentioned which were ranked between 1-10 for each aspect of healthy eating

	Fat	Fat	Sugar	Sugar	Fibre	Fibre	Salt	Salt
	More	Less	More	Less	More	Less	More	Less
Total number of foods mentioned	57	63	57	40	41	37	41	32
Number of FIQ items ranked 1-10	9	9	8	9	6	7	4	4

Tables 7.2-7.5 list the foods identified by dietitians as those having the greatest impact on achieving each aspect of healthy eating (all food names were recorded verbatim). Each table shows the frequency with which a particular food was named and the percentage of dietitians of the total sample who mentioned it, for example to reduce intake of fat, eating more fruit was the food selected as first choice by one hundred and three dietitians; 90% of the total sample. Of the eighty foods which were ranked 1-10 fifty six appeared as items on the FIQ (table 7.1.1).

7.3.2 Comparison of ranked foods with FIQ items

Thirty one (39%) foods ranked 1-10 were mentioned by more than 50% of dietitians (tables 7.2-7.5), of these, twenty seven (87%) appeared on the FIQ. Only five foods mentioned by most dietitians did not appear on the FIQ: brown rice (fibre group), tinned soup (salt group), pasta, rice, and mayonnaise (fat group).

Table 7.2 Lowering Fat intake: Number and percentage of dietitians who mentioned each food

	Foods to eat more of				Foods to eat less of		
Rank	**Food**	**Frequency**	**%**	**Rank**	**Food**	**Frequency**	**%**
1	**Fruit***	103	90	1	**Butter***	90	79
2	**Vegetables***	99	87	2	**Full fat Cheese***	80	70
3	Pasta	60	53	3	**Fried food***	77	68
4	**Potatoes (no fat)***	58	51	4	**Full fat Milk***	70	61
5	Rice (any type)	57	50	5	**Cakes***	66	58
6	Bread (any type)	55	48	6	**Pastry***	64	56
7	Low fat Spread	47	41	7	Mayonnaise	64	56
8	Breakfast cereals	37	33	8	**Crisps***	62	54
9	Fish	33	29	8	**Biscuits***	62	54
10	Low fat Milk	32	28	10	Chips	51	45

* = Food selected by 50% or more of dietitians which appeared on the FIQ.

Table 7.2 describes the most common foods dietitians would advise clients to eat more of, and less of, to bring about a decrease in fat intake. Fourteen foods from both food lists were named by more than 50% of dietitians. Of these, 11 were included in the FIQ.

Table 7.3 Lowering Sugar intake: Number and percentage of dietitians who mentioned each food

	Foods to eat more of				Foods to eat less of		
Rank	**Food**	**Frequency**	**%**	**Rank**	**Food**	**Frequency**	**%**
1	**Fruit***	108	95	1	**Sweets***	98	86
2	**Vegetables***	64	56	2	**Fizzy drinks***	95	83
3	**Bread***	63	55	3	**Chocolate***	93	82
4	Pasta	43	38	4	**Cakes***	92	81
5	Artificial sweetener	41	36	5	**Biscuits***	86	75
6	Rice	39	34	6	**Sugar***	70	61
7	Sugar free Drinks	38	33	7	**Puddings***	62	54
8	Potatoes	36	32	8	Sugared cereals	54	47
9	Diet Yoghurt	33	30	8	Jam	53	46
10	Sugar free Squash	26	23	10	Squash (sugared)	45	39

* = Food selected by 50% or more of dietitians which appeared on the FIQ.

Table 7.3 lists the foods thought to help reduce sugars intake. 10 foods out of the two lists were mentioned by over half of respondents; all were included in the FIQ. 17 foods out of 20 in this group appeared on the FIQ, the exceptions being jam, rice and pasta. Table 7.4 shows the foods thought to be important when

increasing fibre intake. 14 of the 20 foods mentioned were included in the FIQ, however only 7 foods were mentioned by more than half of the sample, 6 of these foods were included in the FIQ, just one food, brown rice, did not appear in the FIQ.

Table 7.4 Increasing Fibre intake: Number and percentage of dietitians who mentioned each food

	Foods to eat more of				Foods to eat less of		
Rank	**Food**	**Frequency**	**%**	**Rank**	**Food**	**Frequency**	**%**
1	**Wholemeal bread***	106	93	1	**White bread***	90	79
2	**Vegetables***	106	93	2	LF Breakfast cereal	55	48
3	**Fruit***	105	92	3	Biscuits	45	39
4	**HF Breakfast cereal***	83	73	4	Cake	36	32
5	Brown rice	75	66	5	Sweets	35	31
6	**Pulses**	59	52	6	Chocolate	30	26
7	Wholemeal Pasta/rice	55	48	7	White Pasta	29	25
8	Potatoes/baked	47	41	8	Chips	17	15
9	Fluid/ H_2O	46	40	8	Crisps	17	15
10	Dry fruit	27	23	10	White flour	13	11

* = Food selected by 50% or more of dietitians which appeared on the FIQ.

Table 7.5 Lowering Salt intake: Number and percentage of dietitians who mentioned each food

* = Food selected by 50% or more of dietitians which appeared on the FIQ.

	Foods to eat more of				Foods to eat less of		
Rank	**Food**	**Frequency**	**%**	**Rank**	**Food**	**Frequency**	**%**
1	**Fruit/ Fresh fruit***	91	80	1	**Crisps***	69	61
2	**Vegetables***	67	59	2	**Cheese***	61	54
3	Fresh meat	25	46	3	Tinned soup	58	51
4	Herbs	45	39	4	Tinned Vegetables	56	49
5	Spices	43	37	5	Processed meat	54	47
6	Homemade soup	25	22	6	Nuts	51	45
7	Potatoes	20	17	7	Added salt	45	40
8	Pepper	17	15	8	Tinned Fish	44	39
9	Pasta	16	14	8	Bacon	44	39
10	Lemon Juice	15	13	10	Stock cubes	43	38

Table 7.5 presents a more complex picture for the foods thought to be important in decreasing salt intake. There appears to be less agreement between dietitians

when suggesting individual foods; only 5 foods out of 20 mentioned were selected by more than 50% of dietitians; four were included in the FIQ.

7.4 Discussion

This study investigated the key foods mentioned by dietetic practitioners when considering healthy eating in order to assess the face validity of items in the FIQ. A food being ranked 1-10 appearing in the FIQ was considered as being consistent with current dietetic practice as represented by dietitians in the North West of England. The results suggest that the items in the FIQ are consistent with the general advice given by dietitians when advising on lowering fat and sugar intake, and increasing fibre intake. There appears to be less agreement between the FIQ and dietetic opinion when considering how to advise about decreasing salt intake. This gives us confidence that the FIQ has face validity. Previous studies have shown that the FIQ can reveal expected differences before and after a healthy eating campaign (Hackett et al. 1989) and between areas of affluence and deprivation, and boys and girls (Hackett et al. 1997; Johnson & Hackett 1997) indicating criterion validity. The method has also been used to assess the impact of a community nutrition project (Johnson & Jones 1998), and to audit the effectiveness of dietetic intervention in the clinical setting (Johnson 1997 unpublished).

The results from this study give some insight into broader issues concerning the way dietitians advise clients. The dietitian's skill is apparent by his/her ability to deconstruct a diet history and translate the broad nutritional aspects of healthy eating into specific advice tailored to an individual's needs and their local food environment, which includes regional and cultural differences in eating habits. The results here are surprising because the list of individual foods mentioned by dietitians is so extensive. This reflects the complexity of translating guidelines for nutrients into advice on food intake. The healthy eating message may be thought to be simple and unambiguous but these results present a nebulous picture of how dietary recommendations are being translated by individual dietitians into practical advice concerning food intake, and some individual idiosyncrasies .

Some suggestions included in the fibre grouping would appear to have little effect on increasing fibre intake. Drinking more water was mentioned by 40% of the sample; increasing fluid intake is advocated when increasing fibre intake but in itself would have no effect on increasing fibre intake. Decreasing the consumption of jam was mentioned by 46% of dietitians as being important in reducing overall sugars intake, however its contribution to total sugars intake in the diet is minor. Rugg-Gunn et al. (1993) reported that the mean daily intake of non-milk extrinsic sugars from syrups and all preserves was only 2% of total sugars intake. This illustrates a need to challenge current perceptions about which particular foods should be included in general advice for health, and suggests advice could be ineffective and counter productive in bringing about lasting change.

The results also suggest there is a level of disagreement between practitioners when suggesting which foods that the public should eat more of or less of when trying to achieve a healthy diet. These differences, which are nutritionally quite minor, nevertheless may exacerbate public confusion about what to eat to achieve a healthy diet, and to some extent provide an understanding of the scepticism consumers have for "experts". This is because dietitians are, inevitably, likely only to mention a limited number of specific foods when discussing dietary change. Different dietitians may, quite legitimately, mention different foods. The recipient of information from different sources might well conclude that he/she is being given different advice.

Stockley (1994) described the international consensus which exists between countries that have produced dietary guidelines on eating for health: the nutritional basis for the guidelines is not disputed. What is difficult to elucidate is why this consensus of expert opinion has not resulted in greater positive dietary changes. Recent studies have highlighted one of the problems for health professionals when delivering health education: the accuracy of communication and interpretation of common words. Nuemark-Sztainer & Story (1998) asked young women to define "dieting"; their subjects interpreted “dieting” and gave six varying definitions of the word. Similar misconceptions about the definition of "a portion" were apparent in a study conducted on primary school children (Boaz et al. 1998). If similar problems exist with the nutritional terms commonly

used by dietitians and other health educators it could suggest one reason for the lack of success in achieving dietary change and one reason why public confusion is cited as a barrier to achieving dietary change (Stockley 1992) .

There is a need to understand how professionals involved in health education frame practical advice on healthy eating. Should health education, aimed at bringing about dietary change, include a nutritional lexicon using an agreed format which all dietitians would adopt? Many dietitians might disagree with such a suggestion and argue that there is more than one way to bring about a desired dietary change. The practice of dietetics involves decisions being made on the basis of each individual's clinical judgement, knowledge and experience. The subjects in this study were asked to consider *general healthy eating advice* alone: free from clinical complexities. Looking at the results in these terms reveals the richness of individuality that exists between clinical practitioners. A number of questionnaires were returned uncompleted by a specialist dietetic department. They felt the content of the questions (healthy eating) was not relevant to their day-to-day practice. It was surprising that the specialists felt unable to offer an opinion on the subject. This may have been because of the pressures within the NHS acute sector, e.g. a shortage of skilled staff and increased clinical caseloads, has resulted in general healthy eating advice being seen as only the remit of the community dietitian. It could also provide an explanation for the 48% response rate to the survey questionnaire.

7.5 Summary of main findings: Face Validity study

* Of the 80 foods ranked as most important (1-10) for each aspect of healthy eating, 56 (70%) appeared in the FIQ.

* 39% of ranked foods were mentioned by more than 50% of the dietitians in the sample, of these 27 appeared in the FIQ.

* Only 5 foods mentioned by dietitians did not appear in the FIQ.

* Results suggested that the items of the FIQ were consistent with current dietetic advice for eating a healthy diet particularly lowering fat and sugar.

Chapter 8 Food Intake Questionnaire Validity Study

A study was conducted to evaluate the criterion validity of the FIQ in schoolchildren attending secondary schools in Liverpool and Rugely, Staffordshire.

8.1 Aim

- To evaluate the criterion validity of the food intake questionnaire (FIQ) designed for use in schoolchildren.

8.2.1 Methods

The validity survey was conducted to compare the FIQ with a three-day diary and interview method. Young people completed the FIQ and two weeks later completed a three-day food diary (with interview).

8.2.2 Sample

106 young people aged 11-13 years (school years 7 and 8) taking part in a school based nutrition education programme in a secondary school in Rugely, Staffordshire agreed to take part in the study. Subjects who failed to complete both a 3-day diary and the FIQ were not included in the final analysis.

8.2.3 Three-day food diary and interview

Details of the dairy and interview method have been reported (Hackett et al. 1983; Nathan & Hackett 1996). Each subject was provided with a pocket-sized food diary to record all foods eaten. Each child was interviewed by one interviewer to clarify dietary information and to assess portion sizes using a calibrated food atlas (Nelson et al. 1998), which was not used in the previous surveys. Nutritional intake was calculated using Microdiet version 9.1 (University of Salford, 1995) with the fifth edition of McCance & Widdowson's, Composition of Foods (Holland et al. 1991) and all available supplements. Children who were absent and did not complete a FIQ were not invited to complete a food diary.

8.2.4 Food Intake Questionnaire

Details of the FIQ have been described in chapter 4. The FIQ was not designed to estimate nutrient intake; the foods included were to reflect current dietary advice only. Nevertheless, if the foods listed are relevant they might be expected to reflect, to some extent, intake of key nutrients, for example the number of fatty foods might be expected to be positively correlated to the intake of fat.

8.2.5 Statistical Analysis

Pearson correlation coefficients were calculated to compare intakes of fat, sugars, energy and fibre assessed by the 3-day diary with scores from FIQ food groups: fatty, sugary, fibre, Positive markers, and Negative markers. Nutrient intakes of children identified by the FIQ and included in Good and Poor diet groups were compared using an independent t-test.

8.3 Results

107 children agreed to take part, 11 failed to complete both a three-day food diary and the FIQ and were eliminated from the analysis. Table 8.1 presents the age and sex profile of those children who completed a 3-day food diary and the FIQ.

Table 8.1 Age and sex distribution of subjects

Age (y)	n	Boys (n)	% of total	Girls (n)	% of total
11	29	13	14	16	17
12	48	21	22	28	29
13	15	7	7	8	8
Missing	3	0	0	3	3
Total	96	41	43	55	57

8.3.1 Correlation between FIQ and 3-day diary

Table 8.2 shows the Pearson correlation coefficients between energy intake, total fat intake as a percentage of energy intake, total sugars intake and fibre intake derived from the 3-day diary and the mean score for foods in FIQ aggregated groups. There were low but significant correlations for the FIQ fatty food group with energy intake and fat intake as a percentage of energy intake. The sugary food group was significantly correlated to total sugars intake and energy intake. There were also significant correlations between the negative marker group for energy and total fat intake as a percentage of energy intake. The fibre, alternative fats, low sugar and positive marker groups were not significantly correlated with the estimates of nutrient intake

Table 8.2 Pearson correlation coefficients (r) between 3-day diary and FIQ food groups.

FIQ	Fatty	Sugary	Fibre	Negmark	Posmark
3d diary					
Energy (kJ)	0.20*	0.28*	0.03	0.23*	0.01
Fat (%)	0.36*	0.27*	-0.17	0.34*	-0.06
Sugars (g)	0.09	0.23*	0.12	0.12	0.07
Fibre (g)	-0.057	0.12	0.04	-0.03	0.03

*p= 0.05 level

8.3.2 Nutrient intakes of sub-groups identified by the FIQ

Table 8.3 describes the mean intakes for macro nutrients derived from food diaries for the good and poor diet groups identified by the FIQ. The groups were selected using the method described in chapter four. Twenty four subjects were identified in the good diet group and twenty subjects in the poor diet group. There were significant differences in the mean intake of fat, fat as a percentage of energy intake, fibre and energy between the two groups. There was no significant difference in the mean sugars intake between the groups.

Table 8.3 Nutrient intakes of children identified by FIQ as Good and Poor diet

	Good diet group n=24		Poor diet group n=20		P*
	Mean	**SD**	**Mean**	**SD**	
Energy (MJ)	6.17	1.68	7.60	1.86	0.01
Fat (%)	32.40	1.89	43.63	2.90	<0.01
Fat (g)	51.22	14.44	88.16	22.70	<0.01
Sugars (g)	84.00	27.00	94.56	41.60	0.24
Sugars (%)	23.12	6.57	16.97	3.75	0.10
Fibre (g)	16.67	7.60	12.96	4.40	<0.01
Fibre (g/MJ)	2.90	1.50	1.71	2.78	0.01

***P** = Significance level for independent t-test

8.4 Discussion

The results provide an estimate of the FIQ's validity. It could be expected that the correlations measuring agreement between the FIQ and the 3-day diary at best would be modest. The modest positive correlations found were encouraging and suggest that the FIQ has criterion validity. The Pearson correlation coefficients for energy, fat, and sugars intake seen in this study are similar to those found by Arnold et al. (1995) which evaluated a questionnaire designed to estimate nutrient intake in children. The levels of agreement between surveys and the significant correlations between the FIQ and the 3-day diary give confidence in the FIQ's ability to monitor changes in food intake over time, and indicate its power to detect differences between groups. The method uses the most unambiguous question related to food intake: " Did you at any time yesterday eat any amount of the following"... Given the simple nature of the stem-question the correlation coefficients support the contention that asking young people food based questions about diet, using a convenient tool is nevertheless valid.

The FIQ was used to classify subjects into good and poor diet groups. When compared, the mean intakes of macronutrients derived from food diaries were significantly different. The results suggested that children identified by the FIQ into the poor diet group were consuming higher levels of fat and eating less fibre, than those in the good diet group, suggesting the FIQ is a valid method for comparing the eating habits of groups of individuals.

This study has provided an indication of the FIQ's validity. It must be stressed that the FIQ was not designed to assess nutrient intakes. The modest but significant correlations merely give added confirmation that the choice of foods in the list is appropriate. The results presented suggest that the FIQ has criterion validity for sugary and fatty foods; two of the major concerns for dietary change. The study has also suggested that the FIQ may be a practical and cost effective method for collecting food intake data in large numbers young people and in evaluating the effectiveness of nutrition interventions.

8.6 Summary of Validity study

* Spearman correlations between the FIQ and 3-day diary method ranged from 0.04 for the fibre group to 0.36 for fatty foods group.

* Correlations between the negative marker group and fat (as a percentage of energy intake) and sugars intake were 0.34 and 0.21 respectively.

* The modest but significant correlations confirm that the choice of foods in the FIQ is appropriate and has criterion validity for fatty and sugary foods.

* Macronutrient intakes (derived from diaries) of good and poor diet groups (classified by the FIQ) were significantly different.

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Chapter 9 Food Intake Questionnaire Reliability study

9.1 Introduction

This chapter outlines the reliability study conducted on the FIQ. Three separate surveys were conducted on a group of 13-14 year old schoolchildren attending two secondary schools in Liverpool.

9.2 Aim

- To evaluate the reliability of the food intake questionnaire (FIQ) designed for use in schoolchildren.

9.3.1 Methods

Two schools were recruited from two areas of Liverpool representative of social and health deprivation based on the receipt of income support (chapter 6). Schools in such areas were chosen because it was intended to use the FIQ in an intervention programme in such schools at a later date. Each child who agreed to take part, completed the self-administered FIQ on three separate occasions (all weekdays), at roughly equal intervals, over a three-month period. It was assumed that any real change in eating habit over this time would be minimal (Bingham 1987). A schedule (which was used in previous surveys) was used to ensure all children followed the same procedures. Each survey was conducted in the same classroom during the morning school session 9-12 noon. Each child completed the survey individually. Conferring between children was kept to a minimum, however it was not possible to eliminate this potential source of bias completely due to the size of class and the space available. Responses were input directly into a computer and stored on disc, and later downloaded into a mainframe computer for analysis.

9.3.2 Sample

All children in school year nine (aged 13-14 years) of each school were invited to participate, 250 children were eligible to take part.

9.3.3 Statistical analysis

Data were downloaded into a mainframe computer and analyzed using Statistical Package for the Social Sciences (SPSS 1990). For the purpose of this study, reliability was defined as the level of agreement represented by a subject giving an identical response to the same item on two occasions either Y Y or N N (Y= a child claimed to eat the food, N= a child claimed not to eat the food). For example, 43 subjects provided an identical response (either YY or NN) for hard margarine when survey 1 and survey 2 were compared (table 6).

Agreement between survey combinations: were compared (tables 9.1-9.2) for the responses given by each subject for each survey combination: FIQ1 and FIQ2, FIQ1 and FIQ3, and FIQ2 and FIQ3 (tables 9.1-9.2). The figures indicate the number of subjects answering either "Yes" or "No" to the same question on each occasion and as a proportion of the total sample who completed each item; 95% confidence intervals were calculated and expressed as a percentage range. The confidence interval is the range of values that contains the true population value for a given specified probability (Bowling 1997).

The width of the 95% confidence intervals for the proportions were calculated using the following formula (Gardner & Altman 1986):

$$CI = \pm 1.96 \sqrt{\frac{p(1-p)}{n}}$$

Where: p= sample proportion
n= sample size

One-way analysis of variance was conducted to assess differences in mean scores, standard error of the mean and ranges are given for each food group, (fatty, sugary, fibre, positive marker foods and negative marker foods).

9.3.4 Reliability of responses over time

To compare the stability of responses over time (intra-individual variation) Spearman correlation coefficients were calculated for scores between surveys. In addition, proportions of subjects reporting eating each food were ranked for all surveys. The foods ranked 1-10 and 41-50 for each of the three surveys were compared i.e. the foods claimed to be eaten by the most, and the least, numbers of children (tables 9.3 and 9.4).

9.4.1 Results

Table 9.1 shows the numbers of children who completed each separate survey. Of the 250 children eligible to take part 98 children completed all three surveys records and so were used for the analysis. Table 9.2 describes the sex and age distribution of those children completing all three FIQ records.

Table 9.1 Number of children completing each survey

	Survey 1	Survey 2	Survey 3	All surveys
n	153	159	153	98

Table 9.2 Age and gender distribution of subjects who completed three FIQ records.

	Age/Years	Boys	Girls	Total
School A	13	13	19	**32**
	14	9	12	**21**
School B	13	7	9	**16**
	14	16	13	**29**
Total (n)		**45**	**53**	**98**

The frequencies for all FIQ items were ranked in order revealing a high level of stability in the foods claimed to have been eaten. Of the foods reported as being eaten by most young people (ranked 1-10), seven appeared in each ranking for FIQ 1, FIQ 2 and FIQ 3: milk, sugared fizzy drink, crisps, boiled sweets,

chocolate and chocolate biscuits (table 9.3). Of the ten foods reported as being eaten by least children (ranked 46-56), eight appeared in all three lists: low fat burger, low fat sausage, mashed potato, roast potato, boiled potato, high fibre breakfast cereal and artificial sweeteners (table 9.4).

Table 9.3 Proportion (%) of subjects eating a particular food "yesterday". ranked 1-10 by survey (foods claimed to have been eaten by most children)

	Survey 1		Survey 2		Survey 3	
Rank	**Food**	**%**	**Food**	**%**	**Food**	**%**
1	Drink milk	82	Fizzy drink	76	Fizzy drink	89
2	Fizzy drink	79	Drink milk	72	Drink milk	76
3	Crisps	74	Crisps	69	White bread	71
4	Boiled sweets	72	Chocolate	65	Crisps	71
5	White bread	69	White bread	65	Boiled sweets	68
6	Chips	65	Chocolate biscuits	62	Regular fizzy drink	67
7	Chocolate	65	Butter/margarine	61	Butter/margarine	65
8	Hot drink	65	Milk on cereal	60	Chocolate biscuits	59
9	Fruit	63	Chips	59	Chocolate	59
10	Chocolate biscuits	59	Sugar in drink	59	Hot drink	58

Table 9.4 Proportion (%) of subjects eating a particular food "yesterday". Ranked 46-56 by survey (foods claimed to have been eaten by fewest children)

	Survey 1		Survey 2		Survey 3	
RANK	**Food**	**%**	**Food**	**%**	**Food**	**%**
46	Low fat spread	12	Muesli	14	Baked potato	10
47	Fried fish	11	Artificial sweetener	14	Mashed potato	9
48	Baked potato	11	Mashed potato	14	Roast potato	9
49	Mashed potato	11	Fried fish	13	Artificial sweetener	8
50	Roast potato	9	Brown bread	13	Fried fish	8
51	Tinned fish	9	Roast potato	11	Wholemeal bread	7
52	Boiled potato	7	Wholemeal bread	10	Boiled potato	7
53	Sultana bran	7	Sultana bran	10	Sultana bran	5
54	Artificial sweetener	4	Boiled potato	8	Low fat burger	6
55	Low fat sausage	4	Low fat sausage	7	Low fat sausage	2
56	Low fat burger	3	Low fat burger	4	Tinned fish	2

The proportion (%) agreement was calculated for foods in each food group (fatty, sugary, fibre, alternative fats and low sugar) by calculating the number and proportion of individual subjects who gave an identical response to each FIQ item on each occasion (Table 9.5-9.6). For example, table 9.5 shows that for

chocolate biscuits, 72% of children gave the same response for survey 1 compared to survey 2: the width of the 95% CI for the proportion is ±0.089 (8.9%) giving a confidence interval of 0.63-0.81 (63-81%).

Table 9.5 Reliability of FIQ combinations: Agreement between surveys For negative marker foods

	FIQ 1 versus FIQ 2			FIQ 1 versus FIQ 3			FIQ 2 versus FIQ 3		
Negative markers	**n**	**Prop**	**95%CI**	**n**	**Prop**	**95%CI**	**n**	**Prop**	**95%CI**
Fatty foods		**%**	**Range±**		**%**	**Range±**		**%**	**Range±**
Sausages	97	80	8	97	77	8	97	96	4
Pies & pasties	96	78	8	97	62	10	70	94	6
Burgers	97	81	8	98	81	8	97	88	7
Crisps	97	74	9	98	73	9	97	7	9
Full fat margarine	57	75	9	56	77	11	56	61	13
Chips	88	80	8	97	62	10	97	64	10
Fried vegetables	98	80	8	98	88	6	98	78	8
Butter	94	69	9	97	73	9	84	67	10
Roast potato	98	88	6	98	82	8	92	87	7
Fried fish	98	82	8	98	85	7	98	85	7
Whole milk	74	78	9	72	78	10	91	66	10
Sugary foods									
Sugar in drink	97	79	8	96	67	9	54	61	13
Puddings	90	68	10	96	75	9	94	73	9
Ice cream	98	69	9	98	55	10	98	69	9
Sugar on food	98	8	8	94	71	9	94	73	9
Boiled sweets	95	77	8	97	74	9	96	67	9
Chocolate	98	78	8	97	74	9	67	68	9
Milkshake	97	74	9	97	65	9	91	75	9
Chocolate biscuits	96	72	9	96	7	9	98	62	10
Plain biscuit	97	64	10	96	67	9	96	71	10
Sugar cereals	98	76	8	98	78	8	98	76	8
Cakes & Tarts	98	59	10	97	58	10	96	59	10
Sugared fizzy drink	97	78	8	98	8	8	86	86	7
Sugared still drink	97	69	9	97	72	9	97	69	9

n = Total number of subjects who answered the question

* **Prop** = The proportion of the total sample who gave an identical response to the same FIQ question on separate occasions i.e. YY or NN

***CI Range** = ± 95% CI expressed as a percentage

Table 9.6 Reliability of FIQ combinations: Agreement between surveys for Positive marker foods

	FIQ 1 versus FIQ 2			FIQ 1 versus FIQ 3			FIQ 2 versus FIQ 3		
Positive markers	**n**	**Prop**	**95%CI**	**n**	**Prop**	**95%CI**	**n**	**Prop**	**95%CI**
Alternative fats		**%**	**Range±**		**%**	**Range±**		**%**	**Range±**
Low fat spread	56	82	15	48	75	7	91	69	11
Semi-skim milk	75	71	10	72	74	10	62	81	11
Low fat burger	97	96	4	96	93	7	97	92	5
Low fat sausage	98	95	4	98	94	5	98	91	6
PUFA	56	66	12	56	61	12	42	64	15
Low sugar foods									
Diet still drink	30	73	16	35	77	14	29	79	17
Diet fizzy rink	70	79	10	78	68	10	68	75	10
Artificial sweetener	96	89	6	92	91	6	94	85	7
Fibre Foods									
Baked beans	97	85	7	95	85	7	96	79	4
Salad	98	74	8	97	67	9	97	64	10
Peas	97	72	9	96	78	8	95	73	9
Baked potato	95	85	7	95	88	7	96	80	8
Fruit	98	76	8	88	80	8	87	78	9
Brown bread	98	78	8	98	83	7	98	83	7
Sultana bran	97	87	7	97	92	5	98	87	7
Wholemeal bread	97	86	7	97	89	6	98	89	6
Muesli	98	82	8	98	84	7	98	84	7
Branflakes	97	82	8	98	82	8	97	81	8
Mashed potato	97	87	7	98	86	7	97	85	7
Boiled potato	93	90	6	97	89	6	95	85	7

n = Total number of subjects who answered the question

* **Prop** = The proportion of the total sample who gave an identical response to the same FIQ question on separate occasions i.e. YY or NN

* **CI Range** = ± 95% CI expressed as a percentage

The proportion of agreement and the width of the confidence limits for all aggregated groups showed the degree of consistency between survey combinations. The widest intervals were 17% from the lowest to the highest estimate of the proportion while the narrowest were 4%. Confidence limits showed a consistency in values from ±7-13% for the sugary food group (table 9.5) . The majority of CI ranges were between ±8-10%, the degree of stability is

also consistent when comparing different survey combinations. The levels of agreement in the fatty food group (table 9.5) are comparable to the sugary group; CI ranges expressed as a percentage were within ±4-13%, the majority of values being ±7-10%. The Fibre food group, alternative fats and low sugar groups (table 9.6) also revealed similar CI ranges for the proportions of young people answering identically FIQ items for individual surveys. CI ranges varied from ±6-17% for foods in the alternative fats group (table 9.6). The Low sugar foods group showed the highest CI ranges; values varied from ±4-17%. Diet still drink had the highest CI range ±17%, for FIQ 1/ FIQ 3.

9.4.2 Analysis of variance

One-way analysis of variance revealed no significant differences in responses for the aggregated food groups by survey (table 9.7) indicating that the children claimed to be eating similar numbers of foods in the different categories on different occasions.

Table 9.7 Analysis of variance for aggregated food group by survey

	FIQ 1		FIQ 2		FIQ 3		
Food group	**mean**	**sem***	**mean**	**sem**	**Mean**	**sem**	**F prob.***
Fatty foods	3.2	0.16	3.2	0.24	3.0	0.2	0.36
Sugary foods	7.5	0.29	8.3	0.43	7.8	0.42	0.43
Fibre foods	2.4	0.16	2.4	0.17	2.9	0.17	0.42
Alternative fats	1.6	0.12	1.5	0.12	1.4	0.12	0.20
Low sugar foods	1.3	0.08	1.3	0.08	1.4	0.07	0.69
Negative markers	12.8	0.78	15.9	1.57	12.2	0.76	0.83
Positive markers	6.1	0.30	5.9	0.40	5.6	0.35	0.39

* F probability (between groups D.F. 2)
*sem= standard error of the mean

The reliability of the FIQ was also assessed by comparing mean scores for each food group by survey using Spearman correlation coefficients (table 9.8). All r values were above 0.5 and the values ranged from 0.41 for the fibre food group to 0.76 for the negative marker group.

