THE MORNING MEALS ON WHEELS PILOT PROGRAM: THE BENEFITS TO ELDERLY NUTRITION PROGRAM PARTICIPANTS AND NUTRITION PROJECTS

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EXECUTIVE SUMMARY

Comments received from elder participants: 'The breakfast program is the best thing you ever did'...'It enabled me to afford medicine and other bills'...'It gave me something to look forward to in the morning'...'It helped me continue living at home'...'I'm so thankful to have this service'...'It is the most wonderful gift'...'I enjoy every bite'...'Good variety'...'Volunteers are great'...'Helped me gain weight'.

The Morning Meals on Wheels (MMOW) Pilot Program demonstrated the benefits of providing breakfast as a second meal to frail homebound older adults. Improvements were seen in nutrient intakes, reduction of malnutrition risk factors, and sense of independence, appetite and health status.

Importance of Breakfast

Breakfast is a popular meal with older adults and contributes to their health and nutritional wellbeing. Breakfast increases intake of the critical, nutrient dense food groups associated with positive health outcomes: cereals and grains, complex carbohydrates, fruits, fiber, milk and milk products. These foods are rich sources of key nutrients related to health outcomes: folic acid, vitamins B_6, B_{12}, E, and C, potassium, magnesium, fiber, calcium, and vitamin D. The Older Americans Act (OAA) Elderly Nutrition Program (ENP) serves a very frail homebound population that is at high risk for malnutrition. Many of these nutritionally needy elders would benefit from the increased dietary intake of a nutrient dense breakfast offered in addition to their noon meal.

Description of project

The MMOW program is a public/private partnership of the U.S. DHHS Administration on Aging, General Mills Foodservice Inc., and the National Policy and Resource Center on Nutrition and Aging. MMOW seeks to increase dietary intake and reduce elder malnutrition risk in frail homebound older adults by providing breakfast as a second meal. When breakfast is planned in conjunction with the noon meal, the two meals together provide at-risk elders with two-thirds of the Recommended Dietary Allowances.

Twenty OAA funded nutrition projects (18 Title IIIC and 2 Title VI) were selected to participate after a competitive nationwide application process. MMOW projects varied in geographic location, food service operations and meal delivery methods, as well as the number of people served. MMOW participants varied by ethnic and racial heritage. All Projects supplied data for the evaluation component that was designed to document outcomes among older participants and nutrition projects.

Technical assistance was provided by the partners to assist MMOW projects with start up and throughout implementation of the pilot program. An introductory manual was developed to assist in planning and guiding the breakfast program. Newsletters communicated technical assistance and project innovations. A toll-free hotline was established to assist programs with menus and recipe development. Telephone conference calls with all projects and partners provided periodic opportunities for information sharing and problem solving.

The 20 projects served breakfast for a six-month period. Projects were given the flexibility to plan menus appropriate for their population, decide upon the number of participants to serve, and design production and service delivery procedures conducive to local operations. Projects delivered breakfast beginning in August or September, 1997 and ending in February or March, 1998. A total of 1493 frail homebound participants were enrolled and 1370 participants completed the six-month pilot project. The unduplicated number of elders served by each nutrition project ranged from 16 to 137. During the enrollment period,

some elders chose not to participate because breakfast was the one meal they could fix for themselves and maintain a feeling of independence. Most projects served a cold breakfast five days a week delivered with the day-before noon meal. Popular breakfast items included yogurt, bowl pack cereals and baked products.

Findings

Nutrient intakes improved considerably. Prior to MMOW, participants reported an average breakfast intake of one serving of cereal or muffin/bread product, and either a fruit or milk serving daily. The average MMOW breakfast meal pattern consisted of one serving each of a cold cereal, a muffin/bread product, milk, fruit or fruit juice, and a fat and/or sweet. Malnutrition risk scores on the Nutrition Screening Initiative Checklist measured before and after MMOW decreased significantly.

MMOW contributed to positive health outcomes in frail homebound participants when it was appropriately targeted to those who would benefit from receiving breakfast. The benefits of MMOW included:

- Provision of nutrient dense breakfasts consisting of key nutrients associated with positive health,
- Increased dietary intake especially from food groups associated with good health outcomes,
- Reduction in malnutrition risk by
  - Increasing the number of meals eaten,
  - Increasing the consumption of cereal and grains, fruits, fiber, and milk products,
  - Reducing unplanned weight change,
  - Reducing food insecurity,
- Increased individual's sense of independence, appetite, and health status,
- Less caregiver time spent in actual breakfast preparation, and
- Excellent client satisfaction.

The participating nutrition projects have made MMOW successful. Most projects either are or plan to continue with MMOW. Some will expand the number of participants they serve. Some programs have found that adequate funding to continue MMOW remains a serious issue.

The majority of projects responded that MMOW was definitely worth the effort because it benefited participants, caregivers, communities, and themselves. They reported that MMOW, as a second meal is a valuable service to at risk elders. Projects worked through major hurdles to offer MMOW with relative ease.

Project benefits/outcomes included:

- Expansion of service to vulnerable clients,
- Delivery and cost efficiencies while improving dietary intake,
- New referrals and improved community service coordination,
- Quicker implementation of breakfast as a new service,
- Identification and measurement of participant and project outcomes.

Conclusions

MMOW has proven to be a successful service innovation. Based on the evaluation evidence, MMOW benefited both participants and nutrition projects. It fit the goals of the AoA to encourage providers to modernize and expand the array of appropriately targeted nutrition services. MMOW also demonstrated the very clear benefits of a public/private partnership.

MMOW is a successful program. The AoA should continue its support of MMOW and promote its benefits to public and private decision-makers at federal, state, and local levels. It should encourage a national expansion of this successful initiative so that it may reach the many more frail, at risk elders served by the ENP. The breakfast program helps decrease malnutrition risk and contributes to positive health outcomes. MMOW improves the lives of frail homebound older adults.

THE MORNING MEALS ON WHEELS PILOT PROGRAM:
THE BENEFITS TO ELDERLY NUTRITION PROGRAM PARTICIPANTS AND NUTRITION PROJECTS

"The Breakfast Program is the best thing you ever did" claims a participant in the Meals on Wheels Breakfast Pilot Study.

BACKGROUND

Good nutrition is essential to the health, self-sufficiency, and quality of life of older persons (1). Scientific evidence continually confirms the connection good nutrition has with health and successful aging. Such evidence has implications for the USDHHS Elderly Nutrition Program (ENP) and provides new opportunities for service innovations. Daily, over 4,000 ENP nutrition projects work to cement this connection through provision of meals and other nutritional services to well over 3 million older persons. New evidence about changing nutrient requirements, eating habits and the importance of nutrition in healthy aging and chronic disease management means nutrition projects should regularly review the services they offer and look for ways to modernize and improve them.

Nutrition is a priority area of Healthy People 2000, the national initiative that promotes prevention as a way to improve the health of all Americans (2). Dietary intake is the most important controllable risk factor affecting long-term health for most people including older persons. The nutrition and health connection is further evident in the similar food and dietary intake recommendations found in Healthy People 2000 and the Dietary Guidelines for Americans (2-4). These recommendations call for increased intake of whole grains, complex carbohydrates, fiber, vegetables and fruits, and calcium-rich foods. These foods contain key nutrients including folic acid, vitamins B-6, B-12, E, and C, potassium, magnesium, calcium, vitamin D.

During the aging process, physiologic and functional changes affect the body's nutrient requirements (5-11). New evidence concerning these requirements often directly affects the nutritional and health outcomes for older persons. For example, recent recommendations for increased requirements of calcium and vitamin D underscores their important role in the prevention or delay of hip fractures and osteoporosis. The increased requirement for folic acid necessary along with vitamin B-6 helps lower the blood levels of homocysteine that is associated with reduced risk of heart disease (5-8).

Many older persons, including those homebound, do not eat a nutritionally

adequate diet placing them at risk for malnutrition and poor health outcomes. There are multiple inter-related reasons for this (11-12). One study found that older persons do not eat for one or more days because of the following factors: ethnicity, geographic location, limited finances, Medicaid eligibility, living alone, health problems, loss of appetite and physical mobility problems (13). Many of these same factors contributed to the hunger and malnutrition among the elderly reported by the Urban Institute (14). Its landmark study found approximately 8-12% of older people suffering from food insecurity or lack of a culturally compatible diet at all times (14).

The ENP serves a functionally frail homebound population that is at high risk for malnutrition as documented in the recent National Evaluation of the Elderly Nutrition Program (ENP Evaluation, 15). Homebound participants averaged three chronic disease conditions. Thirty percent reported an unplanned weight loss or gain, and 32% bordered on underweight with a BMI below 22. About two-thirds rated their health as poor or fair. Forty-three percent had a hospital or nursing home stay in the past year (15).

Many ENP homebound participants had severe functional impairments that caused difficulty with or prohibited them from performing basic self-care Activities of Daily Living (ADLs, grooming, eating, walking, getting in or out of bed). Further, this group experienced difficulty performing or required assistance with the more complex skills needed to live independently (Instrumental Activities of Daily Living, IADLs). These IADLs included meal preparation, food shopping, taking medications and performing household chores. Food security was a serious problem for these homebound participants. The evaluation indicated that 18% of those surveyed did not always have enough money to buy food. In addition, 16% had to choose between buying food and medications or paying rent or utility bills during the past month (15).

