

**A pilot study to test the
methodology for determining
nutrient intake for
MOW recipients**

Sarah Kepert and Roslyn Soanes

Eastern Perth Public and Community Health Unit



© Eastern Perth Public and Community Health Unit, 2001

Eastern Perth Public and Community Health Unit

PO Box S1296

Perth WA 6845

Phone: 61 8 9224 1625

Fax: 61 8 9224 1612

Email: rph.eppchu@health.wa.gov.au

Website: <http://www.rph.wa.gov.au/hpnetwork/>

September, 2001

This work is copyright. Apart from any use as permitted under the Copyright Act 1968, no part may be reproduced without written permission from the Eastern Perth Public and Community Health Unit

Every effort has been made to ensure that the information contained in this document is free from error. No responsibility shall be accepted by the Eastern Perth Public and Community Health Unit to its officers involved in the preparation of the document for any claim that may arise from information contained herein.

Eastern Perth Public and Community Health Unit

Sarah Kepert BAppSc (Nutrition and Food Science), PostGradDip (Dietetics)
Project Dietitian
Eastern Perth Public and Community Health Unit

Roslyn Soanes BAppSc (Nutrition and Food Science), PostGradDip
(Dietetics), MPH
Nutrition Coordinator
Eastern Perth Public and Community Health Unit

Cover designed by White Castle Design & Illustration and printed by Della Print.

Report printed by: Royal Perth Hospital, Perth, Western Australia

Citation

The citation below should be used when referencing this work:

Kepert, S. & Soanes, R. 2001. *A pilot study to test the methodology for determining nutrient intake in MOW recipients.* Eastern Perth Public and Community Health Unit, Perth.

ACKNOWLEDGEMENTS

The authors of this report wish to thank the individuals who gave invaluable input into this pilot study including; Janis McCowat, Meals on Wheels Coordinator, Mike Smith and all kitchen staff who allowed us to roam the kitchen, and all the volunteers from the Meals on Wheels service that allowed us to join in with the MOW delivery rounds.

We would like to thank and acknowledge the time generously given by Cathy Campbell and Ruth Foley from the Health Department of Western Australia, Colleen Glasson, Nutrition Coordinator, South West Population Health Unit, Gail Milner, Director of Community Services, Home and Community Care, Helen Valentini, Acting Public Health Nutritionist, Southern Public Health Unit Network, Jacquie Krassie, University of Newcastle and Rudi Bartl, Central Coast Nutrition Department.

Thank you also to Eastern Perth Public and Community Health Unit staff, Dr Charles Douglas, Director, Ilse O’Ferrall, Deputy Director, Karen Forde, Research Officer, Leeann Murphy, Drug and Alcohol Project Manager, David Yates, Drug and Alcohol Coordinator, Susan Hansen, Assistant Research Officer and Trish Marshall, Diabetes Project Officer for feedback and comments throughout the pilot study and report.

A special thanks to Mel Macourt for providing us with motivation and support and a friendly setting in which to compile this report.

EXECUTIVE SUMMARY

There are currently no appropriate nutrient standards for MOW services. The most recent nutrient standards for MOW services were written in 1977 by the Commonwealth Department of Health. Since this time, the Recommended Dietary Allowances for men and women aged 55-75 have changed and the appropriateness of the nutrient standards for MOW has never been formally reviewed in light of the new Recommended Dietary Intakes (RDIs) (National Health and Medical Research Council, 1991). Due to the wide-scale public health significance of the nutrient standards, their development should be a priority area for future research.

This report provides a summary of the key findings of *A pilot study to test the methodology for determining nutrient intake for MOW recipients*. The pilot study was conducted by the Eastern Perth Public and Community Health Unit (EPPCHU) from June 2000 to June 2001. This pilot study tested a research methodology designed for use in a larger-scale research study. The objectives of the main research study are: to determine the total daily nutrient intake of a group of older Australians over 65 years; to determine the proportion of the total daily nutrient intake contributed by the MOW meal; and, to compare the total daily nutrient intake of MOW recipients with the Recommended Dietary Intakes for Australians (RDIs) and with a comparison group.

