

Meal System

FOR THE ELDERLY:



Conventional Food in Novel Form

Lyndon B. Johnson School
of Public Affairs
The University of Texas at Austin



LYNDON B. JOHNSON SCHOOL OF PUBLIC AFFAIRS
POLICY RESEARCH PROJECT REPORT

Number 16

MEAL SYSTEM FOR THE ELDERLY:
CONVENTIONAL FOOD
IN NOVEL FORM

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The Meal System for the Elderly Policy Research Project
Lyndon B. Johnson School of Public Affairs
The University of Texas at Austin
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FOREWORD

The Lyndon B. Johnson School of Public Affairs conducts interdisciplinary research on policy problems as an integral part of its educational program. In the Policy Research Project, 3 faculty members and about 15 graduate students, all with diverse backgrounds, research a policy issue, analyze and write up their results, and formulate policy recommendations. The Policy Research Project brings the student face-to-face with administrators, legislators, and other officials in the policy process; it is intended to develop the special talents which are needed for the conduct of research in a policy environment.

The Policy Research Project is a year-long effort which involves students in a range of related activities, such as preparation of research plans; preparation of grant proposals; evaluation of programs, legislation, and proposals; organizing conferences and briefings; testifying before legislative committees; and reporting on research findings.

During 1975-76 one of the LBJ School's Policy Research Projects was a cooperative venture with the National

Aeronautics and Space Administration, Lyndon B. Johnson Space Center in Houston, *Meals for the Elderly: Conventional Food in Novel Form*. The LBJ School's part of the project was financed under a grant from the Texas Department of Public Welfare. Funds were also made available under a Ford Foundation grant to the School. The report presented here deals with the development of the meal system and evaluates the results obtained from two field tests. Based on this project, additional work is currently underway at the LBJ School to explore potential uses of the NASA meals system for other populations and purposes.

The LBJ School seeks to develop men and women with the capacity to perform effectively in public service and to produce research that will enlighten and assist those actively engaged in the policy process. The project which produced this report has helped to accomplish the former; it is our hope and expectation that the report itself will contribute to the latter.

Jurgen Schmandt
Acting Dean

PREFACE

This document is the product of a cooperative venture involving several public agencies. It started when Anne Kohler, Director of the Texas Governor's Committee on Aging Research Utilization Program (now a part of the Texas Department of Public Welfare) made a request of NASA: could the space agency help to improve nutritional services for the elderly, particularly those in areas not reached by meals-on-wheels programs? As it turned out, NASA's experience in developing a shelf-stable, nutritious, easily transportable meals system for its manned space programs provided the foundation for design and development of a meals system intended to meet the special needs of the elderly. A joint project was launched to develop the system, conduct technical and user taste tests, develop new delivery systems, conduct field tests, undertake medical assessments, and evaluate the results of these various activities. The participating institutions included the following:

National Aeronautics and Space Administration
LBJ School of Public Affairs
United Action for the Elderly
Texas Research Institute of Mental Sciences
The University of Texas Medical Branch at Galveston

Funding was obtained separately by each participating organization. The Texas Department of Public Welfare provided funds for the participation of the LBJ School and United Action for the Elderly. The LBJ School made funds from a Ford Foundation grant available to finance the medical component of the project.

The LBJ School had been involved previously in a number of policy research projects concerned with social services, particularly for the aged. In many respects, however, the *Meal System for the Elderly* project was different: here was an opportunity not only to research what had been done, but to take part in planning, implementing, and evaluating a social experiment. All student members of the LBJ team spent a significant amount of time in direct contact with the "clients"—elderly individuals, most of them poor, with many suffering from numerous ailments. Thus, ethical issues of social experimentation were directly experienced: what were the rights of the clients? Would they really understand what we told them about their rights? What would happen to them after the demonstra-

tion was over? Would it be "right" to use a control group? How would we make sure that the medical condition of applicants allowed for their participation in the project? Was it possible to dissociate the elderly participants' reaction to the social contact from their reaction to the meals as such?

On a different level, interaction with various administrative and policy environments provided a source of instant learning which could not be matched by classroom experience: what approach would NASA officials, used to dealing with issues in the clear cut language of engineering, take in dealing with poor, old, frail individuals? How would the Administration on Aging of the Department of Health, Education, and Welfare, react to a project of this kind? Would there be interest at the Congressional level?

Out of these varied experiences one lesson emerged with suggestive force: social experimentation of the kind tried here needs careful planning, deep respect for those intended to be helped, a blending of many professional skills, a willingness to work with others, and a commitment to social improvement which does not end with the publication of research results. We submit that these factors carry sufficient weight to justify the fact that our team was involved in all stages of the project. Traditionally, responsibility for project development and program evaluation is entrusted to different groups, in order to ensure greater objectivity in evaluating results. Under ideal circumstances this may well be the case. But working with the kind of client population as we did—many had infrequent social contacts, and were not used to meeting with strangers or being interviewed—we felt justified in serving both functions simultaneously. However, within the group we did establish a division of labor among those principally responsible for field work and others in charge of evaluation.

The experiment described in the report was a small one. We are gratified to find that the project led to national legislation proposing a larger and longer demonstration. We also see possible uses of the meal system for other social services, for disaster relief and emergency aid, and, perhaps, there is even potential for wide commercial utilization. At the same time, we realize that these developments can only occur if and when government agencies and industry

determine on their own that there is real potential in the concept and that the system can be used, however refined and changed, to meet a variety of human and social needs.

There are many individuals and organizations who made it possible for us to undertake the project. We greatly

appreciate their help and encouragement. Our greatest appreciation is due to those 200 volunteers who agreed to participate in the project. Their lots need to be improved. We hope that our work will make a small contribution to this task.

Jurgen Schmandt
Project Director

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SUMMARY OF FINDINGS

Sample Characteristics:

- 1) Almost half of the elderly were 71 to 80 years of age. Women comprised 72 percent of the sample. All but five participants had incomes which made them eligible to receive Title XX Social Service benefits.
- 2) While two-thirds of the elderly lived alone, most reported relatively frequent contact with friends and relatives. In addition, 60 percent had regular contact with social service providers with transportation being the most frequently received service.
- 3) Only 37 percent of the elderly owned and drove their own vehicles. The rest were dependent upon others for transportation assistance for shopping, errands, doctor's visits, church, etc.
- 4) Three-quarters of the group reported eating a daily hot meal before participating in the NASA meals program. However the limited budgets of almost all restricted the types and quantities of foods that could be regularly eaten.
- 5) About 30 percent of the group was essentially homebound due to extreme poor health. In addition, about a quarter of the sample reported having difficulty getting around their home, and performing basic household tasks, including cooking.

Evaluation Summary:

- 1) Over three-quarters of the participants liked the NASA meals "very much" and wanted to continue receiving them, although not necessarily on a daily basis. Ninety percent found it convenient to have a complete meal in one box. The two most attractive features of the system, according to the participants, were the food itself, and the ease of food preparation.
- 2) Almost half of the group felt each meal provided more than enough to eat. Many participants could not eat a single meal at one sitting, and routinely stretched each meal over the course of the day to provide two meals, or one meal and several snacks.
- 3) Overall, participants did not become bored eating the NASA meals on a daily basis. Less than a third

felt some food items had been repeated too frequently during the course of the program. Over a third missed eating certain favorite food items normally a part of their diet.

- 4) The vast majority of participants had no difficulty either opening the food packages or in preparing the food items. Ease of food preparation was one of the most attractive features of the meal system for these elderly.
- 5) The majority of participants expressed a preference for home delivery of meals by a volunteer. When asked if they could pick up the meals from a central location such as a church, over 50 percent said "no". Mail delivery of the food packages was acceptable to the 15 participants who received their meals by that method.
- 6) The majority of participants receiving the NASA meals as a weekend supplement found the meals of similar or better quality than the meals provided by their hot meals program during the week. All but one wanted to continue receiving the meals for weekend use. The fact that almost 20 percent of this group did not frequently eat a hot meal on the weekend prior to this program suggests there is a service gap on weekends which the NASA meal system worked well to fill.
- 7) The ease of preparation of the NASA meals allowed some alternate care participants to prepare the meals themselves. In addition, providers or homemakers who normally prepared meals and/or shopped for this group reported a savings of time by using the NASA meals.
- 8) The majority of participants who received the meals for 105 days reported no decrease in interest in the program over the additional two cycles. Additionally, most participants said that since they had been eating the NASA meals, they had more free time which they spent gardening, visiting friends, or doing household chores.

Economic Summary:

- 1) The highest per meal cost was \$5.58 while the lowest per meal cost was \$2.33. The average cost per meal

for food and primary packaging was \$2.88. The cost of the special-run single serving sized cans was considerable. The average cost of a meal, adjusted for the high packaging cost, is approximately \$1.60 per meal.

- 2) Personal delivery costs ranged from \$.87 to \$1.55 per seven-day package. The average cost was about \$1.20 per pack or \$.17 per meal. Mailing costs were about \$1.20 per seven-day pack—a cost comparable to the average cost of personal delivery.

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CHAPTER I

INTRODUCTION

Information presented at hearings on the Older Americans' Act and subsequent amendments revealed that a significant number of elderly people "do not eat adequately because (1) they cannot afford to do so; (2) they lack the skills to select and prepare nourishing well-balanced meals; (3) they have limited mobility which may impair their capacity to shop and cook for themselves; and (4) they have feelings of rejection and loneliness which obliterate the incentive necessary to prepare and eat a meal alone."¹

As a result, government action was taken to provide hot meal programs for the elderly. More than 700 Title VII feeding programs are currently in operation across the country, providing 300,000 meals daily for elderly citizens, mostly on a five-day a week basis.²

Most of these hot meal programs provide meals in a congregate meal setting, thereby addressing the nutritional needs of the elderly and the problems of social/psychological isolation which often accompanies old age, and contributes to poor eating habits. However, even if congregate meal programs are expanded, an estimated 3 to 4 million elderly Americans cannot participate in group meals because they are ill, handicapped, or otherwise homebound.³

In an effort to reach these individuals, "meals-on-wheels" programs have been established to provide home-delivered hot meals to the homebound elderly. Title VII meals-on-wheels programs presently deliver about 30,000 meals daily, operating primarily in urban areas. This type of meal service is seldom available in small-town or rural areas where many elderly live.⁴

Recognizing this problem, the Texas Governor's Committee on Aging (GCA) approached the National Aeronautics and Space Administration (NASA) in early 1974, to see if the agency's expertise in food technology could be used to improve the nutrition of the homebound elderly. In response to this request, NASA scientists and engineers at the Lyndon B. Johnson Space Center in Houston developed a shelf-stable, nutritious, and easily transported meal system for older Americans not currently served in nutrition programs.

The NASA Meal System for the Elderly was not designed to serve as a substitute for congregate meal programs, which have social and psychological benefits for those individuals who are able to participate in them. Instead, NASA wanted to design a meal service for the rural and small-town aged who have little opportunity to participate in either congregate or home-delivered meal programs. It was intended also to serve as a supplement to feeding programs which operate in urban areas on a limited number of days each week. In these ways it was hoped that the meal system would assist in preventing or delaying the unnecessary placement of many older Americans in hospitals and nursing homes.

PROJECT RESPONSIBILITIES

NASA's Lyndon B. Johnson Space Center decided to work with other groups in planning, implementing, and evaluating the field tests. The Lyndon B. Johnson School of Public Affairs at the University of Texas at Austin (LBJ School), the Texas Research Institute of Mental Sciences (TRIMS), United Action for the Elderly, Inc. (UAE), an Austin-based Meals-on-Wheels program, and the University of Texas Medical Branch at Galveston (UTMBG) under contract to the LBJ School, helped in developing, testing, and evaluating the meal system. The duties of the various participating institutions are presented here:

NASA

- Overall program responsibility
- Design and development of meal system
- Provide all meals

LBJ School

- Plan, administer, and execute program evaluation
- Assist in field demonstrations
- Advise on policy implications

TRIMS

- Develop and conduct the preference and attitude survey
- Plan and execute the user taste test

UAE

- Train field workers
- Plan, coordinate, and execute field demonstrations
- Responsible agent for the receipt, storage and distribution of meals

UTMBG

Conduct medical-nutritional screenings of participants in the field demonstration

NASA contracted with two private firms in carrying out its project responsibilities. Technology, Inc. provided diet planning, and food acquisition and packaging. The Martin Marietta Corporation Biomedical Applications Team was responsible for project technical support.

Funding for the project was provided by NASA for program development and meal costs, the Texas Department of Public Welfare (DPW) for field demonstration activities and program evaluation, and the Ford Foundation for the medical assessment.

PROGRAM APPROACH

The project was approached in four phases. (See Appendix I for timetable.) The initial stage focused on the technical development of the meal system: selection of the

food items, menu development, and package design. These tasks were accomplished through a series of surveys and taste tests conducted by NASA and TRIMS, in addition to design work completed by NASA. Preparations were also made for a short-term pilot demonstration.

During the second phase of the project a pilot field demonstration was conducted. Forty-one elderly citizens were selected to receive meals for a two-week period. Their comments were recorded and several technical changes were made in the package design and menu composition as a result.

A major field demonstration was carried out during the third phase. Meal packages were distributed to 128 elderly citizens by volunteers and through the mail, providing a hot meal daily for nine weeks. A small group continued to receive meals for an additional six weeks. Another 40 elderly persons who were participants in hot meal programs during the week received NASA meals as a weekend supplement. Detailed interviews of all meal recipients and case studies of some participants served as the major source of data for evaluating the meal system. The field demonstration also included a medical-nutritional component to screen potential participants for health problems which would prohibit participation in the program and to assess the nutritional impact of the meals over time.

The final phase was an overall evaluation of the program. The issues addressed include: (1) the acceptability of the meals themselves; (2) the adequacy of the delivery mechanisms employed; and (3) the psychological, economic, and nutritional impact of the program upon meal recipients. Future uses of the meal system as a supplement to traditional feeding programs were also examined in light of current legislation.

REFERENCES

¹ Older Americans Act—Amendment, Sec. 701 (a), 86 Stat. 88(1972).

² "Older Americans," *Weekly Compilation of Presidential Documents*, volume 12, number 7 (Feb. 16, 1976), p. 170, Gerald R. Ford, Message to Congress, Feb. 9, 1976

³ U.S. Congress, Senate, Select Committee on Nutrition

and Human Needs, Opening Statement of Senator Charles H. Percy, *Hearings on S. 3585*, 94th Cong., 2d Sess., June 17, 1976.

⁴ *Ibid.* Opening Statement of Senator George McGovern, "The Homebound Elderly—Our Most Dependent Citizens," *Hearings on S. 3585*, 94th Cong., 2d Sess., June 17, 1976.

CHAPTER II

SYSTEM DEVELOPMENT

The initial phase of the project, extending from March to October, 1975, focused on the technical development of the meal system. Activities during this period included: (1) a Food Preference and Attitude Survey, (2) a technical taste test to screen all food items under consideration for use in the meal system; (3) a user taste test conducted over a five-day period during which a group of elderly citizens rated the food items which had successfully passed technical screening; and (4) the identification of a set of technical requirements for the design of the meal packaging system.

FOOD PREFERENCE AND ATTITUDE SURVEY

As a first step in deciding on menu composition TRIMS conducted a survey of elderly citizens to determine their eating habits, meal preparation practices, and food preferences.¹ A survey instrument composed of 34 questions was administered to 100 elderly citizens, representing both rural and urban populations. Fifty-five percent of the group were white while the remaining 45 percent were black. Most of the respondents were currently active in senior citizen programs. The major findings are outlined below.

1. *Eating Habits.* Seventy-one percent of the elderly citizens surveyed stated that they usually ate their meals at home, although only half commented that they preferred eating at home. Over half of the sample reported eating three meals the previous day, while the group was evenly split between those who ate their main meal in the evening and those who consumed it at breakfast or lunch. More than half of the respondents ate snacks each day, usually fruit, desserts, or beverages. Ninety-two percent reported that they drank either coffee, tea, or juice with their meals. Over two-thirds of the sample stated that they normally ate alone.

2. *Meal Preparation.* Ninety-two percent of the respondents prepared their own meals, the majority reporting no problems in preparation. Half of the sample members often used convenience foods such as frozen TV dinners, prepared frozen foods, and drink mixes. All the respondents had access to basic kitchen facilities. Ninety-one percent of those interviewed did their own shopping, with one-third of this group encountering problems due to impaired physical mobility. (An example cited is difficulty in pushing a

grocery cart.) Several mentioned that it was troublesome to open jars and complete related tasks.

3. *Food Preferences.* Specific food preferences varied widely among the elderly citizens interviewed. Meat preferences include fish, beef, and poultry. A variety of vegetables and fruits were mentioned while a preference for cheese items emerged from the dairy products discussed. Pies and cakes received numerous mentions among desserts. Cost and appearance were the most influential factors affecting food purchases. Taste, ease of preparation, and brand names were also important.

More than half of the respondents reported that they were on a special diet. Of this number, over 75 percent had their diet prescribed by a doctor. Low-sodium diets were most frequently cited. Three-quarters of the sample group said there were food items which they could not or did not like to eat. The items mentioned varied widely.

The general conclusions of the TRIMS survey were that most elderly citizens interviewed consumed three meals daily, with their main meal at noon or in the evening. Almost all reported eating snacks during the day, usually desserts, fruits, or beverages. Most of the elderly citizens interviewed prepared and consumed meals in their own homes. They also did their own shopping, although some experienced difficulty in completing this task because of limited physical capabilities. While food preferences varied widely, a definite trend toward bland, low-sodium diets was evident. Cost was frequently mentioned as an important factor influencing food purchases, with weekly expenditures on food items averaging \$10 to \$15 for each individual.

TECHNICAL TASTE TEST

Based upon these findings, NASA obtained a variety of food items for testing purposes.² These meal components were procured internally from NASA, the U.S. Army Natick Development Center, which develops feeding systems for military use, and several commercial food vendors.

Once the food items were received, NASA conducted a technical taste test of the numerous food items and different brand names. The purpose of this testing proce-

ture was to ensure that only the most acceptable food items would be selected from those which were available.

A total of 149 food items was evaluated over a three-week period by a panel of five to seven NASA technicians trained in sensory evaluation. The panel members evaluated each food item on a nine-point hedonic scale, with a score of nine indicating the highest rating of acceptability. Only those items receiving a consensus rating of 5.0 or above were recommended for inclusion in the program. Ninety-six items received acceptable ratings.

USER TASTE TEST

A second taste test was conducted by TRIMS and NASA with a potential user group in June, 1975. Seventy elderly citizens from rural Waller County, Texas—located near Houston—were selected to sample the 96 food items recommended by the technical taste test panel. This group consisted of 55 females and 15 males. Fifty-six of the group members were blacks while the remaining 14 were white.

The user taste test was conducted at the Newman Center, Prairie View A & M in Prairie View, Texas (two days), and at the County Court House in Hempstead, Texas (three days). Each of the 96 food items was evaluated between 16 and 26 times. All food items were evaluated on a five-point hedonic scale. Foods were accepted only if they received an overall rating of 5.0 or above.

The results of the user taste test correlated highly with the recommendations of the technical taste test panel. Only one food item received an unacceptable rating.

TECHNICAL REQUIREMENTS

Meals

All meals were designed to meet at least one-third of the daily recommended dietary allowances for males 51 years of age and older, as established in January, 1974, by the Food and Nutrition Board of the National Research Council, National Academy of Sciences. (This requirement more than meets the needs of women in the same age group.) The nutritional value of meals was based upon manufacturers' data, label information, Agriculture Handbook No. 8, and NASA nutritional data.³ No special menus were developed for individuals with health-related dietary restrictions or those who prefer traditional ethnic foods, though it would be technically easy to design such meals.

The 95 food items which had successfully passed the user taste test were used to assemble 21 different meals. (See Appendix II for a list of the meals.) Each meal contained an entree, two side dishes, dessert, and a beverage. Fifteen of the 21 meals were composed primarily of thermostabilized "canned" items, while the remaining six meals consisted of freeze-dried and dehydrated items. Every item was packaged in single-serving sized units (approximately 5 ounces per item.) Plans were made to include several meals containing a thermostabilized retortable "flex pouch", a foil-polyethylene pouch sealed under high pressure and high temperature. However, flex pouches were still under safety investigation by the U.S. Food and Drug Administration (FDA) and were not released in time for their use during either field demonstration. No decision



had been made by the FDA as of August, 1976, on whether to approve the flex pouches for commercial development. Two exceptions to this—pineapple and applesauce—were included in the project. The temporary hold did not cover them because they have a high acid content and require low retort heat processing.

Packaging

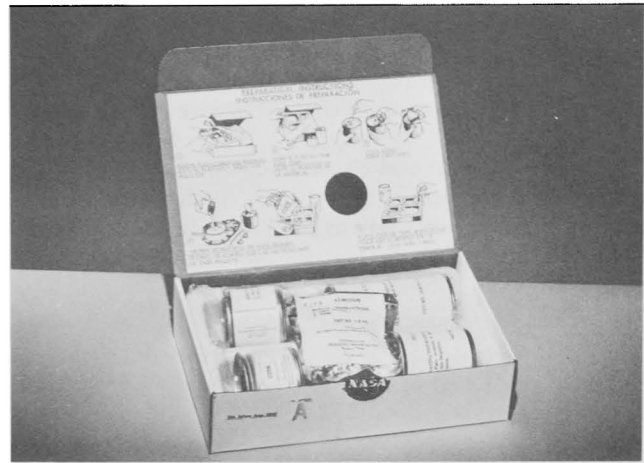
All meal packages were designed with the following objectives in mind: (1) protection of the food items from damage; (2) maximization of product shelf-life with no need for refrigeration prior to opening; (3) convenience of packaging for the consumer; (4) ease of transportation; and (5) aesthetic appeal for the user group.

Primary packaging (that which contained the actual food product) consisted of two types: metal cans for the thermostabilized foods and foil packages for the freeze-dried and dehydrated items. All cans had ring-top lids for easy opening while the foil containers were opened by tearing or cutting off the top of the package.

As a part of the secondary packaging, a plastic tray held the primary food packages in place and also served as a container in which to prepare and eat the meal. The tray itself was sealed in a polyethylene bag and wrapped in a shrink film with the individual food items in place. Each meal was placed in an individual box. Meal boxes were wrapped together into seven-day meal packages for distribution to the program participants.

Labeling

Each can and foil package had a label which described its contents and provided instructions for preparation. All labels were printed with blue lettering on a white back-



ground.

On the inside lid of each meal box, written and graphic instructions were provided on meal preparation. Instructions were printed in both English and Spanish. Meal boxes were labeled with menu number and meal contents.

SUMMARY

The technical development of the NASA Meal System for the Elderly was accomplished over an eight-month period in 1975. The Food Preference and Attitude Survey conducted by TRIMS determined that the eating habits of the elderly are heterogeneous, although a preference for bland, low-sodium diets exists.

Based on this finding, NASA obtained 149 food items for testing. A technical taste test conducted by NASA resulted in the elimination of 53 food items from consideration for the meal system.

Next, a user taste test was conducted with 70 elderly citizens to determine the acceptability of the 96 food items recommended by the technical taste panel. Only one item was found to be unacceptable.

The 95 food items which passed both taste tests were used to develop 21 different meals for the field demonstrations. All meals were designed to meet at least one-third of the daily recommended dietary allowances of males 51 years of age and above. Food items were packaged in cans or foil containers, and held in place in plastic trays. The trays were placed in individual meal boxes which were bound together into seven-day meal packages for distribution to meal recipients in the field demonstration project. All individual items had printed instructions while general bilingual and graphic instructions were provided on the inside lid of each meal box.



REFERENCES

¹This section borrows heavily from a draft report prepared by TRIMS on the Food Preference and Attitude Survey.

²The remainder of this chapter borrows heavily from a Technology Incorporated report. See Technology Incorporated, "Final Report: Design and Development of a Meal System for the Elderly," Contract No. NAS-9-14672, 15

September 1975.

³NASA has complete nutritional data on those food items which are the same as the ones used in the space program. Also, additional nutritional data, based on analytical analysis was obtained on other representative menus for verification of design specifications.

CHAPTER III

PRELIMINARY FIELD DEMONSTRATION

The preliminary demonstration of the NASA Meal System for the Elderly was conducted from October 1-15, 1975. At this stage, a seven-day meal cycle was available. The two-week demonstration afforded an opportunity to obtain the reactions of a typical user group to the technical aspects of the meal system, including the individual food items, ease of preparation, and packaging.

SITE SELECTION

Five central Texas sites were selected for the preliminary demonstration. These included four small communities—Bastrop, Elgin, Lockhart and Smithville—which range from 3,000 to 7,500 in population. Located in rural Bastrop and Caldwell Counties, these communities serve as the commercial centers for an area dominated by agriculture and oil and gas production. Travis County was the fifth location for the two-week demonstration. Special attention was given to selecting participants from the rural areas surrounding the City of Austin.

Small-town locations in central Texas were utilized during the two-week demonstration for several reasons: (1) rural and small-town residents were the primary target

group for the major field demonstration; (2) contacts were already established with social service agencies in several small central Texas communities, facilitating prompt location of a number of potential participants; and (3) a heavy reliance upon field personnel from the Austin area for meal delivery and interviewing meal recipients.

PARTICIPANT SELECTION

In August, 1975, UAE and the LBJ School asked social service agencies in the sites selected for the preliminary demonstration to locate potential meal recipients. Three criteria were established for participation in the field test: (1) meal recipients were not to be bed-ridden; (2) they were to have no health-related dietary restrictions; and (3) participants were to possess a reasonable degree of mental acuity, so they could record their comments and reactions to the meal system. An effort was also made to select an array of participants in terms of ethnicity, sex, and dexterity.

The LBJ School complied with Federal regulations on the "Protection of Rights and Welfare of Human Subjects" by obtaining approval of the project from an LBJ School Committee on Human Rights. Guarantee was given to the committee that elderly people would participate in the demonstration only on a voluntary basis with full knowledge of their right to withdraw at any time and with an understanding of project goals and purposes. To ensure participant rights, a consent form had to be signed by each participant before he/she received any meals. (See Appendix III.)

Approximately 65 elderly citizens from the five sites were interviewed to determine their interest in participating in the preliminary demonstration. (See Appendix III for the application form.) Forty-one elderly persons were selected to receive NASA meals for two weeks.

MEAL DELIVERY METHOD

A personal delivery method was selected for the preliminary demonstration. Since one objective of the field demonstration was to obtain as much information as possible on participant reactions to the meal system, it was felt that this would best be achieved through direct contact





with meal recipients. Meals were delivered by LBJ students and site volunteers. Meal orientations were conducted at the time of the first delivery. At the second delivery, a week later, meal evaluation forms were collected from the participants and their questions answered. A final interview was conducted and meal questionnaires collected at the end of the second week.

PARTICIPANTS

Demographic Characteristics

A breakdown by sex, age, ethnicity, and geographic location of the participants in the two-week demonstration is presented in Table III-1. Two-thirds of the meal recipients were female and one-half of the user group ranged from 60-70 years of age. Only one participant was less than 60 years, while 20 percent were over the age of 80.

Blacks were the largest ethnic group, comprising 18 of the 41 participants. The two largest groups of meal recipients were from Bastrop and Lockhart, accounting for 50 percent of the participants in the field demonstration.

Income

Low-income elderly citizens were the target group for the preliminary demonstration because they have the greatest need for such a service. Table III-2 details the income sources of the meal recipients. The two largest groups were those receiving a combination of Supplemental Security Income (SSI) payments, Social Security Administration (SSA) benefits, and U.S. Department of Agriculture



Food Stamps, and those who received SSA benefits only. These two groups totaled half of the user population.

Mobility

While no attempt was made to systematically measure the physical capabilities of the user group, several questions were raised which assessed this factor for each meal recipient. When asked if they experienced any difficulty getting around the house, only one of the participants responded affirmatively. Arthritis and the gout severely hampered this individual's mobility. However, among those who said they experienced no mobility problems, several

TABLE III-1

**DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS
IN PRELIMINARY DEMONSTRATION**

| | <u>No. of Participants</u> | <u>% of Total</u> |
|--|--------------------------------|-----------------------|
| Total Number of Participants Who Began Meals Programs | 41 | 100% |
| Sex | | |
| Female | 27 | 66 |
| Male | 14 | 34 |
| Age | | |
| Under 60 | 1 | 1 |
| 60-70 | 21 | 52 |
| 71-80 | 11 | 27 |
| 81 and above | 8 | 20 |
| Ethnicity | | |
| Black | 18 | 44 |
| Mexican-American | 12 | 29 |
| Anglo | 11 | 27 |
| Location | | |
| Bastrop | 11 | 27 |
| Elgin | 5 | 12 |
| Lockhart | 13 | 31 |
| Smithville | 4 | 10 |
| Travis County | 8 | 20 |

TABLE III-2

**INCOME SOURCES OF PARTICIPANTS
IN PRELIMINARY DEMONSTRATION**

| <u>Income Source</u> | <u>No. of Participants</u> |
|----------------------------------|----------------------------|
| SSA, SSI, and Food Stamps | 12 |
| SSA only | 10 |
| SSA and SSI | 5 |
| SSI and Food Stamps | 5 |
| SSI only | 6 |
| Neither SSA, SSI, or Food Stamps | 2 |
| SSA and Food Stamps | 1 |
| TOTAL | 41 |

comments such as “have to use crutches” and “weak knees, move slowly” were recorded.

Only four meal recipients said they never left their homes to run errands, relying upon friends or relatives to meet their shopping needs. Nine participants said they had friends or relatives who cooked for them, normally a spouse or “live-in” relative. A total of nine meal recipients also said they owned and operated their own automobiles.

Health Status

Thirteen participants indicated they had been patients in a hospital or nursing home within the past year. The reasons for their stay ranged from major surgery such as back and kidney operations to X-rays and other forms of

diagnosis and treatment.

The vast majority of the meal recipients in the two-week demonstration received some form of Federal assistance to cover health care expenses. As Table III-3 illustrates, all but five of the elderly participants were enrolled in Medicaid, Medicare, or both programs.

Dental Condition

Responses to questions concerning current dental condition indicated the poor status of the user group in this regard. Thirty percent of the participants had full sets of teeth, eight persons wore dentures, and the remainder had an incomplete set or no teeth at all.

TABLE III-3
HEALTH CARE COVERAGE OF ELDERLY
PARTICIPANTS IN THE PRELIMINARY DEMONSTRATION

| <u>Federal Program</u> | <u>No. of Participants</u> |
|------------------------|----------------------------|
| Medicare | 15 |
| Medicare and Medicaid | 11 |
| Medicaid | 10 |
| No Assistance | 5 |
| TOTAL | <hr/> 41 |

Four Recipients

A better understanding of the living conditions of elderly citizens can be obtained by looking at the lives of four participants in the preliminary demonstration. While not intended to be a representative sample, these individuals nonetheless typify low-income elderly citizens and the difficulties they encounter. (All names are fictional.)

The oldest participant in the two-week demonstration is Mrs. Bessie Johnson, a 93-year old woman who lives in Elgin, a small central Texas community with approximately 3,800 residents. She lives alone on the outskirts of town.

Leg ailments leave Mrs. Johnson almost entirely homebound, although she does manage to attend church services each week and makes a monthly shopping trip with the assistance of friends. Poor eyesight and dental condition are also troublesome, although she has not seen a doctor or dentist in over six years.

Mrs. Johnson's only regular visitors are several elderly women who live in the area. Supplemental Security Income (SSI) payments are her only source of income which she supplements by purchasing food stamps.

* * *

Two other meal recipients are William and Emily Thomas, an elderly couple who also reside in Elgin. Both are in their mid-eighties and have a number of maladies which leaves them homebound. Mr. Thomas is very hard of hearing and shakes considerably. His wife is afflicted with arthritis in her back and hips.

A community van provides transportation for the couple when it is necessary for them to travel, although they rarely leave their cluttered three-room house except for monthly shopping trips. Their daughter lives nearby and visits them occasionally. The Thomases also rely upon SSI payments for support and purchase food stamps.

* * *

A fourth participant is Roosevelt Jefferson, a 56-year old Smithville resident. The youngest recipient in the pilot demonstration, Mr. Jefferson is physically disabled and looks much older than his actual age. He recently underwent surgery for a kidney ailment.

Mr. Jefferson lives alone in a small wooden-frame house which he rents for \$25 per month. He seldom leaves home except when his brother takes him on a monthly shopping trip.

Meals are generally prepared at home, with Mr. Jefferson frying eggs or other staples. He occasionally walks to a local cafe where he pays between 50 cents and \$1 for a dinner of soup and coffee.

SSI payments are Mr. Jefferson's sole source of income. He purchases food stamps regularly.

Dropouts During the Pilot Demonstration

A total of 35 individuals completed the two-week demonstration. Six people withdrew from the program, two for personal reasons and four as a result of health problems.

The two participants who withdrew for personal reasons did not elaborate on why they no longer wished to receive meals. Several unsuccessful attempts were made at interviewing these individuals. The impression left was that both had simply lost interest in the project.

Of those who were forced to withdraw for health reasons, two individuals had special dietary requirements as a result of ulcer conditions which they did not reveal during the initial interview. A third participant suffered a mild stroke just prior to the beginning of the field test and withdrew the second day of the program when he experienced high blood pressure. The final health-related dropout decided against continuing in the project when she experienced stomach cramps and gas after consuming two meals.