Given the frailty of this population, nutrition projects are particularly challenged to meet increased needs and connect nutrition and health while faced with erosion of traditional funding sources. Projects are expected to modernize and improve their array of nutrition services. One way is to increase the number and variety of meals they offer to participants who have different needs and preferences (16). In fact, one objective of Healthy People 2000 is to increase the number of home delivered meals to people age 65 and over who have difficulty preparing their own meals or are otherwise in need of this service (2)**.**

The addition of breakfast as a nutritionally dense second meal could benefit the ENP homebound population. Breakfast is a popular meal with older adults and contributes to their nutritional wellbeing (17). It is nutrient dense, providing key nutrients related to health outcomes, calcium, folic acid, vitamins D, B-6, B-12, E, and C, potassium and magnesium. It increases intake of the critical food groups associated with positive health outcomes:

cereals and grains, complex carbohydrates, fruits and vegetables, fiber, milk and milk products. Folic acid is now being added to enriched breads, flours, and grain products (9). The choice of a breakfast meal meets the needs of older persons whose appetite is better in the morning, or must take medications with food in the morning or with juice. In addition, it is 'portable' for those with smaller appetites and 'who fill up fast', or like to 'graze', or prefer 'lighter foods' such as cereal, milk and fruit as an evening meal.

THE MORNING MEALS ON WHEELS PILOT PROGRAM

The Public/Private Partnership

MMOW is a public/private partnership between the USDHHS Administration on Aging (AoA) and General Mills Foodservice, Inc. (General Mills) to encourage innovation among Title IIIC Elderly Nutrition Projects to better serve their at risk homebound participants. The National Policy and Resource Center on Nutrition and Aging (Center) conducted the evaluation of the MMOW.

Purpose

The Morning Meals on Wheels Breakfast Pilot Program (MMOW) seeks to reduce malnutrition risk in frail homebound older adults. MMOW enables nutrition projects to modernize and innovate to go beyond provision of the traditional one noon meal and offer breakfast as a second meal for homebound participants at high risk for malnutrition. When breakfast is planned in conjunction with the noon meal, the two meals together provide at risk elders with two-thirds of the Recommended Dietary Allowances (RDA). MMOW allows participating nutrition projects to expand services to an at-risk population, test a new service delivery and access additional funding sources. MMOW allows the development of outcomes and the opportunity to measure achievement.

Selection of Projects

Over 100 applications were received after a national mailing inviting participation. After an initial review, a selection committee consisting of representatives from AoA, General Mills, the Center, the Meals on Wheels Association of American (previously known as National Association of Meals Programs), and the National Association of Nutrition and Nutrition Services Programs (NANASP) reviewed the applications and selected twenty-one (one project eventually dropped out) based in part on descriptions of the target population and planned outcomes they hoped to achieve. The projects were geographically distributed, served ethnically diverse populations, targeted varied groups of at risk

individuals, used different methods to produce meals, and consisted of direct services provided by AAAs in addition to nutrition service providers.

Negotiation phone calls were held with the twenty nutrition projects to ensure that they would implement the program, participate in the evaluation, collect the data and write the narrative of their experiences. Projects were assured that their individual reports and participant data would remain confidential and only the pooled findings would be included in the final report.

Implementation

All participating projects received a Breakfast Manual developed by General Mills for use in developing their MMOW programs. The Manual included the steps and information needed to plan and implement a breakfast program. It also included ten sample menus with food cost and macronutrient analysis. Technical assistance from the AoA nutritionist, General Mills, and the Center was available to all projects during MMOW planning, start-up and implementation. A newsletter was used to communicate information and technical assistance.

Several monthly MMOW conference calls were held throughout the MMOW pilot. These conference calls provided a networking forum for sharing among all projects, AoA national and regional staff, Center personnel and General Mills staff. There was a pre-set agenda that all received prior to the call. This was an opportunity to provide technical assistance, share best practices, and answer questions.

Nutrition projects had flexibility in how they chose to implement MMOW. They were encouraged to incorporate this new service into their standard daily routine. They had the freedom to choose the breakfast meal pattern and foods that would meet the needs of their participants. The methods they used to develop and implement MMOW are described in Findings: ll. ENP Project Outcomes (p. 22).

DESCRIPTION OF EVALUATION COMPONENTS

Objectives and Outcome Criteria

In today's era of limited resources and program accountability, policy decisions to support and fund new home and community health and social services are based on evidence of improved outcomes/ benefits for the target population. Evidence must demonstrate that MMOW is a good service that results in expanded, improved services for at risk older adults, and can be implemented by nutrition projects with varied resources and programmatic capabilities. Equally important, participants, caregivers, and nutrition projects

must be satisfied with MMOW results.

The purpose of the MMOW evaluation was two-fold. First, it sought to determine if MMOW was appropriately targeting those at greatest socioeconomic need and malnutrition risk, and then whether increased dietary intake and food availability resulted in reduced risk factors, improved health and ability to remain independent at home. Second, the evaluation sought to learn what capacities and resources nutrition projects needed to successfully implement the program.

A variety of audiences, including the AoA nutritionist and other personnel, state and local aging networks, nutrition providers and the 20 projects selected to participate, provided input into the design of the evaluation, criteria and data collection instruments. All agreed the evaluation should include pre/post comparisons, have reasonable, achievable participant and program outcomes, be able to fit into each project's daily routine, and use information readily available to nutrition projects (e.g. Nutrition Screening Initiative Checklist, NSI Checklist).

Two evaluative components evolved: MMOW nutritional outcomes on ENP participants and MMOW outcomes on nutrition project service provision. These components with their evaluative criteria follow.

I. ENP Participant Outcomes

1. Targeting the most needy participants to receive MMOW as measured by:
   - Participant demographics including age, race/ethnicity, income status, and living arrangement.
   - Availability of Breakfast before MMOW.
2. Improvements in dietary intake, caregivers' role, and food security benefits as measured by:
   - Improvement in food intake, and availability of food (pre/post comparison)
   - Ability to prepare breakfast (pre/post comparison)
   - Caregiver role in breakfast preparation (pre/post comparison)
   - Improved food security and quality of life (pre/post comparison).
3. Improvements in participant nutritional and health status and independence as measured by:
   - Reduction in malnutrition risk (pre/post NSI Checklist).
   - Improvement/maintenance of nutritional status (pre/post increased nutrient intake, pre/post self reported rating of appetite, pre/post reduced risk factors self-reported amount breakfast eaten).

- Remaining independent at home (pre/post number of ADLs, IADLs).
- Improvement/maintenance of health status (pre/post self reported rating of health).

4. Participant satisfaction with MMOW as measured by:
   - Meal service quality factors, including taste and delivery (post evaluation).

II. ENP Project Outcomes

1. Development of MMOW service delivery procedures as measured by:
   - Start-up preparations (pre/midpoint)
   - Participant enrollment and tracking (pre/midpoint)
   - Meal preparation and delivery aspects (pre/midpoint).
2. Provision of nutritionally adequate and regionally acceptable breakfast menus as measured by:
   - Breakfast pattern and nutrient analysis (pre/midpoint/ three-day menus, with nutrient analysis attached).
   - Adaptability to meet two-thirds Recommended Dietary Allowance (RDA) (pre/midpoint).
   - Adaptability to meet regional eating patterns (pre/midpoint).
3. Financial aspects of providing MMOW as measured by:
   - Costs and revenues (pre/post).
   - State Unit on Aging/Area Agency on Aging support (midpoint).
   - Private fundraising (pre/midpoint/post).
4. Value of MMOW as a new service opportunity as measured by:
   - Achievable planned outcomes (pre/midpoint/post)
   - Project plans to continue with MMOW (post narrative).
   - Suggestions for MMOW expansion nationally (post narrative).

Implementation of Evaluation

Initial contact with the MMOW projects came in the form of negotiation telephone calls held with each project, the AoA nutritionist, and Center staff. Prior to the negotiation telephone calls, each program received an outline of the evaluation data they would be expected to collect and how to collect it.

During the telephone calls (average 45- 60 minutes), project plans for enrolling participants, implementing breakfast and evaluation data collection were discussed. Programs were also asked how they planned to measure the outcomes listed on their application. As a result of the telephone calls, it became apparent that projects differed in their capacity and ability of personnel to collect the evaluation information. A few projects offered suggestions about information to collect and these were incorporated. A survey format was selected as the best method to collect the data based on project feedback.

The programs began the MMOW pilot program and evaluation phase between August and September 1997 and ended the evaluation phase six months later during January and February 1998. Technical assistance concerning the evaluation and completion of the survey instruments continued on an individual program level and during the several monthly MMOW conference calls with the projects and partners. In October 1997, individual Midpoint Conference Calls were held with each program and representatives from the Center, AoA, and GMFS were conducted to learn how MMOW was progressing. Data on midpoint program performance and participant receptivity was gathered (Appendix D).

Evaluation data on participants was collected using a pre/ post survey questionnaire and guided by an accompanying protocol (Appendix C). The survey could be administered either in person or by telephone. Each project had the freedom to decide who would administer the survey (e.g. intake workers, case managers, meal delivery personnel, volunteers, and drivers). The questionnaire consisted of closed-ended questions and had one open ended dietary recall question. Midpoint conference calls also provided evaluative information.

Evaluation data for nutrition projects was collected at the beginning and end of the study using a self-administered survey that consisted of short answer responses and open-ended narratives (Appendix C). Projects were encouraged to send in copies of articles that described community support and activities and were provided with forms to record “compelling stories” about clients, project initiatives, volunteer efforts (Appendix C).

Data were analyzed using descriptive tabular methods. Material/forms used to develop and conduct the evaluation (Appendix C) can be used or modified to collect other types of outcomes and results.

Limitations

The six-month time frame, plus programmatic differences and participant diversity found among the MMOW projects affected the evaluation design. A tightly controlled experimental approach with potential participants randomly assigned either to receive MMOW or not was deemed inappropriate.

During the negotiation process it became apparent that every project might not have the capability to fully comply with all parts of the evaluation. It was beyond the scope of the evaluation to maintain field control or verification of reports. Projects differed in their ability to complete all phases of the evaluation and some did not complete all parts. A 100% response rate for all participant or project questions did not occur.