Table 9.8 Spearman correlation coefficients between Food group by FIQ

Food group	FIQ 1 and FIQ 2	FIQ 1 and FIQ 3	FIQ 2 and FIQ 3
Fatty	0.59	0.55	0.59
Sugary	0.58	0.62	0.69
Fibre	0.45	0.42	0.44
Positive marker	0.57	0.55	0.56
Negative marker	0.68	0.76	0.71

All correlations significant p= <0.005

9.4.3 Estimating sample size for a group study

The mean scores and standard deviations for food groups were used to estimate the sample size required for an intervention study, or for effective monitoring of dietetic intervention. This information is extremely useful to prevent the possibility of a false negative (type II error) or a false positive (type I error) result. The formula suggested by Hall (1983) assumes an acceptability level for type I and type II error probabilities of 0.05 (appendix 5). Table 9.9 shows the sample size required to detect a specified difference in the mean scores for the negative marker group. For example, a study measuring the effectiveness of a nutrition intervention would require a sample size of 132 to detect a change in mean score of 2 foods i.e. sixty five subjects in each group.

Table 9.9 Estimate of the sample size required to detect a difference in mean score for Negative food group.

Difference between group means*	Sample size for each group (n)	Total sample size (2n)
1	261	522
1.5	116	232
2	65	132
2.5	42	84
3	29	58
4	16	33
5	10	21
6	7	14

* number of foods
Number of negative foods in group = 24.
Mean intake of negative foods15.9 (mean of three surveys)

9.5 Discussion

The results provide an estimate of the FIQ's reliability. There were no significant differences in mean scores for separate food groups between the three surveys, and if it is assumed that intake did not change significantly during the study period, these results show the extent of changes which the FIQ should be able to detect (±4-17%). Correlations for mean scores estimated by separate FIQ ranged from 0.42 for fibre to 0.71 for the negative marker group indicating the reliability of the FIQ as a tool for detecting change. The majority of the r values were above 0.5, the lowest being associated with the fibre food group. Since some change in eating habits almost certainly did occur over the three month study period, which would lower correlations, and that correlations with discrete variables are attenuated (Appleton et al. 1989), this suggests that the FIQ has a considerable degree of reliability. In addition, foods ranked according to reports by most and least subjects also confirmed the stability of responses. As expected from other surveys (DHSS 1989; Adamson et al. 1992; Hackett et al. 1997), popular foods included: boiled sweets, chocolate, fizzy drinks and crisps. The foods reported least often included: low fat sausages, high fibre breakfast cereals, baked potato, and mashed potato, unfortunately these are the more desirable foods.

The agreement in responses between surveys also documents the reliability of the FIQ. The widest confidence intervals were related to foods with the lowest

proportion of subjects who claimed to have consumed the item, this was a result of branched questions e.g. drinking milk: subjects can select semi-skimmed, skimmed, or whole milk as appropriate. Confidence limits showed a consistency in values from ±7-13% for the sugary food group. The majority of values being within the range ±8-10%, and the degree of stability was consistent when comparing different survey combinations. When comparing FIQ1 versus FIQ2, and FIQ1 versus FIQ3 for sugary foods, the confidence limits could be expected to deteriorate as the length of time between each survey increases, however this was not found, for example the CI ranges for the majority of the sugary foods group were similar in each survey combination that was compared. FIQ1 versus FIQ2 (one month apart) CI ranged from ±8-10%, this was similar to FIQ1 versus FIQ3, (approximately 3 months apart) CI range ±8-10%. The levels of agreement in the fatty food group was comparable to the sugary group. Confidence limits were within ±4-13% with the majority of values being ±7-10%. This suggests that the FIQ should be able to detect a change of ±10% or greater.

The study has described the level of reliability of the FIQ when assessing the eating habits of schoolchildren over time and has described its power to detect differences. The results from this study also indicate the sample size required when using the FIQ for an intervention study, which are not so large as to render the tool unacceptable for community dietetic use.

9. 6 Summary of main findings: Reliability study

* Of the foods ranked 1-10 in order of reported consumption in the three surveys (foods eaten most often) 7 appeared in each ranking: sugared fizzy drinks, crisps, chocolate, chocolate biscuits and milk.

* 8 foods reported as being eaten less frequently appeared in all three surveys list (ranking 46-56): low fat burgers, low fat sausages, mashed potato, roast potato boiled potato, and artificial sweetener.

* There were no significant differences in the mean scores for all marker food groups between each survey (ANOVA $p<0.05$).

* Correlations between mean scores for all marker food groups by survey were all above 0.50 (range $r = 0.42$-0.76).

* The results suggested that the FIQ could detect a change of ± 10% in eating habits over time.

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9.7 Summary of Diet surveys

The results from the dietary surveys using the FIQ indicated that the method was suitable for use in the main study. Studies of face validity, reliability and criterion validity suggest that the FIQ is a valid and reliable method giving sufficient power, with an acceptable sample size, to be used in the main study, and the planned intervention study. Using the FIQ marker food groups enabled sub groups of children with good and poor eating habits to be identified.

The list of foods in the original questionnaire was amended to include pasta. Although brown rice was also mentioned in the face validity study when describing healthy eating it was not included in the FIQ because its contribution to the eating habits of young people was thought to be negligible.

Because of the problems encountered with the computerised survey questionnaire it was decided to use the FIQ in paper format in the main study.

Chapter 10 Focus group pilot study

10.1 Introduction

The method to be used for the focus group sessions was piloted at a secondary school in Staffordshire. The school was a mixed comprehensive with a school population drawn from a local housing estate and suburban areas of Staffordshire. Twelve percent of pupils who took part in the pilot study were entitled to receive a free school meal. All children in Year 7 and 8 completed the FIQ. After analysis those children with "good" and "poor" eating habits were invited to take part in the focus group sessions. Six separate focus groups were conducted over a two-day period. Two researchers conducted each group. The first acted as the facilitator and the second acting as a facilitator/ observer. The second researcher also took field notes. Each group consisted of 4-7 children from school year 7 and 8 (ages ranged from 13-14 years). For two group sessions a class teacher was present. This allowed feed back and comments to be made about the language used by the researchers and the benefits of the card game.

10.2 Aims of the pilot sessions

- To evaluate the focus group method to be used in the main study
- To evaluate the card sorting activity as a tool for stimulating discussion

Each group lasted forty five minutes and included the card sorting game (fifteen to twenty minutes), in which group members arranged the series of thirty cards into two groups: factors important when thinking about what to eat; and factors that were not important when thinking about what to eat. This was followed by open discussion (thirty minutes), exploring why particular cards were included in each group. At the end of each session children were asked for comments to evaluate and improve the facilitation of future groups.

10.3 Reflections on pilot studies

The focus group method was considered suitable for the main study. The method allowed a relationship to be made when the researcher was not known by the group.

Reflecting on the pilot sessions and discussing the sessions with school staff and children who had taken part indicated that the optimum group size was 4-5 young people. This number seemed less intimidating to participants than a larger group and caused fewer problems for the facilitators. During the analysis stage, quality of audio recording was very poor and made it difficult or impossible to transcribe sections of text. Children said the card game was enjoyable. It enabled a wide range of topics to be discussed by the researchers without young people feeling they were being directed to talk about any particular subject. The game took between ten and fifteen minutes to conduct, for some groups this took as long as twenty minutes. Both facilitators agreed that it acted as an "ice-breaker"; the cards also worked as triggers, allowing young people to discuss issues, individually, i.e. "snack foods are for young people" or as a group of related statements: one group of young people grouped nutritional related cards together: "it contains fat", "it contains sugar", "it contains vitamins". This allowed the group to discuss healthy eating from a nutritional perspective.

Analysis and transcription of the focus data was particularly difficult. The relatively large numbers in the focus groups and the enthusiasm of the young people involved resulted in very poor quality taped recordings. Valuable information was lost because it was not possible to transcribe sections of conversation accurately. For this reason the data transcription and analysis was compromised and was not included in this section. The main recommendations for the main study based on the pilot was to limit the group numbers to 4-5 participants and to ensure a good quality microphone was used with tape recorder.

Section 4 Results and Discussion

Chapter 11 Phase I dietary survey

11.1 Introduction

The main study was conducted in conjunction with Liverpool City Council's Leisure directorate. The survey was conducted on 1275 schoolchildren from primary and secondary schools across the Liverpool area. The primary children are not included in this report. The aim of this study was to select young people with good and poor eating habits who would then be invited to take part in the focus group study.

11.2 Sample

Schoolchildren aged 11-14 years were eligible to take part. Seven secondary schools, were included in the study providing a city-wide sample synonymous of both affluent and less affluent areas of Liverpool.

11.3 Methods

All children completed the FIQ in paper format. Class teachers were responsible for the distribution of questionnaires, which were returned after completion to a researcher who was present. The food related items were identical to the FIQ used in previous cross-sectional and validation studies.

11.4.1 Results

805 questionnaires were returned from the secondary schools for analysis. After cleaning the data, a final sample of 697 questionnaires were suitable for analysis. Table 11.1 describes the age and sex profile of those who successfully completed the survey. More boys than girls took part in the study. The age distribution was not even and the majority of respondents were aged 11-12 years.

Table 11.1 Age and sex distribution of children taking part in the study

Age/years	Boys	Girls	Total
11	238	166	404
12	135	107	243
13	20	14	34
14	10	6	16
Total (%)	**403 (58)**	**293 (42)**	**697**

Table 11.2 Percentage of children eating each food "yesterday" comparison by survey.

	Hackett et al. 1989	Bakker 1991	Johnson & Hackett 1993	Main study 1997
	Newcastle	Liverpool	Liverpool	Liverpool
Food				
Brown bread	15	33	15	30
Jacket potatoes	12	15	13	15
Chips	69	65	64	54
Low-fat milk	31	41	50	35
High fibre cereals	63	47	21	22
Fizzy drinks (sugar)	60	77	67	65
Baked beans	29	23	23	33
Added salt	42	54	47	58
Crisps	68	66	68	54
Sweets/chocolate	54	60	62	60
Added sugar	63	50	25	40
Diet fizzy drinks	28	38	35	41
Fruit	70	65	68	75
Sample size	**240**	**487****	**707**	**697**

** mean is used

The results from the main survey were compared to previous studies that used the FIQ (Table 11.2) allowing direct comparisons to be made. The results revealed trends in eating patterns, showing the value of comparing results over time. The popularity of sweets and chocolates, fizzy drinks and the continued

use of added sugar are apparent across surveys. The proportion of young people in this study eating chocolate biscuits and fizzy drinks was identical to the pilot study also conducted in Liverpool. Positive trends were seen when the results from the four studies were compared: the reported consumption of fruit, high fibre cereals, baked beans and brown bread increased whilst the consumption of chips and crisps was lower than previously reported. The apparent decrease in the use of low fat milks and the increase in salt added to food was disappointing.

Table 11.3 Number and proportion of young people eating breakfast and lunch

	Boys		Girls		Chi square	P
	n	%	n	%		
Eat breakfast	319	80	217	74	2.85	0.09
Eat on way to school	131	33	70	24	6.03	0.01
Eat at Lunch	373	95	280	96	0.36	0.54
Free school meal	199	69	127	48	2.97	0.05

Girls were more likely not to eat breakfast before going to school than boys, (table11.3). Boys however, claimed to eat on the way to school more often than girls. There was a high percentage of children in receipt of a free school meal, 82% of boys and 69% of girls. 5% of boys and girls admitted to not eating lunch on the previous day.

Table 11.4 Comparison of mean scores of marker foods consumed by boys and girls

	Boys (n=403)		Girls (n=293)		
Food group	**Mean**	**SE**	**Mean**	**SE**	**P***
Sugary	5.13	0.12	4.44	0.12	0.64
Fatty	2.73	0.08	2.16	0.08	<0.001
Fibre	2.36	0.08	2.24	0.08	0.30
Snacks	4.46	0.10	3.35	0.10	<0.001
Alternative fats	0.75	0.44	0.59	0.04	0.09
Negative marker	10.11	0.23	8.35	0.23	<0.001
Positive marker	5.18	0.18	4.80	0.15	0.02

P* = significance level for independent t-test

11.4.2 Differences between boys and girls

Table 11.4 shows the differences in mean scores for aggregated food groups. For all groups, except alternative fats and sugary foods, there were significant differences between boys and girls. Boys claimed to be consuming approximately two more negative foods than girls. Mean snack intake in boys was higher than girls. This was lower than that reported by young people in the pilot survey, where mean intake in boys was 5.86, and for girls was 5.30.

Table 11.5 Proportion (%) of boys and girls claiming to have eaten negative marker foods on the previous day

	Boys		Girls		Chi	
Negative markers	**n**	**%**	**n**	**%**	**square**	**p-value**
Fatty foods						
Burgers	103	28	32	12	25.48	<0.001
Butter	117	31	60	23	5.12	0.02
Sausages	129	35	57	21	15.60	<0.001
Pies & Pasties	90	25	52	19	2.93	0.08
Whole milk	170	49	107	38	6.22	0.01
Full Fat Margarine	56	15	28	10	3.45	0.06
Fried vegetables	88	24	53	20	1.45	0.22
Roast potato	44	12	23	8	2.21	0.14
Crisps	207	54	150	54	0.09	0.76
Fried fish	30	8	11	4	5.23	0.02
Chips	214	57	143	51	2.28	0.13
Sugary foods						
Sugar in drinks	235	63	132	47	17.44	<0.001
Sugar on food	171	46	88	31	14.58	<0.001
Still drinks	220	63	168	63	0.02	0.88
Plain biscuits	192	51	122	43	4.48	0.03
Chocolate	231	61	114	41	25.62	<0.001
Ice cream	113	30	52	18	10.94	0.009
Sugared cereals	146	38	86	30	4.81	0.02
Cakes & tarts	93	25	75	27	0.78	0.39
Fizzy drink	243	68	164	60	4.70	0.02
Boiled sweets	230	61	162	58	0.53	0.46
Puddings	151	40	73	26	13.53	0.002
Chocolate biscuits	215	56	154	54	0.17	0.67
Salt added to food	167	63	93	51	5.98	0.01

Differences in the proportions of boys and girls who reported consuming positive and negative marker foods were assessed by χ^2 (tables 11.5). More boys claimed to eat chocolate, burgers, fizzy drinks. Significantly more boys also reported using whole milk and cakes than girls and reported adding sugar to foods and drinks. The numbers of boys and girls reporting eating boiled sweets, crisps, chips, chocolate biscuits, cakes and still drinks was similar.

Table 11.6 Number and proportion (%) of boys and girls claiming to have eaten positive marker foods on the previous day

		Boys		Girls		Chi	
Positive Markers		**n**	**%**	**n**	**%**	**square**	**p-value**
Alternative fats							
Low fat spread		45	12	31	11	0.01	0.74
Semi-skim milk		124	35	94	34	0.04	0.82
Low fat cheese		31	9	23	8	0.04	0.83
Low fat burger		28	8	7	2	7.29	0.04
Low fat sausage		33	9	12	4	5.11	0.02
PUFA		103	27	77	27	0.023	0.96
Low sugar foods							
Diet still drink		90	25	60	22	1.21	0.27
Diet fizzy drink		146	41	106	39	0.40	0.49
Artificial sweetener		34	9	22	8	0.37	0.54
Fibre foods*							
Baked beans		142	38	61	22	18.45	<0.001
Salad		101	28	95	35	4.14	0.04
Vegetables		108	30	77	28	0.11	0.73
Baked potato		43	12	53	19	6.71	<0.001
Fruit		281	76	202	73	0.81	0.34
High fibre cereals		59	16	38	13	0.65	0.41
Brown bread		117	31	83	29	0.19	0.65
Mashed potato		71	19	46	17	0.67	0.41
Boiled potato		53	14	32	12	0.08	0.29

*High fibre breakfast cereals have been combined

There were differences between girls and boys in the reported consumption of high fibre foods such as baked beans, baked potato and salads (Table 11.6). There was no difference in the numbers who said the consumed vegetables, fruit, brown bread, and potatoes. A higher proportion of boys reported eating low fat burgers and sausages than girls.

11.4.3 Differences between schools

Differences between schools were compared using analysis of variance. Mean scores for positive and negative marker food groups are presented in table 11.7

There were no significant differences in the mean scores for negative and positive food groups between schools.

Table 11.7 Differences in mean score for positive and negative marker group between schools

Positive marker foods					Negative marker foods			
School	**mean**	**Sem+**	**F***	**95% CI****	**mean**	**sem**	**95% CI**	**F***
3	5.30	0.34	NS	4.61-5.99	9.92	0.50	8.93-10.91	NS
4	5.23	0.21	NS	4.84-5.67	8.62	0.26	8.08-9.12	NS
7	4.41	0.28	NS	4.03-4.79	9.40	0.28	8.86-9.96	NS
8	4.89	0.19	NS	4.23-5.58	9.43	0.51	8.42-10.44	NS
12	5.01	0.30	NS	4.21-5.82	10.15	0.56	9.04-11.25	NS

F* = Significance level for Oneway analysis of variance
\+ = Standard error of the mean
** = 95% confidence interval for the mean

11.4.4 Selection of subjects for inclusion into focus group study

The method for selecting subjects has been described in chapter four. A subject was included in the *poor diet* group if he/she reported to consume more than 12 negative foods **and** less than 3 positive foods A subject was included in the *good diet* group if he/she reported to consume more than 7 positive foods **and** less than 6 negative foods.

Table 11.8 lists the numbers of young people selected in each quartile. 42 subjects were identified in the poor diet group and 54 in the good diet group.

Table 11.8 Quartiles for positive and negative marker foods (all subjects)

	Positive			
Negative	Lowest	Second	Third	Upper
Lowest	22	32	25	**54****
Second	42	76	43	30
Third	34	65	55	36
Upper	**42***	45	43	51

*** = poor diet group**
**** = good diet group**

11. 5 Discussion

The results from the study suggest that there has been little change in eating habits over the last nine years. Overall, the results of the main study and the comparisons made to previous studies using the FIQ (Bakker 1991; Hackett et al. 1990; Johnson & Hackett 1997; Hackett, Howie & Kirkby 1997) suggest the consumption of high sugar snack foods such as crisps and biscuits (plain and chocolate coated) and fatty foods such as chips are prominent and eating habits remain far from ideal. Breakfast is an important meal of the day and the proportions of young people who reported not eating breakfast remains high, almost thirty percent of girls and twenty percent of boys did not eat breakfast on the previous day. The pattern of differences between the sexes are of interest; mean intakes of the least desirable foods i.e. negative markers was significantly different between boys and girls, although in practical terms this may have little utility because of the very small differences between the mean scores in aggregated food groups, it nonetheless suggests the FIQ can describe eating habits and detect differences between sexes that have been reported by other studies (Adamson et al. 1992; Prescott-Clarke & Primalesla 1998). Snack foods are ubiquitous in the diets of these young people the popularity of such foods provide further evidence of the importance of snacking in the foodways of adolescents. The significant place of snack foods in the culture of young people is common in young people across the UK (Hackett, Howie & Kirby 1997). In addition, international studies have shown similar patterns of snacking or "grazing" in adolescents from other countries to the young people investigated in Liverpool (Vereecken & Maes 2000). The numbers of girls in this study who claimed not to eat breakfast was consistently higher than previous studies that have used the FIQ (Hackett et al. 1989; Bakker 1991, Johnson & Hackett 1997). There is evidence to suggest girls are concerned by body shape and body image, and some young people may use a strategy of "meal skipping" to reduce calorie intake (Hill 1992). This will be one important factor to be discussed in the focus groups.

Oneway analysis of variance detected no differences in the mean score for negative and positive marker foods between schools. It was interesting to note that schools were recruited from parts of the city with varying degrees of

affluence and deprivation, and suggests a poor quality eating habits across the city. Staff in school seven declined an invitation to take part in the second phase of the study because their school was involved in the Liverpool healthy school initiative.

11.6 Summary

The FIQ identified trends in the diets of young people. There were positive changes in the reported consumption of less favourable foods such as crisps and chips, however the continued popularity of snack foods such as chocolates, fizzy drinks and the use of added sugar suggest there is a significant difference between the habits of young people and the collective consensus from nutrition experts about the optimum diet required for health. The FIQ was used to identify children who were invited to take part in the qualitative phase of this study and to classify young people into good and poor diet groups.

Understanding the cultural and social significance of foods in the lives of young people is central to this thesis. It is incumbent on health educators to be cognisant of the social milieu of young people; their notions and perceptions of "health" should inform the development of practical interventions to facilitate change. Such an approach will allow the voice of young people to be heard, descibing the "cultures of health" that are most relevant to them (Aggleton 1998). A focus group method and a questionnaire were used to investigate the social and cultural background influencing food choice of young people of children with very contrasting eating habits by assessing the differences and the commonalties in food choice that exist between these two groups. By comparing children with good and poor eating habits, living in the same areas and attending the same school, modes of intervention could be planned that are relevant. The subjects who were identified in the good and poor diet groups were allocated to focus groups. Two focus group sessions in each of four schools were planned and took place in four secondary schools in Liverpool.

Chapter 12 Phase I Focus group study

12.1 Introduction

The FIQ identified young people with good and poor eating habits attending schools in different areas of the city (in terms of social and economic factors). The focus group study specifically targeted children attending the same school, and living in similar areas of the city. Previous studies using the FIQ (Bakker 1992; Hackett & Howie 1999) described differences between children living in affluent and poor areas. This phase of the study was unique because children would be interviewed, with good and poor diets, attending the same schools, covering areas of similar social and economic influence. By exploring the difference and similarities in understanding between these children it was hoped that an understanding of their eating behaviour could be investigated and novel approaches for nutrition education could be designed that would be beneficial in delivering the school intervention. The aim of the focus group study was to explore the important factors affecting the food choice of the young people (and the language used), and to use this understanding to design a questionnaire to be used in the intervention study. Key themes related to diet and health behaviour and ideas for interventions would be used to design items for the combined questionnaire i.e. FIQ items and non food related items derived from the qualitative focus group data.

12.2 Sample selection

Six schools were selected from the list of schools that had taken part in the main dietary survey using the FIQ, and were invited to take part in this phase of the study. This purposive sample of schools were situated in areas of the city with different degrees of social and health inequality. Two schools declined to take part; one school had recently been chosen as a pilot school in Liverpool's Healthy School initiative, the second declined because they were having staffing problems. The schools selected were large mixed sex comprehensives. No school was involved in the Liverpool healthy school initiative and had no input from community dietitians or other professionals such as dental health educators. Each school was contacted in writing explaining the aims of the group discussions.

12.3 Selection process

Young people in Year 8 classified from the FIQ as having "good" and "poor" diets were eligible to take part. A simple random sample was drawn from those children identified by the FIQ study. Names of children identified for each group were given to individual schools who invited the young people to take part. Schools contacted children. The numbers identified by the FIQ are described in table 12.1

Table 12.1 Numbers of young people selected by FIQ who were invited to take part

School		Good diet	Poor diet
	Area*		
School B	L8	4	6
School A	L18	8	7
School D	L24	4	6
School C	L19	7	6

Area* L8, L24 are two of the poorest electoral wards in the city.
L19 is more affluent than L8 and L24.
L18 is one of the most affluent areas of the city.

Table 12.2 Numbers and sex of young people who agreed to take part in focus groups

School	Group	Good diet		Group	Poor diet	
		Boy	Girl		Boy	Girl
B	**1**	1	3	**5**	2	3
A	**2**	0	4	**6**	5	0
D	**3**	0	4	**7**	2	3
C	**4**	2	2	**8**	2	2

The numbers and sex of children who agreed to take part are presented in table 12.2 more children were initially selected for inclusion into the focus groups to allow for absentees and children who might decline to take part.

12.4.1 Methods

The method for the focus group has been described in chapter 5. Two focus group discussions; good diet and poor diet groups, were conducted at each school. The sessions took place in classrooms allocated by the school in time allocated for PSE. Two researchers were present, one acted as the facilitator of the sessions the second took notes. No class teacher was present. The facilitator welcomed the group, explained to young people the nature of the session, and the card game to be used. Young people were assured of the confidential nature of the discussions and the purpose of the study.

12.4.2 The card game

Children were presented with thirty cards and asked to group cards in two ways: the factors that are important in their food choice and factors that were less important in food choice. This allowed the facilitator to discuss the reasons for including particular cards into each group. Sessions lasted between forty and fifty minutes and took place in time allotted to PSE.

12.4.3 Analysis of data

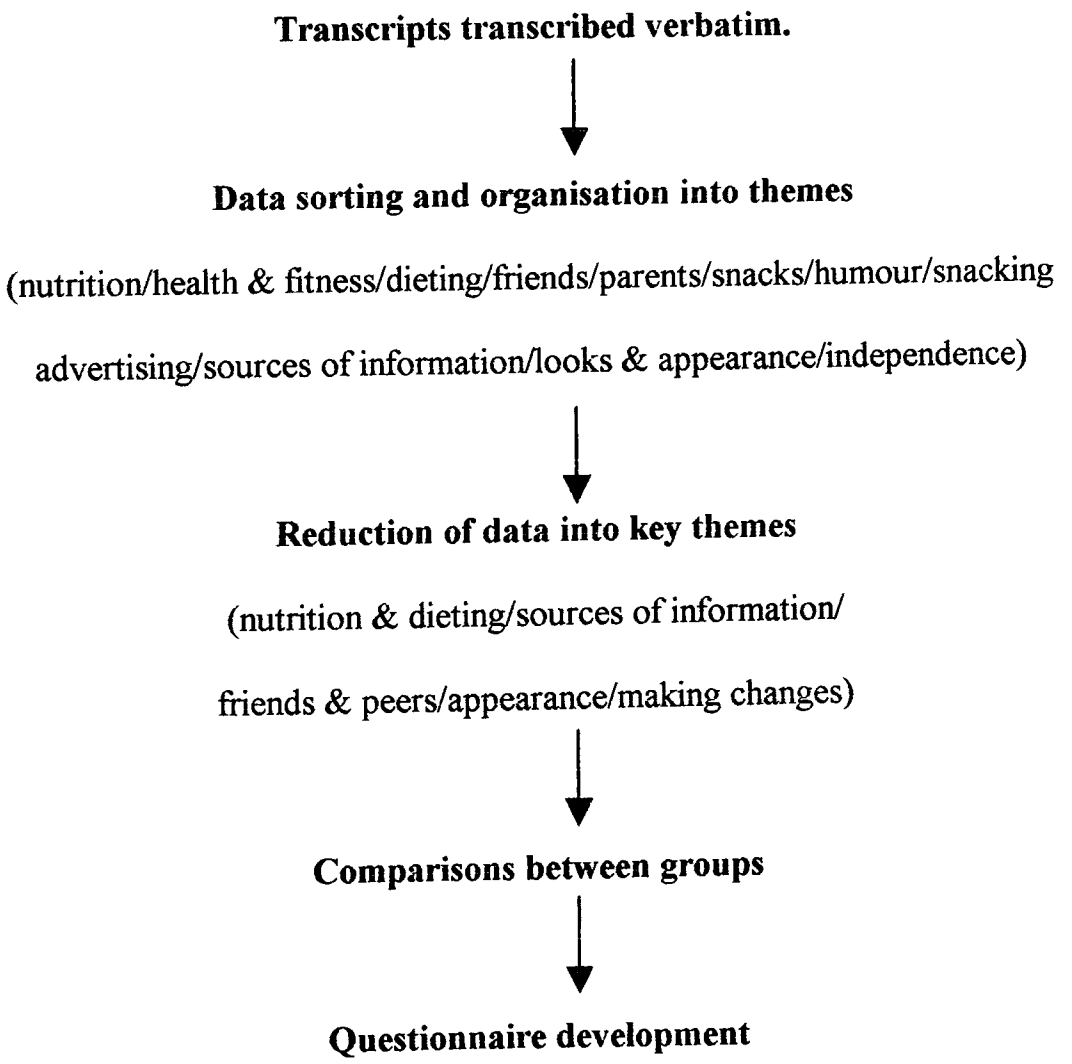
Data were analysed using the continuum described by Krueger (1998). The stages used are set out below. The final stage of Krueger's continuum (recommendations) informed the design of a questionnaire, which was used in school (chapter 14).

Raw data ------> Description ------> Interpretation ------> Recommendations
(*Transcripts*) [*Questionnaire design*]

12.4.4 Coding and analysis

Data (transcripts) were analysed firstly by sorting the data (described in chapter 5). This began by grouping quotes and sections of text that were related, for example, young people talked around general *nutrition* areas; describing issues about vitamins and sugar, other text also revealed relationships between the general nutrition discussion and other related subjects e.g. dieting and health. In this way twelve groups were derived (appendix 7). The themes identified, were compared and organised into subject categories, and the first stage of data reduction twelve key areas or themes were generated. The twelve categories were then collapsed into larger thematic groups. Thus as the analysis process continued the larger groups were reduced to five main theme areas: *nutrition and dieting*, *friends and peers*; *sources of information*; *appearance*; and *making changes*. The five categories provide the framework for interpretation and discussion of the of the data.

Diagram 12.1 Data analysis



12.5.1 Results

Diagram 12.1 details the process and stages of the analysis. The key themes were arranged into five headings. For brevity, direct quotes from the data have been kept to a minimum. A comprehensive list of quotations from the data which have relevance to the following discussion can be seen in appendix 7.

The discussion that follows uses quotes derived from the text. The following conventions are applied to quotes:

M	=	Male
F	=	Female
R	=	Researcher
Good	=	Good diet group
Poor	=	Poor diet group

Numbers were used e.g. **F1 F2 M1** only to indicates that a *different* individual was involved in the particular discussion quoted. The numbers are exclusive to each section of text quoted and do not identify the *same* individual in the group for different quotations.

12.5.2 Nutrition and dieting

Children from good and poor diet groups showed a similar awareness of the basic messages about healthy eating and had a basic appreciation of general nutrition. The sources of nutrients in food was understood e.g. fruit and vegetables being a good source of vitamins. However both groups were confused about the specific role of vitamins e.g. many young people thought vitamins "gave you energy" or caused hyperactivity in children. Healthy eating was seen as *"eating the right stuff"* (male) and the notion of balance and variety was well understood: *"you can have some meat and fat"* (male). Although the majority of young people were cognisant of the messages about health and diet there was confusion on some aspects of healthy eating. Common nutritional terms appeared to be understood by some young people, but the concepts of energy, calories and fibre were the most likely to be confused. The debate about fat, and young peoples' feelings about healthy eating was expressed succinctly by one female group member:

> ***F1.*** *"It's good but its bad in the same way... it doesn't make sense but it's good and it's bad".*
>
> **Group 1/Good**

This contradiction was evident across groups; young people were aware of the nutritional messages given by schools and other professionals but failed to put the theory into practice. One male group member, discussing how fatty foods may help prevent disease, suggested the decision is ultimately the young person's to make: *"You can choose to eat those"*. Taste was a major reason for eating a particular food, and was consistently the primary consideration, health and well-being were low priorities when considering the benefits of eating a particular food.

