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An investigation into the diet of Liverpool based Big Issue vendors

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ABSTRACT

Background: Liverpool has a relatively large homeless population particularly with regards to people sleeping rough. It is recognized that morbidity and mortality rates are higher among homeless people when compared with the general population and diet has been identified as a factor in the worse health of the homeless. The heterogeneous nature of the population means that the diet of subgroups needs to be assessed in order to establish a foundation from which further research and recommendations can be made. The Big Issue in the North Trust is a charitable organization that provides homeless people with employment opportunities through support, advice, training and selling its magazine from designated pitches. The aim of this study was to examine the diet of Liverpool based vendors of The Big Issue in the North magazine.

Methods: The 24-hour dietary recall method was used with 25 subjects. They were selected through opportunistic sampling at the Liverpool Big Issue in the North office. The study focuses on the 22 men in the sample. The accommodation status of the men was that 27% were living in hostels, 45% with family, friends or in their own accommodation and 27% were sleeping rough. The age range of the men was 24-39 years.

Results: While 55% of the men had access to cooking facilities only 5 made use of them on more than an occasional basis. Takeaway foods, in particular chips, were found to make a considerable contribution to the diets of male Big Issue vendors. The consumption of fruit was found to be low and the consumption of vegetables was found to be very low. This was determined through reference to 'food contribution tables' for energy and selected nutrients. Intakes of energy (mean = 3124 kcal/day) and saturated fat (mean = 13% of total energy intake) were high. While it was not possible to calculate the intake of non-milk extrinsic sugars it was concluded from their contribution to total sugars intake that the consumption was high. Non-starch polysaccharide (mean = 7.8 g/day), polyunsaturated fat (mean = 3.6% of total energy intake), folate (mean = 191 ug/day), iodine (mean = 71 ug/day) and selenium (mean = 29.2 ug/day) intakes were found to be low.

Conclusion: In order for Big Issue vendors in Liverpool to meet dietary guidelines it was concluded that a number of issues need to be addressed. Before the quality of food consumption can be addressed sufficient food to offset the feelings of hunger is required. Increasing the nutritional knowledge of vendors is possibly a step in improving their nutrient intake but is not the answer in itself. Affordable fresh fruit and vegetables are required as is access to hygienic storage and cooking facilities.

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INTRODUCTION

“Inequality in health is the worst inequality of all.”

(Frank Dobson, Secretary of State for Health, 1997)

Health inequalities

The 1980 Black Report recognized that health inequalities existed in Britain and that they took a number of distinctive forms. Mortality rates differed between occupational classes and between the sexes. There were racial and regional variations in mortality rates as well as differences according to housing tenure. It was noted that men and women in occupational class V were 2.5 times more likely to die before reaching retirement age than their professional counterparts in occupational class I (Black et al, 1992). In the new century inequalities in health still exist. Income inequality has undergone a dramatic increase in Britain during the last 25 years (Kawachi et al, 2002). Davey Smith et al (2002) provide Standardised Mortality Ratios (SMRs) for the British population for the year 1998-1999 according to decile of poverty. The first decile had a figure of 138 compared with 80 for the tenth decile.

The socioeconomic gradient of health is a term used to refer to the worse health of those people who are at a lower socioeconomic position (Kawachi et al, 2002). Health-related behaviours such as diet are strongly influenced by the social environment (Shaw et al, 1999). According to Giskes et al (2002) studies in Western countries have shown that socioeconomic position impacts on morbidity and mortality from diet-related chronic disease. Galobardes et al (2001) carried out a study in Geneva to research cardiovascular risk factors. They found that subjects from lower paid occupations and/or education consumed less fish and vegetables but more fried foods, pasta, potatoes, table sugar and beer. Hulshof et al (2003) conducted a cross-sectional study based on data from three Dutch National Food Consumption Surveys. It was found that subjects experiencing very low socioeconomic status reported higher consumption of meat and meat products, visible fats, potatoes and coffee. Higher socioeconomic status was associated with increased consumption of vegetable protein, dietary fibre and most micronutrients. Fine

et al (1996) suggest that the class differences in food consumption are so pronounced that a person's class could be determined by reference to their food shopping receipts.

Material deprivation affects people's health and wellbeing and according to Daly (1996) the mortality rate among homeless people is about four times greater than that of the general population.

Gravelle and Sutton (2003) examined self-assessed health in Britain for the period 1979-1995 in relation to income inequalities. They concluded that throughout the period pro-rich health inequality increased. In the early 1980's rising income inequality was thought to be the primary cause of health inequality. Subsequently however it was claimed that the increased share of health attributable to income was the main reason for the increase in health inequality. Griffiths (2002) recognizes that while rough sleepers have a number of specific health needs and experience poor physical health these needs are not being addressed in a systematic and effective manner. Stern et al (2002) state that the whole system of public services becomes harder to use when one is homeless. Griffiths (2002) identifies a number of barriers to obtaining the appropriate health care including limited or poor access to physical and mental healthcare services. It is also stated that rough sleepers themselves do not prioritise their health.

Homelessness: the scale of the problem

Low incomes, rising unemployment, the lack of affordable accommodation, the decline of availability in rented accommodation and the growth in single households are economic and social factors that have led to a significant increase in homelessness in recent years (Resource Information Service, 2002). To be homeless is not necessarily to be in the unenviable position of not having a roof over one's head. Although further legislation has been introduced, the meaning of the term 'homelessness' is still based in the Housing Act 1996 which states:

“A person shall not be treated as having accommodation unless it is accommodation which it would be reasonable for him to continue to occupy”

(Housing Act 1996, section 175(3)).

Homeless people can therefore be living in hostels, bed and breakfast accommodation (B&Bs), sleeping on friends' floors or on the streets (Diaz, 2001). The great majority of

single homeless people are men (Burrows, 1997). In 1978 English local housing authorities accepted that 53,100 households were homeless. This figure had increased to 110,810 by 1996-97. These people are regarded as the 'official' homeless but there are however many unregistered single homeless people sleeping rough or living in temporary hostels and shelters. In London alone estimates range from 69,600 to 128,000 people (Crane and Warnes, 2000). In April 1999 the Rough Sleepers Unit (RSU) was established within the Department of the Environment, Transport and the Regions (DETR) replacing the Social Exclusion Unit. Its role was to assume responsibility for national rough sleeping policy (Rough Sleepers Unit, 2002).

The figures for people sleeping rough are politically sensitive particularly since the government set targets to reduce the number of people sleeping rough by two thirds by the year 2002. The number of people sleeping rough in England in June 1998 was estimated to be 1850 (Department of Health, 1999a). While the RSU is claiming that their initiatives have been successful, allegations have been made that the results were falsified. It is suggested that methods were employed to move rough sleepers off the streets for the night of the survey including the arrest of homeless people or short term provision of B&B accommodation (Branigan, 2001). While the number of people sleeping rough on the streets of England is disputed, the Rough Sleepers Unit (2000) has identified Liverpool as having one of the highest concentrations of rough sleepers in the country.