Projects were not required to report on their internal filing and tracking system to monitor MMOW participants. A total of 1493 participants were enrolled at the start and had a pre-program survey. During the first few weeks, some dropped out and others were added to the program. Some left the program later. Projects were asked to supply pre and post-program surveys for all participants, including those joining late or not completing the full six months. At the end of the evaluation phase, 1370 participants were recorded with post-program surveys of whom 1148 had matched pre and post surveys. Again, not all post survey responses were completed for all participants.

Participants who were selected and agreed to join may not have been representative of the frail homebound population. Project and participant data were self-reported, descriptive and narrative in format. Projects and participants may have responded more favorably because they were part of a special pilot program (Hawthorne effect).

Although it was beyond the scope of this evaluation for all projects, some initially planned to measure pre/post body weight and one planned to collect pre/post laboratory data to measure change in nutrition status. One project wanted to survey participants' physicians to document change in health status. However, these projects reported not being able to do this because of time, staffing and system constraints.

The Center maintained consistency and uniformity in data collection through standardized forms and protocols, defined categories and rechecking/cross-checking data upon receipt. Ongoing technical assistance was provided. Projects were contacted by Fax or telephone whenever data were missing or to verify survey responses. Participant pre/post responses were matched by hand if discrepancies were suspected. Data

entry was continually monitored and data files cleaned.

These limitations should be kept in mind as they may affect some details of the study. However, the sample size was adequate and the conclusions and recommendations offered in this evaluation are sound and supported by the findings.

FINDINGS:

I. ENP Participant Outcomes

"Mrs. W. is 80 years old and lives alone with her 11 year old dog. She is confused and forgetful. She was on the verge of starvation, almost at 80 pounds. Her volunteer/neighbor would bring food, but could not spend additional time reminding her to eat. Since the breakfast program began, she has gained weight, although still very thin. Delivery of breakfast allows her volunteer to visit rather than prepare meals, bring them over then see them wasted because Mrs. W has forgotten to eat them. She is also receiving a more balanced diet, as breakfast and lunch provide two-thirds of her daily nutritional requirement." (Project report).

MMOW has helped improve participants' nutritional and health status and their ability to remain independent at home. These outcomes were measured by demographic data, pre/post comparisons of NSI Checklist scores and nutrition risk factor questions, pre/post comparisons of functional activities of living limitations, and pre/post comparisons of participant self reported food intake, breakfast preparation, appetite, and health status.

Evidence supports the fact that MMOW has contributed to improved nutritional status and availability of food as many participants ate more then they would if left to their own resources. This constitutes a significant step toward malnutrition risk reduction. Perceived health and quality of life for participants has also improved. There has been evidence of a decline in functional frailty, possibly contributing to increased independence to remain at home. The pilot achieved more than this as it reached a vulnerable subset. Prior to the MMOW pilot, over 10% of the participants said that they do not "…usually eat or drink something at breakfast time." MMOW enabled these 170 individuals to eat breakfast.

MMOW outcomes contributed to both the Healthy People 2000 Nutrition Objectives and Dietary Guidelines by providing an additional home delivered meal that increased consumption of cereal/grain products, fiber, fruit and calcium rich foods. These outcomes resulted from an interdependent process that began with appropriate targeting and screening of participants.

I (1). Targeting the Most Needy

MMOW was targeted to the most demographically and nutritionally at risk older individuals who liked and could benefit from breakfast as a second meal. The evaluation found breakfast was not for everyone.

Some projects reported enrollment problems with participants refusing MMOW because it was one meal they could fix themselves with relative ease. It gave them a sense of independence that they did not want to lose. Further, some projects reported that many potential enrollees identified by case managers and outreach workers as being appropriate did not want MMOW because of the sense of independence they associated with breakfast preparation. Others wanted to spend this time with their caregiver. Others refused because they would not eat breakfast.

Demographics

MMOW targeted the most poor, socially isolated and minority older adults served by the ENP as described in Table 1. This was important because each individual project had the flexibility to choose its group of participants to receive MMOW. Collectively, MMOW served a higher percentage of minorities, a greater number of low income/minority elders, as well as a higher percentage of those living in rural areas than reported in the ENP Evaluation (15).

Participants ranged in age from 33 to 103 years old. Approximately 95% of the participants were between the ages of 61 and 98 with a median age of 77 years.

Table 1

MMOW participant profile

	Total participants responding (N=1493) %	Matched pre/post responses (N=1148) %
Gender :	(n=1473)	(n=1135)
Male	32	32
Female	68	68
Age:	(n=1483)	(n=1143)
59 or less	3	3
60-80	58	56
81 or more	39	41
Race/Ethnicity:	(n=1450)	(n=1118)
African American	18	20
American Indian	7	0
Caucasian	67	72
Hispanic	8	8
Low income/Non-Minority	46	49
Low income/Minority	26	24
Rural	25	27
Lives Alone	53	54

Not all participants completed the full six months of the program. Of the 26% who left the study, the majority (60%) changed their mind, moved away or had “other” reasons. However, 37% either expired, went to a nursing home or hospital, perhaps demonstrating the frailty of this homebound population. Approximately 4% transitioned from being homebound to attending a congregate meal site or adult day services.

Malnutrition Risk

The target population was at high risk (NSI Checklist score >6) for malnutrition with a mean NSI Checklist score of 8.18 (out of 21). A vulnerable subgroup, those that didn't not usually eating anything for breakfast prior to MMOW was identified. This group was even more at risk with a mean NSI Checklist of 9.22. The NSI Checklist individual risk factors on Table 2 demonstrate that more than half had an illness requiring a change in foods eaten, and more than one third experienced an unplanned weight change. One quarter ate fewer than two meals a day and one third lacked sufficient money to buy needed food. Further, 80% had physical limitations affecting their ability to shop, cook, or feed themselves. More than 40% reported eating few fruits, vegetables, or milk products.

Table 2

% of affirmative responses to each DETERMINE YOUR NUTRITIONAL HEALTH statement

Health statements **N=1148**	**Pre %**	**Post %**	**Decrease %**
I have an illness or condition that made me change the kind and/or amount of food I eat.	53.0	44.6	8.4
I eat fewer than 2 meals per day.	24.1	12.1	12.0
I eat few fruits or vegetables, or milk products.	43.4	30.7	12.7
I have 3 or more drinks of beer, liquor or wine almost Every day.	1.0	1.2	-0.2
I have tooth or mouth problems that make it hard for me to eat.	19.5	18.3	1.2
I don't always have enough money to buy the food I need.	34.2	27.9	6.3
I eat alone most of the time.	65.2	60.5	4.7
I take 3 or more different prescribed or over-the-counter Drugs a day.	65.8	59.8	6.0
Without wanting to, I have lost or gained 10 pounds in the last 6 months.	33.2	20.1	13.1
I am not always physically able to shop, cook and/or Feed myself.	80.1	74.8	5.3

Availability of Breakfast before MMOW

One program reports that a lady "is going through a hard time right now since her daughter is near death. She's lost her appetite and is feeling depressed. She's on the MMOW breakfast program, which I think helps her eat more. They really need the meals- they receive a box of groceries from the food bank...says they have enough food now with MOW and food bank."

The MMOW program targeted those who were not eating breakfast for a variety of reasons. Although most participants ate or drank “something” for breakfast prior to MMOW, 43% of all participants responded that they did not always have enough food to eat, and many participants reported being too functionally frail to provide breakfast for themselves. Prior to MMOW, 54% of all participants needed help fixing breakfast but only 35% reported receiving that help.

The vulnerable subset of more than 10% (n=170) of those with pre/post comparisons reported that they did not usually eat or drink anything for the following reasons:

- Can't fix it myself 40%
- Not hungry 39%
- No one else to fix it 28%
- Can't shop or get food 25%
- Must use money for other things 14%
- Don't like it 8%

I (2). Improvements in Dietary Intake, Caregivers’ Roles, and Food Security

A program reports, "A female participant no longer worries about preparing food. Legally blind, she has only a sister in the immediate area. She is in such poor health. She had been hospitalized and started getting meals upon returning home. She benefited greatly from MMOW, as she cannot prepare food. After eating breakfast for six weeks she was so appreciative. Her cereal is easy to open and she loves the muffins. Her energy has improved considering her illness. The breakfast in combination with the lunch meal provide a large percentage of her nutrition requirements that she otherwise would not be receiving or consuming. This helps promote better health and well being."

Table 3
MMOW outcomes on breakfast intake, food security and other benefits

	All post responses (N=1371) %	**Matched pre/post responses (N=1148) %**	**Vulnerable Subset[2] (N=170) %**
Improved Food Intake and Availability How much of the home delivered breakfast do you usually eat?			
	(n=1136)	(n=962)	(n=106)
All	62	61	54
More than half	25	25	19
Half	7	7	10
Less than half	6	6	14
Hardly any	1	2	3
If you usually save breakfast food to eat at other times, why?			
	(n=580)	(n=507)	(n=61)
Too Full	54	55	41
Stretching it	33	34	43
Frequently Sick	13	12	16
Food Security and Other Benefits: How have the home delivered meals helped you?			
Can now eat more than one meal per day	51	50	38
Able to continue living at home	48	49	30
Have more energy for every day activities	39	39	25
Outlook on life has improved and feel more independent	30	31	20
Able to afford other essentials	23	22	17
Other	7	7	9

[2]The vulnerable subset refers to a group of 170 MMOW participants who reported not usually eating or drinking anything for breakfast prior to the MMOW program.

Improved Food Intake and Availability of food

MMOW provided participants with a nutritious breakfast that enhanced food security and could be prepared with relative ease. As a result, several malnutrition risk factors decreased. Food intake and nutrient intake improved as most participants received two-thirds of the RDA. Participants reported eating more fruits and milk products resulting in a 13% drop in this risk factor (Table 2). Grain/ fortified cereal servings also increased. This is important because without MMOW many elders could experience difficulty meeting the new increased requirements for calcium, vitamin D and folic acid.