One group commented:

> ***F1.*** *" You think about it when you are putting loads of salt on your chips.* **F2.** *You're just doing it for the taste...* **F1.** *Of course its important but nobody is bothered.* **F2.** *It's afterwards that you like face the consequences.....it's afterwards that you realise I shouldn't eat so many chips because it's killing me now but....* **F3.** *... you don't really think I'm going to have 23 calories I shouldn't eat it, you just eat what's there"*
>
> **Group 1/Good**

The notion of nutritional balance and fitness was described as part of being healthy. Eating regular meals was also described by young people in this same context. Despite this other members of the same group did not put the theory into practice and regularly "skipped" breakfast. One young girl suggested a reason for eating breakfast: *"it gets your brain functioning"*. Girls were also more likely to mention skipping breakfast as a strategy to lose weight:

> **F1.**. ..."*they* (friends) *don't have breakfast because they think they are fat"* **Group 2/Good**

The poor groups showed a similar understanding of healthy eating and nutrition to the good diet group. This group were also confused over the role of vitamins in the diet, suggesting vitamins were linked to hyperactivity in children. This group described the foods they liked to eat in greater detail than the good diet group. There was a consistent belief within all of the groups that good foods promoted health, fitness, and appearance. Both good and poor groups talked about "skipping" meals particularly breakfast, and girls in the poor diet groups were more likely to admit to skipping breakfast, than boys. When asked "what are fatty foods?" young people in the poor groups were able to elaborate naming junk foods and snacks as fatty foods. However the understanding appeared to be at a basic level only. One example showed the confusion about vitamins:

> **F1.** *Vitamins are really important...* **F2.** *but I don't need vitamins to make me hyperactive...* **F1.** *but you need fibre..* **M1.** *without enough fibre you can't go to the toilet... [laughs] and then you get pains...* **M1.** *so you need fruit so you won't be sick"* **Group 6/Poor**

The poor groups described the link between food and health in similar terms as the good diet groups. The benefits of a good diet were related to fatness. When asked why keeping fit was important, two boys in the same group described the health implications of being unfit or overweight:

> **M1.** *"You are unfit if you have a lot of fat ...* **M.** *if you eat too much fat you gain weight and that"* **F1.** *Yes, cause you die.... some fella on the telly is forty stone...* **F1.** *have you seen the fella in the paper who cannot get out of his bed... he is unfit...* **Group 6/Poor**

There was an understanding of the foods that were detrimental to long-term health. This understanding was accompanied by a similar ambivalence shown by the good groups about the long-term consequences. The recognition that control over the food you eat is with the young person was evident. In the context of making changes in diet some groups could articulate some of the messages about positive nutrition.

Regular meals were seen as an important, but young people in the poor groups did not suggest why this was important. Children were asked why they skipped breakfast and three members of this group of four said they did not eat breakfast, even when prompted by parents:

> **F1**. *" but it's so important my mum always says and make sure you get up early and I will make you porridge... "*
>
> **Group 6/Poor**

The good diet groups talked at length about diets and dieting. Young people described dieting and diets in various ways and made no clear distinction between dieting (to lose weight) and healthy eating. "Eating with care", "going on a health week", cutting down on things, skipping breakfast and exercising, were among the descriptions given when discussing diets. Appearance and looking good was a theme described in all the focus groups. Both good and poor diet groups described looking good in the context of health and fitness. Fitness was described as not being a "couch potato"; being normal was commonly described as having an acceptable body weight. The notion of "feeling right" and "being happy" was seen as part of being a healthy person. Young people from poor and good groups were aware that diet could have effects on health but they also thought diet would affect appearance. Girls were more likely to discuss issues about appearance than boys. Appearance appeared to be a powerful motivator for young girls deciding to "go on a diet" (however defined). The media and television was cited as being a vehicle for defining body image. Conformity with the peer group was a powerful influence in determining the degree and extent to which young people will make decisions about health change. Decisions to *"go on a health week"* were only made after discussions with friends. Nearly all groups cited experiences of friends being "on a diet",

despite being of "normal weight". This generalised perception appeared to be very common within the groups. With respect to girls, going on a diet, or more specifically, *talking about going on a diet,* would seem to be an implicit aspect of adolescent culture. Most girls would try various eating strategies to modify weight (whether they are overweight or not). It was interesting to note that many young girls openly admitted that such strategies would last no longer than "a few days", begging the question: why go on a diet at all?

Young people from the good diet groups gave varying definitions for diets and dieting:

> **F1.** *" we don't call them diets because they are too strict.*
> **F2.** *"You don't call them diets you call them eating healthily"*
> **F1.** *"dieting is not eating anything that is fatty. We are going on a health week but it is not a diet..."* **Group 1/Good**

The group member suggested that the motivation for changing eating habits was not strong: *" you will only go on them* ["diets"] *for four days at the most"* Another group explained that some girls did not take dieting too seriously. Dieting was seen as an activity associated with girls, especially those concerned about their weight and body image. When discussing losing weight, the pressure from peers was evident; weight and diet are for girls, when one group was asked why they selected a card [it will help me lose weight] they suggested it was because they were "four girls". Peer pressure and conformity outweighed parental advice or concerns. Dissatisfaction with perceived body weight was cited as a motivating factor for dieting amongst girls. One group however disagreed with the suggestion that weight was exclusively a thing for girls, suggesting it was also important for boys:

> **F.** *"Lads are concerned (about their weight) they just don't want to admit it."* **Group 3/Good**

12.5.3 Friends and Peers

The significance of friends and peers within the lives of young people was evident from the focus group discussions. Both the good and poor diet groups reported the need to conform to the norms of their peer group. Friends were a valued source of information on diet and food, their opinions were respected despite there being an awareness that what friends said was not always factually accurate. Friends were seen as close group members as distinct from "others" representing the wider peer group of young people in the same school year.

> **F1.** *If you think you are ok and are happy with your look you don't listen to them [other peers]...* **F2.** *so long as your friends don't think nothing.*
>
> **Group 6/Poor**

In relation to food young people described a social context for food and eating. The place you eat is closely linked to who you are out with. There appeared to be social differences between foods eaten within the family, "family foods", and the types of foods eaten with friends. Eating with parents was often described in the context of formal eating and when out with friends young people would go to a fast food restaurant.

> **F1**. ... *if you are out with your friends you go to MacDonalds, and if you are with your mum and dad you go to a café.*
>
> **Group 3/Good**

The food culture of these young people conformed to descriptions of other groups of teenagers. The notion of snack foods was described in relation to foods tasting good; the context was being with friends, having "a laugh" and socialising. The cultural pressures not to eat healthy foods was also highlighted. Some group members provided a reason for conforming to peer norms. The social significance of food and a fear of being embarrassed by peers was a major barrier to choosing the healthy option:

> **F1**. *You can't exactly go to a burger bar and say can I have a salad...*
>
> **Group 1/Good**

Snack foods play an important cultural role in the lives of young people, however snacks were not seen as exclusively for young people and subjects in the focus groups described that parents eat them as well. The social context of when and where these foods were eaten was also significant. Snacks were associated with being eaten out of the house, with friends and when *"having a laugh"*. Both the good and the poor diet groups perceived snacks as being unhealthy, containing too much fat and sugar and being detrimental to health and appearance. Snack foods "taste nice" and this factor was a key reason for not wanting to cut down. Young people described snack foods as popular with adults and young people they did not accept that they were only foods for young people. Snack foods were universal:

> **M1.** *... but parents eat snack foods as well.* **F2**. *we all do [eat snacks] everyone does... unless you are a big health freak or something*
>
> **Group 7/Poor**

Descriptions of snack foods given by young people in the good and poor diets were consistent. Young people also provided other definitions which included chocolates, crisps and fizzy drinks. Some young people in the good diet group described fruit as a snack food another member of the same group suggested that sandwiches could be snack food, but her fellow group members did not accept this suggestion. However, the most prominent descriptions of snack foods suggested a classification based on a "healthy" "unhealthy" dichotomy. Snack foods were eaten because they "tasted good"; young people were also careful to acknowledge the poor nutritional quality of snacks:

> **M.** *But snack foods contain things that are not really good for you...*
> **F.** *... 'cause they are full of fat and sugar...* **F.** *but they taste really good*
>
> **Group 8/Poor**

One group also described snack foods as the main cause of ill health. Young people in both good and poor diet groups were aware that snack foods could be unhealthy. This knowledge however did not deter young people from consuming snacks; taste and liking were the most significant reasons for eating snack foods.

Three separate groups described what would happen if boys attempted to eat foods seen as being healthy or were associated with girls. One group of girls suggested that it would be difficult for some boys to make positive food choices in some social settings like the school canteen; the result would be ridicule from friends. Young people in one group described how eating the "wrong" foods would result in jokes being made. However girls cited an opposite view, they would be ridiculed by boys for eating a whole meal:

> **F1**. *If you have a big massive meal... [laughs] sometimes when you finish your dinner they [lads] call you a "scav" [scavenger] because you have left an empty plate.* **Group 2/Good**

12.5.4 Sources of information

Young people in the good and poor diet groups provided different perspectives on the importance of parents, teachers and other role models in relation to food and diet. In general, the good diet groups, and girls in particular, talked about parents more positively. Poor diet groups provided less discussion about their relationships with parents. Both groups did describe clear distinctions made between foods eaten with parents and those foods eaten with other young people and friends. They also provided a picture of parental control and concern over family foods including what young people should be eating. It was suggested that parents would stress the importance of a healthy diet:

> **F1.** " *some people don't like vegetables and they* [parents] *say eat them... they're healthy...* **M1.** *they make you grow that's what mine say...* **(Group 6/Poor)**

Some young people from the poor groups perceived parents as sources of information on food and health. The information they provided would be considered with some reservations and scepticism if advising young people to follow a healthy diet. Other relations within the family (aunts) were sometimes cited as a positive role model for positive ideas about healthy eating, these relatives were considered credible sources of information because they were perceived as being informed about health and fitness. Despite this the desire to be

independent was strong enough for some young people to override parental wishes. One apparent difference between the two diet groups was in how they appeared to talk about their relationships with their mum or dad. Poor diet groups did not describe in any detail relationships with parents. In contrast one group of girls with good diet were able to describe how they would discuss problems with their mother whilst preparing a meal. This group also made a distinction between when to trust friends and parents:

> **F1**. *...but sometimes you will make a cake with your mum..* **F2**. *mother and daughter bonding, talk about what the day has been like ...problems with fellers while your sitting peeling the carrots...* **F1**. *she* [mother] *it's the only person you can trust..*
> **Group 1/Good**

Young people in the good groups agreed that it was important to cook and talked about the foods they would cook at home. Both boys and girls would attempt to cook snack type foods or sandwiches and more elaborate dishes. Young people from the good diet groups derived information about diet from various sources, identifying television, magazines, family and friends and school as important sources. Parents were also cited as reliable sources of information. There appeared to be a hierarchy of information sources to trust with parents, schools and news programmes being cited as most factual or reliable. Many also agreed that the information from magazines aimed at young people particularly girls was chatty and less factual than school based information or news programmes (related to BSE). In school, PSE and biology were the main lessons to discuss food issues. Young people in the good groups discussed the role of the media and advertising and the influence it may have on the diets of young people. There were a number of cynical comments about the motivations driving advertising, young people felt that adverts were directed at them to buy particular products: *"it may be good for them [advertisers] but not good for us"*. Girls commented that they could be influenced by comments in magazines and on TV which suggested what foods to eat. Despite a somewhat cynical view of adverts one group member commented on the subtle influence from advertising:

> **M.** *Sometimes you don't really pay any attention but it still gets in your head, you still remember things from it* [the advert] ...
> **Group 3/Good**

12.5.5 Appearance

Appearance and looking good was a theme described by young people in all focus groups. Both good and poor diet groups described looking good in the context of health and fitness. Physical attributes: good skin, healthy teeth and not having spots were defined as "looking good". Fitness was described as not being a "couch potato", normal was exclusively described as being a normal body weight. Fitness, looking good were described in the context of being "normal". Looking good and feeling good about oneself increased self-confidence and self–esteem. The notion of "feeling right" and "being happy" was also seen as an integral part of being healthy, this idea was described in the context of appearance. The relationship between the way you eat and the way you look was acknowledged by the girls in the focus groups. The groups were aware that diet could affect health but also felt that what they ate would affect appearance, although there was some confusion about the role of diet in the cause of acne. Girls were more likely to discuss issues about looking good and appearance than boys. It was suggested that the boys reluctance to discuss looks and appearance was due to peer pressure and the fear of being ridiculed by friends. Young people described looking good in various ways. Not being overweight was the most frequently used example of looking good, it was also frequently mentioned in relation to being healthy. The ideal of not being fat was equally important for boys as well as girls.

Having good skin was also described as looking good; this group also described "feeling right" and "being happy" and having confidence as part of looking good, which also provided a broader definition of being healthy:

> **M.** *Because you don't want to be fat.... You just want to be normal.*
> **R**. *What's being normal?* **M.** *like losing weight and being fit....*
> **F**. *have foods that make you look good having good skin...*
>
> **Group 2/Good**

Another group also concurred with the idea that feeling good gave confidence. When asked if looking good was related to any foods eaten one group suggested that fruit would help. Young people were also able to articulate about the foods they thought would have a negative effect on their appearance. A second group also intimated that eating fatty foods would have detrimental effects on their

appearance. Looks and appearance were not discussed in as much detail in the poor diet groups. Boys did not describe appearance in the context of health and predominately described aspects of health in terms of being able to compete at sports. However girls in these groups did acknowledge that looking good was not being fat or overweight, and having good skin and hair.

> **F1.** ... *like fat or skinny 'cause if you were far overweight you would go on a diet.. 'cause if you eat like healthy your skin and all that will look good and your hair...* **F2.** *and if you eat like sweets all your teeth will go bad...*
>
> **Group 8/Poor**

They were also less likely to describe feeling confident about oneself in the context of appearance. When talking about the influence of the media there was a suggestion that the media would affect girls more than boys. A male member of one group also suggested that although boys in the focus groups may have been reticent to talk about their appearance explicitly, they were still concerned about it. A group of girls also gave an opinion on why boys would not want to appear overtly show this concern with how they looked:

> **F1.** *...I do think lads care more about themselves...* **F2.** *... lads would.... take care of themselves more or look after what they are eating if other lads didn't say stuff to them because they get skitted..*
>
> **Group 1/Good**

12.5.6 Making changes

Two themes were combined to discuss the feelings about, and problems that might be encountered, when making changes to diet. Independence and autonomy are central to adolescence. The major difference between the two diet groups was in the amount of discussion directed at this subject. The poor diet groups were particularly reticent to raise independence issues when discussing card choices. The good diet groups in contrast were more able to articulate their concerns. Within the home, parents decided what was to be eaten:

M. *I'm not really in control of what I eat I don't make any decisions...*

Group 3/ Good

This idea [lack of control] was expressed across all four goods diet groups, and there was a perception expressed that parents gave advice that was seldom heeded. Some groups suggested that they should be more involved in making food choice decisions inside the home. The results suggested that independence would make some impact on when, and to what extent, young people will make changes to diet. There were a variety of reasons for making changes presented within the groups. This inevitably resulted in young people exerting their own authority.

F. *It's better if they* [parents] *listen to what we say...* **M.** *... I would like to* [be involved in decisions] *but my mum won't let me.*

Group 8/Poor

In relation to making changes to promote good health young people did not generally agree that they would change diet for health reasons. Some young people discussed how being made aware of the consequences of poor health behaviours might be used to motivate change and focus young people to make changes:

M. *seeing what the after-effects are.... really scaring people into it... if they see what can happen to them they will think I don't want to do that*

Group 3/Good

One girl stated that when being asked to make changes, the cultural context in which the change takes place must be considered. The ubiquitous link between peer acceptance (described here as *"not being a divvy")* was stressed as a key factor in the context of change. Making positive changes could receive a negative response from peers therefore the pressure to conform is strong; change has to be acceptable to the individual and the wider peer group:

F1. *I suppose... making changes should be good for you but you can't be seen as a divvy* [looking silly, not cool].... **M1** *It* [making changes] *would have to be seen as ok to everyone...*

Group 8 /Poor

Young people were asked to describe and suggest sessions and interventions that would assist them make changes. In this context the young people suggested traditional modes of education and intervention that have been used in schools. Young people were asked to think about designing a lesson aimed at influencing their friends to make changes to their diet. Discussions focussed on what should be included in such lessons, how difficult it would be to motivate young people and what strategies would make the most impact. Regarding the sessions young people stressed that they should be interesting and relevant. Appearance and looking good was a consistent theme described in various contexts. It was a common reason for dieting or considering going on a diet. The relationship between health fitness and feeling good was appearance. Appearance and looks were mentioned by both girls and boys as an important focus for assisting others to make changes to diet:

> **M.** *Show them* [young people] *what they would look like in a few years time.* **F.** *yes, it's not so much the heart and that because they don't care ... it's what they look like, their appearance would be more better to get them to change.* **M.** *They don't really care about what's going to happen in twenty years time its about what happens now.*
>
> **Group 3/Good**

One suggestion from a two separate groups was to integrate information on physical education and a health related subject such as nutrition. When asked about this, suggestions one group elaborated on what they considered were suitable topics for separate lessons:

> **M.** *For girls it would be stuff like how you look...* **F.** *like the magazines ... but better... more real...* **F.** *yes we would have to have the lesson without them* [boys].
>
> **Group 4/Good**

Young people were asked also about who delivers messages about health in school and whether role models would be of benefit when talking about food and health in school. Doctors nurses and dentists were mentioned as credible sources of information. Young people thought health professionals had a role to play in school; the surveillance role of school nurses and the health promoting role of the dental health promotion department was understood. One group described a "one off" session in which school nurses, community dietitians and dental health service had promoted the benefits of fitness, exercise and diet on well being.

Young people thought that pop stars and footballers could be role models when trying to make people listen to a health message. Describing how athletes and footballers needed to eat a healthy diet and keep exercising was seen as a positive example for young people:

> **F.** *People always look at footballers don't they... the boys like* footballers.... **M.** *Michael Owen and Allan Shearer...*
>
> **Group 5/Poor**

12.6 Discussion

The focus groups provided insights into the eating habits and the social milieu affecting the food choice of young people. Friends were seen as close group members as distinct from "others" representing the wider peer group of young people in the same school year. This distinction between these two classifications is similar to that presented by Dunphy (1972). The analysis revealed similarities in themes and descriptions of adolescent life described in other studies (Aggleton 1996; Watt & Shieham 1997; HEA 1992). The perception and understanding of dieting and foods habits associated with teenagers described in this chapter is similar to work conducted in the United States (Neumark et al. 1998), and in the UK (Watt & Shieham 1997).

It could be expected that young people from the two groups identified by the FIQ would differ in the way they described food and health. The analysis of the focus group data revealed commonalities both between and within groups, and the expected demarcation in views was not apparent. Both the good and poor diet groups showed similarities in their discussions of food and diet. The demarcation between family foods and foods eaten with friends was evident; foods eaten with friends were described as snacks, or fast foods. Foods eaten at home were seen as "proper" foods. Parents, teachers and health professionals (doctors) were cited as important sources of information. PE lessons, teachers and trainers were also mentioned as sources of diet information. Young people in the groups described how some behaviours, particularly those related to aspects of healthy eating, or those not conforming to peer or friends' norms may be ridiculed [skitted] by peers and friends. The poor and good diet groups provided similar experiences about conforming to what peers expected. The result of not conforming would be ridicule. Ridicule was likely if boys displayed positive dietary behaviour. The fear of being made a fool ("a divvy") by friends could be a barrier to eating healthy foods in the school situation. One target that might attract ridicule was eating healthily or making changes to promote health. Changing diet for health reasons appeared to have little credibility, and this appears to present a strong barrier preventing change. The scepticism displayed when young people talked about an individual making any positive diet change reinforced the social constraints that may exist in the peer group.

Snack foods are synonymous with the diet and culture of young people not adults, although young people acknowledged that adults do eat them. Studies have shown the popularity of snack foods. This has been illustrated by various studies (Gregory et al. 2000; Adamson 1992; Johnson & Hackett 1997; Anderson 1992) and confirms the social demarcation between adult and adolescent cultures manifested in eating habits (Chapman & McClean 1992; Watt & Shieham 1996; Coleman & Hendry 1999). It is acknowledged that traditionally snack foods have, and still, play an important cultural role in the lives of young people, however data from the focus group suggested that snacks were not seen as exclusively "young people's foods" and subjects in the focus groups described them as ubiquitous particularly eaten by that parents. Within the family and the home parents have traditionally acted as "gatekeepers" to the family's health particularly when related to food (Crotty 1995; Charles & Kerr 1998). Frank (1998) cited work which described roles for parents that may affect adolescent food choices. Parents can provide young people with a meaning for eating foods ("meaning creators"), at the same time parents, predominantly mothers, try to encourage and negotiate with young people to make sensible healthy food choices ("the family diplomat"). Young people acknowledged parents as sources of information but generally claimed to ignore what they said. There is evidence that younger children would listen to parents (Ross 1995), however whether the social pressures of early adolescence would allow young people to take parental messages seriously in the context of their peer group relations is debatable (Shepherd & Dennison 1996). The debate about fat, and young peoples' feelings about healthy eating was defined as a dichotomous viewpoint: fatty foods are bad; but also taste good. This illustrates some of the difficulties faced by young people: mixed messages received from health professionals and the media, both with separate agendas, can leave young people confused and ambivalent about making changes. Snacking and "grazing" remains a constant in the social life of adolescents. Social and gendered roles manifested through food habits were apparent. The groups described "feminine" foods as including salads, boys foods were described as "manly" or "macho" and included meat and pies. Young people did simple cooking at home. The main foods prepared were snack type meals but some members of the groups described making desserts and cakes and assisting with food preparation at home (mainly

girls). The decline of cooking within the school curriculum has been criticised (Lang et al. 1999), the young people interviewed in the focus groups appeared to be making some positive efforts to prepare foods at home, in discussions some young people also suggested that practical cooking sessions would be useful as intervention strategies. Nutrition awareness appeared to be variable between the groups. Young people were aware of the basic facts about healthy eating and could articulate what they thought a healthy diet and lifestyle should consist of. However, there were areas of confusion for example, the ideas related to vitamins. Many young people felt that vitamin supplements were part of a healthy diet. This perception was described in both good and poor diet groups.

There were a variety of reasons suggested by young people for making changes to their diet. The main difference between the good and poor diet group was the degree of concern about discussing making changes to lifestyle. The poor groups were more reticent to discuss these issues than the good diet groups. The majority of groups felt that they were not in control of what they eat in the home. Parental control over what is eaten in the home has been shown, however recent research conducted in the United States (Neumark-Sztainer et al. 2000) reported that young people were more confident in making healthy choices of food at home than in other situations e.g. when out with friends, this could be related to social pressure within the family, and suggests that the home environment remains influential. The notion that young people would make changes to diet for health reasons was not supported although a number described one reason why they would consider making a change. One theory that has been described in the literature is the influence that a critical incident may have on the health behaviour of children. Denscombe (1998) has suggested that the idea of critical incidents may be useful in trying to understand the motivations influencing health related behaviour in young people. Taking a graphic approach to delivering health messages or warnings has recently been attempted. Governments (in the UK and Australia) have used graphic T.V. campaigns as the focus for public health information. One recent public information campaign over the Christmas period in the UK portrayed the consequences of a road traffic accident in graphic detail. Whether a similar campaign aimed at improving the dietary health of young people would work in the UK is both controversial and unproven. When asked specifically about what

would help young people to make changes to their diet in the school setting, the problem of peer pressure was raised, young people suggested that messages to promote health would have to have resonance in the lives of young people to make them acceptable. Changing the focus away from a "diet will improve your risk of not suffering heart disease" approach in favour of factors concerning appearance physical well being and "feeling good" about oneself may offer a more realistic way to target this group. Despite the negative view of changing diet to improve health, young people classed health professionals as credible sources of information. The benefit for nutrition educators is that the messages of positive nutrition will fit either model, it also suggests that the message delivered in the holistic, non health context, may have greater credibility with young people because it connects directly with their concerns.

The Focus group data suggested that the two diet groups shared a great deal in their perception of diet, health and lifestyle. There was agreement in a range descriptions related to health, diet and looking good between focus groups. A commonality of factors emerged that appeared to be influential in influencing their food intake. It could be expected that children who have significantly different eating habits may differ in how they perceive their own health, and how they describe the most important factors driving their food behaviour. The notion that having knowledge of a healthy diet is enough to affect eating behaviour did not appear to be relevant between the two groups of young people interviewed in the focus groups, and suggests that the idea suggesting that informed choice will bring about changes in eating habits is erroneous. The tangible differences between the groups were manifested in the described role of peers, the media and family in the foodways of young people. Both groups showed confusion about the importance of micro-nutrient intakes as part of a healthy diet. Descriptions of "fitness" were predominately focussed on not being overweight, this idea was also shared within groups by boys and girls. However there were differences between the groups in some discussions. The poor groups raised issues about the cost and availability of healthy foods, suggesting lack of money and not being able to but a food locally was a constraint on eating habits. This was also mentioned in some of the good diet group but to a lesser degree. Good and poor groups were sceptical of advertised media and magazines as a source of nutrition information, this concordance in views was also shared in the

scepticism to some health related research; scepticism was directed at the motives driving research i.e. that it had no relevance to their lives. The degree to which the separate groups described relationships within the family was an area of difference between the two groups, good diet groups were more likely to cite positive relations with parents. The poor diet groups were more reticent to discuss relationship issues in the context of the family, relationships were described in terms of the peer group and friends rather than describing parents and siblings. The explicit relationship between the foods you eat and health was another area of difference between good and poor groups. Young people from the good groups described in clear detail how specific foods may affect health, in contrast young people from the poor diet groups did not relate benefits to health from avoidance or consumption of specific foods, although they too were aware of the link between diet and disease.

The focus group data suggested that the social and cultural networks that operate within the culture of young people that influence food choice must be considered in developing interventions. Phase II of the study involved the design of a questionnaire to be used in a school-based intervention (see appendix 1). In designing the combined survey questionnaire, key themes from the focus group data related to peer influences, appearance, sources of diet and health information, the motivations for eating a healthy diet, and the personal benefits of eating a health diet were developed.

Chapter 13 Development of the combined questionnaire

13.1.1 Introduction

One of the main aims of the study was to design a questionnaire to assess the current eating habits of young people and also to collect information about the factors affecting their dietary behaviour and their motivations to make changes to eating habits. In addition, the questionnaire study would be conducted on a separate school population than the focus groups, to provide data about the diet and lifestyle habits of young people, that could be compared to the focus group data. The focus group study provided data that was used for the development of the items to be included the combined questionnaire. A questionnaire based on closed ended responses was thought to be appropriate for the baseline intervention study. Questionnaires can be used on relatively large numbers of children and, pose fewer coding and analysis problems and can be completed more quickly than open ended questions (Oppenheim 1992).

13.1.2 The Combined Questionnaire

A combined Behaviour/Choice Questionnaire (BCQ) was developed by combining the items from the FIQ and items based on from data gathered from the focus group sessions and the literature review (chapters 2, 3, 12 and appendix 10). In addition, general questions e.g. age, sex etc. were included to classify young people. Questions were also included that provided information on the activities young people engaged in, the importance and credibility of different sources of information and their perceptions of health and control over health (locus of control). A series of items, derived from focus groups interviews, investigated young people's attitudes to healthy eating, influence of peers and friends and the personal benefits of eating a healthy diet (appendix 9).

The BCQ was developed to:

1. Collect baseline information on current eating habits.
2. Collect data on a range of lifestyle factors that may influence diet and health.
3. Collect information on attitudes to healthy eating and making changes to diet.
4. To confirm the data from the focus groups in a separate population of schoolchildren.

The questionnaire was designed in two sections: firstly, lifestyle/non food items followed by the dietary related items of the FIQ.

Question 1-4

Collected information on gender, age and entitlement to a free school meal (which was used to indicate a family living on a low income).

Question 5

Asked young people to list the different activities that they had participated in during the last month.

Question 6

Asked young people to rate their own health

Question 7

Investigated young people's perception about the degree of personal control they have over improving their health (Locus of control).

Question 8

The first set of Likert statements investigated the influences of friends and peers. Young people were asked to respond to 5 point Likert scales, coded from 1 (strongly disagree) to 5 (strongly agree). Individual items were summed and a high mean score for the four items suggested that friends and peers may be an influence on easting habits.

Question 9-10

Computer technology is becoming more important in the school environment and two items asked if respondents had regular use of a PC and what they used it for.

Question 11

Young people interviewed in the focus groups showed a basic understanding of the messages about healthy eating. However, the focus groups identified some areas of confusion about nutrition. The items presented in the question 11 were used to assess the depth of nutrition knowledge young people had and to investigate if the areas of confusion displayed in the focus groups was common in other young people. Four true or false statements, coded "true", "false" and "don't know" were used as a measure of knowledge. Item one investigated understanding of the "five a day" message. Item two investigated understanding of the difference in calories between fats and sugars. Item three probed understanding of the role of vitamin supplements as part of a healthy diet. The final item investigated young people's awareness of the origin of heart disease.

Question 12-13

Two items collected data on the importance of sources of information and facts young people receive from various sources.

Question 14

Probed personal motivations about eating a healthy diet.

Question 15

Focus groups had shown that appearance factors and relationships were important aspects of lifestyle. The items listed various factors and young people were asked to select those that were important for them to feel good about themselves.

Question 16

Five statements related to healthy eating were presented using 5 point Likert scales, coded from 1 (strongly disagree) to 5 (strongly agree) a high mean score for the five items on items suggested a positive disposition to healthy eating.

Question 17

The four items were scored in the same way as question 16 and contained statements that probed the personal reasons why young people may decide to eat a healthy diet. A high mean score suggested that young people agreed that eating a healthy diet was personally beneficial for them.

Question 18

The final list of items, derived from the focus group discussions, was used to collect information on the types of activities that may help young people make changes to their diet. The items were designed to assist the development of a multidisciplinary diet and activity intervention in school.

Question 19

Presented the items from the FIQ to assess current eating habits.

Question 20

The final question was open ended and allowed young people to make comments on anything they thought relevant to their making changes to their diet.