Diet and health

The basic function of food is to keep the person consuming it alive and healthy (Fox and Cameron, 1995). People require a range of dietary chemicals for growth and metabolism. The right proportion of these is a prerequisite for health. A deficiency or excess in the intake of energy or individual nutrients can result in nutritional disorders (Eastwood, 1999). Scurvy is an example of a deficiency disease. It claimed the lives of thousands of seafarers until it was discovered in the 1750's that it could be treated with lime juice. Scurvy is the result of a deficiency in vitamin C but at the time the nature and importance of vitamins had not been established (Fox and Cameron, 1997).

The science of nutrition has advanced and the role of nutrients is better understood. Optimal intakes have been quantified for the majority of them. It is known for instance that zinc plays a role in wound healing and that the main dietary sources are meat, milk, bread and other cereal products (Ministry of Agriculture, Fisheries and Food, 1999). It has also been calculated that an intake of 9.5 mg/day will make the risk of deficiency among men aged 19-50 years very small and that the same applies to an intake of 7.0 mg/day for children aged between 7 and 10 years etc. (Department of Health, 1999b). Dietary reference values is a term used to cover a range of nutrient intake levels which can be referred to when assessing dietary adequacy. It is recognised that physiological needs differ during an individual's lifetime. A person's sex and age, whether or not they are still growing, if they are pregnant or lactating or how active they are all make their own nutritional demands. The calcium requirements of a growing adolescent for instance are greater than those of a fully developed adult (Department of Health, 1999b).

Homelessness, diet and health

Research that has been conducted into the diets of homeless people during the last ten years includes a pilot study by Stitt et al (1994). They examined the diets of 30 homeless adults living in Liverpool. Homeless in this case was defined as living in B&Bs. The questionnaire results found that two thirds of the respondents considered their diet to be 'very unhealthy' and half stated that they did not have enough money for food for the entire week. Dietary analysis found that every person was consuming too much saturated fat. This was largely attributed to the majority of respondents starting the day with a 'fry up' provided by the B&B hotel. Vitamin C was identified as the most deficient nutrient. All of the respondents were deemed to fall 'substantially' short of nutritional guidelines and were described as being unhealthy in the extreme. It was concluded that the foods consumed by the individuals were heavily influenced by immediate circumstances and that in such circumstances the consumption of a healthy diet is virtually impossible. Evans and Dowler (1999) analysed the diets of 423 (348 men and 75 women) single homeless and marginalized people in London. The sample population comprised of rough sleepers (25%), hostel dwellers (19%) and people sleeping in squats, B&Bs or on a friend's floor (12%). The remaining 43% of respondents had a flat or bedsit but were

using soup runs and day centres due to financial difficulties. It was found that the diets of both men and women were high in non-milk extrinsic sugar and saturated fat while being low in vitamins A, C and E, selenium, potassium, zinc and non-starch polysaccharide. The lack of fruit and vegetables in the group's diet was noted with 52% of subjects reporting to eat fruit less than once a week. Vegetables were consumed less than once a week by 20% of respondents.

The dietary intakes and vitamin status of homeless people in Paris were studied by Malmauret et al (2002). Initially 329 homeless people were interviewed but based on the selection criteria only 87 (77 men and 10 women) subjects were recruited. The selection criteria included the need for the subject to be over the age of 18 years, to have been homeless for more than 2 years and habitually sleeping rough and to not have any acute condition that might affect usual dietary habits. In addition to a 24-hour recall questionnaire the subjects were asked to provide blood samples to measure circulating vitamin levels. Although total energy intake was found to be too low the balance of macronutrients was considered to be satisfactory. For all micronutrients, with the exception of iron in men, the intakes were below French recommendations in more than 50% of the population. The measurement of serum vitamin levels showed a vitamin deficiency in 95% of subjects predominantly for vitamin C.

Bines (1994) found that homeless people living in hostels and B&Bs reported higher rates of morbidity than the general population (table 1). According to Branigan (2002) there are presently record numbers of homeless people living in B&Bs in Britain the majority of whom are enduring cramped, unhygienic living conditions and poor diet. People sleeping rough however report an even greater occurrence of health problems than those living in B&Bs. Bines (1994) found that 58% of people sleeping rough have more than one health problem. This compares with 24% of the population in general. The high levels of stress associated with being homeless will undoubtedly contribute to higher morbidity rates as will numerous other factors. The Royal College of Physicians (1994) state that an inadequate diet is a factor in people developing new physical disorders once they become homeless. They highlight malnutrition and reduced disease immunity as the results of an inadequate diet. The 1998 Acheson Report includes nutrition as an area to be addressed in policy development to tackle health inequalities

(Acheson, 1999). Despite links being made between nutrition and health there has been relatively little research into the diet of homeless people.

Table 1 The percentage of people reporting health problems in relation to their accommodation circumstances.

Population	Hostels and B&Bs	Sleeping Rough	General
Health Problem	%	%	%
Musculoskeletal problems	24	39	23
Difficulty in seeing	10	18	7
Difficulty in hearing	10	11	7
Wounds, skin ulcers/complaints	10	18	10
Chronic chest or breathing problems	18	26	10
Heart problems	5	5	12
Digestive problems	9	12	6
Depression, anxiety or nerves	28	38	5
Fits or loss of consciousness	5	13	1
Frequent headaches	16	18	8

(Source: Bines, 1994)

Power et al (1999) recognise the heterogeneous nature of the homeless population and state that there is a requirement to identify the specific health promotion needs of subgroups of homeless people. This will necessitate an increase in assessment and research in a number of areas not least that of nutrition. People selling 'The Big Issue in the North' were identified as a subgroup of homeless people. It has been estimated that 28% of The Big Issue in the North vendors suffer from the effects of poor nutrition. Vendors believe that the three things that would best allow them to improve their health are better housing, a better diet and improved access to a General Practitioner (The House of Commons Select Committee on Health, 2001). The research was conducted to assess the dietary intake of this group of people. To this end the aims and objectives of the study are laid out on the following page.

Aims and Objectives

Aims: An investigation into the diet of Liverpool based vendors of 'The Big Issue in the North' magazine.

- Objectives:**
- 1) To determine the diet of Liverpool based vendors of 'The Big Issue in the North' magazine.
 - 2) To determine the nutrient content of the group's diet.
 - 3) To evaluate the diet of the vendors.
 - 4) To compare the group's diet with that of other groups.

METHODOLOGY

A research project starts with a question. This is examined and refined until it becomes specific enough to provide a focus and direction for answering the question (Graziano and Raulin, 1989). In this case a letter in *The Big Issue in the North* (2002) regarding the quality (or in this instance lack of quality) of hostel food initiated the research into the dietary sufficiency of homeless people. This was followed by a literature review.