Fewer participants reported an unplanned weight change resulting in a 13% decrease in this risk factor perhaps as a result of increased food intake. The average breakfast calories consumed by participants increased by over 250% with MMOW. Program benefits were especially pronounced for the group of 170 participants who, prior to MMOW, did not usually eat breakfast (Table 3).

Prior to the MMOW breakfast program, the average participant's breakfast did not provide one-third the RDA as determined by a brief dietary recall. Approximately 56% of 1175 participants responding consumed only one serving bread/cereal and one serving of either fruit or milk (Table 4). Many participants consumed less.

Table 4
Comparison of Average Pre MMOW and MMOW Breakfast Meal Patterns

Pre-MMOW	
One serving each:	1 bread or cereal
	1 fruit or milk
During MMOW	
One serving each:	1 cold cereal
	1 muffin/bread
	1 milk
	1 fruit
	1 fat/sweet

Each nutrition project designed its own breakfast pattern, menu and style. However, the intent of the meal was the same for all projects. The breakfast was to provide one-third of the RDA on its own or to equal two-thirds of the RDA when added to the home delivered lunch. The MMOW breakfast meal patterns offered by the majority of nutrition projects is described in Table 4.

A comparison of the kilocalories, protein, carbohydrate and fat content between the pre and post MMOW meal patterns indicates that each of these nutrient parameters were substantially increased (Table 5).

Table 5
Nutrient Intake of Participants[3]

	Energy (kcal)	Carbohydrate (gm)	Protein (gm)	Fat (gm)
Pre (1)[4]	140-150	15	2-3	1-2
Pre (2)[5]	200-210	27	10	6-7
Post	415-445	57	15-18	14-16

[3]Estimated from average breakfast pattern.
[4]If bread + fruit
[5]If bread + milk

The MMOW breakfast provided participants with a greater amount of food, energy, and nutrients and it was determined that the food was actually consumed. More than 60% reported eating all and another 30% ate at least half of the breakfast (Table 3). Overall, participants ate more food and consumed more nutrients with MMOW.

Breakfast is normally considered a morning meal. But some participants are unable to eat in the morning and some are uncomfortable eating their entire meal at one time. Forty-two percent of the participants (n=580) reported saving some of their food for later. These participants reported being too full to eat the entire meal in one sitting, stretching their food to have something to eat later, or being too sick to eat it at one time (Table 3).

The program gave the participants the flexibility to eat when they were ready. Most of the participants (n= 1104, 79%) ate in the morning. However, 8% of the participants ate their breakfast in the afternoon and 13% ate it at night. Many of the home delivered meals were refrigerated or frozen, facilitating later consumption with minimal preparation. Most of the participants (n= 1087, 96%) reported no problems storing, reheating or preparing their breakfast meals.

Ability to Prepare Breakfast and Caregiver Roles

Prior to MMOW, 54% of this physically frail population needed help fixing breakfast. In contrast, only 35% reported needing help post MMOW. A full 65% reported that they could fix their MMOW breakfast without difficulty. Caregivers have also had a change in their “breakfast preparation tasks”. As discussed previously, malnutrition risk reductions (Table 2) occurred as the number of meals eaten per day increased, the availability of

money to buy food increased, and one's physical ability to cook, shop or prepare food increased.

Caregiver tasks for helping with breakfast preparation change when pre and post MMOW responses are compared. Fewer family members living at home, family members not living at home and friends and neighbors provided assistance post MMOW. Post MMOW assistance increased for aide or homemaker and the new category of meal delivery person (Table 6). Although not measured, this could have been the result of better care coordination or less extensive preparation activities that are required with MMOW. The level of assistance shifted from cooking pre MMOW to opening packages, clean up, and set up post MMOW. Caregiver time spent in preparing breakfast decreased 72%. Some participants mentioned that caregivers now didn't have to cook or shop, they had more time for themselves as well as for other chores. Some participants reported that now they could "help" the caregiver.

Table 6
Pre/post comparison of help needed at breakfast

	Matched responses (N=1148)		**Vulnerable subset (N=170)**	
	Pre (n=383) %	**Post (n=314) %**	**Pre (n=28) %**	**Post (n=33) %**
Who helps you prepare breakfast?				
Family member living at home	40	39	46	42
Aide or homemaker	26	32	14	24
Family member not living at home	22	13	21	6
Friend or neighbor	12	10	18	15
Meal delivery person	---	6	---	12
If someone helps you prepare breakfast, what do they do? (All that apply)				
Cook	77	40	75	40
Shop	80	---	68	---
Clean up	73	73	64	70
Serve	65	49	61	48
Set up	63	67	64	64
Open packages	59	76	57	87

Improved Food Security and Other Benefits

"Other" (Table 3) benefits listed specifically addressed food security in that MMOW helped save money and enabled participants to buy more food, afford medicine, and pay bills and utilities. Quality of life and functional independence frequently appeared together as participants described how MMOW helped them. They cited ability to remain independent and live at home, having a reason to get up in the morning, having something to look forward to, relief from the worry of finding someone to shop for them ("a real lifesaver", "a great option"), having someone to help feed them, eating more often because they didn't have to prepare the food themselves, and achieving more peace of mind as some of the benefits of the MMOW program.

I (3). Improvements in Nutrition and Health Status, and Independence

The B-D-P Family:

This is an unrelated group of three very elderly people who live together, just barely managing. Outside assistance provides the linchpin that enables them to remain in their home, where they choose to stay until they die.

- ***Mrs. B is 101 years old, bed-bound. Incontinent and mute (and does not understand English);***
- ***Mrs. D is 103 years old, with unspecified dementia, uses a walker, is somewhat incontinent, has a past history of strokes, poor hearing (also doesn't speak English) heart problems and some arthritis.***
- ***The caregiver, Mr. P. is himself 84 years old, still drives, and feeds Mrs. B..***

They all receive breakfast and hot lunches, 7 days per week, which relieves the burden on Mr. P. In an effort to prevent placement, an aide was placed in the household for needs major repairs. None of them qualify for Medicaid or other assistance, because together they have jointly amassed a small savings account (for a rainy day), and are afraid to deplete it. Without the meal program, the burden on Mr. P. would be unbearable, and the two women would be separately placed in nursing homes, at great additional expenses, and against their wishes. Mr. P., the spokesperson for the trio, expressed great satisfaction with the breakfast program, as it is self-contained, diversified, and easy to manage. The fruit was an item that was not previously available to them, as fresh fruit requires more frequent shopping. This trio both vocally and with smiles, expressed their appreciation for the service. (As reported by a nutrition project).

Table 7
MMOW Influence on Nutritional and Health Status

	Matched pre/post responses N=1148 **m? SD**		**Vulnerable subset N=170 m? SD**	
Malnutrition Risk Score (NSI Checklist)	(n=1017)		(n=117)	
Pre	8.19 ± 4.31		9.22 ±4.86	
Post	7.34 ±3.89		8.29 ±4.42	
Difference	0.85 ±4.02	(p<.001)	0.93 ± 4.63	(p=.031)
Functional Limitations				
ADL:	(n=966)		(n=115)	
Pre	2.70 ± 2.93		2.20 ± 2.84	
Post	2.46 ± 2.92		2.00 ± 2.84	
Difference	0.24 ± 1.64	(p<.001)	0.19 ± 1.22	(NS)
IADL:	(n=967)		(n=116)	
Pre	5.23 ± 2.24		5.28 ± 2.43	
Post	5.25 ± 2.72		5.06 ± 2.38	
Difference	-0.02 ± 2.12	(NS)	0.22 ± 1.03	(p=.021)

Self-Reported Appetite	(n=982)		(n=111)	
	No.	%	No.	%
Improvement (poor† fair† good)	245	25	32	29
Decline (good† fair† poor)	161	16	11	10
Appetite improvement	p<.001			
Self-reported overall level of Health	(n=988)		(n=113)	
	No.	%	No.	%
Improvement (poor† fair† good† excellent)	264	27	36	32
Decline (excellent† good† fair† poor)	199	20	18	16
Health improvement	p=.004			

MMOW demonstrated that an improvement in nutrient intake could be accompanied by a reduction in malnutrition risk. Further, the combination of increased nutritious dietary intake and malnutrition risk reduction may have resulted in the participant reports of improved health and the ability to remain independent at home.

Malnutrition Risk Reduction and Improved Food Intake

MMOW has helped reduce malnutrition risk as documented by a significant decrease between pre and post NSI Checklist scores in the general population (Table 7). Although their risk scores were higher, the subgroup not eating breakfast prior to MMOW also decreased their malnutrition risk.

The provision of MMOW breakfast directly impacted several critical risk factors on the NSI Checklist as shown in Table 2. MMOW contributed to a more nutritious dietary intake. Participants received two meals a day, ate more fruits and milk, had more money for food, and reduced unplanned weight fluctuations. Further, the ability to remain independent at home increased as problems associated with shopping, cooking and or feeding themselves decreased. The decrease in malnutrition risk reflected a short MMOW six-month time frame. Extended monitoring of those participants and projects presently continuing the MMOW program could result in a greater decrease.

The MMOW participants were provided with more food and were able to consume this food as well. The increase in food consumption was accompanied by an increase in appetite as reported by participants. Overall, there was a significant ($p<.001$) increase in good appetite and decrease in fair/poor appetite, although 16% participants ended the program with less of an appetite then at the beginning (Table 7).

Ability to Remain Independent at Home

The ability to feed oneself and have the energy and physical capacity to perform selfcare activities such as shopping and preparing meals is important to remaining independent at home. The MMOW population was particularly frail, and as 80% reported, needed assistance with these critical selfcare activities. This is further documented by the fact that the mean number of limitations of Activities of Daily Living (e.g. eating) reported for this population was 2.7. The mean number of limitations for Instrumental Activities of Daily Living (e.g. cooking, shopping) reported for this population was 5.2. The MMOW population may be frailer and more impaired than the population studied in the ENP evaluation which reported the mean number of ADL limitations as 1.7, and IADL limitations as 2.1(15).

