

Research Report

# Old and alone: barriers to healthy eating in older men living on their own

Georgina Hughes, Kate M. Bennett, Marion M. Hetherington\*

*Department of Psychology, University of Liverpool, Eleanor Rathbone Building, Liverpool, L69 7ZA, UK*

Received 10 December 2003; revised 29 March 2004; accepted 11 June 2004

## Abstract

Ageing is associated with reduced energy intake and loss of appetite. Older men tend to have poorer dietary intakes including consumption of fewer fruits and vegetables in comparison to older women. Living and eating alone further diminishes food consumption and dietary quality. The aim of the present study was to explore food choice and energy intake in older men living alone using both quantitative and qualitative methods. 39 older men were interviewed and completed questionnaires on health, food choice, dietary patterns and appetite. Few men managed to consume recommended levels of energy, essential trace elements or vitamins A and D. Age and BMI failed to predict patterns of intake, but men with good cooking skills reported better physical health and higher intake of vegetables. However, cooking skills were negatively correlated with energy intake. Men who managed to consume at least 4 portions of fruits and vegetables each day had significantly higher vitamin C levels, a greater percentage of energy as protein and generally more adequate diets. Interviews revealed that poor cooking skills and low motivation to change eating habits may constitute barriers to improving energy intake, healthy eating and appetite in older men (193).

© 2004 Elsevier Ltd. All rights reserved.

*Keywords:* Ageing; Food intake; Cooking; Fruits and vegetables; 5-a-day; Appetite

Ageing is characterized by a decrease in activity (Drewnowski & Warren-Mears, 2001), a decline in lean body mass (Morley, Baumgartner, Roubenoff, Mayer, & Nair, 2001) and loss of appetite (Hetherington, 1999). Poor nutritional status and low energy intake may increase the risk of diet-related illnesses (Drewnowski & Shultz, 2001) and affect cognitive performance (Ortega et al., 1997). Taken together, poor diet impacts upon quality of life through compromised health outcomes and lower general functioning.

Evidence of lower energy intakes is derived from large-scale USA nutritional surveys (NHANES, 1994) and in Europe (Sjogren, Osterberg, & Steen, 1994). These suggest that many older adults do not meet daily energy requirements. Indeed low energy intake is often coupled with nutrient deficiency in both free-living older adults and those in care settings (Vellas et al., 2001). Inadequate nutrition is linked to the anorexia of ageing and to changes in social status. In addition to the characteristic loss of sensory acuity

and desire to eat with old age (Hetherington, 1999), widowhood and bereavement may compromise nutrition and health (Bennett, 1998). A key element of the general trend to eat less with ageing is that quantity and quality of food intake are affected by a number of modifiable factors including cooking skills (for a discussion see Caraher, Dixon, Lang, & Carr-Hill, 1999), nutritional knowledge (Baker & Wardle, 2003) and social engagement (Donini, Savina, & Cannella, 2003). Thus, although appetite tends to diminish with old age, there are nevertheless several potential routes available to delay or reduce these changes.

It has been well established in younger adults, that eating in social groups enhances food intake by as much as 40% (de Castro, 1994). When older adults were invited to a laboratory to eat with familiar others intake was enhanced by 60% (McAlpine, Harper, McMurdo, Bolton-Smith, & Hetherington, 2003). Healthy older adults therefore respond to social contexts in the same way as younger adults, but opportunities to eat meals with family and friends may diminish.

During the Nottingham Longitudinal Study of Activity and Ageing (NLSAA) older adults were asked who did

\* Corresponding author.

*E-mail address:* m.m.hetherington@liv.ac.uk (M.M. Hetherington).

the cooking. There were significant gender differences in who cooked, with women cooking significantly more than men. These gender differences were reduced but not eradicated when controlling for marital status. Men living alone cooked more than married men but still significantly less than women who lived alone. There is also evidence that as the respondents aged they cooked less, with relatives, friends and formal support agencies cooking on behalf of the respondent (see Bennett, 1998, for a discussion of gender and domestic activities). Similarly, a more recent study (Bennett, Hughes & Smith, 2003) revealed that a small, but nonetheless significant issue in the experience of widowhood is that of cooking and nutrition more generally. Many widowed men rely on luncheon clubs, family and 'ready meals' to provide dietary intake. A small minority of the men interviewed prepared substantial meals and enjoyed cooking. Indeed, these men were predominantly those men widowed at a younger age with a family to raise. During interviews participants suggested that women are better able to deal with widowhood, largely because of their perceived greater domestic experience (e.g. cooking and shopping).