13.2.1 Pilot study of BCQ

This chapter describes the pilot study of the combined questionnaire which was used in the main study.

13.2.2 Aims

- To confirm items identified in focus groups as being important in explaining eating habits of (good and poor diet).
- To investigate if the BCQ could assist the development of an intervention

13.2.3 Sample

A secondary school in a less affluent area of the city was approached and agreed to participate in the pilot study. The school was not selected randomly and served as a purposive sample. The school had not been a participant in the Liverpool healthy school initiative or any previous surveys related to this study. Sample size calculations using the formula by Hall (1989) suggested that a sample size of 130 was required for the pilot study i.e. the number required to detect a ±10% change in negative marker food group (appendix 5).

One hundred and forty children in school years 7 and 8 were invited to take part in the survey. It was not possible to randomly select children for inclusion in the pilot study, and the purposive selection of young people was carried out by the school.

13.2.4 Statistical analysis

Data were input and analyzed (after cleaning) using SPSS for Windows (Norius 1995). FIQ data was analysed using the same procedures described in the chapter on dietary methodology: Chi square, and unpaired t-test were conducted to assess differences in proportions of boys and girls eating specific foods and the mean score for food groups. The behaviour related items were analyzed using Chi square, unpaired t-test was used to compare differences between boys and girls and between sub groups of children with good and poor eating habits.

13.2.5 Methods

One researcher explained to class teachers the procedures for completing the questionnaire and provided written instructions on the procedures to be followed. A class teacher and researcher were available in the classroom to help with any problems regarding completion.

The BCQ used in this study was a combined questionnaire that included the items from the FIQ and the non-food variables derived from focus group interviews. To assess response bias, the order in which the diet and non diet questions appeared in the questionnaire was varied: in fifty percent of the questionnaires the diet related items were completed before the behaviour related items, the remaining fifty percent of questionnaires required young people to complete the non-food items before the diet items.

13.3.1 Results

Twenty seven young people declined to take part and the questionnaires were returned uncompleted. One hundred and five young people returned questionnaires, nine were returned only partly completed and were removed from the analysis. Ninety six (76%) completed questionnaires were returned for analysis. Table 13.1 details the age and sex characteristics of those young people who completed the survey questionnaire. As previously described (chapter 6) the entitlement to claim a free school meal was used as being indicative of social disadvantage (table 13.2) .

Table 13.1 Age and sex of young people who Completed the survey questionnaire.

Age/years	Boys	Girls	Total
11	8	5	13
12	34	30	64
13	12	7	19
Total	**54**	**42**	**96**

More boys than girls took part in the survey. The majority of subjects were aged 12 years. The percentage of young people entitled to receive a free school meal (63%) was higher than the mean for Liverpool 42% (Liverpool Health Authority 2000).

Table 13.2 Number and percentage of subjects entitled to receive a free school meal

	All	%	Boys	%	Girls	%
Free school meal	60	63	31	56	29	67

13.3.2 Eating habits

Tables 13.3-13.4 below present the number and proportion of young people who reported eating specific marker foods.

Table 13.3 Proportion of boys and girls claiming to eat negative marker foods "yesterday".

Negative markers	Boys	Girls	
	N=54	N=42	P*
Fatty foods			
Burgers	40	23	0.12
Sausages	36	23	0.30
Pies & Pasties	20	21	0.87
Whole milk	32	28	0.7
Butter	38	42	0.44
Full Fat Margarine	6	16	0.19
Fried vegetables	22	23	0.85
Fried fish	14	14	0.92
Roast potato	20	30	0.11
Crisps	51	42	0.43
Chips	49	51	0.59
Sugary foods			
Sugar in drinks	56	37	0.1
Sugar on food	29	33	0.75
Still drinks	48	42	0.6
Plain biscuits	42	37	0.77
Chocolate	51	54	0.61
Ice cream	60	67	0.56
Sugared cereals	38	23	0.23
Cakes	38	37	0.73
Fizzy drink	64	64	0.75
Boiled sweets	67	47	0.05
Puddings	24	19	0.73
Chocolate biscuits	51	53	0.61
Salt added to food	42	44	0.67

P* significance level for χ^2 test

The intake of negative marker foods presented in table 13.3 shows boys and girls reporting similar intakes of negative foods. The only significant difference was for the reported consumption of boiled sweets, boys reported eating sweets

more than girls. The popular foods included fizzy drinks chocolates and chocolate biscuits and crisps. Boys reported adding sugar to drinks more than girls.

Table 13.4 Proportion (%) of boys and girls claiming to eat positive marker foods "yesterday".

Positive Markers	Boys	Girls	
	N=54	N=42	P*
Alternative fats			
Low fat spread	9	26	0.05
Semi-skim milk	51	40	0.29
Low fat cheese	11	5	0.51
Low fat burger	0	2	0.52
Low fat sausage	9	9	0.95
PUFA	18	23	0.73
Low sugar foods			
Diet still drink	51	42	0.43
Diet fizzy drink	36	37	0.74
Artificial sweetener	13	19	0.66
Fibre foods			
Baked beans	40	30	0.46
Salad	27	56	0.01
Vegetables	31	30	0.33
Baked potato	15	25	0.34
Fruit	76	74	0.83
Brown bread	16	28	0.33
High fibre breakfast	13	21	0.49
Mashed potato	28	16	0.35
Boiled potato	20	19	0.87

P* significance level for χ^2 test

The intake of positive foods (table 13.4) shows a similar pattern between the sexes. The reported consumption of brown bread, baked potatoes, high fibre breakfast cereals, PUFA fats was similar for boys and girls. The only significant differences between boys and girls was in the reported intake of salads and the use of low fat spread, both of which was higher in girls. More girls (28%) than boys (24%) reported not eating breakfast, however the difference was not significant.

13.3.3 Recreation and physical activity

Young people were asked about the types of physical and recreational activities they had taken part in during the last month. Table 13.5 details the numbers and percentages of young people who said they had taken part in various activities. No information on the intensity or duration of the activities was collected.

Table 13.5 Percentage of boys and girls who reported taking part in activities during the last month.

	Boys	**Girls**	
Active	**N=54**	**N=42**	**P***
Football	86	56	0.003
Rugby	20	2	0.02
Swimming	66	67	0.37
Judo/Boxing	27	26	0.82
Dancing	11	61	<0.001
Jogging	51	49	0.59
Athletics	62	72	0.22
Cycling	60	58	0.48
Passive			
Play computer games	87	74	0.03
Use the Internet	42	16	0.02
Watch a video	87	84	0.52
Listen to music	83	93	0.34
Go to the cinema	53	65	0.24

P* = significance for χ^2 test

More boys reported that they had played football, played with a computer or used the Internet than girls. More girls reported dancing than boys. There were no significant differences in the numbers of boys and girls who reported that they had cycled, jogged or took part in athletics during the last month. Over 80% of both boys and girls had watched a video or listened to music during the last four weeks. Although boys were significantly more likely to have regular use of a computer than girls, they reported using it primarily to play games or use the Internet. Over half the sample claimed to use the computer to complete schoolwork.

Table 13.6 Percentage of young people who have regular use of a personal computer at home or in school.

	Boys	Girls	
	N=54	N=42	P*
Have use of a computer	96	81	0.06
Playing games	87	74	0.03
Using the Internet	42	16	0.01
Using CD Rom	38	23	0.39
Schoolwork	33	40	0.64
Writing letters/email	44	65	0.12

P* = significance for χ^2 test

13.3.4 Sources of information

Both boys and girls cited school lessons as a source of "a lot of facts" about food and health, consequently teachers were also cited as an important source of information for 47% of girls and 65 % of boys. TV advertisements were rated sources of "some facts" by both girls and boys. Parents were the source of "a lot of facts" about health and diet for a majority of both boys and girls, (table 13.7). The least credible sources of useful facts on food and health to young people were newspapers. PE teachers were perceived to be credible sources of information related to diet and health issues. Both boys and girls indicated that parents, friends and teachers were important sources of information on diet and health (table 13.8). Young people also rated the Internet and CD Rom equally as an important sources of information.

Table 13.7 Have any of these sources of information taught you any useful facts about diet and health (%).

	No facts		Some facts		A lot of facts		
	Boy	Girl	Boy	Girl	Boy	Girl	P*
TV advertisements	15	21	72	70	13	9	0.88
TV Programmes	22	19	59	65	20	16	0.90
Newspapers	41	42	35	39	24	19	0.78
Magazines	31	12	43	54	26	35	0.17
School lessons	4	3	25	33	71	65	0.52
Internet/CD ROM	31	34	33	33	37	33	0.69
Posters/leaflets	28	26	59	50	14	24	0.65

P*= significance level for χ^2 test
Boys n= 54 Girls n= 42

Table 13.8 Which of the following do you think is an important source of information for you (%).

	Important		Not Important		Not Sure		
	Boys	Girls	Boys	Girls	Boys	Girls	P*
Family members	87	97	4	0	9	0	0.30
Friends	55	47	22	14	18	23	0.43
School teachers	65	47	13	21	22	33	0.36
Magazines	20	30	49	47	26	23	0.80
Internet	17	33	16	14	20	16	0.89
PE Teachers	76	63	4	14	16	23	0.60
CD ROM	31	33	29	28	36	37	0.68

P*= significance level for χ^2 test
Boys n= 54 Girls n= 42

13.3.5 Nutrition Knowledge

Young people who responded "Don't know" to an item were excluded from the analysis of mean scores. Table 13.9 shows the percentages of boys and girls who provided the correct response to the four true or false knowledge statements. The lowest percentage of correct answers was related to the question *"you need vitamin supplements to stay healthy"*. Young people were confused about the role and use of vitamins in the diet. A maximum score of 4 and a minimum of 0 were possible from the four true and false statements. The mean score for nutrition knowledge was low for boys, 1.11 and girls 1.14. Only one subject scored all items correctly.

Table 13.9 Nutrition knowledge, percentage of boys and girls providing the correct answer.

	Boy	Girl	P*
Statement	N=54	N=42	
Five a day message	36	42	0.79
Energy in food	35	30	0.56
Vitamins	11	16	0.82
Heart disease	33	40	0.40

*P= significance level for χ^2 test

13.3.6 Perception of own health and Locus of control

The majority of young people perceived their health to be good (table 13.10) . A significant number girls (30%) described their health as fair with 5% of girls perceiving their health as poor.

Table 13.10 In general would you say your health is (%)

	Girls	Boys	P*
	N=42	N=54	
Excellent	19	20	NS
Good	53	56	NS
Fair	30	10	0.06
Poor	5	3	NS

P* = significance for χ^2 test NS= >0.05

Table 13.11 Which one of the following statements best reflects your view on improving your health (%).

	Boys	Girls	
	N=54	N=42	P*
There is NOTHING you can do for yourself which can help improve your health	10	12	0.70
There are SOME THINGS you can do for yourself which might help improve your health	41	45	0.61
There are DEFINITELY things you can do for yourself that will help improve your health	49	43	0.64

P* = significance for χ^2 test

Two questions asked young people their views on making changes to improve their health and how they think about the foods they eat. Table 13.11 shows that most young people felt that their health could be improved by their own actions. There was an equal perception amongst boys and girls that there were some things or definitely things you could do to improve personal health. Although 10% of boys and 12% of girls claimed there was nothing they could do to improve their health.

Table 13.12 Which one of the following describes how you think about the foods you eat (%)

Statement	Boys N=54	Girls N=42	P*
1. I only eat and drink the things that are good for me	4	9	NS
2. I don't worry too much as long as I eat enough healthy foods	45	66	NS
3. I can eat and drink what I like if I take plenty of exercise	23	6	NS
4. I eat and drink the things that I like	21	19	NS
5. I don't care about food and will eat anything	6	2	NS

P* = significance level for χ^2 test
NS = significance < 0.05

Most young people felt they did not need to worry as long as they ate enough healthy foods, however more girls than boys agreed with this statement (table 13.12). Boys were more likely to feel that they can eat what they like as long as they took plenty of exercise. The perception of eating "enough healthy things" was more prevalent in girls. Over twenty percent of boys and girls did however would prefer to eat "the things they like".

13.3.7 Attitudes to healthy eating

A group of questions presented Likert statements related to healthy eating and the influence of peers. Young people were asked to what degree they agreed or disagreed with each statement about healthy eating (table 13.13).

Table 13.13 Proportion of responses to attitude statements about healthy eating (%)

Intervention school	Strongly Agree		Agree		Neither agree or disagree		Disagree		Strongly Disagree		
Statement	Boys	Girl	Boy	Girl	Boys	Girls	Boys	Girls	Boys	Girls	P*
1	40	44	49	49	7	3	2	4	4	3	0.88
2	49	37	44	56	6	5	1	2	2	0	0.79
3	29	23	33	47	25	26	7	2	6	2	0.63
4	44	42	35	35	13	13	1	5	7	5	0.78

*P= significance level for χ^2 test
Boys N= 54 Girls N= 42

Statement 1 Eating a healthy diet will help me prevent disease
Statement 2 Eating a healthy diet gives me a healthy body
Statement 3 Eating a healthy diet will help me look good
Statement 4 I still need a healthy diet even if I am fit

92% of boys and 78% of girls agreed or agreed strongly that a healthy diet was important for them. Over eighty percent of boys and girls agreed or agreed strongly that regular meals were an important part of healthy eating. Healthy eating was not seen as a "cool" activity for young people; more boys (59%) than girls (50%) disagreed that "eating healthy foods make me look cool" (13.14). Despite this negative view of healthy foods young people of both sexes would experiment with new foods; 62% of boys and 67% of girls agreed or agreed strongly that they would be willing to try new foods (table 13.15).

Four statements were used to assess attitudes to peer pressure (table 13.14). The level of agreement with the four statements was generally low; 83% of girls and 72% of boys disagreed or disagreed strongly with the statement: *"I would not eat a food if my friends skitted me"*. A high percentage of young people also disagreed with the idea that eating too many healthy foods *"makes me look like a health freak"* Boys gave similar responses to the peer related statements as girls. The idea that young people would not eat a particular food because of the fear of being ridiculed by friends, a common theme in the focus groups, was not of

major concern to the young people in this sample. The notion that healthy foods were associated with a "health-freak" image was not generally accepted, however 15% of girls and 20% of boys did agree or agree strongly with the statement.

The vast majority of boys and girls agreed with the general statements about why healthy eating was beneficial to them (table 13.15). When those agreeing or strongly agreeing with each statement about the benefits of healthy eating were combined, 93% of boys and 89% of girls agreed with the statement *"eating a healthy diet can help me avoid heart disease"*. Over 90% of both boys and girls agreed that a good diet would give a healthy body and help to improve appearance. The statement regarding resistance to peer pressure, and having the will-power to resist friends, was poorly understood.

Table 13.14 Attitudes to statements about peer influences on diet (%)

	Strongly Agree		Agree		Neither agree or disagree		Disagree		Strongly Disagree		
Statement	**Boys**	**Girl**	**Boy**	**Girl**	**Boys**	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**	**P***
1	5	6	0	5	12	20	32	22	51	50	0.46
2	8	3	14	16	26	27	33	36	19	16	0.95
3	10	7	5	13	19	18	33	45	33	16	0.07
4	7	17	39	37	30	26	19	11	5	9	0.62

*P= significance level for χ^2 test
Boys N = 54 Girls N = 42

Statement 1 I would not eat a food if my friends skitted me
Statement 2 If my friends were eating the same food I would eat it as well
Statement 3 Eating too many foods makes me look like a health freak
Statement 4 I will try new foods if I am out with friends

Table 13.15 Proportion of responses to attitude to statements about healthy eating (%)

Intervention school	Strongly Agree		Agree		Neither agree or disagree		Disagree		Strongly Disagree		
Statement	Boys	Girl	Boy	Girl	Boys	Girls	Boys	Girls	Boys	Girls	P*
1	40	34	52	44	4	17	4	5	0	0	0.44
2	37	33	41	49	15	5	6	7	2	7	0.14
3	11	7	7	10	60	61	13	15	9	10	0.76
4	27	12	35	45	20	31	13	12	6	0	0.28
5	7	2	9	19	35	21	29	30	30	20	0.49

*P= significance level for χ^2 test
Boys N= 54 Girls N= 24

Statement 1 It is important for my diet to be healthy
Statement 2 It is important that I eat regular meals
Statement 3 With some foods I have the will-power to resist[1]
Statement 4 I would like to try as many new foods as I can
Statement 5 Eating healthy food makes me look cool

13.3.8 Feeling good about yourself

Young people were presented with eight statements that focus group interviews had suggested were important for young people to feel good about themselves. Table 13.16 shows that young people of both sexes felt that a majority of the statements were salient factors in their lives. Although there were no significant differences between boys and girls for each factor, it was interesting to note that more boys (85%) than girls (79%) reported that *not being overweight* was important in feeling good about yourself. More girls reported that eating the right foods was more important than boys, however boys were significantly more likely to feel that "being one of the crowd" was important, than girls; although this was ranked the least important factor by both groups. Both boys and girls attached similar levels of importance to the statements related to appearance including: having clear skin, and healthy teeth.

[1] This statement was not used after the pilot study (see section 13.5.2)

Table 13.16 Which of the following are important for you to feel good about yourself (%).

Statement	All N=96	Boys N=54	Girls N=43	P*
	% (rank)	% (rank)	% (rank)	
Not being over weight	83 (1)	85 (2)	79 (4)	0.62
Having healthy teeth	83 (1)	77 (4)	91 (1)	0.20
Having friends to talk to	80 (2)	78 (3)	84 (2)	0.68
Able to share a problem with parents	76 (3)	86 (1)	70 (6)	0.15
Eating the right foods	73 (4)	67 (5)	81 (3)	0.05
Having clear skin	70 (5)	63 (7)	79 (4)	0.18
Being able to compete at sport	65 (6)	64 (6)	67 (7)	0.37
Being one of the crowd	43 (7)	54 (8)	33 (8)	0.05

13.3.9 What would help young people make changes to diet?

Ten statements were used to assess the types of intervention that would assist young people make changes to their diet.

Table 13.17 Which of the following would help you in making changes to your diet (%).

	Intervention school		
	Boy	**Girl**	**P***
	N=54	**N=42**	
Designing a poster for use in school	71	81	0.14
Including information on food and diet in PE	83	91	0.51
Lessons just for boys	69	36	0.03
Lessons just for girls	30	70	0.002
Having a food magazine in school just for young people	62	74	0.35
Being able to buy more healthy foods in the tuck shop/canteen	79	93	0.15
Learning how diet can affect your teeth	78	77	0.91
Learning how to look good and stay healthy	80	83	0.84
Having access to an Internet site for young people	69	79	0.16
School lessons on how diet can prevent disease	77	86	0.52

P*= significance level for χ^2 test

Table 13.17 shows that boys and girls would prefer sessions on diet and health to be targeted specifically at each sex. The agreement between boys and girls about

the types of activities that would be helpful was similar for many of the activities listed. It was interesting to note that boys would be interested in having sessions on how to look good and stay healthy. Sessions on the health benefits of healthy eating were also cited as being beneficial. The data suggested that boys may be interested in sessions which placed the emphasis on physical activity and how diet relates to sport.

13.4.1 Selection of good and poor diet groups

The diet records of young people who took part in the survey were analysed to identify children with "good" and "poor" eating habits. As described earlier the terms "good" and "poor" do not imply a difference in the nutritional quality of the diets of the subjects, rather they describe children at the extremes of the distribution. Reported intake of positive and negative marker foods was used to identify children. Subjects identified in both the upper quartile for negative marker foods and the lower quartile for positive marker foods, were included in the poor diet group. Subjects identified in both the lower quartile for negative marker foods and the upper quartile for positive marker foods, were included in the good diet group (table 13.18).

Table 13.18 Quartiles for positive and negative marker foods (all subjects)

	Positive			
	Lowest	Second	Third	Upper
Negative				
Lowest	2	1		**9**
Second	9	3	2	
Third	17			7
Upper	**17**	19	8	2

All subjects n = 96

Nine subjects were identified in both the upper quartile for the positive marker food group and the lower quartile of the negative marker food group these subjects were included in the good diet group. Seventeen subjects were identified in both the upper quartile of the negative marker group and the lower

quartile of the positive marker food group and were included in the poor diet group.

Differences in mean intake of marker foods between diet groups is presented in table 13.19 Despite the very small sample size there were statistically significant differences between the good and poor diet groups in the mean intake of foods in all marker food groups.

Table 13.19 Mean reported intake of marker foods by diet group

Marker food group	Poor diet N=17		Good diet N=9		
	Mean	SE	Mean	SE	P*
Sugary foods	7.17	0.39	2.7	0.45	<0.001
Fatty foods	4.33	0.41	1.62	0.38	<0.001
Fibre foods	1.33	0.26	3.75	0.26	<0.001
Low sugar foods	0.17	0.11	1.12	0.29	0.03
Negative marker foods	12.58	0.85	4.5	0.46	<0.001
Positive marker foods	2.3	0.89	7.5	0.54	<0.001

P* = significance for unpaired t-test
SE standard error of the mean

Table 13.20 Mean score for attitude statements and nutrition knowledge between good and poor diet groups

	Poor diet N=17		Good diet N=9		P*
Non food variables	Mean	SE	Mean	SE	
Attitude to diet	20.80	0.46	19.90	0.51	0.17
Attitudes to healthy eating	16.38	0.39	16.51	0.37	0.82
Attitudes to peers	10.29	0.34	9.70	0.40	0.34
Mean knowledge score	1.11	0.13	1.14	0.16	0.87

P*= significance level for unpaired t-test

Mean scores for attitude statements and nutrition knowledge between the good and poor diet groups were very similar.

13.4.2 Validity and reliability

The BCQ was developed and reviewed by other professionals: academic staff, teachers and dietitians to assess its content. Validity was not assessed formally. However, during the pilot study the sample was split and the BCQ was administered in two different forms to assess if there was bias in the ordering of the BCQ items; firstly, the diet related questions were presented before the non food related items and secondly; the diet related questions were completed after the non food related questions. Mean scores were calculated for negative and positive marker group and the Likert statements to assess if the order of either set of questions biased responses (table 13.21).

Table 13.21 Mean scores for marker food group and Likert statements for separate administrations of BCQ

	BCQ 1	BCQ 2	P*
Negative marker	9.2	8.8	0.59
Positive marker	5.3	4.7	0.32
Healthy eating statements	20.65	20.18	0.49
Friends and peers statements	16.38	16.47	0.88

BCQ 1= Diet items presented first
BCQ 2= Non food items presented first

P* significance level for independent t-test

13.5.1 Discussion

The results suggested that young people were aware of the need for their diets to be healthy, and that a regular meal pattern is important. The responses also confirmed focus group suggestions in the way young people described health. Health was often described in functional terms i.e. being able to participate in sport and having a healthy body. The focus groups suggested that healthy foods may be viewed as boring and "un-cool" by young people, the proportions of girls and boys in this sample who agreed with statements that health eating was not cool appeared, to some extent, agree with this perception. Boys and girls reported that they would try new foods if out with friends, which suggested that peer pressure was not a major constraint to eating new foods. Healthy foods were however seen as foods that did not taste good. Taste has been consistently rated as one of the most influential factors driving young peoples' food selections

(Krondle & Lau 1992; Aggleton et al. 1998; Dennison & Shepherd 1996). Young people's responses to items about feeling good suggested that appearance factors such as looking good, having good teeth and being the right weight were consistent with other studies (Aggleton 1996; Balding 1997). Such perceptions about health and factors relating to improved appearance and body image, could form the basis for a school intervention. By using this perception of nutrition related to self-awareness, having a good appearance and being fit could enable the promotion of the same messages that offer improvements in disease prevention.

The apparent confusion identified in the focus group interviews regarding vitamins and their role in a healthy diet was confirmed in the pilot study; the majority of young people thought they needed vitamin supplements to stay healthy. It suggests that some basic facts about nutrition may be understood by young people but a deeper understanding appears be lacking. It was disappointing to note the numbers of young people who failed to provide the correct answer to the five a day question. Advocating an increase in fruit and vegetable intake is a key health promotion message aimed at the general population and young people (WHO 1994; BDA 1999; Cox et al. 1996). Promoting the benefit of a healthy diet, and eating more fruit and vegetables in particular will be a key message in the school based intervention.

13.5.2 Feedback from teachers

After the pilot sessions class teachers and young people were asked to assess the questionnaire items and young people's ability to complete the questionnaire. The questionnaire took young people approximately 30-35 minutes to complete; one class with special needs took fifty minutes to complete the questionnaire. The diet items were completed without any problems being encountered. Of the non diet items, two questions were poorly understood by young people: attitude statement four: *"when it comes to food I have the will-power to resist"* was difficult for young people to interpret, over 60% of boys and girls could not agree or disagree with the statement. One knowledge statement *"Fat contains more energy than sugar"* was also poorly understood. Young people appeared to

be confused about the definition of energy. After discussing the pilot and young peoples responses with the class teachers who had assisted in the school, it was agreed to change the wording of one item: the knowledge statement was amended to: "*Fat contains more calories than sugar* ". Because the concept of "*will-power*" was so poorly understood by young people this statement was removed from the questionnaire.

13.6 Summary of main findings Chapter 13

* The most frequently reported foods were: fizzy drinks, chocolate biscuits, ice cream and crisps. More boys (67%) reported eating sweets than girls (47%).

* Girls reported eating more salads and low fat spread than boys.

* Over 70% of boys and girls claimed to eat fruit on the previous day, however only 30% reported that they ate vegetables on the previous day.

* 28% of girls and 24% of boys reported that they did not eat breakfast

* Boys were significantly more likely to have reported playing active sports such as football and rugby than girls.

* Girls were significantly more likely to go dancing than boys.

* Boys reported having greater access to a PC than girls, using it primarily to play computer games.

* Responses to knowledge statements were very poor, mean score for girls (1.11) was similar to boys (1.14) but both were below the maximum of 4.

*50% of girls and 59% of boys disagreed that "*healthy eating makes me look cool*"

*Agreement with statements about influence from peers was low. Concern for health and appearance were cited as motivating factors for eating a healthy diet.

Chapter 14

Implementation study of the Behaviour & Choice Questionnaire

14.1 Introduction

This chapter describes the implementation survey using the Behaviour and choice questionnaire (BCQ). The BCQ was designed to identify factors and concerns that young people consider salient to their eating habits or that may be helpful in assisting to make changes in diet. As described in Chapter 1 section 1.8, the intervention did not form part of this thesis, however preliminary results are described in appendix 1 to allow the reader to view the complete action research cycle.

14.2 Sample and Setting

Data were collected from two large city comprehensive schools (Year 8 schoolchildren) in December. The selection of the two schools was not random and was determined by the need for health promotion to be targeted to areas of the city in which the community dietitians worked. Three secondary schools were situated in the area selected for the intervention and were approached to take part. Two schools declined, one because of an impending Ofsted inspection, the second because of work pressures on the PSE coordinator. The remaining school, a large mixed comprehensive of approximately 1500 young people, agreed to take part (school A). A second school in a separate electoral ward (school B), with similar characteristics to school A but a smaller school population was agreed to take part. Both schools were located in city wards with social disadvantage. As with previous studies, entitlement to a free school meal and standardised mortality ratios (SMR) for coronary heart disease were used as indicators of deprivation and ill health. The area in which School A was situated had a SMR for CHD of greater than 131 this was higher than the average for the North West (120) (NHS Executive North West 1997). The SMR for CHD in the ward in which school B was located was 130 (Liverpool Health Authority 2000). Entitlement to free school meals for each school is presented in table 14.2.

All young people in school year 8 (ages 12-13 years) of both schools were eligible to take part in the survey.

14.3 Statistical analysis

Data were input and analyzed using SPSS for Windows Version 9 (SPSS inc.). FIQ data were analysed using the same procedures described in the chapter on dietary methodology: Chi square, and unpaired t-test were conducted to assess differences in proportions of boys and girls eating specific foods and the mean scores for food groups respectively. The behaviour related items were analysed using Chi square, and unpaired t-test to compare differences between boys and girls and between sub-groups of children with good and poor eating habits.

14.4 Methods

The same method used in the pilot survey (chapter 13) was used to explain the procedure for the BCQ surveys. One researcher explained to the PSE coordinator the procedures for completing the questionnaire and provided written instructions for class teachers (appendix 10). Data were collected during the final week of the Christmas term.

14.5.1 Results

152 (66%) young people aged 12-13 years old in Year 8 took part in the implementation survey at school. A, seventy four young people in school B completed the survey questionnaire. Table 14.1 describes the age and sex characteristics of the young people who took part in the study. The proportion of children entitled to FSM at each school was similar to the electoral ward average (table 14.2).

Table 14.1 Age and sex of young people who completed the survey questionnaire .

	School A				School B			
	Boys		Girls		Boys		Girls	
Age/Years	n	%	n	%	n	%	n	%
12	53	60	41	64	19	51	21	60
13	35	40	23	36	18	49	14	40
Totals	**88**		**64**		**37**		**35**	

Table 14.2 Number and percentage of girls and boys entitled to a free School Meal* (FSM).

	All		Boys		Girls	
School	n	%	n	%	n	%
School A $^{\Phi}$	76	50	41	47	35	55
School B $^{\Omega}$	33	44	18	47	15	42

Φ = average for electoral ward 47%
Ω = average for electoral ward 45%
* *Source: Liverpool Health Authority (2000)*

14.5.2 Eating habits

Young people's eating habits were assessed using the FIQ items. The intake of specific marker foods was used to describe current eating habits and to classify sub-groups of young people with good and poor diets. Tables 14.3-14.4 present the number and proportion of young people who reported eating foods from two marker groups, negative marker foods and positive marker foods.

Table 14.3 Proportion (%) of boys and girls claiming to eat negative marker foods "yesterday".