The methodology for the pilot study would be suitable for use in this larger research study, should the recommendations be taken into account.

The pilot study was implemented on a small number of participants and therefore no conclusions of significance can be made with respect to how the results compared to the nutrient guidelines. However, it is evident that the results are reflective of previous studies and highlight the inadequacy of nutrient intake in the MOW population. Energy intake was below recommendations based on weight and age for both males and females. Further research with a larger group of MOW recipients is required in order to establish reliable and valid revised nutrient standards for MOW services.

.

RECOMMENDATIONS

Although the methodology tested in this report worked well, a number of aspects could be improved for the larger study. These include:

- Informal contact sessions initiated by the researcher with MOW recipients and carers to enhance rapport, recruitment, data collection and feedback.
- The participation of the researcher in MOW rounds as a strategy for increasing enrolments.
- To ensure accuracy of data;
 - The researcher should clarify when the MOW foods will be cooked prior to the collection day,
 - The data should be collected on different days of the week to avoid collection of data on identical meals; and
 - The researcher should clarify that the recipients are obtaining the same constituents in meals that were weighed and averaged at the MOW site.
- Further education into accurately obtaining weight data and an adequate description of food should be given prior to the commencement of student involvement, to avoid inaccurate data collection.

1.0 INTRODUCTION

In Western Australia, approximately 92% of people aged 70 and over are currently living in the community. Many of these people (143 500) live independently and rely on home-delivered meal services (Health Department of Western Australia, 1999). It is estimated that by the year 2016, 16% of the 3.5 million people in Australia will be over the age of 65 years and, of this group, 25 per cent will be over 80 years of age (National Health and Medical Research Council 1999). The current policy of hospitals to discharge older people into the community quickly will increase the demands on community care services and nursing homes. Community services will be expected to deliver the services formerly managed by health care facilities (Administration on Aging 2000). Meals on Wheels (MOW) is one of these services.

The primary aim of MOW services is “to improve the health of the client by providing a nutritious meal” (Commonwealth Department of Health 1977 p.1). The 1977 Commonwealth Department of Health nutrient guidelines for MOW state that a MOW meal should aim to provide: “Two-thirds of the daily requirement (RDA)¹ of vitamin C, one half of the (RDA)¹ other vitamins, protein and minerals and at least one-third of the calories for energy” (Commonwealth Department of Health 1977 p.7). The success of MOW in achieving this goal has not been evaluated to any significant extent.

¹ The Recommended Daily Allowances (RDAs) used in the Commonwealth Department of Health nutrition guidelines were developed in 1954 and reviewed in 1971. These have been superseded by the 1991 RDIs.

Table 1: Comparison of 1971 recommended dietary allowances (RDAs) and current Australian recommended dietary intakes (RDIs)

	Australian RDA (1971) (men and women aged 55-75 years)		Current Australian RDI (1991) (men aged 64+ years, women aged 54+ years)	
	Males	Females	Males	Females
Energy (kJ)	8790	6280	7400 – 11000 ^a	6500 – 9300 ^a
Protein (g)	70	58	55	45
Vitamin A (µg)	750 R.E. ^b	750 RE	750 R.E. ^b	750 R.E. ^b
Thiamin (mg) (vitamin B₁)	0.8	0.6	0.9	0.7
Riboflavin (mg) (vitamin B₂)	1.0	0.6	1.3	1.0
Niacin (mg) (vitamin B₃)	14 N.E. ^c	10 N.E. ^c	16 N.E. ^c	11 N.E. ^c
Vitamin B₁₂ (µg)	2.0	2.0	2.0	2.0
Vitamin C (mg)	30	30	40	30
Calcium (mg)	400 – 800	400-800	800	1000
Magnesium (mg)	Not available		320	270
Folate (µg)	200	200	200	200
Iron (mg)	10	12	7	5-7

(NHMRC 1971, NHMRC 1991)

^a Energy values are for males and females over 60 years of age (NHMRC, 1991).