Healthy eating is both desirable and achievable in old age despite changes in appetite regulation. Women appear to fare better than men in valuing and achieving a healthy diet. Studies have now shown that older women consume more fruit and vegetables than men (Baker & Wardle, 2003; Donkin et al., 1998; Johnson et al., 1998) and this seems to be due, in part, to a better awareness of dietary recommendations in women (Baker & Wardle).

Overall, a significant pattern has emerged from the literature. This indicates that barriers to eating sufficient energy and choosing healthy foods in older adults include both the consequences of normal ageing for the control of appetite, and changes in psychosocial circumstances which may exacerbate diminished appetite such as fewer social eating occasions, poor cooking skills, bereavement and loss.

The aim of this study was to investigate barriers to healthy eating, focusing on energy intake, food choice (specifically fruits and vegetables), cooking skills and well-being in a group of older men living alone. To date, most studies on appetite in older adults have applied quantitative methods and many have focused on women. Therefore, the approach adopted was to apply both quantitative and qualitative research methods to further our understanding of the experience of older men living alone in relation to appetite, food choice and diet quality. This approach permits a deeper analysis of attitudes, beliefs and feelings, which lie behind data taken from diet records and questionnaires. Interviews were used to complement and extend quantitative analyses. In particular, intake of fruits and vegetables was quantified using recall, interview and food frequency questionnaires, and then characteristics of those achieving the recommended five portions of fruits and vegetables each day were profiled.

## Methods

### Participants

Older men were recruited from the Merseyside area, a largely urban region of the north west of England. The aims of the project were communicated to a wide range of formal and informal groups of older people. Contact was made with welfare organisations, social services and sheltered housing schemes, who then circulated details of the study within their groups. Flyers were posted in libraries, drop-in centres and other public spaces known to be used by older people. An 'expression of interest' form was completed and returned by those people interested in taking part in the study. A suitable time and venue for interview was then arranged. All who volunteered were recruited to the study.

Thirty-nine men aged between 62 and 94 years ( $M = 74$ ) living alone were interviewed and completed questionnaires on health, food frequency, and dietary intake (one participant did not complete the questionnaire data as he was unwell on the day of testing). Characteristics of the sample are summarised in Table 1. Eighteen were widowed (46%), 14 were single and had never married (36%), 6 were divorced (15%) and one man was married but his wife was in care. 92% of participants were retired and 8% currently unemployed. Former employment of the participants, classified traditionally, were professional (2.5%), managerial (21%), skilled (31%), partly skilled (15%) and unskilled (28%) with 1 unknown occupation (2.5%). All participants had kitchen facilities where they could prepare their own meals. No-one was totally reliant on others for meal provision or preparation.

### Procedure

The men were interviewed at home ( $n = 12$ ), at a day centre ( $n = 3$ ), sheltered housing office ( $n = 1$ ) or in the laboratory ( $n = 23$ ) according to preference. Questionnaires were administered in the same place. Body weight

Table 1  
Mean (SD) and range of characteristics and data from the sample

Variable	Mean	SD	Range
Age in years	74.8	8.21	62–94
BMI	26.5	3.55	21.2–34.9
Daily Energy Intake (Mcal)	1.87	0.52	1–3.13
Daily fruit and vegetables portions	2.79	1.82	0–6.75
Daily vitamin C (g)	72	49.4	4–225
Daily alcohol (g)	10.6	18.1	0–89
Physical health <sup>a</sup>	5.53	2.27	1–11
Self-assessed health <sup>a</sup>	25.64	4.61	16–37
Symptoms of anxiety <sup>a</sup>	1.95	2.34	0–8
Symptoms of depression <sup>a</sup>	1.45	2.41	0–10
Life satisfaction <sup>b</sup>	17.24	4.16	5–26
Social engagement <sup>b</sup>	16.16	3.62	8–23

<sup>a</sup> Higher scores indicate poorer outcomes.

<sup>b</sup> Higher scores indicate better outcomes.

and height were calculated using a stadiometer (Leicester Height Measure distributed by Seca Limited, Birmingham) and portable scales (Seca 770, Hamburg, Germany). Body mass index was calculated as weight (kg)/[height(m)]<sup>2</sup>. Two 24-h food recall questionnaires were conducted, one on a weekday (Monday,  $n=12$ , Tuesday,  $n=14$ , Wednesday,  $n=8$ , Thursday,  $n=3$ , Friday,  $n=1$ ) and the other on a day during the weekend (Sunday). Both recalls were completed within two weeks and collected by the same, trained individual (GH).

### Materials

To assess physical and mental health, general well-being and mood, questionnaires used in the Nottingham Longitudinal Study of Activity and Ageing (Morgan, 1998) were utilised. The questionnaires enquired about physical and mental health, self assessed levels of health (subjective health); symptoms of anxiety and depression, life satisfaction and social engagement. Details of smoking and alcohol consumption were also recorded.