Evaluation Instruments

Two evaluation instruments were designed to record the reactions of participants to the meal system. An individual meal evaluation form was included inside each meal box asking the recipient to rate the individual food items with regard to taste, appearance or texture, quantity, and ease of preparation. In addition, several open-ended questions were included. These forms were printed in both English and Spanish. (See Appendix IV.) Also, a questionnaire was administered to all meal recipients by field personnel at the conclusion of the two-week demonstration, covering all aspects of the meal system. (See Appendix V.)

The individual meal evaluation form was not as successful in obtaining user responses to specific food items as had been hoped. The complexity of this form was a stumbling block for a number of recipients who experience difficulty in reading and writing. Also, participants reported that completing a detailed form after each meal became tedious over a two-week period, resulting in a loss of interest on the part of many meal recipients. Furthermore, several people mixed food items from the different meal packages, making it impractical to fill out the forms on a regular basis. In spite of these problems, 322 meal evaluation forms were returned in varying degrees of completion.

Post-demonstration interviews were heavily relied upon to determine participant reactions to the technical aspects of the meal system. Within a week of the completion of the preliminary demonstration, a total of 31 interviews were conducted with individuals and couples who had received meals. The results of these interviews serve as the basis for many of the comments which follow.

FINDINGS

Food Items

The overall reaction to most food items was favorable. All recipients said they enjoyed most of the food items and the majority felt these foods were very similar to what they normally consumed. Approximately 80 percent of the participants stated that they would purchase food items included in the NASA meals if they were available at prices which compared favorably with what they normally spent on food. Food stamp recipients also indicated a willingness (86 percent) to purchase these meals with their stamps if they were available commercially. These comments were reinforced by positive responses to open-ended questions on the meal evaluation forms.

One further note is that all 12 Mexican-Americans who participated in the preliminary demonstration also responded favorably to the meal system. Although 6 individuals said the food items were dissimilar to what they typically ate, all but 2 of the 12 indicated that they would like to continue in the program.

Although this group is too small to serve as a basis for any conclusions on how Mexican-Americans in general would react to the meal system, these results are encouraging. They suggest that ethnic dietary preferences may not be a major obstacle to the acceptability of the meal system.

Food Items Disliked

In determining what food items were least liked by meal recipients, the number of fair/poor responses was totaled from the meal evaluation forms for each food item. Peas and green pea soup were the most poorly received food items. Canned (thermostabilized) peas received a total of 23 negative responses on the meal evaluation forms. Freeze-dried peas received 14 negative votes, and 13 fair/poor responses were recorded for green pea soup. These items were also singled out for criticism in answers to open-ended questions on the meal evaluation forms and were frequently mentioned as the least-liked items during the post-demonstration interviews.

The assembled data suggest that the unfavorable reaction to the pea items can be accounted for by these factors: (1) some recipients simply do not like peas; (2) several individuals were not used to eating peas; (3) peas and green pea soup showed up too frequently in the seven-day menu cycle (five times); and, (4) there is an indication that the freeze-dried peas were not properly prepared. Several complaints focused on the "crunchiness" of the freeze-dried peas; this suggests that an inadequate amount of time was allowed for this item to reconstitute after hot water

had been added.

The other soup item—vegetable soup—also received a higher than average number of fair/poor responses. Meal recipients gave this item 11 negative votes.

Peanuts and almonds proved troublesome for several members of the user group. Based on the post-demonstration interviews, 24 percent of the participants did not eat these items at all. This is probably a result of the poor dental condition of many meal recipients. Of the 19 individuals who reported that they ate the nuts, three were able to do so only after crushing them.

Additional Data on Food Items

1. *Menu Composition.* The majority of the participants indicated that the seven different meals provided adequate variety. The only problem noted in this regard was that the peas and green pea soup were included in five of the seven meals.

2. *Meal Consumption.* Nearly 75 percent of the meal recipients prepared and consumed the NASA meal as their main meal at mid-day. Approximately 70 percent prepared all of the contents of the meal package at one time.

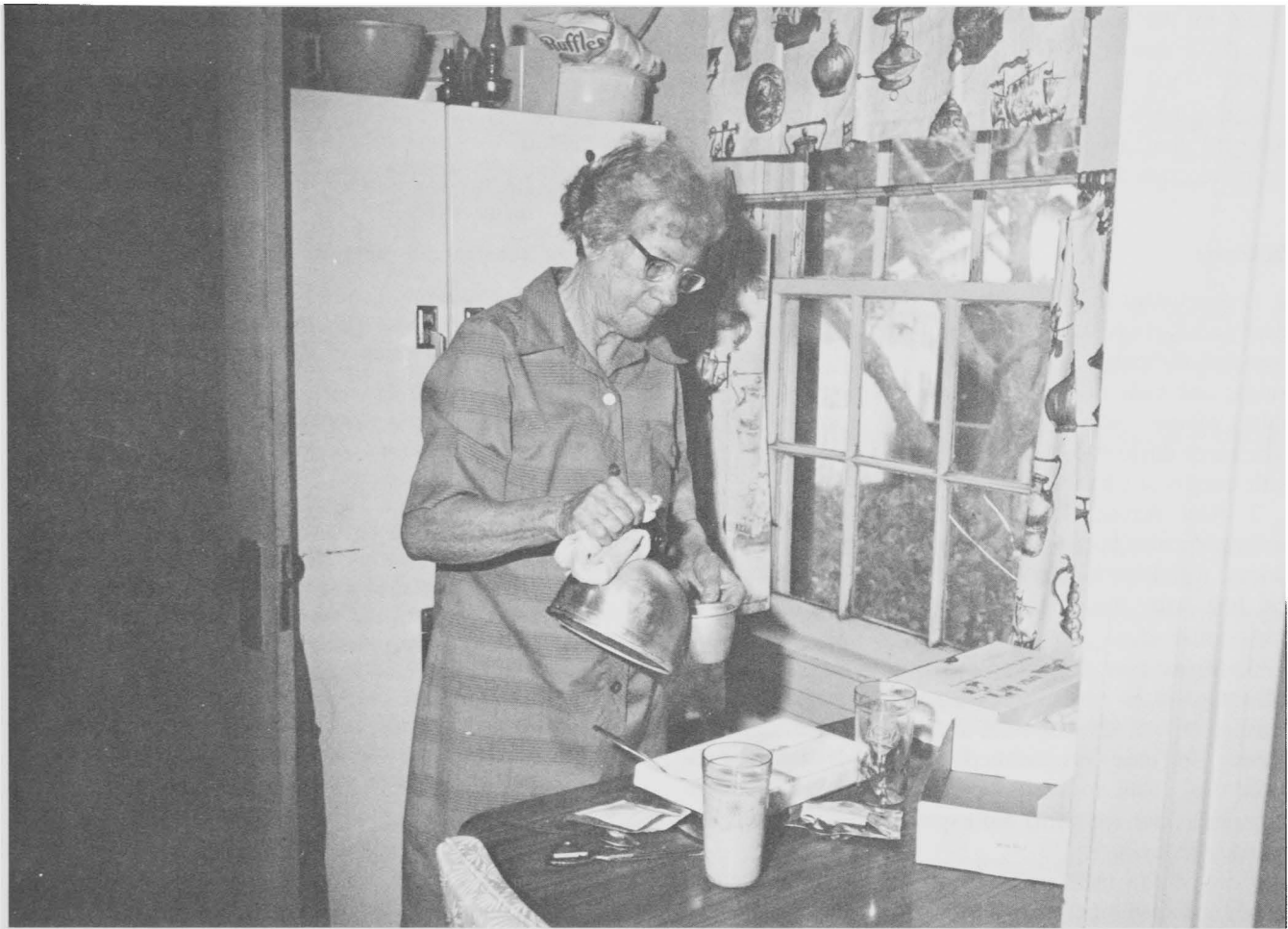
3. *Meal Quantity.* Of the 27 responses recorded on this question, 23 individuals said the meals provided a sufficient amount of food to eat. Half of this group said they could not eat an entire meal at one sitting and saved leftover food items for use as snacks later in the day. Almost two-thirds of the recipients said that at least one meal from the seven-day cycle provided too much food to be consumed at a single sitting.

4. *Freeze-Dried vs. Canned Items.* Seventy percent of the participants expressed a preference for the canned items while 11 percent favored the freeze-dried foods. The remaining 19 percent expressed no preference.

Comments made during the post-demonstration interviews suggested that the strong preference for the canned items may be related to the familiarity of participants with this type of packaging and contents. No preferences were noted with regard to the canned or dehydrated drinks, however.

Food Preparation

The food items used in the pilot demonstration were designed for easy preparation. The canned foods are opened with a pop-top or can opener. Some items require heating in a sauce pan while others need no further preparation. The freeze-dried foods are prepared by tearing open the top of the pouch and adding a measured quantity of hot or cold water to the contents. The powdered drinks also require the addition of a specified amount of water.



On the basis of the post-demonstration interviews, it appeared that the meal recipients did not encounter any major difficulties in preparing the food items. Several minor problems were evident, however:

1. *Opening Pouches and Cans.* Twelve percent of the respondents stated that opening the pouches was difficult. The apparent problem was the lack of a perforation or dotted line on the freeze-dried packages indicating where to tear them open.

The results of the interviews also showed that 20 percent of the meal recipients experienced difficulty opening the pop-top cans. After breaking off the opening ring, several participants used scissors or knives to remove the can lids.

2. *Reconstituting vs. Heating.* All participants had access to stoves on which they could heat the canned foods and boil water for the freeze-dried items. They also had a sufficient number of pans in which to prepare the different food items.

In reconstituting the freeze-dried foods, only two recipients reported having difficulty measuring the proper

quantities of water. No other complaints were registered regarding food preparation.

3. *Refrigeration.* Seventy-five percent of the meal recipients indicated that they refrigerated particular food items such as the drinks, puddings, and cottage cheese before consuming them.

Delivery

Three-quarters of the participants interviewed indicated that, given the choice, they preferred having the meals delivered by a volunteer. Twelve percent expressed a desire for delivery by an impersonal method. The remaining 12 percent indicated that they had no preference.

Although a majority registered a strong preference for personal meal delivery, 72 percent indicated a willingness to accept the meals by impersonal methods if no other alternative existed.

Mail delivery would present a major problem for many small-town residents who do not receive mail at their homes. Several participants said they had to travel up to 10

blocks to the local post office to pick up their mail. Carrying a seven-day meal package that weighs approximately 15 pounds would be impossible for many of these elderly citizens. Only 12 percent of the user group indicated that they were willing or able to travel to a central location to pick up the meals themselves.

Packaging

1. *Seven-Day Package.* With regard to the seven-day meal packages, 10 percent of the participants stated that they had difficulty carrying or opening the package. The weight and bulk of the package was a problem for several older women who were unable to move it without substantial difficulty. Most recipients cut the binding straps with scissors or a knife.

2. *Meal Boxes.* No complaints were recorded concerning the design and size of the individual meal boxes. Several recipients had trouble breaking the NASA seal on the box with their fingernails so they used a knife or scissors instead.

3. *Instructions.* The instructions on the inside lid of the individual meal boxes were largely disregarded or overlooked. Of the 25 responses recorded to questions concerning the meal box instructions, nine participants indicated they could not understand them. However, Mexican-American meal recipients did express satisfaction with the bilingual instructions.

Most of the meal recipients relied on the instructions which appeared on the individual food items. More than 75 percent of those questioned reported no problem in following these directions. Several participants said they experienced difficulty in reading the instructions because the blue print did not provide an adequate contrast against the white background.

4. *Trays.* Just over half of the participants reported using the meal trays occasionally; only two recipients said they used them every day. Among those using the trays, all said they only ate from the tray and none indicated that they prepared the meals in it.

DESIGN CHANGES

All of the findings from the two-week demonstration were presented to NASA and UAE at an evaluation meeting held in late October. Recommendations for changes in the meal system were made to assist NASA in developing the final design of the 21-day menu cycle for the long-term demonstration. On the basis of the LBJ School's recommendations, NASA made a number of changes in the meal system.

CHANGES RECOMMENDED

A. Individual Food Items

1. Peas

- a. Reduce the number of times peas are used in the menu cycle; or
- b. Substantially improve the quality of the peas; or
- c. If peas were included frequently because of high nutrient levels, redistribute those nutrients among other food items.

Action Taken: It was not possible to drop the pea items completely from the meal system because of their high nutrient content. However, the repetition problem was reduced during the long-term demonstration because a 21-day menu cycle was used. As a result, peas appeared less frequently than during the 7-day cycle used in the pilot demonstration. The preparation instructions for the freeze-dried peas were improved, and a cream sauce was added to enhance their acceptability.

2. Soups

- a. A greater variety of soups should be included in the 21-day menu cycle.
- b. The possibility of dropping the green pea soup should be investigated.

Action Taken: Greater variety in the soups appeared in the 21-day menu cycle. The green pea soup was retained during the long-term demonstration.

3. Nuts

Other high protein snacks should be substituted for the peanuts and almonds during the major field demonstration.

Action Taken: Peanuts and almonds were dropped from the 21-day menu cycle. High protein candy bars were substituted for these items.

4. Drinks

No preference was noted for the canned over the dehydrated drinks. The significance of this finding should be explored.

Action Taken: The canned drinks were phased out entirely. Dehydrated drinks were included in the long-term demonstration. This change resulted in a substantial reduction of the weight and bulk of the seven-day meal package as well as the individual meals.

B. Meal Quantity

The possibility of reducing the quantity of each meal while maintaining current nutrient levels should be investigated.

Action Taken: NASA officials decided that this was a long-term design issue and that no specific action should be taken at this time.

C. Food Preparation

1. To facilitate the opening of the pouches, a dotted line or perforation should be included along one edge of the package.
2. The pop-top mechanism of the cans should be improved.
3. Conventional cans should be substituted for those with the pop-top openers.

Action Taken: 1) Dotted lines were included on one edge of each pouch to assist in opening. 2) Pop-top openings were retained for all aluminum cans. All steel cans had instructions noting the conventional seal on the bottom which permits them to be opened with a can opener. 3) A greater emphasis was placed on proper opening of the pop-top cans during the orientation of meal recipients for the long-term demonstration.

D. Instructions

1. Freeze-dried food instructions need to be modified. The amount of water added and the time needed for reconstitution should be increased.
2. Instructions on drinks and other appropriate food items should state that the enjoyment and taste of these products would be enhanced by prior refrigeration.
3. Instructions should be simplified and color coding utilized so that they are easily comprehended by participants who experience reading difficulties.
4. Bilingual instructions should be retained because these were well received by Mexican-American meal recipients.
5. The printing on the labels should be darkened and the letters enlarged to provide for easier readability.

Action Taken: 1) Instructions on the freeze-dried items were changed to reflect more accurately the amounts of water needed and the time necessary for reconstitution. 2) Instructions recommending refrigeration were included on appropriate food items. 3) A new, simplified

color-coding system was developed for the separate food items—red indicated heat and blue indicated cold. General instructions were no longer provided on the individual meal box. 4) Instructions and labels were printed in large black letters to make reading easier. 5) With the new instruction system, it was not feasible to retain the bilingual instructions because of space limitations.

E. Packaging System

1. Because the meal trays were used infrequently, the following alternatives should be considered:
 - a. Substitute a lightweight aluminum tray such as used in TV dinners;
 - b. Include only one tray per seven-day meal package; or
 - c. Eliminate the tray altogether.
2. The graphics on the individual meal boxes should be improved, i.e., more color should be added.

Action Taken: 1) The tray was eliminated entirely, reducing meal costs greatly. Light cardboard containers served as individual meal boxes and were enclosed in a large paperboard container to make up the seven-day meal package. 2) An eye-catching design consisting of red, yellow and black colors was created for the individual meal boxes.



SUMMARY

The preliminary demonstration of the NASA Meal System for the Elderly was conducted in October, 1975. Forty-one elderly citizens from four small towns and one rural site received meals for a two-week period. Their observations concerning the technical aspects of the meal system—acceptability of the food items, ease of preparation, and packaging—were recorded on forms accompanying each meal and detailed interviews at the conclusion of the demonstration. This information served as the basis for the redesign of the meal system.

The overall reaction to the meal system was positive. The only complaint concerning the food items centered on

the number of times peas were included in the seven-day meal cycle. This problem would be resolved during the long-term demonstration because a 21-day menu cycle would provide increased variety. Few problems were encountered in preparing the meals, although some individuals experienced difficulty with the pop-top cans.

The packaging system was altered significantly as a result of the preliminary demonstration. Few individuals used the meal tray and it was subsequently dropped from the meal system. More color was added to the graphics on the individual meal containers and labels on the food items were printed in large, black letters for easier reading. A color-coded set of instructions was developed to indicate which items required heating or refrigeration.

CHAPTER IV

PLANNING AND IMPLEMENTATION OF THE MAJOR FIELD DEMONSTRATION

The major field demonstration was intended to test the social, economic, and psychological impact of the meal system, in addition to the acceptability of the food items, packaging, and delivery mechanisms.

Planning for the demonstration was conducted during the fall of 1975. UAE and the LBJ School developed a detailed implementation plan which outlined the responsibilities of each of the principal agents. NASA was to provide all meals and redesign the meal system, taking into account the recommendations which emerged from the evaluation of the two-week preliminary demonstration. UAE was to plan, coordinate, and execute the field demonstration, as well as organize and control the storage and distribution of the meals. The LBJ School was responsible for assisting UAE in the planning of the field demonstration, and for evaluating the impact and feasibility of the program. Also, the LBJ School was to arrange for a medical-nutritional screening of participants to insure that they could tolerate a normal diet and to assess the nutritional impact, if any, of the meals on the participants.

In planning the long-term demonstration, the LBJ School identified five major variables which might affect the acceptability of the meal system: length of participation in the program; geographic environment; method of meal delivery; amount of social interaction normally experienced by the participants; and income. This section outlines the rationale behind selection of these variables.

1. *Length of Participation.* The long-term demonstration was to run for nine weeks to gauge participant reaction to the meal system over time. It was assumed that initial participant reactions would be biased because of the novelty of the entire system. It was hoped that, by the ninth week, this bias would not be a factor and any problems, dissatisfaction or boredom with the system could be detected. To further assess the acceptability of the system over time, 15-20 participants were to continue the program for six more weeks.

2. *Geographic Location.* The NASA meal system was designed to supplement existing meal programs. Since nutrition programs are mostly located in urban areas, the long-term demonstration was to be tested primarily in rural and small-town areas where no other meal programs were in operation. However, many urban elderly cannot avail

themselves of meals because they are ill, have no transportation or are homebound, because existing nutrition programs are full, or because there is not a meals program in the area. Thus an urban group was included in the sample to see if they reacted differently from rural or small-town participant groups.

3. *Method of Meal Delivery.* Most participants were to receive their meals by a personal delivery method. To guard against the bias of the "halo effect", some participants were to receive meals by impersonal delivery of meals to control against reactions based on personal attention instead of on the merit of the meal system. Use of impersonal delivery also provided an opportunity to test mail and van delivery methods which, due to shortages of volunteers, would play an important role in any large-scale distribution of the NASA meals.

4. *Degree of Social Contact.* The degree of social contact normally experienced by participants might affect the acceptability of the meal system. For those individuals who were relatively socially isolated and who did not receive other social services, a "halo effect" would likely be observed. For those individuals with greater social contact and for those already receiving a wide range of services, less of a halo effect would be expected. Accordingly, a decision was made to evaluate the meal system both as part of a well established social network, and as the principle service. The hypothesis was that those participants receiving the fewest services prior to their participation in the NASA project would respond more favorably than those who were already receiving a wide range of services.

5. *Income.* Since the elderly poor are in greatest need of services, focus was on them. However, income was not considered as important a variable as dependency. So, for evaluation purposes, need for services, dependence on others for help, and degree of physical mobility were viewed as more important dependence indicators than income alone. A relationship between dependency and acceptability of the meal system could have implications for the general marketability of such a system.

The LBJ School seriously considered whether or not there should be a control group for the long-term demonstration. The idea was rejected for three reasons: (1) It would be unethical to select a sample of elderly, ask them

questions about their eating habits and give them nothing in return. (2) It would be difficult to arrange logistically and monetarily. (3) Any nutritional-medical information gained from screening a control group would be of dubious validity. It was felt that choosing the sample on the basis of the five variables provided internal controls adequate for the LBJ School evaluation of the NASA Meal System.

SITE SELECTION

UAE and the LBJ School looked for sites which could meet the program criteria. During the summer of 1975, UAE contacted several social service agencies in central Texas to find out if they would be interested in taking part in the NASA meal system demonstration. Two considerations in site selection were that: (1) the area have a large population of persons 60 years of age or older, and (2) that the site be conveniently located—preferably within four hours driving time from Austin. In addition, several service agencies contacted UAE, expressing a desire to participate in the demonstration. A preliminary list of sites was compiled and an additional site was selected to insure that a group of elderly receiving a wide range of services would be included in the sample.

Since extensive outreach would be necessary to locate 170 participants, a decision was made to select a large number of sites. By doing so, the amount of outreach activity necessary in each area would be minimized. The following sites were selected:

1. San Saba County
2. Waco/Falls County
3. Wilson, Karnes, Guadalupe, Comal, and Atascosa Counties
4. Bastrop County
5. Travis County
6. Austin
7. Houston
8. Paris

Each of these sites was selected because of specific characteristics.

San Saba. San Saba County is rural—the total population is only 5,540. Twenty-two percent of the population is over the age of 65 and 47 percent of those are poor. A final consideration was local willingness to test an impersonal meal delivery system.

Five-County Area. The five-county area is composed of Comal, Guadalupe, Wilson, Karnes, and Atascosa Counties. The area is predominantly rural, with a high percentage of elderly poor and a substantial Mexican-American population. The entire area is service-poor. Agreement was reached that a personal meal delivery system would be used.

Waco/Falls County. Waco (in McLennan County) and Falls County offered a mixture of conditions. Waco is an

urban area with many services for the elderly. Falls County, adjacent to McLennan County is a rural area with a minimal service network for the elderly.

Travis and Bastrop Counties. These two counties had several small towns with a large percentage of elderly. The proximity was convenient for UAE and the LBJ School. Also, there was no objection to using an impersonal delivery system in either county.

Paris. Paris, located in Lamar County close to the Oklahoma border, was selected because of the special demonstration being conducted there by the Texas Department of Public Welfare. This project includes approximately 1,200 elderly persons and is designed to determine the feasibility of providing comprehensive alternate care services in a small-town/rural area. Together, a social worker and a nurse interviewed potential clients, worked out a plan of services to meet his/her needs and then implemented the plan. Services included homemakers, transportation, and home health care. This project was well underway when the LBJ School approached DPW to determine how the meal service might be incorporated into an alternate care program.

Austin—Home Health. Efforts were made to find out if any agency in the Austin area (Travis Co.) was providing alternate care to the elderly. No organization was offering a full range of services, but two agencies were offering Home Health Services. They agreed to participate in the demonstration. The closeness of this participant group offered the LBJ School a chance to conduct extensive interviews and develop several case studies as part of the evaluation of the meal system.

Houston. One of the largest congregate meal programs in Texas is operated in Houston. That site was selected to receive weekend supplements.

Austin Day Care and Meals-on-Wheels. Austin was the other site receiving weekend meal supplements. There are three kinds of daily meal service in Austin: congregate meals; a noon meal served at the Austin Day Care Center; and Meals-on-Wheels, delivered by UAE. Since a congregate group was receiving weekend supplements in Houston, participants were selected from the Austin Adult Day Care Program and from UAE's client list.

The number of participants to be selected from each site was established by taking into consideration the population distribution of the area, its ethnic makeup, and the outreach capacity of the coordinating agency.

Once the sites were selected, a memorandum of agreement was signed with the local social service agencies. This document defined the duties and rights of UAE and each service agency as a working agreement of participation in the project for the period from November 1, 1975 to May 7, 1976.

TABLE IV-1 EVALUATION VARIABLES BY SITE

| | 63 day | extended | weekend | alternate care | urban | small town | rural | many services | few services | personal | van drop off | mail delivery | medical screening |
|-----------------|--------|----------|---------|----------------|-------|------------|-------|---------------|--------------|----------|--------------|---------------|-------------------|
| San Saba Co. | • | | | | • | • | | • | | • | • | • | |
| Travis Co. | • | • | | • | • | • | • | • | | | • | • | |
| Bastrop Co. | • | | | | • | | | • | | • | • | • | |
| Waco | • | | | • | | | • | | • | | | | • |
| Falls Co. | • | | | | • | • | | • | • | | | | • |
| Austin | • | • | • | • | | | • | | • | | | | • |
| Paris | • | | • | | • | | • | | • | | | | |
| Austin Day Care | | | • | • | | | • | | • | | | | |
| Houston | | | • | • | | | • | | • | | | | |
| Wilson Co. | • | • | | | • | • | | • | • | | | | • |
| Karnes Co. | • | | | | • | • | | • | • | | | | • |
| Atascosa Co. | • | | | | • | • | | • | • | | | | • |
| Comal Co. | • | • | | • | • | • | | • | • | | | | • |
| Guadalupe Co. | • | • | | • | • | • | | • | • | | | | • |

PARTICIPANT CHARACTERISTICS

In light of the program variables, participants were selected for the long-term demonstration on the basis of income, geographic location, and access to other services. An effort was made to include elderly citizens who were relatively homebound and had few services available to them as well as those who were fairly mobile and could take advantage of a wide range of services. A representative mix in terms of ethnicity and sex was felt to be desirable. (See Appendix VI for application materials.)

Also, meal recipients had to be relatively lucid, displaying the ability to understand what was being said to them and to respond in a coherent fashion. This was necessary since participants would be receiving instructions on how to prepare the food and would also be evaluating the acceptability of the meal system. Second, participants could have a wide range of physical disabilities, but none could be bedridden. Finally, participants had to be able to consume a regular diet and have no health-related dietary restrictions.

Forty persons currently participating in a hot meals program were to receive two NASA meals per week as a weekend supplement to their regular service and 130 elderly were to receive seven meals per week for nine weeks, with 15-25 out of this group continuing for six more weeks.

Field Network

The field network was designed to ensure the maximum amount of communication between the field personnel, the LBJ School, and UAE. (The coordinating agencies are listed in Appendix VII.)

Each site had a coordinator from the local service agency in charge of operations for their area. An LBJ student coordinator was assigned to each area to maintain regular phone or personal contact in order to channel information to UAE, as well as monitor site operations for evaluation purposes.

Field operations—prior to the actual meal system demonstration—consisted of (1) the recruitment of volunteers for outreach activities; (2) training of field workers

(Orientation I); (3) interviewing of potential participants; (4) recruitment of delivery volunteers; (5) final participant selection; and (6) training of delivery personnel (Orientation II).

Orientation I was held in December, 1975 to familiarize the site personnel with the nature of the meal system and their responsibilities during the major field demonstration. After this orientation, outreach workers filled out application forms for potential meal recipients within their area. These were sent to UAE for review and final selection of participants for the long-term demonstration.

Orientation II was held in late January, 1976 at each site after the outreach activities were completed. During these sessions, the delivery volunteers were briefed on all of the important aspects of the field demonstration, such as instructions on the preparation of meal items, hints on how to train participants to fully utilize the meal system, types of delivery systems to be used, meal storage and distribution, and personnel to contact in case of difficulty.

Medical Component

Since a number of elderly persons cannot tolerate a normal diet, potential participants were asked to obtain certification from their personal physician indicating that they had no health-related dietary restrictions. In addition, participants in most sites were offered the option of a free medical-nutritional examination performed by medical personnel from The University of Texas Medical Branch at Galveston. It provided medical certification for participants who had not obtained the necessary approval from their personal physicians, further assurance of safe participation from those who already had a certificate, and some preliminary information with which to judge the impact of the meal system. A second medical examination was scheduled at the completion of the nine-week demonstration and a third check-up was made at the end of the 15-week program in order to assess any change in health status which might be attributable to the person's participation in the program. A report describing the administration of the medical component is found in Appendix VIII.

Field Operations

The field demonstration began in late January and early February, 1976. The actual starting dates and number of initial meal recipients in each site were:

| Site | Starting Date | Number of Participants |
|---------------------------|----------------------|-------------------------------|
| Paris | 2/2/76 | 15 |
| Five Counties | 2/2/76 | 39 |
| Travis/Bastrop | 2/2/76 | 14 |
| Waco-Falls County | 1/26/76 | 28 |
| San Saba | 1/26/76 | 16 |
| | 2/9/76 | 5 |
| Travis County—Home Health | 2/5/76 | 10 |
| Austin—Weekend | 1/30/76 | 16 |
| Houston—Weekend | 2/7/76 | 25 |
| TOTAL | | 168 |

Meal Delivery Methods

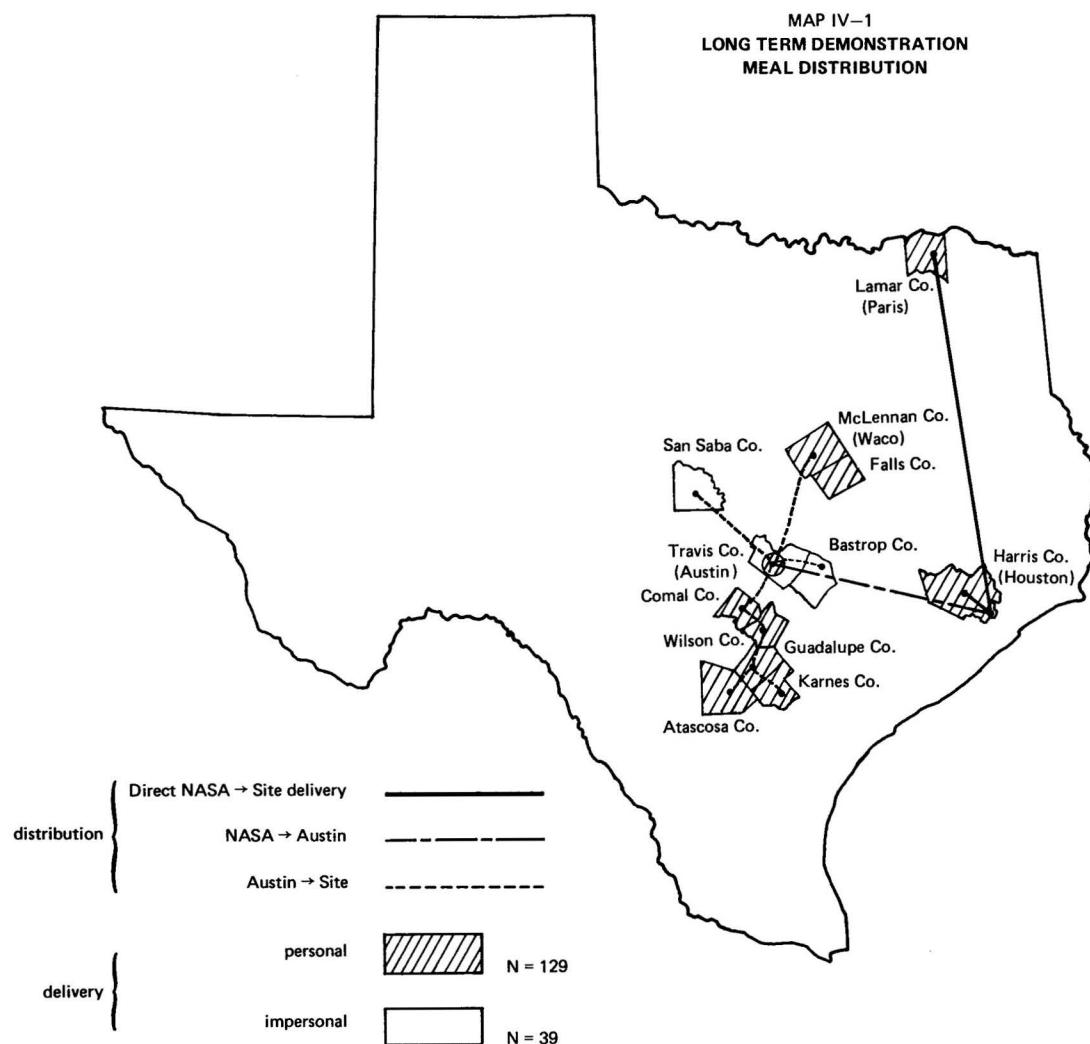
Participants received their meals by either a personal or impersonal delivery method during the long-term demonstration. The two types of delivery were distinguished by the extent and degree of contact which the field volunteers maintained with the participants.

The majority of the participants had their meals delivered to their home by a site volunteer. The volunteer made an effort to establish a personal relationship with the meal recipient and was available to answer any questions about the program that might arise. In the impersonal method, participants received their meals either through the mail or from a delivery van.

Deliveries for the weekend supplement participants were handled in two ways. A NASA packet consisting of two meals was distributed on Friday to those participating in congregate or day care programs. Meals-on-Wheels participants received their NASA weekend meals on Friday at the time of their hot meal delivery. Deliveries to home health and alternate care participants were made by their service providers during regular visits to the home.

At the time of the initial delivery of NASA food to the participants, a volunteer gave each participant complete training in meal preparation, and answered any questions the participant had about the program. This personal orientation was given to all participants regardless of their subsequent mode of delivery, whether personal or impersonal.

After the initial supply of meals had been delivered to



each site, additional meals were delivered once a week, or twice a month, depending upon the storage capability of each site.

