

THE EFFECT OF FOOD COST ALLOWANCE ON
OTHER MANAGEMENT RESOURCES

by

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the use of resources applied to food management is needed. This study was designed to investigate the use of time, energy (footsteps), and material goods (equipment) at both a low-cost and a liberal food budget allowance.

OBJECTIVES

The general objective of this study was to determine whether more management was required when planning and preparing meals on a low cost versus a liberal food cost allowance. Specifically the use of the management resources: time, energy, and material goods at the two food cost allowances were examined. The meals at both allowances were rated to determine their acceptability in regard to serving at a future time.

SURVEY OF LITERATURE

Search of the literature revealed numerous studies on time use as applied to food management, but limited information on the use of energy and equipment in meal preparation. To obtain the necessary background information for this problem, a selected review of literature on food costs, meal planning, and forms of food was performed.

The public media have directed attention to the poor, the hungry, and the undernourished. Food prices have been increasing, with a five percent increase in 1969 over 1968 prices [19]. The low income families must spend a greater percentage of their income on food (30%) in comparison to the 23% spent by higher income groups. Therefore, the food choices made by the low income families are especially important. Those who lack the ability to spend money wisely will compound their error in the absence of knowledge of the nutritional status of the family. Furthermore, the defining of "low-income" is in itself a problem. The difficulty in determining the base for low income people was expressed by Gertrude Lotwin [14], Home Economics Consultant for New Jersey State Division of Public Welfare at the National Conference on Social Welfare: "We have more than fifty definitions for this nebulous level of living . . . in some states there is more than one minimum level of living for health and decency."

Regardless of how low income is defined, those with lower incomes are not obtaining adequate nutrients. Adelson and Peterfin [1] reported that compared with 1955 the 1965 diets of lower income families were lower in calcium, vitamin A, thiamine, and ascorbic acid. The authors expressed the

need to develop "an awareness of the foods that make up a good diet, a desire to choose those foods, and enough money to buy adequate food." Eagles [9], pointed out that low income families received a greater nutritional return from their food dollar than did the high income families. This occurred because they used greater amounts of foods which have a high nutrient content in relation to cost.

The results based on studies of small groups, Hunsaker [11] and Barney [3] indicated a lack of money spent to obtain adequate nutrients for their families. Hunsaker found the mean value of food expenditures by twenty low-income families (\$4,000 or less annual income) of \$3.90 per person per week. One-half of the households had food supplies valued below the economy food plan published in Family Economics Review. Buymanship of thirty-one low income homemakers studied by Barney revealed them spending approximately one-half the amount of money on food needed to adequately supply their family's nutritive needs.

The effect of educational programs, presented by the mass media, of families with incomes less than \$3,000 per year was studied by Carson [4]. She identified the need for further education in the areas of marketing and nutrition. She also emphasized the need for menu planning guides for use with women having little formal education.

Management, in simplest terms, is "using what you have, to get what you want." The management process involves three steps regarding any particular resource: planning, controlling, and evaluating. Gross and Crandall [10] identified the following as resources which all families possess and use: time, energy, money, material goods, knowledge, interest, abilities, skills, attitudes of family members, and community services. Food management requires all of them.

The need to include meal planning in a study directed at use of management factors was concluded by Chabliss [5] who identified management problems in a survey of 137 rural farm, rural non-farm, and urban families in Iowa. Meal planning, identified by 43% of the homemakers, was the second highest ranking activity problem.

Tallman [17] investigated planning related to meal preparation with six students living in home management houses using an \$0.85 per person per day allowance. The mean time spent by these students in menu planning was 8.0 hours and the average food preparation time was 4.69 hours per day for a five day period. Tallman asserts that the amount of time spent at menu planning was not the best indicator of results. For example a student who spent more time than another in planning did not always have the best meals or use money most efficiently. She suggested that other methods of evaluation of results be used to test quality of planning. For example, the quality of the meals was one of her suggestions.