Literature search

According to Birley and Moreland (1998) the key to almost all research projects is the completion of a literature review. Bowling (2000) points to a literature search as the first step in deciding on a topic for study. While books generally provide a comprehensive coverage of a subject a journal search tends to produce more contemporary information. Searching the literature has been made easier by internet databases such as PubMed central and CABI Online Abstract Journals Data Service (articles can be accessed using key words i.e. homelessness, recall etc.). This however does not make hand searches of journals redundant since not all of the relevant articles will necessarily be displayed under the key words decided upon. The bibliography features books and journals evidencing a literature search. This was conducted on a monthly basis throughout the research and writing period. The literature search led to a realisation of the diversity of homelessness. It was therefore decided to focus on an easily identifiable group of homeless people which brought the focus back to the *Big Issue*. The *Big Issue in the North* Trust is a registered charity that provides homeless people with employment opportunities as well as training and advice/support. Vendors buy the magazines and then sell them at a profit from designated pitches. There are approximately 90 vendors who buy their magazines from the Liverpool office (*The Big Issue in the North*, 2001).

Dietary assessment

Dietary assessment methods tend to be of a quantitative nature. That is numbers are the unit of analysis (as opposed to qualitative research which focuses on words). Thomas (2001) divides assessment methods into three categories: i) current food intake ii) past

food intake iii) typical food intake. A 'gold standard' does not exist and each method has its own strengths and weaknesses.

Prospective methods of measuring food consumption are labour intensive for both the respondents and the interviewer. Limitations on time alone might rule out this set of approaches but the more salient reason was that it was felt that there would be a lack of motivation on the part of the subjects to take part in such assessment. Homeless people have more pressing matters than food measurement/weighing. Even if they were willing to take part in such a survey they may lack the equipment required.

Retrospective methods on the other hand are relatively quick. The 24-hour recall method being the least time consuming. Garrow et al (2000) state that the main advantage of the 24-hour recall approach is that it is quick to administer (10-15 minutes). While it is recognised that this approach cannot be used to assess a single subject's level of nutrient intake an estimate of the mean intake of the group can be produced. Biró et al (2002) state that the approach has a relatively low respondent burden, is cost-effective and can be used to obtain population mean intakes. This approach was therefore deemed to be the most appropriate to this study.

Pilot study

The pilot study used volunteers outside of the population to be researched. A pilot study enables one to try out the research techniques and methods that one has chosen (Blaxter et al, 2002). Since the 24-hour recall method is an established assessment method the pilot study was used to familiarise oneself with the procedure and use of the recall kit. It was also employed to estimate the time taken to complete and analyse each recall in order to determine a viable sample size. It was estimated that the process of interviewing a subject, converting the recorded measures to weights and inputting the data into *Microdiet* and then into a statistical program would take a mean time of 1.5 hours/person.

Sample selection

The initial contact with the Liverpool Big Issue in the North office was by letter which led to telephone conversations and a visit to discuss details. The sampling method employed is opportunistic thereby ensuring the anonymity of the subjects. A sample is

intended to be a representative portion of a larger group (Fink, 1995). According to Birley and Moreland (1998) the target is a balance between obtaining a sample that is large enough to produce meaningful data but small enough to be manageable. With this in mind the intention was to interview approximately a quarter of the population (20-25 vendors). The pilot study suggested that such a sample size would be within the imposed time constraints. The interviews were divided between five different days of the week (one of them to reflect the dietary intake of a Saturday or Sunday). Individual diet can vary on a daily basis but tends to have the most marked differences between weekdays and weekends.

During the course of a day vendors visit the Liverpool Big Issue office to buy magazines and may make a number of trips. The selection process simply entailed each vendor who arrived during one of the interview periods being asked to take part in a food survey.

During the course of the study vendors were interviewed on a single occasion only.

Since this would require them to take time out from their working day they were offered 5 magazines in return (courtesy of The Big Issue in the North). This is not an uncommon practice with magazines being offered to those attending training sessions etc.

24-hour recall

All of the interviews were conducted on a one-to-one face-to-face basis. The interviewee having been assured of confidentiality was asked to describe all of the food and drink consumed during the 24 hours of the previous day. Initially s/he was asked to recall what was consumed. Questions were open-ended and non-verbal communication was intended to be neutral expressing neither approval nor disapproval of the foods recalled. Once it had been clarified that the list was as complete as possible it was then reviewed to determine the amounts of food consumed. To this end a '24-hour food recall kit' was used.

The initial kit (figure 1) was influenced by Cox (2002) and included:

- Standard measuring spoons:
 - 1/4 teaspoon
 - 1/2 teaspoon
 - 1 teaspoon

- 1/2 tablespoon
- Bowls – one round and one square
- Measuring cups:
 - 60 ml cup
 - 80 ml cup
 - 125 ml cup
 - 250 ml cup
- 350 ml beaker
- 550 ml measuring jug
- 20 cm ruler
- Plastic container of rice
 - Rice was used to measure dense foods such as mashed potato.
- Plastic container of pasta tubes
 - Pasta was used to measure loosely packed foods such as vegetables.
- 8 shapes made from laminated white card:
 - 1" (2.5 cm) square
 - 2" (5 cm) square
 - 3" (7.5 cm) square
 - 4" (10 cm) circle
 - 1/8 of a 9" (22.5 cm) circle
 - 1/7 of a 9" (22.5 cm) circle
 - 1/6 of a 9" (22.5 cm) circle
 - 1/4 of a 12" (30 cm) circle

Early interviews suggested that takeaway foods were a considerable part of the diet of Liverpool Big Issue vendors (LBIVs). For this reason 2 sizes of foil dish, 2 sizes of polystyrene tray and 2 sizes of polystyrene cup of the type commonly found in takeaway outlets were added to the kit (figure 2). Such adaptations give weight to the belief that all social research is in effect a pilot exercise (Blaxter et al, 2002).



Figure 1 The initial 24-hour food recall kit

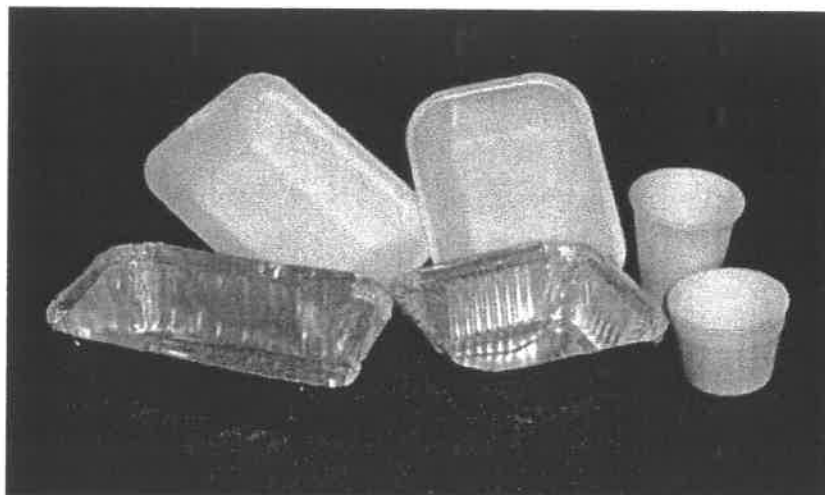


Figure 2 Additions to the recall kit

Analysis

There are a number of ways to convert the measures recorded to their corresponding weights:

- Liquid measures can be multiplied by the appropriate specific gravity (Holland et al, 1991, Food Standards Agency, 2002)
- The Food Standards Agency (2002) provides estimated weights for food portions.
- The relevant food packaging may provide mean weights.
- Measures can be replicated and then weighed.
- Foods can be purchased and weighed.
- The respondent may recall weights (eg. of raw ingredients).