Communication with the Field

LBJ student coordinators contacted the site coordinators on a weekly basis to keep abreast of any developments, and to obtain a general sense of the participants' reactions to the meals program. Any relevant information was conveyed to the LBJ project coordinator, UAE, and NASA. Site coordinators were instructed to contact student coordinators whenever a participant dropped out of the program, or whenever a participant received a damaged food item. In the case of program dropouts, arrangements were quickly made to administer the dropout questionnaire. In the case of damaged food items, NASA recovered them to determine the problem. Replacements for damaged food items were provided.

EVALUATION INSTRUMENTS

Four evaluation instruments were used to get participant reactions to the meal system during the major field demonstration. These included

- the dropout interview;
- the post-demonstration interview;
- the extended demonstration interview;
- the meal evaluation post card.

A dropout questionnaire was developed for those participants who withdrew from the program during the first 21 days. (See Appendix IX.) Questions were asked concerning the participant's reasons for withdrawing, his/her overall assessment of the program, and his/her living environment. The questionnaire was designed to identify the factors which prompted the meal recipients to drop out of the program. It was administered by the student coordinator as soon as possible after notice was received from the site.

Meal evaluation cards were developed to provide information about the acceptability of the individual food items in the 21-day menu cycle. (See Appendix X.) The cards were distributed to meal recipients by the delivery volunteer or were placed inside of the seven-day meal box. Each participant filled out cards for three of the nine weeks he or she received meals.

The post-demonstration interview was the major evaluation tool used to assess the long-term demonstration. It was administered to all meal recipients at the conclusion of the program. Sections of the questionnaire covered an overall assessment of the program, packaging and delivery, financial status, living conditions, transportation, self-sufficiency, and current eating habits. (See Appendix XI.)

The extended interview schedule was administered to those participants who took part in the six-week extended program. Its major purpose was to provide information on the effect of the meals upon the participants' daily routine and their reaction to the meal system over a longer period of time. Several questions were designed to elicit information about possible boredom. (See Appendix XII.)

SUMMARY

The project evaluation had a two-fold purpose. First, it sought to provide information on the target populations' response to the meals and the delivery system. Second, it was designed to explore in detail several factors—nutritional, economic, and social-psychological variables—which are likely to be important in forming new policies.

Five major variables—length of participation, geographic environment, method of meal delivery, amount of social contact, and income—which might affect the acceptability of the meal system were identified. Eight sites were selected on the basis of these variables.

A total of 168 participants were selected for the long-term demonstration. Forty of them were selected to receive weekend supplements; 128 were selected to receive 7 meals per week for 9 weeks and a group of 15-20 was to be selected to continue receiving the meals for an additional 6 weeks. Participants were selected on the basis of income, geographic location, and access to other services.

The field network was set up to ensure the maximum amount of communication between the field coordinators for each site, the LBJ School, and UAE. Orientations were conducted to train field workers, delivery volunteers, and participants in the various aspects of the demonstration.

All participants were required to have medical clearance through certification from their personal physicians or from a medical screening conducted especially for this demonstration.

The demonstration started the last week of January and first weeks of February. Meals were delivered to participants by personal delivery or through impersonal delivery—the U.S. mail or van dropoff.

Participant reactions to the meal system during the major field demonstration were elicited by dropout interviews, meal evaluation postcards, post-demonstration interviews, and interviews for those in the extended demonstration. LBJ School students administered the interviews.

CHAPTER V

DEMONSTRATION RESULTS

SAMPLE CHARACTERISTICS

One-hundred sixty-eight elderly persons began the long-term meals demonstration. Age, sex, and ethnicity are summarized in Figure V-1. Almost three-quarters of the meal recipients were female, and nearly one-half of the user group ranged in age from 71 to 80 years. Anglos were the largest ethnic group, comprising 51 percent of the sample.

FIGURE V-1
AGE, SEX AND ETHNICITY OF THE PARTICIPANT POPULATION
N=168

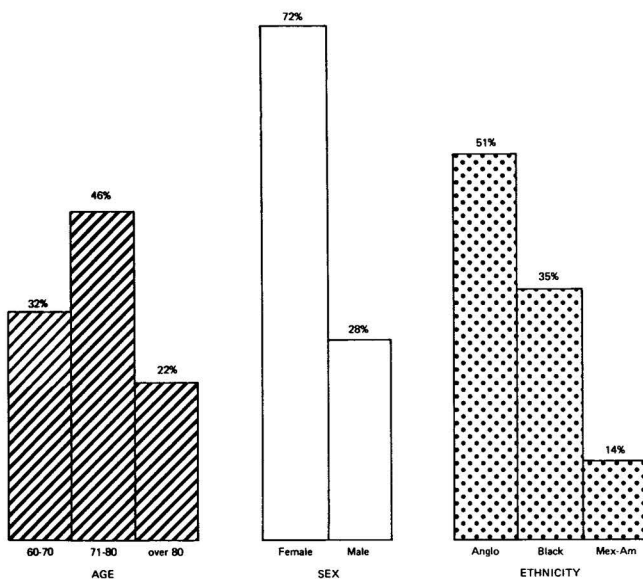
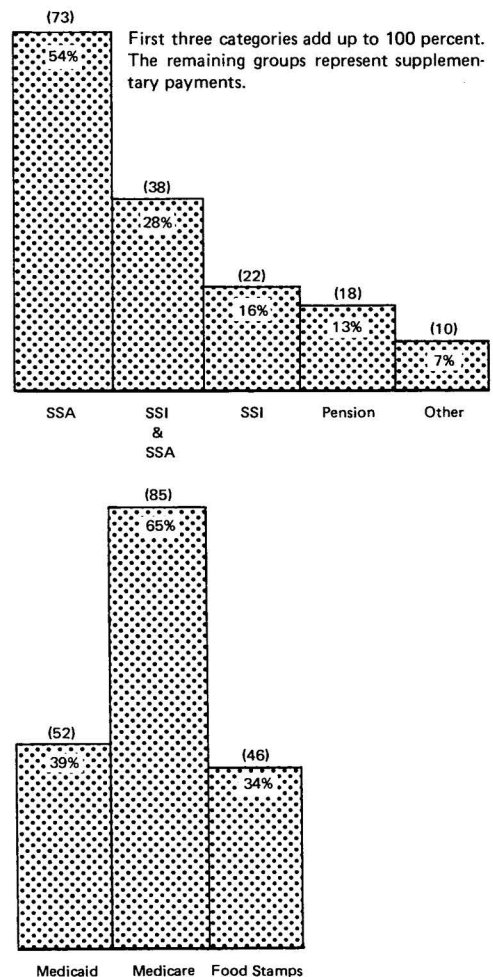


Figure V-2 outlines the income supplements and services received by the participants. The majority, 54 percent, received Social Security benefits, while 28 percent received both Social Security and Supplemental Security Income. Sixty-five percent of the meal recipients obtained Medicare benefits while 39 percent qualified for Medicaid coverage. Thirty-four percent of the user population also received Federal Food Stamps.

FIGURE V-2

Income Sources and Other Benefits
N = 136



Social Contact

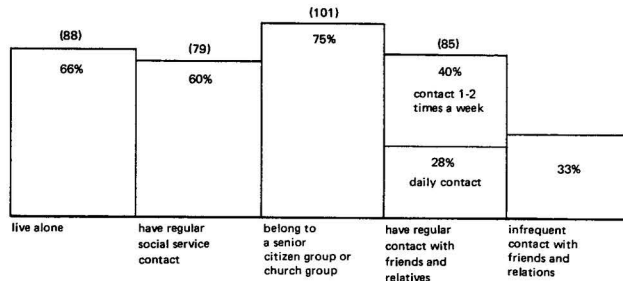
Two-thirds of the elderly participants in the NASA meal program lived alone. The remaining one-third lived with one other person, most frequently a spouse but in some cases a parent, sister, brother, or adult son or daughter. When the other occupant was elderly, both received the NASA meals.

The social contacts experienced by the elderly in the program were of two kinds:

1. Contact with social service providers such as nurses, senior citizen aids, chore helpers, or homemakers. (In the case of home health, and alternate care participants, service providers were often members of their family.)
2. Contact with members of their household, neighbors, friends, or relatives.

When asked about their frequency of contact with social service providers, sixty percent reported having regular contact on either a weekly or bi-monthly basis, while 40 percent reported no regular contact. The service most frequently received by participants was transportation aid furnished by senior citizen vans or buses. (See Figure V-4.) Other services received included homemaker and chore help, congregate meals, and meals on wheels. Most persons

FIGURE V-3
Social Contact
N = 137



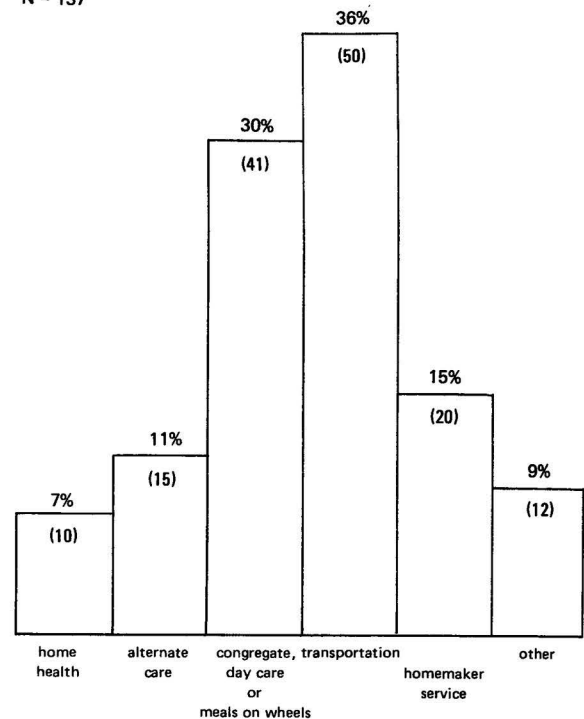
who received homemaker and chore help were members of either the alternate care or home health group, while most who received meals were members of the weekend supplement group.

The 60 percent figure is primarily a function of the way the sample was chosen. Local outreach was done through social service agencies in each site, and there was a tendency to select persons with whom contact was already established. In addition, two population groups—those in alternate care, and congregate and home delivered meal programs—were selected because of their current service contact. Except for transportation service, many of the rural and small town residents had no other regular social service contact.

FIGURE V-4

TYPE OF SERVICE RECEIVED

N = 137



Most participants reported relatively frequent contact with friends and relatives. Twenty-eight percent had daily contact while 40 percent had contact once or twice a week. Most of this contact took the form of visits in the home of the participants, but also included seeing friends at a senior citizen center, and at church. A third of the sample was relatively isolated and only had social contact with friends and relatives every one or two months.

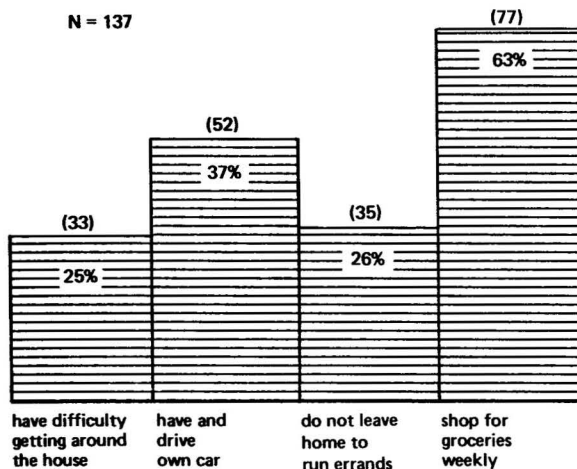
In addition, 75 percent of the sample either belonged to a senior citizen group, church group, or participated in activities with other elderly persons. This high figure is also a function of the way the sample was chosen, and is not necessarily typical for elderly persons in Texas.

Mobility

Most of the NASA meal recipients were not homebound. Almost three-quarters reported they left home to run errands, pay bills, visit the doctor, purchase food stamps, visit friends, and the like. Most were dependent, however, upon others for transportation assistance for all activities which required them to go beyond walking distance of their homes. Only 37 percent of the group owned and drove their own cars. The remaining 63 percent had to rely on friends, relatives, city buses, or senior citizen vans for transportation aid. The fact that only the urban areas of Houston and Austin have a public bus system underscores the importance of the senior citizen van as a major source of transportation for participants in the rural and small-town sites.

FIGURE V-5 PARTICIPANT MOBILITY

N = 137



The poor health of the Paris alternate care participants and the Austin home health participants rendered them homebound—they did not leave their homes to run errands. Shopping was done for them by their homemakers or service providers. In other sites, approximately 20 percent of the meal recipients also reported they did not leave their homes to run errands because of poor health. Shopping was usually performed for these homebound persons by their relatives.

Almost two-thirds of the elderly sample shopped for groceries, or had shopping done for them, on a weekly basis. Seventy-five percent stated that the store they shopped at most frequently was less than a mile from their house. Distance to the store was greatest in rural areas, but rural participants shopped just as frequently as did those in urban and small-town sites. When asked how they usually got their groceries home from the store, 14 percent said that they walked, 37 percent drove their own cars, 26 percent rode with friends or relatives, 11 percent used public transportation (usually senior citizen vans), and 12 percent used a combination of the preceding methods.

Household Management

Most NASA meal recipients stated that they had no difficulty getting around in their homes and in performing routine cooking and cleaning chores. Arthritis, poor vision, emphysema, and heart condition did lead to some difficulties for approximately 20 percent of the regular 63-day and weekend participants. However, most had adapted their routines taking their medical problems into account and thus managed fairly well. A common complaint was not having as much energy as they used to because they were “getting old.”

When asked, “What kinds of services would you like to receive that would make living in your own home easier?”, only 44 percent of the participants listed one or more

services. The reason for this low response rate is two-fold. First, some of the elderly participants prided themselves on their self-sufficiency and independence and felt they were getting along fine by themselves. Second, some elderly knew that they were getting all the services offered in their area, and that it would do little good to speculate about any others. For those 44 percent who did answer the question, most felt chore helpers for heavy yard work and cleaning, and homemakers for cooking and personal aid would make their lives easier.

Eating Patterns Before NASA Meal Program

Before participating in the NASA meals program, almost three-quarters of the elderly sample ate a hot meal daily. Ten percent had three to four hot meals a week, while 12 percent had a hot meal only once or twice a week. Four percent of the participants stated they never prepared a hot meal for themselves, but it is unclear whether this means they never ate hot meals or simply did not prepare them for themselves.

The majority of participants usually cooked for themselves. Only 20 percent stated they normally had someone else prepare meals for them. Of this number, most were home health or alternate care participants who had homemakers or service providers to cook their meals. In addition, there were some fairly infirm participants in the regular 63-day program (e.g., blind, badly arthritic) who had friends or relatives cook meals for them.

Participants prepared and ate a fairly wide range of food before the NASA program. The major meal of the day was usually eaten at mid-day, and consisted of a meat or poultry dish (often a soup or stew which lasted several days), vegetables, bread, a beverage, and dessert. Breakfast for most participants often consisted of toast or cereal, coffee, and occasionally bacon, sausage or eggs. The evening meal was usually light—fruit, bread or cereal, and a beverage. Participants said they frequently prepared a snack or a sandwich for themselves in lieu of fixing a full meal.

The limited budgets of all of the elderly participants restricted the kinds and amounts of food they could regularly buy. Some had access to fresh garden produce which augmented their purchasing power. Most said they would have liked to include meat in their diet more often but could not afford to do so.

Over a third of the elderly in the sample were currently using food stamps. Others had previously used stamps but felt that the return for their money was not enough to balance the trouble and inconvenience of purchasing them. For example, one elderly woman in Waco stated that she had paid \$38 for \$45 worth of stamps. The transportation arrangements necessary to get to the post office to purchase the stamps created more trouble for her than she felt they were worth.

EVALUATION RESULTS

Response to the NASA meals program, on the basis of information provided in the post-demonstration interviews, and the meal evaluation cards, was quite favorable. In general, the elderly found the meals convenient, easy to prepare, tasty, and filling. Some participants missed eating fresh fruits, vegetables, and meat items, and others had favorite food items that they wished had been included in the menus such as greens, spinach, and black-eyed peas. However, the boredom factor was not significant, even for those participants in the extended 105-day demonstration.

In the section which follows, more detailed information will be presented about the participants' response to the entire program, to individual food items, to the packaging and delivery systems, and other technical aspects of the program.

Overall Response to the Program

Three-quarters of the elderly participants stated that they liked the program very much. When asked what they

FIGURE V-6 Overall Response to program
N = 137

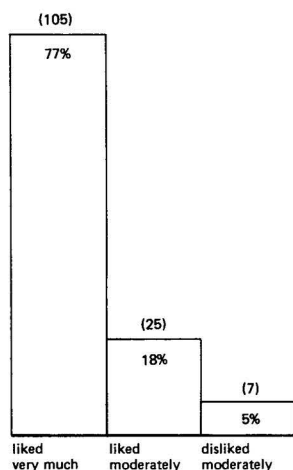
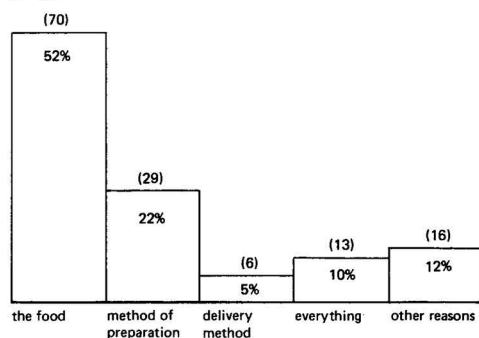


FIGURE V-7
Response to Question: What did you like most about the program?
N = 134

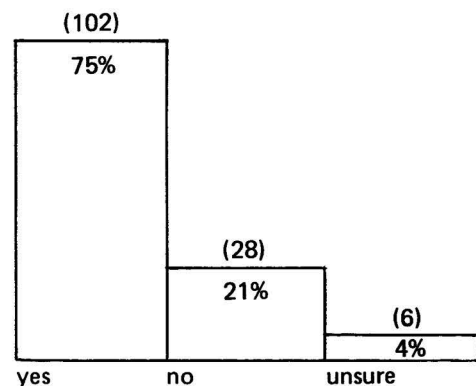


liked the most, more than half cited the food while 22 percent cited the method of food preparation. Others liked the delivery system and the lack of expense associated with the program.

To gauge whether participants became bored with the prepackaged NASA meals, they were asked whether they would like to continue the program if they had the chance. It was felt that if participants found the meals tiresome after eating them for 63 or 105 days, little interest would be expressed in continuing. However, 75 percent of the sample said they would like to continue, and of that

FIGURE V-8

Desire to continue the program
N = 136



number, 50 percent wanted to eat the meals on a daily basis. Some participants only said they did not want to continue the program because they had a number of meals stockpiled for future use.

The number of meals per week that participants wanted to receive seemed to be related to their health, degree of mobility, financial resources, and other meal programs available to them. For example, all of the 63-day participants in the Travis/Bastrop area indicated that they would like to continue eating a NASA meal daily. In general these participants were less mobile, less healthy, and had more limited financial resources than participants in some of the other sites. None were currently participating in other hot meal programs although Travis County had both congregate and meals-on-wheels programs in operation.

Most Five-Counties participants indicated interest in continuing the program on a daily basis. Sixty-three percent wanted a meal daily while 29 percent wanted the meals two to three times weekly. No other meal programs operated in any of the five counties, and many participants had difficulty arranging transportation to shop on a regular basis. The appeal of the program seemed to be related to the dearth of services as well as to the low incomes of many of the participants.

In contrast, only 26 percent of the Falls/Waco participants wanted the meals on a daily basis, although 52 percent indicated they would like them two to three times a week. The low percentage of those elderly desiring the meals every day can be explained by two facts. First, Waco had both a congregate and a meals-on-wheels program in operation and eight of the nine Waco participants were participating in one or the other program. Second, about half of the Falls participants had moderate incomes. Compared to many of the others in the sample, they had sufficient funds to purchase the kinds of groceries and meats they desired, grew their own vegetables, and enjoyed cooking. While they liked the idea of using the meals on an occasional basis, they showed little interest in having one daily.

Many participants realized that daily meals would be particularly useful to them if they became less mobile, and less able to shop and cook for themselves. A recurrent comment made to student interviewers by participants was that should they become ill, they would like the meals on a daily basis. However, as long as they were physically able, they would prefer to cook for themselves most of the time. Several of the men in the sample said that if their wives became ill, they would like the meals on a daily basis due to their convenience and ease of preparation.

Would Participants Buy the Meals?

Except for five participants in San Saba, all participants in the program had incomes which entitled them to Title XX Social Services. In addition, 60 of the elderly were receiving Supplemental Security Income (SSI) benefits. To qualify for Title XX, one can earn no more than \$233 a month; under SSI, the income limit for eligibility is \$180 a month. Some of the elderly who took part in the project even had incomes below the SSI level and were trying to subsist on \$80 to \$100 a month.

Participants were asked if they would buy the meals in the store if they were available and cost about the same as the groceries they usually bought. If participants were responding positively to the meals because they were free, it was unlikely they would be willing to buy them in the grocery store. However, if participants were responding positively because they found the meals tasty, easy to prepare, and convenient to store, it is likely they would want to purchase them. Eighty-five percent of the sample indicated that they would like to purchase the meals in the grocery store at a price comparable to what they normally pay.

It is interesting to note that while 54 percent of the sample wanted to continue eating the NASA meals on a daily basis if the free program were to continue, only 14 percent indicated they would buy the NASA meals on a

daily basis. However, 16 percent would buy between 5 to 7 meals a week, and 71 percent said they would buy up to 4 meals per week.

FIGURE V-9

Response to Question: How frequently would you like to eat these meals?

N = 114

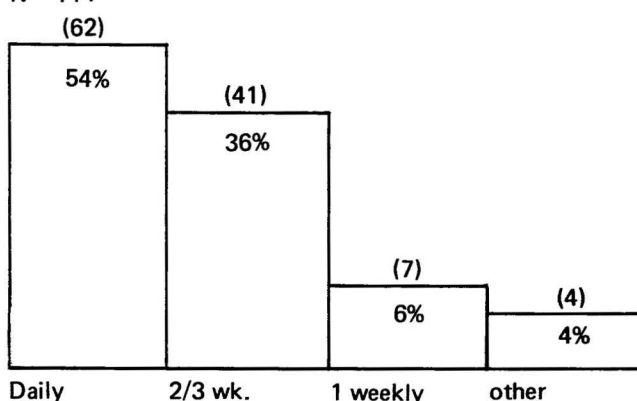


FIGURE V-10

Response to Question: How many meals would you buy each week?

N = 108

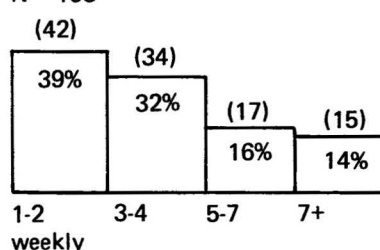
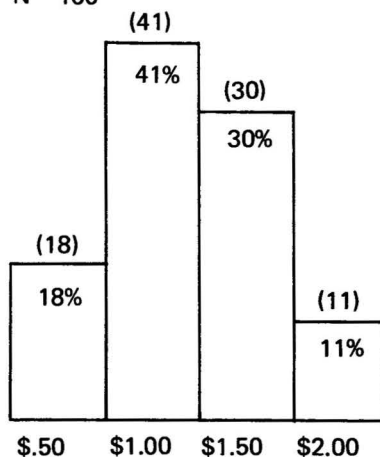


FIGURE V-11

Response to Question: How much would you pay for each meal?

N = 100



To find out how much the participants could afford, they were asked how much they would pay for one meal in a grocery store. The hypothetical nature of this question proved troublesome for many of the elderly. On one hand, some had a sense that the meals were "worth" a lot since each contained many food items. On the other hand, some knew that they could not afford to pay more than a set amount per meal no matter how much the meals were worth. Thus some of the elderly answered this question with a dollar amount that reflected what they could afford, while others answered with a dollar amount which represented what they thought the meals were worth. (See Figure V-11.)

Dropouts

Eighteen elderly persons dropped out of the long-term demonstration. This represents a dropout rate of 11 percent, which is lower than had been expected on the basis of the 20 percent dropout rate for the October pilot demonstration. The small percentage of dropouts further indicates that boredom with the meals was not a major problem during the 63-day program.

A special questionnaire was developed for those participants who withdrew from the program during the first 21 days. It was administered to thirteen of the eighteen elderly persons who dropped out. Two women died (of reasons unrelated to the program), the widower of one of the deceased women decided to discontinue, one man left town, and one woman was not at home either time the student coordinator called to see her.

The most common reason persons dropped out of the program was health problems related to food consumption. Six elderly participants felt that the taste, consistency, or ingredients of some of the food items aggravated existing health conditions such as colon problems, gas, constipation, or "tender stomachs" prone to indigestion. Certain food items such as chili, barbecue beef, spaghetti, and onions were particularly troublesome to these persons. The relative richness and spiciness of these dishes caused three of the Paris participants to have gas and indigestion. (These three women normally stayed away from rich or spicy foods.) Two women from Comal County also felt the tomato sauced meat dishes aggravated stomach problems. The last health-related dropout gained nine pounds while on the program, which his doctor felt was bad for his heart condition. There is no way of knowing how much of the weight gain was due to the food.

In general, those dropping out of the program due to health problems related to food consumption also disliked the taste of those items which disagreed with them. Two Paris participants dropped out of the program after eating only two or three meals primarily because they thought the food tasted unpleasant.

Of the remaining dropouts, three entered the hospital for health conditions unrelated to the NASA food (cataracts, pneumonia, and heart attack). Before becoming ill, all three participants had liked the food program and indicated that had they not become ill, they would have continued. One other Paris dropout had liked the food but her provider objected to using extra utensils, pots and pans to prepare each food item.

One participant decided to discontinue the program primarily because he was being inundated with food and food services. He had been discharged from the hospital after suffering from malnutrition shortly before the program began. In addition to receiving the NASA meals as a weekend supplement, he was also participating in congregate dining and receiving meals on wheels. The student who interviewed him felt he was being overwhelmed by social contact as well as food after having led a fairly solitary life.

The only general recommendation which can be made on the basis of information obtained from the dropout questionnaires is that rich and/or spicy food items be avoided in future food demonstrations since these items proved troublesome for a few of the elderly to digest.

The Response of Alternate Care Participants

In order to determine how the NASA meal service could be incorporated into ongoing alternate care programs, two groups of participants currently receiving either home health care or alternate care were included in the sample. The research for the alternate care portion of the meal demonstration focused on the acceptability of the service to the elderly, the economic benefit of the service to alternate care, and the health or social benefits accruing to the elderly as a result of their participating in the program.

Paris

The participants in the Paris project—all in poor health—tended to tire of the meal program. Six dropped out during the first two weeks. Three of the dropouts indicated that the food upset their stomachs. The others did not like the taste of the food though it did not cause them any health problems.

Nine participants completed the 63-day cycle, and of this number, four indicated they had become tired of the food by the program's end. They missed eating food items such as fresh vegetables, ham, and steaks, and were looking forward to resuming their former eating patterns at the program's end. The remaining five participants who completed the program liked the meals very much and indicated they would like to continue the program.

Even though the food was easy to prepare, participating in the program did not allow the provider to shift the task

of preparing meals to the client. Providers who had prepared meals prior to the program continued to do so. Several providers did indicate, however, that they saved time by preparing the NASA meals instead of regular meals, and that they used this time to perform other chores for their clients. Two other providers who did not cook for their clients but did do the grocery shopping said the meals saved them shopping time in the grocery store. They also used this extra time to perform additional services for their clients.

Reports of the service providers indicates, therefore, that the meal program was of some economic benefit. The convenience and ease of preparation of the meals allowed the providers to save cooking and shopping time, and to use this time to provide other help for their clients. In addition, seven out of the nine participants who completed the 63-day program reported that they used fewer food stamps while on the program. When asked how many fewer, four replied \$10 to \$14 a month, and two indicated it was "a lot" although they could not fix on a dollar amount. The remaining participant felt she saved several dollars a month while on the program.

Most of the clients who completed the program said they experienced an improvement in their health after eating the NASA food. While the following observations are primarily self-reports, or reports made by the providers, and not medical assessments, they express the participants' perceived sense of improvement, and are important for that reason.

One participant said she rested better at night because the food did not upset her stomach or cause gas. Another participant said the ease of preparing the meals left her less tired than she had been before. A third participant became more lively, ate with more pleasure, and looked healthier than before the program (provider made these observations). A fourth participant had been feeling depressed before starting the program, but reported feeling better after consuming the NASA food.

One elderly couple reported quite unusual improvement in their health after starting the program. The husband had suffered a severe heart attack one month before the project began, and was not expected to live. Both husband and wife normally suffered from heartburn and indigestion and found that the only thing which they could tolerate with minimum ill effect was canned soup. However, they found they could eat the NASA food with no discomfort. The husband became stronger, and his doctor felt the food was partially responsible for his improved condition. Several times during the project, the couple tried eating "regular" food but suffered heartburn and indigestion whenever they did so. They decided that even though they were becoming tired of the NASA food, they needed to continue eating it to maintain their health.

The availability of homemakers to prepare home-cooked meals was not the deciding factor in whether the alternate care participants wanted to continue the NASA program. While all 15 had service providers come regularly to their homes, only five normally had their meals cooked for them by their providers. Of those who liked the program well enough to continue it, half usually prepared their own meals, and half had homemakers prepare meals for them.

Even though the dropout rate was relatively high for the alternate care group, there is no reason to conclude that the program could not be successfully integrated into an ongoing alternate care system. Because many in the Paris group were ill and suffered from two or more rather serious medical conditions, they tended to be particular about what they ate, and set in their food likes and dislikes.

Austin

Home health agencies, as the name implies, provide elderly persons with health care in their homes. The people utilizing the service have health problems, such as chronic illness or recuperation from an illness or hospitalization, which require continuous medical attention but not hospital care.

Seven home health recipients and four family members who lived with the recipients were included in the sample. Detailed case histories of six of the participants are included in Appendix XIII. Only brief descriptions of the participants are given here.

- Case 1: Single black woman (75) with broken hip. Great financial need.
- Case 2: White man (71) ill with emphysema, heart, and kidney trouble; sister (76) DPW provider.
- Case 3: Single white woman (68) with severe emphysema. Receives homemaker services twice monthly. Mobility limited.
- Case 4: Black mother and daughter, great financial need, limited mobility. Mother 102 and bedridden; daughter 70 and DPW provider.
- Case 5: Mexican-American husband (63 and blind) and wife (61) with back problem which limited mobility. Quite socially isolated.
- Case 6: White man (69) ill, and wife (61) not sympathetic to his condition.
- Case 7: Black woman single (76) very ill with terminal cancer. Homemaker six hours every day and part-time on weekends. Very lonely and isolated.

The prepacked meals were quite useful to the elderly in the home health setting. This was true of those who cooked for themselves as well as for the providers who prepared meals for their clients. For those recipients who normally

prepared their own meals (case 1, case 3), the ease of preparation of the meals increased their self-sufficiency, and saved them cooking time. The ease of preparation was also appreciated by the providers who often were family members of the recipients and were themselves elderly.

Results show that the delivery of the meals can be incorporated in the home health agency service delivery structure. Since the food is shelf-stable, nurses can deliver the meals in number to coincide with the frequency of their visits.

The addition of a meals system would make home health agencies more comprehensive service providers. If the meal system was an adjunct service provided by home health agencies, direct meals service could be provided to home health recipients without the delay of making other agency connections.

NASA Food as a Weekend Supplement

Participants were asked if the NASA meals were an acceptable weekend supplement to their ongoing hot meals program. All but one participant said they enjoyed the meals for weekend use, and would like to continue receiving them.

Participants were also asked to compare the NASA meals with the meals they normally fixed for themselves on the weekend. The majority stated that they frequently had prepared hot meals for weekend use, and that the NASA meals were generally of similar quality to those meals. However, 19 percent indicated that they usually did not prepare hot meals for weekend use, and that the NASA meals were of better quality than their normal weekend fare.

FIGURE V-12
Quality of NASA meals
compared to usual weekend
meal.

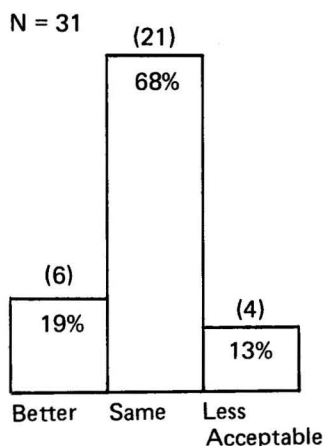
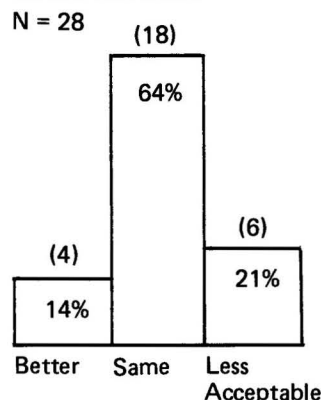


FIGURE V-13
NASA meals compared to
current hot meals.



The majority of participants said the NASA meals were of similar quality to the meals they received in their hot meal program. Fourteen percent felt the NASA meals were better, giving a 78 percent favorable rating. Some participants felt the NASA meals were less acceptable because they lacked certain food items such as rolls, fresh salads, fresh vegetables, cakes and pies, and milk which were frequently served in their hot meal program.