It is very possible that MMOW helped participants remain at home. MMOW contributed to increased intake of nutritious food and a 13% reduction in unplanned weight change. The number of responses for individuals at risk with cooking, shopping and feeding problems slightly decreased. The current wording of this NSI Checklist question may not have detected change in this risk factor.

Perceived Health Status

Health status as measured by participant self-assessment increased. Although 20% of the participants ended the program feeling less well, there was a significant increase (p=.004) in self-reported health ratings of excellent/good responses and a decline in the fair/poor responses (Table 7). Participants reported an improvement in their health in their anecdotal comments. They mentioned that they had more and better food, could control their blood sugar, gained needed weight, kept up energy, helped build up energy for surgery, and increased their appetite. In combination with the 13% reduction in unplanned weight loss occurring as a result of MMOW (Table 2), these responses may be evidence that participants experienced the benefits of the increased food intake.

I (4). Participant Satisfaction

Clients have said, "God bless you for this service", "I'm so thankful to have this service", "Enjoy every bite", "Good choice and variety", " Reasonably priced at $1.00 per day", " Delivery service was courteous and prompt", "Very pleased with the meals", "Breakfast is excellent", "I look forward to it".

Participants are satisfied with the taste, variety, and delivery service provided by their local MMOW program (Table 8)

Table 8
Participant Satisfaction
(Percent of all post responses, N=1371)

	Taste (n=1210)	Variety (n=1207)	Delivery service (n=1122)
Very Satisfied	73	69	87
Somewhat Satisfied	23	25	12
Not Too Satisfied	3	5	1
Not At All Satisfied	1	1	0

A participant states, "I live alone and heat everything in the microwave. Everything is very good. The food tastes like I cooked. I use breakfast at 11:00AM when breakfast comes and lunch for dinner. I don't get up until around 10:00AM. I would like to continue the breakfast. I'm on social security and only get $800.00 per month. I can hardly walk, have gout all over by body and real bad in my legs".

FINDINGS:

II. ENP Project Outcomes

One program reported, "In Appalachia, many people go to bed hungry each night. Many of them are elderly. Some have outlived their families and some have families who no longer visit. Imagine yourself as an elderly person. You are frail, you can no longer drive or cook for yourself and you are hungry. The Meals on Wheels brings you a hot meal each day. You eat your meal as soon as it arrives and realize that you will not eat again until the driver returns tomorrow. As the evening goes on your tummy hurts. You feel a little shaky. You are hungry. Imagine the delight you feel when you are asked, "Would you like to receive breakfast everyday? Now you can eat two times a day! This is the joy we shared with our clients in Southeastern Ohio. The breakfast program has been such a blessing to our clients. Many clients eat part of the breakfast in the morning and part in the evening. They love breakfast items, items that they cannot afford. Thank you so much for this project. Everyone deserves more than one meal a day."

The 20 nutrition projects were pioneers and worked hard to successfully implement MMOW. This section describes project reports on procedures, hurdles, solutions, issues and the outcome MMOW as a new opportunity had on nutrition project service provision. Projects reported on their plans to continue MMOW beyond the pilot and offered suggestions for successful replication and expansion of MMOW. The information for this section was gathered during the planning and ending stages using project self-reported data and at midpoint through each individual conference call with the partners. Evaluation forms are included in Appendix C.

The intent of this national pilot program was to maintain consistency in purpose and data collection yet allow flexibility in planning and implementing MMOW to accommodate variation in operating procedures. Each project individualized MMOW to fit into its daily routine. Thus, each project maintained its unique characteristics while keeping the national purpose. Nutrition projects varied by geographic region, numbers of participants served, operational structure, capacity and goals (Appendix F). Some projects were components of their Area Agencies on Aging. Some projects used caterers to provide meals, while many prepared their own. Programs also varied in the use of paid and volunteer labor and types of duties performed.

II (1). Development of MMOW Service Delivery Procedures

Start-up

Projects had a short two-three month period to prepare for MMOW. As with any new initiative, they had to plan ahead and rearrange operating procedures to incorporate MMOW. As reported during the Midpoint Conference Calls, this took time. Preparations included developing/selecting a nutritionally adequate menu, food procurement and production planning, development of service delivery procedures and route adjustments as necessary. Staff and volunteers had to be trained. In addition, decisions had to be made concerning financing and the number of participants to enroll.

The level of communication with oversight agencies throughout the MMOW timeframe varied from project to project. However, communicating with these agencies during the planning stage to gain their approval was identified as critical to success. Some projects needed to modify their contract/grant agreement with their Area Agency on Aging/ State Unit on Aging to change the meal contract, price rate or to include the addition of breakfast to the area plan.

Projects wishing to replicate MMOW can use the planning stage to address several hurdles encountered during the pilot. As suggested, adequate preparation time must be incorporated to overcome system stress. Projects should attempt to anticipate and plan ahead for the additional workload and initial confusion that normally accompanies a new service. This includes additional paperwork and record keeping, administration and organization of the evaluation pre/post participant and project surveys, and coordination of communication among client, site manager, outreach workers, kitchen staff, delivery workers and volunteers.

Participant enrollment and tracking

Projects were not required to enroll a pre-determined number of participants. Enrollment depended on the number of clients each project decided it could adequately serve. Prior to study enrollment, projects identified potential participants, screened them for malnutrition risk using the NSI Checklist, explained the pilot, and invited participation. Different methods of client enrollment were used depending upon project resources and capability. Some projects sent out notices to solicit interested participants. Others used case managers/project staff to phone or visit participants who they thought would benefit. The number of participants per program enrolled at the start ranged from 16 to 163. The number of unduplicated participants per program who completed the full six months ranged from 14-137.

As discussed previously, targeting the most appropriate recipients has been recommended for as a key success factor. Many potential participants declined the service because preparing breakfast gave them a sense of independence or they had breakfast arrangements in place. One project reported that many of the seniors did not feel they needed the breakfast. Others reported that seniors were “resistant” to certain types of foods. In some cases, participant breakfast perceptions/expectations and MMOW menus differed initially but projects made acceptable modifications.

The most appropriate MMOW recipients are among the most frail. Projects learned that this client group can be in and out of hospitals/nursing homes for a variety of reasons. As suggested, prior to beginning MMOW, thought should be given to a system of participant tracking that allows for these interruptions and facilitates coordinated service.

Meal Preparation and Delivery Aspects

Most projects began service between August and September 1997 and ended January and February 1998. The majority of projects served breakfast five days/week (15 projects), followed by seven days (3 projects), four days (1projects), and three days (1project). Most packaged meals in individual paper bags/sacks (1 project). Others used plastic grocery bags, small individual boxes, plastic wrap for hot items, shrink wrapped Styrofoam dishes, and microwaveable containers.

Most projects delivered tomorrow’s breakfast with today’s noon meal. One project delivered its breakfasts (cold) once a week. Volunteers (10 projects), paid staff (11 projects) or a combination of both are used to deliver meals. The meal was self-produced in central kitchens by 10 projects, in commissary settings by two projects, in a small kitchen by one, and supplied by a vendor/caterer to seven projects.

Most projects had to make some adjustments in their daily practices. Three projects reported that the addition of the breakfast meal required minimal or no changes in their routines. Several reported a need to increase staffing and volunteer time or adjust their schedules to prepare or assemble breakfast. They also had to expand reporting measures (e.g. to include breakfast foods and menus/client breakfast rosters/production schedules/client contributions), subcontract with food suppliers and to develop additional tracking methods (e.g. additional meals served, costs). Other adjustments needed for the increased service were the purchase of additional packing and transporting materials, alterations in delivery/driver routes, additional training sessions, and procurement of additional revenue. Some programs sought community support or product donations. One program tapped local corporate sponsorship and received donations of packaging supplies and orange juice.

Some problems did occur during MMOW and projects were able to solve them. Those reported dealt with getting the requested food from suppliers (solved by follow-up phone calls), the expense of delivering breakfast (solved by delivering breakfast and lunch together), packing breakfast and lunch to keep hot and cold meals separate (solved by packing separately and labeling with participant name), excessive bulky and loose items (solved by putting breakfast and lunch in the same coolers to conserve space, wrapping complimentary items together, e.g. butter and muffins), and moisture from frozen foods soaking packing materials (solved by switching from frozen to canned juices, and from paper to plastic bags).

Projects cited multiple factors as being critical to their success with MMOW. The most popularly reported factors were the cooperation of the caterer/subcontractor, the enthusiasm and skills of the staff/volunteers, the enthusiasm of the participants, and the support from General Mills and their own communities. Projects found the communication link with their fellow 'pioneers' through the conference calls and individual calls with each other to be helpful and reassuring.

The ability to provide a quality product was important to success. Projects that were able to purchase quality foods at affordable prices, to develop well-balanced and good tasting meals, offer ample variety and participant friendly convenience reported success. Some projects offered seasonal fresh fruit. At least one program reported very enthusiastic participant response to the fruit. Fresh fruit was too expensive for participants to purchase themselves and the single size portions didn't spoil.

Also reported as important to success were factors dealing with efficient use of resources. These included targeting the most needy, communicating effectively with hospitals, health care agencies and all individuals associated with the meals program. Some programs used student interns to help with dietary analysis/planning and to assist with administering the pre/post NSI Checklist.

II (2). Provision of A Nutritionally Adequate and Regionally Acceptable Breakfast Menu.

Programs offered breakfast menus that were nutritionally adequate and regionally acceptable. Prior to the initiation of the MMOW breakfast program, each project was asked to provide the planned breakfast meal pattern. They were asked to provide a nutrient analysis of both a three-day average of breakfast, and a three-day average of breakfast and lunch combined. An average nutrient analysis of the finalized menu was also requested. More than half of the programs complied completely with the request. The individual breakfast meal patterns are grouped by region and can be found in Appendix G.