^b Retinol equivalents. 1µg retinol equivalents = 1µg retinol or 6µg β carotene (NHMRC 1991 p. 9).

^c Niacin equivalents. 1mg niacin equivalents = 1mg of niacin or 60mg of dietary tryptophan (NHMRC 1991 p.11).

The most recent nutrition guidelines for Australian MOW were written in 1977 (Commonwealth Department of Health 1977) and were based on the 1971 RDAs (NHMRC, 1971). Since this time, the RDIs have been updated (National Health and Medical Research Council, 1991). See Table 1. The 1977 MOW guidelines have not been formally reviewed since their induction and the basis for these guidelines is not discussed (Krassie *et al.*, 2000). For these reasons, there is a need to update the MOW nutrition guidelines.

The report on the Meals on Wheels Project conducted by the Royal North Shore Hospital and Community Health Services included the recommendation that ‘a Commonwealth funded project be undertaken to determine standards for the nutrient content of MOW meals’ (Northern Sydney Area Health Service, 1994). In a review of the nutritional needs of MOW consumers, Krassie *et al.* (2000, p.276), stated ‘there

is a consensus in the literature that there is a paucity of data on the nutritional status of home-bound older people and other Meals on Wheels consumers'. These documents provide further justification for a study into the nutrient intake of MOW recipients.

1.1 The Australian recommended dietary intakes

The current recommended dietary intakes (RDIs) for all older Australians include recommended intakes of nutrients for men aged 64 years and over and women aged 54 years and over (National Health and Medical Research Council, 1991). However, the RDIs for older people have not been well researched for subgroups within this large, heterogenous group of the population. For example age, activity levels, physical state, drug therapy and other factors vary considerably in this group, which in turn determine nutrient requirements (McCormack, 1997).

1.2 Australian research

The 1995 National Nutrition Survey (ABS 1998) is one of the few Australian studies on the nutrient intake of older people. The NNS will be used as a comparison group for the participants in this pilot study.

Other Australian studies measuring the nutrient intake of recipients of MOW show a number of nutrients to be deficient. See Table 2.

Table 2: Australian studies reporting inadequate nutrient intake for recipients of MOW

Nutrient	Stuckey <u>et al.</u> , 1984	Pargeter <u>et al.</u> , 1986	Lo <u>et al.</u> , 1989	Northern Sydney Area Health Service, 1993	Bell <u>et al.</u> , 1993
Protein	X	X			
Calcium	X	X		X	X
Zinc		X		X	X
Magnesium					X
Iron	X				
Thiamin	X				
Riboflavin	X				
Fibre			X		

X indicates a study in which nutrients listed in the left-hand column were consumed in inadequate quantities by MOW recipients.

1.3 Measuring nutrient intakes in older people

The nutrient intakes of older people can be estimated by either measuring and/or estimating the foods/drinks consumed, or by measuring biochemical indices. As measuring and/or estimating foods and drinks consumed is less invasive it was the method used in this pilot study.

1.4 Method of estimating food consumption used in this pilot study

Food consumption can be recorded by food accounting methods, retrospective methods or prospective methods. From a review of the literature on methods of dietary assessment (Bingham, 1987; Bone 1992, Kemm and Booth, 1992; Van Stavaren et al., 1994), it appeared that the diet diary (a prospective method) was the most appropriate method of recording food intake in older persons because of the relative ease of completing a diet diary and the acceptable degree of accuracy obtained. A repeated diet diary of two, twenty-four hour periods was the method used in this pilot study.

1.5 Factors that Influence the Nutrient Availability in MOW meals

The MOW menu should be compiled to satisfy a certain proportion of the daily nutrient needs of recipients. It is known that some nutrient loss may occur during storage, food preparation, cooking, reheating, holding the food for long periods while it is still warm and other factors (Williams, 1996). These factors need to be taken into account when planning the MOW menu.