The social contact experienced in the congregate meals program was considered important and enjoyable by all congregate participants. While they liked the meals for weekend use, the majority did not want to receive them seven days a week in lieu of participating in the congregate meals program. However, more than a third said they would not mind eating the NASA meals in a congregate setting.



In summary, the meals proved to be an acceptable weekend supplement to those elderly currently participating in hot meals programs. The delivery mechanism worked smoothly both for those who picked up their meals at the congregate site, and for those whose meals were delivered to their homes. Importantly, the fact that almost 20 percent of the group did not eat a hot meal on the weekend prior to this program suggests that there is a service gap on weekends when hot meal programs do not operate. The NASA meal system worked well to fill this gap.

Participants in the Extended Program

The extended demonstration was conducted mainly to see if participants tended to become bored with the meals over time. While some boredom with the food might be expected during the regular 63-day phase of the program, the novelty of the food, packaging, and delivery method would probably work against any early reactions of boredom on the part of the participants. Continuing the program for an additional six weeks provided information on the acceptability of the NASA food over an extended period of time after the novelty presumably had worn off.

Sixteen of the 24 participants in the extended program completed an additional interview. Information from the interviews indicates that only one participant experienced boredom with the NASA meals. This participant complained of monotony and felt he needed to eat fresh fish and fresh vegetables once in a while. All other participants who were interviewed said that they enjoyed the meals as much during the extended phase of the demonstration as they had the first 63 days of the program.

While this information is encouraging, a word of caution is in order. All participants in the extended demonstration took part by choice; they liked the food well enough during the 63-day program to want to eat it for an additional six weeks. Other prospective participants had said that they did not want to continue primarily because they were tired of the food. Thus, only those individuals who were positive about the program in the first place were included in the extended demonstration. It is therefore not surprising that they expressed no loss of interest, or sense of boredom during the additional six weeks of participation.

All of the extended participants interviewed said that they would buy the meals in the grocery store if they were available and cost about the same as the food they usually bought. As an indication of the enthusiasm of this group for the meals, over half said they would buy five to seven meals per week.

The convenience aspect of the meals, and their ease of preparation were particularly appealing to the extended participants. For the homebound elderly, having the meals

delivered allowed them to eat nutritious food without having to leave their homes to shop.

The extended participants were asked, "Since you have been eating these meals, do you find you have more free time?" The majority responded that since they no longer had to shop, or shop as frequently, a time savings was realized. In addition, since the meals were so easy to prepare, most of the elderly reported that they spent less time cooking than they had previously. The free time was used to garden, do household chores, or visit friends.

Ten out of the 16 extended participants who were interviewed reported that they felt better during the time they were eating the NASA meals than they had before. One 71-year-old woman reported that her constipation problem had improved considerably while she had been eating the meals. A 71-year-old man felt his gall bladder condition had improved, which left him with a better appetite. A 63-year-old recipient who previously had eaten a great deal of fried foods said that the NASA foods had made his stomach feel better. He felt that the meals contained nutritious food and he was very much interested in buying them in quantity when they became available.

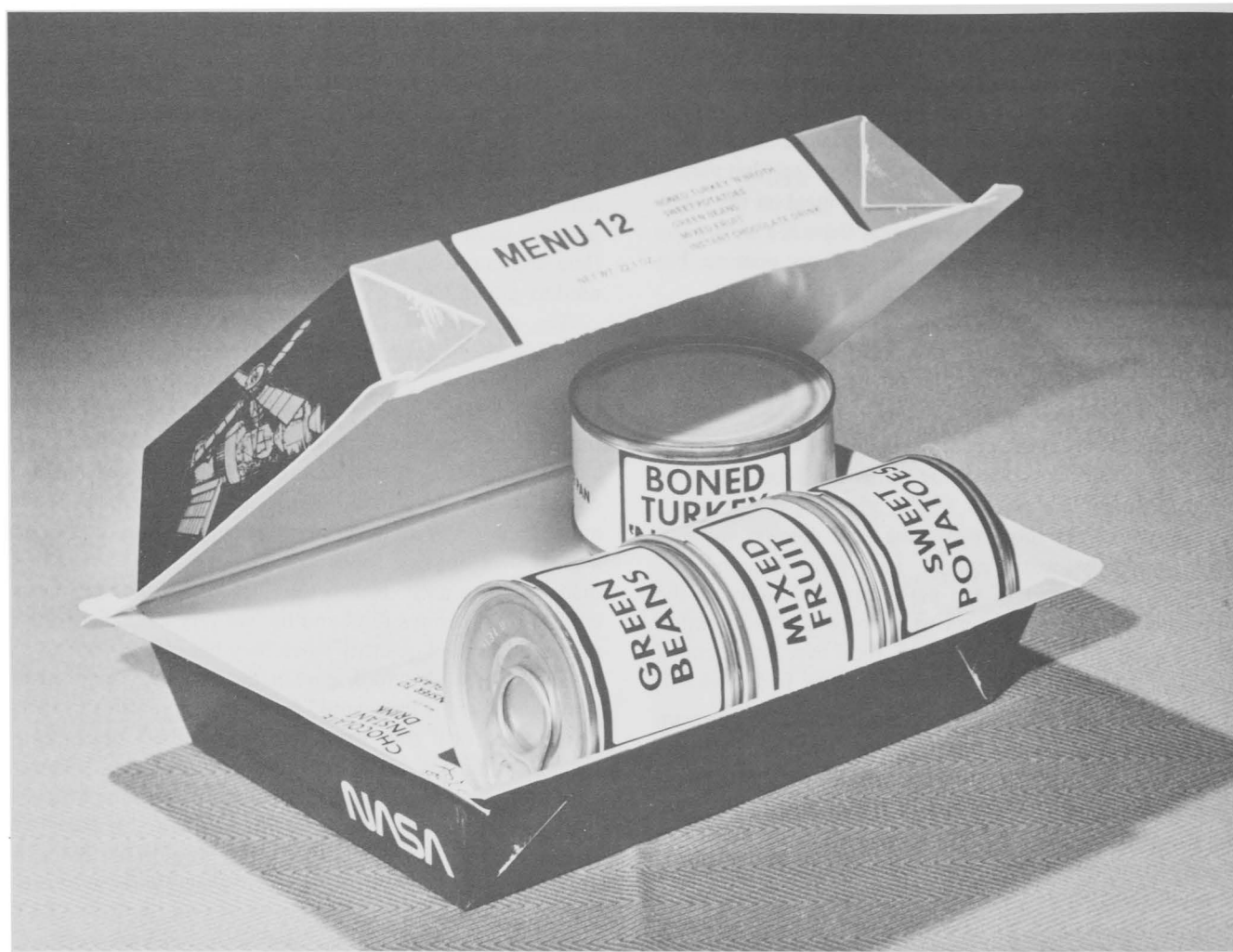
The elderly who took part in the extended demonstration were asked if they would rather continue living in their own homes, or if they would rather live in a group setting such as a nursing home or home for the aged. Without exception, all replied that they wanted to continue living in their own homes. Participants were also asked if they felt receiving meals like the NASA meals would help them to continue living in their own homes. Again, without exception all replied "yes".

TECHNICAL RESULTS

Participant Reaction to Complete Meal Units

One of the innovative features of the Meals for the Elderly project was the delivery of complete and balanced prepackaged meals. How convenient was it for participants to receive a complete meal in one package? Did participants feel constrained by the meal units or did they feel free to mix food items from various boxes? Did participants find the meals provided enough variety? Did participants add ingredients to the meals, or eat other foods along with the meals? Did each meal provide enough to eat? Answers to these questions would help to assess the overall acceptability of the meal system.

Ninety percent of the participants found it convenient to have a complete meal in one box. Comments were made by some that it was "nice" not to have to put together a whole meal once or twice a day but to have an already planned meal available.



During the first three weeks of the project, most participants tended to eat the meals in numerical order, and to eat only those items contained within that day's meal box. However, as the project continued, more than half of the participants frequently selected food items from different boxes to make up that day's meal. Additionally, 44 percent of the group reported that they did not generally eat the meals in numerical order, but instead picked out their favorite meals and items to eat first. Some participants opened up the entire week's supply of meals and placed all food items in a large box to pick and choose favorite items during the week, although this was not a common occurrence.

These findings suggest that while almost all participants said they liked the idea of a complete meal in a box, a majority exercised judgment in meal planning by combining food items from different boxes, and in choosing the order in which to eat the meals. The meal box, and the numerical

ordering of the meals was neither a source of complaint, nor a source of constraint. Participants operated within the general framework of the meal system, while also adapting it to meet their specific meal preferences and styles.

Participant Reaction to Food Variety Over Time

The 21-day meal cycle was designed to give participants maximum variety in food choices. Repetition of food items was minimal although some did occur, particularly among the vegetables, puddings, and drinks. To gauge whether the variety of food was sufficient, participants were asked if any of the items had been repeated too frequently. Participants were also asked if they had some favorite food items that they wished had been included in the NASA meals.

Less than a third of the elderly reported that any food items had been repeated too often during the course of the program. The items most frequently mentioned were green beans (repeated 3 times per 21-day cycle), mixed vegetables (4 times per 21-day cycle), corn (4 times per 21-day cycle), English peas (1 time per 21-day cycle), macaroni and cheese (2 times per 21-day cycle), and sauced items (repeated 5 times per 21-day cycle). In addition, about 20 percent of the elderly sample commented that the meals contained more starchy food items and more casseroles than they were used to, or liked eating.

Data compiled from the post-demonstration questionnaires indicated that participants were responding not only to the absolute frequency of repeated items, but also to a general dislike of those items. English peas were used only one time per 21 days, yet a number of participants thought they occurred too frequently. Mixed vegetables and corn did recur with some frequency, and participants might have enjoyed those items more if they had eaten them less throughout the 63-day program. On the other hand, mixed fruit and diced peaches were repeated 2 times per 21-day cycle, and puddings of various flavors were included in 12 out of the 21 menus, but no participants complained about this. In fact, many requests were made for even more fruit and puddings.

In an effort to see whether participants missed eating other types of foods, they were asked if they had some favorite food items that they wished had been included. Over a third of the participants listed some items that they had missed eating, and wished had been included in the meal boxes. Some of these requests were for items that could not be included in a prepackaged food program such as "fresh" vegetables, "fresh" fruits, and "fresh" meats. A number of participants missed eating such vegetables as collard greens, broccoli, asparagus, and black-eyed peas. While some of these items are packaged in cans, participants commented that they missed eating them in "fresh" form. It remains to be seen whether canned broccoli or canned greens would be an acceptable substitute.

Participants who expressed a desire for "fresh" meat said they would have liked solid pieces of meat such as steak, liver, or pork chops instead of meat primarily in casseroles or sauces. Two main dish items—boned turkey and Vienna sausages—were relatively "solid" and unsauced, and both were cited by 25 participants as their favorite item. The frequency of sauced meat items and casseroles made some participants feel that the food began to taste alike as the demonstration wore on.

About half of the Mexican-American participants wished some traditional Mexican-American items had been included. However, this did not prove to be a problem, as they doctored the foods by adding peppers, spices, onions,

and cheese to more closely approximate their tastes and preferences.

Response to Individual Food Items

Individuals participating in the full-scale demonstration were asked to rate the acceptability of all food items in the 21-day menu cycle. The format chosen was a printed, self-addressed, prepaid postcard listing each food item on that day's meal, and asking the participant to rate it "good", "fair", or "poor". Space was also provided for short comments at the bottom of the card, and for the participant's name and address. Of the 96 food items used during the project, only 11 had a combined fair/poor response of 20 percent or higher. Those items are listed in Table V-1.

The freeze-dried items tended to have higher rates of fair/poor responses than did the canned items. In general, participants found the "crunchy" consistency of some freeze-dried items unappealing. Complaints about the "gritty" taste of the rice occurred with some frequency. As the project progressed, some participants simmered the freeze-dried items in a saucepan after reconstituting them to get them to a more desired consistency.

TABLE V-1
FAIR/POOR RESPONSES OF
INDIVIDUAL FOOD ITEMS

| | Percent |
|----------------------------------|---------|
| Tuna a la Neptune (F.D.) | 31 |
| Beef Almondine (F.D.) | 30 |
| Cream of Mushroom Soup (D) | 27 |
| Peas (C) | 24 |
| Mixed Vegetables (C) | 24 |
| Chicken Pilaf (F.D.) | 24 |
| Beans with Tomato Sauce (C) | 23 |
| Potatoes and Beef (F.D.) | 23 |
| Meat Balls in Barbeque Sauce (C) | 22 |
| Vegetable Stew (F.D.) | 21 |
| Chocolate Drink (D) | 20 |

| | | |
|------|---|--------------|
| F.D. | = | freeze-dried |
| D | = | dehydrated |
| C | = | canned |

The richness and spiciness of some tomato-based canned items, such as meatballs in barbeque sauce and beans with

tomato sauce, were disliked by a number of participants. Some indicated that those items "upset" their stomachs and were avoided after the first meal cycle. The drinks, and the chocolate drinks in particular, while liked by the majority of participants, were mentioned by others (20) as their least favorite item. Some participants found the dry milk-base drinks (many were instant breakfast) too rich and filling as a meal beverage.

Two canned vegetables—peas and mixed vegetables—had a 24 percent fair/poor response. Other vegetables in the 21-day cycle, such as lima beans and green beans, were judged more acceptable, probably because they more closely approximated the participants' prior eating patterns. Some comments were made that a wider variety of vegetables would have been preferred, with the inclusion of such items as greens, broccoli, spinach, and black-eyed peas.

Given that food preferences vary within any population, a 20 percent or higher fair/poor response may not call for a food item to be removed from the menu cycle. However, the possibility of finding alternates for these items should be considered in any future food demonstration.

Similarity of NASA Food

One of the main goals of the Food for the Elderly project was to provide food for participants that was not only nourishing, but palatable. Program acceptance could be jeopardized if the meals contained a majority of items with highly unfamiliar tastes and textures, or which required preparation techniques new to the participants.

Of the three types of food preservation technologies used in the meals program—thermostabilized (canned), freeze-dried, and flex pouch—only the freeze-dried items were somewhat unfamiliar to participants. Before reconstitution, freeze-dried foods were either granular or powdery. After reconstitution, the items looked like "regular food," although some retained a crunchy or gritty consistency which drew unfavorable comments from some participants.

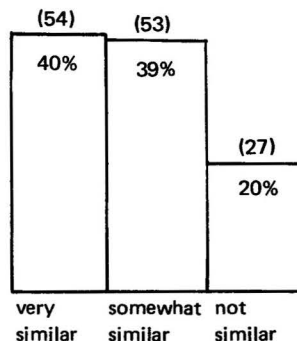
The majority of the food was canned—obtained from well-known commercial producers. Almost all items, whether meats, vegetables, fruits, or desserts, were familiar to participants, and many had purchased the same or similar items in the grocery store. The only innovation was the single serving sized cans which are not usually found in grocery stores. While the flex pouch was new to participants, once opened, the pineapple and applesauce looked the same as canned fruit.

During the post-demonstration interview, participants were asked how similar the kind of food they ate in the program was to the kind of food they ordinarily ate. It was felt that participant acceptance of the program would be related to the degree of similarity of the NASA food to the food they ate before the program.

FIGURE V-14

Similarity of NASA food to food usually eaten.

N = 134



Participants who found the NASA food "somewhat similar" or "not similar" cited a variety of differences between the NASA food and the food they normally ate, including differences in food items per se, differences in preparation, differences in quantity, and differences in taste.

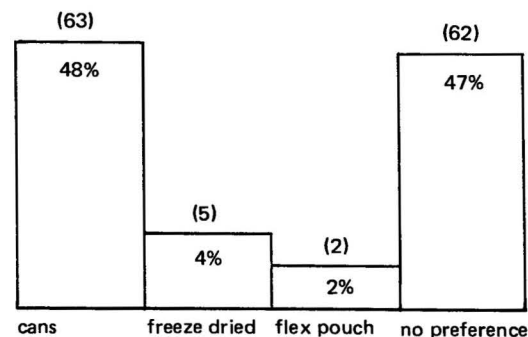
Several Mexican-American participants said the food was unlike the food they normally ate but the differences were not a source of complaint—data on the post-demonstration questionnaire show that Mexican-American response to the program was as favorable as the response of other participants.

Lack of experience with freeze-dried items also led some participants to find the NASA food "not similar" or only "somewhat similar" to the food they normally ate. But again, the lack of familiarity with these items did not invariably cause participants to reject the items, or the program in general.

Almost half of the sample indicated they had no packaging preference, which suggests that unfamiliarity with freeze-dried items did not constitute a major barrier to program acceptance.

FIGURE V-15

Packaging Preference



Other participants found the NASA food different because it included a wider variety of dishes, and a greater quantity of food than they were used to. Rather than being a problem, these factors were cited favorably by participants, and seemed to enhance their acceptance of the program. For example, a woman from Five-Counties commented that the canned beef stew contained more vegetables than she normally had on hand, and that the stew tasted wonderful as a result. Some participants indicated that the meals contained items they had not been able to afford to eat for years.

Meal Consumption Patterns

Eighty-five percent of the elderly participants ate the meal at noon as their main meal of the day. Just over half prepared all the food items from the meal box at the same time while the remainder of the group prepared some items at meal time, and the rest of the items at other times during the day—sometimes for a snack and sometimes as part of another meal. At the beginning of the project, most participants prepared all the food items from a single-meal box at the same time and tried to consume them at meal time. However, the majority of the participants found they could not eat so much food at one time and altered their food preparation habits.

About half of the participants routinely stretched the NASA meals into two or even three meals. For some, this “stretching” was an economizing measure to make the food go farther. But for most, the stretching reflected an inability to eat the entire meal at one sitting. In households where two elderly persons were participating in the program, often only one box per day was used. In some sites, student coordinators found that participants had uneaten meals stacking up—they could not, or chose not to,

eat the meals as fast as they were arriving. By preparing only a portion of the food items at any one time, and by saving leftovers for future use, participants adapted the meal system to suit their own eating preferences.

Change in Eating Habits During Program

One-third of the participants questioned said their eating habits changed while they were participating in the NASA program. Most reported that they were eating both a greater variety and an increased amount of food than they had prior to participating in the program. Other participants indicated that it was now easier to prepare meals, that they were eating more nutritious foods, and that they needed to eat less for other meals than they had before.

One of the dilemmas faced by demonstrations of this kind is the abrupt discontinuation of service after participants have become used to a new level of consumption. While some participants were looking forward to resuming their previous eating patterns and indicated that they would not miss receiving the food, others indicated that they had become accustomed to the food packages and regretted the program’s end. Some of these participants had been able to save money during the demonstration, or stockpile some of the food for later use enabling them to maintain their new level of consumption for a while. However, only several weeks of improved eating can have resulted.

Delivery

Two delivery modes were used during the field demonstration—personal and impersonal. The majority of the 63-day participants had their meals delivered to their home by a volunteer. The volunteers often carried the seven-day meal package directly into the kitchen for the participants, and in cases where the participants had impaired strength, the volunteers also opened the seven-day package for them. Most participants receiving their meals via the personal delivery mode reported that the volunteers stayed about 5 to 10 minutes with them, answering questions about the program, or just chatting.

Two types of impersonal delivery methods were used during the demonstration—van dropoff, and the U.S. mail. The aim of the less personal mode was to minimize personal interaction between the participants and those who delivered the meals. It was expected that the personal interaction present in the volunteer delivery mode might create a “halo” effect, and bias the participant’s reaction to the meals. In addition, volunteer delivery might not be available in large-scale uses of the meal system. Therefore, the feasibility of other forms of delivery was tested.

Data obtained do not support any appreciable “halo effect.” While those who received the meals from a volunteer enjoyed the social contact, they did not evaluate

FIGURE V-16

Response to Question: Did the meals give you enough to eat?

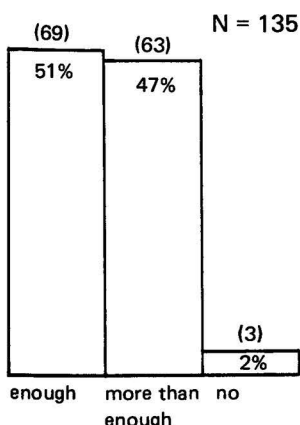
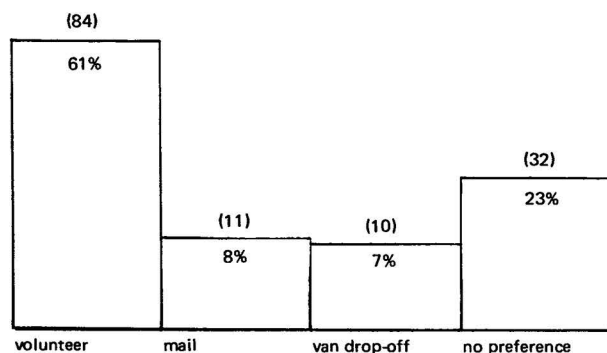


FIGURE V-17

Delivery System Preference

N = 137



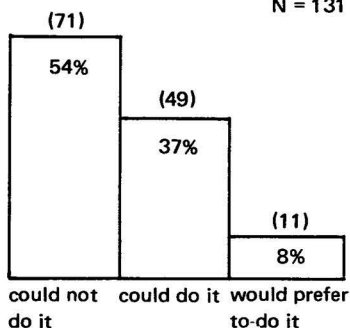
the program more positively than did those who received their meals via the impersonal delivery mode. Volunteer delivery was the preferred choice of the majority of participants. More than 60 percent replied that if they had their choice, they would prefer volunteer delivery over van dropoff or U.S. mail delivery. However, all of the 15 participants who received their meals by mail found that delivery system acceptable.

Since volunteer delivery might not be possible for an extended period of time, participants were asked if they could pick up the meals from a central location, such as a church or a community center. Fifty-four percent said such a pick-up would be impossible for them, due to transportation problems, or personal debilities. Thus, delivery to the home, either by a volunteer, van, or U.S. mail, is important since many participants do not have the means to pick up the meal packages themselves. Delivery to a post office box, or to a mail box not immediately adjacent to the home, would also be problematic since the weight of the seven-day package makes carrying it, for even a short distance, difficult for many elderly persons.

FIGURE V-18

Response to Question: Would you pick up the meals yourself?

N = 131



Packaging

Certain packaging changes were recommended to NASA on the basis of findings of the preliminary two-week field demonstration. Those recommendations included reducing the size and bulk of the seven-day package for easier handling by the elderly participants, redesigning the external covering of the seven-day package for greater durability during the mailing process, and making the seven-meal package and individual meal boxes easier for participants to open. Packaging changes were well received by the elderly and minimized certain difficulties that had been present during the two-week demonstration.

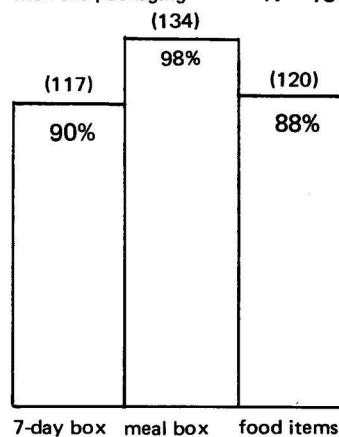
The seven-day pack used during the nine-week field demonstration was about two-thirds the size of the earlier one. It measured 22x10x7-1/4 inches and weighed approximately 10 pounds. Its external cover was a rigid corrugated box. With the exception of those seven-day packs sent through the mail, no external twine, fiberglass ribbon or tape was used on the outer box. The top of the outer box was sealed with an adhesive and the box could be opened easily with two or three fingers.

Participants were asked if they had any difficulty carrying or opening the seven-day meal package. (See Figure V-19 for response.) Ten percent said they had some trouble, which was largely one of carrying the seven-day box, not opening it. While the size and weight of the box was reduced from the earlier demonstration, it was still relatively bulky, and its 10-pound weight made it difficult for some participants to carry, even for a few feet. At least half of the 63-day participants never needed to carry or lift the larger box—the delivery volunteers did this for them. If the volunteers had not done this, it is likely that an even higher percentage of participants would have reported difficulty carrying or lifting the seven-day meal package.

FIGURE V-19

Participants who had no difficulty with the packaging

N = 137



The opening procedure for the redesigned individual meal box was very simple. It was sealed by a perforated paper strip which was easily torn open by participants. Removable fiberboard spacers were used to help keep the food stable inside the box. While packaging redesign did simplify opening procedures (98 percent of the participants said they had no trouble opening the individual meal boxes), the changes also brought about some new problems specifically related to mail delivery.

While the external cover of the seven-day package had been redesigned to completely enclose the food package for greater protection during the mailing process, the changes in the individual boxes made them less secure than they had been during the pilot demonstration. The dividers, used in place of the shrink wrap, did not make the food items completely immobile—there was room for considerable movement of food items during mailing and delivery. Six participants reported receiving opened or leaking cans during the field test. Five of these six had received their seven-day package through the mail. Two persons also reported receiving puffed-up cans, which could signify some seal leakage, and two said they received cans with dents in them.

NASA was concerned about the damaged cans and a special effort was made to recover these items. Upon investigation, they found that the cans had been packed in such a way that a severe jolt could cause one can to break open the pop-top seal of an adjacent can. As soon as this problem was identified, all remaining meal boxes were

repacked by NASA. No additional instances of seal leakage were reported.

The food items need to be more firmly stabilized within the meal package in any future demonstration. While the problem of seal leakage was overcome, the considerable play present within the packages could still produce dented cans since the dividers did not adequately secure the food items within the meal boxes. In addition, the lightweight fiberboard of the individual meal box was susceptible to crushing during delivery, particularly if delivered by mail. The possibility of using a sturdier individual meal box should be considered in any future demonstration.

Preparation

Ease of preparation was a key goal of the NASA meals system. Whether because of disability, lack of energy, or listlessness brought on by psychological depression, it is believed that food preparation presents a major problem for many elderly persons. Because of this difficulty, many elderly do not prepare adequate meals, and thus suffer nutritionally. The meal system attempted to solve this problem by making food preparation extremely simple and fast. To achieve this goal, these food processing technologies were used:

1. Powdered drinks and dehydrated soups were packaged in tear-open foil pouches.
2. Vegetables, side dishes, desserts, and entrees came in either:



- a. aluminum pop-top cans
- b. steel pop-top cans
- c. steel cans which required use of a can opener
- d. foil pouches for freeze-dried foods
- e. flex pouches for applesauce and pineapple

General Reaction

The preparation methods were well liked. When asked what part of the program they liked best, 21 percent of the participants replied the "method of preparation". This was the second most frequent response after the "food" itself. Participants found the meals convenient to prepare, taking a minimum of time and effort.

Instructions

Some of the food preparation methods were unfamiliar to many of the participants, so a special effort was made to make the instructions on the meal items as clear as possible. Instructions were simple; graphics were used, and color coding indicated the use of either hot or cold water. In addition, every participant received a demonstration of the food preparation methods.

Participant reaction to the instructions was favorable—92 percent found them easy to follow. However, two qualifications must be made.

1. Field reports indicated that Spanish-speaking participants had problems with the instructions (which were written in English) even though graphics were used to overcome the language barrier. On the other hand, data from the post-demonstration questionnaire shows that Spanish-speaking participants found the instructions clear. No conclusions were reached about the extent of the problem. However, use of bilingual instructions is recommended in any future demonstrations which include Spanish-speaking participants.

2. Participants were given a demonstration of meal preparation on a one-to-one basis in all but three sites. Field reports showed that a few (2-3) participants who received group training had trouble preparing the freeze-dried foods or did not prepare them at all until they received an individual explanation of the preparation method. Care must be taken to judge the environment and audience capacity when conveying similar information in the future.

Canned Foods

During the pilot demonstration about 20 percent of the participants reported having problems opening the pop-top cans. Many found the tabs hard to manipulate, or broke the tabs off while trying to open the cans. To solve this problem the instructions on use of the pop-tops were clarified (the tabs had to be lined up properly with the can for maximum ease and to avoid breakage). Instruction on

correct technique was emphasized during the individual instruction sessions and it was made clear that can openers could be used on the steel cans. These precautions largely eliminated any problems with the cans. Only eight people reported having difficulty with the pop-tops and only five reported having any problem using a can opener on the cans.

Drinks

There were no reports of people having trouble preparing the drinks. The participants were advised to cool the drinks before consuming them (to improve their taste) and 75 percent reported that they had.

Conclusion

The available information indicates that the simple preparation technology used in this program was both practical and acceptable. Field reports indicate that the majority of participants appreciated the ease and speed with which the meals could be prepared. On the other hand, a few people, mostly women, disliked the fact that the meals made cooking too mechanical and simple. As noted, there was a need to make the freeze-dried instructions very clear and a need for bilingual instructions.

MEDICAL FINDINGS

As part of the evaluation of the field trials of "Meals System for the Elderly", a small team of physicians, dietitians, and biochemists from the University of Texas Medical Branch - Galveston carried out serial health and nutritional assessments prior to starting and after completing both the 9- and 15-week feeding trial. On each occasion in February, March, and May, 1976, a medical evaluation (history, physical examination, and biochemical screen of 20 metabolic and physiologic items) and a nutritional assessment (dietary history, clinical examination, and nutritional biochemical assessment) were performed (see Appendix VIII).

Of the original 75 participants examined in late January or early February, 61 (81%) were re-assessed in late March, 18 of whom were continued on the feeding program an additional six weeks and reevaluated for a third time in mid May, 1976. All persons enrolled in the study were in "good health" without contraindication to the use of the NASA dietary foods. Their past history revealed an anticipated incidence of chronic health problems (Table V-2). Current review of systems provided a variety of significant health disabilities (Table V-3). It is of note that almost one half (46.7%) reported that they had no past history of any of the 31 major health disorders about which they were

TABLE V-2

Percent Elderly Persons with Positive Past Medical History*

n = 75

| Prior Medical Disorder | Percent |
|---------------------------|---------|
| 1. Major Respiratory | 13.3 |
| 2. Major Cardiovascular | |
| — Coronary/Stroke | 9.3 |
| — Elevated Blood Pressure | 28.0 |
| 3. Liver Trouble | 6.7 |
| 4. Restricted Activity | 9.3 |

*February, 1976

TABLE V-3

Percent Elderly Persons with Positive Review of Systems*

n = 75

| Current Medical Symptoms | Percent |
|--|---------|
| 1. Weakness and/or Fatigue | 16.0 |
| 2. Vision Alteration | 45.3 |
| 3. Use Dentures | 74.7 |
| 4. Short of Breath | 22.7 |
| 5. Edema | 29.3 |
| 6. Elevated Blood Pressure | 37.3 |
| 7. Chronic Constipation | 37.3 |
| 8. Nocturia | 54.7 |
| 9. Loss of ankle and/or knee reflexes | 35.0 |
| 10. Atrophic changes in the tongue papilla (indicator sign of lack of hemopoetic elements) | 12.0 |
| 11. Follicular hyperkeratosis of the skin (possible indicator sign of either Vitamin A or C insufficiency) | 13.0 |

*February, 1976

questioned. However, only one percent were free of any of the 34 current medical symptoms about which they were queried.

A dietary food frequency history was obtained at each time of examination. The participants' dietary data (Table V-4) from the initial assessment provided a few surprises. Over one-third (34%) were ingesting a daily mineral vitamin supplement. Over one in two (55%) were drinking a glass or more of milk each day; 7 percent drank more than six cokes and/or cups of coffee each day, and one individual acknowledged being an alcoholic. From the dietary data in Table V-4 one might predict an adequate mean intake of most nutrients. Examination of those who "never" (in-

TABLE V-4

Percent Food Use by Elderly Persons

n = 75

| Serving of Food Item Ingested | Daily | Never |
|-------------------------------|-------|-------|
| A. 1. Breads | 91 | 3 |
| 2. Cereals | 36 | 21 |
| 3. Noodles/Rice | 11 | 45 |
| B. 1. Milk | 55 | 21 |
| 2. Eggs | 33 | 21 |
| 3. Beef | 16 | 13 |
| 4. Chicken | 8 | 28 |
| 5. Cheese | 8 | 48 |
| 6. Fish | 1 | 73 |
| 7. Beans | 1 | 45 |
| C. 1. Fruit Juice | 55 | 25 |
| 2. High Vitamin C | 28 | 29 |
| 3. High Vitamin A & C | 12 | 43 |
| 4. High Vitamin A | 7 | 35 |
| 5. Moderate Vitamin A & C | | 28 |
| D. 1. Sweets | 23 | 11 |
| 2. Soda Water | 12 | 63 |
| 3. Candy | 9 | 67 |
| 4. Chips | 8 | 63 |
| 5. Alcohol | 3 | 92 |

adequate < one serving/month) used a moderate or high food source of Vitamins A and C suggests the possibility of an "at risk" subgroup within the study group.

Subjective evaluation from the participants at their secondary dietary assessment indicated that 28 percent reported they ate more, 5 percent ate less, and 67 percent ate about the same during the first 9 weeks of their feeding trial. Examination of the paired weight data obtained before and at the end of the feeding trial found no difference in mean body weight, 148.4 lbs. versus 148.6 lbs.

Two segments of biochemical assessment were undertaken. Not all the data has been analyzed at this time. Mean data for 10 nutrient related items are presented in Table V-5 including paired data for the 18 subjects who had measurements made at 0, 9, and 15 weeks into the feeding trial. Mean levels of hemoglobin were significantly lower at the second and third evaluation. These data were not the result of altered hematocrit determinations (44.3 to 43.5). Serum iron values declined but not at a significant level.