Once the weight of foods had been determined they were then entered into *Microdiet* to be analysed in terms of energy, macro- and micronutrients. While the programme provides an extensive list of foods it does not feature all of the foods recalled. It was therefore necessary to resort to 'best fits' on occasion. That is the food considered to most closely resemble the food in question was analysed e.g. 'Drifter' does not feature in *Microdiet* so 'Twix' is entered in lieu. The nutrient analysis for each recall was then inputted into the statistical program SPSSv10 (Statistical Package for Social Sciences). This was to provide a group mean and standard deviation for each selected nutrient.

Questionnaire

A short questionnaire followed the recall. This was primarily employed to record information needed to make use of dietary reference values (age and sex). Other questions were designed to ascertain current accommodation, the prevalence of particular dietary requirements, access and use of cooking facilities and the consumption of oily fish. The latter was included due to the existence of guidelines regarding the consumption of oily fish. The Big Issue in the North (2001) use the type of accommodation that vendors had slept in the previous night as the determinant of current accommodation. The vendors were also given the opportunity to add any information that they thought relevant.

RESULTS

Interviews took place on a Monday, Tuesday, Wednesday, Thursday and Friday between 8th August and 2nd September 2002. There is fluidity to the population of Big Issue in the North vendors but during this period it was estimated that there were 90 vendors (approximately 94% being men). Twenty-five LBIVs agreed to take part in the survey. The sample population comprised of 22 (88%) men and 3 (12%) women. The sample size of women was considered to be too small to produce valid nutrient means and the results are therefore based on the interviews with male vendors of The Big Issue.

The male population ranged in age from 24 to 39 years and had a mean age of 32 years (standard deviation = 4.7). All of the men interviewed were therefore aged between 19 and 50 years which is an age grouping specified in the 1991 Dietary Reference Values (Department of Health, 1999b). Out of the 22 men 6 (27%) were living in hostels, 10 (45%) were living with family, friends or their own accommodation and 6 (27%) were 'sleeping rough'. Two vendors stated that they had special dietary requirements one of whom believed that he should avoid dairy products due to him having hepatitis and the other reported to regularly eat black pudding to address anaemia.

Ten (45%) of the male respondents stated that they did not have access to cooking facilities and therefore did not prepare meals themselves from fresh ingredients. From the 12 (55%) LBIVs who reported having access to cooking facilities only 1 prepared meals from fresh ingredients on a daily basis, 4 did so 3-6 times a week, 4 occasionally and 3 never prepared meals from fresh ingredients. Two of the male vendors stated that they ate oily fish 3-6 times a week, 3 once a week, 8 occasionally and 9 reported to never eat oily fish.

The tables in this section are based on the 1991 Dietary Reference Values (DRV). These are Department of Health (1999b) recommended intake levels. Abbreviations used are:

- EAR: Estimated Average Requirement.
- NSP: Non-starch polysaccharide measured using the Englyst method.

- RNI: Reference Nutrient Intake for a nutrient. This represents the amount of a nutrient that is considered to be sufficient for about 97% of people in a group.

When converting the weight of macronutrients to determine the energy provided it is calculated that:

- 1g of carbohydrate provides 3.75 kcal
- 1g of fat provides 9 kcal
- 1g of protein provides 4 kcal
- 1g of alcohol provides 7 kcal.

Energy

The mean daily energy consumption of the group was determined to be 3124 kcal with a standard deviation of 1532 kcal. The intake for the group ranged from 837 kcal to 6456 kcal.

Table 2.1 Group energy intake

	Mean	Standard deviation (SD)	EAR	% EAR of mean
Energy (kcal/day)	3124	1532	2550	123
Energy (kJ/day)	13111	6428	10600	124

Table 2.2 Range of group energy intake

	Minimum	Maximum	Range
Group energy intake (kcal/day)	837	6456	5619

Table 2.3 lists the 5 food items that were identified as making the greatest contribution to the energy intake of the male subjects. Chips were estimated to provide more than 8% of the group's total daily energy intake followed by whole milk, lager, sugar and cream liqueur.

Table 2.3 Contribution of foods to group energy intake

Food item	% energy
Chips, retail	8.2
Whole milk, pasteurised	6.6
Lager, premium	5.4
Sugar, white	3.8
Cream liqueurs	3.6

Macronutrients

The mean total fat intake for the group is shown in table 3.1 to be 109% of the DRV.

While saturated fat consumption was 130% of the DRV the intake of monounsaturated and polyunsaturated fat was 86% and 61% of the recommended intake respectively.

Carbohydrate intake was determined to be 102% of the DRV. Total sugars contributed to 20% of the total energy intake. Alcohol contributed to 7% of the total energy intake.

The protein consumption of the group was determined to be 164% of the RNI (table 3.2).

Table 3.1 Group macronutrient intake in relation to DRVs

	Mean	SD	% of total energy intake	DRV	% DRV of mean
Total fat (g/day)	126	77	36	33%	109
Fat -saturated (g/day)	45	38	13	10%	130
Fat -monounsaturated (g/day)	36	27	10	12%	86
Fat -polyunsaturated (g/day)	12.7	9.8	3.6	6%	61
Carbohydrate (g/day)	373	192	48	47%	102
Total sugars (g/day)	165	107	20	NA	NA
Alcohol (g/day)	32	58	7	5%	140

Table 3.2 Group protein intake

	Mean	SD	RNI (g/day)	% RNI of mean
Protein (g/day)	91	64	55.5	164

Mean non-starch polysaccharide intake was calculated to be 7.8 g/day with a standard deviation of 7.3 g/day. The mean intake was 43% of the DRV. The individual consumption for the group ranged from 0 - 25.8 g/day.

Table 3.3 Group non-starch polysaccharide intake

	Mean	S D	DRV	% DRV of mean
NSP (g/day)	7.8	7.3	18	43

Table 3.4 Range of group non-starch polysaccharide intake

	Minimum	Maximum	Range
NSP (g/day)	0	25.76	25.8

Contribution of foods to the intake of selected macronutrients.

Tables 3.5 – 3.9 list the 5 food items that in each case were identified as making the greatest contribution to the intake of selected macronutrients. Whole milk was identified as making the single largest contribution to saturated fat intake. Chips represented the most significant source of monounsaturated and polyunsaturated fats as well as NSP in the group's diet. White sugar was calculated to provide 19.4% of the energy provided by total sugars in the diet.