2.0 METHOD

2.1 Participants

A sample size of 15 people was considered suitable for the pilot study. One hundred and sixty-three invitations to participate in the pilot study were sent out to recipients of the MOW service. A leaflet introducing MOW recipients to the pilot study, an information sheet detailing what was required of participants, and an invitation into the pilot study were attached to all MOW meals (163) ten weeks prior to commencement of the pilot study. The leaflet specified that the study was voluntary, the responses would be confidential and the participant could withdraw from the study without prejudice. A response slip and a self-addressed stamped envelope accompanied the leaflet. Two weeks later a reminder note was attached to all MOW meals.

A telephone call was made to all recipients who forwarded the return slip to ensure that they were over 65 years of age, were receiving MOW at least three times per week, could communicate in English, were free of terminal illness and had been receiving MOW meals for at least three months. Interested participants that met these criteria were then screened by the MOW coordinator to ensure that they were living alone, that they were able to fill in 24-hour food record sheets and that they were not on a strict exclusion diet. A letter of acceptance into the study was sent to all pilot study participants to advise them of selection and the dates of data collection/interviews. In the letter, participants were offered personal feedback on their individual diets after completion of the pilot study in return for their participation. Telephone calls were made one week prior to the preliminary visit to arrange a visiting time and on the day of the preliminary visit as a reminder to the participants.

2.2 Site

A metropolitan MOW service was the site of the pilot study. The food service involved outsourced its meals (the meals were cooked by an outside provider and not by MOW staff/volunteers). The MOW service used a cook/hot-hold system (food is held hot from the time of cooking to service) which is typical of approximately half of the suburban MOW services in WA.

2.3 Procedure

2.3.1 Preliminary Visit

The research officer went to the participants' houses to perform the preliminary visit. Signed consent was obtained from the participants and the purpose of the study was explained. Self-reported height, weight and physical activity levels were recorded. Participants were instructed on how to complete a 24-hour diet diary record of foods, beverages and nutritional supplements consumed. The 24-hour diet diary commenced at 12 am on the first day of data collection and finished at 12 am the following day. The time of the day, the quantity and type/brand of food that was consumed was recorded. A questionnaire was included at the beginning of the 24-hour diet diary asking how participants stored the MOW meal prior to consumption, the method of reheating the meal and the time taken for reheating. Measuring cups and spoons were provided to increase the accuracy of recording food portions. Participants were encouraged to record all food throughout the day prior to consumption to minimise memory failure. Participants were asked to keep the portion of the MOW meal not eaten in foil trays or plastic containers in a refrigerator.

2.3.2 First day of data collection

The 24-hour data collection period began within five days of the preliminary visit. The weights of individual food items in the MOW meal were measured at the MOW preparation site. The average weights of the food items in five meals provided an estimate of the weights of items in the meals delivered to study participants. Philips electronic kitchen scales HR2385 were used, which provided accuracy to 1 gram. On the same day, the cooking/holding times, the time taken for foods to be cooked and plated and the method of cooking vegetables were assessed in order to determine potential nutrient losses.

2.3.3 Preparation for the first interview

Curtin University dietetics students aided in the interview process. The research officer conducted a training inservice to dietetics students one week prior to the first interview and the students were paired. The research officer made a reminder telephone call to participants on the day prior to the first day of data collection and the students made a reminder telephone call to participants one hour prior to the commencement of the first interview.

2.3.4 First interview

The research officer/paired university students went to each of the participants' houses to perform the first interview at the end of the first data collection period, which involved checking the diary with the respondent for completeness and accuracy. This was achieved by questioning on specific types or brands of food/beverages consumed, recipes used and types of cooking methods. The portions of the uneaten foods from the MOW meal were weighed by the research officer/students using the same scales that were used for weighing foods at the MOW service. A quality procedure was instigated on the data collection and interview process. A sample of five participants was randomly selected to provide feedback on data collection and interviews. This was completed on the day following the interview via a telephone questionnaire.