Most projects were able to adjust breakfast and/or lunch menus so that together the two meals equal two-thirds of the RDA and adhere to the US Dietary Guidelines. The most problematic area in this regard was meeting kilocalorie and micronutrient requirements. After discussions with their respective State Units on Aging, two projects received waivers: one for menu pattern and the other for kilocalorie requirement because it was thought that the current requirement might not be realistic for frail elders.

No insurmountable difficulties with menu development were reported. The proposed breakfast patterns were very good indicators of the actual breakfasts. Projects adjusted their menus somewhat to increase nutrient density, accommodate participant preferences, cost, product availability, and production capability.

The Breakfast Manual developed by General Mills proved helpful to projects by supplying sample menus with nutrient analysis and offering suggestions for starting a breakfast program. General Mills also provided technical assistance (e.g. recipe modification, development of shelf stable emergency meals), and developed a second set of menus in response to project requests. To better meet its needs, one nutrition project developed a third set of menus with nutrient analysis that was distributed to the other 19 projects.

The typical menu pattern consisted of one serving each of cold cereal, a muffin/bread, fruit/fruit juice, milk, and margarine/jelly. Some projects alternated the usual menu with hot breads, frozen pancakes and waffles. Five projects included a protein source consisting of an egg, peanut butter, or yogurt on several days. The most commonly used General Mills products were the cereal bowl pack and baking mixes. Yogurt proved to be very popular with participants.

Projects adapted menus to regional tastes and participant expectations of ‘what breakfast should be’. They substituted heavier breakfast items (e.g. waffles) and more hot

entrees or lighter items (e.g. cold cereal) as appropriate. Granola bars were added for variety and to increase kilocalories, as were fats, jellies, and syrups. One project reported it overcame participant reluctance to powdered milk through one on one educational efforts by staff and volunteers.

II (3). Financial Aspects

Funding is key to any successful program and locating sources of revenue was an important issue from the start of MMOW. Some nutrition projects were partially supported through their local AAA funds or state Medicaid Waiver programs. One used previously collected revenues from private fundraising to cover costs because it was not able to access funds from its AAA quickly enough. Another received local county funds. Projects reported that good planning and communication with their agencies and communities were important in accessing revenues.

Common revenue sources included USDA reimbursement, additional Title IIIC funding, and participant donations. But these could not be accessed by all projects. Several programs reported problems obtaining USDA reimbursements. These problems may have been avoided with better initial AAA/SUA communication. A convincing description of the purpose of MMOW at the beginning may have resulted in more effective and prompt action from oversight agencies.

The short start-up time may have precluded full use of potential revenue sources. AAA's may not have been able to re-allocate funds on short notice and possibly were reluctant to do so in communities with waiting lists for home delivered meals. Client donations may have been over or under reported because few projects had an accurate method in place for reporting this revenue source. As suggested, time must be taken to develop a system for reporting client donations if this revenue source is to be used. Even then, project sites targeting very low-income participants were hesitant to use this option.

The total average revenue was $1.35 (Table 9). Total revenues ranged from $0.62 to $5.13 (Table 9). Only one project reported revenue as high as $5.13 and was excluded from average. Anticipated revenues averaged $1.53, which is higher than actual average revenues reported. Thus, with average reported revenue of $1.35, projects appeared to be unable to meet the full cost of the breakfast program. Not all projects could take advantage of all sources of revenue. Rather, they used combinations of funding sources described in Table 9.

Costs are an integral component of program considerations. Programs were asked to provide cost (and revenue data) at the start (anticipated) and at the end (actual) of MMOW. Total breakfast costs ranged from $0.70 to $2.51 with an average total cost

of $1.52 per meal (Table 10). Anticipated costs covered a smaller range, $0.78 to $2.34 with a lower average of $1.47. Of the actual costs, food alone ranged from $0.56 to $1.62, averaging $1.00, or approximately 66% of total costs.

Costs varied with region, with size of project, and with food preparation method (Table 11). Average costs were lowest in the Midwest, increasing from the South to the Northeast to the West. Regardless of region, costs were greater for smaller project sites (serving less than 50 breakfasts/day) than for larger project sites (serving 50+ breakfasts/day), and catered meals were more costly than those prepared in a local or central kitchen. These findings are similar to those reported in the ENP Evaluation (15).

When considering the cost of food to reduce malnutrition, the nutrient content of the meal cannot be ignored. Over half of the projects were able to provide menu analysis documentation to demonstrate that when MMOW was combined with the home delivered noon meal, at least two-thirds of the RDA for over 16 nutrients was provided to their participants (Appendix G).

Table 9

Revenue for Breakfast ($)

Revenue component	**Average**[6]	**Range**
Total	1.35[7]	0.62---5.13
Title IIIC or VI	1.21	0.07---4.20
USDA Reimbursement	0.55	0.40---0.59
USDA Commodities	0.12	0.05---0.20
Private Fund Raising	0.43	0.10---1.21
Participant Contribution	0.23	0.06---1.00
State or Tribe	1.12	1.12
Local	0.12	0.10---0.14
Social Service Block Grant	0.46	0.46
Community Service Block Grant	0.03	0.03
Private Pay	0.00	0.00
Other	0.71	0.50---2.75

[6]Average and range values for each revenue source are based on projects receiving that source of revenue. One or more sources may be utilized, therefore, will not add up to *Total.*

[7]Excluding the largest revenue drawing program.

Table 10
Costs of Breakfast ($)[8]

Cost component	Average[9]	% of total[10] costs	Range
Total	1.52	100	0.70 ----2.51
Food	1.00	66	0.56---1.62
Paid Labor	0.30	20	0.03---0.42
Volunteer Labor	0.17	11	0.04---0.42
Supplies	0.07	5	0.01---0.26
Administration	0.19	12	0.30---0.67
Transportation	0.05	3	0.03---0.10
Other	0.18	12	0.03---0.357
Operations	0.08	5	0.30---0.13

[8]Determined from 18 programs responding.
[9]The average value for each cost component was determined independently from sites providing information on that particular component, therefore, will not add up to *Total.*
[10]The % of total costs for each cost component was determined independently from sites providing information on that particular component, therefore, will not add up to 100%.

Table 11

Average Breakfast Cost to project site by Region, Size and Preparation Method

Factor	n	Average cost ($)	Total category average ($)
Region			
Midwest	5	1.12	1.48
South	4	1.47	
NE	4	1.59	
West	5	1.75	
Production setting			
Kitchen	11	1.38	1.64
Catered	6	1.89	
Project size			
Small	6	1.70	1.60
Large	11	1.49	

II (4). Value of MMOW as a Service Opportunity

MMOW has been a valuable service providing clear benefits to clients and caregivers, the community and to the projects themselves. The diversity among the 20 projects and their experiences in how well they could successfully implement MMOW is reflected in their comments and suggestions.

Most projects reported that their efforts to provide MMOW as a new service opportunity were well worth it. Participants benefited from increased dietary intake and reduction in malnutrition risk and food insecurity. As a result of MMOW, participants had cereal, which for some had been too expensive when purchased from the grocery. In addition, participants received milk in smaller containers that they could drink without worrying about spoilage. Previously, participants wouldn't consume milk because the smallest size available (quart) would spoil.

One project expressed satisfaction that none of its participants were hospitalized during MMOW. Another reported that the home health care agencies it works with remarked about participant improvement. Projects reported that families and caregivers benefited because they no longer had to make provisions for breakfast, had more free time, and experienced less stress and worry. The community benefited as MMOW became a source of local pride, a publicity generator and a source of satisfaction knowing elders were receiving more than one meal a day.

Projects themselves directly benefited from MMOW. They reported they could offer more complete and comprehensive services. They experienced greater efficiency by expanding their services to provide two meals with one delivery. Not all projects experienced full success. One project reported being hindered by the financial burden and another could not serve all its needy elders because of funding constraints.

Achievable planned outcomes

Projects were asked to identify their planned outcomes at the start and determine at the end of the pilot phase whether or not they were achieved. Measuring if a project met all of its outcomes was difficult, as many appeared to change during the course of the pilot. Most outcomes were given as general statements and have been incorporated into several themes for this evaluation.

Projects hoped their participants would experience increased availability and intake of high quality nutritious food, that would result in decreased malnutrition risk, food insecurity, and weight loss. Most projects reported meeting these goals. MMOW enabled projects to increase the amount of food they provided and participants to

increase their intake to approximately two-thirds of the RDA. MMOW provided a convenient, visually appealing variety of food. As such, projects provided some financial relief to their participants and a simple, nourishing meal to those unable to prepare their own. Projects reported that MMOW helped participants feel more food-secure. The home delivered breakfast helped those who could not shop and enabled participants to have more food throughout the day, reducing the need to spread the noon meal over the entire day.

One program reported no instances of participant hospitalizations during MMOW. Another project intended to measure reduction in participant weight loss as an outcome. This reduction was achieved as monitored through client self-reports. A few programs planning to weigh participants and collect other clinical measures could not because of staffing and feasibility constraints. One project planning to measure change in client health status and amount of hospitalizations by working with physicians could not because of insufficient time to make arrangements and because of medical record confidentiality and patient consent.

Projects hoped MMOW would increase participants' abilities to remain independent and result in improved overall well being. They reported that through MMOW, participants were encouraged to eat more which increased their energy, made them feel more independent, and enabled many to continue living at home.

Projects also intended to determine the need for the breakfast program, the level of acceptability of the breakfast meal/foods, effectiveness of community/social service referral networks, and fund-raising possibilities. Projects stated the MMOW program helped them expand services to better meet the needs of their clients. Projects reported good participant satisfaction and demand for MMOW. The demand came in part from offering MMOW as a new service opportunity to community referral networks. Good case management resulted in increased referrals of new participants just discharged from hospitals and referrals from community agencies of elders needing more long term nutrition services.