### Interviews

All interviews were tape-recorded (Sanyo Compact Cassette Recorder TRC-960C and Sanyo MM01 Conference Microphone) and then transcribed. The interview began by asking respondents general questions about family, living circumstances, previous occupation and then set questions relating to diet and activity (what constitutes a healthy diet; how important it is; how easy or difficult it is to maintain); appetite (changes in appetite or weight; skipping meals/forgetting to eat); shopping and dietary choices (meal planning; access to shops; food purchases; eating out; eating fast food); circumstances of eating (eating alone or not; meal patterns and timing); domestic skills (cooking; home help; domestic assistance; growing own food). Finally, the interviewer invited the respondent to discuss any strategies they thought might assist other men living alone to achieve a healthy diet.

### Food intake

To determine typical dietary intake two methods were employed. First was a Food Frequency Questionnaire (FFQ: Margetts, Cade, & Osmond, 1989) which asks respondents to indicate how often they eat particular types of food. Second respondents were asked to report food intake over two 24-h periods, adapting the multiple pass technique (Conway, Ingwerson, Vinyard, & Moshfegh, 2003) for 24-h dietary recall. Two members of the team were trained in use of multiple-pass dietary recalls, which were conducted face to face or over the phone and randomized across condition and day of recall. 'Multiple-pass' refers to the method of extracting dietary information

via a series of prompts in order to obtain as accurate recall as possible.

For the purposes of this report, daily energy intake, percentage of energy from protein, fat and carbohydrate, vitamin C and alcohol intake will be reported alongside fruit and vegetable intake from recall and the FFQ.

### Data analysis

The interviews were analysed using grounded theory and content analysis (see Bennett & Vidal-Hall, 2000, for a detailed description of the analytical technique). Four members of the team coded the interviews and inter-rater reliability was 80%. QSR NUD\*IST revision 4 (QSR International Pty Ltd) software was used to assist in this process. Statistical analysis of questionnaires was carried out by SPSS (v11). The multiple-pass 24-h food recalls were analysed using WISP<sup>®</sup> (V2.00, Tinuviel, Warrington) nutritional analysis software. Energy and nutrient intakes are compared against UK reference nutrient intakes (RNI) (Department of Health, 1991). These are calculated on the basis of the age, sex, BMI and physical activity level of each participant. It was assumed that the men were relatively sedentary and so low levels of physical activity were used as the standard for all participants for dietary analyses.

## Results

In order to investigate possible barriers to healthy eating the data was examined under four themes investigating the following areas: health and well-being, energy and nutrient intakes, cooking skills, and fruit and vegetable intake. The questionnaires provided numerical data on health and well-being, energy and nutrient intakes, and fruit and vegetable intake, whilst cooking skills were extracted from the interview data. The interviews were also used to provide clarification relating to these themes, as illustrated later. All data are presented as mean  $\pm$  SD, unless otherwise stated.

### Health and well-being

Ages ranged from 'young old' (62 years) to 'very old' (94 years). Health status varied across the sample, but chronological age did not correlate with self-assessed health, physical health, life satisfaction, mood or social engagement. Body mass index also varied across the sample, with 21 normal weight, 8 overweight (BMI  $\geq 27 < 30$ ) and 8 men classified as obese (BMI  $\geq 30$ ). A comparison of variables by weight status revealed no significant differences in health and well-being.

There were 8 smokers and 31 non-smokers in the sample. Analysis of variance revealed no significant differences in any of the health and well-being variables although smokers were significantly younger ( $68.2 \pm 6$  years) than non-smokers ( $76.5 \pm 8$  years,  $p < 0.01$ ).

Overall, reported levels of subjective health correlated positively with physical health,  $r(35)=0.346$ ,  $p<0.05$ , and negatively with life satisfaction,  $r(35)=-0.408$ ,  $p<0.01$ . Thus better subjective health corresponded with better physical well-being, and poor subjective health was related to a lower life satisfaction. Life satisfaction was also highly correlated with social engagement,  $r(37)=0.555$ ,  $p<0.001$ . As expected, scores of depression and anxiety were closely linked,  $r(37)=0.805$ ,  $p<0.0001$ , but these mood variables did not correlate significantly with any of the health and well-being questionnaires.

### Energy and nutrient intakes

Energy intake was calculated from 24-h recalls for each day then averaged across the two days for all dietary reference values. Most men ( $n=25$ , 64%) consumed less energy on average than recommended (adjusted for BMI, physical activity and age). Only 4 of the men (10%) managed to consume at or above the RNI on at least one day. Considering diet quality, most of the men had low intakes from sources of potassium, calcium, magnesium, copper and zinc. All of the men had below the RNI for Vitamin D and almost half of the sample failed to meet the RNI for Vitamin A. In contrast most of the men (65%) consumed above the RNI for Vitamin C and around half of the men (47%) did not drink any alcohol on either of the dietary recall days.