2.3.5 Second day of data collection and second interview

The second day of data collection occurred two weeks after the first day of data collection. The methodology used for the second day of data collection and the second interview was a repeat of the first day of data collection and the first interview. Feedback on the data collection and interview process was obtained from all participants following the second interview via a telephone questionnaire.

3.0 Data analysis

The weights of the uneaten portions of food from MOW were subtracted from the average weights of the MOW meals for the same day to determine the amount of food consumed from the MOW meals.

The average total nutrient intake of participants per day was calculated by averaging total food intake over two days. The average nutrient intake from MOW meals was calculated by averaging the total intake from the MOW meals over two days.

The nutrient content of dietary records was analysed with the SERVE program version 3.99 that uses the Austnut and NUTTAB95 databases of the Australian Department of Community Services and Health (SERVE 3.99 2000). The total average daily nutrient intake was determined as well as the nutrient content provided by each MOW meal. Potential nutrient loss during hot-holding, refrigeration and reheating (if applicable) was estimated for each MOW meal using combined information from numerous studies on vitamin retention in foodservices (Williams, 1996).

4.0 RESULTS

4.1 Response rate

Of 163 invitations to participate in the study only 16 (10%) MOW recipients replied. Of this group, 10 (6%) recipients elected to participate, however only four (2.4%) were eligible for inclusion in the pilot study. Additional MOW recipients volunteered to take part in the study when the researcher paid personal visits. After talking with the MOW recipients whilst on the MOW rounds, a further six (3.7%) recipients were selected to participate and were eligible for inclusion in the pilot study. As participant numbers in the pilot study were still low, the MOW Coordinator from the MOW service was asked to provide names of potential participants. A list of likely participants was obtained, from which two further MOW recipients were enrolled in the pilot study, giving a total of 12 participants.

4.2 Nutrient intake

Table 1: The total 24-hour nutrient intakes of MOW recipients

Nutrient	Males n = 7		Females n = 5	
	Mean	% of RDI met	Mean	% of RDI met
Energy (kJ)	6773.6	84	5,663.3	84
Protein (g)	68.6	125	60.5	134
Thiamin (mg)	2.3	179	1.1	163
Riboflavin (mg)	2.6	145	1.8	182
Niacin eq (mg)	42.8	201	27.7	252
Vitamin C (mg)	230.6	472	109.6	365
Vitamin A (ug)	1,059.3	105	938.9	125
Sodium (mg)	3,236.9	102-254	1,496.0	65-163
Potassium (mg)	3,769.9	54-151	2,903.2	53-149
Magnesium (mg)	324.4	79	255.4	95
Calcium (mg)	1,101.8	104	782.1	78
Phosphorus (mg)	1,522.7	114	1,126.4	113
Iron (mg)	13.2	144	10.1	145-202
Zinc (mg)	10.9	65	7.9	66
Fibre (g)	28.9	75	22.2	74

Table 2: The calculated nutrient intake from MOW meals compared with Commonwealth Recommendations (Commonwealth Department of Health, 1977)

Nutrient	Males n=5		Females n=7	
	Mean	% of Commonwealth recommendations	Mean	% of Commonwealth Recommendations
Energy (kJ)	1696.9	63	1510.4	66
Protein (g)	28.4	103	25.0	111
Thiamin (mg)	0.2	48	0.2	57
Riboflavin (mg)	0.5	72	0.3	64
Niacin eq (mg)	10.2	128	10.0	181
Vitamin C (mg)	39.6	148	53.0	265
Vitamin A (µg)	311.3	83	275.5	73
Sodium (mg)	296.9	26-64	249.1	22-54
Potassium (mg)	1077.3	39-227	1071.5	40-110
Magnesium (mg)	75.3	47	66.3	49
Calcium (mg)	312.9	78	155.4	31
Phosphorus (mg)	380.8	76	302.4	60
Iron (g)	2.6	75	2.6	74-90
Zinc (mg)	3.8	64	3.4	56

The average total daily intake of energy, zinc and fibre of both males and females and the calcium intake of females were found to be insufficient. The average energy, thiamin, zinc and calcium intakes from MOW meals did not meet Commonwealth recommendations (Commonwealth Department of Health, 1977).