Project plans to continue with MMOW

Most of the projects reported continuing or planning to continue with MMOW. However, several reported the extent of the service was funding dependent. While one project will be supported by its AAA, another anticipates depletion of its funding. Two programs will be unable to continue due to lack of funds or other support.

Several program revisions have been discussed by many of the projects. Of those continuing to deliver the morning meal, two intend to continue with no additional changes. Others would like to expand the number of clients served and/or the number of days per week the breakfast is offered. More projects would like to be able to offer an

occasional hot breakfast or add hot cereal to the menus. Some projects are considering raising the suggested participant contribution. Another project intends to "fine tune" participant criteria to ensure that the service is provided to the most needy.

Suggestions for MMOW expansion nationally

Each pilot project offered suggestions for expanding MMOW nationally. The suggestions fell into three categories: funding issues, project management, and garnering support for MMOW. Intertwined throughout was the suggestion that open communication be maintained with all parties including funders, participants, caregivers, project employees and volunteers. This was noted as absolutely critical for success. Projects also acknowledged the value of public relations efforts to promote MMOW.

Funding issues and obtaining financial support during the planning stage may be most critical. Maintaining open communication with local and state funders is important. Funding avenues to explore include: using existing OAA Title IIIC-2 grants to fund a second meal, working with the AAA to tap additional sources including USDA commodity foods and meal reimbursement and include Title XX clients in the program. One project advised aggressive searching for grant opportunities and marketing the benefits of MMOW. Other projects suggested looking to nationally recognized companies like General Mills for support/backing and securing opportunities for local publicity and promotions that offer direct financial, product or product discount, or other in-kind support.

Project management issues need attention as well. Recommendations include targeting only those clients who want and need breakfast. It is suggested that projects begin by reviewing MMOW sample menus. This will help projects determine cultural appropriateness and possibilities for incorporating reduced sugar, sodium, or Kosher products. Costs must also be identified. Breakfast costs when combined with lunch to meet two-thirds of the RDA may be lower than the costs of a breakfast that alone meets one-third of the RDA. Delivery of the two meals together should reduce costs as well.

It is recommended that projects start small to make MMOW manageable. A local pilot study would be helpful to determine what works in an individual community. Managers must evaluate the delivery capabilities of their systems and develop a pool of volunteers. It is important to assess training needs of employees and volunteers and develop comprehensive training routines as needed.

Garnering outside support for MMOW is very important. Projects suggested that national recognition and support from AoA and like agencies as well as General Mills highlight the importance of MMOW and the value of breakfast. Several reported that they would have been much slower developing their breakfast program without the technical assistance, support and materials provided by General Mills.

CONCLUSIONS AND RECOMMENDATIONS

MMOW is a successful new service innovation. From the evidence found in this evaluation, it provides benefits both to participants and nutrition projects. It fits the goal of the AoA to encourage providers to modernize and expand the array of appropriately targeted nutrition services offered. It also demonstrates the very clear benefits of a public/private partnership.

MMOW contributed to positive health outcomes in frail homebound participants when it was appropriately targeted to those who would benefit from receiving breakfast. MMOW contributions included:

- Nutrient dense breakfast consisting of many key nutrients associated with positive health,
- Increased dietary intake especially from the key food groups associated with good health outcomes,
- Reduction in malnutrition risk resulting from:
  - increased number of meals eaten,
  - increased consumption of cereal and grains, fruits, fiber, and milk products,
  - reduced unplanned weight change,
  - reduced food insecurity,
- Increased sense of independence, appetite, and health status,
- Less caregiver time spent in actual breakfast preparation,
- Excellent client satisfaction.

The participating nutrition projects made MMOW successful. Nutrition projects were able to offer MMOW with relative ease and for the most part resolve major hurdles. They were in the line of fire and many of them learned “the hard way”. The flexibility allowed in the pilot to plan menus, select participants, and design procedures conducive to individual operations was a factor contributing to success. Project benefits/outcomes included:

- Expansion of service to vulnerable clients,
- Delivery and cost efficiencies while improving dietary intake,

- Improved community service coordination and new referrals,
- Quicker implementation of breakfast as a new service,
- Identification and measurement of participant and project outcomes.

MMOW has demonstrated the tangible benefits that occur through public/private partnerships such as this one with the AoA and General Mills Foodservice, the Center, the 20 nutrition projects and the aging network. These collaborations should continue, as it is a winning situation for all. The MMOW network relationship and the technical assistance and materials were the linchpin for making MMOW successful.

The success of this program is remarkable given the fact it embarked on a new initiative with a group of diverse projects selected without the benefit of a site visit. Almost all communication occurred by phone, fax or in writing. The amount of pre planning among AoA, General Mills, and the Center helped insure the success. Once the program started, all entities were kept in the communication loop. This was important because it kept things on track. Conference calls encouraged networking and provided support.

The AoA should continue its support of MMOW and promote its benefits to public and private decision-makers at federal, state, and local levels. The AoA should promote the advantages of public/private partnerships. It should encourage a national expansion of this successful initiative by building upon the existing infrastructure for the public/private partnership with AoA, General Mills, the Center, the nutrition projects and the aging network.

Some form of program evaluation needs to be included in a rollout. In today's era of accountability, outcome documentation, and performance improvement, no nutrition project can go without evaluating impact. Client 1 and 2 forms coupled with the NSI Checklist enables projects to collect useful information and document outcomes. They can use these findings locally and state wide to demonstrate the value of the nutrition services they provide. Outcome measures and the materials projects used to evaluate achievement are available in the appendix of this report. They can be modified and adapted for use in other settings.

In any MMOW rollout, sufficient time is necessary to allow projects to prepare and resolve funding and menu pattern issues with local or state agencies. Communication is the key and projects should share plans with their state and local network partners. It appears from the comments and experiences shared by the projects, community resources and new funding streams need to be explored. Innovative grants, community support and

sponsorship through funding, food or public events or publicity should be tapped. Intergenerational activities should be investigated.

Projects need to carefully target who will receive breakfast. As found in the evaluation, the fact that someone is at malnutrition risk does not always mean breakfast is appropriate or that the individual wants it. With appropriate targeting, projects might be able to provide a nutritionally complete breakfast that in conjunction with a “lighter” noon or evening meal to meet two-thirds of the RDA as an option. This might be a less expensive option for those who enjoy breakfast and prefer “grazing” or less heavy noon meals. Some states and AAAs prefer not to fund a second meal when there are waiting lists. A well-planned and costed breakfast meal served in combination with a second meal to increase nutrients and meet two-thirds of the RDA might be a viable option.

MMOW demonstrated it is a popular and successful program. With advanced planning and simple evaluation measures, MMOW helps decrease malnutrition risk and improves the lives of frail homebound older adults.

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Appendix A

MMOW Breakfast Program Nutrition Program Application

Appendix B

MMOW Nutrition Programs

Appendix C

MMOW Evaluation Instruments

C1: Instructions for Completing Forms

C2: Participant Enrollment - Survey

C3: Participant at End or Leaving Program – Survey

C4: Program Report at Beginning – Survey

C5: Program Final Report – Survey

C6: Monthly Status Report – Forms

C7: “Compelling Stories” – Form

Appendix D

MMOW Mid-Project Individual Conference Call Summary

Appendix E

Measured Program Benefits

E1: How Much of the MMOW Breakfast Do You Usually Eat?

E2: If You Usually Save Breakfast to Eat at Other Times…Why?

E3: How have the Home Delivered Breakfasts Helped You?

E4: Appetite Rating

E5: (a) Mean # ADL/IADL for matched pre/post pairs

(b) Mean # ADL/IADL for all pre and post surveys

E6: Perceived Health

E7: NSI Checklist – all pre and all post surveys

Table E1

How much of the home delivered breakfast do you usually eat?

Amount	**All post responses (N=1371) %**	**Matched pre/post responses (N=1148) %**
	(n=1136)	(n= 962)
All	62	61
More than half	25	25
Half	7	7
Less than half	6	6
Hardly any	1	2

Table E2

If you usually save breakfast food to eat at other times, is it because you are…

	All post responses (N=1371) %	**Matched pre/post responses (N=1148) %**
	(n=580)	(n= 507)
Too Full	54	55
Stretching it	33	34
Frequently Sick	13	12

Table E3
How have the home delivered breakfasts helped you?