Energy intake was positively correlated with amount (g) of alcohol consumed,  $r(37)=0.406$ ,  $p<0.01$ , thus for those consuming alcohol on the days of the dietary recall, energy from alcohol boosted overall intake, although on average energy from alcohol constituted only  $6.7\pm 5.7\%$  of total energy intake (i.e. an amount within recommended guidelines).

Normal weight men ( $87\pm 57$  g) consumed more Vitamin C than overweight and obese men ( $54.8\pm 30$  g;  $p=0.05$ ). However, the most significant differences between members of the sample were observed when the men were categorized by their cooking skills.

### Cooking skills

The data has been shaped by a combination of participants' interpretations of cooking skills and the researcher's understanding of the meanings attributed to these skills. Participants were asked if they cooked, if someone else cooked for them, if they heated food and how they described their cooking skills. This question was subsequently coded as 1 'no, poor or basic', 2 'adequate' or 3 'good'. Coding was based on the participants' descriptions, using their exact words. Therefore 'no, poor or basic skills' were stated as such by the participants. Basic skills differed from our coding of 'adequate' because from reading the interviews 'basic' skills appeared to imply a lack of necessary skills, whereas 'adequate' was specifically

referred to by participants as being adequate for their needs. For example Participant 28, age 86 years, described his cooking skills:

"They're adequate for what I need."

'Good' skills were identified from the answer to this question where participants said they were good cooks and/or they offered a list of skills. This is illustrated as follows:

Q. How would you describe your cooking skills?

"Above average. (laughs) I can cook a joint, I can cook fish, I can poach a salmon, I can make me sauces, I can do er it's hard to describe this—seems like boasting (laughs). I can cook pastry, I can cook cake, I can cook bread.

Q. Do you use a pressure cooker?

Yes. Very fond of it. (laughs)

Q. What do you use it for?

"I use that to make soups, stuff like that." [Participant 33, age 76 years]

Good cooking skills are also illustrated by this participant, in the following way:

"Good. I'm a good cook. I watch it, I don't go away and leave it. If I'm cooking vegetables broccoli and stuff like that—tri minuto—huh OK. Only soon as it's done three minutes off. Because it's just nice for chewing it's crisp, they're not soft, They're not boiled, you haven't boiled all the goodness out of them. Three minutes dead." [Participant 30, age 94 years].

Using these categories, the men were compared on a number of different parameters (see Fig. 1). Men with good cooking skills reported better physical health,  $F(2,34)=7.077$ ,  $p<0.01$ , and consumed more vegetables than men with poorer cooking skills,  $F(2,34)=3.545$ ,  $p<0.05$ , which then contributed to a significant overall effect on fruit and vegetable intake. Energy intake was negatively correlated with cooking skills,  $r(34)=-0.336$ ,  $p<0.05$ , suggesting that men with better cooking skills consumed less energy than men with poor or adequate skills. This relationship

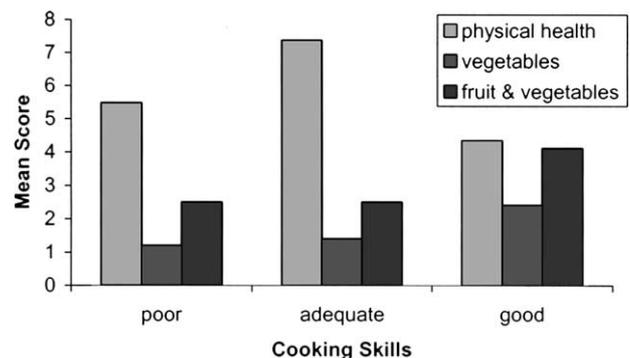


Fig. 1. Cooking skills, physical health and intake of fruits and vegetables.

may, in part, be explained by the observation that men with good cooking skills consumed more vegetables and these foods tend to be low in energy density thus contributing to a lower overall energy intake. Those eating more fruit and vegetables did not just eat more of everything.

#### *Fruit and vegetable intake*

As expected, Vitamin C was highly positively correlated with reported intake of fruits and vegetables,  $r(37)=0.623$ ,  $p<0.001$ , and cooking skills correlated with portions of fruits and vegetables consumed,  $r(34)=0.363$ ,  $p>0.05$ . Vitamin C intake was negatively correlated with subjective health,  $r(35)=-0.365$ ,  $p<0.05$ , thus poorer subjective health as indicated by a higher score on this measure was associated with lower intakes of Vitamin C.