The total daily nutrient intake of MOW recipients was compared to the total daily nutrient intake of Australians aged 65 years and over as reported in the National Nutrition Survey (NNS) (Australian Bureau of Statistics, 1997). See Table 3. The average intake of energy and zinc per day was low in the MOW recipients compared to the participants in the NNS.

Table 3: The total daily nutrient intake of MOW recipients compared with the total daily nutrient intake of Australians aged 65 years and over as reported in the National Nutrition Survey (NNS) (Australian Bureau of Statistics, 1997).

Nutrient	Males n = 7		Females n = 5	
	Average total daily intake from MOW	Average total daily intake from NNS (65 and over)	Average total daily intake from MOW	Average total daily intake from NNS (65 and Over)
Energy (kJ)	6773.6	8510.1	5,663.3	6367.0
Protein (g)	68.6	83.7	60.5	64.3
Thiamin (mg)	2.3	1.6	1.1	1.2
Riboflavin (mg)	2.6	2.0	1.8	1.6
Niacin eq (mg)	42.8	38.8	27.7	29.4
Vitamin C (mg)	230.6	127.1	109.6	111.5
Vitamin A (ug)	1,059.3	1310.3	938.9	1064.4
Potassium (mg)	3,769.9	3232.0	2,903.2	2626.0
Magnesium (mg)	324.4	334.2	255.4	267.9
Calcium (mg)	1,101.8	795.6	782.1	685.6
Phosphorus (mg)	1,522.7	1419.1	1,126.4	1131.7
Iron (mg)	13.2	14.4	10.1	11.3
Zinc (mg)	10.9	11.4	7.9	9.0
Fibre (g)	28.9	24.0	22.2	20.2

Factors that may have affected nutrient availability (in particular, vitamin C and thiamin) in foods consumed from MOW meals include chilled storage, food preparation, hot-holding, cooking and reheating and drug-nutrient interactions amongst other factors.

5.0 DISCUSSION

The pilot study methodology would be suitable for use in a larger scale research study, providing some modifications are made. The outcomes of the use of the pilot study methodology are discussed below.

The response rate was poor. Much effort went into enrolling 12 participants in the pilot study, which was below the number of participants desired (15). Upon joining the MOW daily rounds, it became evident that in most cases the volunteers had suitable rapport with the recipients and could determine which recipients would be able to complete the diet records. The help of the volunteers should not be underestimated in recruiting participants for subsequent studies of this group.

Five MOW meals were weighed on site on both days of data collection. This weighing technique appeared to be of little disturbance to kitchen staff.

The paired university students took an average of two hours to complete each set of interviews (this included driving time to the participants houses, the interview time for two participants and the time taken to drive home).

There were rarely any leftovers from the MOW meals. In the instance of leftovers, the students had no trouble in determining the weight of the uneaten portions. One participant threw their leftover MOW away before it was weighed. In this instance, the student estimated the approximate amounts of the uneaten foods.

Two participants were unable to complete the food records. However, these participants were able to verbally reproduce their intake sufficiently. With adequately trained interviewers there should be little problem in eliciting food intake in sufficient detail.

Feedback questionnaires revealed the students found the interview process to be a positive experience and allowed them to practice interview techniques and make

assessments on how they conducted interviews. One student offered the suggestion of using food models to increase accuracy of serving sizes.

The two meals recorded were consumed on the same day of the week (ie Wednesday). At the MOW service studied, similar meals were cooked on the same day of the week. For example, roasts were cooked on Wednesdays. To obtain a more realistic record of foods consumed from the MOW meals, dietary records should be carried out on different days of the week.