Table 3.5 Contribution of foods to group saturated fat intake

Food item	% of saturated fat energy
Whole milk, pasteurised	16.7
Butter	8.3
Chips, retail	8.6
Sausage roll	6.1
Sandwich biscuits	3.0

Table 3.6 Contribution of foods to group monounsaturated fat intake

Food item	% of monounsaturated fat energy
Chips, retail	15.3
Whole milk, pasteurised	10.3
Sausage roll	8.3
Butter	6.9
Biscuits, homemade	3.4

Table 3.7 Contribution of foods to group polyunsaturated fat intake

Food item	% of polyunsaturated fat energy
Chips, retail	26.3
Egg fried rice	8.0
Sausage roll	8.3
Biscuits, homemade	3.7
Margarine, soft	3.1

Table 3.8 Contribution of foods to group total sugars intake

Food item	% of total sugars energy
Sugar, white	19.4
Whole milk, pasteurised	9.2
Cream liqueurs	4.8
Cider, sweet	4.8
Lager, premium	4.2

Table 3.9 Contribution of foods to group NSP intake

Food item	% contribution to NSP intake
Chips, retail	30.8
Baked beans	17.9
Bran flakes	12.1
Fruit cake	5.3
Wholemeal bread, toasted	4.3

Vitamins

It was found that of the vitamins being examined folate was the only one that had a mean intake below the RNI. The intake was 96% of the RNI. Focus is also directed towards vitamins and minerals that had a mean intake close to the RNI or a standard deviation greater than the mean intake. While vitamin C intake had a mean of 62 mg/day representing 155% of the RNI it had a standard deviation of 130 mg/day.

Table 4.1 Group vitamin intake

	Mean	SD	RNI	% RNI of mean
Vitamin A (retinol equivalent, ug/day)	949	703	700	136
Vitamin B ₁ /thiamin (mg/day)	1.4	1.1	1.0	140
Vitamin B ₂ /riboflavin (mg/day)	2.0	1.9	1.3	154
Vitamin B ₃ /niacin (mg/day)	22	16	17	129
Vitamin B ₆ /pyridoxine (mg/day)	2.0	1.6	1.4	143
Vitamin B ₁₂ (ug/day)	4.0	4.5	1.5	267
Vitamin C (mg/day)	62	130	40	155
Vitamin D (ug/day)	2.7	3.4	NA	NA
Vitamin E (mg/day)	3.1	2.5	NA	NA
Folate (ug/day)	191	231	200	96

Table 4.2 shows that one or more of the subjects were found to have had zero intakes of the antioxidants vitamin C and vitamin E during the recalled 24-hour period.

Table 4.2 Range of group intake for selected vitamins

	Minimum	Maximum	Range
Vitamin C (mg/day)	0	618.6	618.6
Vitamin E (mg/day)	0	9.0	9.0
Folate (ug/day)	48.1	1115.6	1067.5

Contribution of foods to the intake of selected vitamins

Tables 4.3 – 4.5 list the 5 food items that in each case were identified as making the greatest contribution to the intake of selected vitamins. Orange juice made the largest single contribution to vitamin C intake. It provided 35.4% of the total vitamin C intake. Crisps provided 10.1% of the vitamin E intake representing the largest single contribution. Lager provided 18% of the folate intake.

Table 4.3 Contribution of foods to group vitamin C intake

Food item	% contribution to vitamin C intake
Orange juice, fresh	35.4
Chips, retail	15.7
Strawberries	10.0
Bananas	5.2
Whole milk, pasteurised	5.1

Table 4.4 Contribution of foods to group vitamin E intake

Food item	% contribution to vitamin E intake
Potato crisps	10.1
Biscuits, homemade	9.7
Sausage roll, flaky pastry	8.1
Cream liqueurs	6.3
Margarine, soft	5.7

Table 4.5 Contribution of foods to group folate intake

Food item	% contribution to folate intake
Lager, premium	18.0
Bran flakes	10.7
Orange juice, fresh	8.5
Whole milk, pasteurised	6.7
Baked beans	4.3

Minerals

Table 5.1 shows that iodine and selenium were both found to have a mean intake below the RNI level. Iron had a mean intake of 16.7 mg/day being 192% of the RNI. The standard deviation for iron was found to be 18.5 mg/day. Potassium had a mean intake of 3639 mg/day which is 104% of the RNI. The standard deviation was 2447 mg/day.

Table 5.1 Group mineral intake

	Mean	SD	RNI	% RNI of mean
Calcium (mg/day)	1048	961	700	150
Chloride (mg/day)	4815	3368	2500	193
Copper (mg/day)	1.4	0.9	1.2	117
Iodine (ug/day)	71	69	140	51
Iron (mg/day)	16.7	18.5	8.7	192
Magnesium (mg/day)	322	206	300	107
Phosphorus (mg/day)	1492	1015	550	271
Potassium (mg/day)	3639	2447	3500	104
Selenium (ug/day)	29.2	28.9	75	39
Sodium (mg/day)	3271	1999	1600	204
Zinc (mg/day)	10.6	8.5	9.5	112

Table 5.2 Range of group intake for selected minerals

	Minimum	Maximum	Range
Iodine (ug/day)	4.9	287.3	282.4
Iron (mg/day)	1.0	87.4	86.3
Potassium (mg/day)	649	12291	11642
Selenium (ug/day)	0.4	125.0	124.7

Contribution of foods to the intake of selected minerals

Tables 5.3 – 5.6 list the 5 food items that in each case were identified as making the greatest contribution to the intake of selected minerals. Whole milk was identified as making the greatest contribution to iodine intake, providing 31.1% of the total iodine

intake. Bran flakes (19.6%) and chips (19.5%) made the greatest contributions to iron and potassium intakes respectively. Canned tuna provided 18.2% of the group's selenium intake which was more than any other single food item.

Table 5.3 Contribution of foods to group iodine intake

Food item	% contribution to iodine intake
Whole milk, pasteurised	31.1
Semi-skimmed milk, pasteurised	10.4
Jaffa cakes	8.0
Chips, retail	7.6
Butter	6.9

Table 5.4 Contribution of foods to group iron intake

Food item	% contribution to iron intake
Bran flakes	19.6
Chips, retail	5.8
Cider	5.4
Liquorice allsorts	3.9
Black pudding, raw	3.4

Table 5.5 Contribution of foods to group potassium intake

Food item	% contribution to potassium intake
Chips, retail	19.5
Whole milk, pasteurised	12.1
Potatoes, roast	4.0
Cider, sweet	3.6
Baked beans	3.2

Table 5.6 Contribution of foods to group selenium intake

Food item	% contribution to selenium intake
Tuna, canned in oil	18.2
White bread, toasted	12.9
Whole milk, pasteurised	10.7
Wholemeal bread, toasted	7.9
Chips, retail	7.4

DISCUSSION

Limitations of methods employed

The 24-hour recall method has recognised limitations. The presence of an interviewer may impact on the reported food consumption with over emphasis being placed on foods that are believed to be healthy being the more likely direction of bias. Memory fallibility however means that consumption may also be underestimated due to recall omissions (Thomas, 2001). The use of food composition tables will result in a degree of error in the estimates of energy and nutrient intake since they only provide average figures for food content (Garrow et al, 2000). Furthermore 'best fit' was employed when a specific food did not feature in the food tables. A 'gold standard' method of dietary survey however is unavailable and alternative survey methods would themselves have limitations.