Dopson [7] studied social and economic trends and their effects on home management laboratory curriculum. One hundred and thirty-three home economics graduates who had taken home management laboratory were surveyed for suggestions as to topics they felt should receive more emphasis in the home management laboratory. The suggestions ranking highest were to provide: "(1) more information and experience in time, money, and energy management, and (2) to give additional information and experience in selection, use, and care of equipment."

Extensive work has been done on time management in the home. However, the traditional time studies have been made with the married homemaker, employed versus unemployed, or rural versus urban.

The most recent studies conducted by Walker [18] and Manning [15]

investigated the time spent in food activities by homemakers in New York and Indiana respectively. Walker found that 979 full-time homemakers spent an average of 2.3 hours per day while 317 employed homemakers spent an average of 1.6 hours per day in all food activities. Manning surveyed the practice of having a family helper to assist the homemaker in food preparation and cleanup. She found that the homemaker spent an average of 1.3 hours per day and her helper spent 0.14 hours per day in meal preparation. The homemakers spent an average of 0.81 hours per day on dishwashing, while her helper spent an average of 0.21 hours per day.

Time use related to cost of meals using home prepared and pre-processed prepared food for a family of four was studied by Gertrude S. Weiss [20]. She found that the home prepared foods took an average of 5.5 hours per day and cost an average of \$4.90. Partially prepared meals required an average of 3.1 hours per day and cost an average of \$5.80. The ready-to-serve food meals averaged 1.6 hours per day to prepare and cost \$6.70.

White [21] studied use patterns of convenience foods and electric housewares with 102 Illinois homemakers. She found that both income and equipment were significantly related to greater use of convenience foods. For example, homemakers with greater incomes used more convenience foods. She also found that women who steadily used convenience foods had seven or more pieces of electric equipment.

Kolmer and Gartner [12] studied the use of time and money on foods in three stages of preparation. The authors classified foods as: (1) foods with a minimum of processing to be done at home; (2) partially prepared foods; and (3) ready-to-serve foods that involve no more than heating or serving. They identified changes in amount of time used when two or more forms of the same food product were prepared. In general, as the food

product was more processed prior to purchase, the cost increased and the preparation time decreased.

The problem of measuring energy expended during walking was met by Agan [2] in a study of location of laundry equipment in the home. The pedometer was considered for measuring the distance traveled. However, the pedometer had to be set at a specific length of step to obtain an accurate measurement. No pedometer on the market would record the short footsteps occurring in the home. A footstep counter was developed by the Departments of Family Economics and Industrial Engineering at Kansas State University. This device was used in Agan's study because it accurately recorded the number of footsteps, and thus could serve as a measure of the energy expended.

PROCEDURE

Senior women majoring in home economics education and family economics who were enrolled in home management laboratory constituted the population studied. The management resource money was selected as the independent variable. The resources of time, energy (defined as footsteps), and material goods (defined as specific pieces of kitchen equipment), were the dependent variables. The remaining resources were either controlled or they were allowed to vary. There was a natural control for the resource knowledge of foods and nutrition because courses in this area are required of these students for graduation. The resources of interest, skill, ability, and attitude were not controlled. However, since the subjects had similar interests in that they had all chosen the same courses of study, the variations in interest were probably less than would be expected from the population at large. Their skills and abilities in food management were expected to vary due to the extent of their previous experience in meal planning, food buying, and meal preparation. Although attitude was not controlled, the investigator maintained a positive attitude throughout the experiment which probably contributed to the attitude of the subject toward food management.

The home management laboratory class is blocked with three other courses for one-half of a semester. For the other half, students are required to live off campus for student teaching. Therefore, one-half of the students enrolled for a given semester are in attendance at one time. The home management laboratory class includes two areas of study: household

operations and family economic analysis. The students were divided into groups of four or five and these groups were rotated between the two areas of study. Each group of students spent twelve days in the study of household operations. Four students per group served as food managers.