Sometimes due to personal dislikes, some recipients may choose a meal different to the main meal of the day. With the current methodology, five standard meals are weighed and averaged to obtain an estimate of the weight of foods delivered. This does not take into account variations in the standard meal. Recipient's meal choices should be checked for the days in which the data collection is to occur prior to selection of participants for the study.

Although students were briefed on appropriate interviewing techniques and provided with training to maximise details of consumption, some intake information was lacking in description. Further training of research assistants should be undertaken to ensure descriptions and weights of foods are suitable for nutrient analysis.

The post interview telephone evaluation by participants revealed that the pilot study process and the student interviewers were well received by participants. One participant found speaking difficult due to a previous stroke, but was still able to effectively manage the interview.

Although rarely, some foods were not included in the SERVE nutrition database for nutrient analysis of foods. As it is not possible to avoid this issue with the current methodology, nutrient analysis can be achieved by analysing the nutrient content of foods similar in nutrient composition to consumed foods (Kemmer and Booth 1992).

The sample size of the pilot study was small with only 12 participants. The larger scale research study will require a sample of 60 participants (with at least 30 being female). This was determined as providing a power of at least 90% at a 0.05 level of

A pilot study to test the methodology for determining nutrient intake for MOW 12 recipients

significance when conducting a two tailed t-test to determine a biologically significant difference in calcium intake of 200mg in females and assuming a standard deviation of 323mg. A sample of greater than 60 will be required to account for attrition. Since there were no participants that withdrew from the pilot study, the attrition rate for the larger scale research study should be minimal.

The 1977 Commonwealth Department of Health nutrient guidelines for MOW state that a MOW meal should aim to provide “two-thirds of the daily requirement (RDA)² of vitamin C, one half of the (RDA)³² other vitamins, protein and minerals and at least one-third of the calories for energy. The pilot study was implemented on a small number of participants and therefore no conclusions of significance can be made with respect to how the results compared to the nutrient guidelines. However, it is evident that the results are reflective of previous studies and highlight the inadequacy of nutrient intake in the MOW population. Energy intake was below recommendations based on weight and age for both males and females. This inadequate intake can be further supported by verbal reports from some of the MOW recipients that they did not “feel full” after the MOW meal and that sometimes they added foods to their MOW meal.

7.0 CONCLUSION

The methodology for the pilot study would be suitable for use in a larger research study, should the recommendations below be taken into account. The most limiting factor of the pilot methodology was the poor response rate. This could be improved with the assistance of volunteers, which may enhance rapport and feedback between the researcher and MOW recipients and carers.

The results, although not statistically significant, indicate the MOW population in this sample may be at nutritional risk. There is a need to establish reliable and valid nutrient standards for MOW services. This study has successfully tested an appropriate methodology.

² The Recommended Daily Allowances (RDAs) used in the Commonwealth Department of Health nutrition guidelines were developed in 1954 and reviewed in 1971. These have been superseded by the 1991 RDIs.

8.0 RECOMMENDATIONS

Although the methodology described in this report worked well, a number of aspects could be improved for the larger study. These include:

- Informal contact sessions initiated by the researcher with MOW recipients and carers to enhance rapport, recruitment, data collection and feedback.
- The participation of the researcher in MOW rounds as a strategy for increasing enrolments.
- To ensure accuracy of data;
 - The researcher should clarify when the MOW foods will be cooked prior to the collection day,
 - The data should be collected on different days of the week to avoid collection of data on identical meals; and
 - The researcher should clarify that the recipients are obtaining the same constituents in meals that were weighed and averaged at the MOW site.
- Further education into accurately obtaining weight data and an adequate description of food should be given prior to the commencement of student involvement, to avoid inaccurate data collection.

REFERENCES

Administration on Aging, 1996, Executive Summary: Serving Elders at Risk; The Older American Act Nutrition Programs – National Evaluation of the Elderly Nutrition Program, 1993-1995, [Online] [Available: <http://www.aoa.gov/aoa/nutreval/execsum.html>]. Accessed 20.11.2000].
Administration on Aging, Washington DC.