Only 5 men (13%) consumed the recommended 5-a-day portions of fruits and vegetables. In order to uncover possible reasons it was decided to investigate high and low consumption. Respondents were selected for further analysis if either they achieved an average of at least four portions of fruits and vegetables a day ( $n=7$ ), or if they achieved less than 1 portion a day ( $n=6$ ). Individual data on members of the two groups are described in Table 2. Applying non-parametric statistics to these small samples, significant differences emerged for intake of protein,  $Z=-2.143$ ,  $N1=7$ ,  $N2=6$ ,  $p=0.03$ , two-tailed, in addition to differences in fruits and vegetable intakes,  $Z=-3.025$ ,  $p=0.002$ , two-tailed. Participants who consumed more fruit and vegetables also consumed a higher percentage of protein ( $17.55\pm 4.3\%$ ), whereas less protein was consumed by men consuming lower fruit and vegetables ( $12.27\pm 2.5\%$ ). Although cooking skills were not statistically significant within this small sample, none of the lower fruit and vegetable group described their cooking skills as good. Given that high sources of proteins are

contained in foods which require cooking, for example, meat, fish, and eggs this might in part explain lower protein intakes and is worth further investigation.

The men who succeeded in eating at least four portions of fruit and vegetables a day (see Table 2 for details) consumed above the RNI for Vitamin C (145%), average energy intake was just below requirement (at least 82% of recommended but no more than 101%), 4 of the men tended to take fruit at breakfast, and the men ate vegetables with their main meal, commonly carrots, salad and peas. Although 4 reported in the FFQ that they habitually consume 5+ portions of fruits and vegetables each day, only one mentioned this in the interview. These men explicitly stated their belief that fruit and vegetables are good for health (and one to a healthy mind).

With respect to cooking skills, there was no clear pattern. Self-reported skills varied from 'very limited' to 'good'. Participant 19 described his cooking skills as 'very limited' but he consumed 98% of daily energy intake and 304% of Vitamin C. He also has strong views about the relationship between food, exercise and mood.

"Unbelievably I have the same dinner about four or five nights a week because I'm too lazy to cook anything else. I have chicken, chicken breasts with potatoes and carrots and fruit and cream and I have that probably four or five nights a week because it's easy and cos I like it. [Do you think it's important to have a healthy balanced diet?] Oh indeed very much yes but then it goes with recreation, a contented mind. I believe in exercise because I find if I don't get the adequate exercise then one doesn't have the appetite so doesn't want to eat. These are things that are linked together really." [Participant 19, age 73 years].

Similarly Participant 25 believes his skills are basic but nevertheless eats more vegetables now than when his wife was alive.

"Er I used to eat what my wife put before me yes we always ate vegetables. [Would you say you eat more vegetables now or not?] Possibly yes, probably a bit more than I used to. [Why is that?] Really its mainly from reading about it although I enjoy eating vegetables." [Participant 25, age 87 years].

Participant 18 is the only man who discusses the 5-a-day message and who achieves it. It is clear that he takes healthy eating seriously:

"Well a variety of food to start with er like I do observe the famous five portions of veg and fruit a day er a varied diet, well cooked food.... I had to do all my own cooking anyway so I thought you know next time make it interesting, make it worthwhile and so took some er I went to night school for three years and so I regard

Table 2

Individual data on men who consumed 5-a-day and those who consumed less than one portion of fruits and vegetables per day

Man	Age	Recall portions	FFQ portions	Energy (%)	Vitamin C (%) RDA
15 <sup>a</sup>	87	6.75	4.5	101	145
18	70	6.75	5.14	82	363
19	73	4.75	2.64	98	304
20	66	6	2.93	128	562
25	87	6.25	5.57	93	200
27	69	4.50	0.71	113	159
28	86	5.75	6.14	84	291
8 <sup>b</sup>	81	0.50	0.43	115	36
14	71	0.0	0.71	63	9
23	79	0.50	0.57	64	88
29	72	0.75	1.57	74	79
37	83	0.75	5.21	108	63
38	73	0.50	1.64	92	58

<sup>a</sup> Men 15–28 consumed 4+ portions.

<sup>b</sup> Men 8–38 consumed <1 portion.

myself as a competent cook.” [Participant 18, age 70 years].

In the Table above Participant 19 stands out since his vegetable and fruit consumption is under-estimated by the FFQ (where one might expect it to be over-estimated). The explanation probably lies in the grouping together of carrots and tomatoes in the FFQ—since this man has both of these almost everyday. The FFQ grouped some items under one heading, for example tomatoes and carrots, and apples and pears so only one portion was counted irrespective of actual intake.