When assessing the validity of the method used the absence of a 'gold standard' poses a difficulty. Validity is the extent to which a method measures what it is being used to measure (Litwin, 1995). Without a definitive method with which it can be compared it would be necessary to carry out physical analyses (blood and urine tests) which would confirm (or contradict) nutrient deficiencies suggested by the 24-hour recall method. Such procedures would not however be practical in this case. It has already been stated that the method is well established and has been employed in similar research involving homeless groups (Evans and Dowler, 1999, Malmauret et al, 2002). Confidence is therefore placed in the competence of previous researchers. The results of the study however should be considered only as estimates on which general recommendations, policies and further research can be based.

Energy

The mean energy intake of the respondents was 3124 kcal/day. This figure is 123% of the EAR cited in the COMA report (Department of Health, 1999b). While such a finding might generally be associated with an increased prevalence of overweight and obesity a visual assessment of the subjects determined that this was not the case. The lifestyles of LBIVs require greater energy intakes than would be required for the general population. Salient examples include long periods of standing outdoors and those subjects sleeping

rough will experience increased energy expenditure in order to maintain body temperature. Therefore the relatively high mean energy intake does not give rise to concern and the issue is more about the composition of the diet. It should be noted however that the range of energy intake starts at 837 kcal/day. Basal metabolic rate (energy use under resting conditions) for a 65kg male aged 30-59 years is approximately 1620 kcal/day (Department of Health, 1999b). A habitual intake approximating the minimum recorded intake would lead to extreme weight loss and increase the risk of deficient micronutrient intake. The following quote illustrates that there can be extremes in the food consumption of individual LBIVs:

“Sometimes I eat a lot sometimes a little”

(Liverpool Big Issue vendor)

The plate model (Food Standards Agency, 2001) is similar to the food pyramid in that it illustrates the recommended contribution of 5 food groups to dietary intake. One third of the diet should comprise of fruit and vegetables and a further third from bread, other cereals and potatoes. The remaining third should comprise predominantly of milk and dairy foods with the remaining contributions being from meat, fish and alternatives and those foods containing fats and/or sugar. The foods that were found to make the largest contribution to the group's energy intake (chips, whole milk, lager, white sugar and cream liqueurs) all belong to those food groups that should be consumed with less frequency and in smaller amounts. Chips represent a paradox. While they could be regarded as a part of the portion 'bread, other cereals and potatoes' they are generally regarded as a high fat item.

Macronutrients

Saturated fat is considered to be an atherogenic risk factor. When viewing non-genetic determinants of coronary heart disease (CHD) death rates there is a strong association with the intake of saturated fatty acids (Department of Health, 1999b). A saturated fat intake 130% of the DRV would lead to a recommendation for a decrease in the intake. Conversely an increase in monounsaturated and polyunsaturated fat would be

recommended. Oily fish being a particularly good source. The Food Standards Agency (2002) recommends that as part of a healthy balanced diet people should eat an average of two portions of fish a week and that one of these should be oily fish. Oily fish was never eaten by 41% of the male respondents.

Protein deficiency is uncommon in British society and protein intakes have generally increased. There is a concern however that excessive intake might be associated with health risks. The protein intake of LBIVs while high does not give rise to concern. It is above the RNI and below the amount which is considered prudent to avoid (1.5 g protein/kg body weight/day) (Department of Health, 1999b). The upper limit for a 70 kg man is therefore 105 g/day. The mean intake for LBIVs was 91 g/day.

It was unfortunate that the resources available for dietary analysis do not have the capacity to provide a figure for non-milk extrinsic sugars. The term refers to those sugars not incorporated into the cellular structure of the food e.g. refined sugars. According to the Department of Health (1989) human epidemiological and observational studies have shown positive correlation between sugar consumption and the prevalence and severity of dental caries. It was therefore proposed that the population's average intake of non-milk extrinsic sugars should not exceed 10% of total dietary energy (Department of Health, 1999b). The intake of total sugars among LBIVs was 20% of the total dietary energy. In determining the main dietary contributors to the group's total sugar intake it was found that 4 of the 5 were foods with a high non-milk extrinsic sugar content. It was therefore concluded that non-milk extrinsic sugars made a contribution to total energy intake of more than 10%. In the absence of the appropriate health services which was noted earlier the intake of non-milk extrinsic sugars has serious implications for the dental health of LBIVs.

NSP softens and increases the bulk of the faeces. A low NSP intake results in increased transit time of intestinal contents and is associated with diverticular disease of the colon (Wiseman, 2002). Hughes et al (2001) examined the effect of dietary meat on endogenous colonic N-nitrosation. Many N-nitroso compounds are considered to be large bowel initiators and promoters in colon cancer. Higher concentrations of N-nitroso compounds were associated with longer transit times in the gut. NSP is found in the two main food groups of the plate model – 'fruit and vegetables' and 'bread, other cereals and

potatoes'. A mean NSP intake of 7.8g (43% of the DRV) would suggest an inadequate consumption from these two groups. The present recommendation for fruit and vegetable intake is at least five portions a day (National Heart Forum, 1997). Although it is recommended that potatoes should be excluded when addressing the requirement for at least five portions a day chips were identified as the chief source of NSP and vitamin C among LBIVs. Chips were followed by baked beans as the main contributor to NSP intake. Daily consumption of fruit juice and baked beans are generally each counted as representing a single portion of fruit and vegetables irrespective of the amount consumed. Much of the fibre is lost in fruit juice and while pulses are rich in fibre they are not a good source of antioxidants (Williams, 1997). These findings strongly suggest that considerable dietary adjustments are required to meet guidelines. The 1998 Acheson Report stated that death from stomach, oropharyngeal and oesophageal cancer has been linked to a low intake of fruit and vegetables (Acheson, 1999).