Australian Bureau of Statistics 1997, Cat. 4802.0 National Nutrition Survey. Selected Highlights Australia 1995, Australian Bureau of Statistics & Commonwealth Department of Health and Aged Care, Canberra.

Australian Bureau of Statistics 1998, Cat. 4805.0 National Nutrition Survey. Nutrient Intakes and Physical Measurements Australia 1995, Australian Bureau of Statistics & Commonwealth Department of Health and Aged Care, Canberra.

Bell, R., P. Dunn, A. Whitehead & S. Xouris, 1993, 'The contribution of meals on wheels to the nutrient intake of the elderly', Australian Journal of Nutrition and Dietetics, Vol. 50, No. 2, pp. 46-50.

Bingham, S.A. 1987, The dietary assessment of individuals; methods, accuracy, new techniques and recommendations, Nutrition Abstracts and Reviews, Vol. 57, no.10, pp. 705-736.

Bone, A. 1992, Methods for studying food consumption (specified time methods), In Promotion of Healthier Eating, Eds J.R. Kemm & D. Booth, HMSO, U.K., pp. 169-188.

Commonwealth Department of Health 1977, Meals-on-Wheels Food Guide, Watson Ferguson & Co., Brisbane.

Health Department of Western Australia 1999, Health and Quality of Life for Older West Australians. Discussion Paper., Health Department of Western Australia, W.A.

Kemm, J.R. & Booth, D. Promotion of Healthier Eating. How to collect and use information for planning, monitoring & evaluation. Her Majesty's Stationary Office, London.

Krassie, J., C. Smart & D.C.K. Roberts 2000, 'A review of the nutritional needs of meals on wheels consumers and factors associated with the provision of an effective meals on wheels service – an Australian perspective', European Journal of Clinical Nutrition, Vol. 54, pp. 275-280.

Lo, C.S., D.R. Briggs & M.L. Wahlqvist 1989, 'Evaluation of dietary fibre in meals-on-wheels meals in Melbourne', The Medical Journal of Australia, Vol. 150, pp. 173-174.

McCormack, P. 1997, 'Undernutrition in the elderly population living at home in the community: a review of the literature', Journal of Advanced Nursing, Vol. 26, pp. 856-863.

National Health and Medical Research Council 1971, Dietary Allowances for Use in Australia (with Explanatory Notes), Australian Government Publishing Service, Canberra.

National Health and Medical Research Council 1991, Recommended Dietary Intakes for Use in Australia, Australian Government Publishing Service, Canberra.

National Health and Medical Research Council 1999, Dietary Guidelines for Older Australians, National Health and Medical Research Council, Canberra.

Northern Sydney Area Health Service 1993, Take a Ride to Good Nutrition. Meals On Wheels Project Report., Northern Sydney Area Health Service, NSW.

Pargeter, K.A., D.R. Briggs, C.S. Lo & R.L. Wood-Bradley 1986, Meals on Wheels: A Nutritional Evaluation (Occasional Paper in Gerontology No. 13_November 1986), National Research Institute of Gerontology and Geriatric Medicine. Melbourne.

SERVE Nutrition Systems 2000, SERVE 3.95, [CD-ROM], M & H Williams Pty. Ltd., St Ives, NS

Stuckey, S.J., I. Darnton-Hill, S. Ash, J.C. Brand & D.L. Hain 1984, 'Dietary patterns of elderly people living in inner Sydney', Human Nutrition: Applied Nutrition, Vol. 38A, pp. 255-264.

Van Staveren, W.A., L. de Groot, Y.H. Blauw & R.P.J. van der Wielen 1994, 'Assessing diets of elderly people: problems and approaches', American Journal of Clinical Nutrition, Vol. 59, 221S-223S.

Williams, P.G. 1996, 'Vitamin retention in cook/chill and cook/hot-hold hospital foodservices', Journal of the American Dietetic Association, Vol. 96, No. 5, pp. 490-498.