There were no significant changes in the serum folate measurements and the other hemopoetic factor (B12) data are not yet completed. While mean levels of hemo-

TABLE V-5
Mean Biochemical Data Elderly Persons
By Duration Feeding Trial

| Month | Total Group | | | Paired Group | | |
|---------------------|-------------|-------|------|--------------|-------|------|
| | February | March | May | February | March | May |
| Duration in Weeks | 0 | 9 | 15 | 0 | 9 | 15 |
| n = | 74 | 59 | 18 | 18 | 18 | 18 |
| Serum Albumin gm/dl | 4.41 | 4.46 | 4.22 | 4.41 | 4.32 | 4.22 |
| Hemoglobin gm/dl | 15.3 | 14.5 | 14.2 | 15.3 | 14.5 | 14.2 |
| Hematocrit % | 44.2 | 43.8 | 43.5 | 43.5 | 43.8 | 43.5 |
| Serum: Iron mcg/dl | 94 | 93 | 90 | 96 | 99 | 90 |
| Folate mg/dl | 7.6 | 9.5 | 7.6 | 6.5 | 5.4 | 7.6 |
| Vitamin A mcg/dl | 91 | 97 | 87 | 78 | 87 | 101 |
| Vitamin C mg/dl | 0.98 | 1.11 | 0.73 | 0.58 | 0.75 | 0.64 |
| Calcium mg/dl | 9.9 | 9.7 | 9.5 | 9.9 | 9.7 | 9.5 |
| Triglycerides mg/dl | 174 | 189 | 209 | 143 | 175 | 209 |
| Cholesterol mg/dl | 268 | 223 | 208 | 249 | 222 | 208 |

globin did decline, no one was "at risk" level. Mean levels of Vitamin A and triglyceride tended to increase (see paired data) while serum albumin, calcium, and cholesterol declined progressively from the beginning to end of the feeding trials.

The percent of participants "at risk" with either low or high levels of items determined by the SMAC - 20 and nutritional biochemical screen are presented in Table V-6. These data are indicative of where further follow-up investigation might be warranted to specifically identify major health problems such as diabetes, renal or liver disease, and

abnormal lipid metabolism from the SMAC - 20 data. Participants with deficits in the hemopoetic, Vitamin B complex and C likewise are in need of more precise evaluation to determine the true significance of the "anemia" and the like. Taken as a whole at this point in the data analyses, there are trends in several nutrients that suggest a longer and larger field trial of this type of feeding program might be in order. It is important to remember that these studies were carried out during only one season of the year (February - May, 1976).

TABLE V-6

Percent Low or High Biochemistry by Time

Elderly Persons

"At Risk" Category

| Month | | February | March | May |
|---------------------|--------------|----------|-------|-----|
| n = | | 75 | 61 | 18 |
| Standard Use | | Percent | | |
| Serum Albumin | < 3.0 gm/dl | 0 | 0 | 0 |
| Hemoglobin | < 12.0 gm/dl | 0 | 0 | 0 |
| Serum Iron | < 40 mcg/dl | 11 | 7 | 17 |
| Folate | < 3.0 ng/dl | 6 | 8 | 12 |
| Vitamin A | < 30 mcg/dl | 0 | 2 | 0 |
| Vitamin C | < 0.2 mg/dl | 11 | 5 | 12 |
| Calcium | > 11.5 mg/dl | 3 | 3 | 0 |
| Triglycerides | > 200 mg/dl | 32 | 34 | 18 |
| Cholesterol | > 300 mg/dl | 16 | 18 | 5 |
| Vitamin E | < 700 mcg/dl | 8 | 3 | 0 |
| Creatinine | > 1.6 mg/dl | 8 | 8 | 10 |
| Blood Glucose | > 120 mg/dl | 3 | 11 | 5 |
| Urea N ₂ | > 30 mg/dl | 8 | 11 | 5 |
| SGOT | > 60 u/l | 3 | 0 | 0 |
| SGOP | > 60 u/l | 2 | 0 | 0 |
| LDH | > 260 u/l | 19 | 21 | 5 |

REFERENCES

¹Information was taken from participant application forms.

²Information was taken from post-demonstration interview forms. Only 137 questionnaires were completed in

time for the computer run, thus the maximum number (N) for any question is 137. Since not all participants answered every question, the number of responses varies from question to question.

CHAPTER VI

THE ECONOMICS OF THE NASA MEAL SYSTEM

EVALUATION OF THE MEAL SYSTEM COSTS

For the Nasa Meal System to be successful, it must be economically feasible besides being acceptable to its user population. Efforts have been made to determine how much the meals and a system of distribution would cost. The emphasis in this section is on the findings from the three-month field demonstration.

Meal Costs

NASA expended \$38,950 for the 10,000 meals produced for the long-term field demonstration. This figure includes the food, labeling, packaging and assembly costs of the meals and does not include any of the NASA research and development costs.

When evaluating the costs of the meals for the Field Demonstration, several pertinent factors should be considered.

1. Twelve of the 96 food items accounted for over 50 percent of the total food costs. These are the items that were packaged in the special single-serving sized cans.

2. Label costs were excessive because labeling could not be made part of the food production runs due to small quantities and schedule constraints. Economies of scale were impossible to achieve because of the high cost of producing such a small number of food items.

3. NASA reported that meal assembly could have been accomplished with less-skilled personnel.

4. No NASA overhead or R & D costs were included except as they appear in the cost of the meal assembly. According to the NASA figures, the costs of the meals can be broken down as follows:

| <u>Items</u> | <u>Total \$</u> | <u>\$ Per Meal</u> |
|-------------------|-----------------|--------------------|
| Food and | | |
| primary packaging | \$28,800 | \$2.88 |
| Labels | 7,500 | .75 |
| Secondary Package | 300* | .03 |
| Multi-meal box | 350* | .035 |
| Meal assembly | 2,000 | .20 |
| Total | \$38,950 | \$3.90 |

The highest and lowest cost meals are itemized below:

| <u>High Cost—Menu No. 19</u> | <u>Item Cost</u> |
|------------------------------|------------------|
| Corn | \$1.46 |
| Beans w/tomato sauce | 1.46 |
| Chicken a' la King | 1.46 |
| Applesauce | .50 |
| Instant Vanilla Drink | .30 |
| Labels | .40 |
| Total | \$5.58 |

| <u>Low Cost—Menu No. 6</u> | <u>Item Cost</u> |
|----------------------------|------------------|
| Beef and rice w/onions | \$.59 |
| Creamed peas | .38 |
| Cottage cheese | .45 |
| Chocolate Crunch Bar | .20 |
| Instant Vanilla Drink | .30 |
| Labels | .41 |
| Total | \$2.33 |

The food items packaged in cans tended to be extraordinarily expensive because the small cans were produced especially for this meals program. This special production resulted in a very large per unit cost for the items packaged in these single-serving sized cans. According to NASA, use of the smaller cans increased the per unit average cost from \$.25 for the standard size can to \$1.46 for the cans specifically produced for this project.

While the average cost per meal for food and primary packaging was \$2.88, the average cost per meal would be approximately \$1.60 once adjustments are made for the high cost of single-serving cans.

These figures dramatically illustrate the high cost of the canned food items. The corn, beans, and chicken items in Menu No. 19 were all packaged in the special run cans. Their costs can be compared to the costs of the food items in Menu No. 6—most of which were freeze-dried food items. The food costs for Menu No. 19 are only \$1.55 when the high cost of special packaging is subtracted.

*These figures are estimates of costs based on large production quantities. These items were provided to NASA by the manufacturer at no cost.

Distribution and Delivery Costs

Distribution costs were the expenses of transporting meals from Austin, the distribution center, to the field sites. Delivery costs consisted of reimbursements for mileage for site volunteers taking meals to participants.

Most of the distribution costs were incurred by LBJ students who delivered the meals (1) with their own cars (mileage reimbursement at 16 cents per mile), (2) with a university car (reimbursement for gas expenses only), or (3) by renting a car or van (all expenses).

For a fair representation of the Field Demonstration distribution costs, note should be made of the following points:

1. NASA absorbed the costs of (a) transporting meals to Austin for further distribution, (b) delivering meals to Paris, (c) mailing meals to selected participants, and (d) transporting meals to the Houston site after the first delivery.

2. Several trips could have been avoided had there been fewer schedule conflicts.

3. If a greater number of meals were delivered, the program would have benefited from economies of scale.

Delivery costs for the meals ranged from \$1.55 to \$.87 per seven-day pack for mileage reimbursement to volunteers making home deliveries. The average cost was about \$1.20 per pack or \$.17 per meal. (These costs are based on reimbursement figures for the five-county area since they were the only group to request payment on a consistent and well-documented basis.)

Meals were mailed to 15 participants for 5 weeks and to 5 participants for an additional 5 weeks. Mailing costs were about \$1.20 per seven-day pack—a cost comparable to the average cost of personal delivery.

It should be noted that delivery in Waco, Falls County, Travis County, Houston, and Paris was incorporated into existing service systems, incurring no new delivery costs.

OTHER CONSIDERATIONS

An alternate meal system for the elderly should revolve around the creation of a complete, nutritionally balanced, shelf-stable, conveniently packaged, single-serving sized meal. At present, private enterprise has not used the concept of complete shelf-stable meals nor has it really advanced the development of single-serving sized containers. According to the U.S. Army Natick Development Center, the main factor inhibiting innovations of this type has been the reluctance of private enterprise to gamble on new marketing ideas in this field. Two reasons for this are: (1) the traditional reluctance to gamble or experiment with new products and, (2) the spiraling costs of aluminum cans which makes single-serving food items relatively more expensive.

If the cost of the meal system cannot be made competitive with the food presently marketed for the public, some alteration of the food system is in order. Flex pouches, currently awaiting FDA approval, provide a low-cost method for packaging single-serving food items. The items can be easily incorporated into a nutritionally balanced meal that is easily delivered by mail or volunteer. The savings in weight and bulk over the metal cans would be considerable—especially if the meals were to be mail-delivered.

POLICY IMPLICATIONS

Meal Cost Guidelines; Title VII

Both Title VII of the Older Americans Act and Title XX of the Social Security Act provide for food services to the elderly. The ability of social service agencies to furnish meals with these funds up to this date has been grossly inadequate.

At every congregate meal site visited for this project, long lists of elderly people waiting to join the programs indicate a large demand for services that is going largely unmet. A social worker with the home health agencies in Austin is discouraged by her inability to provide home-delivered meals for her patients. Further, many of the elderly who participated in this NASA meals project had never heard of, nor been involved in a meals program, although they all fit the eligibility criteria.

A conclusion to be derived from this situation is that there is a need for a substantial increase in the total appropriations for food programs through Title VII of the Older Americans Act and Title XX of the Social Security Act. Even with all of the meals programs being run at capacity, the need has hardly been touched. There is an apparent contradiction in the Federal legislation that expresses the desirability for alternate care (home care) over institutional care and yet severely limits the percentage of funds available for home-delivered meals.

The elderly participants in the NASA meals project—especially those most likely to enter nursing homes—indicated an appreciation of the independence the meals system provided. This suggests that a meals system similar to the NASA system could play an integral role in maintaining the elderly in their own homes. However, it should be noted that before such a system could be made available on a larger scale, Title VII would have to be amended to provide for more home-delivered meals. Congress has a bill before it which would do just this. (See Appendix XV.)

Competitive Pricing—Costs of Other Food Programs

To be considered as a partial solution to the nutritional needs of the elderly, the NASA system must be competitive

with the costs of existing meal services.

1. Costs of Home-Delivered Meals

According to the director of UAE, the major provider of home-delivered meals in Austin, the costs of that program are as follows:

| | |
|---|-------------|
| Number of clients as of 10/1/75 | 181 |
| Number of clients as of 3/31/76 | 180 |
| Number of meals served 10/1/75-3/31/76 | 27,790 |
| Total cost per person per meal | \$ 1.76 |
| Total operating costs | \$48,824.81 |
| Total food costs | \$15,073.21 |
| Raw food costs per meal | \$ 0.54 |

Six meals are delivered to each participant each week. Each meal consists of:

- (1) 2 oz. serving of cooked meat or meat alternative
- (1) 3 oz. serving of a starch
- (1) 3 oz. serving of a cooked vegetable
- (1) 3 oz. serving of a complementary vegetable or fruit
- (1) serving of bread
- (1) 8 oz. half pint of milk
- (1) 3 oz. serving of fruit or dessert

Each meal attempts to provide one-third of Recommended Dietary Allowances (RDA).

2. Costs of Congregate Meals

The costs of congregate meal programs were calculated from records from the Texas Governor's Committee on Aging (GCA). These calculations indicated a wide range of costs per meal, from a low of \$1.92 per meal to a high of \$2.97. Economies of scale are a major reason for the cost differences.

Costs for the Travis County (Austin) site in the 1975 budget year were itemized as follows:

| | |
|------------------------------|-----------|
| Personnel | \$ 10,255 |
| Equipment | 3,250 |
| Raw food | 0* |
| Travel | 1,000 |
| Consultants | 300 |
| Other | 130,456* |
| Total | \$145,261 |
| Supplemental Social Services | 30,441 |
| Administration | 25,041 |
| Total | \$200,743 |

*A caterer provides the food and thus accounts for these two figures.

A total of 404 elderly citizens are served each day at the seven congregate meal sites in Austin. The average cost per meal, including support and administration, is approximately \$1.90. Food costs are \$1.29 per meal. According to the guidelines, each meal provides:

- (1) 3 oz. serving of meat
- (1) ½ cup serving of vegetables/fruit
- (1) serving ½ pint of milk and pat of butter
- (1) serving bread or alternate
- (1) serving of ½ cup dessert

3. Costs of Homemaker Services

Homemakers (funded through Title XX) often prepare meals for elderly citizens. A private contractor provides the services for the elderly, and charges the Texas Department of Public Welfare \$7.35 per hour for homemaker services—which include light household chores, as well as meal preparation. Since most contract homemakers are only scheduled once every two weeks, they are not a regular source of meal preparation. However, individual providers may provide daily meal service through individual DPW contracts. The Texas DPW Director of Services for the Elderly welcomed the NASA meals because the elderly need every source of independence they can get.

SUMMARY

In order to be considered a viable alternative and/or addition to the current food programs for the elderly, the NASA meal system must be competitive in cost with the current food programs when operated on a larger scale. In other words, the cost of the food, administration, and delivery should range between \$1.75 and \$3. It appears that the new packaging technique of the flex pouches would greatly enhance the viability of this type of meals system.

The total cost for the NASA meals ranges from a maximum of \$5.80 to a minimum of \$2.45 with an average cost of \$3.05 per meal. If the high cost of special packaging could be reduced, the average cost per meal would be \$2.17. (These figures all include meal costs and delivery costs.)

Thus, should production of single-serving sized cans or flex pouches occur on a large scale, NASA meals would certainly become a viable option and a necessary supplement to existing meal programs.

CHAPTER VII

THE POLICY IMPLICATIONS OF THE MEAL SYSTEM

The Meals for the Elderly demonstration showed shelf-stable, nutritious, single-meal units to be popular, and beneficial. However, these types of meals are not currently available to the general public, or to public agencies. If mass produced, the cost of the meal system may fall within federal guidelines for Title VII meals for the elderly. The meals could also be used in a number of federal programs with similar cost guidelines. In addition, the meals may be inexpensive enough to be attractive for general use.

What are the implications of this successful demonstration? Should such meals be produced for the elderly? Are there other users who might find this meal concept equally beneficial? The potential of the meal system to meet a wide range of needs will be examined in the sections which follow.

SOCIAL SERVICES

This report has shown that the meals system can serve the needs of the elderly. But the system could also be of benefit to the handicapped, the ill, those without transportation, and those needing emergency relief on a short-term basis. The meals could be used to help many individuals who are homebound and prevented from shopping easily or regularly. For the handicapped, ease of preparation of the meals may mean less frustration in preparing hot meals, and thus promote a greater sense of personal independence. The Veterans' Administration is considering use of the meals system for their homebound veterans.

Certain emergency situations—such as a house fire, or a severe personal problem—often arise creating a need for quickly available, easily prepared balanced meals. Providing prepackaged meals for persons in the midst of emergency situations would be an efficient way of taking care of their food needs.

There may be situations where the meals could be used as a supplement or an adjunct to the food stamp program—for use on weekends before recipients can go to the food stamp office or during the waiting period between application for and receipt of the food stamps. Certain food stamp eligibles who cannot go shopping regularly might prefer to use their food stamps to purchase meals instead of

purchasing individual food items in the grocery store. To those who criticize the food stamp program because it does not guarantee that recipients will buy a balanced diet, the meal system may be one way to achieve this objective.

Thus there are many situations where the meals could fit into existing social service programs not so much as a substitute for current services, but as a flexible option to meet special needs as they may arise.

DISASTER RELIEF AND EMERGENCY AID

During the fifties considerable attention was given to the need for civil defense and emergency preparedness. While these concerns are less visible at the present time, conditions can change rapidly. The meals system needs to be evaluated for its potential in this context.

The same is the case with regard to natural disasters, such as earthquakes and floods. Traditionally, aid to disaster victims takes the form of mass feeding programs, using army-type cooking facilities. Central food preparation makes it possible to control purity of water used—a consideration of prime importance following disruption of normal service. At the same time, dispersed individuals often are not reached and may go without food for several days in a row. The NASA meals system might provide additional flexibility in emergency and disaster relief efforts. Perhaps a supply of sterile water, sufficient for preparing the food items contained in each box, could be provided. Where use of freeze-dried foods is impractical, meals could consist wholly of canned or flex pouch items and water purification tablets could be included. The Defense Department, in particular the Army laboratory in Natick, Massachusetts, is developing emergency rations which will meet similar needs.

INSTITUTIONAL USE

The NASA meals system should be examined for potential use in hospitals, nursing homes, schools, and prisons. Complete conversion to individually prepared NASA-type meals is unlikely to meet the needs of any institution. But occasional use, during weekends, or to meet temporary manpower shortages might provide better and

more varied service than is now available. The meals could be used in some institutions as a first step in rehabilitation of some patients who would value the self sufficiency of a personally prepared meal. Having a standby meal system in case of equipment or power failure is also a consideration. New accreditation standards for hospitals require a minimum one-week standby supply of food.

Many hospitals and nursing homes have to make arrangements to prepare special diet meals for patients. If the actual number needing such meals is low, the cost of the service is high. Purchase of a large order of prepackaged, shelf-stable, special diet meals may save time and money.

RECREATIONAL AND PERSONAL USE

Presently, freeze-dried foods are available at a high price to campers and recreational groups. The NASA meals eliminate the need for the careful calculations needed to put together several appetizing menus from mass quantity items. For those who do not need food for extended periods, packing several NASA meals could provide everything necessary for a weekend hiking trip. Also, production of the NASA meals for many users would tend to lower the price of the meals to individuals.

Many people want convenience foods which are of better quality than frozen foods or which take even less time to prepare. Others would like the convenience of having a preplanned, balanced meal as an alternative to TV dinners. The NASA meals could fill this need if they were commercially available at a reasonable price.

INDUSTRY

In the long run the meals concept developed by NASA will only survive if industry finds it commercially attractive. Many of the individual food items used as part of the meals are already commercially available. However, rarely—if ever—is the concept carried to the point where food items are assembled into full meal units. Also the distribution system presently used for prepackaged meals is highly specialized, being restricted mainly to outlets catering to backpackers or mail order houses. In many instances food items have to be ordered in large numbers, which is attractive for such users as the Boy Scouts or Girl Scouts but not for individual consumers. Individuals can buy “a year’s supply”, but this requires a large investment at the time of purchase.

In several countries, such as Japan, small individual-sized serving units similar to those used as part of the NASA demonstration, are widely available in commercial retail outlets. The German airlines use the system for some of their inflight meal service. Detailed market research concerning consumer reaction and cost comparisons with conventional food will need to be undertaken by industry

itself. In the meantime there needs to be discussion between industry and government about possible cooperation in developing the meals concept prior to full commercialization. Such cooperation might take the form of government guaranteeing a certain production level for public sector use while industry simultaneously test markets the meals.

Since the meals do not need refrigeration once produced, simple shelf storage is all that would be required on the part of supermarkets as well as the individual consumer. In contrast, “TV dinners” need to be kept frozen from production through distribution to eventual consumption. Perhaps a research project should be initiated to measure the potential energy savings of a shelf-stable meals system.

THE NEXT STEPS

The meals for the elderly demonstration was only the first step in a longer process of testing which when completed, will show whether this new meals concept will survive and grow or join the ranks of stillborn innovations. In concluding this report, it is useful to reflect on the next steps in the development of the system. It should be noted, however, that neither NASA nor the LBJ School is in a position to take the leading role in this process. Our role will be limited to two functions: (1) to widely disseminate the results of the field demonstration, and (2) to help in assessing the potential of the meals system for a variety of public and private sector uses.

This report, obviously, will be a principal source of information on the demonstration of the meals system with the elderly. A brochure highlighting program objectives and results was prepared and distributed by NASA. NASA also filmed a 20-minute documentary which is available to interested groups upon request. Faculty and student members of the LBJ research team have responded—and continue to do so—to invitations requesting reports on the project, and testimony was presented before two Congressional committees (see Appendix XIV). A number of articles are being prepared for publication in professional journals. Activities of this kind will continue for some time to come.

The second task—assessing the potential of the meals system to meet a variety of needs, particularly in the public sector—is presently underway.

Testimony to the U.S. Senate Select Committee on Nutrition and Human Needs preceded the introduction of the “National Meals-on-Wheels Act of 1976” in both Houses of Congress (S.3585, H.14450). The general thrust of this legislation is to improve nutritional services for the homebound elderly and thereby reduce the need for premature institutional care. A national demonstration of the meals system was proposed as part of the legislation:

The bill would establish a demonstration project to study the National Aeronautics and Space Administration Meal Systems for the Elderly . . . The NASA Meal System can effectively serve those persons who are geographically isolated, live in areas where no program exists, or are on waiting lists of programs with limited case loads.

The pilot project would be conducted in portions of three States, chosen to provide an appropriate mix of rural and urban environments. Each demonstration project will include a medical evaluation to assess, at minimal inconvenience to the participants, the health benefits of nutritional support for the elderly.

At the conclusion of the demonstration project, the Commissioner (Administration on Aging, HEW) shall report the results to Congress, together with recommendations for legislation which he deems appropriate. (Senator George McGovern on introducing S. 3585, *Congressional Record*, June 17, 1976, p. S9755).

The proposed legislation did not reach the floor for decision in either the House or Senate during the remaining months of the 94th Congress. However, the legislation is expected to be re-introduced early in 1977. The information and experience gained through the NASA demonstration of the meals system will be at the disposal of those planning the larger demonstration proposed by the Congress.

A number of local, state, and federal agencies have expressed interest in initiating demonstration projects of their own which would test the applicability of the system for a variety of user groups. The Veterans Administration, for example, is considering a project involving a substantial

group of their homebound patients. For projects of this kind, the Johnson Space Center in Houston is prepared to make available its expertise and to establish contacts between user agencies and industry for production of the required number of meal units. The possibility of pooling requests of this nature, thus reducing production costs due to economies of scale, is being discussed.

The culmination of the LBJ School/NASA efforts will be a jointly sponsored conference, to be held in the Spring of 1977. The conference will focus on the potential of the meals system to meet a variety of needs in the public sector and will provide a forum for industry-government dialogue.

CONCLUSION

The long process of technology transfer, in the case of the meal system, is still in its early stages. All those associated with the project realize that this process is dependent on social and economic arrangements for making use of a new technical concept. The technological changes which are embodied in the meals system are simple and almost trivial: they consist of nothing more than reduction in size of food containers and assembling different food items into full meal units. These simple innovations now need to be tested for a variety of social uses, all necessitating some rethinking of delivery systems and "consumer" relations. What made sense for the user group of the elderly may not make sense for other groups. In each case, the social need to be served and the institutional mechanisms to achieve this goal have to receive detailed attention. The meal system has real potential when the technology used in the NASA meal system can help in meeting concrete social or economic needs.

APPENDIX I

NASA MEAL SYSTEM FOR THE ELDERLY—PROJECT SCHEDULE

| PROJECT OVERVIEW | | | | | | | | | | | | | NASA MEAL SYSTEM FOR THE ELDERLY | | | | | | | | | | | | | |
|---------------------------------------|------|---|---|---|---|---|---|---|---|---|---|---|----------------------------------|------|---|---|---|---|---|---|---|---|---|---|--|--|
| Milestones | 1975 | | | | | | | | | | | | | 1976 | | | | | | | | | | | | |
| | J | F | M | A | M | J | J | A | S | O | N | D | J | F | M | A | M | J | J | A | S | O | N | D | | |
| Phase I System Development | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Phase II Preliminary Demonstration | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Phase III Field Demonstration | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Phase IV Program Assessment | | | | | | | | | | | | | | | | | | | | | | | | | | |

| PHASE I: SYSTEM DEVELOPMENT | | | | | | | | | | | | | NASA MEAL SYSTEM FOR THE ELDERLY | | | | | | | | | | | | | |
|--|------|---|---|---|---|---|---|---|---|---|---|---|----------------------------------|------|---|---|---|---|---|---|---|---|---|---|--|--|
| Milestones | 1975 | | | | | | | | | | | | | 1976 | | | | | | | | | | | | |
| | J | F | M | A | M | J | J | A | S | O | N | D | J | F | M | A | M | J | J | A | S | O | N | D | | |
| Preference and Attitude Survey | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Food System Design | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Food Selection, Technical Taste Test and Menu Development | | | | | | | | | | | | | | | | | | | | | | | | | | |
| User Taste Test | | | | | | | | | | | | | | | | | | | | | | | | | | |

| PHASE II: PRELIMINARY DEMONSTRATION | | | | | | | | | | | | | NASA MEAL SYSTEM FOR THE ELDERLY | | | | | | | | | | | | | |
|---|------|---|---|---|---|---|---|---|---|---|---|---|----------------------------------|------|---|---|---|---|---|---|---|---|---|---|--|--|
| Milestones | 1975 | | | | | | | | | | | | | 1976 | | | | | | | | | | | | |
| | J | F | M | A | M | J | J | A | S | O | N | D | J | F | M | A | M | J | J | A | S | O | N | D | | |
| Planning | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Participant Selection | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Demonstration | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Quick-Look Evaluation and Program Review | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Final Evaluation and Design Review | | | | | | | | | | | | | | | | | | | | | | | | | | |

| PHASE III: FIELD DEMONSTRATION | | | | | | | | | | | | | NASA MEAL SYSTEM FOR THE ELDERLY | | | | | | | | | | | | | |
|---------------------------------|------|---|---|---|---|---|---|---|---|---|---|---|----------------------------------|------|---|---|---|---|---|---|---|---|---|---|--|--|
| Milestones | 1975 | | | | | | | | | | | | | 1976 | | | | | | | | | | | | |
| | J | F | M | A | M | J | J | A | S | O | N | D | J | F | M | A | M | J | J | A | S | O | N | D | | |
| Implementation Plan Development | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Participant Selection | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Field Worker Training | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Field Demonstration | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Medical Component | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Quick Look Phase III Review | | | | | | | | | | | | | | | | | | | | | | | | | | |

| PHASE IV: PROGRAM ASSESSMENT | | | | | | | | | | | | | NASA MEAL SYSTEM FOR THE ELDERLY | | | | | | | | | | | | | |
|---|------|---|---|---|---|---|---|---|---|---|---|---|----------------------------------|------|---|---|---|---|---|---|---|---|---|---|--|--|
| Milestones | 1975 | | | | | | | | | | | | | 1976 | | | | | | | | | | | | |
| | J | F | M | A | M | J | J | A | S | O | N | D | J | F | M | A | M | J | J | A | S | O | N | D | | |
| Final Report | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Workshops, Conferences* and Seminars | | | | | | | | | | | | | | | | | | | | | | | | | | |

*Conference planning will continue through March 1977.

APPENDIX II

MEAL SYSTEM FOR THE ELDERLY

MENU LISTING AND NUTRITIONAL DATA January, 1976

| | | | |
|--------|---|---------|---|
| Menu 1 | Meat Balls in BBQ Sauce Lima Beans Pineapple Peanut Butter Bar Instant Chocolate Drink | Menu 8 | Noodles and Stroganoff Sauce w/Beef Cottage Cheese Creamed Peas Chocolate Instant Pudding Instant Strawberry Drink |
| Menu 2 | Chicken Stew Tomato Soup Rice and Chicken Lemon Instant Pudding Instant Strawberry Drink | Menu 9 | Beans and Franks in Tomato Sauce Cream of Mushroom Soup Green Beans Diced Peaches Instant Chocolate Drink |
| Menu 3 | Spaghetti and Beef in Tomato Sauce Cream Style Chicken Soup Lima Beans Chocolate Crunch Bar Instant Vanilla Drink | Menu 10 | Boned Chicken 'n Broth Cream Style Corn Stewed Tomatoes Vanilla Pudding Instant Strawberry Drink |
| Menu 4 | Beef Stew Cream Style Corn Mixed Fruit Tapioca Pudding Instant Chocolate Drink | Menu 11 | Vienna Sausage Corn Mixed Vegetables Butterscotch Pudding Hot Cocoa Drink |
| Menu 5 | Chicken a la King Green Pea Soup Corn Peanut Butter Bar Instant Strawberry Drink | Menu 12 | Boned Turkey 'n Broth Sweet Potatoes Green Beans Mixed Fruit Instant Chocolate Drink |
| Menu 6 | Beef and Rice w/Onions Creamed Peas Cottage Cheese Chocolate Crunch Bar Instant Vanilla Drink | Menu 13 | Tuna a la Neptune Bean Soup Chicken Pilaf Lemon Instant Pudding Instant Vanilla Drink |
| Menu 7 | Chili Con Carne w/Beans Macaroni and Cheese Mixed Vegetables Banana Pudding Orange Drink | Menu 14 | Spaghetti and Beef in Tomato Sauce Cream of Mushroom Soup Peas Chocolate Fudge Pudding Instant Strawberry Drink |

MENU LISTING (CONTINUED)

| | | | |
|---------|--|---------|---|
| Menu 15 | Boned Chicken 'n Broth Scalloped Potatoes 'n Ham Mixed Vegetables Peanut Butter Bar Orange Drink | Menu 19 | Chicken a la King Beans w/Tomato Sauce Corn Applesauce Instant Vanilla Drink |
| Menu 16 | Chili-Mac Cream Style Corn Stewed Tomatoes Rice Pudding Instant Vanilla Drink | Menu 20 | Boned Turkey 'n Broth Mixed Vegetables Applesauce Tapioca Pudding Instant Chocolate Drink |
| Menu 17 | Beef Almondine Spring Vegetable Soup Chicken Pilaf Vanilla Instant Pudding Instant Chocolate Drink | Menu 21 | Vienna Sausage Macaroni and Cheese Green Beans Peanut Butter Bar Hot Cocoa Drink |
| Menu 18 | Vegetable Stew w/Beef Tomato Soup Potatoes and Beef w/Onions Vanilla Instant Pudding Instant Chocolate Drink | | |

NOTE: Plans included the possibility of using thermostabilized foods in flexible pouches during the course of the demonstration. Should this have occurred, the following six-menu substitutions would have been made.