Negative marker Foods	School A			School B			School A	School B	
	Boys	Girls	P	Boys	Girls	P	All subjects	All subjects	P
	N=88	N=64		N=37	N=35		N=152	N=72	
Fatty Foods									
Burgers	22	11	0.02	32	23	0.53	18	29	0.06
Sausages	31	25	0.21	41	34	0.8	29	38	0.17
Pies & Pasties	18	23	0.64	30	29	0.66	20	28	0.17
Whole milk	51	42	0.58	51	40	0.27	47	45	0.74
Butter	36	45	0.26	46	46	0.86	41	32	0.24
Full fat margarine	7	13	0.46	14	17	0.39	9	16	0.53
Fried vegetables	14	23	0.26	32	17	0.23	18	24	0.24
Fried fish	10	8	0.83	3	9	0.51	9	6	0.48
Roast potato	15	16	0.90	49	46	0.97	15	47	<0.01
Crisps	51	61	0.33	51	68	0.32	56	59	0.58
Chips	60	55	0.40	29	42	0.06	58	42	0.04
Sugary Foods									
Sugar in drinks	55	50	0.6	54	54	0.99	52	54	0.86
Sugar on food	35	24	0.6	31	30	0.79	31	32	0.82
Plain biscuits	42	38	0.61	51	46	0.31	40	47	0.29
Chocolate	53	47	0.96	62	37	0.04	51	51	0.96
Ice cream	40	25	0.13	32	40	0.46	33	35	0.79
Sugared cereals	40	31	0.42	43	31	0.55	33	35	0.78
Cakes	34	30	0.66	38	49	0.31	32	42	0.14
Fizzy drinks	67	56	0.19	49	54	0.32	62	50	<0.01
Puddings	33	27	0.23	35	37	0.18	31	38	0.28
Boiled sweets	64	56	0.47	73	60	0.45	61	66	0.43
Chocolate biscuits	59	56	0.65	68	60	0.46	61	65	0.33
Still drinks	56	47	0.33	49	54	0.32	52	50	0.80
Salt added to food	57	52	0.45	49	57	0.26	54	51	0.68

P = significance level for χ^2 test

Table 14.3 shows that popular foods included fizzy drinks with added sugar, boiled sweets, chocolate and still drink. Reported consumption of these high sugar foods was similar in boys and girls. Proportions of boys who said they had eaten negative marker foods was higher than that of girls, significantly more boys reported eating higher fat foods including burgers and ice cream. Eating

habits were similar when schools were compared, the major differences being in the reported consumption of chips and fizzy drinks which was higher in school A. There were no major differences between the proportion of boys and girls who reported consuming positive marker foods (Table 14.4) but significantly more girls in school A reported eating baked potato on the previous day. Between schools, there were significant differences in the reported intake of high fibre breakfast cereals and vegetables (higher in school A), and fruit in school B. There were no significant differences in lower fat and lower sugar alternatives such as semi-skimmed milk and diet fizzy drinks.

Table 14.4 Proportion (%) of boys and girls claiming to eat positive marker foods "yesterday".

	School A			School B			School A	School B	
Positive markers	**Boys**	**Girls**	**P***	**Boys**	**Girls**	**P**	**All**	**All**	**P**
	n=88	**n=64**		**n=37**	**n=35**				
Alternative fats									
Low fat spread	11	14	0.47	13	23	0.43	12	18	0.29
Semi-skim milk	35	33	0.47	32	34	0.14	34	35	0.89
Low fat cheese	5	9	0.44	3	9	0.51	7	5	0.74
Low fat burger	8	3	0.59	0	6	0.32	6	3	0.29
Low fat sausage	9	5	0.59	11	6	0.70	7	8	0.78
PUFA	24	27	0.88	24	29	0.64	25	26	0.78
Low sugar foods									
Diet still drinks	26	25	0.24	16	20	0.20	26	20	0.33
Diet Fizzy drinks	41	33	0.25	35	37	0.91	38	36	0.81
Artificial sweetener	6	5	0.94	3	14	0.18	5	9	0.40
Fibre foods									
Baked potato	10	25	0.04	14	26	0.32	16	19	0.63
Baked beans	27	30	0.78	35	20	0.24	28	27	0.86
Salad	22	27	0.16	27	37	0.57	28	27	0.19
Vegetables	27	30	0.27	51	46	0.31	30	50	<0.01
Fruit	67	72	0.27	49	57	0.26	69	51	<0.01
Brown bread	23	19	0.73	16	17	0.81	21	16	0.40
HF breakfast cereal	11	18	0.41	3	4	0.81	14	4	0.02
Mashed potato	15	19	0.73	30	31	0.64	16	30	0.02
Boiled potato	11	14	0.82	11	23	0.31	12	16	0.43

*P= Significance level for χ^2 test

HF= High fibre

Table 14.5 Proportion (%) of boys and girls eating breakfast and different type of lunch.

	School A			School B			School A	School B	
	Boys	Girls	P*	Boys	Girls	P*	All	All	P*
	n=88	n=64		n=37	n=35		N=152	N=72	
Breakfast	76	70	0.36	65	71	0.54	76	69	0.27
School lunch	56	74	0.05	78	69	0.49	26	16	0.11
Packed lunch	22	13	0.14	22	20	0.61	20	22	0.72
Eat out of school	18	9	0.29	19	8	0.37	15	19	0.09

P* = significance level for χ^2 test

In general the majority of young people reported eating breakfast The trend for skipping breakfast was reversed in school B, although the numbers were not significant.

Table 14.6 Proportion (%) of boys and girls claiming to eat "other" foods and alcohol "yesterday".

	School A			School B			School A	School B	
Other foods	Boys	Girls	P*	Boys	Girls	P*	All	All	P*
	n=88	n=64		n=37	n=35		N=152	N=72	
Hard margarine	7	13	0.46	14	17	0.39	9	16	0.12
Full fat cheese	26	29	0.48	41	54	0.50	28	47	0.01
Breakfast cereal	27	16	0.20	30	29	0.81	22	30	0.06
White bread	71	73	0.87	81	77	0.23	72	80	0.38
Alcohol									
Spirits	4	9	0.70	5	9	0.80	7	7	0.78
Wine	12	14	0.89	8	17	0.44	13	13	0.78
Beer and cider	10	11	0.93	3	14	0.18	11	9	0.56

P* = significance level for χ^2 test

There were no significant differences between boys and girls in the consumption of foods not in the positive or negative food groups, except for the reported consumption of full fat cheese which was higher in school B. The number reporting eating white bread was higher than that for any other food item in the FIQ in both boys and girls

14.5.3 Rank Order of foods

Table 14.7 shows the percentages of young people who reported consuming negative marker foods ranked in order of each school. Boiled sweets, chocolate biscuits and crisps were amongst the most frequently reported foods in both schools.

Table 14.7 Rank order (1-10) and percentage of marker foods by school

	School A		School B	
	Rank order	**Percentage**	**Rank order**	**Percentage**
Negative markers				
Fizzy drink	1	62	6	50
Boiled sweets	2	61	1	66
Choc. Biscuits	2	61	2	65
Chips	4	58	8	42
Crisps	5	56	3	59
Salt on food	6	54	5	51
Sugar in drink	7	52	4	54
Sugared still drink	7	52	6	50
Chocolate	9	51	5	51
Whole milk	10	47	7	45
Positive markers				
Fruit	1	69	1	51
Diet fizzy drinks	2	38	3	36
Semi skim milk	3	34	4	35
Vegetables	4	30	2	50
Salad	5	28	6	27
Baked beans	5	28	6	27
Diet still drink	7	26	9	20
PUFA spread	8	25	8	26
Brown bread	9	21	Not ranked	16
Mashed potato	10	16	5	30

Fruit was the highest ranked food in the positive marker food group in both schools. Salads, PUFA spreads, semi-skimmed milk and diet fizzy drinks had similar percentages. Overall the reported intake of foods in this group was generally lower than the negative marker group.

14.5.4 Mean intake of marker food groups

There were no significant differences in mean score for marker foods between boys and girls in either schools. Young people in school B reported significantly higher mean scores for sugary and fatty foods than school A (Table 14.8) .

Table 14.8 Mean intake of marker food groups reported by boys and girls by school

	School A					School B				
	Boys n=88		Girls n=64			Boys n=37		Girls n=35		
Food group	Mean	SE	Mean	SE	P*	Mean	SE	Mean	SE	P*
Sugary foods	5.20	0.26	4.90	0.27	0.38	6.70	0.39	6.70	0.36	0.90
Fatty foods	2.80	0.17	2.90	0.17	0.65	3.70	0.28	3.40	0.32	0.51
Fibre foods	2.10	0.14	2.30	0.18	0.15	1.90	0.17	1.90	0.18	0.81
Low sugar foods	0.72	0.83	0.62	0.83	0.45	0.54	0.65	0.71	0.14	0.32
Negative marker foods	9.70	0.39	8.70	0.35	0.11	10.10	0.50	10.30	0.61	0.85
Positive marker foods	4.10	0.29	4.20	0.25	0.16	4.50	0.35	4.80	0.39	0.51
Snack Foods	4.60	0.23	4.20	0.25	0.16	4.70	0.30	4.70	0.32	0.92
Alternative fats	0.90	0.09	0.90	0.13	0.92	0.80	0.80	1.00	0.97	0.29

P* = significance level for paired t-test
SE = standard error of the mean

Table 14.9 Mean intake of marker foods reported by schools (all subjects)

Marker food group	School A		School B		
	n =152		n =74		
	Mean	SE	Mean	SE	P*
Sugary foods	5.09	0.18	6.70	0.26	<0.001
Fatty foods	2.89	0.14	3.53	0.21	0.01
Fibre foods	2.16	0.12	1.91	0.12	0.20
Low sugar foods	0.69	0.07	0.65	0.08	0.69
Snack foods	4.43	0.17	4.66	0.22	0.44
Negative marker foods	9.33	0.31	10.13	0.39	0.12
Positive marker foods	4.17	0.21	4.67	0.25	0.15

*P = significance level for independent t-test

14.5.5 Recreation and physical activity

The percentages of boys and girls claiming to take part in various recreational activities during the last month is presented below. More boys reported taking part in physical activities than girls. Significantly more boys had played football, rugby, or jogged than girls. Boys were also more likely to use a computer to play games than girls.

Table 14.10 Percentage of boys and girls who reported taking part in activities during the last month.

	School A			School B		
ACTIVITIES	**Boys**	**Girls**	**P***	**Boys**	**Girls**	**P***
	N=89	**N=65**		**N=37**	**N=35**	
Active						
Football	83	48	<0.001	57	40	0.14
Rugby	11	2	0.06	6	5	0.94
Swimming	60	55	0.40	72	68	0.94
Dancing	11	42	0.001	27	68	0.002
Jogging	43	23	0.05	49	46	0.33
Athletics	39	31	0.26	27	29	0.95
Cycling	55	11	0.001	41	43	0.95
Passive						
Play computer games	89	50	<0.001	78	71	0.57
Use the Internet	33	36	0.72	46	60	0.49
Watch a video	89	75	0.07	86	83	0.76
Listen to music	84	92	0.91	92	86	0.62
Go to the cinema	68	61	0.68	46	54	0.78

P* = significance level for χ^2 test

Table 14.11 Percentages of subjects who reported taking part in various activities (All subjects)

Activity	School A	School B	
	N=152	N=74	P
Active			
Football	68	47	0.003
Rugby	7	5	0.61
Swimming	58	47	0.15
Dancing	25	50	0.001
Jogging	35	49	0.13
Athletics	40	28	0.26
Cycling	36	42	0.39
Passive			
Play computer games	87	87	0.93
Use the Internet	34	53	0.007
Watch a video	83	85	0.68
Listen to Music	84	89	0.32
Go to the cinema	65	50	0.06

P*= significance level for χ^2 test

There were similar levels of reported activities between schools. Significant differences between schools were found for football and dancing and more young people reported using the computer for surfing the Internet in school A.

Table 14.12 Percentage of young people who have regular use of a personal computer at home or in school.

All Subjects	School A	School B	
	N=152	N=74	P*`
Have regular use of a PC	89	89	0.33
What do you use it for?			
Playing games	70	61	0.17
Use the Internet	35	50	0.03
Use CD Rom	26	37	0.08
Schoolwork	61	73	0.07
Write letter/email	30	37	0.31

*P= significance level for χ^2 test

Eighty nine percent of boys and girls in both schools claimed to have regular access to a computer in school or at home. Young people in school B were more likely to use the Internet or use the PC for schoolwork.

14.5.6 Nutrition Knowledge

Four statements assessed the understanding of basic nutrition concepts. Two statements investigated young peoples' perception of vitamins in the diet and the "5-a day" message. One statement was presented which investigated if young people were aware of the energy content of fat and sugar. The final statement probed understanding of the origins of CHD.

Table 14.13 Nutrition knowledge; percentage of boys and girls providing the correct answer.

	School A			School B		
	Boy	Girl	P	Boy	Girl	P
Statement	N=88	N=64		N=37	N=35	
5 a day message	34	28	0.26	26	28	0.62
Calories in food	31	37	0.45	40	44	0.90
Vitamins	18	17	0.93	16	8	0.36
Heart disease	15	8	0.18	18	28	0.34

*P= significance level for χ^2 test

The numbers of young people giving the correct responses to the true or false statements was very poor. Young people appeared to be confused about the need for vitamin supplements as part of a healthy diet, there was also confusion about the five-a-day message. The statement on the origins of CHD resulted in the lowest percentage of correct responses.

The percentage of boys and girls providing the correct responses to the true or false knowledge statements was similar within each school.

Table 14.14 Percentage of boys and girls scoring 0-4 for true and false statements

	School A			School B		
Score	**Boys**	**Girls**		**Boys**	**Girls**	
	%	**%**	**P**	**%**	**%**	**P**
0	53	47	*	33	67	*
1	36	64	*	65	35	*
2	33	67	NS	52	48	NS
3	50	50	NS	25	75	*
4	0	0	NS	0	0	NS

* = Significance level for χ^2 <0.05
NS = not significant

Table 14.14 shows the scores for boys and girls from the four true or false (knowledge) items. There were significant difference between the sexes in the percentages scoring one and two in school A, and scoring one, two and three in school B. No subject received a maximum score of four in either school.

Table 14.15 Percentage providing the correct answer for nutrition knowledge statements by school (all Subjects).

	School A	**School B**	
	N=152	**N=74**	**P***
Statement			
5 a day message	32	29	<0.001
Calories in food	35	55	<0.001
Vitamins	18	12	0.02
Heart disease	12	23	0.01

*P= significance level for χ^2 test

Table 14.15 shows the differences between schools. Differences were apparent for all questions. Understanding of the concepts about the energy content of food and the origins of CHD was higher in school B. More correct answers relating to vitamin supplements and the five-a-day message were given in school A.

14.5.7 Perception of own health

The majority of young people perceived their health to be good or better. Seventeen percent of boys described their health as fair with one percent perceiving their health as poor with 3% of girls in school B(table 14.16).

Table 14.16 Proportion (%) of responses to the question: In General would you say your health is excellent-poor

	School A		School B		
	Boys	**Girls**	**Boys**	**Girls**	**P***
	N=89	**N=65**	**N=37**	**N=53**	
Excellent	16	16	8	17	NS
Good	65	73	68	63	NS
Fair	17	11	24	17	NS
Poor	1	0	0	3	NS

*P significance level for χ^2 test
NS = P> 0.05

14.5.8 Perception towards control over health

Table 14.17 provides some insight into how much the young people in this sample felt they were in control of their own health. The majority of those sampled felt that there were at least "some", or "very definitely" things they could do to improve their health. More girls shared the definite view than boys

Table 14.17 Proportion (%) of responses to the question: Which one of the following statements best reflects your view on improving your health ?

	School A			School B			School A	School B	
	Boys	Girls	P*	Boys	Girls	P	All	All	P
	N=88	N=64		N=37	N=35		N=174	N=74	
There is NOTHING you can do for yourself which can help improve your health	2	2	NS	10	6	NS	2	8	NS
There are SOME THINGS you can do for yourself which might help improve your health	41	41	NS	36	31	NS	42	35	NS
There are DEFINITELY things you can do for yourself that will help improve your health	56	57	NS	51	63	NS	56	57	NS

P* = significance level for χ^2 test
NS =not significant

Table 14.18 Proportion (%) of responses to the question: Which one of the following describes how you think about the foods you eat?

	School A			School B		
	Boys	Girls	P*	Boys	Girls	P
Statement	N=88	N=64		N=37	N=35	
1. I only eat and drink the things that are good for me	3	11	NS	3	6	NS
2. I don't worry too much as long as I eat enough healthy things	32	56	*	49	53	NS
3. I can eat and drink what I like if I take plenty of exercise	41	13	*	27	20	NS
4. I eat and drink the things that I like	14	20	NS	16	18	NS
5. I don't care about food and will eat anything	9	0	NS	5	3	NS

P * significance level for χ^2 <0.05, NS= not significant P> 0.05

Most young people agreed with statement two, and significantly more girls in school A agreed with this statement. Boys were more inclined to agree with statement three relating food to keeping fit and being physically active.

14.5.9 Sources of information

Tables 14.19-14.20 shows that young people obtained information on nutrition and diet from a variety of sources. A high percentage reported that TV advertisements and programmes were useful sources of information on diet. School lessons, posters and magazines also provided young people with information. There was a similar pattern of responses in school B with TV advertisements, TV programmes, posters, and school lessons reported as useful sources of facts. The Internet was also seen as a useful source of information on diet in both schools by a substantial proportion.

Table 14.19 Proportion (%) of responses to the question: Have any of these sources of information taught you any useful facts about diet and health?

	No facts		Some facts		A lot of facts		
School A	**Boy**	**Girl**	**Boy**	**Girl**	**Boy**	**Girl**	**P***
	%	**%**	**%**	**%**	**%**	**%**	
TV advertisements	21	15	65	74	15	11	0.73
TV Programmes	27	18	61	52	12	30	0.06
Newspapers	43	39	39	40	18	21	0.77
Magazines	40	22	48	52	12	25	0.02
School lessons	19	11	45	58	36	29	0.50
Internet/CD ROM	38	39	37	40	26	21	0.71
Posters/leaflets	39	23	45	55	16	23	0.23

P*= significance level for χ^2 test
Boys n= 88 Girls n= 64

Table 14.20 Proportion (%) of responses to the question: Have any of these sources of information taught you any useful facts about diet and health?

	No facts		Some facts		A lot of facts		
School B	**Boy**	**Girl**	**Boy**	**Girl**	**Boy**	**Girl**	**P***
	%	**%**	**%**	**%**	**%**	**%**	
TV advertisements	16	17	78	77	5	6	0.82
TV Programmes	14	17	56	54	31	29	0.78
Newspapers	39	29	36	43	25	29	0.81
Magazines	14	23	63	51	23	26	0.72
School lessons	3	3	56	54	42	43	0.81
Internet/CD ROM	44	49	25	31	31	20	0.74
Posters/leaflets	28	11	50	66	22	23	0.36

P*= significance level for χ^2 test
Boys n= 37 Girls n= 35

Table 14.21 Proportion (%) of responses to the question: Which of the following do you think is an important source of information for you ?

	Important		Not Important		Not Sure		
School A	**Boys**	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**	**P***
	%	**%**	**%**	**%**	**%**	**%**	
Family members	94	95	3	2	3	2	0.92
Friends	51	63	27	19	21	17	0.39
School teachers	50	64	30	17	17	17	0.14
Magazines	32	44	51	45	13	11	0.06
Internet	39	36	33	36	23	23	0.74
Sports coach	67	78	17	8	11	11	0.54
CD ROM	34	25	40	44	22	28	0.54

*P= significance level for χ^2 test
Boys N= 88 Girls N= 64

Table 14.22 Proportion (%) of responses to the question: Which of the following do you think is a good source of information for you?

	Important		Not Important		Not Sure		
School B	**Boys**	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**	**P***
	%	%	%	%	%	%	
Family members	89	97	3	3	8	0	0.53
Friends	51	60	24	17	24	23	0.79
School teachers	46	60	32	23	22	17	0.06
Magazines	27	34	51	51	19	14	0.67
Internet	21	40	30	31	43	26	0.28
Sports trainer	70	69	14	20	16	11	0.80
CD ROM	24	46	30	26	46	29	0.12

*P= significance level for χ^2 test
Boys N = 37 Girls N = 35

In school A young people felt that parents were the most important sources of information. Other credible sources of information were teachers, sports coach or trainer, and friends. More girls cited school teachers, magazines, friends as an important source of information than boys in school B. The Internet was also cited as an important source of information although fewer boys suggested this despite them claiming to use the Internet more than girls. None of the differences were significant.

14.6.1 Selection of good and poor diet groups

The diet records of all the young people who took part in the survey, regardless of school, were analysed to identify two sub groups of children with good and poor eating habits. Reported intake of positive and negative marker foods was used to identify children (Chapter 4). Subjects identified in both the upper quartile for negative marker foods and the lower quartile for positive marker foods, were included in the poor diet group. Subjects identified in both the lower quartile for negative marker foods and the upper quartile for positive marker foods, were included in the good diet group (table 14.23).

Table 14.23 Quartiles for positive and negative marker foods (all subjects N=224)

	Positive			
Negative	Lowest	Second	Third	Upper
Lowest	20	18	13	**13***
Second	10	16	10	10
Third	17	12	12	9
Upper	**29****	16	11	8

* = Good diet group
** = Poor diet group

Twenty nine children (13%) were included in the poor diet group. Thirteen children (6%) were identified in the good diet group from the 224 who completed a survey questionnaire.

Mean intakes of marker foods for good and poor diet groups (table 14.24) were significantly different for all food groups except the alternative fats group.

Table 14.24 Mean intake of marker foods consumed by diet group

Marker food group	**Poor diet n= 29**		**Good diet n=13**		**P***
	Mean	**SE**	**Mean**	**SE**	
Sugary foods	6.64	0.80	3.49	0.44	0.003
Fatty foods	4.63	0.45	1.33	0.27	<0.001
Fibre foods	1.00	0.17	4.00	0.33	<0.001
Low sugar foods	0.36	0.15	0.88	0.19	0.07
Snack foods	7.18	0.35	2.00	0.33	<0.001
Alternative fats	0.82	0.26	0.77	0.17	0.89
Negative marker foods	14.4	0.88	5.90	0.45	<0.001
Positive marker foods	8.90	0.88	1.42	0.423	<0.001

*P = significance level for independent t-test

14.6.2 Differences between Good and Poor diet groups

Mean scores for Likert statements and true and false statements (knowledge) were calculated for each diet group and compared using an independent t-test. There were no significant differences in the mean score for the statements between the two diet groups. Knowledge score (possible maximum of 4) was consistently low in both groups.

Table 14.25 Mean score for attitude statements and nutrition knowledge between good and poor diet groups

Baseline survey	Poor diet n= 29		Good diet n=13		P*
	Mean	SE	Mean	SE	
Attitude to diet	15.8	0.62	15.30	0.89	0.67
Attitudes to H E	18.61	0.55	17.00	1.04	0.15
Attitudes to peers	10.27	0.54	10.45	0.89	0.85
Knowledge	1.05	0.20	1.00	0.30	0.87

P*= significance level for independent t-test

H E = Healthy eating

14.6.3 Attitudes towards healthy eating

Five point Likert statements were presented to young people which probed the reasons why they would eat a healthy diet, the influence of peers, and their attitude to healthy eating (tables14.26- 14.31).

In school A school both sexes were generally in agreement with the statements on why a healthy diet would benefit them personally (table 14.26). Girls were less likely to strongly agree with the statement *"eating a healthy diet will help me avoid disease"* than boys. Boys and girls agreed strongly with the statement that a healthy diet would benefit appearance, and both sexes agreed that a healthy diet would "give me a healthy body". In school B there was a similar level of agreement towards the separate statements (table 14.27) as was seen in school A. Both boys and girls also agreed with the statements that diet would benefit their appearance and give them a healthy body.

A number of statements investigated how young people may be influenced by peers (tables 14.28-14.29). Young people in school A showed a general disagreement with the statements regarding peers. 77% of boys and 89% of girls disagreed with statement related to being ridiculed for eating particular foods (table 14.28). There was also general disagreement with the statement that suggested eating healthy foods *"made you look like a health freak"* however 23% of boys agreed or agreed strongly with this statement. Fewer boys and girls in this group agreed with the statement: *"I will try a new food if I'm out with friends"* than young people in school B. Young people in school B showed a similar pattern of responses for the statements overall (table 14.29). This group also disagreed with the notion that healthy food made you look like a health freak, but more children (33%) in this group agreed that they "*would eat a food if their friends were eating the same food as well*", than in school A (12%).

Young people were asked a second series of statements about healthy eating (table 14.30-14.31). The responses to these items were similar for boys and girls in school A (table 14.30). Most young people agreed that a good diet was important for health, and that regular meals were important. There appeared to be more ambivalence in both schools. In school A 43% of boys and 36% of girls could not agree or disagree with the statement: *"healthy foods make me look cool"*: 42% of boys and girls also could not agree or disagree that *"healthy foods taste nice"*. In school B there was a similar pattern of responses, young people showing an ambivalence towards healthy foods tasting nice and making you "look cool" (table 14.31). Boys and girls in this group strongly agreed with the statement that *"regular meals are important"*.

Table 14.26 Proportion of responses to attitude statements about healthy eating (%)

School A	Strongly Agree		Agree		Neither agree or disagree		Disagree		Strongly Disagree		
Statement	Boys	Girl	Boy	Girl	Boys	Girls	Boys	Girls	Boys	Girls	P*
1	27	13	39	39	22	31	7	10	6	8	0.02
2	41	29	41	60	7	8	2	2	1	2	0.89
3	21	21	31	39	35	36	8	2	6	3	0.66
4	69	32	41	57	15	10	1	5	0	2	0.45

*P= significance level for χ^2 test
Boys N= 88 Girls N= 64

Statement 1 Eating a healthy diet will help me prevent disease
Statement 2 Eating a healthy diet gives me a healthy body
Statement 3 Eating a healthy diet will help me look good
Statement 4 I still need a healthy diet even if I am fit

Table 14.27 Proportion of responses to attitude statements about healthy eating (%)

School B	Strongly Agree		Agree		Neither agree or disagree		Disagree		Strongly Disagree		
Statement	Boys	Girl	Boy	Girl	Boys	Girls	Boys	Girls	Boys	Girls	P*
1	30	14	27	43	38	26	0	9	5	9	0.1
2	51	43	43	49	5	9	0	0	0	0	0.57
3	24	26	54	40	19	23	0	6	3	6	0.69
4	30	54	54	40	14	6	3	0	0	0	0.26

*P= significance level for χ^2 test
Boys N = 37 Girls N = 35

Statement 1 Eating a healthy diet will help me prevent disease
Statement 2 Eating a healthy diet gives me a healthy body
Statement 3 Eating a healthy diet will help me look good
Statement 4 I still need a healthy diet even if I am fit

Table 14.28 Proportion of responses to attitude statements about peer influences on healthy eating (%)

School A	Strongly Agree		Agree		Neither agree or disagree		Disagree		Strongly Disagree		
Statement	Boys	Girl	Boy	Girl	Boys	Girls	Boys	Girls	Boys	Girls	P*
1	6	3	3	2	16	6	39	53	38	36	0.53
2	3	0	13	11	36	23	41	55	8	11	0.55
3	8	5	15	8	19	22	32	42	26	23	0.74
4	10	2	42	41	28	38	12	17	7	3	0.42

*P= significance level for χ^2 test
Boys N= 88 Girls N= 64

Statement 1 I would not eat a food if my friends skitted me
Statement 3 If my friends were eating the same food I would eat it as well
Statement 3 Eating too many healthy foods makes me look like a health freak
Statement 4 I will try a new food if I am out with friends

Table 14.29 Proportion of responses to attitude statements about peer influences on healthy eating (%)

School B	Strongly Agree		Agree		Neither agree or disagree		Disagree		Strongly Disagree		
Statement	Boys	Girl	Boy	Girl	Boys	Girls	Boys	Girls	Boys	Girls	P*
1	3	0	3	3	14	9	41	43	41	46	0.77
2	0	0	33	33	30	11	47	51	11	20	0.22
3	0	9	8	3	22	14	43	40	27	34	0.45
4	8	6	51	57	30	23	11	14	0	0	0.88

*P= significance level for χ^2 test
Boys N= 88 Girls N= 64

Statement 1 I would not eat a food if my friends skitted me
Statement 3 If my friends were eating the same food I would eat it as well
Statement 3 Eating too many healthy foods makes me look like a health freak
Statement 4 I will try a new food if I am out with friends

Table 14.30 Proportion of responses to attitude statements about healthy eating (%)

School A	Strongly Agree		Agree		Neither agree or disagree		Disagree		Strongly Disagree		
Statement	Boys	Girl	Boy	Girl	Boys	Girls	Boys	Girls	Boys	Girls	P*
1	36	29	44	59	17	13	3	0	0	0	0.15
2	36	34	49	50	18	13	1	3	0	0	0.82
3	16	14	42	44	33	22	8	17	1	3	0.59
4	3	3	16	6	43	36	23	41	15	13	0.35
5	13	16	23	33	42	42	15	8	8	2	0.36

*P= significance level for χ^2 test. Boys N= 88 Girls N= 64

Statement 1 It is important for my diet to be healthy
Statement 2 It is important that I eat regular meals
Statement 3 I would like to try as many new foods as I can
Statement 4 Eating healthy food makes me look cool
Statement 5 Healthy food tastes nice

Table 14.31 Proportion of responses to attitude statements about healthy eating (%)

School B	Strongly Agree		Agree		Neither agree or disagree		Disagree		Strongly Disagree		
Statement	Boys	Girl	Boy	Girl	Boys	Girls	Boys	Girls	Boys	Girls	P*
1	29	29	40	63	29	9	3	0	0	0	0.24
2	51	49	32	40	14	9	1	3	3	0	0.92
3	5	26	54	54	27	11	11	6	3	3	0.33
4	0	3	3	0	49	46	30	31	19	17	0.95
5	14	14	19	23	49	49	14	9	5	6	0.98

*P= significance level for χ^2 test. Boys N= 88 Girls N= 64

Statement 1 It is important for my diet to be healthy
Statement 2 It is important that I eat regular meals
Statement 3 I would like to try as many new foods as I can
Statement 4 Eating healthy food makes me look cool
Statement 5 Healthy food tastes nice

14.6.4 Mean scores for attitude statements and knowledge

Mean scores for each series of statements about healthy eating and peers were calculated for boys and girls in each school and compared (Table 14.32). There were no significant differences between boys and girls at either school in the mean score for attitude statements and nutrition knowledge, except for question eight in school B. Girls had a higher mean score for the statements on healthy eating than boys which suggested a more favourable predisposition to eating a healthy diet.

Table 14.32 Mean score for attitude statements and nutrition knowledge between boys and girls by school.

	School A			School B		
	Boys	Girls	P*	Boys	Girls	P*
	N=88	N=64		N=37	N=35	
Attitudes towards						
healthy eating	17.45	17.61	0.77	18.03	18.83	0.05
Attitudes towards a						
healthy diet	15.60	15.30	0.62	16.35	15.94	0.43
Attitudes to peers	10.33	9.61	0.07	9.89	9.31	0.23
Nutrition knowledge	1.02	0.84	0.21	1.12	1.09	0.64

P* Significance level for independent t-test

14.6.5 Feeling good about yourself

A list of statements which had been identified by focus groups as being socially important were presented to young people (table 14.33).

Table 14.33 Proportion (%) of responses to the question: Which of the following are important for you to feel good about yourself?