The men who consumed less than 1 portion of either fruit or vegetables each day tended to have lower energy intakes with 3 consuming less than 75% of the RNI for energy (although two had adequate intakes greater than 105%); 2 of these men consumed alcohol in excess of recommended amounts (17% of energy from alcohol, where maximum should be 7%); all of the men consumed 90% or less of RNI of Vitamin C (4 below 65%); cooking skills varied but none described themselves as good cooks; reasons given for not eating fruits and vegetables varied from dislike to health problems; two men commented that they had eaten more vegetables when their wives were alive. Finally, knowledge of the 5-a-day message was poor and general nutritional knowledge was weak.

Participant 8 knows he should eat more but cannot eat fresh fruit (due to an ulcer) so tries to compensate with home-made jam and tinned vegetables. His quote illustrates ironically, health as a barrier to healthy eating:

“Oh I think that you should be able to eat anything but I can’t eat anything at all (laughs) I had erm gastric ulcers ooh erm about sixty years ago now and I was put on two medicines for six months... but of course I was put on a diet then you know for the stomach ulcers and I’ve more or less stuck to it ever since you know I don’t erm I eat very little vegetables, I can’t eat raw fruit at all, fresh fruit you can’t eat it at all no...” [Participant 8, age 81 years].

The next man, on the other hand, makes no apologies for his dislike of fruit and vegetables. Indeed it is interesting that his grandchildren would like him to eat fruit.

“Well first of all can I tell you this I don’t eat greens or fruit I hate them, I hate greens—(...) even the grandchildren sometimes when their mam’s has given them a banana now sometimes they try and come near me like you know and I (...) I just can’t stand them and I don’t like fruit shops its awful if I have to go in there...” [Participant 23, age 79 years].

The last man did eat vegetables when his wife was alive and indeed still has frozen vegetables that she had bought but which he does not eat.

“I don’t carry in the house any vegetables whatsoever. ...Don’t buy potatoes, don’t buy anything at all like that, don’t buy anything, don’t buy any fruit.” [Participant 29, age 72]

Participant 37 demonstrated a contrast between his FFQ (5.2) and recall ratings of fruit and vegetable portions (0.75). Insight can be gained from his interview where he discusses at some length making soups with a variety of vegetables for his lunch on a regular basis. On the two days where he was asked to recall what he had eaten he had not eaten soup.

“...well lunchtime today I had—well I had suffice for me—I had some soup but in the soup I also add fresh vegetables into the soup such as carrots, onions, either or sprouts you see things like that peas. Well all those go into it you see that’s my fresh vegetables going into the soup you see. It’s like a kind of a dinner at night but only in soup and I do all that in the microwave oven you see. Er and after that all that I have is er—oh probably a sandwich of...” [Participant 37, age 83 years]

The interviews highlighted the diversity of attitudes and beliefs about nutrition. Clearly some men are highly motivated to follow a healthy diet and did not identify barriers to achieving a healthy diet. Others are not interested in including more fruits and vegetables in the diet. For those who are interested in improving healthy eating, one option emerging from the diet records of men achieving 5-a-day is to include at least one piece of fruit with breakfast. This does not require any cooking skills and it appears to be straightforward to incorporate into a morning routine. In the interviews 85% of the men reported having breakfast. This suggests that advising men to have breakfast and to include fruit in that breakfast is a reliable way of encouraging men to eat 5-a-day, especially when other meals may be eaten less regularly. However, lack of interest and in at least one case, health concerns may prevent this solution being adopted.

## Discussion

The present study confirms the relatively low energy intakes observed in older adults and in particular, low intakes of fruits and vegetables, with a very small proportion achieving 5-a-day. Reduced energy intake may be attributable to lower energy requirements as a normal response to healthy ageing, and to changes in life circumstances such as living alone. Older men living alone have less adequate diets, less dietary variety and less frequent intakes of fruits and vegetables than older women who live alone (Davis, Randall, Forthofer, Lee, & Mergen, 1985). They also tend to have poor cooking skills (Lilley, 2002).

Men with better cooking skills consumed more vegetables and reported better physical health. However, these men consumed a diet lower in energy than those with poorer

cooking skills. Therefore, whilst cooking may be key to achieving a healthier diet and better physical health it does not necessarily ensure a higher energy intake. Although the diets of these men were not inadequate and may well have been appropriate for their energy expenditure. Nevertheless, a consideration in promoting fruits and vegetables to older adults is that these foods are low in energy density and in those failing to meet energy requirements, it is not sufficient to advise eating more fruits and vegetables without also boosting energy intake by other means.