| | | | |
|-------------|--|-------------|--|
| Menu 1(FP) | Chicken and Gravy Lima Beans Pineapple Peanut Butter Bar Instant Chocolate Drink | Menu 12(FP) | Beef Loaf Lima Beans Mixed Fruit Chocolate Crunch Bar Instant Chocolate Drink |
| Menu 5(FP) | Beef and Onions Green Pea Soup Corn Peanut Butter Bar Instant Strawberry Drink | Menu 15(FP) | Beef Pattie Scalloped Potatoes Mixed Vegetables French Apple Dessert Instant Vanilla Drink |
| Menu 10(FP) | Ham Pattie Green Beans Beans in Tomato Sauce French Peach Dessert Instant Strawberry Drink | Menu 19(FP) | Frankfurters Beans in Tomato Sauce Corn Applesauce Instant Vanilla Drink |

| | Kcal | gm.Pro | gm.Fat | gm.CHO | mg.Ca | mg.P. | mg.Fe | IU Vit A | mg. Thiamin | mg. Riboflavin | mg. Niacin | mg. Vit C |
|--|-------|--------|--------|--------|--------|--------|-------|-------------|----------------|-------------------|---------------|--------------|
| (1/3 Recommended dietary allowances for males 51 years old or older | 792.0 | 18.50 | ----- | ----- | 264.00 | 264.00 | 3.30 | 1650 | 0.400 | 0.500 | 5.300 | 15.00 |

| Menu No. 1 Food and Description | | Kcal | gm.Pro | gm.Fat | gm.CHO | mg.Ca | mg.P. | mg.Fe | IU Vit A | mg. Thiamin | mg. Riboflavin | mg. Niacin | mg. Vit C |
|------------------------------------|---------|------------|-------------|--------------|---------------|--------------|--------------|--------------|-------------|----------------|-------------------|---------------|--------------|
| Meat Balls in BBQ Sauce | 4.8 oz. | 283 | 20.8 | 10.30 | 15.60 | 38.0 | 172.0 | 2.30 | 582 | 0.070 | 0.240 | 4.62 | 5.00 |
| Lima Beans | 5 oz. | 110 | 6.2 | 0.30 | 21.00 | 32.0 | 81.0 | 2.80 | 218 | 0.030 | 0.060 | 0.60 | 7.00 |
| Pineapple | 5 oz. | 87 | 0.6 | 0.15 | 22.65 | 24.0 | 12.0 | 0.60 | 90 | 0.150 | 0.045 | 0.45 | 15.00 |
| Peanut Butter Bar | 1.5 oz. | 210 | 6.0 | 11.00 | 21.00 | 50.0 | 50.0 | 4.50 | 1000 | 0.300 | 0.090 | 5.00 | 20.25 |
| Chocolate Instant Drink | 8 oz. | 210 | 15.0 | 1.00 | 35.00 | 350.0 | 300.0 | 4.50 | 1500 | 0.390 | 0.540 | 5.00 | 21.15 |
| TOTALS | | 813 | 48.6 | 22.75 | 115.25 | 494.0 | 615.0 | 14.70 | 3390 | 0.940 | 0.975 | 15.67 | 68.40 |

| Menu No. 2 Food and Description | | Kcal | gm.Pro | gm.Fat | gm.CHO | mg.Ca | mg.P. | mg.Fe | IU Vit A | mg. Thiamin | mg. Riboflavin | mg. Niacin | mg. Vit C |
|------------------------------------|-------|------------|--------------|--------------|---------------|---------------|---------------|-------------|---------------|----------------|-------------------|---------------|--------------|
| Chicken Stew | 8 oz. | 216 | 15.68 | 7.84 | 21.52 | 20.03 | 46.85 | 0.32 | 449.8 | 0.038 | 0.060 | 1.89 | 3.30 |
| Tomato Soup | 6 oz. | 80 | 1.00 | 1.00 | 17.00 | 20.00 | ----- | 0.72 | ----- | ----- | 0.036 | 0.80 | ----- |
| Rice 'n Chicken | 8 oz. | 324 | 9.36 | 10.80 | 47.52 | 3.31 | 24.05 | 0.62 | 53.9 | 0.086 | 0.090 | 1.08 | 2.00 |
| Lemon Instant Pudding | 4 oz. | 140 | 4.00 | ----- | 31.00 | 150.00 | 325.00 | ----- | 250.0 | 0.045 | 0.225 | ----- | 0.45 |
| Strawberry Instant Drink | 8 oz. | 210 | 15.00 | 1.00 | 35.00 | 350.00 | 300.00 | 4.50 | 1500.0 | 0.390 | 0.540 | 5.00 | 21.15 |
| TOTALS | | 970 | 45.34 | 20.64 | 152.04 | 543.34 | 695.90 | 6.16 | 2253.7 | 0.559 | .951 | 8.77 | 26.90 |

| Menu No. 3 Food and Description | | Kcal | gm.Pro | gm.Fat | gm.CHO | mg.Ca | mg.P. | mg.Fe | IU Vit A | mg. Thiamin | mg. Riboflavin | mg. Niacin | mg. Vit C |
|------------------------------------|---------|------------|-------------|-------------|--------------|--------------|--------------|--------------|-------------|----------------|-------------------|---------------|--------------|
| Spaghetti 'n Beef | 7.5 oz. | 238 | 11.8 | 14.7 | 27.0 | 26.0 | 128.0 | 2.60 | 1802 | 0.170 | 0.170 | 3.70 | ----- |
| Cream Style Chicken Soup | 6 oz. | 90 | 2.0 | 5.0 | 10.0 | ----- | ----- | ----- | ----- | ----- | 0.060 | 0.32 | ----- |
| Lima Beans | 5 oz. | 110 | 6.2 | 0.3 | 21.0 | 32.0 | 81.0 | 2.80 | 218 | 0.030 | 0.060 | 0.60 | 7.00 |
| Chocolate Crunch Bar | 1.5 oz. | 220 | 6.0 | 12.0 | 21.0 | 50.0 | 50.0 | 4.50 | ----- | 0.300 | 0.090 | 5.00 | ----- |
| Vanilla Instant Drink | 8 oz. | 210 | 15.0 | 1.0 | 35.0 | 350.0 | 300.0 | 4.50 | 1500 | 0.390 | 0.540 | 5.00 | 21.15 |
| TOTALS | | 868 | 41.0 | 33.3 | 114.0 | 458.0 | 559.0 | 14.40 | 3520 | 0.890 | 0.920 | 14.62 | 28.15 |

| Menu No. 4 Food and Description | | Kcal | gm.Pro | gm.Fat | gm.CHO | mg.Ca | mg.P. | mg.Fe | IU Vit A | mg. Thiamin | mg. Riboflavin | mg. Niacin | mg. Vit C |
|------------------------------------|---------|--------------|--------------|--------------|---------------|--------------|--------------|--------------|-------------|----------------|-------------------|---------------|--------------|
| Beef Stew | 7.5 oz. | 186.0 | 16.90 | 5.60 | 16.40 | 38.0 | 73.0 | 2.600 | 4513 | 0.080 | 0.170 | 4.00 | — |
| Cream Style Corn | 5 oz. | 132.3 | 3.15 | 0.60 | 30.00 | — | 94.5 | 0.680 | 189 | 0.038 | 0.090 | 1.26 | 7.08 |
| Mixed Fruit | 5 oz. | 100.0 | — | — | 27.00 | — | — | 0.360 | 200 | — | 0.036 | 0.40 | 45.00 |
| Tapioca Pudding | 5 oz. | 170.0 | 3.00 | 4.00 | 30.00 | 150.0 | 100.0 | 0.360 | — | 0.030 | 0.180 | 0.40 | — |
| Chocolate Instant Drink | 8 oz. | 210.0 | 15.00 | 1.00 | 35.00 | 350.0 | 300.0 | 4.500 | 1500 | 0.390 | 0.540 | 5.00 | 21.15 |
| TOTALS | | 798.3 | 38.05 | 11.20 | 138.40 | 538.0 | 567.5 | 8.500 | 6400 | 0.538 | 1.016 | 11.06 | 73.23 |

| Menu No. 5 Food and Description | | Kcal | gm.Pro | gm.Fat | gm.CHO | mg.Ca | mg.P. | mg.Fe | IU Vit A | mg. Thiamin | mg. Riboflavin | mg. Niacin | mg. Vit C |
|------------------------------------|---------|--------------|--------------|--------------|---------------|--------------|---------------|--------------|---------------|----------------|-------------------|---------------|--------------|
| Chicken a la King | 5.0 oz. | 186.0 | 19.10 | 5.00 | 7.50 | 50.0 | 193.00 | 1.30 | 174.0 | 0.010 | 0.220 | 6.37 | 2.00 |
| Green Pea Soup | 6.0 oz. | 130.0 | 7.00 | 1.00 | 20.00 | 20.0 | — | 1.44 | — | — | 0.144 | 1.20 | — |
| Corn | 5.0 oz. | 98.0 | 2.82 | 0.88 | 23.21 | 5.9 | 71.78 | 0.59 | 400.4 | 0.044 | 0.077 | 1.34 | 7.43 |
| Peanut Butter Bar | 1.5 oz. | 210.0 | 6.00 | 11.00 | 21.00 | 50.0 | 50.00 | 4.50 | 1000.0 | 0.300 | 0.090 | 5.00 | 20.25 |
| Strawberry Instant Drink | 8 oz. | 210.0 | 15.00 | 1.00 | 35.00 | 350.0 | 300.00 | 4.50 | 1500.0 | 0.390 | 0.540 | 5.00 | 21.15 |
| TOTALS | | 834.0 | 49.92 | 18.88 | 106.71 | 475.9 | 614.78 | 12.33 | 3074.4 | 0.744 | 1.071 | 18.91 | 50.83 |

| Menu No. 6 Food and Description | | Kcal | gm.Pro | gm.Fat | gm.CHO | mg.Ca | mg.P. | mg.Fe | IU Vit A | mg. Thiamin | mg. Riboflavin | mg. Niacin | mg. Vit C |
|------------------------------------|---------|--------------|--------------|--------------|---------------|---------------|---------------|--------------|---------------|----------------|-------------------|---------------|--------------|
| Beef & Rice w/Onions | 8 oz. | 256.0 | 13.36 | 5.60 | 38.60 | 7.13 | 48.00 | 1.00 | 3.6 | 0.086 | 0.100 | 1.400 | 2.75 |
| Creamed Peas | 4.5 oz. | 151.9 | 5.30 | 2.80 | 22.30 | 60.10 | 118.41 | 1.12 | 207.0 | 0.095 | 0.080 | 0.910 | 10.50 |
| Cottage Cheese | 5 oz. | 135.0 | 5.28 | 4.92 | 17.43 | 209.00 | 54.00 | 1.18 | — | 0.008 | 0.201 | 0.098 | — |
| Chocolate Crunch Bar | 1.5 oz. | 220.0 | 6.00 | 12.00 | 21.00 | 50.00 | 50.00 | 4.50 | — | 0.300 | 0.090 | 5.000 | — |
| Vanilla Instant Drink | 8 oz. | 210.0 | 15.00 | 1.00 | 35.00 | 350.00 | 300.00 | 4.50 | 1500.0 | 0.390 | 0.540 | 5.000 | 21.15 |
| TOTALS | | 981.9 | 44.94 | 28.82 | 134.33 | 676.23 | 570.41 | 12.30 | 1710.6 | .879 | 1.011 | 12.408 | 34.40 |

| Menu No. 7 Food and Description | | Kcal | gm.Pro | gm.Fat | gm.CHO | mg.Ca | mg.P. | mg.Fe | IU Vit A | mg. Thiamin | mg. Riboflavin | mg. Niacin | mg. Vit C |
|------------------------------------|----------|--------------|--------------|--------------|--------------|--------------|------------|------------|--------------|----------------|-------------------|---------------|---------------|
| Chili Con Carne w/Beans | 7.75 oz. | 295.0 | 17.40 | 14.40 | 23.9 | 77.0 | 227 | 4.7 | 1451 | 0.09 | 0.180 | 5.50 | ----- |
| Macaroni & Cheese | 7.5 oz. | 213.8 | 8.78 | 9.00 | 24.0 | 186.8 | 171 | 0.9 | 248 | 0.11 | 0.225 | 0.90 | ----- |
| Mixed Vegetables | 5 oz. | 100.0 | 5.00 | 0.46 | 20.9 | 39.0 | 98 | 2.0 | 7734 | 0.19 | 0.109 | 1.72 | 12.50 |
| Banana Pudding | 5 oz. | 180.0 | 3.00 | 5.00 | 30.0 | 100.0 | 100 | ----- | ----- | 0.03 | 0.180 | ----- | ----- |
| Orange Drink | 8 oz. | 132.0 | ----- | ----- | 32.8 | 84.0 | 139 | 0.1 | 2077 | ----- | ----- | ----- | 185.00 |
| TOTALS | | 920.8 | 34.18 | 28.86 | 131.6 | 486.8 | 735 | 7.7 | 11510 | 0.42 | 0.694 | 8.12 | 197.50 |

| Menu No. 8 Food and Description | | Kcal | gm.Pro | gm.Fat | gm.CHO | mg.Ca | mg.P. | mg.Fe | IU Vit A | mg. Thiamin | mg. Riboflavin | mg. Niacin | mg. Vit C |
|------------------------------------|---------|--------------|--------------|--------------|---------------|---------------|---------------|-------------|-------------|----------------|-------------------|---------------|--------------|
| Beef Stroganoff | 8 oz. | 240.0 | 10.16 | 12.76 | 23.94 | 15.70 | 37.70 | 0.36 | 71 | 0.020 | 0.040 | 0.590 | .25 |
| Cottage Cheese | 5 oz. | 135.0 | 5.28 | 4.92 | 17.43 | 209.00 | 54.00 | 1.18 | ----- | 0.008 | 0.201 | 0.098 | ----- |
| Creamed Peas | 4.5 oz. | 151.9 | 5.30 | 2.80 | 22.30 | 60.10 | 118.41 | 1.12 | 207 | 0.095 | 0.080 | 0.910 | 10.50 |
| Chocolate Instant Pudding | 4 oz. | 150.0 | 4.00 | 1.00 | 34.00 | 150.00 | 375.00 | ----- | 250 | 0.045 | 0.225 | ----- | .45 |
| Strawberry Instant Drink | 8 oz. | 210.0 | 15.00 | 1.00 | 35.00 | 350.00 | 300.00 | 4.50 | 1500 | 0.390 | 0.540 | 5.000 | 21.15 |
| TOTALS | | 886.9 | 39.74 | 21.88 | 132.67 | 469.80 | 884.81 | 7.16 | 2028 | 0.558 | 1.086 | 6.598 | 32.35 |

| Menu No. 9 Food and Description | | Kcal | gm.Pro | gm.Fat | gm.CHO | mg.Ca | mg.P. | mg.Fe | IU Vit A | mg. Thiamin | mg. Riboflavin | mg. Niacin | mg. Vit C |
|------------------------------------|----------|--------------|--------------|-------------|---------------|------------|---------------|--------------|-------------|----------------|-------------------|---------------|--------------|
| Beans & Franks in Tomato Sauce | 8.75 oz. | 399.0 | 20.40 | 17.7 | 39.14 | 157 | 28.40 | 6.00 | 319 | 0.18 | 0.180 | 2.70 | ----- |
| Cream of Mushroom Soup | 6 oz. | 100.0 | 2.00 | 3.0 | 17.00 | 40 | ----- | ----- | ----- | ----- | 0.108 | 0.40 | ----- |
| Green Beans | 5 oz. | 25.2 | 1.26 | ----- | 5.04 | 38 | 25.20 | 0.90 | 788 | 0.04 | 0.090 | 0.25 | 2.80 |
| Diced Peaches | 5 oz. | 110.0 | ----- | ----- | 28.00 | ----- | ----- | 0.36 | 300 | ----- | 0.360 | 0.80 | 45.00 |
| Chocolate Instant Drink | 8 oz. | 210.0 | 15.00 | 1.0 | 35.00 | 350 | 300.00 | 4.50 | 1500 | 0.39 | 0.540 | 5.00 | 21.15 |
| TOTALS | | 844.2 | 38.66 | 21.7 | 124.18 | 585 | 353.60 | 11.76 | 2907 | 0.61 | 1.278 | 9.15 | 68.95 |

| Menu No. 10 Food and Description | | Kcal | gm.Pro | gm.Fat | gm.CHO | mg.Ca | mg.P. | mg.Fe | IU Vit A | mg. Thiamin | mg. Riboflavin | mg. Niacin | mg. Vit C |
|-------------------------------------|-------|------|--------|--------|--------|-------|-------|-------|-------------|----------------|-------------------|---------------|--------------|
| Chicken 'n Broth | 5 oz. | 215 | 37.50 | 7.0 | — | 20 | 205.0 | 2.00 | 345 | 0.05 | 0.150 | 13.00 | — |
| Cream Style Corn | 5 oz. | 132 | 3.15 | 0.6 | 30.0 | — | 94.5 | 0.68 | 189 | 0.04 | 0.090 | 1.26 | 7.08 |
| Stewed Tomatoes | 5 oz. | 44 | 1.00 | — | 10.0 | 40 | 20.0 | 0.72 | 750 | 0.06 | 0.036 | 0.80 | 15.75 |
| Vanilla Pudding | 5 oz. | 190 | 3.24 | 5.0 | 32.0 | 100 | 100.0 | 4.50 | — | 0.03 | 0.180 | — | — |
| Strawberry Instant Drink | 8 oz. | 210 | 15.00 | 1.0 | 35.0 | 350 | 300.0 | 4.50 | 1500 | 0.39 | 0.540 | 5.00 | 21.15 |
| TOTALS | | 792 | 59.89 | 13.6 | 107.0 | 510 | 719.5 | 12.40 | 2784 | 0.57 | 0.996 | 20.06 | 43.98 |

| Menu No. 11 Food and Description | | Kcal | gm.Pro | gm.Fat | gm.CHO | mg.Ca | mg.P. | mg.Fe | IU Vit A | mg. Thiamin | mg. Riboflavin | mg. Niacin | mg. Vit C |
|-------------------------------------|-------|-------|--------|--------|--------|-------|--------|-------|-------------|----------------|-------------------|---------------|--------------|
| Vienna Sausage | 5 oz. | 360.0 | 21.00 | 29.70 | 0.45 | 12.0 | 299.50 | 3.15 | — | 0.120 | 0.195 | 3.90 | — |
| Corn | 5 oz. | 98.0 | 2.82 | 0.88 | 23.21 | 5.9 | 71.28 | 0.59 | 400.4 | 0.044 | 0.077 | 1.34 | 7.43 |
| Mixed Vegetables | 5 oz. | 100.0 | 5.00 | 0.46 | 20.90 | 39.0 | 98.00 | 2.00 | 7734.0 | 0.190 | 0.109 | 1.72 | 12.50 |
| Butterscotch Pudding | 5 oz. | 180.0 | 3.00 | 5.00 | 31.00 | 100.0 | 100.0 | — | — | 0.030 | 0.180 | — | — |
| Cocoa Drink | 6 oz. | 100.0 | 4.00 | — | 22.00 | 100.0 | — | 0.36 | — | .030 | 0.180 | — | 0.90 |
| TOTALS | | 838.0 | 35.82 | 36.04 | 97.56 | 266.9 | 568.78 | 6.10 | 8134.4 | 0.414 | 0.741 | 6.96 | 20.83 |

| Menu No. 12 Food and Description | | Kcal | gm.Pro | gm.Fat | gm.CHO | mg.Ca | mg.P. | mg.Fe | IU Vit A | mg. Thiamin | mg. Riboflavin | mg. Niacin | mg. Vit C |
|-------------------------------------|-------|-------|--------|--------|--------|-------|-------|-------|-------------|----------------|-------------------|---------------|--------------|
| Turkey w/Broth | 5 oz. | 303.0 | 31.35 | 18.75 | — | 20.0 | 205.0 | 2.10 | 195 | 0.030 | 0.210 | 7.05 | — |
| Sweet Potatoes | 5 oz. | 171.0 | 1.50 | 0.30 | 41.25 | 19.5 | 43.5 | 1.05 | 7500 | 0.045 | 0.045 | 0.90 | 12.00 |
| Green Beans | 5 oz. | 25.2 | 1.26 | — | 5.04 | 38.0 | 25.2 | 0.90 | 788 | 0.040 | 0.090 | 0.25 | 2.80 |
| Mixed Fruit | 5 oz. | 100.0 | — | — | 27.00 | — | — | 0.36 | 200 | — | 0.036 | 0.40 | 45.00 |
| Chocolate Instant Drink | 8 oz. | 210.0 | 15.00 | 1.00 | 35.00 | 350.0 | 300.0 | 4.50 | 1500 | 0.390 | 0.540 | 5.00 | 21.15 |
| TOTALS | | 809.2 | 49.11 | 20.05 | 108.29 | 427.5 | 537.7 | 8.91 | 10,183 | 0.505 | 0.921 | 13.60 | 80.95 |

| Menu No. 13 Food and Description | | Kcal | gm.Pro | gm.Fat | gm.CHO | mg.Ca | mg.P. | mg.Fe | IU Vit A | mg. Thiamin | mg. Riboflavin | mg. Niacin | mg. Vit C |
|-------------------------------------|-------|--------------|--------------|--------------|---------------|--------------|--------------|-------------|---------------|----------------|-------------------|---------------|--------------|
| Tuna a la Neptune | 5 oz. | 157.9 | 12.00 | 5.47 | 15.26 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Bean Soup | 6 oz. | 110.0 | 6.00 | 1.00 | 18.00 | 40.0 | ----- | 1.80 | ----- | ----- | 0.036 | 0.40 | ----- |
| Chicken Pilaf | 8 oz. | 328.0 | 11.76 | 11.76 | 42.78 | 3.7 | 52.8 | .64 | 53.9 | 0.070 | 0.110 | 1.57 | 1.85 |
| Lemon Instant Pudding | 4 oz. | 140.0 | 4.00 | ----- | 31.00 | 150.0 | 325.0 | ----- | 250.0 | 0.045 | 0.225 | ----- | 0.45 |
| Vanilla Instant Drink | 8 oz. | 210.0 | 15.00 | 1.00 | 35.00 | 350.0 | 300.0 | 4.50 | 1500.0 | 0.390 | 0.540 | 5.00 | 21.15 |
| TOTALS | | 945.9 | 48.76 | 19.23 | 142.04 | 543.7 | 677.8 | 6.94 | 1803.9 | 0.505 | 0.911 | 6.97 | 23.45 |

| Menu No. 14 Food and Description | | Kcal | gm.Pro | gm.Fat | gm.CHO | mg.Ca | mg.P. | mg.Fe | IU Vit A | mg. Thiamin | mg. Riboflavin | mg. Niacin | mg. Vit C |
|-------------------------------------|---------|------------|-------------|-------------|--------------|--------------|--------------|-------------|-------------|----------------|-------------------|---------------|--------------|
| Spaghetti 'n Beef | 7.5 oz. | 238 | 11.8 | 14.7 | 27.0 | 26.0 | 128.0 | 2.60 | 1802 | 0.170 | 1.170 | 3.70 | ----- |
| Cream of Mushroom Soup | 6 oz. | 100 | 2.0 | 3.0 | 17.0 | 40.0 | ----- | ----- | ----- | ----- | 0.108 | 0.40 | ----- |
| Peas | 5 oz. | 69 | 4.4 | 0.6 | 12.6 | 25.2 | 63.0 | 1.13 | 630 | 0.095 | 0.090 | 1.00 | 9.92 |
| Chocolate Pudding | 5 oz. | 190 | 4.0 | 6.0 | 31.0 | 100.0 | 100.0 | 1.08 | ----- | 0.030 | 0.180 | 0.40 | ----- |
| Strawberry Instant Drink | 8 oz. | 210 | 15.0 | 1.0 | 35.0 | 350.0 | 300.0 | 4.50 | 1500 | 0.390 | 0.540 | 5.00 | 21.15 |
| TOTALS | | 807 | 37.2 | 25.3 | 122.6 | 541.2 | 591.0 | 9.31 | 3932 | 0.685 | 2.088 | 10.50 | 31.07 |

| Menu No. 15 Food and Description | | Kcal | gm.Pro | gm.Fat | gm.CHO | mg.Ca | mg.P. | mg.Fe | IU Vit A | mg. Thiamin | mg. Riboflavin | mg. Niacin | mg. Vit C |
|-------------------------------------|---------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|----------------|-------------------|---------------|---------------|
| Chicken 'n Broth | 5 oz. | 215.0 | 37.50 | 7.00 | ----- | 20.0 | 205.0 | 2.00 | 345 | 0.050 | 0.150 | 13.00 | ----- |
| Scalloped Potatoes 'n Ham | 7.5 oz. | 209.5 | 16.31 | 2.79 | 23.60 | 71.9 | 149.2 | 2.04 | 181 | .214 | .151 | 1.40 | 18.24 |
| Mixed Vegetables | 5 oz. | 100.0 | 5.00 | 0.46 | 20.90 | 39.0 | 98.0 | 2.00 | 7734 | 0.190 | 0.109 | 1.72 | 12.50 |
| Peanut Butter Bar | 1.5 oz. | 210.0 | 6.00 | 11.00 | 21.00 | 50.0 | 50.0 | 4.50 | 1000 | 0.300 | 0.090 | 5.00 | 20.25 |
| Orange Drink | 10 oz. | 132.0 | ----- | ----- | 32.80 | 84.0 | 139.0 | 0.10 | 2077 | ----- | ----- | ----- | 185.00 |
| TOTALS | | 866.5 | 64.81 | 21.25 | 98.30 | 264.9 | 641.2 | 10.64 | 11,337 | 0.754 | .500 | 21.12 | 235.99 |

| Menu No. 16 Food and Description | | Kcal | gm.Pro | gm.Fat | gm.CHO | mg.Ca | mg.P. | mg.Fe | IU Vit A | mg. Thiamin | mg. Riboflavin | mg. Niacin | mg. Vit C |
|-------------------------------------|---------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-------------|----------------|-------------------|---------------|--------------|
| Chili-Mac | 8.5 oz. | 275.0 | 13.5 | 10.60 | 31.4 | 77.0 | 162.0 | 4.30 | 1250 | 0.170 | 0.170 | 3.30 | — |
| Cream Style Corn | 5 oz. | 132.2 | 3.15 | 0.60 | 30.0 | — | 94.5 | 0.68 | 189 | 0.038 | 0.090 | 1.26 | 7.08 |
| Stewed Tomatoes | 5 oz. | 44.0 | 1.00 | — | 10.0 | 40.0 | 20.0 | 0.72 | 750 | 0.060 | 0.036 | 0.80 | 15.75 |
| Rice Pudding | 5 oz. | 200.0 | 4.00 | 5.00 | 34.0 | 150.0 | 100.0 | — | — | .030 | 0.144 | 0.80 | — |
| Vanilla Instant Drink | 8 oz. | 210.0 | 15.00 | 1.00 | 35.0 | 350.0 | 300.0 | 4.50 | 1500 | 0.390 | 0.540 | 5.00 | 21.15 |
| TOTALS | | 861.2 | 36.65 | 17.20 | 140.4 | 617.0 | 676.5 | 10.20 | 3689 | 0.688 | 0.980 | 11.16 | 43.98 |

| Menu No. 17 Food and Description | | Kcal | gm.Pro | gm.Fat | gm.CHO | mg.Ca | mg.P. | mg.Fe | IU Vit A | mg. Thiamin | mg. Riboflavin | mg. Niacin | mg. Vit C |
|-------------------------------------|-------|--------------|--------------|--------------|---------------|---------------|---------------|-------------|---------------|----------------|-------------------|---------------|--------------|
| Beef Almondine | 6 oz. | 165.0 | 12.96 | 5.87 | 14.54 | — | — | — | — | — | — | — | — |
| Spring Vegetable Soup | 6 oz. | 45.0 | 1.00 | 1.00 | 8.00 | — | — | .36 | — | — | .036 | .40 | — |
| Chicken Pilaf | 8 oz. | 328.0 | 11.76 | 11.76 | 42.78 | 3.70 | 52.80 | .64 | 53.9 | .070 | .110 | 1.57 | 1.85 |
| Vanilla Instant Pudding | 4 oz. | 140.0 | 4.00 | — | 31.00 | 150.00 | 325.00 | — | 250.0 | 0.045 | 0.225 | — | 0.45 |
| Chocolate Instant Drink | 8 oz. | 210.0 | 15.00 | 1.00 | 35.00 | 350.00 | 300.00 | 4.50 | 150.0 | 0.390 | 0.540 | 5.00 | 21.15 |
| TOTALS | | 888.0 | 44.72 | 19.63 | 131.32 | 503.70 | 677.80 | 5.50 | 1703.9 | 0.505 | 0.911 | 6.97 | 23.45 |

| Menu No. 18 Food and Description | | Kcal | gm.Pro | gm.Fat | gm.CHO | mg.Ca | mg.P. | mg.Fe | IU Vit A | mg. Thiamin | mg. Riboflavin | mg. Niacin | mg. Vit C |
|-------------------------------------|-------|------------|--------------|--------------|---------------|---------------|---------------|-------------|---------------|----------------|-------------------|---------------|--------------|
| Vegetable Stew w/Beef | 8 oz. | 216 | 12.00 | 7.12 | 25.52 | 6.98 | — | 0.45 | 505.9 | 0.040 | 0.026 | 0.56 | 2.75 |
| Tomato Soup | 6 oz. | 80 | 1.00 | 1.00 | 17.00 | 20.00 | — | 0.72 | — | — | 0.036 | 0.80 | — |
| Potatoes w/Beef | 8 oz. | 288 | 14.10 | 13.32 | 27.90 | 42.30 | 162.00 | 2.17 | — | 0.085 | 0.187 | 3.14 | 23.64 |
| Vanilla Instant Pudding | 4 oz. | 140 | 4.00 | — | 31.00 | 150.00 | 325.00 | — | 250.0 | 0.045 | 0.225 | — | 0.45 |
| Chocolate Instant Drink | 8 oz. | 210 | 15.00 | 1.00 | 35.00 | 350.00 | 300.00 | 4.50 | 1500.0 | 0.390 | 0.540 | 5.00 | 21.15 |
| TOTALS | | 934 | 46.10 | 22.44 | 136.42 | 569.28 | 787.00 | 7.84 | 2255.9 | 0.560 | 1.014 | 9.50 | 47.99 |

| Menu No. 19 Food and Description | | Kcal | gm.Pro | gm.Fat | gm.CHO | mg.Ca | mg.P. | mg.Fe | IU Vit A | mg. Thiamin | mg. Riboflavin | mg. Niacin | mg. Vit C |
|-------------------------------------|-------|--------------|--------------|-------------|---------------|--------------|---------------|-------------|----------------|----------------|-------------------|---------------|--------------|
| Chicken a la King | 5 oz. | 186.0 | 19.10 | 5.00 | 7.50 | 50.0 | 193.00 | 1.30 | 174.00 | 0.010 | 0.220 | 6.37 | 2.00 |
| Beans in Tomato Sauce: | 5 oz. | 204.0 | 10.35 | 1.95 | 36.30 | 85.5 | 196.50 | 2.55 | 424.50 | 0.135 | 0.050 | 1.35 | ---- |
| Corn | 5 oz. | 98.0 | 2.82 | 0.88 | 23.21 | 5.9 | 71.28 | 0.59 | 400.40 | 0.044 | 0.077 | 1.34 | 7.43 |
| Applesauce | 5 oz. | 135.2 | 0.30 | 0.15 | 35.34 | 5.9 | 7.48 | 0.75 | 59.40 | 0.030 | 0.015 | ---- | 1.49 |
| Vanilla Instant Drink | 8 oz. | 210.0 | 15.00 | 1.00 | 35.00 | 350.0 | 300.00 | 4.50 | 1500.00 | 0.390 | 0.540 | 5.00 | 21.15 |
| TOTALS | | 833.2 | 47.57 | 8.98 | 137.35 | 497.3 | 768.26 | 9.69 | 2558.30 | 0.609 | 0.902 | 14.06 | 32.07 |

| Menu No. 20 Food and Description | | Kcal | gm.Pro | gm.Fat | gm.CHO | mg.Ca | mg.P. | mg.Fe | IU Vit A | mg. Thiamin | mg. Riboflavin | mg. Niacin | mg. Vit C |
|-------------------------------------|-------|--------------|--------------|--------------|---------------|--------------|--------------|-------------|-------------|----------------|-------------------|---------------|--------------|
| Turkey w/Broth | 5 oz. | 303.0 | 31.35 | 18.75 | ---- | 20.0 | 205.0 | 2.10 | 195 | 0.030 | 0.210 | 7.05 | ---- |
| Mixed Vegetables | 5 oz. | 100.0 | 5.00 | 0.46 | 20.90 | 39.0 | 98.0 | 2.00 | 7734 | 0.190 | 0.109 | 1.72 | 12.50 |
| Applesauce | 5 oz. | 137.6 | 0.30 | 0.15 | 35.99 | 6.0 | 7.6 | 0.75 | 60 | 0.030 | 0.015 | ---- | 1.50 |
| Tapioca Pudding | 5 oz. | 170.0 | 3.00 | 4.00 | 30.00 | 150.0 | 100.0 | 0.36 | ---- | 0.030 | 0.180 | 0.40 | ---- |
| Chocolate Instant Drink | 8 oz. | 210.0 | 15.00 | 1.00 | 35.00 | 350.0 | 300.0 | 4.50 | 1500 | 0.390 | 0.540 | 5.00 | 21.15 |
| TOTALS | | 920.6 | 54.65 | 24.36 | 121.89 | 565.0 | 410.6 | 9.71 | 9489 | 0.670 | 1.054 | 14.17 | 35.15 |

| Menu No. 21 Food and Description | | Kcal | gm.Pro | gm.Fat | gm.CHO | mg.Ca | mg.P. | mg.Fe | IU Vit A | mg. Thiamin | mg. Riboflavin | mg. Niacin | mg. Vit C |
|-------------------------------------|---------|--------------|--------------|-------------|--------------|------------|--------------|-------------|-------------|----------------|-------------------|---------------|--------------|
| Vienna Sausage | 5 oz. | 360.0 | 21.00 | 29.7 | 0.45 | 12 | 299.5 | 3.15 | ---- | 0.12 | 0.195 | 3.90 | ---- |
| Macaroni & Cheese | 7.5 oz. | 213.8 | 8.78 | 9.0 | 24.00 | 186 | 171.0 | 0.90 | 248 | 0.11 | 0.225 | 0.90 | ---- |
| Green Beans | 5 oz. | 25.2 | 1.26 | ---- | 5.04 | 38 | 25.2 | 0.90 | 788 | 0.04 | 0.090 | 0.25 | 2.80 |
| Peanut Butter Bar | 1.5 oz. | 210.0 | 6.00 | 11.0 | 21.00 | 50 | 50.0 | 4.50 | 1000 | 0.30 | 0.090 | 5.00 | 20.25 |
| Cocoa Drink | 6 oz. | 100.0 | 4.00 | ---- | 22.00 | 100 | ---- | 0.36 | ---- | 0.03 | 0.180 | ---- | 0.90 |
| TOTALS | | 909.0 | 41.04 | 49.7 | 72.49 | 386 | 545.7 | 9.81 | 2036 | 0.60 | 0.780 | 10.05 | 23.95 |

APPENDIX III

PARTICIPANT APPLICATION AND AGREEMENT FORMS

NAME _____ AGE _____ BIRTHDATE _____

ADDRESS _____

CITY _____ ZIP _____ PHONE # _____

ETHNICITY _____ DATE _____ SEX _____

INTERVIEWER'S NAME _____ SOCIAL SECURITY # _____

1. FINANCIAL RESOURCES: (INDICATE MONTHLY AMOUNT) SSI _____ SS _____
MEDICARE _____ MEDICAID _____ PENSION _____ OTHER (SPECIFY) _____

2. MONTHLY EXPENSES: (INDICATE MONTHLY AMOUNT) RENT _____
UTILITIES _____ FOOD STAMPS _____ DR. OR DRUGS _____ TAXES _____
INSURANCE _____ FOOD AND NECESSITIES _____ OTHER _____

3. DOES APPLICANT LIVE ALONE? _____ IF NOT, WHO LIVES WITH THIS PERSON?
GIVE ANY RELEVANT DETAILS _____

4. DOES THE APPLICANT HAVE A CAR? _____ IS HE/SHE ABLE TO DRIVE? _____
DOES HE/SHE DO ROUTINE SHOPPING _____ ALONE? _____ WITH HELP? _____
HOW OFTEN? _____ WHERE? _____

5. CAN THE APPLICANT READ AND/OR WRITE? _____ HOW MANY YEARS OF
EDUCATION HAS HE/SHE HAD? _____

6. HOW FAR IS THE APPLICANT FROM HIS/HER MAILBOX? _____

7. WHERE IS THE APPLICANT LOCATED IN RELATION TO A POPULATION CENTER?

8. DOES THE APPLICANT HAVE ANY DIETARY RESTRICTIONS? _____
DIABETIC _____ CALORIC INTAKE/DAY _____ SODIUM RESTRICTION _____
_____ GRAM INTAKE _____ OTHER (SPECIFY) _____

9. DATE OF LAST MEDICAL CONTACT _____ NAME OF DOCTOR _____

10. WHAT SERVICES HAS THE APPLICANT RECEIVED IN THE PAST FIVE YEARS?

IN THE LAST 6 MONTHS _____

11. HOW HAS APPLICANT MANAGED TO DATE? WHAT CONTACTS DOES HE/SHE HAVE
WITH FRIENDS, FAMILY, ETC.? _____

12. ANY OTHER INFORMATION THAT WOULD BE HELPFUL IN UNDERSTANDING THE
APPLICANT'S SITUATION? _____

13. DOES THE APPLICANT HAVE A: STOVE____HOT PLATE____REFRIGERATOR____
 RUNNING WATER____COOKING UTENSILS____

 NET INCOME____APPLICANTS NAME CAME FROM: SITE COORDINATOR____
 OUTREACH WORKER____SERVICE WAITING LIST____OTHER____

NASA, the LBJ School of Public Affairs, and United Action for the Elderly (UAE) have joined in a venture to deliver shelf-stable, nutritious meals to homebound elderly persons with no known dietary restrictions. Each meal will provide at least 1/3 of the daily recommended dietary allowance for your age group. In addition, all foods and packaging you will receive have been approved by the Food and Drug Administration (FDA).