Statement	School A			School B		
	Boys	Girls	P*	Boys	Girls	P
	N=88	N=64		N=37	N=35	
Not being over weight	68	74	0.47	70	80	0.68
Having clear skin	59	65	0.56	65	74	0.58
Having healthy teeth	74	73	0.83	78	80	0.76
Being able to compete at sport	54	60	0.41	38	43	0.46
Eating the right foods	55	68	0.14	35	57	0.17
Having friends to talk to	75	77	0.79	89	80	0.46
Able to share a problem with parents	55	63	0.45	67	69	0.86
Being one of the crowd	40	37	0.62	35	31	0.84

P* = significance level for χ^2 test

The pattern of responses was similar between the schools, but there were no significant differences between boys and girls for any of the statements. Having friends to talk to, not being overweight and having healthy teeth were also thought to be important by the majority of the children in each group.

14.6.6 What would help young people make changes to diet?

The aim of the items presented to young people was to develop and focus nutrition messages in ways that were particularly relevant for the young people in the study.

Table 14.34 Which of the following would help you in making changes to your diet (%)

	School A			School B		
	Boy	Girl	P*	Boy	Girl	P*
	N=88	N=64		N=37	N=35	
Designing a poster for use in school	79	93	0.03	49	48	0.51
Including information on food and diet in PE	47	52	0.06	75	25	0.004
Lessons just for boys	73	30	0.001	51	46	0.36
Lessons just for girls	71	63	0.44	45	50	0.45
Having a food magazine in school	51	66	0.08	52	45	0.75
Being able to buy more Healthy foods in the tuck shop/canteen	75	94	0.01	50	48	0.31
Learning how diet can affect your teeth	75	92	0.03	49	48	0.81
Learning how to look good and stay healthy	87	88	0.9	48	49	0.82
Having access to an Internet site for young People	53	54	0.56	42	56	0.48
School lessons on how diet can prevent disease	78	87	0.35	48	49	0.83

P*= significance level for χ^2 test

Table 14.34 shows that boys and girls would prefer separate sessions on diet specifically for their sex group. More boys than girls would prefer the delivery of nutrition information to be related to physical education. More girls thought having a school food magazine would be helpful to them when making changes. Girls also thought having lessons on the care of teeth and how to look good would be beneficial.

Boys and girls in this group also considered that changes to tuck shops would be helpful in assisting them to make changes to diet. The proportions of young people who thought that having access to an Internet site would be helpful was low but above 50% in school A. In school B the only significant difference between boys and girls was in the higher proportion of boys who agreed that diet should be included within the PE curriculum.

14.6.7 Predicting group membership

A stepwise discriminant function analysis was performed to investigate if the BCQ items (excluding the diet questions) could predict membership of good and poor diet groups. Discriminant analysis is a multivariate technique in which membership of a group *[dependent variable]* can be inferred from a set of "predictors" *[independent variables]*. One facet of the technique is to allow researchers to use the analysis to interpret the combination of variables that may distinguish between groups (Tabachnick & Fidell 1996).

Variables relating to the attitudes young people hold about food and diet and to the factors that would assist them in making changes (n=29) were incorporated stepwise into the analysis as independent (predictor) variables. Diet group (good diet, poor diet) was entered as the dependent variable (n=42). The predictor variables are entered stepwise into the analysis, those that increase the predictability of the discriminant function are retained and those that do not increase the predictive ability are removed. The discriminant analysis tests each predictor variable for tolerance (to avoid problems due to collinearity between predictors), and removes those where collinearity is found. For two groups (good and poor diet) the analysis specifies one discriminant function in which predictor variables are assigned a weight, or coefficient.

Table 14.35 Discriminant function analysis after step Five

Predictor Variable	Tol.*	F to Remove	Wilk's Lambda	Loading matrix°
Perception of own Health	37	33.04	0.75	.34
Have a Food magazine in school	.50	10.92	0.49	.10
I will try new foods if I am out with friends	.61	18.22	0.57	-.23
Have food included in PE lessons	.73	9.94	0.48	.26
Separate nutrition lessons for boys	.62	7.1	0.45	-.01

* = Tolerance level

° = Pooled within group correlation between predictor variables and discriminant function.

One discriminant function was calculated and classification included five variables as being predictors of diet group (table 14.35), Chi square = 28.65, $p < 0.001$. Classification results suggested that 84% of subjects in the good diet group were correctly classified, and that 89% of poor group members were classified correctly. The loading matrix (table 14.35) suggested that the best predictors for distinguishing between good and poor diet groups were perception of health; incorporating information on food within PE, and attitudes towards trying new foods when out with peers.

14.7.1 Discussion

The eating habits reported in the baseline study were similar to previous studies using the FIQ described in this thesis. The results suggest that boys and girls were consuming foods likely to be associated with a high intake of fat and sugars intake and included fewer desirable foods such as diet drinks, baked potatoes and vegetables. There were no major differences in the eating habits of boys and girls in either school except for the higher proportion of boys in school B who reported consuming chocolate, and the proportion of subjects in school A who reported consuming sugared fizzy drink. Girls in school A were more likely to report eating the more desirable positive marker foods. Although most young people ate lunch, the

numbers not eating breakfast was consistent with other surveys (Haseldon et al. 1999; NDC 1997) and studies using the FIQ (Johnson & Hackett 1997). Girls in both schools were more likely to report not eating breakfast than boys. It has been speculated that one reason for skipping breakfast could be to affect body weight (Hill 1992; Johnson & Hackett 1997). Children may compensate for not having breakfast by snacking on the way to school. There were no differences in mean scores for marker foods between boys and girls. One survey (Mintel 2000) showed the most popular snacks to be crisps, chocolate and fruit, but Prescott-Clarke & Primalesla (1998) reported that sweet foods, including biscuits and "sweets" and drinks were most frequently reported in the younger age group of children (2-15 years).

Government advice for a healthy diet advocates increasing intakes of fruit and vegetables and starchy carbohydrates. In this respect the high proportion of young people reporting the consumption of bread, albeit white bread, is a positive finding. The National diet and Nutrition Survey (Gregory et al. 2000) reported that white bread was the most popular food being consumed by 75% of respondents, the numbers of boys and girls who reported eating white bread was similar in this study. The proportions of young people who said they had fruit on the previous day was encouraging (67%), however if young people are expected to meet the targets for five portions every day this proportion must be far closer to a hundred percent. Barriers to eating fruit and vegetables outside of the home, such as a lack of availability in cafeterias, have been acknowledged (Anderson et al. 1998), in the case of schoolchildren the recent "Fruit in school scheme" (DoH 2000b) is one initiative that may address this problem albeit for primary schoolchildren. Other popular foods reported in this study: crisps, chocolate and chocolate biscuits, and chips were also similar to the reported eating patterns of teenagers living in the West of Scotland (Anderson et al. 1994), and confirms the need for continued efforts to improve in the eating habits of adolescents.

It has been reported (Armstrong & Van Mechelen 1998; Haseldan et al. 1999) that boys are more likely than girls to exercise every day, and take part in more vigorous forms of physical activity. Results from this study showed a similar trend, boys were more likely to report taking part in physical activities than girls. Although no information on the duration and intensity of activities was collected in this study the

general trends seen in the data support the contention that asking simple questions can provide useful information for practitioners. Boys were paradoxically also more likely to use the computer to play games than girls.

Healthy eating and diet are important aspects of the prevention of chronic diseases and nutrition information has traditionally been delivered in schools, based on a medical model of health (Bowker et al. 1998). Diet is seen as the cause, or means of preventing, a medical condition such as heart disease or obesity. Young people are told that having a healthy diet now will prevent the onset of disease in later life. The paternalistic nature of nutrition education within the curriculum may exacerbate the image of healthy eating as boring and irrelevant. The perception of personal health described by young people in this sample shows a similar pattern to data presented by Haseldan et al. (1998); the majority of young people defined their health as "quite healthy". The results also suggested that young people are cognisant of the relationship between diet and health but reflect this understanding in two ways: by thinking about the long-term benefits of eating a healthy diet (preventing disease) and the short-term benefits (improving appearance and "looking good"). In reality such health concerns are seldom seen as important to young people (Vereecken & Maes 1999) the culture of the adolescent is fixed in the *"here and now"* (Shepherd & Dennison 1996) and it is unlikely that health and the prevention of disease can be a major motivation for making young people consider changing established eating practices. Including young people in the focus groups provided insight into their thinking about health and diet. The health belief model (Becker 1974) has been used in health promotion as a theoretical basis for change; the model suggests that perceived benefits to future health will be one motivator of change. Prochaska and Diclemente's, Stages of Change model (1986) has also gained prominence in health promotion and nutrition education. A drawback of many such models is their focus on the individual as the agent for change. The importance of peer relationships as seen in this research would suggest that individualistic models may be inappropriate methods to encourage change in behaviour. Shepherd & Dennison (1996) have used the theory of Planned Behaviour (TPB) to investigate attitudes towards food choice in adolescents. The authors state that the TPB is "*very structured*", and as such is unable to provide detailed information on how adolescents are thinking about food. They conducted in-depth interviews in addition to the TPB attitudinal surveys to

collect information, their data revealed similar results presented in this thesis. Adolescents were able to define differences between adult and "kid's" food and data suggested that strong peer group relationships between adolescents were influential factors affecting food choice.

The context in which young people interact and make decisions is social and group related. For many young people health is seldom a reason to change behaviour; however replacing the health dimension of such models with a more appropriate "cue for action" such as improved physical well being or appearance, factors often prized by the peer group, may provide a more realistic motivation for eating a healthy diet. Young people were likely to agree that eating a healthy diet would "make me look good", and this perception was similar between the sexes and between schools. The concept of body image is a powerful one within teenage culture (Hill 1996) and as such must be acknowledged when considering the content of nutrition related sessions in school.

There were similar patterns of responses for the attitude statements in each school. Shepherd and Dennison (1996) found that adolescents attitudes to eating were not affected by type of school or socio-economic factors. There was general agreement between boys and girls with the statements about the importance of a healthy diet and eating regular meals, although both boys and girls tended to disagree with the statement: *"healthy food makes me look cool"*. This was similar to the focus group data, where healthy eating and making sensible food choices were not the norm within the peer group. This suggests that if educators can stress positive benefits and outcomes for the individual,l if he or she follows a healthy die, they may be more disposed to change (Kearney et al. 1997). Research shows that peer group acceptance is important to young people (Aggleton 1998), and some behaviours may be more prone to exerting pressure on young people, for example making decisions to drink alcohol, to smoke or to take drugs have been linked to peer pressure (Botvin & Botvin 1992). Adopting overtly positive health behaviours may be constrained by the need to conform to peer group expectations and norms: for a substantial minority of young people in this sample it was not cool to be seen as a "health-freak".

These results confirmed the importance of friends and peers as sources of information

on diet and health. Almost eighty percent of young people claimed to learn "some" or "a lot" of facts from television adverts and programmes. Shepherd & Dennison (1996) also reported that advertisements had an effect on adolescent food choice. This suggests that children may be influenced by biased or misleading information. The perception that TV advertising has little effect on the behaviour of young people has been challenged (Dibb 1992). One recent report (Mintel 2000) suggested that television was a key marketing medium for the promotion of snack foods. The Internet was also cited as a source of information and facts. Approximately one third of the young people surveyed said they had regular use of a PC at home or in school, despite this more than fifty percent of boys and girls thought that an Internet site would be a useful source of information, a figure which is likely to increase in the future. The opportunity for health professionals to utilise the Internet as a means of education provides possibilities to reach vast numbers of young people is especially important because the time available within schools to deliver nutrition education is very limited (Contento et al. 1995). The development of the National Grid for Learning (DfEE 2001) nationally, with local initiatives in Liverpool linked to the Healthy Schools project, has potential to develop the Internet based resources in consultation with teachers and young people.

Boys and girls did not differ in what they thought was important to feel good about themselves. Boys and girls were equally likely to state that not being overweight, looking good and having clear skin were important. Including such factors within a intervention programme may offer such a programme credibility with young people by grounding the intervention "where they are". Green (1992) suggested that compelling young people to change eating habits to prevent disease was unlikely to be successful, as other factors related to food such as taste will override any health imperative. Effective communication on diet must provide credible, and viable reasons for making changes. The credibility of the message will also impact on the credibility of the messenger. Gibney (1990) suggested that dietary advice has to be realistic: realistic in cultural as well as nutritional terms: [the] *...credibility of nutritionists and dietitians will diminish if the advice we offer is not effective, not feasible or not practical".* One study (Aggleton 1996) reported that young people perceived health professionals as "people who tell you what to do". The negative connotation for health promotion is evident: dietetic advice has to be

scientifically correct but also have a resonance in the lives of young people. One recent campaign supporting this contention was described in an attempt to prevent young people, particularly young girls, smoking (BBC 2000). Supermodels have been used to describe the health consequences of smoking. The campaign, funded by the Department of Health, used a supermodel to describe a personal tragedy of cancer caused by smoking, although the effectiveness of the approach is not known .

When young people where asked about the activities that would help them make changes, similar numbers of boys and girls in school A (were a nutrition intervention was planned to be carried out) suggested that school lessons should be delivered to separate sex groups. Between schools, both sexes showed concern about appearance. Girls were generally concerned about looking good and would find magazines helpful. Significant numbers of girls said they would find sessions on dental health helpful, girls also suggested that changes to food availability within the school would assist them making changes. Despite health being a low priority in the focus group interviews, young people in both schools suggested that learning about health and disease would assist them in making changes to diet. Peer group influences on eating were not apparent from the questionnaire responses; young people appeared to be less inclined to agree with statements suggesting peer group influence. The focus group interviews in contrast suggested that peer group pressures were influential. This paradox between the two studies could be methodological, illustrating the depth of data provided by a group interview compared to a structured questionnaire (Oppenheim 1992; Denzin & Lincoln 1992). Qualitative interviews in general, and focus groups in particular, allowed young people to explore and discuss, in depth, their attitudes and feelings about health and diet. The questionnaire study in which subjects were limited to closed response questions allowed for a larger sample of subjects to be investigated (Oppenheim 1992), however it restricted detailed discussion and may have resulted in a possible diminution in data quality. The study design also necessitated that the interviews were conducted in schools. The "Hawthorn effect" has been described in adolescents taking part in research on health subjects (Murray et al. 1988), and it is difficult to assess if the schools setting affected responses. The general trends seen in the BCQ data regarding the activities young people take part in, and the differences between the sexes, are consistent with other studies and would suggest the responses have validity.

The Discriminant function analysis identified five variables as being predictive of inclusion into diet group: perception of health, peer relations and attitudes towards education strategies i.e. having a food magazine in school; integrating nutrition information with physical education and activity and separating sessions by sex were specified in the discriminant function. Focus group data also suggested that combining information on diet and nutrition within sports lessons and understanding the role of peers in the food habits of young people may help dietitians to improve the communication of nutrition messages. The results from the discriminant analysis would support this contention. The view that activity should be included in the promotion of nutrition and healthy lifestyle in young people, has been increasing in Liverpool (Sportslinx 1998), it should also provide a salient focus in which to promote nutrition messages.

One attitude statement linked to peer influences was identified by the analysis. Peer relations are important aspects of adolescent culture (Coleman & Hendry 1996), and the focus group discussion suggested that peer influences affect eating habits in a negative direction. However, Woodward et al. (1998) reported that perception of a friend's food consumption was poorly correlated to an individual's consumption of the same food. The authors suggested that the influence of peers on the food choices of an individual may be less strong than influences on smoking or alcohol consumption. In this sample it would appear that the influence from friends could be more pronounced than Woodward's study conducted in Australia.

The variables that emerged from the discriminant analysis mirrored the concerns of young people from the focus groups and reinforced a view that nutrition should be explicitly linked to the promotion of physical activity and a healthy lifestyle in young people. It also suggests that including young people in the development process of nutrition education will enable dietitians to focus an intervention to the most relevant concerns of adolescents.

Nutrition intervention in schools requires a major input in terms of dietetic time and staff resources. The lack of community dietetic staff necessitates the use of other technologies to promote nutrition in schools. Using new information technologies

such as the Internet offers potential routes for promotion of diet and nutrition in schools and should be developed further. Interventions combing knowledge of good nutrition practices with practical skills based sessions and a realistic focus to the intervention may offer a potential for future in community dietetic interventions.

One aim stated at the outset of this thesis was that eating habits should be examined from a young person's perspective and that by understanding the factors that may affect food selection modes of intervention could be developed. The BCQ has been shown to be able to classify the diets of young people for use in epidemiological and dietetic interventions. The BCQ has also offered a method to enable dietitians to focus an intervention to the specific needs of the target group.

14.7. 2 Summary of Implementation survey

Diet

- Reported food intake was similar between boys and girls. The most frequently reported foods included: fizzy drinks, boiled sweets, crisps and chocolate biscuits.

- More girls than boys reported eating baked potatoes, vegetables and fruit.

- Mean intake of marker foods was similar in boys and girls.

****

Non Diet variables

* Boys were more likely than girls to report that they had taken part in activities such as football and rugby.

* 89% of boys and girls had regular access to a PC at home or in school

* Mean scores for nutrition knowledge for boys and girls were poor.

* Important sources of information reported by all subjects were parents, friends, teachers and sports trainers.

* Boys and girls felt that eating a healthy diet would benefit their appearance and give them a healthy body.

* Young people tended to disagree with the statement: *"Healthy food tastes nice"*

Section 5 Discussion and Conclusions

Chapter 15 Discussion

The starting point for this thesis was the need to develop community dietetic practice and effective action in the school setting, to influence dietary change. Undertaking this study has graphically illustrated the problems facing practitioners undertaking research to provide evidence on which to base their interventions. Nonetheless it has been a formative experience and the skills that have been acquired will be a valuable resource for the community dietetic department and the wider Trust environment. The methods chosen allowed an investigation of adolescent's views about health and diet and the motivations influencing their food behaviour to assist the design of school based interventions.

The results from this thesis have shown that understanding the cultural influences that affect eating habits, and developing an appropriate tool to assess the eating habits of schoolchildren, have the potential to design nutrition and other interventions that are relevant to the cultural imperatives of adolescents.

The results from the dietary studies (chapters 7, 8, 9,11) indicate that the FIQ is a useful tool for evaluating community dietetic practice. It has been used for over ten years and the development as part of this research suggests it has utility for epidemiological and observational research and when evaluating dietetic intervention. The FIQ was pilot tested as an interactive computer program. The problems encountered in the pilot survey of the computerized questionnaire were generally technological, primarily a lack of compatible computer hardware in schools. Although the computerized delivery of the FIQ was not developed further in this study, the increasing use of the Internet within schools offers a potential avenue for further development of the interactive computerized version of the questionnaire[1]. The technological and hardware problems encountered in the early stages of development have been overcome and many schools have Internet access. The foods included in

[1] The Sportslinx project which also monitors eating habits will be piloting an Internet delivered version of the FIQ.

the FIQ were shown to be valid and consistent with dietetic practice and advice on healthy eating. The simple nature of the stem question " *did you at any time yesterday eat any amount of...* " suggests that asking simple questions about eating habits has validity and can provide dietitians with meaningful information to assist evaluation. The reliability study indicated that the FIQ could be expected to detect a change in eating habits of ±10% in populations of approximately 100 individuals. The reported eating habits of young people in this survey are consistent with national trends and provide further evidence of the validity of the FIQ. The most commonly reported foods included sugared fizzy drinks, crisps, chocolate and biscuits. These are similar findings to the most recent national survey of adolescent's eating habits in England (Gregory et al. 2000) and Scotland (Inchley et al. 2001). It also shows that it is not always necessary to estimate nutrient intakes to monitor eating habits in the community setting. This is important for practitioners who need to evaluate changes in eating habits, over time and in response to interventions, but who are unable to use more elaborate dietary survey methods because of constraints due to the time and expense.

The focus group study (chapter 12) revealed insights into how young people with different eating habits think about food and health. The study revealed that there were few differences between the two groups in how they described food and health issues.

Some young people felt they have a lack of control over food decisions made in the home with decisions being made by parents. Both good and poor diet groups described similar demarcations between " foods for young people" and "parental foods", the former were described as snack or junk type foods, the latter almost always described as "proper" food. This is similar to previous research (Watt & Shieham 1997; Chapman & McClean 1993) and provides a useful comparison between Liverpool schoolchildren and those in other parts of the UK (Watt & Shieham 1997) and the United States of America (Chapman & McClean 1993). Boys and girls both indicated that pressure from peers to conform was a major constraint to eating healthy foods in socially sensitive locations, for example, the school canteen. The paradox between knowing what to eat to stay healthy and putting this into action was evident from the focus groups. Snacking and grazing was described by all groups and as such remains a permanent feature of the social life and cultural identity of the

adolescent; in the context of nutrition education, this fact must be acknowledged and made part of any advice aimed at young people. The good and poor groups tended to differ in how they discussed making changes to the diet. Young people in the poor groups were more reticent to discuss relationship issues than the their peers in the good groups. Despite being quite negative about making changes to improve their long-term health, many young people cited health professionals as being important and credible sources of information. If health professionals and dietitians are seen as unbiased sources of information, the opportunity exists to reinforce this credibility by delivering advice to young people relating positive nutrition messages in the context of appearance and well being factors; factors shown in this study to be more relevant to young people. Young people, however felt that such personal benefits were more important; the immediacy of the "here and now" taking precedence over any future health gains.

Their description of dieting was more elaborate than expected. Young people included various descriptions of "going on a diet"; this was similar to other studies (Neumark-Sztainer & Story 1998; Roberts 1999) and suggest that health professionals need to be aware of misconceptions between the adult language of nutrition and the dialect of the young person. It also implies that there is a need for further research which investigates how young people interpret dietary information given by teachers and health professionals. An understanding of how the nutritional lexicon is delivered by dietitians and subsequently decoded by young people would assist educators in developing more appropriate nutritional messages for the schools. The low levels of nutritional awareness of the young people in this study would also suggest why dietary information may be difficult to comprehend. The focus group data suggested that there is a less clearly defined route by which young people collect health and diet related information. The networks they use involve schools, peers, parents and the media in ways that can contribute to "informed choice". Informed choice is a key to government policy, however this research suggests that it does not account for the informal networks that affect awareness to health messages. In addition, young people did not see long term health benefits of positive lifestyle choices as an imperative for making changes in eating habits. A cost benefit analysis based on health gain would

appear to be irrelevant to their lives, and suggests that the health model of behaviour change should be challenged in favour of a more appropriate vehicle to deliver positive health messages. An approach built on the immediate personal benefits of following advice on nutrition and activity, (feeling fitter, improving appearance and feeling good about oneself) should be used to deliver the same lifestyle messages.

The combined BCQ questionnaire (chapter 13, 14) was shown to be a useful way of assessing the context in which specific nutrition education should be delivered in the school as part of a planned intervention. This approach would allow other health professionals to target other health messages in a way that has resonance in the culture of young people. In particular, messages regarding dental health and personal appearance, could be delivered to promote good dental hygiene practice.

The implementation study of the BCQ (chapter 14) provided information on the current eating habits of the sample and additional data on their concerns regarding health, diet and making changes. There were few differences in the eating habits of boys and girls the main difference was in the number of girls who reported eating vegetables, baked potatoes and fruit, which is consistent with the latest national study (Gregory et al. 2000), this study showed that girls ate greater quantities of vegetables and fruit than boys. The BCQ questionnaire revealed that boys and girls provided similar responses to the attitude statements, and were in agreement about what would make them feel good about themselves, both groups suggested not being overweight was important and reinforces the social desirability of an acceptable weight; other appearance factors, having good teeth and skin, also scored highly. Young people reported that using separate sex groups for the delivery of nutrition information, such as focusing on activity related factors for boys was preferable to mixed sex classes. The results from the BCQ also suggested that the awareness of nutritional messages in young people was superficial and that an intervention should aim to address this deficit. The results are limited to the young people in the schools involved in this study, and cannot be generalised to other populations of young people. However the results strongly suggest that positive nutrition messages can be delivered by providing a holistic framework in which to discuss the benefits of dietary change and physical activity. The results indicate that within geographically small, less affluent areas, there is great diversity in eating habits with some children having excellent eating

habits and others have less desirable eating habits.

For the purpose of this thesis a line had to be drawn when presenting the results from the action elements of the study. This necessitated a decision being made to include only data up to and including the BCQ implementation survey. In common with the philosophy of action research time is required to pause and reflect on the progress made so far, and to consider further developments. The emerging culture of evidence based practice within the NHS demands that the process of evaluation and change should continue: lessons for practice will be implemented and the research and development process will be a continuous one.

Discriminant analysis suggested that some of the reasons for this can be teased out of focus groups, but do not seem to be related to knowledge. Levels of awareness to common nutritional messages in this sample appeared to be very poor and as such should be addressed in future interventions. Although the notion that "knowledge does not change behaviour" has gained prominence in the debate about how to bring about dietary change, nutrition education can only be successful if the advice that is given is both understood and relevant to the target population. The findings also showed that food culture can divide the generations: the demarcation between "junk" food and "proper" foods was apparent. Many studies have confirmed this dichotomy between adults and young people (Aggleton 1996; Watt & Shieham 1997), and dietitians should acknowledge the differences and deliver education based on the cultural differences.

There has been a general consensus within public health nutrition that interventions aimed at decreasing the levels of obesity in the population should incorporate a dual approach using diet and activity as the foci for intervention (Booth et al. 2001). Baronowski (2001) has eluded to the difficulty in bringing about changes in dietary behaviour using knowledge based interventions alone, suggesting that a paradigm shift is required from targeting knowledge to altering behaviour. Nutrition behaviour is affected by competing mediating factors, the design and content of interventions therefore must accommodate the priorities of the target group to allow strategies to be successful. The paradigm shift in public health nutrition approaches towards decreasing obesity in the US is underway (Booth et al. 2001). Using qualitative

methods such as focus groups furnishes a broader understanding of why young people eat what they do. The results described here also indicate that individualistic behavioural models designed to change behaviour may need to be used in tandem with other mediating factors such as group and peer influences.

There are implications for schools and the position of nutrition within the curriculum that have been highlighted by this study. At present nutrition is taught within personal & social education, food and technology and science and in the cross curricular theme of "health"; a context which is generally focussed on disease prevention. Refocusing the context of nutrition education, from one of disease prevention, to one stressing the personal and the peer group contexts may have advantages over a health and medically orientated approach. Using after school clubs or team sports as a setting, with key group leaders as peer role models to promote change may be more credible than programmes directed at the individual. Such interventions should also include practical food skills training and tasting sessions, to affect mediating variables. These ideas need further development and discussion with schools and other health professionals to ensure that collaboration is focussed. There are benefits in collaborating with other health professionals and local council staff who are also working with young people in schools

This thesis has provided information that will have implications for local dietetic practice. Firstly, the move to a culture of evidence based practice within the NHS, and dietetics in particular, can only proceed if dietitians and other professionals have access to advice and support to develop their capacity for research. It has also shown that by creating more formal links to academic institutions, benefits for practitioners and academics can accrue. The research experience provided by colleges can be directly applied to evaluate current dietetic practice, and allow practitioners to build a research culture "at the coal face" of the profession. By doing so, research will be seen as an integral aspect of practice rather than the purview of academic departments. The project has also shown the utility of working closely with young people and school staff to develop the tools to monitor interventions. Research governance is beginning to emerge in the NHS and including service users in the research process is explicit.

The use of focus groups to investigate dietetic practice is one way to include young people directly in interventions and the research process. These studies have begun to develop a "tool kit" for planning dietetic s and more general epidemiological use. In the case of Liverpool children, it was apparent that focussing less on disease prevention and more on the positive personal benefits from making positive choices about diet and physical activity to bring about change was valid.

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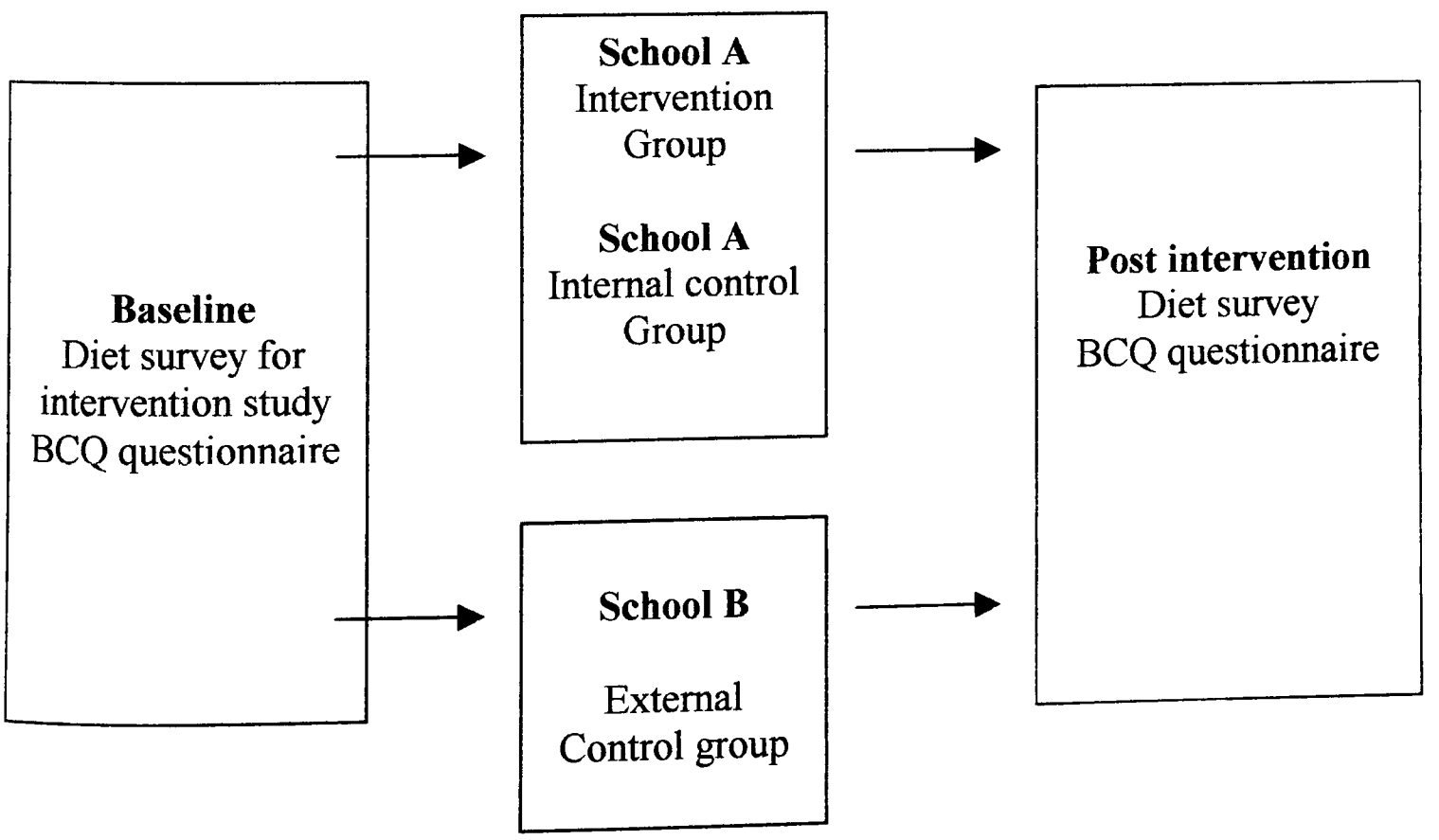
Appendix 1 Intervention study: Preliminary Report

Overview and study design

The BCQ was used to evaluate a controlled nutrition intervention in two Liverpool schools. The intervention school was a large mixed comprehensive of approximately 1500 young people. The control school had similar characteristics to the intervention school but had a smaller school population. Both schools were located in city wards with high levels of social disadvantage. The selection of the two schools for the intervention study was not random and was determined by the need for health promotion to be targeted to areas of the city in which the community dietitian worked. Three secondary schools were situated in the area and were approached to take part. Two schools agreed to take part, one school declined due to an Ofsted inspection. School one received the intervention which was delivered by a team of health professionals: dietitians, dental health educators, university staff and exercise trainers. School two acted as a control and received no intervention. Baseline data was collected prior to Christmas. Diagram A1 sets out the design of the intervention study

Diagram A1 Intervention Study Design



Sample

All young people in school year 8 (ages 12-13 years) of both schools were eligible to take part in the baseline survey. In the intervention school, four classes were selected randomly to form the intervention group. The remaining five classes acted as an internal control group. Four classes in the non intervention school were randomly assigned to the external control group.