In the present study, no differences were observed between those men who had lived alone and were unmarried and those whose living arrangements had changed as a result of divorce or widowhood. It might be expected that those men who were previously married may have acquired dietary habits, which differed from single-living men, but this did not appear to be so. Although single living men consumed slightly more food overall than the other groups, there were no fruit and vegetable differences. Only 13% of the men in this sample achieved the recommended 5 portions of fruits and vegetables which is somewhat lower than 16% of 485 men surveyed by Baker and Wardle (2003), although this difference could be attributable to the very different methods of these two studies. A comparison between men in the present study consuming at least 4 portions a day with those consuming one or fewer portions each day revealed some interesting differences. Those eating more fruits and vegetables consumed significantly more Vitamin C than those consuming one or fewer portions of fruits and vegetables. It is known that fruits and vegetables convey significant benefits to consumers including protective effects against cancer and coronary heart disease (Liu, 2003). It has also been suggested that Vitamin C improves immunity, vascular function and may reduce risk of developing cognitive impairments with old age (Martin, Cherubini, Andres-Lacueva, Paniagua, & Joseph, 2002). Therefore, a small change in dietary habits to increase fruits and vegetables provides considerable benefits to both physical and mental well-being. Those eating one or fewer portions of fruits and vegetables also consumed less energy as protein, drank more alcohol and tended to have lower energy intakes. Clearly, low intake of fruits and vegetables is a general marker of a less healthy dietary profile than those consuming 4 or more portions of fruits and vegetables each day.

From the interviews it was clear that although most participants acknowledged the importance of diet, there was a varied understanding of the constituents of a healthy diet. There was evidence too that there was a mismatch between the understanding men had of a healthy diet and what they actually achieved. It was not just that some participants believed they had a healthy diet when in fact they did not, it was also that a few men believed their diet was for example boring or basic, when in fact their diets were healthy and were relatively high in fruits and vegetables. Older adults have been shown to make an effort to achieve a healthy diet (Kearney et al., 2001) therefore, a clearer understanding of

dietary adequacy coupled with improved clarity of healthy eating messages specifically tailored for elders are likely to make an impact on achieving a healthy diet in older adults.

Motivation was an important contributory factor to healthy eating when cooking and shopping for one and eating alone. Those men who maintained a healthy diet were those who were motivated to cook, even if their meals were simple. They were proud of their abilities and several men offered recipes or described their techniques for cooking vegetables or preparing breakfast. Interestingly some of those men who described their cooking as basic or routine managed to eat 5-a-day in part because they always ate from the same menu(s).

Men in the present study frequently described in detail what they ate for breakfast, while providing less detail for other meals. Those men who achieved or approached the 5-a-day requirements were likely to eat fruit at breakfast, often as an addition to cereals, adding bananas or dried fruit. Indeed, these types of additions could be easily incorporated into a daily diet.

The interviews also showed that men were more able to talk in detail about fruit than about vegetables. When asked about fruit men described the fruit they ate and how they prepared it. In contrast men often talked about vegetables as one item such as greens or roughage but few of the men talked in detail about how they prepared their vegetables (except for those reported earlier). This suggests that there is much work to be done on encouraging men to cook and eat vegetables. This difference may be accounted for by the need for cooking skills—fruit can be eaten raw, vegetables are traditionally eaten cooked, with only a few exceptions.

Implications for applying the findings of this study to improving the diets of older adults include offering cooking classes to older men, providing healthy eating information tailored for them in the context of the whole diet and not merely a focus on 5-a-day, and encouraging the adoption of simple strategies such as eating breakfast and including fruit with breakfast. Consistent with Baker and Wardle (2003) the present study identifies a need to devise interventions which directly address the wishes and needs of older adults, and in particular those of older men.

## Acknowledgements

This research was funded by the Institute of Human Ageing, University of Liverpool. We would like to acknowledge the assistance of Dr Brian Merry, Biological Sciences, University of Liverpool, in the initial stages of designing this study.

## References

- Baker, A. H., & Wardle, J. (2003). Sex differences in fruit and vegetable intake in older adults. *Appetite*, 40, 269–275.