This program seeks to know. . .

1. If the food is acceptable (tastes good, easily chewed, etc.)
2. If the food is easy to prepare
3. If the packaging is easy to open
4. If the packaging is convenient for storage purposes

Your name has been suggested as a participant in this project. Knowing the purposes of the project, as outlined above, we would like to have your consent to participate in it. You will be provided with one meal a day, * for **. The meal packages will be delivered to you once a week. If you agree to participate, we would like your comments on the meals, the meal packaging, the system of delivery, and the overall program.

All personal information you may provide us will remain strictly confidential. Your name will not be used in any report or description of the project. You have the right to withdraw from the project at any time.

Having read and understood the above, and having had the possible and attendant risks explained to me, I agree to participate in the NASA, LBJ School, UAE project in Meal Systems for the Elderly.

FILL IN THE APPROPRIATE BLANK

*seven days a week
 *two days a week

**nine weeks
 **fifteen weeks

 Signature of Subject

 Date

 Signature of Witness

APPENDIX IV

RES 23
MEAL 6 A

MEAL EVALUATION FORM—2 WEEK DEMONSTRATION

NAME _____ DATE _____

1. PLEASE FILL IN THE TIME OF DAY YOU ATE THIS MEAL

_____ A.M. _____ P.M.

PLEASE CIRCLE ONE ANSWER FOR EACH OF THE FOLLOWING QUESTIONS

2. THIS MEAL WAS EATEN ON

MON TUES WED THURS FRI SAT SUN

3. OPENING THE INDIVIDUAL FOOD PACKAGES WAS

EASY A LITTLE HARD VERY HARD

COMMENTS _____

4. PREPARING THE FOOD ITEMS WAS

EASY A LITTLE HARD VERY HARD

COMMENTS _____

CIRCLE THE ANSWER THAT BEST DESCRIBES YOUR FEELING ABOUT EACH FOOD ITEM.

| | HOW FOOD TASTES | | | HOW FOOD LOOKS | | |
|--------------------------|-----------------|------|------|----------------|------|------|
| 5. BEEF & RICE W/ ONIONS | GOOD | FAIR | POOR | GOOD | FAIR | POOR |
| 6. PEAS | GOOD | FAIR | POOR | GOOD | FAIR | POOR |
| 7. COTTAGE CHEESE | GOOD | FAIR | POOR | GOOD | FAIR | POOR |
| 8. CHOCOLATE CRUNCH BAR | GOOD | FAIR | POOR | GOOD | FAIR | POOR |
| 9. VANILLA DRINK | GOOD | FAIR | POOR | GOOD | FAIR | POOR |

10. AS A WHOLE, THE MEAL WAS

GOOD FAIR POOR

COMMENTS _____

11. DID THIS MEAL GIVE YOU ENOUGH TO EAT? YES NO

COMMENTS _____

12. WHICH FOOD ITEMS DID YOU HAVE LEFT OVER? _____

WHY? _____

13. WHICH FOOD ITEM DID YOU LIKE THE MOST? _____

WHY? _____

14. WHICH FOOD ITEM DID YOU LIKE THE LEAST? _____

WHY? _____

15. WHAT ELSE HAVE YOU EATEN TODAY? _____

16. WHAT ELSE DO YOU PLAN TO EAT TODAY? _____

17. WOULD YOU LIKE TO EAT THIS MEAL AGAIN? YES NO

WHY? _____

18. WHAT ARE YOUR OVERALL COMMENTS ABOUT THIS MEAL (FOOD, PACKAGING, PREPARATION, ETC)

RES
MEAL 6 A

LA FORMA DE EVALUCATION DE COMIDA

NOMBRE _____ FECHA _____

1. POR FAVOR DE INDICAR LA HORA EN QUE TOMÓ ESTOS ALIMENTOS.

_____ A.M. _____ P.M.

POR FAVOR MARQUE LA RESPUTA INDICADA

2. ¿EN QUE DÍA TOMÓ ESTOS ALIMENTOS?

LUN MAR MIE JUE VIE SAB DOM

3. ¿TUVO DIFICULTAD AL ABRIR LOS PAQUETES?

NO SI-POCA SI-MUCHA

COMENTARIOS _____

4. ¿TUVO DIFICULTAD EN LA PREPARACIÓN DE LOS ALIMENTOS?

NO SI-POCA SI-MUCHA

COMENTARIOS _____

POR FAVOR MARQUE LA RESPUTA INDICADA

| | ESTABA SABROSA | | | SE MIRA | | |
|----------------------------|----------------|---------|------|---------|---------|------|
| 5. RES CON ARROZ Y CEBOLLA | BUENO | REGULAR | MALO | BUENO | REGULAR | MALO |
| 6. CHICHAROS | BUENO | REGULAR | MALO | BUENO | REGULAR | MALO |
| 7. QUESO DESCREMADA | BUENO | REGULAR | MALO | BUENO | REGULAR | MALO |
| 8. POSTRE DE CHOCOLATE | BUENO | REGULAR | MALO | BUENO | REGULAR | MALO |
| 9. BEBIDA DE VAINILLA | BUENO | REGULAR | MALO | BUENO | REGULAR | MALO |

10. LA COMIDA ENTERA FUE

BUENA REGULAR MALA

COMENTARIOS _____

11. ¿QUEDO USTED SATISFECHO DESPUES DE ESTA COMIDA? SI NO

COMENTARIOS _____

12. ¿SOBRO COMIDA? SI NO ¿QUE PLATILLO SOBRARON? _____
¿PORQUE? _____
13. ¿QUE PLATILLO LE GUSTO MAS? _____
¿PORQUE? _____
14. ¿QUE PLATILLO NO LE GUSTO? _____
¿PORQUE? _____
15. ¿QUE MAS HA COMIDO USTED HOY? _____

16. ¿QUE MAS VA A COMER USTED HOY? _____

17. ¿LE GUSTARIA COMER ETOS PLATILLOS OTRA VEZ? SI NO
¿PORQUE? _____
18. SI USTED DESEA, DUEDE COMENTAR SOBRE LA COMIDA EN GENERAL.

APPENDIX V

POST-DEMONSTRATION QUESTIONNAIRE—2 WEEK DEMONSTRATION

PARTICIPANT'S NAME

PARTICIPANT'S ADDRESS

INTERVIEWER

DATE

Overall Program Evaluation

1. What did you think about this meals program?
2. What did you like most about this program?
3. What did you like least about the program?
4. Would you continue in this meals program if you could? YES NO
If not, why?
5. Would you recommend this food program to your friends? YES NO
6. Did you enjoy the kind of food in this program? YES NO
7. Some people prefer either the canned or the freeze-dried food. Which did you prefer?
CANNED FREEZE-DRIED (circle one)
8. How similar was this food to the food that you ordinarily eat?
9. Was there anything that kept you from using and enjoying these meals? YES NO
Comments:
10. Would you like to eat this type of meal every day? YES NO
Comments:
11. Did these meals cause constipation? YES NO
12. Did these meals cause any other health problems? YES NO
If so, what?
13. Has this meals program changed your eating habits? YES NO
How?

14. Describe the difference in each meal. (Breakfast, Lunch, Supper:)
15. Describe the meals that you ate the day after you completed this program: (Breakfast, Lunch, Supper)
16. If you had the chance, would you spend the amount you presently spend on a meal on buying a meal of the type used in this program? YES NO
17. If you receive food stamps, would you use food stamps for these meals? YES NO
18. Would you have friends/family over for a meal if you had extra meals of this type? YES NO
19. If you could, would you like more than one of this type of meals per day? YES NO
20. As a result of your participation in this program, did you use as many food stamps as usual this month?
YES NO
21. Did these meals give enough to eat? YES NO
Comments:
22. Did you generally prepare all the food items at one time? YES NO
23. Was this too much to eat in any one meal? YES NO
Which ones?
24. Did you usually eat the entire meal at each single setting? YES NO
Comments:
25. What did you do with leftovers?
26. Did you often save something from the meal for a snack? YES NO
What did you save?
27. Did you ever prepare one part of the meal and eat it, then go back later and prepare another part and eat it?
YES NO If yes, describe:
28. Did you ever select meal items from different packages to put together to make your meal? YES NO
Why?
29. Did you usually eat these meals in: Morning Mid-day Evening? (circle one)
30. Did you add any seasoning to the food? YES NO What?
31. Did you supplement these meals with any other foods (e.g. bread/butter, crackers, milk, coffee, tea)?
YES NO What?
32. Were you able to prepare the foods at the temperature that was satisfactory to you? YES NO
Comments:
33. Did you cool any part of the meal (e.g. drinks, pudding)? YES NO
Which parts?
34. Did you use the drinks in these meals? YES NO
If not, why?

35. Do you have a measuring cup? YES NO

36. Did you have any trouble with measuring hot water and preparing the dehydrated foods? YES NO

Comments:

37. Were the meal menus worked out to provide you with enough variety from day to day? YES NO

38. What were your favorite—meals?

food items?

39. What were your least favorite—meals?

food items?

40. Did you eat the nuts? YES NO

If not, why?

41. Was there anything that you didn't like about the appearance, smell, or texture of these meals? YES NO

What?

42. Did you eat the meals in numerical order (1 through 7)? YES NO

If not, what order did you use?

Packaging and Preparation

43. What did you like about the food packaging?

44. What did you dislike about the food packaging?

45. Was it convenient to have a whole meal in one package? YES NO
Why?

46. Did you have any difficulty carrying or opening the seven-day (large) food package? YES NO

Suggested changes:

47. Did you have any trouble with the individual meal boxes or wrappers? YES NO

Suggested changes:

48. Did you understand the instructions on the meal box? YES NO

If not, why?

49. Were the instructions on the individual food items understandable? YES NO
If not, why?

50. Could you read the labels on the boxes and food items? YES NO
If not, why?

51. Did you make use of the plastic tray provided in each meal? YES NO
How?

52. Was the tray and its compartments big enough? YES NO
53. Did you have any problems with the tray? YES NO Describe:
54. Did you have any difficulty opening any of the cans or individual food item packages? YES NO
Describe:
55. Did you spill any food when opening the pop-top cans? YES NO
56. If you could receive meals like these in the mail, would you like that? YES NO
57. Would you rather have the meals personally delivered? YES NO
58. Would you rather pick the meals up yourself? YES NO
59. What did you think about the method of delivery?

Mobility and Self-Sufficiency

60. Do you have difficulty getting around the house? YES NO
Why?
61. Do you leave your house for errands? YES NO
62. Do you drive?
63. Do you have a car?
64. Do you walk to your neighbor's house? YES NO
65. Do you walk to the grocery store? YES NO
66. How far is the nearest grocery store or supermarket that you use the most?
How do you get your groceries home from the store?
67. How often do you go to the grocery store?
68. Do you usually cook for yourself? YES NO
69. Do you have a relative or friend who cooks for you or helps around the house? YES NO
70. How many times per week do you prepare a full meal for yourself?
71. Do you often just fix a snack or a sandwich for yourself instead of a full meal? YES NO
72. Do you have trouble using your stove? YES NO If so, why?
73. Did you have enough pans to prepare these meals? YES NO
74. Was there any problem cleaning up after any of these meals? YES NO
75. Did you have someone help you fill out the evaluation forms included in the meal packages?
YES NO Who?
76. Do you have difficulty reading?
77. Do you have difficulty writing?

78. Are you able to make your bed and change the sheets? YES NO
79. Do you have any difficulty with a can opener? YES NO
80. Do you get food stamps? YES NO
81. Do you go to the post office for food stamps? YES NO
If no, who picks them up for you?
82. Do you have dentures? YES NO
83. Did your dentures prevent you from enjoying any part of these meals? YES NO
Which food items?
84. Do you have a full set of teeth? YES NO

Alternate Care

85. Does anyone help you with your household chores? YES NO
Who?
86. Have you been in a hospital or nursing home recently? YES NO
When?
87. Does a public nurse come into your home? YES NO
How often?
88. Do you participate in community activities with other elderly persons? YES NO
89. Have you heard about meals-on-wheels, group dining, or congregated meals programs? YES NO
90. Have you participated in any of these programs? YES NO

Interview Opinion

91. Where on a continuum between complete independence of outside household assistance and total dependence would you rate this person?

Independence Dependence
5 4 3 2 1

92. Could the participant hear well? YES NO
93. Is the mailbox of this participant of adequate size to accomodate the seven-day meal package?
YES NO
94. How far is this person's mailbox from his/her house?
95. What was the climate of this interview (e.g. friendly, hostile, defensive)?
96. General Comments:

Time interview took:

SIGNATURE OF INTERVIEWER:

APPENDIX VI

PARTICIPANT APPLICATION FORM—63 DAY DEMONSTRATION

Field Location _____
 Interviewer _____
 Date of Interview _____
 Participant Referred By _____

1. Name _____
 Address _____ Phone _____
 City _____ County _____ Zip _____

2. Age _____ Birthdate _____ Sex _____

3. Ethnic I.D. _____ S.S. # _____

4. Diet Restrictions Yes _____ No _____
 Are you on a Special Diet or supposed to be?
 Yes _____ No _____
 Type _____
 Self Report _____ M.D. Certificate _____

5. Name of Doctor _____
 Address _____

6. Date last visit/medical contact _____

7. Have you been hospitalized within the last year?
 Yes _____ No _____ For what Medical Condition _____

8. Have you ever had a major operation? Yes _____ No _____
 For what reason _____

9. Are you taking medicines? Yes _____ No _____
 Name _____

Sub Group
 R Sm T U

10. Are you taking a Mineral or Vitamin supplement?
 Yes _____ No _____ Name _____

11. Willing to undergo Medical: Yes _____ No _____
 (Expense and transportation provided)

12. Number of Occupants in Residence _____
 Includes Spouse Yes _____ No _____

13. Extent of Contact: Family/Neighbors/Church? _____

14. Routine Shopping: Yes _____ No _____
 How Often _____
 Who Helps _____

15. Have garden or access to fresh vegetables: Yes _____ No _____
 Raise chickens? Yes _____ No _____

16. Drives _____ Have Car _____

17. Read: Spanish _____ English _____
 Write: Spanish _____ English _____

18. Stove _____ Hot Plate _____
 Refrigerator _____ Cooking Utensils _____
 Measuring Cup _____

19. Financial Resources: SSI _____ SS _____
 Pension _____ Other _____ Medicaid _____
 Medicare _____ Food Stamps _____

20. Social Agency Contact:
 Public Health _____ # Times _____
 Housekeeping _____ # Times _____
 Transportation _____ # Times _____
 Social Service _____
 Counseling _____ # Times _____

21. Do you prepare your own meals? Yes _____ No _____

22. Type of food (you) prepare and eat:
 (hot meals) _____

23. When do you eat your main meal of the day? _____

24. Are there any foods that disagree with you?
 Name _____

25. Do you have any allergies to food?
 Name _____

26. Have you ever participated in a meals program before?
 Yes _____ No _____
 Type _____

Describe in detail the physical and/or mental disabilities or
 abilities of the person. _____

Interviewer's Comments _____

APPENDIX VII

FIELD NETWORK

| Site | Contact Agency | Site Coordinators | Areas Involved | Field Coordinators | LBJ School Coordinators |
|-------------------|---|---|---|--|--------------------------------|
| San Saba County | Hill Country Community Action Agency Box 846 San Saba/76877 | Maureen Romero Louise Long | San Saba Richland Springs Cherokee | Martha Jones Vada Taylor HCCAA | Joe Motter |
| Waco/Falls County | Area Agency on Aging/Hot Cog Kathey Terrel Director 110 South 12th St. Waco/76701 | Lynn Pearson | Waco Marlan Satin Lott Rosebud | Minny Maloy Waco Meals on Wheels Gladys Reyes Marlon Senior Citizens | Peggy Wilson |
| 72 5-County Area | Community Council of South Central Texas R. A. Sanders Director New Braunfels/78130 | R. A. Sanders | Atascosa County Karnes County Wilson County Comal County Guadalupe County | David Davidson Elline Schmidt Eva Travieso R. A. Sanders Garner Anderson | Barbara Dydek Dan Casey |
| Bastrop County | Community Action Agency of Bastrop Steve Quitta Director P. O. Box 753 Smithville/78957 | Steve Quitta | Elgin Smithville Bastrop | Bobby Hatch Willie Mae Harris Frances Hornsby | Al Giles |
| Travis County | United Action for the Elderly, Inc. Janet Perino Director P. O. Box 6235 Austin/78762 | Sandra Cohen Caroline Ward Janet Perino | Pflugerville/ King's Village Clarksville | Caroline Ward | Al Giles |

| Site | Contact Agency | Site Coordinators | Areas Involved | Field Coordinators | LBJ School Coordinators |
|---------------------------|--|---|---|--------------------|------------------------------|
| <i>ALTERNATE CARE</i> | | | | | |
| Paris | D.P.W. Bobby Kennedy | | Paris | | Francine Pegues |
| Austin Home Health | Schlesinger Home Care 600 West 28th Austin/78705 | Ruth Siler | Austin | | Hanna Eisner Rita Seymour |
| Travis/Bastrop | Girling Home Health Services, Inc. 4205 Marathon Austin/78756 | Jolie Hutchison Deborah Hodson, R.N. Betty Brooks Ben Garcia | Austin | | Hanna Eisner Rita Seymour |
| <i>TWO-DAY SUPPLEMENT</i> | | | | | |
| Austin | United Action for the Elderly, Inc. Janet Perino Director P. O. Box 6235 Austin/78762 | Caroline Ward | Edna Youngblood Meals on Wheels Sandra Brooks Suzanne DeLunne Austin Adult Day Care | | John Hunt |
| Houston | Harris County Senior Citizens Program 406 Caroline, Room 201 Houston/77002 | Margaret Sharp Karen Absher | Harris County Senior Luncheon Project (Houston) | | Julius Whittier |

APPENDIX VIII

MEDICAL COMPONENT

I. PURPOSE AND GOALS

The original March, 1975, implementation plan for the Meals for the Elderly Program specified that only persons able to tolerate a normal diet could participate in the project. No provision would be made for special diets required by persons suffering from such medical conditions as diabetes, extreme hypertension, or ulcers.

Over the summer and fall of 1975, the LBJ School began to consider the type of medical clearance which would be required of potential participants. At that same time, interest was expressed in gathering medical-nutritional information on the elderly involved in the feeding program, and if possible, in measuring any change in their physical status which might be attributable to participation in the meals program.

The need for medical clearance of each participant was underscored by events during the two-week pilot demonstration when four persons dropped out of the project for health reasons. All four had a medical condition which restricted their diets although none had acknowledged them at the time of their application interview. These cases pointed out the need for systematic medical clearance for participants in the 63-day demonstration.

The search for a group which could carry out the medical-nutritional evaluation began in the fall of 1975. In January, the LBJ School contracted with the University of Texas Medical Branch (UTMB) at Galveston to perform medical-nutritional evaluations before and after the long-term demonstration.

II. IMPLEMENTATION

Medical clearance was required of every participant receiving daily meals. Clearance could be obtained through medical certification by a private physician or through the medical-nutritional evaluation conducted by the UTMB team. Applicants who obtained a private physician's clearance were invited to also undergo the UTMB exam for the following reasons:

1. to protect the health of the participant
2. to demonstrate the improvement or maintenance of health of the participant
3. to conduct medical-nutritional research involving a partially known dietary intake of consistent composition
4. to establish baseline data on the health status of the elderly population represented by the program participants

All applicants consenting to undergo the medical screenings were examined a week or so before meals were to be delivered. All participants who volunteered for the exam were asked to return for a follow-up at the end of the 63-day period. Those participating in the extended program underwent a third exam at the end of that period.

The exams were offered to applicants from San Saba, Falls County, Waco, Travis and Bastrop Counties, and the five-counties area. In setting up locations and dates for the examinations several factors had to be considered such as the distance applicants would have to travel to the exam, available facilities, distance between sites (to allow exams in two or three sites in one day), medical personnel schedules, and site volunteer schedules.

| Site | Place of Exam | Date of exam | | |
|--------------------|---------------|--------------|------|------|
| | | 1st | 2nd | 3rd |
| 5-county area | Pleasanton | 1/31 | 4/2 | |
| | Seguin | 1/30 | 4/3 | 5/15 |
| | Kennedy | 1/31 | 4/2 | 5/15 |
| | New Braunfels | 1/30 | 4/3 | 5/15 |
| Travis/ Bastrop | Austin | 2/1 | 3/28 | 5/15 |
| Waco/Falls | Waco | 1/7 | 3/27 | |
| San Saba | San Saba | 1/7 | 3/27 | |

Arranging the medical-nutritional clearance for participants was a more difficult task than originally anticipated. The problems encountered included:

1. Doctors in some areas resented having "another welfare program" in their area.
2. Some doctors refused to sign the medical clearance form without charging a fee.
3. Many elderly had not seen a doctor in years and had no desire to see one to obtain a clearance.
4. Some doctors felt that their elderly patients might be mistreated while serving as subjects in a medical experiment.

Letters were sent to County Medical Societies in an effort to enhance cooperation.

Despite the difficulties, 75 applicants consented to undergo the screenings, and 61 returned for the follow-up. Sixteen of the 18 expected participants went through the final exam at the end of the extended program.

APPENDIX IX

DROPOUT QUESTIONNAIRE

Participant's Name: _____

Participant's Social Security Number: ____ - ____ - _____

| | | |
|----------------------|---|---|
| *A. Type of Delivery | Personal. | 1 |
| | Less Personal | 2 |
| *B. Program Type | 63-day. | 1 |
| | 63-day extended | 2 |
| | Home health care | 3 |
| | Weekend | 4 |
| | Alternate Care (Paris). | 5 |
| *C. Setting | Rural | 1 |
| | Small-town. | 2 |
| | Urban | 3 |
| | Home Health Care/Paris Weekend | 4 |
| *D. Site | San Saba | 1 |
| | Travis/Bastrop | 2 |
| | Falls/Waco | 3 |
| | Five-Counties | 4 |
| | Paris | 5 |
| | Houston | 6 |
| *E. Ethnicity | Black | 1 |
| | Caucasian. | 2 |
| | Mexican-American. | 3 |
| | Other | 4 |

*Also used for Questionnaires in Appendices XI and XII.

Background—ask of all participants

1. About how many meals did you eat before you decided to drop out of the program?
2. What was your main reason for deciding to drop out of the program (circle as many as applicable).
 - a. Health problems related to the meals received.
(Specify)
 - b. Health problems not related to the meals.
(Specify)
 - c. Difficulty in preparing food.

- d. Unpleasant taste and/or unfamiliarity with food items.
(Specify)
- e. Damaged food items.
- f. Unexpected departure from home area during food demonstration.
- g. Lack of contact from volunteer.
- h. Lack of interest in the program.
- i. Delivery problems.
- j. Other (Specify)

A. Health Reasons Related to Food Consumption

1. Did you feel that the food caused you any health problems? YES NO
Specify.
2. Were there any specific food items that caused you any health problems? YES NO
Which items:
3. How soon after you noticed these problems did you stop eating the food?
immediately the next day within one week over a week
 - a. How soon after did you contact your volunteer and request food delivery be stopped?
immediately the next day within one week over a week
4. What was it about the food that didn't agree with you? (Spices, consistency, quality, other, etc.)
Specify?
5. Did you need to contact a doctor about these health problems? YES NO
Name of doctor:
6. If these health problems had not arisen, would you have continued in the program?
YES NO UNSURE
Additional Comments:

B. Health Reasons Not Related to Food Consumption

1. Did this health problem begin before you started the meals or afterwards?
Before After
2. If you had this health problem before you began the meals program, do you feel eating the food made any difference?
(Leave blank if not applicable.) Better Worse No Difference
3. Did you contact your volunteer about your health difficulties? YES NO
4. Did you need to contact a doctor? YES NO
Name of Doctor:
5. If you had not had this health problem, would you have continued in the meals program?
YES NO UNSURE
Additional Comments:

C. Difficulty in Preparing Food

1. Did you have any trouble in opening the food packages? YES NO
 - a. Did you have any trouble in opening the cans? YES NO
2. What kind of difficulties did you have?
3. Did you generally have any trouble measuring the correct amount of water to be added to the food?
YES NO
4. Did you generally have any trouble in heating the food? YES NO
5. Did you generally have any trouble following the food preparation directions on each package or can of food?
YES NO Specify:
6. Were the pictures on the cans and packages which showed how to prepare the food helpful to you?
Very Helpful Helpful Not Helpful Enough Confusing Not Needed
7. If the preparation of the food were made easier, would you have wanted to continue in the program?
YES NO UNSURE
Additional Comments:

D. Unpleasant Food Taste/Unfamiliarity With Food Items

1. Did the food taste unpleasant or bad to you? YES NO
Comments:
2. Were there any specific items which were particularly unpleasant to you? YES NO
Which ones:
3. What was it about the food that made you dislike it? (Flavor, color, texture, portion size, smell, etc.)
4. Did you feel any ill effects from the food? YES NO
Specify:
5. Did you add anything to the food to try to improve its taste and make it more to your liking?
YES NO Specify:
6. Did you contact your volunteer about this problem? YES NO
7. If the food would be improved to suit your tastes, would you continue in the meals program?
YES NO UNSURE
Additional Comments:

E. Damaged

1. What kind of damage did your meals suffer? (Crushed boxes, seals not intact, spillage, other, etc.)
2. Was there any damage to the individual meal boxes? YES NO
3. Was there any damage to the individual food items within the meal boxes? YES NO

4. Were you generally able to eat the meals even though they were damaged? YES NO
5. Do you have any idea what caused the damage? YES NO
Specify:
6. If the meals had been delivered undamaged, would you have continued in the program?
YES NO UNSURE
Additional Comments:

F. Unexpected Departure

1. If you had not left the area, would you have continued in the meals program?
YES NO UNSURE
2. When did you contact your volunteer and request delivery be stopped?
3. How long was this after you left the area? (Answer in days)
Additional Comments:

G. Lack of Contact From Volunteer

1. How often did you see or talk to your volunteer while you were receiving meals?
more than once a week about once a week about once every two weeks once every 3 weeks
2. Did you ever attempt to get in touch with your volunteer? YES NO
If so, how many times?
3. Did you have questions about, or problems with the food that you wanted to discuss with your volunteer?
YES NO Specify:
4. If you had received additional contact from your volunteer, would you have continued in the program?
YES NO UNSURE

H. Lack of Interest

1. Did you get tired of eating these meals? YES NO
2. Please tell us of any other reasons why you lost interest in this program?
3. Did you contact your volunteer regarding this situation? YES NO
4. Did you ask that food deliveries be stopped? YES NO

I. Delivery Problems

1. What kind of delivery problem did you have?
2. If the meals had been delivered on time and intact, would you have continued in the program?
YES NO UNSURE

J. Other

Specify:

Overall Program Evaluation

1. What did you like the most about the program?
amount of contact with volunteers the food method of preparation delivery method
lack of expense other (specify)
2. What did you dislike most about the program?
amount of contact with volunteers the food method of preparation delivery method
other (specify)
3. Was this food similar to the food you ordinarily eat? similar somewhat different very different
4. The meals you received had canned foods, and freeze-dried foods. Did you prefer one or the other? (Find reasons for any preference.) canned freeze-dried no preference
Reasons for preference:
5. If you receive food stamps, would you use your food stamps to buy these meals?
YES NO UNSURE NO STAMPS
6. While you were participating in this meals program did you use fewer food stamps than usual?
YES NO NO STAMPS
About how many fewer?
7. Did you generally get enough to eat with each meal? YES NO
8. Did you often have leftovers from the meals? YES NO
9. If you had leftovers, did you eat them later in the day for a snack, or as part of another meal? (If not applicable, leave blank.) snack part of another meal other (specify below)
10. Did the meals provide you with enough variety? YES NO
11. Were any of the food items repeated too often? YES NO
If so, which ones:

Packaging and Preparation

1. Did you have any trouble carrying or lifting the seven-day food package?
YES NO Did not receive a 7-day meal pack
2. Did you have any trouble opening the seven day food package?
YES NO Did not receive a 7-day meal pack
3. Did you have any trouble measuring the correct amount of water? YES NO
4. Did you have any trouble heating the food? YES NO
5. Did you have any trouble following the food preparation directions on each package or can of food?
YES NO Detail any difficulties:
6. Did you have any trouble opening the individual food items? YES NO
Specify:

Social

1. Does anyone help you with your household chores? YES NO
Who?
2. Do you participate in community activities with other elderly people? YES NO
What kind of activities? (church, social, etc.)
3. Have you heard about meals-on-wheels or group-dining programs? YES NO
4. Have you participated in any of these programs? YES NO
5. Does a public health nurse or a visiting nurse come to your home? YES NO
6. What kind of services would make living in your home easier for you? (e.g., transportation, homemaker, etc., probe)

**Questions to Second Party If Participant Is
Unavailable for Questioning**

1. Please give reasons for the participant's withdrawal from the meals program:
 2. Why is participant unavailable for questioning? Specify:
 3. Do you feel that the participant would have stayed in the program if his problem was remedied?
YES NO UNSURE
 4. What did the participant like most about the program? the food method of preparation
delivery method amount of contact with volunteers lack of expense other (specify below)
 5. What did the participant dislike the most about the program? the food method of preparation
delivery method amount of contact with volunteers other (specify below)
- Additional comments:

To Be Completed By Interviewer

Please describe your overall impression of the participant with particular emphasis on his reasons for withdrawing from the program.