Data analysis

Data were input and analyzed using SPSS for Windows (SPSS inc.). FIQ data was analysed using the same procedures described in chapter six. Chi square, and unpaired t-test were conducted to assess differences in proportions of boys and girls eating specific foods and the mean score for food groups. The behaviour related items were analysed using Chi square, unpaired t-test to compare differences between boys and girls and between intervention and control groups.

Methods

The BCQ was used to evaluate the pilot intervention (Chapter 13 describes the methods used in the intervention study). Baseline data was collected during the final week of the Christmas term. Post intervention questionnaires were completed in March of the following year. The study design can be seen in chapter one.

The Intervention

The short-term pilot intervention was delivered over an eight-week period at the start of the spring term. Each intervention class received four separate education sessions delivered by health professionals. Each session lasted one hour and took place in school during time allocated to PSE. The BCQ survey suggested that nutrition sessions delivered to separate groups of girls and boys would have more impact. Girls and boys received two sessions on nutrition which were delivered to single sex classes, one session on care of the teeth and a session on the benefits of increasing physical activity.

Session One: Eating for health and fitness

Boys

The session focussed on the personal benefits of good nutrition, using the balance of good health was used as the basis for the activities. Information was delivered in the context of keeping fit e.g. taking part in sport and physical activity. The messages promoted the benefits to the individual of eating a healthy diet in terms of improved appearance and increasing self esteem. Activities included using individual food diaries and activities based on the plate model.

Girls

The content of the session was based on analysis of BCQ responses: girls had suggested that body image and self esteem were important social factors for them when considering changes to diet. The session discussed nutrition in the context of body image and how to make positive changes to diet. The nutrition messages were the same as those delivered to the boys group.

Session two: Dental Health and appearance

Session two was delivered by the Dental Health Officer and discussed the personal benefits of looking after the teeth in terms of appearance. Information delivered in this session related to good dental hygiene practice and care of the teeth and gums to prevent dental problems.

Session three: Keeping active

This practical sessions were delivered by staff from Liverpool John Moores University. Both boys' and girls' sessions discussed how to keep fit and the benefits to heart health by increasing physical activity levels. The session included information on the basic biology of the cardiovascular system and a range of non-sport related

activities.

Session four: Nutrition 2

Boys

The second nutrition consolidated the information from the first session, and introduced messages aimed at nutrition and sport. Activities included comparing personal diets to those of professional sportsman, footballers and athletes to promote change in personal eating habits.

Girls

This session was based on the descriptions from the focus groups i.e. aspects of physical appearance, including care of the skin, and hair. The session also allowed discussion of issues related to body weight. The session was delivered by female dietitians.

Results

Table A1 describes the age and sex characteristics of the young people completed pre and post questionnaires and who took part in the study from the three groups.

Table A1 Age and sex of young people who completed the survey questionnaire .

	Intervention Group				Internal Control Group				External Control Group			
	Boy		Girl		Boy		Girl		Boy		Girl	
Age/Years	N	%	N	%	N	%	N	%	N	%	N	%
12	34	65	21	58	20	54	20	71	19	50	22	61
13	18	35	15	42	17	42	17	46	8	29	14	39
Total	52		36		37		37		27		36	

Mean intake of marker foods before and after the intervention

Post intervention differences between groups is presented in table A2 There were small, but significant, positive differences between pre- and –post intervention scores for the alternative fats (such as PUFA), fibre, positive marker and snack food groups in the intervention group. There were increases in the mean score for fibre foods, alternative fats (such as PUFA) and positive foods, and decreases in the mean score for fatty foods. The internal control group showed a significant increase in the post intervention mean score for positive marker foods, and there was a significant decrease in the post intervention score for sugary foods in the external control group.

Table A2 Differences in mean score for food group pre and post intervention

	Intervention group			Internal control group			External control group		
	Pre	**Post**	**P***	**Pre**	**Post**	**P**	**Pre**	**Post**	**P**
Alternative fats	0.85	1.16	0.03	0.98	1.27	0.12	0.95	1.01	0.61
Fatty foods	2.60	2.28	0.24	3.29	3.30	0.95	3.52	3.49	0.89
Fibrous foods	2.02	2.43	0.05	2.35	2.40	0.82	1.91	2.08	0.36
Low sugar foods	0.57	0.66	0.45	0.86	1.03	0.25	0.65	0.66	0.91
Negative markers	8.28	8.64	0.42	10.24	9.90	0.56	10.13	9.92	0.40
Positive markers	3.92	4.67	0.03	4.50	5.28	0.04	4.73	4.69	0.86
Sugary	4.72	4.59	0.16	5.60	5.57	0.79	6.70	5.02	0.01
Snack foods	4.50	3.61	0.05	4.96	4.29	0.30	4.66	4.50	0.53

P* = significance level for paired t-test

Perception of own health

Table A3 presents the differences between boys and girls in the perception of their own health in the intervention group. There were significant differences in perception of own health after the intervention. Fewer boys and girls classified their health as "good" and more considered their health as "fair" after the intervention study.

Table A 3 Perception of own health differences pre and post intervention for the Intervention group

	Baseline		Post intervention		
	Boy	**Girl**	**Boy**	**Girl**	**P**
	N=52	**N=36**	**N=52**	**N=36**	
Excellent	12	14	17	6	NS
Good	71	75	54	61	0.02
Fair	16	11	29	33	0.02
Poor	0	0	0	0	NS

*P = significance level for χ^2 test
NS = Not significant p>0.05

Table A4 Proportion (%) of boys and girls responding to the question: Which one of the following statements best reflects your view on improving your health (%).

Baseline Survey	There is Nothing you can do		There are Some things you can do		There are definitely things you can do		
	Boy	**Girl**	**Boy**	**Girl**	**Boy**	**Girl**	**P***
Intervention group	0	3	44	39	56	58	0.45
Internal Control	6	0	39	44	56	56	0.45
External Control	10	6	37	33	53	61	0.64

*P= χ^2 significance level for difference between boys and girls

Table A5 Proportion (%) of boys and girls responding to the question: Which one of the following statements best reflects your view on improving your health (%).

Post intervention	There is Nothing You can do		There are Some Things you can do		There are definitely Things you can do		
	Boy	**Girl**	**Boy**	**Girl**	**Boy**	**Girl**	**P***
Intervention group	0	3	25	26	75	71	0.46
Internal Control	3	0	37	54	60	46	0.34
External Control	19	9	28	35	53	56	0.06

*P= χ^2 significance level for difference between boys and girls

There were no significant differences in the proportions of boys and girls who responded to the locus of control item at baseline (Table A4) or post intervention (Table A5). When the proportions of young people (all subjects) who felt there *were definitely things they could do to improve health* was compared at baseline and post intervention, there were differences between the intervention and control groups. There was a significant increase post intervention in the proportion who felt there *were definitely things they could do to improve health* in the intervention group (χ^2= 3.9, p= 0.05). There were no difference in locus of control in young people in the internal control group (χ^2= 0.33, p= 0.56), or the external control (χ^2= 0.19, p= 0.67).

Discussion

The results from the post intervention survey showed that the intervention group reported small but significant changes in eating habits after the sessions suggesting that the impact of the intervention was a positive one. The degree of change in diet seen after intervention may reflect the short-term nature of the intervention on dietary behaviour change. Behaviour changes slowly, nonetheless the modest positive changes in diet suggest that a long-term programme combining diet and activity could bring long-term change in behaviour. The changes in perception of health and locus of control in the intervention group would suggest that some young people had re-evaluated their perceptions of their health and the degree by which they could affect health by their own actions.

Effective communication on diet must provide credible, and viable reasons for making change (Booth 2001). Health promoting advice has to be scientifically correct but also have a resonance in the lives of young people. These findings suggest that stressing positive individual benefits and outcomes, if he or she follows a healthier diet, may make young people more disposed to change, in the short term. Research shows that peer group acceptance is important to young people (Aggleton 1998) the results described here suggested that focussing the intervention on concerns that were important to young people and their peer group (rather than the health professional's agenda) has some utility in the school setting. The studies conducted by Lowe et al. (1998) as part of the Nation's Diet study support the notion that an intervention

sensitive to the cultural drivers of behaviour has potential to effect change. Bringing about long-term changes will only be feasible if there is collaboration between the various actors. Such an approach could be developed to incorporate the wider school environment including schools councils or governing bodies, local councils, and health professionals to ensure policies are encouraged that allow a synergy between the classroom, the environment in the school and the local community.

Using a dual focus for the intervention, combining diet and exercise with gender specific messages, was capable of effecting short-term change. Combining nutrition and activity messages is considered to be one way forward in tackling the seemingly ever increasing obesity levels (O'Hill 2001). The sessions were conducted in time allocated by the school for PSE, young people had suggested that nutrition should be promoted as part of the Physical Education curriculum. It was not possible to deliver the intervention in time allocated to PE due to pressures on school staff, however future interventions could be delivered as part of the PE curriculum with PE staff.

Chapter one proposed that interventions based on the cultural imperatives of young people may deliver changes in diet and lifestyle. Results in this thesis have described how adopting overtly positive health behaviours was described by a substantial minority of young people as "not cool", they were more concerned with their own agenda for change: an agenda based on personal concerns linked to personal appearance, and well being factors. The messages of good nutrition can fit either a health focussed intervention or an intervention concerned with issues that are more important for young people.

The pilot intervention provided evidence that an holistic approach based on young people's concerns was able to bring about changes in reported behaviour and suggests that the work in Liverpool schools should be developed further to build partnerships between all those concerned with improving the health of young people: health professionals schools, councils and local communities.

Appendix 2 Food Intake Questionnaire

What did *YOU* eat and drink yesterday?

These questions are very important. Please answer them very carefully.
All your answers will be kept secret. Please leave blank:

ID: [ ][ ][ ][ ][ ]
[ ][ ][ ][ ][ ]

Date: _____, 200_

About yourself:

What is your name? (e.g. Alex Smith) _____

How old are you (numbers only)? _____

Are you a boy or a girl (B or G)? _____

What is your postcode (e.g. L23 6JT)? _____

What school do you go to? _____

Do you get a free school meal? (Please tick the box) **Yes [ ] No [ ]**

Please tick a box to answer Yes or No or leave box empty.

Yesterday, did you have anything at all:	**Yes**	**No**
to eat or drink before leaving home to come to school?	[ ]	[ ]
to eat or drink on your way to school?	[ ]	[ ]

Yesterday, did you:		
Eat or drink nothing at lunch time?	[ ]	[ ]
Eat a school lunch?	[ ]	[ ]
Eat a packed lunch from home?	[ ]	[ ]
Go home for your lunch?	[ ]	[ ]
Eat out of school but not at home?	[ ]	[ ]

Did you at any time yesterday eat any amount of any of the following:

Breakfast cereals:		
Frosties or Sugar Puffs, Ricicles, Coco Pops?	[ ]	[ ]
Branflakes or Weetabix, Allbran, Branbuds, Sultana Bran, Fruit 'n' fibre?	[ ]	[ ]
Muesli or Shredded Wheat, Porridge, Ready Brek?	[ ]	[ ]
Rice Krispies or Cornflakes, Puffed Wheat, Pufa Pufa Rice?	[ ]	[ ]

Bread:		
White bread (slices or buns)?	[ ]	[ ]
Brown or wholemeal bread any type (slices or buns)?	[ ]	[ ]

Butter or margarine (including on bread, crispbread, potatoes or vegetables etc)?
If you had any butter or margarine yesterday do you think that it was:

Butter:	[ ]	[ ]
Hard margarine: e.g. Stork, Echo?	[ ]	[ ]
Ordinary soft margarine: e.g. Blue Band, Summer County?	[ ]	[ ]
Polyunsaturated spread: e.g. Vitalite or Flora?	[ ]	[ ]
Low fat spread: e.g. Outline, Gold, Freeway, Hi-life or Delight?	[ ]	[ ]

Did you at any time yesterday eat any amount of any of the following:	**Yes**	**No**
Biscuits:		
Plain biscuits eg malted milk, Digestives, Rich Tea etc?	[ ]	[ ]
Any Biscuits which were covered all over in chocolate: eg Kit-Kat, Penguin, United etc?	[ ]	[ ]
Cakes and puddings:		
Any sort of cake, Swiss roll (plain or chocolate), doughnuts scones, individual pies, jam tarts, custard tarts etc?	[ ]	[ ]
Any sort of pudding: Fruit pie, sponge pudding, tinned fruit, jelly, trifle, lemon meringue, cheesecake, milk pudding (like rice, semolina tapioca, custard etc) etc?	[ ]	[ ]
Sweets & chocolates:		
Sweets such as: boiled sweets, fruit gums or pastilles, liquorice, jelly sweets, chews, toffees, chewing gum etc?	[ ]	[ ]
Chocolates or chocolate bars like: Quality Street, Rolos, Mars Bar, Twix?	[ ]	[ ]
Ice cream, choc-ices, ice lollies, ice-pops?	[ ]	[ ]
Sugar:		
Sugar (white or brown) in any drink such as tea, coffee, cocoa etc	[ ]	[ ]
Sugar (white or brown) on any food such as cornflakes or pancakes?	[ ]	[ ]
An artificial sweetener (like saccharin, sweetex, sweet'n'low, canderel etc)?	[ ]	[ ]
Potatoes:		
Boiled potatoes?	[ ]	[ ]
Mashed potatoes?	[ ]	[ ]
Baked or jacket potatoes?	[ ]	[ ]
Roast potatoes?	[ ]	[ ]
Chips?	[ ]	[ ]
Crisps (any type or flavour)?	[ ]	[ ]
Fruit:		
Any fresh fruit such as apples, oranges (any type), pears, bananas, plums etc?	[ ]	[ ]
Vegetables:		
Baked beans?	[ ]	[ ]
Any type of salad such as: celery, tomatoes, lettuce, cucumber, celery etc?	[ ]	[ ]
Any fried vegetables e.g. Fried onions, fried mushrooms or fried tomatoes etc?	[ ]	[ ]
Any other vegetables e.g. Peas, cabbage, carrots, leeks, green beans, kidney beans, parsnips, tinned tomatoes, cauliflower, leeks, turnips or sprouts etc?	[ ]	[ ]
Meat		
Ordinary burger?	[ ]	[ ]
Ordinary sausages?	[ ]	[ ]
Low fat burger?	[ ]	[ ]
Low fat sausages?	[ ]	[ ]
Meat pie, Cornish pastie or sausage roll etc?	[ ]	[ ]
Minced meat?	[ ]	[ ]
Steak?	[ ]	[ ]
Fish		
Fish fried in batter?	[ ]	[ ]
Fish cooked in other ways e.g.	[ ]	[ ]
Tinned fish e.g. sardines, tuna, pilchards, etc?	[ ]	[ ]
Fish fingers?	[ ]	[ ]

Did you at any time yesterday eat any amount of any of the following:	**Yes**	**No**
Eggs		
Boiled?	[ ]	[ ]
Poached?	[ ]	[ ]
Scrambled	[ ]	[ ]
Fried?	[ ]	[ ]
Cheese		
Cheese e.g. Cheddar, Leicester, Cheshire?	[ ]	[ ]
Soft cheese e.g. Philadelphia, Dairy Lea?	[ ]	[ ]
Low fat cheese e.g. Shape or Philidelphia lite?	[ ]	[ ]
Take-away food		
Fish and chips?	[ ]	[ ]
Pizza?	[ ]	[ ]
Curries?	[ ]	[ ]
Chinese?	[ ]	[ ]
Kebabs?	[ ]	[ ]
Salt		
Did you put any Salt on your food?	[ ]	[ ]

Did you at any time yesterday drink any amount of:

Fizzy drinks (like: lemonade, soda stream, Coca-Cola, Pepsi, 7-UP, Fanta etc)

If you had any fizzy drink yesterday do you think that it was:		
Diet or low calorie sort of fizzy drink?	[ ]	[ ]
Regular or ordinary fizzy drink?	[ ]	[ ]

Still cordials (which you add water to like: orange squash, Ribena, Barley water etc)

If you had any still cordial yesterday do you think that it was:		
Diet or low calorie sort of still drink?	[ ]	[ ]
Regular or ordinary still drink?	[ ]	[ ]

Milk (including milk in tea, coffee, milkshakes, flavoured milk, cocoa or on cereals etc)

If you had any milk yesterday do you think that it was:		
Ordinary full fat milk?	[ ]	[ ]
Semi-skimmed or skimmed milk?	[ ]	[ ]
Alcoholic drinks:		
Beer, lager or cider	[ ]	[ ]
Wine	[ ]	[ ]
Sherry, Port, Martini, Cinzano, Pony, Cherry-B	[ ]	[ ]
Spirits such as whiskey, gin, brandy, vodka, rum Bacadi or Pernod	[ ]	[ ]

Appendix 3 Face validity questionnaire (Chapter 7)

The following format was used for each aspect of healthy eating.

As part of a healthy diet **lowering fat intake is important**. When advising on eating less fat, what are the most common foods you would ask clients to eat **MORE** of (list up to 10 foods 1=most important). Please include any brand names if you consider them appropriate e.g. PUFA fats: Flora or Vitalite. Please work quickly as your first impressions are the most important.

Foods to eat **MORE** of	Brand name (if appropriate)
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

As part of a healthy diet **lowering fat intake is important**. When advising on eating less fat, what are the most common foods you would ask clients to eat **LESS** of (list up to 10 foods 1=most important). Please include any brand names if you consider them appropriate e.g. PUFA fats: Flora or Vitalite. Please work quickly as your first impressions are the most important.

Foods to eat **LESS** of	Brand name (if appropriate)
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Appendix 4 Complete list of foods mentioned by dietitians who returned Face validity study questionnaires

Lowering SUGAR intake: Foods to eat LESS of n=40

Sweets	Yoghurt (added sugar)	Marmalade	Confectionary
Fizzy drink	Lucozade	Sugar in drink	Cream biscuits
Chocolate	Jelly	Honey	Custard/rice
Cakes	Fruit juice	Honey & syrup	Sweet pies
Biscuits	Mints	Fruit pies	Grapes
Sugar	Pastries	Syrup	Flavoured water
Puddings	Bottled sauce	Iced cake	Drinking chocolate
Sugared cereals	Horlicks	Chocolate biscuits	Ice lollies
Jam	Sugared Cereals	Ice cream	Chocolate bar
Squash	Dried Fruit	Alcohol	Sugar added to food

Lowering sugar intake: foods to eat MORE of n=57

Fruit and Vegetables	Malt loaf	Diet drinks	Low sugar mints
Fruit	Wholemeal Bread	Plain Biscuits	Low sugar marmalade
Vegetables	Pulses	Starchy Cereal	Oatcakes
Bread	Sandwiches	Sugar free tinned fruit	SF milk products
Pasta	Low sugar foods	Sugar free jelly	Low calorie choc drink
Artificial sweetener	Lean meat	High fibre breakfast cereal	Fruit juice
Rice	Fruit Bread	Salad	Savoury snacks
Sugar Free Drinks	SF chocolate drink	Fruit Juice	Starchy foods
Potatoes	Crumpets	Sugar free products	Lentils
Diet Yoghurt	Fibre foods	Scone	Toast
Low sugar quash	Water	Sugar free gum	Custard
Low sugar jam	Oat cereal bars	Crackers	Crisps
SF breakfast cereal	Sugar free cakes	Diet products	Popcorn
Sugar free puddings	Nuts	Unsweetened drinks	Semi-skimmed milk
Plain biscuits			

SF= sugar free

Appendix 4

Lowering salt intake: foods to eat MORE of n=56			
Vegetables	Frozen vegetables	Low salt breakfast cereal	Shredded Wheat
Fruit	Sweets Chocolate	Garlic	Fresh fish
Fresh meat	Low salt snacks	Low Salt margarine	Low salt foods
Herbs	Dried Fruit	Tinned Foods	Lime juice
Spices	Fresh sauces	Fresh Food	Milk
Fresh fruit	Salt free crisps	Low salt nuts	Low salt bread
Soup: Homemade	Low salt butter	Salt Substitute	Skimmed milk
Potatoes	Mustard	Unprocessed meats	Beetroot, Pickles
Pepper	Fruit Juice	Fruit and vegetables	Salt free rice cakes
Pasta	Eggs	Cottage cheese	Yoghurt
Lemon juice	Salad	Bread	Grilled Foods
Rice: No salt	Reduce salt at table	Vinegar	Water
Low salt tinned vegetables	Jam, Honey, marmalade	Home prepared Foods	Fish in Tomato sauce
Herbs/Spices	Porridge	Un-smoked fish	Tomato Puree

Lowering SALT intake: foods to eat LESS of n=32			
Crisps	Salt	Bacon	Spreads
Cheese	Bovril	Stock cubes	Chinese foods
Tinned soup	Processed foods	Ready meals	Savoury snacks
Tinned Vegetables	Packet soups	Gravy mixes	Savoury rice
Processed meat	Sauces	Add salt to cooking	Fish paste
Nuts	Smoked meats	Boiled ham	Dried foods
Salt added to food	Marmite	Salty snacks	Digestive biscuits
Tinned fish	Meat pies	Smoked fish	Butter/margarine

Increasing fibre intake: foods to eat MORE of n=41			
			Cereal bar
Wholemeal bread	Lentils	Wholemeal flour	Bread
Vegetables	Pulses and beans	Wholemeal pasta	Granary
Fruit	Nuts	Beans	Wholemeal bread rolls
High fibre breakfast cereal	Fruit & Vegetables	High fibre cereals	Wholemeal pastry
Brown rice	Nuts	High fibre white bread	Vegetable soup
Pulses	Tinned peas	Digestive biscuits	Butter beans
Wholemeal pasta/rice	Malt loaf	Oats	Sweetcorn
Baked potato	Oat biscuits	High fibre crackers	Weetabix
Fluid/H2O	High fibre cakes	Salads	Branflakes
Dry fruit	Wheatbread	High fibre biscuits	Ready Breck

Appendix 4

Increasing fibre intake: foods to eat Less of n=37

White Bread	Cakes Plain	White flour	Butter and margarine
Biscuits	Sweets and chocolate	Cornflakes	Fatty meat
White rice	Pies	Mashed potato	Sugared puddings
Cake	Sugar	Refined cereals	Decrease meat portions
Sweets	Sweet drinks	Plain biscuits	Cakes and pastry
Chocolate	Plain cracker	Rice Krispies	Confectionary
White pasta	Refined CHO	Fruit Pies	Full fat dairy foods
Chips	Sugary foods	Boiled potatoes	Low fibre breakfast cereal
Crisps	Fruit Juice	Creamed soup	Peeled vegetables & Fruit
Tin fruit			

Lowering fat intake foods to eat MORE of n=57

Fruit	Starchy CHO	Unsaturated oils	Fluid (no sugar)
Vegetables	Low fat cheese	MUFA	Noodles
Pasta	Low fat yoghurt	Semi Skimmed	Grilled foods
Potatoes no fat	Salad	Cottage Cheese	High fibre foods
Rice any type	Low fat dairy foods	White fish	Low fat mayonnaise
Bread	Wholemeal bread	Low fat products	Low fat ice cream
Low fat spread	Chicken &Turkey	Low fat desserts	Diet foods
Breakfast cereals	Brown Bread	Skimmed milk	Wholegrain prod
Fish	Cereals	Baked potatoes	Oven chips
Low fat milk	Baked beans	Fruit & Vegetables	Casseroles
Chicken	Low fat puddings	PUFA	Teacake
Pulses	Oily Fish	Added bran	Dried food
Lean meat	Oatmeal	Low fat snacks	White bread
Rice	Rice white & brown	Beans	Sugar
Cereals			

Appendix 4

Lowering fat intake: foods to eat LESS of n=63			
Butter	Cooking oil	Margarine	Pies
Pastry	Chips	Crisps	Cakes
Biscuits	Fatty meat	Processed meats	Full fat spread
Saturated fat	Full fat cheese	Salami	Spreading fat
Lard/dripping	dressing	Full fat dairy products	Nuts
Take away meals	Confectionary	Chocolate	Pate
Cream	Burger	Healthy cooking techniques	Ice cream
Decrease meat portions	sauces	Mayonnaise	Puddings
Creamed soups	Sugared drinks	Fat on meat	Roast potatoes
Sugar	Chicken(no skin)	Decrease semi-skimmed milk	Spam fritters
Low fat spread	Alcohol	Reduce saturated fats	Battered fish
Eggs	Corned beef	Mayonnaise/salad cream	Fried fish
Pizza	Fried breakfast	Decrease saturated fat	Fatty meats
Full fat yoghurt	Bacon	battered foods	Full fat milk
Bombay mix	Fried foods	Kebabs	High fat snacks
Fried Mars bars	Sausage	Doughnut	

Appendix 5 Assessment of sample size in dietary studies (Hall 1983)

$$n = 2 \cdot \left[\frac{(Z\alpha - Z\beta)\sigma}{\delta} \right]^2$$

Where,

n = the sample size in each group

Zα = the upper α percent point of a normal distribution (α is the probability of a false positive error)

Zβ = the lower β percent point of a normal distribution (β is the probability of a false negative error).

σ = the SD of the variable under study (Mean score of food group): based on the assumption that it is approximately the same for both groups.

δ = the difference in population means that is thought to be of interest.

The formula reduces to:

$$n = 2 \cdot \left[\frac{3.3.\sigma}{\delta} \right]^2$$

e.g. To estimate the sample size required to detect a change in mean score of two foods in the negative foods group:

$$n = 2 \cdot \left[\frac{3.3 \cdot 4.9}{2} \right]^2$$

n = 132

Where: 4.9 = SD of mean score for negative food group
2 = The difference in mean scores between survey

Appendix 6 Parental letter for main study (Chapter 14)

North Mersey Community Trust
Abercromby Health Centre
Grove Street
Liverpool L7 7 HG
Telephone: 0151-708-9370

Dear Parent,

Diet survey of 11-14 Year-old schoolchildren

This project is concerned with the food habits of Liverpool schoolchildren. It is being conducted by Liverpool John Moores University, North Mersey Community NHS Trust, and Liverpool City Council. The project will take part in your child's school. The project will have two parts:

Part One: Diet survey

This will take part in your child's school. He/She will be asked about his/her diet. The questionnaire will take between 15 and 30 minutes. The school has agreed to participate and the information collected will be kept strictly confidential and will not be used for any other purpose other than his study. ***YOUR CHILD CAN LEAVE THE STUDY AT ANY TIME WITHOUT QUESTION.***

Part Two: Focus group study

Some children who take part in the diet survey will be invited to attend a focus group. The focus group will discuss why children eat particular foods and their views on diet and health. We will not be asking any sensitive questions e.g. concerning alcohol consumption. The focus group will take forty five minutes and will be conducted by two university staff.

If you would like to give your signed consent for your child to take part please complete the slip below, returning it to school. If you would like any further information please contact: *Brian Johnson, John Moores University 0151-231-5271.*

Please tick one box

I would like my child to take part in the study [ ]

I would not like my child to take part in the study [ ]

Signed..... Parent/guardian

Date .....

PLEASE RETURN THE COMPLETED SLIP TO CLASS YOUR TEACHER.

Appendix 7 Phrases and statements used for card game

It will help prevent heart disease	It contains sugar
It will help me lose weight	It contains fat
It will help keep me fit	It contains vitamins
It is healthy	I must eat breakfast
It will help me look good	Cooked meals are best
It makes me feel good	I must eat regular meals
It tastes good	It contains fibre
Information from T.V.	It is healthy
Doctors say its good for me	I can make choices for myself
Magazines articles	I can eat what I like as long as I am fit
Friends say its good for me	I can be with friends
Parents say its good for me	Snack foods are for young people
Friends may laugh if I eat it	I can eat it at home
It is easy to eat	I can afford it
It is too expensive	I do not have to prepare it

All cards were presented as 3 inch squares. Typed in Black on yellow card

Appendix 8 Quotations used for focus group discussion

The quotations derived from Focus group text are grouped under the five key areas described in chapter twelve. For brevity they were not included in the main text.