- Bennett, K. M. (1998). Longitudinal changes in mental and physical health among recently widowed men. *Mortality*, 3, 265–274.
- Bennett, K. M., Hughes, G. M., & Smith, P. T. (2004). "I think a woman can take it": widowed men's views and experiences of gender differences in bereavement. *Ageing International*, 28, 408–424.
- Bennett, K. M., & Vidal-Hall, S. (2000). Narratives of death: a qualitative study of widowhood in later life. *Ageing and Society*, 20, 413–428.
- Caraher, M., Dixon, P., Lang, T., & Carr-Hill, R. (1999). The state of cooking in England: the relationship of cooking skills to food choice. *British Food Journal*, 101(8), 590–609.
- Conway, J. M., Ingwersen, L. A., Vinyard, B. T., & Moshfegh, A. J. (2003). Effectiveness of the USDA's five-step multiple-pass method to assess food intake in obese and nonobese women. *American Journal of Clinical Nutrition*, 77, 1171–1178.
- Department of Health (1991). *Dietary reference values for food and nutrients for the United Kingdom Report of the Panel on Dietary Reference Values of the Committee on Medical Aspects of Food Policy*.
- Davis, M. A., Randall, E., Forthofer, R. N., Lee, E. S., & Margen, S. (1985). Living arrangements and dietary patterns of older adults in the United States. *Journal of Gerontology*, 40, 434–442.
- de Castro, J. M. (1994). Family and friends produce greater social facilitation of food intake than other companions. *Physiol. Behav.*, 56(3), 445–450.
- Donini, L. M., Savina, C., & Cannella, C. (2003). Eating habits and appetite control in the elderly: the anorexia of aging. *International Psychogeriatrics/IPA*, 15, 73–87.
- Donkin, A. J. M., Johnson, A. E., Lilley, J. M., Morgan, K., Neale, R. J., Page, R. M., et al. (1998). Gender and living alone as determinants of fruit and vegetable consumption among the elderly living at home in urban Nottingham. *Appetite*, 30, 39–51.
- Drewnowski, A., & Shultz, J. M. (2001). Impact of aging on eating behaviors, food choices, nutrition, and health status. *Journal of Nutrition, Health and Aging*, 5(2), 75–79.
- Drewnowski, A., & Warren-Mears, V. A. (2001). Does aging change nutrition requirements? *Journal of Nutrition, Health and Aging*, 5, 70–74.
- Hetherington, M. M. (1999). Taste and appetite regulation in the elderly. *Proceedings of the Nutrition Society*, 57, 625–631.
- Johnson, A. E., Donkin, A. J., Morgan, K., Neale, R. J., Page, R. M., & Silburn, R. L. (1998). Fruit and vegetable consumption in later life. *Age and Ageing*, 27, 723–728.
- Kearney, J. M., Gibney, M. J., Livingstone, B. E., Robson, P. J., Kiely, M., & Harrington, K. (2001). Attitudes towards and beliefs about nutrition and health among a random sample of adults in the Republic of Ireland and Northern Ireland. *Public Health Nutrition*, 4, 1117–1126.
- Lilley, J. M. (2002). *Food choice in later life*. London: Food Standards Agency.
- Liu, R. H. (2003). Health benefits of fruit and vegetables are from additive and synergistic combinations of phytochemicals. *American Journal of Clinical Nutrition*, 78(Suppl 3), 517S–520S.
- Margetts, B. M., Cade, J. E., & Osmond, C. (1989). Comparison of a food frequency questionnaire with a diet record. *International Journal of Epidemiology*, 18, 868–873.
- Martin, A., Cherubini, A., Andres-Lacueva, C., Paniagua, M., & Joseph, J. (2002). Effects of fruits and vegetables on levels of vitamins E and C in the brain and their association with cognitive performance. *Journal of Nutrition and Healthy Aging*, 6, 392–404.
- McAlpine, S. J., Harper, J., McMurdo, M. E., Bolton-Smith, C., & Hetherington, M. M. (2003). Nutritional supplementation in older adults: pleasantness, preference and selection of sip-feeds. *British Journal of Health Psychology*, 8, 57–66.
- Morgan, K. (1998). The Nottingham longitudinal study of activity and ageing: a methodological overview. *Age and Ageing*, 27(3), 5–11.
- Morley, J. E., Baumgartner, R. N., Roubenoff, R., Mayer, J., & Nair, K. S. (2001). Sarcopenia. *Journal of Laboratory and Clinical Medicine*, 137, 231–243.
- National Health and Nutrition Examination Survey (NHANES) (1994). *Daily dietary fat and total food intake. Phase 3. 1988–1991 Morbidity and Mortality Weekly Report*, 43 pp. 116–125.
- Ortega, R. M., Requejo, A. M., Andres, P., Lopez-Sobaler, A. M., Quintas, M. E., Redondo, M. R., et al. (1997). Dietary intake and cognitive function in a group of elderly people. *American Journal of Clinical Nutrition*, 66, 803–809.
- Sjogren, A., Osterberg, T., & Steen, B. (1994). Intake of energy, nutrients and food items in a ten year cohort comparison and in a six year longitudinal perspective: a population study of 70- and 76-year old Swedish people. *Age and Ageing*, 23, 108–112.
- Vellas, B., Lauque, S., Andrieu, S., Nourhashemi, F., Rolland, Y., Baumgartner, R., & Garry, P. (2001). Nutrition assessment in the elderly. *Current Opinion in Clinical Nutrition and Metabolic Care*, 4, 5–8.