The food allowance per person per day was set at either \$0.80 or \$1.60. The meal management experiment in which the subjects participated was one of the four problem areas studied in the household operations section of home management laboratory. Each food manager planned nutritionally well-balanced menus, purchased the groceries, prepared three meals a day for three days, and recorded her food management activities on standard forms. In addition, for purposes of this study the food manager completed other forms which will be explained later in the procedure.

Subjects

The 37 subjects, all seniors in the College of Home Economics, were majoring in either home economics education or family economics. Due to the limited number of days in the semester and the desired three days per food manager subject, only 32 subjects served as food managers. Selection of the 32 subjects was made by assigning each of the 37 students a number from a table of random numbers [8]. The 32 students assigned the lowest numbers were selected as food managers. These subjects were divided into eight groups of four subjects each according to whether they took the course in the first or second half of the semester. Each of the five students who did not serve as food manager was added to a group and performed as an additional member.

Experimental Problem

The effect of two food budget levels (\$.80 and \$1.60 per person per day) on time, energy, material goods was the subject of this study. To determine the acceptability of meals, individual ratings of the meals were made by the subjects. The food managers planned and prepared the meals for five or six persons, which included the following: the four food managers of the groups, one additional member in five of the eight groups, and the graduate student advisor. The investigator served as the graduate student advisor, and was in position to give directions and observe laboratory operation.

The lower level, \$.80 per person per day, corresponded roughly to the "economy" level, published in the Family Economics Review [6], for women 20-34 years of age. The \$1.60 level was slightly above the "liberal" plan. However, both amounts were rounded to obtain a simple two to one ratio. During the previous semester three food budget levels had been used with the home management laboratory, but the difference reflected in time and menu selection were small. This suggested use of a larger spread in cost per person per day.

A five percent tolerance on the actual cost per person per day was allowed the food managers as a condition for obtaining the highest grade rating in the food management problem. This gave them a goal and incentive to plan menu costs carefully.

Each group was assigned a sequence of food cost allowance. A three-day period was allowed for each food cost allowance. This sequence, shown in Table 1, was developed to reduce the possible effect of learning.

Table 1. Sequence chart of food cost allowance for food managers.

Sequence of 3-day periods	Groups							
	1	2	3	4	5	6	7	8
First	A ¹	B	A	B	A	B	A	B
Second	B ²	A	A	B	B	A	A	B
Third	A	B	B	A	A	B	B	A
Fourth	B	A	B	A	B	A	B	A

¹A = \$0.80 per person per day

²B = \$1.60 per person per day

Food management includes the tasks of menu planning, food buying and storing, and food preparation and cleanup. The food managers had the responsibility of planning nutritious, well-balanced, aesthetically attractive meals, buying and storing the groceries, and preparing all the foods on the menu with the exception of the salad and beverage. The nutritive content of the menus was checked by the food manager by completing the "Adaptability of Basic Four" form (Appendix A-1). As a customary part of the laboratory course, the nutritive balance was checked by the graduate student advisor. Appropriate changes were made in the menus by the food managers where inadequacies were found before the menus were approved. One of the members of the group acted as an assistant in food preparation. Her responsibilities included preparing a table centerpiece for each meal, setting the table, preparing the salad and beverage, and assisting with cleanup after the meal was eaten.