	All post responses (N=1371) %	Matched pre/post responses (N=1148) %	Rarely breakfast prior to MMOW (N=170) %
Can now eat more than 1 meal per day	51	50	38
Able to continue living at home	48	49	30
Have more energy for every day activities	39	39	25
Outlook on life has improved and feel more independent	30	31	20
Able to afford other essentials	23	22	17
Other	7	7	9

Table E4
Appetite Ratings
(Percent from matched pre/post responses, N=1148)

n=982	**Good**	**Fair**	**Poor**
Pre-Program	44	45	11
Post-Program	49	43	8

Table E5
Mean number of ADL/IADL
(Percent from matched pre/post responses, N=1148)

	ADL (n=996)	**IADL (n=997)**
Pre-Program	2.70	5.23
Post-Program	2.46	5.25
Pre/Post Difference	0.24	-.02
Significance	<.001	NS

Table E5b

ADL/IADL - % of all pre (N=1493) and all post (N=1370)				
	ADL		IADL	
Time	**N**	**Mean**	**n**	**mean**
Pre	1375	2.71	1370	5.16
Post	1109	2.58	1110	5.28

Table E6
Overall, how do you consider your health?
(Percent from matched pre/post pairs, N=1148)

(N=988)	**Excellent**	**Good**	**Fair**	**Poor**
Pre-Program	2	23	50	25
Post-Program	3	26	49	21

Table E7
DETERMINE YOUR NUTRITIONAL HEALTH
% Responding Positively to Each Statement

The percentages are based on all pre checklists and all post checklists separately. They cannot be directly compared.	***Pre (N=1493) %***	***Post (N=1370) %***
I have an illness or condition that made me change the kind and/or amount of food I eat.	47.8	40.1
I eat fewer than 2 meals per day.	21.1	11.7
I eat few fruits or vegetables, or milk products.	39.2	28.5
I have 3 or more drinks of beer, liquor or wine almost every day.	1.1	2.0
I have tooth or mouth problems that make it hard for me to eat.	17.4	16.9
I don't always have enough money to buy the food I need.	30.3	26.2
I eat alone most of the time.	61.0	55.3
I take 3 or more different prescribed or over-the-counter drugs a day.	61.2	54.6
Without wanting to, I have lost or gained 10 pounds in the last 6 months.	28.8	19.1
I am not always physically able to shop, cook and/or feed myself.	73.5	69.3

Appendix F

MMOW Pilot Program Site Characteristics

Appendix G

MMOW Project Site Breakfast Meal Nutritional Characteristics

G1: Proposed and Actual Breakfast Meal Pattern

G2: MMOW Breakfast Nutrient Estimates

Table G1

Proposed and Actual Breakfast Meal Pattern

Region	Proposed Breakfast Pattern (from pre administrative survey)	Type of Meal	Actual Breakfast Pattern (obtained from program menus)
$MidW_1$	Not given	Cold	1 or 2 bread, 1 fruit/juice, 1-2 fat/sweet on 3 of 5 days, 1 milk, 1 protein (yogurt) on days w/ 1 bread (2 of 5 days)
$MidW_2$	1 juice/fruit, 2 bread, 1 milk, 1 fat	Froz	2 bread, 1 juice/fruit, 1 milk, 1 fat (1 day has a protein and only 1 bread)
$MidW_3$	1-2 bread, 1 fruit, 2 fat/sweet OR 1 bread, 1 milk	Cold Froz	1-2 bread, 1 fat/sweet, 1 fruit OR 1 bread, 1 fruit, 1 milk
$MidW_5$	1 juice/fruit, 2 bread, 1 milk, 1 fat/sweet	Cold	1-2 bread (yogurt on days w/ only 1 bread), 0-1 fat/sweet, 1 milk, 1-2 juice/fruit (2 on days w/ only 1 bread)
NE_2	Juice/fruit, bread, milk, fat, protein on alternate days	Cold	2 bread (1 bread on days w/ protein), 1 juice/fruit, 1 fat, 1 milk, 1 protein on alternate days
NE_3	2 bread, 1 fruit/juice, 1 milk, 1 fat (occasionally)	Cold	2 bread (1 bread on days w/ yogurt), 1 fruit/juice, 1 milk, 1 fat (2 days)
NE_4	Not given	Cold	2 bread (2 of 10 days only 1 bread), 1 fruit/juice (3 of 10 days have 2 and 3 of 10 days have none), 1 milk, 1 protein (yogurt) on days w/ no fruit
NE_5	Not given	Cold Froz	2 bread (yogurt on 1 day w/ only 1 bread), 0-1 fat/sweet, 1 milk, 1 fruit/juice
S_1	1 bread, 1 milk, 1 fruit/juice, 1 fat	Cold	No actual menu given
S_2	1 juice/fruit, 2 bread, 1 milk, 1 fat/sweet, occasional protein	Cold	2 bread, 1 milk, 1 juice/fruit, 1 fat
S_3	1 juice/fruit, 2 bread, 1 milk, 1 fat/sweet	Cold	1 juice/fruit, 2 bread (yogurt on 1 day w/ only 1 bread), 1 milk, 1 fat/sweet (none on day w/ yogurt)
S_4	1 juice/fruit, 2 bread, 1 milk, 2 fat	Cold	2 bread (1 of the days has 3 breads), 1 juice/fruit, 1 milk, 2 fat
S_5	1 juice/fruit, 2 bread, 1 milk, 1 fat/sweet	Cold Froz	2 bread, 1-2 fat/sweet, 1 juice/fruit, 1 milk
W_1	1 juice/fruit, 1 milk, 1 bread, 1 protein	Cold	1 bread, 1 protein, 1 milk, 1 fruit
W_2	1 juice/fruit, 1 bread, 1 milk, 1 protein	Cold	No Report
W_4	2 juice/fruit, 1.5 bread, 2 protein, 1 milk, 1 fat/sweet	Cold Froz	1.5 bread, 2 protein, 2 fruit/juice, 1 milk, 2 fat/sweet
W_5	3 bread, 1 milk, 1 fruit/veg, 1 fat/sweet, 1 protein	Cold	3 bread, 1 milk, 1 fruit/veg, 1 fat, 1 sweet, 1 protein

Table G2

MORNING MEALS ON WHEELS Breakfast Patterns

Notes: (1) Nutrient selection was based on that used by Mathematica for the evaluation of the ENP. (2) most average looking of the three day nutrient analyses for each program was selected for inclusion in no information regarding the group used as the basis for comparisons to the RDA (to determine %RDA) v

	Kcal	**%Prot**	**%CHO**	**%Fat**	**A**	**C**	**D**	**E**	**B1**	**B2**	B3	**B6**	**Folate**	B12	Ca	Iron	Pho
1[1]	**533**	**14**	**60**	**26**	**35**	**67**	**70**	**59**	**71**	**77**	**61**	**47**	**82**	**111**	**58**	**89**	**54**
2[2,5]	**539**	**11**	**69**	**19**	**29**	**75**	**264**	**NA**	✍[3]	✍	**212**	✍	**46**	✍	**41**	✍	**34**
3	**408**	**15**	**63**	**22**	**117**	**166**	**NA**	**2**	**52**	**57**	**30**	**38**	**40**	**18**	**39**	**NA**	**NA**
4[4]	**441**	**14**	**50**	**36**	**48**	**69**	**65**	**NA**	**44**	**57**	**33**	**28**	**45**	**74**	**46**	**35**	**50**
5[5]	**595**	**33**	**NA**	**22**	**22**	**7**	**63**	**NA**	**25**	**54**	**21**	**16**	**19**	**77**	**62**	**31**	**NA**
6	**575**	**11**	**71**	**18**	**90**	**80**	**NA**	**NA**	**49**	**54**	**44**	**25**	**39**	**97**	**57**	**47**	**NA**
7[4]	**388**	**17**	**28**	**13**	**22**	**90**	**31**	**NA**	**42**	**43**	**32**	**37**	**68**	**46**	**20**	**36**	**29**
8[6]	**439**	**36**	**Ng**	**Ng**	**47**	**61**	**70**	**156**	**104**	**130**	**102**	**80**	**138**	**211**	**64**	**121**	**61**
9[7]	**530**	***9***[8]	***64***	**28**	**20**	**90**	**45**	**NA**	**45**	**40**	**30**	**20**	**50**	**40**	**40**	**70**	**30**
10[7,5]	***454***	***12***	***66***	***23***	***186***	***77***	***NA***	***NA***	***108***	***71***	***30***	***NA***	***NA***	***NA***	***49***	***46***	***54***
11[4,5]	**519**	**11**	**61**	**28**	***44***	***80***	***60***	***73***	***66***	***79***	***53***	***53***	***85***	***140***	***54***	***82***	***61***
12[19,20]	**854**	**14**	**47**	**34**	**63**	**110**	**53**	**44**	**74**	**75**	**59**	**34**	**76**	**144**	**64**	**59**	**84**
13[5]	**684**	***15***	***44***	***41***	***47***	***114***	***NA***	***22***	***108***	***61***	***28***	***25***	***152***	***57***	***62***	***39***	***71***

[1] Seven day average of breakfasts/RDA Male 51+ yrs.
[2] One of three daily breakfast averages

[3] ✍ = greater than 1000% RDA
[4] Actual 3-day average
[5] comparison to US male 51+ years

[6] Actual average/RDA – female 51+ years

[7] Italicized values are determined from information given
[8] Comparison to “RDA for Seniors”
[20] Percent RDA for males, 75 years

Table G2 (continued)

MORNING MEALS ON WHEELS Breakfast Patterns (continued from p

	Protein (gm)	CHO (gm)	Total Fat (gm)	Sat. Fat (gm)	Chol. (mg)	Sodium (mg)	Dietary Fiber (gm)[9]	
1	19	82	16	4.5	16	792	6	
2	16	98	12	1.5	4	930	1.5	
3	15	66	10	4	NA	NA	NA	
4	*15*	*55.5*	*39.5*	6	33	883	NA	
5	20.5	*86*	19	NA	91	704	5	
6	16.8	102.6	11.3	1.6	11.7	731	3	
7	9	69	9	3	16	572	3	
8	18	64	13	5	89	492	5	
9	12	85	16	6	35	670	NA	
10	14	75	11	NA	23	572	0.5	
11	14	81.5	17	5	32	655	4	
12[19]	29.4	101	31.9	10	79.7	1418	10.8	
13	26	75	31	5	43	1114	5	

[9] Fiber values were not considered in the Mathematica evaluation
[10] 1/3 RDA is met if 90% of 1/3 RDA for each of the 16 nutrients has been provided by breakfast.
[11] 2/3 RDA is met if 90% of 2/3 RDA for each of the 16 nutrients has been provided by breakfast and lunch together.
[12] Of information provided, vitamin E is low.
[13] Of information provided, magnesium and zinc are low.
[14] Three-day average meets 2/3 RDA.
[18] Of the information provided, only zinc is less than the RDA
[15] Of the information provided, zinc is low.
[16] Information provided is not completely clear. However, it appears that 2/3 RDA has been met.
[17] Of the information provided, meal plan is low in zinc.
[19] This was the information provided but not sure if it is breakfast or lunch or both