Vitamins

There is an extreme lack of vegetable consumption among the subjects. Vegetables do not feature in any of the food contribution tables. It is therefore not surprising that the group folate intake is below the RNI. Good sources (more than 100 ug/100g) include broccoli, Brussels sprouts, cabbage (dark-green) and peas. The result of a folate deficiency might include lethargy and breathlessness (Wiseman, 2002). Although the standard deviation for vitamin D intake was calculated to be greater than the mean intake it has not received further attention due to the outdoor lifestyle of the subjects. The skin responds to UV rays in sunlight and this leads to the synthesis of vitamin D (Tortora and Grabowski, 2000). Vitamins C and E are antioxidant nutrients and while their intakes are not below the RNI (vitamin E does not have a RNI) concern is expressed due to the particularly low intake recorded for a number of individuals. In both cases the minimum calculated intake was zero. Once again the risk of deficiency is mainly due to a lack of fruit, vegetables and whole-grain cereals. According to Daly (1996) the nutrients of greatest concern for homeless people in general are vitamin C, thiamin and folate. This is due to the lack of a regular supply of fresh fruit and vegetables. While it was calculated that the mean thiamin intake among LBIVs is adequate concern has been expressed with

regards to the intake of the other two vitamins. A lack of these vitamins is associated with a feeling of weakness, fatigue, depression and emotional disturbances. Bines (1994) found a far greater incidence of depression, anxiety or nerves among homeless people. The standardised morbidity rate for those sleeping rough was 1112. It is not surprising that such health problems are greater amongst homeless people. The problem itself might be the cause of homelessness. Ignoring other contributory factors the fact that a person is homeless is highly likely to induce anxiety if it was not already present but the possibility of a dietary impact should not be overlooked.

Minerals

Selenium is a further antioxidant nutrient that was found to have an intake below the RNI. An inadequate intake of selenium may produce general muscle pain as well as a degeneration of the cardiac muscle (Wiseman, 2002). In this instance an intake of 39% of the RNI points to a lack of wholegrain cereals, fish and meat in the group's diet.

Brazil nuts are a particularly good source of selenium. Iodine was also found to have an intake less than the RNI. Seafood and vegetables grown in iodine rich soil provide a plentiful supply of iodine in the diet. Iodine deficiency however is associated with goitre.

A deficient potassium intake might also produce muscular weakness and cardiac problems (Wiseman, 2002). Bines (1994) found a higher incidence of musculoskeletal problems among homeless people. While the mean potassium intake was found to be 104% of the RNI the minimum intake was less than 20% of the RNI. Once again a deficient intake of potassium is associated with a lack of fruit and vegetables in the diet. Potatoes are also a rich source of potassium and chips were found to be the chief source of potassium with roast potatoes also being found to be one of the five main sources of the mineral. Iron intake has also been highlighted since the standard deviation was found to be greater than the mean and the minimum recorded intake was estimated to be 1 mg/day. Red meat, kidney, liver and nuts are all good sources of iron non of which appear as the main contributors to iron intake. Iron plays a role in disease resistance (Mindell, 2000).

Comparisons of intake

Evans and Dowler (1999) in their study of the diet of homeless and marginalized people in London also found the diets of men to have a mean energy intake above the EAR at 2725 kcal/day with considerable variation within the group (SD = 1566 kcal). The intake of saturated fat and non-milk extrinsic sugars was also found to be high. Intakes of NSP, vitamins A, C, E, potassium, selenium and zinc were low. A relatively low consumption of vegetables, fruit and wholemeal products was also reported.

Table 6 Similarities in intake between LBIVs and homeless men living in London

Nutrient	Present study	Evans and Dowler (1999)
	Mean intake (SD)	Mean intake (SD)
Protein (g/day)	91 (64)	85 (50)
Vitamin B ₁ / thiamin (mg/day)	1.4 (1.1)	1.3 (1.0)
Vitamin B ₂ / riboflavin (mg/day)	2.0 (1.9)	1.8 (1.4)
Vitamin B ₃ / niacin (mg/day)	22 (16)	22 (16)
Vitamin B ₆ / pyridoxine (mg/day)	2.0 (1.6)	1.9 (1.3)
Magnesium (mg/day)	322 (206)	342 (301)
Phosphorus (mg/day)	1492 (1015)	1458 (992)
Potassium (mg/day)	3939 (2447)	3579 (2400)
Zinc (mg/day)	10.6 (8.5)	10 (7)

Table 6 lists those nutrients whose mean intakes in the two studies (Evans and Dowler (1999) and the present study) were found to have a difference of less than 10%.

Similarities in the studies suggest reliability in the method employed. The heterogeneous nature of homeless people however means that differences in intake will also occur and therefore the table does not include all of the estimated intakes.

Malmauret et al (2002) studied the dietary intakes and vitamin status of homeless people in Paris. They found men to have a daily energy intake of 2111 kcal. It was reported that with the exception of iron more than 50% of the men had intakes below the French recommendations. With regards to the nutrients in question (Table 7) the French recommended intakes are all higher than those detailed in the COMA Report

(Department of Health, 1999b). Nevertheless with the exception of iron the nutrient intake among LBIVs was found to be higher than that of Parisian homeless men. This is most likely due to the higher food consumption levels of LBIVs indicated by the greater energy intake.

Table 7 Comparison of intakes among LBIVs vendors and homeless Parisian men

Nutrient	Present study	Malmauret et al (1999)
	Mean intake (SD)	Mean intake (SD)
Vitamin B ₁ / thiamin (mg/day)	1.4 (1.1)	0.46 (0.47)
Vitamin B ₆ / pyridoxine (mg/day)	2.0 (1.6)	1.9 (3.0)
Vitamin B ₁₂ (ug/day)	4.0 (4.5)	2.9 (7.0)
Vitamin C (mg/day)	62 (130)	17 (26)
Vitamin E (mg/day)	3.1 (2.5)	1.1 (1.8)
Calcium (mg/day)	1048 (961)	477 (345)
Iron (mg/day)	16.7 (18.5)	17 (26)
Magnesium (mg/day)	322 (206)	374 (287)

Gregory et al (1990) conducted a dietary and nutritional survey of British adults allowing some comparisons to be made with the nutrient intakes of LBIVs. While there are similarities in the saturated and monounsaturated fat intake the largest difference with regards to fat intake is in polyunsaturated fat intake. The population of British men in general was found to meet the DRV compared with an intake of 61% of the DRV for LBIVs.

Table 8 Intake of nutrients found to be less than the RNI among LBIVs compared with the intake of the adult population of British men

Nutrient	LBIVs	British adult men
Folate (ug/day)	191	312
Iodine (ug/day)	71	243
Selenium (ug/day)	29	1679

The nutrients found to be less than the RNI among LBIVs are featured in table 8. The mean intakes for the same nutrients among British men were found to exceed the RNIs. This suggests that the diet of LBIVs differs to some extent from that of the general population. This is not surprising when the role of takeaway foods in the diet of LBIVs is considered. From the sample group 45% of male respondents stated that they did not have access to cooking facilities. Among those who did have access to facilities 58% only occasionally or never prepared meals from fresh ingredients. The lack of cooking facilities and the reasons for not making use of them when they do exist need to be considered when making dietary recommendations.

Recommendations and conclusions

While an improved 'dietary balance' might be achieved by reducing the intake of chips, whole milk, alcohol and table sugar in favour of fresh fruit, vegetables, whole grain cereals and fish the cost both in monetary terms and with regards to energy intake must be considered. When making recommendations practical issues and lifestyle factors should be taken into consideration.