1. Nutrition and dieting

F 1. *"It's one were you've got calories...* **F2.** *"you have carbohydrate and protein...* **F1.** *"like fruit and vegetables and healthy food like that."*

F. *...mostly like vitamins, fruit and that, but you've got to have some meat and that...you've got to have fibre from bread... and some meat and egg.* **M.** *protein from meat and fish "It's good but its bad in the same way... it doesn't make sense but it's good and it's bad".* ***Group2/good***

M. *"fatty foods... too much fat in your food ... You can choose to eat those"*

M. *"er, its like part of a healthy diet, and I know you have to exercise but its good to have a healthy diet".* **Group2/good**

F. *exercise is also good for you...* **M.** *yes...you need to burn the fat off... I think that... lots of us think it's ok if you burn the fat off you can eat and stay fit.* **Group 6/poor**

***F*1.** *" You think about it when you are putting loads of salt on your chips.* **F2.** *You're just doing it for the taste...* **F1.** *Of course its important but nobody is bothered.* **F2.** *It's afterwards that you like face the consequences.....it's afterwards that you realise I shouldn't eat so many chips because it's killing me now but....* **F3.** *... you don't really think I'm going to have 23 calories I shouldn't eat it, you just eat what's there"* **Group 2/good**

M. *"but it's because you have to keep fit, regular meals can help keep you fit, that's what I think"* **Group 4/poor**

F. *"I never eat breakfast* [Unison]*...well because my dad says eat.. you've got to eat breakfast* [Unison] *it's the most important meal of the day and things like that".* **Group 5/poor**

F. *"... because fat doesn't always mean that it's... fat is energy... and you need your energy but like calories are not necessarily the same thing"*

F. *Vitamins are really important...* **F.** *but I don't vitamins to make me hyperactive...* **F.** *but you need fibre..* **M.** *without enough fibre you can't go to the toilet... [laughs] and then you get pains...* **M.** *so you need fruit so you won't be sick"*

F. *"it builds your energy up"* **M.** *it can build your muscles... makes you stronger.. F. makes you more energetic...* **F.** *From foods that contain a load of fat... "* **Group 5/good**

When asked: What food is bad for you?

F. *Fried stuff...* **M.** *junk food...* **Group 7/poor**

F. *Chips, burgers, pizza and things like that* **Group 6/poor**

F *"well chocolate and that are nice to eat and we're not going to stop eating them but I know that too much fat can give you heart disease but it's not something we think about".* **Group 6/poor**

F1. *" 'cause you feel you haven't got time for it...*
F2. *I don't feel like it...* **F3.** *I eat my breakfast in the night before I go to bed....* **Group 8/poor**

F. *" but it's so important my mum always says and make sure you get up early and I will make you porridge... "*

F1. *"everyone is on a diet... they are munching... like sweets ..eating with care.* F2. *"they just don't eat like they should some don't eat meals.... They don't have breakfast because they think they are fat".* **Group 2/good**

F. *"she's not starving herself, she's cutting down on things... Cutting down is not on a diet"* **Group 4/good**

F1. *" we don't call them diets because they are too strict.*
F2. *"You don't call them diets you call them eating healthily"*
F1. *"dieting is not eating anything that is fatty. We are going on a health week but it is not a diet... "* **Group 1/good**

F1. *" you will only go on them* ["diets"] *for four days at the most"*

Group 2/good

F. *"Yes, I think so, well sort of... you know they are on and off... not serious ones. You know they say I want to be skinnier."*
Group 2/good

F3. *The thing is it's your parents... say you don't need to go on a diet.*
F2. *Exactly.* **F1**. *But you feel you do don't you.* **Group 1/good**

F1. *"you just have an inspiration, your sitting there eating bars of chocolate ...* **F2**. *And then you start moaning and go I'm too fat"*
Group 1/good

F1 *" some of my friends think they are too fat and do the same* [go on a diet]. **Group 4/good**

Sources of information

F1. " *my mum normally decides what to eat...* **Group 1/good**

F1. " *some people don't like vegetables and they* [parents] *say eat them... they're healthy...* **M1**. *they make you grow that's what mine say...* **Group 5/ poor**

F1. *"parents say it's healthy..* **F2**. *No.* **F3**. *No ...* **M1.** *You just don't listen to your mum and dad...* **Group 7/ poor**

F1. *Its just when I feel like listening to them, then you listen but if you don't..* **F2**. *you just turn off... "* **Group 1/ good**

F1. *...but sometimes you will make a cake with your mum..* **F2**. *mother and daughter bonding, talk about what the day has been like ...problems with fella's while your sitting peeling the carrots...* **Group 2/ good**

F1. *you can gossip about someone... she [mother] will not go back and tell anyone... it's the only person you can trust..* **Group 2/good**

M1. *my auntie does fitness training and she tells me what to do...*
Group 1/good

M1. yes my mum is into healthy eating and that...

F2. *toast...* **M1.** I *made bread yesterday... and he [father] said he couldn't afford to Stay off work [laughs]* **F1**. *my mum and dad will let me cook... apple pie this week...*
Group 4/good

F1. *..you make simple things like bacon sandwiches* **F2**. *or microwave it different things....* **F3**. *you will make something like dessert...*
Group 2/ good

F1. *...yes you do try new snacks and stuff like that but other things... family foods you wouldn't eat outside [with friends]...you know meals and things like meat and fish and vegetables. . I would eat them at home...*
Group 1/ good

F1. *like when you go out to town ...you seem to go to the big nice restaurants, but with your friends you just go to MacDonald's...*
Group 6/ poor)

Friends and peers

F1. *"they [lads] look like...fools. You don't see them eating salads... if a lad came out with a plate of salad and said I'm watching my weight...* **F2.** *the rest of the lads will laugh at him*
Group 2/ good

M1. *... cause if you eat carrots or something your friends may skit... in the canteen they look at you funny.* **Group 6/poor**

F1. *but lads would never eat salads... they would eat meat pies.* **F2.** *they don't come out with lettuce do they...*
Group 5/poor

F1. *If you have a big massive meal... [laughs] sometimes when you finish your dinner they [lads] call you a "scav" [scavenger] because you have left an empty plate.* **Group1/good**

F1. *yes, when people look around and see what you are eating like that... and especially lads* **M1**. *yes, come in with a carrot instead of a packet of crisps....* {Laughter}

Group 4/ poor

F1. *I suppose... making changes should be good for you but you can't Be seen as a divvy* [looking silly, not cool].... **M1** *It* [making changes] *would have to be seen as ok to everyone...* **Group7/poor**

F1. *"I think you take advice from...* [friends] **F2.** *You listen to friends more than your parents"* **R.** how factual are they *?* **F1.** *not very...*
Group 2/good

M1. *... you want to listen to friends don't you ...* **F1.** *No, 'cause like they don't know anything.* **Group 8/poor**

F1. *... if you are out with your friends you go to MacDonalds, and if you are with your mum and dad you go to a café.*

Group 4/good

F1. *I'd say you eat snack foods while your out with your friends...*

Group2/good

F1. You can't exactly go to a burger bar and say can I have a salad... **Group2/good**

M. *"You are unfit if you have a lot of fat ..***M.** *if you eat too much fat you gain weight and that"* **F.** *Yes, cause you die... some fella on the telly is forty stone...* **F.** *have you seen the fella in the paper who cannot get out of his bed... he is unfit...*
Group 5/poor

Appearence

F. ..."*they* (friends) *don't have breakfast because they think they are fat"*
Group 5/poor

F. *"Girls in dancing are always saying do I look fat in this, when they wear their leotard, so it's only girls who are saying stuff like that".* **Group 2/good**

F3. "*We only put it there because we are four girls, and most girls think it's important. It's not important for lads* [losing weight] " [laughs] **Group 1/good**

F. *"Lads are concerned (about their weight) they just don't want to admit it."*
Group 2/good

F1. *If you think you are ok and are happy with your look you don't listen to them [other peers]...* **F2**. *so long as your friends don't think nothing.*
Group 1/good

R. So is appearance and skin important when choosing what to eat?
M *Yes sometimes it does.* **F.** *Yes, I wouldn't eat chips all the time, like fattty meats 'cause that would make you all spotty because of the fat* ***M.*** *Show big fat blokes (interupted by **F**).. or skin, hair teeth, or if you were fat.*
Good 4/good

Discussing what parents say about being healthy

F. [unison] *Eat more fruit, eat more vegetables,... Liver...* ***F.*** *drink water it will make your skin brighter....* ***F.*** *You've got a bad diet.* R. Do you think that's right? ***F.*** *It probably is, when you drink warm water it makes your skin, it washes the pores* ***F.*** *And yes it cleans your system* ***F.*** *Looking good... .....**F.** Without spots,* ***F.*** *Look healthy.* **Group 2/ good**

R. What's look healthy? ***F.*** *Healthy.. when you feel right... and happy, you feel good. R Anything else?* ***F.*** *If your not healthy it doesn't help you, it's the shape of you as well and the state your in....F. and you have to think about exercise* **Group 2/ good**

F. *Probably girls because they see all the skinny models and feel they have to be skinny as well. Like it shows you pictures of people that are really, really fit and they're healthy and they eat salads and that's why they look like that... and you could look like that too.* **M.** *Not with boys.* **R.** *Does it tend to be the opposite way? Yes... ...Pause.... but... I also think some lads would like to look like the pictures of footballers and that but I know I wouldn't tell me mates about it.*

Group 5/poor

R. [discussing card choice] is how you look important? *yes, like fat or skinny... 'cause if you were far overweight you would go on a diet wouldn't you if you were* really... **R.** Is it just about weight or is it about anything else? **F.** *No, 'cause if you eat like ... healthy your skin and all that will look good and your hair and whatever* **F.** *and if you eat sweets all the time your teeth will go bad.* **R.** Ok, is that appearance? **F.** *Yes.. it's the main reason why you would... you want to look good* ... **F.** so you feel better.

Group 7/poor

5. Making changes

R. *Go on to the sometimes, you sometimes listen to parents don't you?*

F. It's just when I feel like listening to them , then you listen but if you don't..[interupted] F. you just turn off, and, ... **F.** Get your arm broken. **F.** you listen if your interested or you think it might be right, but most of the time you don't.

Group 3/good

R. So do you listen to parents?

M. Sometimes... **F.** If I like it I'll eat it. **M.** I don't listen... **R.** *Even if they say it is good for you?* **M.** Yes... you can't eat something you don't like can you

Group 1/good

R. So your weight will make you think about changing?
F. *Yes your weight...* **F.** *And your health* **R.** Your health? *F. It's the most important as well. F. If you got ill or you were seriously overweight, youv'e got like too much fat on your heart and all that... Cholesterol.*

Group 2/good

F. Parents say its healthy F. No.. **F.** No... You just don't listen to your mum and dad.

Group 5/poor

R. (discussing cards) **" I can make choices for myself"** *is that important being in control of what you eat?* **M.** I am not really in control of what I eat I don't really make any decisions.. **F.** yes its just what I'm given.... **M.** I would like to be but my mum won't let me.

Group 1/good

Discussing things that would help young people make changes

R. Ok you would have some pictures of people with diseases, you would have information **F.** *how to prevent them and what to do once you've got them.* ***R.*** *when you said exercise what do you mean, what aspect of exercise?* **F.** *jogging and bike riding.* F. *sit-ups are good aren't they F. and walking and do little activities like rock climbing* [laughs] **F.** *pamphlets and leaflets so, saying about what you are doing in the lesson.*

R. *So what types of things do you think they [boys] would be interested in?* **F.** *Exercise football and lots of football.* **F.** *more sports for the lads, because they don't really care about their skin, or anything.* **F.** *Eating healthy for them would be eat lots of meat and stuff like that because it is a Macho food*

Group 2/good

F. *Pictures of illness and prevention.* **R** What else would you include? **F.** *People that have got illness or know someone who has illness because they ate so much or because they, I don't know, diabetes with sugars and stuff.*

Group 2/good

R. *Ok, We are interested in what would encourage young people to make changes …* **M.** *Show them what they would look like in a few years time.* **F.** *Yes. Its not so much the heart and that because they don't care what's happening to them, its what they look like, their appearance would be more better to get them to change wouldn't it.* R. *so would you do that as part of a class lesson?* **F.** Yes, (**M.** yes) in biology or PE or something because its difficult to fit it in.

Group 1/good

F. *They* [other young people] *don't care if they are not going to die till they are older or something. Its like smoking, people do that and they know, it's the same as food. It's about what they look like not that they are more bothered about...* **M.** *They don't really care about what's going to happen in twenty years time its about what happens now.*

Group 8/poor

R. If you were asked to design a school lesson to tell your friends how to eat a healthy diet what would the lesson contain?

M. *Eat less fat some information.* **F.** *Showing something like a diseased heart... or a healthy one , organs from the body... it brings it home more.* **F.** *I think it would be good to do things together... 'cause food technology's more about in the kitchen and that, cooking, how to learn to cook properly. PE's is outside...* **M.** *Like a lesson to do with the sorts of sports you should do and the healthy foods you should eat, I think they should have a lesson that goes together like that...* **F.** *Like use exercise bikes and running machines and that and then get some leaflets….*

R. What is the key time that people think about changing?
F. *When they are older... don't they then they think about all the time they wasted.* **F.** *Yes its…. I think it starts right now to like when your like ten you are not bothered are you and when you start learning more you start getting a bit more interested. More independent.* **Group 7/poor**

R. who else could come in and talk about food and nutrition? **F.** *the doctors.. the nurses or the* ***dentist*** **F.** *he comes into school..* **F.** *they would just*

say don't eat sweets because of your teeth m. the people do know what's healthy for you and what is not... **F.** *you know like the doctor comes in and he tells you are eating unhealthy food ... ... and you will see the nurse or whatever someone like anybody in the hospital world... medical.* **M.** *most people change their lifestyle because they may be like they are fat or something and they want to change...* **F.** *No be skinny...* **M.** *be one of the agile more* **M.** yes F. be a model....

Group 1/poor

F1. *"but you don't have to change much to be fit you just have to stop eating chocolate...* **F.2** *it's not that about eating chocolate it's about eating sensible... some meats can be fatty like bacon..*
F1. *if you like bacon...* **F2.** *Vegetables... people might get bored of vegetables... they are just water and taste of nothing...* **Group 5/poor**

Appendix 9 Categories derived from focus group analysis (Chapter 5).

Five categories were derived from the focus group analysis after reducing the key themes generated by the data.

1. Nutrition & Dieting

Two themes were grouped together which showed a link between nutrition and diet and health.

Nutrition

Vitamins	Healthy eating definitions	Nutrition knowledge/awareness
Fibre	Sugar	Skipping meals
Junk food	Balanced diet	Health foods
Confusion	Health food claims	Cooking snacks
"Kids" food	Consumer issues	

Dieting

Definition of diet	Peer acceptance	Appearance
Health/motivation	Gender roles	Advertising/media

2. Friends and peers

Sub codes of snacks, friends and Peers and joking were combined into one sub group. Many of the perceptions of identifying with friends and peers were described using examples of snack and fast foods. The use of jokes and humour was directed at young people by young people. This category shows the social significance of food and diet in the lives of young people.

Friends and peers

Self-esteem	Friends and "others"	Youth culture
Food culture/snacking	Knowledge/advice	Ridicule
Healthy eating		

Snacks

Fast food versus normal food	Friends/culture	Health concerns
Feminine/male foods	Taste/hedonism	Appearance
Adults/Kids	Cooking snacks at home	

Humour

Knowledge/understanding	Eating the wrong foods	Bowels

3. Sources of information

Two themes were combined to form this group.

Parents and teachers

Parental control	Role models	Family relationships
Independence	Trust	Ambivalence
School teachers		

Sources of information

Scepticism	Role models	Advertising	Friends
Trainers/teachers	Sport coaches	School	Family
Health scares			

<u>4. Appearance</u>

Appearance and health and fitness themes were collapsed together into one group.

Appearance

Looking good	Looks/health	Physical appearance	Being normal
Feeling good	Emotions	Self-esteem	Role models
Salads			

Health and Fitness

Functional	Fun & enjoyment	mental well-being	Feel good
Obesity	Friends/family differences	Appearance	
Nutrition/vitamins			

5. Making changes

Two groups of comments under the headings making changes and independence were considered as one larger group. This coding group described the motivations and the barriers to behaviour changes.

Making changes

Practical sessions	Pictures	Magazines	Motivation
Appearance	Critical incidents	Hedonism	School

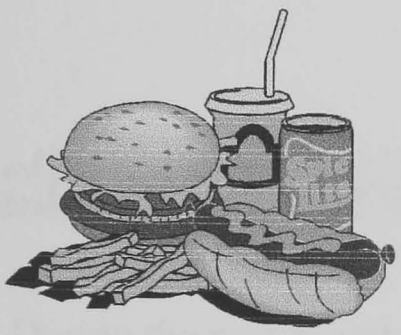
Independence

Parents/control	Not being listened to	Ambivalence to adults/teachers
Making choices	Neophobia	Culture/control
Adult role models		

Appendix 10 The combined Behaviour & Choice Questionnaire

What do you think?

Diet and Health
Your views



We would really like to know what your views on diet and health are. This questionnaire will ask you some questions about why you eat certain foods. There are no wrong or right answers; we are interested only in **YOUR** opinions and what you think is important to **YOU**. Please answer all the questions.

All the information you give will be kept secret, and no teacher at the school will see your answers.

Class .....
School .....

Start here

About Yourself

1. Are you a boy or a girl? Boy [ ] Girl [ ]

2. Age in Years .....

3. School Year .....

4. Do you receive a free school meal?

Yes	No
[ ]	[ ]

Activities and Hobbies

5. During the past month have you taken part in any of the following (tick more than one box if you need to)

Football	[ ]	Played computer games	[ ]
Rugby	[ ]	Used the Internet	[ ]
Swimming	[ ]	Watched a video	[ ]
Dancing	[ ]	Listened to music	[ ]
Jogging	[ ]	Gone to the cinema	[ ]
Athletics	[ ]		
Cycling	[ ]		

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6. In general would you say your health is:

☑ Your Health

Tick one box

Excellent	[ ]
Good	[ ]
Fair	[ ]
Poor	[ ]

7. Which one of the following agrees with **YOUR** view on improving **YOUR** health.

☑

Tick one box

There is **LITTLE** you can do for yourself Which will help improve your health it is all down to fate or luck.	[ ]
There are some things you can do for yourself which **MIGHT** help improve your health.	[ ]
There are some things you can do for yourself that will **DEFINITELY** help to improve your health.	[ ]

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What do you think?

8. Below are a number of things that young people have said are important when choosing what to eat. For each one please say if you agree or disagree by putting a tick in the box.

	Strongly Agree	**Agree**	**Neither Agree or Disagree**	**Disagree**	**Strongly Disagree**
I would not eat a food if my friends skitted me	[ ]	[ ]	[ ]	[ ]	[ ]
If my friends were eating the same food I would eat it as well.	[ ]	[ ]	[ ]	[ ]	[ ]
Eating too many healthy foods makes me look like a health-freak	[ ]	[ ]	[ ]	[ ]	[ ]
I will try a new food if I am out with friends	[ ]	[ ]	[ ]	[ ]	[ ]

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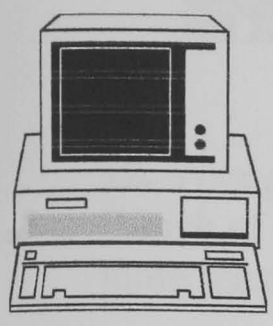

Computers

9. Do you have regular use of a computer at home or in school?

Yes [ ]

No [ ]

10. *If YES* what do you use it for?

Playing games [ ]
Using the Internet [ ]
Using educational CD Rom [ ]
Schoolwork [ ]
Writing letters/ e-mail [ ]

True or False?

11. Which of the following is true or false.

	True	False	Don't know
To be healthy you need to eat at least THREE portions of fruit and vegetables each day.	[ ]	[ ]	[ ]
Fat contains more calories than sugar	[ ]	[ ]	[ ]
You need vitamin supplements to stay healthy.	[ ]	[ ]	[ ]
Heart disease begins when you are young.	[ ]	[ ]	[ ]

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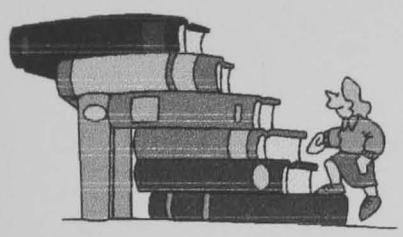

12. Young people can find information about food and health from different sources. Which of the following do you think is a good source of information for you (Tick more than one box if you need to).

☑

	Important	**Not important**	**Not sure**
Family	[ ]	[ ]	[ ]
Friends	[ ]	[ ]	[ ]
School teachers	[ ]	[ ]	[ ]
Magazines	[ ]	[ ]	[ ]
Internet	[ ]	[ ]	[ ]
Computer activity, (CD Rom)	[ ]	[ ]	[ ]
Sports Coach/ PE teacher	[ ]	[ ]	[ ]

13. Have any of these sources of information taught you any useful facts about diet and health? (*Tick more than one box if you need to*).

☑

	No facts	**Some facts**	**A lot of facts**
T.V. Advertisements	[ ]	[ ]	[ ]
T.V. programmes	[ ]	[ ]	[ ]
Newspapers	[ ]	[ ]	[ ]
Magazines just for young people	[ ]	[ ]	[ ]
School lessons	[ ]	[ ]	[ ]
The Internet/CD ROM	[ ]	[ ]	[ ]
Posters/leaflets	[ ]	[ ]	[ ]

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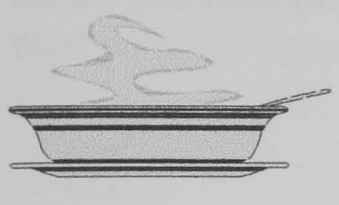

My Diet

16. Here are a number of things which some young people have said about their diet. Show how much you agree or disagree with what they have said.

For each one tick the box that you agree with most

	Strongly Agree	**Agree**	**Neither Agree or Disagree**	**Disagree**	**Strongly Disagree**
It is important for my diet to be healthy	[ ]	[ ]	[ ]	[ ]	[ ]
It is important that I eat regular meals	[ ]	[ ]	[ ]	[ ]	[ ]
I think healthy foods taste nice	[ ]	[ ]	[ ]	[ ]	[ ]
I would like to try as many new foods as I can	[ ]	[ ]	[ ]	[ ]	[ ]
Eating healthy foods makes me look cool	[ ]	[ ]	[ ]	[ ]	[ ]

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Not long to go now!

17. Here are some more things young people have said about why they eat certain foods. For each phrase show how much you agree or disagree with it by ticking one box.

	Strongly Agree	**Agree**	**Neither Agree or Disagree**	**Disagree**	**Strongly disagree**
Eating a healthy diet will help prevent disease.	[ ]	[ ]	[ ]	[ ]	[ ]
Eating a healthy diet gives me a healthy body.	[ ]	[ ]	[ ]	[ ]	[ ]
Eating a healthy diet will help me look good.	[ ]	[ ]	[ ]	[ ]	[ ]
I still need a healthy diet even if I'm fit	[ ]	[ ]	[ ]	[ ]	[ ]

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Time for a change?

18. Different school activities can be used to get you to think about changing diet. Which of the following would help you in making changes to your diet. (Tick more than one box if you need to).

☑

	Would be helpful	**Would not helpful**
Having lessons on healthy food just for boys.	[ ]	[ ]
Having lessons on healthy food just for girls.	[ ]	[ ]
Designing a poster for use in the school canteen or tuck shop.	[ ]	[ ]
Including information about food and nutrition in P.E. lessons.	[ ]	[ ]
Having a food magazine in school just for young people.	[ ]	[ ]
Being able to buy more healthy foods in the school tuck shop and canteen.	[ ]	[ ]
Learning how diet can affect your teeth.	[ ]	[ ]
Learning how to look good and stay healthy.	[ ]	[ ]
Having access to an Internet site with information just for young people.	[ ]	[ ]
School lessons on how diet can help to prevent disease.	[ ]	[ ]

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19. YOUR DIET

Do you get a free school meal? (Please tick the box) **Yes [ ] No [ ]**

Please tick a box to answer Yes or No.

	Yes	No
Yesterday, did you have anything at all:		
to eat or drink before leaving home to come to school?	[ ]	[ ]
to eat or drink on your way to school?	[ ]	[ ]
Yesterday, did you:		
Eat or drink nothing at lunch time?	[ ]	[ ]
Eat a school lunch?	[ ]	[ ]
Eat a packed lunch from home?	[ ]	[ ]
Go home for your lunch?	[ ]	[ ]
Eat out of school but not at home?	[ ]	[ ]
Did you at any time yesterday eat any amount of any of the following:		
Breakfast cereals:		
Frosties or Sugar Puffs, Ricicles, Coco Pops?	[ ]	[ ]
Branflakes or Weetabix, Allbran, Branbuds, Sultana Bran, Fruit 'n' fibre?	[ ]	[ ]
Muesli or Shredded Wheat, Porridge, Ready Brek?	[ ]	[ ]
Rice Krispies or Cornflakes, Puffed Wheat, Pufa Pufa Rice?	[ ]	[ ]
Bread:		
White bread (slices or buns)?	[ ]	[ ]
Brown or wholemeal bread any type (slices or buns)?	[ ]	[ ]
Butter or margarine (including on bread, crispbread, potatoes or vegetables etc)?		
If you had any butter or margarine yesterday do you think that it was:		
Butter:	[ ]	[ ]
Hard margarine: e.g. Stork, Echo?	[ ]	[ ]
Ordinary soft margarine: e.g. Blue Band, Summer County?	[ ]	[ ]
Polyunsaturated spread: e.g. Vitalite or Flora?	[ ]	[ ]
Low fat spread: e.g. Outline, Gold, Freeway, Hi-life or Delight?	[ ]	[ ]
Did you at any time yesterday eat any amount of any of the following:	**Yes**	**No**
Biscuits:		
Plain biscuits eg malted milk, Digestives, Rich Tea etc?	[ ]	[ ]
Any Biscuits which were covered all over in chocolate: eg Kit-Kat, Penguin, United etc?	[ ]	[ ]
Cakes and puddings:		
Any sort of cake, Swiss roll (plain or chocolate), doughnuts scones, individual pies, jam tarts, custard tarts etc?	[ ]	[ ]
Any sort of pudding: Fruit pie, sponge pudding, tinned fruit, jelly, trifle, lemon meringue, cheesecake, milk pudding (like rice, semolina tapioca, custard etc) etc?	[ ]	[ ]

	Yes	No
Sweets & chocolates:		
Sweets such as: boiled sweets, fruit gums or pastilles, liquorice, jelly sweets, chews, toffees, chewing gum etc?	[ ]	[ ]
Chocolates or chocolate bars like: Quality Street, Rolos, Mars Bar, Twix?	[ ]	[ ]
Ice cream, choc-ices, ice lollies, ice-pops?	[ ]	[ ]
Sugar:		
Sugar (white or brown) in any drink such as tea, coffee, cocoa etc	[ ]	[ ]
Sugar (white or brown) on any food such as cornflakes or pancakes?	[ ]	[ ]
An artificial sweetener (like saccharin, sweetex, sweet'n'low, canderel etc)?	[ ]	[ ]
Potatoes:		
Boiled potatoes?	[ ]	[ ]
Mashed potatoes?	[ ]	[ ]
Baked or jacket potatoes?	[ ]	[ ]
Roast potatoes?	[ ]	[ ]
Chips?	[ ]	[ ]
Crisps (any type or flavour)?	[ ]	[ ]
Fruit:		
Any fresh fruit such as apples, oranges (any type), pears, bananas, plums etc?	[ ]	[ ]
Vegetables:		
Baked beans?	[ ]	[ ]
Any type of salad such as: celery, tomatoes, lettuce, cucumber, celery etc?	[ ]	[ ]
Any fried vegetables e.g. Fried onions, fried mushrooms or fried tomatoes etc?	[ ]	[ ]
Any other vegetables e.g. Peas, cabbage, carrots, leeks, green beans, kidney beans, parsnips, tinned tomatoes, cauliflower, leeks, turnips or sprouts etc?	[ ]	[ ]
Meat		
Ordinary burger?	[ ]	[ ]
Ordinary sausages?	[ ]	[ ]
Low fat burger?	[ ]	[ ]
Low fat sausages?	[ ]	[ ]
Meat pie, Cornish pastie or sausage roll etc?	[ ]	[ ]
Minced meat?	[ ]	[ ]
Steak?	[ ]	[ ]
Fish		
Fish fried in batter?	[ ]	[ ]
Fish cooked in other ways e.g.	[ ]	[ ]
Tinned fish e.g. sardines, tuna, pilchards, etc?	[ ]	[ ]
Fish fingers?	[ ]	[ ]

Did you at any time yesterday eat any amount of any of the following:	**Yes**	**No**
Eggs		
Boiled?	[ ]	[ ]
Poached?	[ ]	[ ]
Scrambled	[ ]	[ ]
Fried?	[ ]	[ ]
Cheese		
Cheese e.g. Cheddar, Leicester, Cheshire?	[ ]	[ ]
Soft cheese e.g. Philadelphia, Dairy Lea?	[ ]	[ ]
Low fat cheese e.g. Shape or Philidelphia lite?	[ ]	[ ]
Take-away food		
Fish and chips?	[ ]	[ ]
Pizza?	[ ]	[ ]
Curries?	[ ]	[ ]
Chinese?	[ ]	[ ]
Kebabs?	[ ]	[ ]
Salt		
Did you put any Salt on your food?	[ ]	[ ]

Did you at any time drink any amount of:

Fizzy drinks (like: lemonade, soda stream, Coca-Cola, Pepsi, 7-UP, Fanta etc)		
If you had any fizzy drink yesterday do you think that it was:		
Diet or low calorie sort of fizzy drink?	[ ]	[ ]
Regular or ordinary fizzy drink?	[ ]	[ ]
Still cordials (which you add water to like: orange squash, Ribena, Barley water etc)		
If you had any still cordial yesterday do you think that it was:		
Diet or low calorie sort of still drink?	[ ]	[ ]
Regular or ordinary still drink?	[ ]	[ ]
Milk (including milk in tea, coffee, milkshakes, flavoured milk, cocoa or on cereals etc)		
If you had any milk yesterday do you think that it was:		
Ordinary full fat milk?	[ ]	[ ]
Semi-skimmed or skimmed milk?	[ ]	[ ]
Alcoholic drinks:		
Beer, lager or cider	[ ]	[ ]
Wine	[ ]	[ ]
Sherry, Port, Martini, Cinzano, Pony, Cherry-B	[ ]	[ ]
Spirits such as whiskey, gin, brandy, vodka, rum Bacadi or Pernod	[ ]	[ ]

And Finally....

20. If you want to tell us anything else about the things that would help **you** make changes to **your** diet, use the space below.

_____

_____

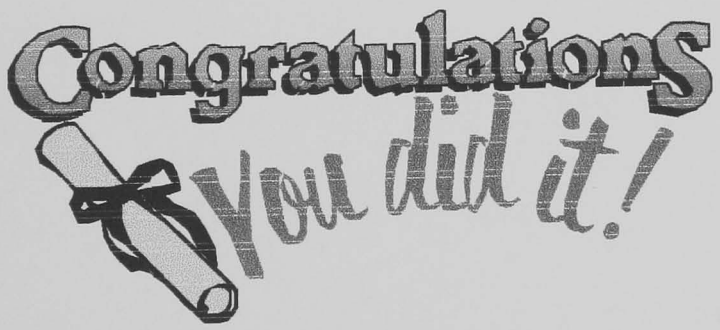
_____

_____

_____

_____

_____



Thank you for completing this questionnaire!

Please check that you have answered all the questions