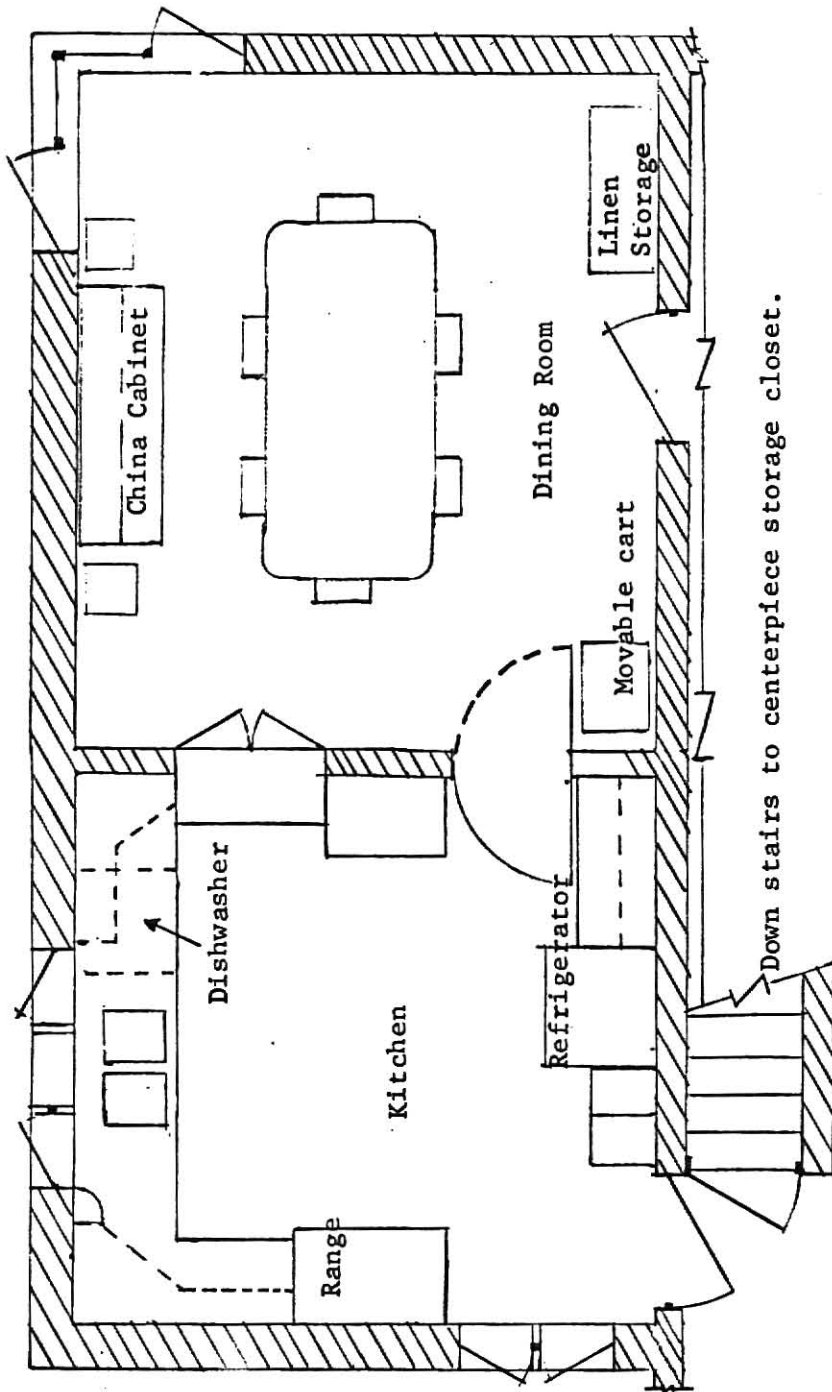
Physical Facilities

The meals were prepared and eaten in Ellen Richards Lodge, home management laboratory, located on the Kansas State University campus. The modified U-shaped kitchen was equipped with a conventional range, refrigerator-freezer, dishwasher, and a double sink. General household utensils for food preparation and adequate storage was provided for food supplies in the kitchen. Informal china and flatware were stored in pass-through storage unit located between the kitchen and dining room. The small electrical appliances which were available included a deep fat fryer, toaster, can opener, frypan, percolator, blender, warming tray and waffle iron. A floor plan of the kitchen and dining facilities appears in Figure 1. A movable cart was stored in the dining room. The dining room was equipped with table and chairs, a china cabinet, and linen storage unit. A generous supply of table linens including napkins, placemats, and table cloths was provided. Centerpiece supplies were stored in a walk-in closet in the basement.