Date

Interviewer's Signature

APPENDIX X

MEAL EVALUATION CARDS

PLEASE COMPLETE AND RETURN THIS CARD AS SOON AFTER
COMPLETING THIS MEAL AS POSSIBLE

CIRCLE THE APPROPRIATE ANSWER

QUALITY OF FOOD

| | | | |
|-------------------------------|-------------|------|------|
| 117 BEEF AND RICE W/ONIONS | <u>GOOD</u> | FAIR | POOR |
| 203 CREAMED PEAS | <u>GOOD</u> | FAIR | POOR |
| 153 COTTAGE CHEESE | <u>GOOD</u> | FAIR | POOR |
| 135 CHOCOLATE CRUNCH BAR | <u>GOOD</u> | FAIR | POOR |
| 113 INSTANT VANILLA DRINK | <u>GOOD</u> | FAIR | POOR |

COMMENTS The Cottage Cheese & Rice

MY NAME IS _____

PLEASE COMPLETE AND RETURN THIS CARD AS SOON AFTER
COMPLETING THIS MEAL AS POSSIBLE

CIRCLE THE APPROPRIATE ANSWER

QUALITY OF FOOD

| | | | |
|--------------------------------|-------------|-------------|------|
| 78 MEAT BALLS IN BBQ SAUCE | <u>GOOD</u> | FAIR | POOR |
| 201 LIMA BEANS | GOOD | <u>FAIR</u> | POOR |
| 160 PINEAPPLE | <u>GOOD</u> | FAIR | POOR |
| 148 PEANUT BUTTER BAR | <u>GOOD</u> | FAIR | POOR |
| 108 INSTANT CHOCOLATE DRINK | <u>GOOD</u> | FAIR | POOR |

COMMENTS The Beans are O.K. just not my favorite

MY NAME IS _____

PLEASE COMPLETE AND RETURN THIS CARD AS SOON AFTER
COMPLETING THIS MEAL AS POSSIBLE

****CIRCLE THE APPROPRIATE ANSWER****
QUALITY OF FOOD

| | | | |
|--------------------------------|-------------|------|------|
| 88 BEEF STEW | <u>GOOD</u> | FAIR | POOR |
| 140 CREAM STYLE CORN | <u>GOOD</u> | FAIR | POOR |
| 34 MIXED FRUIT | <u>GOOD</u> | FAIR | POOR |
| 28 TAPIOCA PUDDING | <u>GOOD</u> | FAIR | POOR |
| 108 INSTANT CHOCOLATE DRINK | <u>GOOD</u> | FAIR | POOR |

COMMENTS

MY NAME IS

I enjoy the food Easy to prepare

APPENDIX XI

POST-DEMONSTRATION QUESTIONNAIRE

Overall Program Evaluation

1. What is your overall reaction to the meals program? Like very much Like moderately
Dislike moderately Dislike very much

2. What did you like the most about the program? the food method of preparation delivery method
amount of contact with volunteers lack of expense other (specify)

3. What did you dislike most about the program? the food method of preparation delivery method
amount of contact with volunteers other (specify)

4. Would you like to continue in this meals program if you could? YES NO UNSURE

5. (If yes) How often would you like to eat these meals?
daily 2 - 3 times/week weekly other

6. Was the food you ate in this program similar to the kind of food you ordinarily eat?
very similar somewhat similar not similar do not know

7. During your participation in this meals program, did you have any noticeable health or medical problems?
YES NO UNSURE

8. If so, what? Headaches Gas Diarrhea Constipation Cramps Other
Specify, (if other)

9. Do you feel that the meals you ate had any effect upon these health problems? YES NO UNSURE

10. Did each meal usually provide you with enough to eat? Yes, enough Yes, more than enough No

11. Did you usually prepare all the food items from each meal at one time? YES NO

12. Did you generally eat all the meal at one sitting? YES NO

13. Did you often have leftovers from the meals? YES NO

14. If you had leftovers, did you usually eat them later in the day for a snack, or as part of another meal? (If not applicable, leave blank.) Snack Part of another meal Other (specify below)

15. Did you generally eat the meals in numerical order? YES NO

16. Did you even select food items from different meal boxes to make up a meal? YES NO

17. Did you ever add seasoning, spices, or other ingredients to the food to try to improve its taste or to make it more to your liking? YES NO

18. What kinds of ingredients or spices did you usually add? (Probe for things like salt, pepper, cheese, milk, etc.)
19. Did you eat any other food items along with these meals, such as bread, crackers, milk, coffee or tea?
 Yes, frequently Yes, occasionally No
 Specify: (Kinds of foods)
20. Do you have some favorite food items that weren't included in these meals that you wish had been included?
 YES NO Specify:
21. Were any of the food items repeated too often? YES NO
 If so, which ones:
22. Could you tell me which were your favorite meals or food items?
23. Could you tell me which meals or food items you like the least?
24. The meals you received had canned, and freeze-dried foods (and ready-to-eat pouches). Did you prefer one of these types of food over the other(s)? Canned Freeze-dried Ready-to-eat pouches No preference
25. Even though you preferred the (canned) or (freeze-dried) or (ready-to-eat pouches), would you mind eating the other types of food occasionally? Yes, would mind No, wouldn't mind
26. What time of day did you usually eat these meals? Morning Midday Evening

Packaging and Delivery

27. Was it convenient for you to have a complete meal in one package? YES NO
28. Did you have any difficulty carrying or opening the 7-day meal package?
 Yes, much trouble Yes, some trouble No trouble
29. In opening the individual meal boxes? Yes, much trouble Yes, some trouble No trouble
30. In opening the individual food items? Yes, much trouble Yes, some trouble No trouble
 Comments (Specify type of trouble):
31. Did you usually use the pop-top tab or a can opener to open the cans? Pop-top Can opener
32. If can opener, did you have any problems? YES NO
 Specify:
33. Were the instructions on how to prepare each food item easy to follow? YES NO
 Specify (if no):
34. Did you have any trouble measuring the water and preparing the freeze-dried food? YES NO
 Specify (if yes):
35. Did you ever cool any parts of the meals, such as the fruits, the pudding, or the drinks before eating them?
 YES NO
36. If your meals were delivered by a volunteer, on the average, how much time did the volunteer spend with you?
 5 - 10 minutes 15 - 30 minutes over 30 minutes

37. If you had your choice, would you rather have the meals delivered by a volunteer, or by a mail or delivery truck?
Volunteer Mail Delivery Truck
38. How would you feel about picking up the meals yourself? Would prefer Could do it Could not do it
39. Did you ever receive any spoiled or damaged food items in your meal boxes? YES NO
Describe:
40. Were there ever any delivery problems? YES NO
Specify:

Financial

41. If these pre-packaged meals were available in the grocery store, and cost the same as the food you usually bought, would you purchase these meals? YES NO
42. How much would you be willing to pay for each meal (maximum)? \$0.50 \$1.00 \$1.50 \$2.00
43. (If yes to above) about how many meals would you purchase each week? 1 - 2 3 - 5 5 - 7 7 or more
44. If you receive food stamps, would you use your food stamps to buy these meals?
YES NO UNSURE NO STAMPS
45. While you were participating in this meals program, did you use fewer food stamps than usual?
YES NO NO STAMPS About how many fewer?

Living Conditions

46. Do you have any regular contact with social service personnel such as nurses, social workers, senior citizen aides, or chore helpers?
47. (If yes) About how frequently do you have contact with them?
Weekly Every 2 weeks Once a month Irregular contact
48. Could you tell me what kinds of social services you are now receiving? (e.g. transportation, homemaker, meals, counseling).
49. What kind of services would you like to receive that would make living in your home easier for you? (e.g. transportation, homemaker, meals, *probe*)
50. Do you belong to any senior citizens' group, or church group or participate in any community activities with other elderly persons? YES NO
51. Have you heard about meals-on-wheels or group-dining programs? YES NO
52. Do you currently participate in any of these meals programs?
Yes, meals on wheels Yes, group dining No, never In the past
53. After participating in this meals program, would you like to participate in any other activities with elderly persons in your community? YES NO

NOTE REACTION AND PROCEED WITH CAUTION

54. Could you tell me about how often your friends or relatives come over and visit you?
Every day 1 or 2/week 1 a month Every 2 - 3 months

55. Do you ever have company over for meals? YES NO
56. About how often? Daily Weekly Monthly Other
57. About how many phone calls do you make during a typical week?
None One or two Three/four Five or more No phone
58. Can you tell me if you regularly read any newspapers or magazines?
Local newspaper National magazine Local paper & magazine No
59. About how many hours a day do you watch TV or listen to the radio
Seldom 1 or 2 hours 3 or 4 hours 5 or more hours

Transportation

60. Do you leave home to run errands? YES NO
Comments: (Kinds of errands, frequency, etc.)
61. Do you have access to public transportation? YES NO
62. If so, what kind? (Check as many as necessary)
City bus Taxi Senior center van Other Combination
63. How far is the nearest grocery store or supermarket that you shop at most often?
0 - ½ mile ½ - 1 mile 1 - 2 miles 2 - 3 miles 3 - 4 miles 4 miles or farther
64. How do you get your groceries home from the store? Walk Drive Ride with relatives or neighbors
Use public transportation (bus, taxi, etc.) Other Specify:
65. How often do you go to the grocery store?
Weekly Bi-weekly Monthly Five weeks or more Specify:
66. Do you have relatives or friends who can drive you to the store, church, etc.? Yes, relatives Yes, friends No

Self-Sufficiency and Current Eating Habits

67. Do you experience any difficulty getting around the house?
Yes, major difficulty Yes, some difficulty No difficulty
68. Does any one assist you with your housekeeping chores? YES NO
If yes, who?
What sort of things do they do?
69. Do you usually cook for yourself? YES NO
(If no) Do you have a relative or friend who cooks for you? YES NO
70. Do you find that with these box meals, you no longer need to have relatives or friends come to help you prepare meals so often? YES NO
71. Before you began receiving these meals, how many times a week did you prepare a hot meal for yourself?
None Once or twice Three or four times Daily
72. Did you often fix a snack or a sandwich for yourself instead of a full meal? YES NO

73. Have your eating habits changed while on this program? YES NO
How?

74. Do you have any health or medical problems?

75. Have you been in a hospital or other health facility recently? YES NO
If yes, when and why?

Housing

76. Do you own or rent your living quarters? Own Rent Live in home of relatives

77. Participant lives in the following: (to be filled in by interviewer)
House Apartment Mobile home Boarding house

78. How many rooms are in this dwelling unit?

79. Briefly describe condition of dwelling (to be filled in by interviewer).

General Comments:

Name of Interviewer:

Date:

Weekend Supplement Section

1. What kind of meals program are you currently participating in?
Congregate Meals-on-Wheels Adult day care
2. (If congregated) How would you feel about eating the NASA box meals in a group setting?
Would like Would not like Unsure
3. Did you like receiving the NASA box meals for use on weekends? YES NO
4. How did the box meals compare with the meals you receive from meals-on-wheels, or at the group dining?
NASA meals better NASA, about the same NASA meals inferior
5. Before receiving the weekend box meals, did you usually prepare a hot meal for yourself on the weekends?
Yes, frequently Yes, occasionally No
6. How did the box meals compare with the meals you normally fixed for yourself on the weekends?
NASA meals better NASA meals about the same NASA meals inferior
7. How would you feel about eating these box meals 7 days a week instead of participating in your current hot meals program? Would like to do it Would not Unsure

APPENDIX XII

EXTENDED SERVICE QUESTIONNAIRE

1. What is your overall reaction to the meals program?
Like very much Like moderately Dislike moderately Dislike very much
2. What did you like the most about the program? the food method of preparation delivery method
amount of contact with volunteers lack of expense other (specify) everything
3. What did you dislike most about the program? the food method of preparation delivery method
amount of contact with volunteers other (specify) nothing
4. How did you feel about eating these meals every day? (Probe for comments about boredom, tedium, etc.)
5. Did you enjoy these meals as much the last few weeks as you did at the beginning of the program?
YES NO Why?
6. During your participation in this meals program, did you have any noticeable health or medical problems?
YES NO UNSURE If so, what?
7. Do you feel that the meals you ate had any effect upon these health problems?
Yes, helped Yes, affected adversely No Unsure
8. Did each meal usually provide you with enough to eat? Yes, enough Yes, more than enough No
9. Did you often have leftovers from the meals? YES NO
10. Did you ever receive any spoiled or damaged food items in your meal boxes? YES NO
Describe:
11. If these pre-packaged meals were available in the grocery store, and cost the same as the food you usually bought, would you purchase these meals? YES NO
12. (If yes to above) about how many meals would you purchase each week?
1 - 2 3 - 4 5 - 7 7 or more
13. Does someone help you to do the following kinds of jobs?
Grocery shopping Housework Cooking Yard work Home upkeep
14. Would you like some help doing those kinds of jobs? YES NO
15. About how often do you leave your home to shop, go one errands, or visit friends, or the like?
Daily Weekly Monthly Other
16. If you had your choice, would you like to continue living in your own home, or would you rather live in a group setting such as a nursing home, or home for the aged? Own home Home for aged Nursing home
17. Do you think receiving meals like these would help you to continue living in your own home? YES NO
Why?

APPENDIX XIII

CASE STUDIES OF ALTERNATE CARE PARTICIPANTS

The LBJ School project participants were particularly interested in finding out more about the needs of alternate care clients and how well the services filled their needs. Likewise, the project also wanted a careful assessment of how well the NASA meals could aid homebound elderly. Since the sample selected in Paris and Austin was so small, it was felt that developing several case studies would provide detailed information missing from our other efforts.

All of the observations are impressionistic. The sample for the case studies was not selected to be representative of the total sample or of the elderly population in Texas. While these people were receiving enough services to allow them to stay in their homes, unlike many other elderly, their economic, social, and medical problems provide some useful insights into the lives of homebound elderly.

Here are four case studies of six of the Austin home health participants. (Names used are fictional).

Case I: Ellie Jones

Ellie Jones is a well-educated 75-year-old black woman. Taking an occasional drag on her cigarette, Ellie instills an almost dramatic image of a tough woman mellowed with age. She lives alone in the family house in a predominately black neighborhood of East Austin. Although situated in a low-income area, the wood frame house has a fresh coat of white paint and the yard is neatly trimmed.

Inside, the house looks neat but lived in. It is furnished with a mixture of modern and Danish furniture—nothing matches but it has all been carefully arranged. On the walls are pictures of Presidents Kennedy and Johnson. On dining room walls hang a calendar and several little league photos of her grandson.

Although Ellie was married twice, she is very comfortable with her current status as head of the household. She takes pride in her independence even though most of her household chores are taken care of by her sister, Mary, a Department of Public Welfare homemaker and she relies heavily on her two sons for transportation. At times, Ellie seems almost embarrassed by Mary's constant attention, yet she would be unable to maintain her home without Mary's help. However, Ellie does relish the attention bestowed on her by her two sons and sees it as their duty to help their aging mother.

Fortunately, Ellie's dependent state is only temporary. She is recuperating from a broken hip which she suffered

nearly a year ago, and is forced to spend most of her time in a wheelchair. She can get around with the aid of a walker and insists that she will soon be rid of it. Still, the recuperation process has been long and frustrating. Recognizing that age slows down the healing process has made the wait bearable.

Ellie was released from the services of the home health agency after she became somewhat mobile, but since the fracture is not completely healed, she must still visit the bone specialist once a month.

The only social service which Ellie receives is the family chore service offered under the Adult Services provision of Title XX of the Social Security Act. Her younger sister spends from three to four hours daily cleaning house, washing clothes, and preparing food. All other needs are met on a voluntary basis by family members—especially her two sons.

Ellie's sons give her great emotional support besides helping her. There seems to be a very traditional mother/son relationship. Frequent calls and visits enhance these ties. Ellie feels no qualms about calling on them for help and is apparently never disappointed. Even the recuperatory process is aided by her sons. They have promised to walk her outside to strengthen the hip joint.

Because of her vibrant personality, Ellie attracts friends. She often has visitors who bring homemade treats such as preserves and desserts. Although she enjoys company, Ellie does not burden her friends with her problems.

Ellie leaves the confines of her home only when it is absolutely necessary (i.e., the monthly trip to the doctor's office). Her isolation is a result of complete reliance on others for transportation and the pain associated with a broken hip. Ellie used to walk nearly every place she wanted to go. Since the isolation has been temporarily imposed, it has not become a crutch or an excuse for depression.

Although physically isolated, Ellie is very much in touch with her environment. She is very interested in political and religious affairs. She recognizes and accepts the different traditions of different cultures. Ellie watches television constantly. News of world events interest her as much as her favorite soap operas. Visits by her sons and grandsons also keep her in tune with the events of the neighborhood.

Ellie definitely feels the pinch of inflation on her fixed and limited income. She often remarks about high utility costs and blames the government for not forcing prices

down. She said, "There is no way that poor people can pay these bills. One day it (the price of electricity) will get so high that no one will be able to pay—and then they'll turn off the electricity." Ellie also commented on the high price of food.

Because of the high cost of food, Ellie never has enough money to buy all the food she wants. She can, however, afford to buy necessities. Necessities in this case seemed to be fresh fruits, canned vegetables, and very limited amounts of meat. Although fish and oysters are her favorite main dishes, she never has enough money to purchase these luxuries. She is forced to stretch a single chicken into a week's worth of meals.

Surprisingly enough for a 5'8" woman who weighs barely 100 pounds, Ellie says she eats more now than she used to. She attributes her increased appetite to the medication she is taking for her hip, but the "hunger" may also be a consequence of the boredom that she experiences by sitting around with little to do all day besides think about food.

Since Ellie likes to feel independent, the meals made available through the NASA meals project for the elderly were greatly appreciated. She reported being able to prepare some meals by herself if her sister was busy. Also, the meals relieved some of the financial burden associated with meal procurement.

Case II: Freida Smith and Ron Lander

In a low-income area of East Austin stands an old family house which has long since fallen into disrepair. The four-room dwelling is occupied by Freida Smith, age 76, and her younger brother Ron, age 71. Built at the turn of the century, the house is now weatherbeaten—in places the wooden structure has completely given way. A wood-burning stove heats the home and bare light bulbs provide the only light in the dwelling. Faded wallpaper and an old spittoon complete the image of an environment suspended in the nineteenth century.

The two people who live there are nearly as picturesque as their surroundings. Ron is painfully thin. His face is weathered and there is always a stubble on his chin. Freida is a healthy robust woman with a loud booming voice and dry sense of humor.

Ron is currently receiving services from a home health agency. He is being treated for a variety of ailments including emphysema, heart trouble, and kidney problems. Although he has required treatment for quite some time, Ron cannot get used to being cooped up in the house. He still tries to chop wood and work in the yard but spends as much time trying to catch his breath as performing the self-appointed tasks. Most of the time he watches television.

Ron is incapable of caring for himself. He is disinterested in food preparation—all housework is done by Freida.

Separation of the household chores is along traditional male/female role definitions even though their physical conditions would warrant definitions along different lines.

Because Freida and Ron share responsibilities, they only require limited professional social service guidance. A nurse visits Ron once a week to check vital signs. There seems to be little contact with Freida's children though she talks about them often. She realizes that they are busy with their own families and lives. This loose relationship with her family probably forces Freida to place a much heavier dependence on Ron than would usually be the case. When any problems develop, the social worker from the home health agency, a new-found daughter, is called to straighten the problem out.

Most of Freida's and Ron's free time is spent at home, sometimes on the porch but most often in front of the television set. Ron seems to live in a world of his own. He has found the aging process tedious and frustrating, and he cannot accept the fact that his physical ailments cut down his ability to perform daily routines. Isolated both from his immediate environment and from the larger world context, Ron hardly notices visitors, let alone communicates with them. He will answer a greeting with a smile or a hello but any further communication is almost impossible. Freida, on the other hand, relishes a chance to talk. She is very concerned with the limited environment that she is familiar with. Although broader local or national events hold no interest for her, Freida tries to keep in touch with her friends and neighbors. She enjoys the daily visit with her next door neighbor and greatly appreciates the infrequent calls from her children.

Freida, still healthy, feels no hindrance from age. The household revolves around her activity and therefore there is no question as to her utility. She has a very strong self-identity even though at times it seems she would be lost without someone to care for. She fits comfortably into the role of homemaker and nurse. In fact by being forced into the provider role, Freida has maintained a useful purpose and thus has not experienced the feeling of uselessness that often accompanies old age.

Since both Ron and Freida are retired, they live on a small monthly stipend. Their combined social security and SSI payments total less than \$400 per month. Medicines take up a large share of their meager income. Fortunately, they have no rent to pay although they still must pay property taxes. This makes their monthly income stretch a lot farther. Their utility bills are minimal because they use a wood stove for heat. In addition, food costs are defrayed by canning the fresh fruits and vegetables that Freida receives from her son.

Since Freida relies on her brother to drive her to the store, her ability to obtain food is subject to Ron's health. Since Ron is hospitalized frequently, transportation often

becomes a problem.

Although somewhat limited by their financial position, Freida usually buys all they need. However, fresh meat is considered a luxury and is rarely purchased. Freida likes to eat well-balanced meals and understands what constitutes a healthy diet. Even though she tries to prepare a nutritious meal at least once a day, her appetite is not as good as it used to be. Ron, however, likes to exist on a very limited diet of grapefruit, bananas, and cornbread.

Although not experiencing many of the problems that the meals system was developed to solve, Freida and Ron liked the meals system very much. When asked, Freida commented that the outstanding feature of the meals system was convenience. It cut down on the time she had to cook. As a second thought she mentioned that the system also saved her money—but this was not the most significant trait. Therefore, in this case, the main value of the food system was simply that it was easy to prepare.

Case III: June Harris

An elderly white frail woman who seems to be somewhat unstable emotionally, June Harris presents the picture of a withered southern belle. She lives in a one-bedroom apartment in a high-rise, old-age apartment complex at the edge of the downtown area. The apartment is well kept and arranged conveniently. The couch, where she spends a great deal of time, is covered with a sheet and serves more as a bed than a chair. The end tables store boxes of tissues, pills, and various other items of daily use, rather than knickknacks or items for display. The apartment is filled with pictures and other memorabilia which remind June of her brighter past.

June lives alone but does not consider herself capable of managing her house. She makes a minimal effort at performing daily household chores, but depends on the service of neighbors and a paid homemaker to do things of great magnitude, such as getting the mail, shopping, etc. June lives in a very "cared for" environment. She has dismissed any attempt at self-sufficiency beyond that necessary to meet her immediate physical needs.

June has emphysema and is extremely conscious of that fact. Her life is very much centered around her physical condition. The emphysema limits her mobility because breathing is difficult, but it does not dictate the minimal mobility June prescribes for herself. Although she is capable of leaving her apartment and doing more for herself in the home, she spends most of the time immobile, watching television. She rarely gets dressed and even more rarely goes out. Most of her immobility can be attributed to her fear that going out will aggravate one condition or another. She often mentioned allergies and claimed that wind, sun, rain, or trees seemed to make her face and neck burn and break out.

June is extremely reconciled to her health condition. In fact, she overcompensates for it by babying herself and allowing others to pamper her. She seems to structure her life around the fact that she frequently does not feel well. She is very aware of what sorts of weather conditions affect her emphysematic condition and does not do much on "bad" days.

She is visited twice weekly by a home health service nurse who provides her with as much emotional as physical support. In addition to this she places a more than average dependence on neighbors and their willingness to help. She is not at all uncomfortable with a dependent role.

Although she has children and grandchildren, she has given up any role of mother or grandmother. They neither depend on her nor she on them. It seems that her close association with neighbors and social service personnel has superseded her family ties. This may be due to their proximity to her and their ability to serve her needs more readily than her family. She does maintain phone contact with her children and grandchildren, however.

June watches television more to "keep the walls from screaming at her" than for the entertainment it provides. She seems little interested or involved even in the activities in her own apartment complex such as shopping or socializing, but takes comfort in the fact that they are provided. The same seems to be true of her neighbors. She likes hearing them overhead, or next door, but does not seem to make much effort to visit them.

June's main problem with food relates to her physical condition. Procuring food has become a matter of sending other people to the store to buy for her. She has transportation available through the apartment complex but chooses not to use it. Instead she relies on a homemaker who goes to the store every two weeks. For small items, she relies on the goodwill of her neighbors, who will do some shopping for her when they are doing their own.

Apparently June has sufficient financial means to purchase all the food she wants—mostly convenience foods, such as TV dinners—food which allows her to cook even when she does not feel up to it. June is aware of the link between nutrition and health and makes herself eat even on the days that she has little appetite. Often she does not feel well enough to cook, but knows she must eat to stay healthy. Thus the NASA meals provide June just what she needs, nutritious meals that require a minimum of effort to prepare.

The meals are less essential for June than other elderly people in her position, since she can already afford many convenience foods. The important feature of the NASA meals is that they are meals, not individual food items. For June, who is not very interested in food, this is good because it reduces the motivation needed to prepare

nutritious meals. They are there for the asking, no planning is necessary. While June could maintain herself without the meals system, she could do a better job of it with the system.

Case IV: Rachel and Lilly Brown

A run-down white frame house is sandwiched in between two bars on 11th street. It is the home of two elderly black women, Lilly and Rachel Brown, mother and daughter. The house belongs to Rachel, who worked long and hard to pay for it. She is extremely proud of it, no matter what the condition. Through it she can provide shelter for both her and her "mama", Lilly.

Lilly Brown is 102 years old, is totally bedridden, and has been for the last 5 years. Rachel, 79, takes care of her mother. Although Lilly is visited weekly by a Schlessinger's Home Health Agency nurse, Rachel takes care of her daily maintenance needs, bathing and feeding her, and turning her over and rubbing her down with oil to prevent bed sores. Rachel's comment on the situation was "I was mama's little girl once and now mama is my little girl!"

"Taking care of the sick is a full-time job," explains Rachel when asked about her daily activities. She has a busy schedule every day. She tends to her mother and all the household duties as well. She gets up early to feed her mother, which requires chopping food to a baby-food consistency. She then does washing, yard work, ironing for a former employer, and a multitude of other household chores.

Rachel is incredibly healthy for a woman of her age—she is still very active and involved in daily life. This is not to say that she does not become tired from her constant activities, it is just that she attributes her fatigue to her activities and not to her age.

Lilly, being bedridden, cannot ignore her aged condition. She is totally dependent on Rachel's care, both for subsistence and emotional needs. She does not like to be left alone. It may be that she is experiencing some anxiety over her condition and feels she is on the verge of death. Rachel does not begrudge the demands her mother makes of her. She feels that it is a privilege to care for her and would never consider putting her in a nursing home.

Rachel centers her life around her mother and derives great emotional satisfaction from the fact that Lilly needs her. She also has a very special relationship with her mother—Lilly has become so accustomed to Rachel's care and presence that she has developed an attachment to Rachel which forecloses any other person's attempts at helping her. She will not let others feed her, Rachel must do it, etc.

Rachel is immobilized by her mother's physical condi-

tion. She only leaves the house when she is forced to. Even going out into the yard to pull weeds requires clearance from her mother, who does not like to be left alone. Fortunately, Rachel has a steady stream of visitors. Her family is very close and visits weekly. She also maintains constant phone contact with her neighbors.

Rachel is a proud woman who tries to be as independent of others as possible. Just recently Rachel has come to realize that she needs and deserves support from others because of her own age and financial condition. The services she does receive stem entirely from Lilly's health needs and her association with the home health service system. An example of her independence and/or pride is that it had never occurred to Rachel to sign up for her SSA or SSI payments. Instead she was receiving income as a paid DPW homemaker for her mother.

Rachel and Lilly survive on a meager income—approximately \$225 a month. This small amount does not stretch very far. Rachel does not even have enough money to buy all of the groceries she and her mother need.

Because of Lilly's dependence on Rachel's constant presence, Rachel cannot get out to get food stamps. She cannot make the trip to apply, or make the necessary visits to the Post Office to pick them up.

Rachel gets some money from taking in washing and ironing. Her family provides moral support, but cannot supply any financial support.

Rachel goes shopping twice monthly either by walking to the corner store or by driving with her niece to a large supermarket. She relies to some extent on the milkman, who brings her milk, butter, and eggs. Since going to the store means leaving her mother, Rachel does not like to do that. Thus, Rachel will often go without small items, such as bread, in between trips to the store, rather than leave her mother.

Rachel says that she goes to the store with a big list of necessities but ends up erasing half the list before she is through because she cannot afford to buy everything. Because she is so limited financially and her mother requires a fairly nutritious diet for sustenance, Rachel often goes to the store and buys for one rather than two people. She sacrifices a well-balanced diet for herself to provide her mother with one.

Rachel seems to live on peanut-butter sandwiches rather than hot nutritious meals. She must cook three hot meals a day for her mother. After preparing the food and feeding her mother, Rachel is often too tired to eat.

The NASA meals system is a help to Rachel because it provides easy convenient meals which she can prepare with minimal effort and which are delivered right to her door. This gives her the opportunity to eat because it eases her burden of cooking for her mother.

APPENDIX XIV

LIST OF BRIEFINGS AND TESTIMONY ON THE NASA MEAL PROJECT

December 6, 1974; Dr. Sam Pool, NASA and R. G. Ritz, Martin Marietta Corp. Presentation at the Texas Governor's Committee on Aging Research Utilization Workshop, "Economics and the Older Texan"; Dallas, Texas.

February 13, 1976; Dr. Charles Bourland, Technology, Incorporated, "Space Food Technology—Applications in Feeding the Elderly" presentation at a national meeting in Houston, Texas of the Research and Development Associates for Military Food and Packaging Systems. Inc.

February 24, 1976; Dr. Jurgen Schmandt before the Committee on Aeronautical and Space Sciences, U.S. Senate, NASA Authorization for Fiscal Year 1977. Hearings on S2864, Part 3, 94th Congress, 2nd Session, 1976, pp. 1944-1951.

April 27, 1976; Dr. Lodis Rhodes, Peggy Wilson, Joe Motter, Dan Casey—presentation to the Statewide Conference for Service Providers to the Elderly; Fort Worth, Texas.

May 10, 1976; Dr. Jurgen Schmandt—presentation at the Texas Governor's Committee on Aging Research Utilization Program, "New Options for Older Texans"; Austin, Texas.

June 17, 1976; Dr. Jurgen Schmandt before Select Committee on Nutrition and Human Needs, U.S. Senate, *The Need for a National Meals-on-Wheels Program*, 1976, pp. 81-99.

July 8, 1976; Dr. Jurgen Schmandt—presentation to the Veterans Administration; Washington, D.C.

July 29, 1976; Mr. Gary Primeaux, NASA, and Mr. R. Ritz, Martin Marietta Corp.; Presentation of program concept and results at the Cleveland Health Museum; Cleveland, Ohio.

September 20 & 21, 1976; Peggy Wilson—presentation to the National Association of Home Delivered and Congregate Meal Programs 3rd Annual Conference; Waco, Texas.

APPENDIX XV

PROPOSED NATIONAL MEALS-ON-WHEELS ACT OF 1976 (S. 3585, H. 14450)

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "National Meals-on-Wheels Act of 1976."

SEC. 2. Section 706(a)(1) of the Older Americans Act of 1965 is amended by inserting "(A)" immediately after "(1)", by inserting after the semicolon the words "and, or", and by adding after such section the following new subparagraph:

"(B) to establish a project (referred to herein as a 'nutrition project') for the elderly blind, and disabled which, five or more days per week, provides as least one home-delivered meal which assures a minimum of one-third the daily recommended dietary allowances as established by the Food and Nutrition Board of the National Academy of Sciences-National Research Council: *Provided*, That any nutrition project which elects to serve such meals more than 5 days a week must assure, at a minimum, an amount of commercially available ready-for-use nutritionally balanced liquid product or light snack, or both, which provide at least 25 per cent of such recommended dietary allowances for each day in which no home-delivered meal is provided. Preference, where feasible, should be given to the use of organizations, such as meals-on-wheels groups, which have demonstrated an ability to operate such services efficiently and reasonably;"

SEC. 3. Section 706(a) of the Older Americans Act of 1965 is amended by striking out "and" at the end of paragraph (10), by redesignating paragraph (11), and all references thereto, as paragraph (13), and by inserting immediately after paragraph (10) the following new paragraphs:

"(11) to operate an information and referral system for homebound individuals receiving meals under this title by—

"(A) training the delivery personnel so that such personnel may make informed judgments about the additional service needs of meal recipients; and

"(B) reporting the additional service needs to agencies, groups, or individuals who might be of assistance in meeting such needs;

"(12) to seek and utilize volunteer personnel for the provision of home-delivered meals to the maximum extent possible and to compensate such personnel when appro-

priate for transportation expenses incurred in the delivery of such meals; and".

SEC. 4. (a)(1) Section 708 of the Older Americans Act of 1965 is amended by inserting "(a)" after the section designation.

(2) Section 708(a) of such Act (as redesignated by paragraph (1) of this subsection) is amended by inserting "and paragraph (1)(B), (11) and (12) of section 706(a)" after "Section 707(c)" in the parenthetical.

(b) Section 708 of such Act is amended by adding at the end thereof the following new subsection:

"(b) In addition to the sums authorized by subsection (a), there are authorized to be appropriated \$80,000,000 for the fiscal year 1977, and \$100,000,000 for the fiscal year 1978 for the purpose of providing home-delivered meals pursuant to section 706(a)(1)(B): *Provided*, That not more than 20 per centum of such funds shall be used for administrative expenses and supportive services. Sums appropriated pursuant to this section to carry out the provisions of this Title shall remain available for such purposes until expended."

National Aeronautics and Space Administration Meals System for the Elderly Demonstration Projects

"SEC. 710. (a) The Commissioner shall conduct a demonstration project involving at least 3 States to determine the feasibility of using the meals system designed by the National Aeronautics and Space Administration for the elderly as a component of or as a substitute for regular nutrition projects assisted under this Act particularly in areas where normal delivery services under such a nutrition project are not feasible or practicable or are too costly. Each such demonstration project shall include a medical evaluation.

"(b) The Commissioner shall report to the Congress on the results of the demonstration project authorized by this section together with such recommendations including recommendations for legislation as he deems appropriate.

"(c) There are authorized to be appropriated for the fiscal year 1977 such sums as may be necessary to carry out the provisions of this section."