Giskes et al (2002) collected food intake data for the 1995 Australian National Nutrition Survey. They found that participants from low-income households ate less in the way of fruit and vegetables and they provide a number of explanations for this:

1. Lower socioeconomic groups are more likely to perceive barriers to fruit and vegetable consumption. Price was found to be the most influential barrier since fruit and vegetables are perceived to be expensive in comparison with more energy-dense foods such as dairy products.
2. Disadvantaged groups are more likely to report storage as a barrier to the consumption of fruit and vegetables.
3. A lack of awareness of dietary recommendations and nutrition knowledge was also believed to account for reduced consumption of fruit and vegetables.

All three of these points might be relevant to LBIVs. Table 9 illustrates the point that with regards to energy intake fresh fruit and vegetables are relatively expensive. The cost of obtaining 100 kcal from apples is about 7 times that for whole milk. In responding to

the open question “Why do you not eat enough?” 68% of the subjects in the study conducted by Malmauret et al (2002) stated that it was due to a lack of money.

Table 9 A comparison of the price and energy content of selected foods

Food item	Price of item (£)	Approx. energy content	Price/100 kcal (£)
Pint whole milk	0.29	390 kcal	0.07
Portion of chips	0.90	500 kcal	0.18
500 g carrots	0.33	120 kcal	0.28
An orange	0.29	60 kcal	0.48
An apple	0.22	45 kcal	0.49

Those sleeping rough or in hostels with shared facilities are unlikely to have areas where perishables (and other foodstuffs) can be safely stored. They may also lack the utensils - plate, knife, fork and spoon etc - needed to eat self-prepared food. Takeaway foods and milk can be consumed from the container in which they are purchased. A plastic/wooden fork is often available with food purchased from chip shops.

Greenwood et al (2000) classified people in terms of their chosen patterns of food consumption. They found that those groups consuming the most fruit and vegetables had a higher proportion of people with ‘A’ level or higher standard of education. Cluster analysis was used to identify groups of people with similar food consumption patterns. 7 clusters were identified. 29% of the cluster labelled ‘monotonous low-quantity omnivores’ (those consuming high quantities of milk, sugar and white bread) had an ‘A’ level or higher standard of education. This compares with 60% of the ‘high diversity vegetarian’ cluster. According to The Big Issue in the North (2002) 55% of vendors in Liverpool are without any educational qualifications. An advantage of the methodology employed in this study is that it does not require or assume literacy skills of the respondents.

The question of motivation might also be added to the above list. According to The Big Issue in the North (2002) 59% of Liverpool vendors said that they had a drug problem and 5% stated that they had a problem with alcohol.

“I’ve let myself go diet wise. Drugs and alcohol are more important than food”

(Liverpool Big Issue vendor)

Maslow (1987) identifies hunger as a basic need in the hierarchy of needs. Obtaining sufficient food to offset the feelings of hunger will naturally take precedence over the quality of food in terms of nutrient intake. The quality of food can only be considered once satiety is assured. Food provision for homeless people generally focuses on hot and filling foods. Economic and storage issues play a part in this. The Liverpool Big Issue office should be recognised for providing some fruit to its vendors but provision on a larger scale is needed and this requires commitment from other statutory and voluntary agencies. Increasing the nutritional knowledge of LBIVs is possibly a step in improving their nutrient intake but is not the answer in itself. Affordable fresh fruit and vegetables are required as is access to hygienic storage and cooking facilities.

Suggestions for future research

Thomas (2001) states that 24-hour recall is a useful starting point for further research. It can be used to set the scene and establish the types of food consumed and this can be used as the basis of further discussion.

1. Having found considerable variations in the diets of LBIVs a more in-depth study of individual diets can be used to provide specific recommendations and advice.
2. Evans and Dowler (1999) found differences in the diets of homeless men and women. This research however was unable to make reliable comment on the diets of homeless women. It is clearly an area that needs to be studied to achieve a more complete picture of the diet of LBIVs. The information gathered from the 3 interviews that were conducted with women is outlined below and suggests a low energy intake and micronutrient deficiencies.

INTERVIEW 1

2 drinks of tea with semi-skimmed milk and 2 teaspoons of white sugar.

2 pieces of white toast with butter.

Portion of steak and kidney pie.

Microwave chips

Processed marrow peas

Carbonated drink

INTERVIEW 2

3 drinks of milky coffee with 2 teaspoons of white sugar.

Portion of chips with salt, vinegar and mayonnaise.

INTERVIEW 3

2 carbonated drinks.

A chocolate bar.

3 10p packets of mixed sweets.

A drink of tea with full fat milk and 4 teaspoons of white sugar.

A drink of coffee with full fat milk and 4 teaspoons of white sugar.

There are a number of possible approaches that can be employed to analyse the diets of female Big Issue vendors:

- If the research is to be confined to LBIVs then due to the low proportion of women in the population a more detailed assessment of individual diets is required (eg. dietary diaries). The difficulties involved in this approach however have already been discussed.
- In order to continue to use the 24-hour recall method a larger sample population of women is required and this could be achieved by expanding the geographical area of research to include other Big Issue offices.
- 3. Further research can be carried out to determine whether or not the findings in Liverpool are representative of the magazine vendors in other areas of the country.
- 4. Health education is an element of health promotion whether one regards the two terms as being synonymous or one takes a broader view of health promotion (Tones, 1997). Research is required to assess the impact of increased nutritional knowledge on the consumption patterns of LBIVs.

APPENDIX I. QUESTIONNAIRE

Interview number DAY TIME

AGE

SEX

WHERE DID YOU SLEEP LAST NIGHT?

DO YOU HAVE ANY SPECIAL DIETARY REQUIREMENTS?

If yes what are they?

DO YOU HAVE ACCESS TO COOKING FACILITIES?

HOW OFTEN DO YOU PREPARE A MEAL FROM FRESH INGREDIENTS

Every day 3 to 6 times a week once a week occasionally never

HOW OFTEN DO YOU EAT OILY FISH SUCH AS MACKEREL, PILCHARD,
SARDINE, HERRING?

Every day 3 to 6 times a week once a week occasionally never

IS THERE ANY INFORMATION ABOUT YOUR DIET THAT YOU WOULD LIKE
TO ADD?

APPENDIX II. Letter to The Big Issue in the North

S. GRAHAM ARTHUR

July 17, 2002

The Big Issue in the North
124 Duke Street
Liverpool L1 4JN

Dear Sir / Madam

I am a final year student at Liverpool JMU studying food and nutrition. A recent Big Issue (no. 417) featured a humorous letter written by a Liverpool vendor concerning hostel food. Prompted by this I would like to research the diet of homeless people and do this by focusing on Big Issue vendors.

The Government regularly produces details of the nutrient intake of households in Great Britain. I am not aware of any such figures being produced for homeless people. My aim is to survey homeless people in order to assess their dietary intake. This would require interviewing individuals (each interview would last about 20 minutes). The end result would be a detailed dietary breakdown (macronutrients, vitamins and minerals) of the group taking part in the survey. To this end I am writing in the hope that you might be able to assist me in my research.

It would be greatly appreciated if I could meet with you to discuss this further.

Yours sincerely,

S.G. Arthur.

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