Measuring Devices and Forms

Footstep counter

Footstep counters (Figure 2), developed by the Departments of Family Economics and Industrial Engineering for measurement of distance traveled, were used to count the number of footsteps taken by the food manager and her assistant during food preparation and cleanup. It consisted of a hand counter mounted on a steel plate attached to a canvas legging. A slot in the counter mounting strap allowed for adjustment for heel height. The counter trigger pointed downward and activated the recording device each time a step was taken. A window in the bottom of the counter made it



Scale 1/4" = 1'

Figure 1. Floor plan of kitchen and dining facilities at Ellen Richards Lodge.



Figure 2. Footstep counter

possible to take readings from the counter at the close of each part of the food preparation and cleanup. The counter was also equipped with a dial which was used to return the counter to zero at the end of each meal.

Experimental data forms

The experimental forms were developed to collect data on each of the variables. The forms were presented to the students by sections. Section I, "Student Data Sheet" (Appendix B-1), contained questions on the subject's background--age, marital status, course background and type of housing during college years. To determine the subject's prior experience in food management, questions were asked about the level of responsibility she had assumed in the areas of meal planning, food buying, and meal preparation. The form requested that the subject assess her own ability in relation to other members of the class in the areas of meal planning, food buying, and meal preparation. The scale which was used for this assessment was developed by the investigator. It consisted of a line 100 mm. long with the words "well below average" located under the "0 mm." end of the line, "average" centered below the middle of the line, and "well above average" located under the "100 mm." end of the line. The subject was instructed to mark along the line where she rated her own ability.

Section II, "Time Record Sheet" (Appendix B-2), provided a record of the subject's time, in minutes, spent while menu planning, food buying, and preparing meals. Menu planning time was further divided into: selection of foods for meals; selection of recipes for food preparation; checking menus for nutritional content; checking menus for color, flavor, and texture; and compilation of the market order. The time spent for food buying was divided into minutes spent in grocery buying and storing foods. Time records were

kept for each of the nine meals by the food manager and her assistant. Records of time spent in cooking were kept separate from cleanup time.

Section III, "Acceptability of Meal" (Appendix B-3), was the form completed by each subject upon completion of the meal. The following descriptive data were collected: subject's name, food manager's name, meal, and cost per person per day. At all times subjects were aware of the particular meal cost allowance level on which they were eating. The subjects rated the meal according to whether they would select the menu for serving to their family. If they answered in the affirmative, they were asked to indicate the frequency they would serve it to their families by selecting one of the following statements: several times a week, once a week, several times a month, once a month, or several times a year. All subjects were asked to check "yes" or "no" to the question: "Would you prepare this meal to guests?" The last four ratings of the meal concerned: variety of color, flavor, and texture found in the meal, and the degree of satiety (hunger satisfied or filling). These ratings were made using the 100 mm. line scale previously discussed. The word "inferior" was written under the "0 mm." point and "superior" was written under the "100 mm." point. "Average" was centered under the middle of the line. A separate scale was provided for each rating. The identification words at either end of the line were selected to give direction to the scale without otherwise biasing the rating.

"Use of Management Factors," Section IV, part one (Appendix B-4), was given to each subject prior to her food management problem. In order to determine the source of the recipes which subjects used in their meals, they were asked to record the number of recipes used from cookbooks, personal recipe file, laboratory file, and other sources.

The types of information used by the food managers while shopping were

enumerated according to those identified by Wright [22]. The types of information include: advertised "specials"; brand; quality (grades); cost per unit, size or weight; and cost per serving. Any one or a combination of these types of information may be used on a specific purchase. The subjects were asked to identify the type of information they used in buying fourteen different foods. If the subject did not purchase a particular item she checked "did not buy."

"Built-in maid service" or the degree of preparation of foods prior to purchase has been found to affect significantly both the cost of the food and the preparation time required by the homemaker [12]. The greater the number of ready-to-serve and partially prepared foods, the greater the cost of the foods and the lower the time required in preparation by the homemaker. Therefore, the forms of food purchased for each meal were recorded on page two of Section IV (Appendix B-4). Definitions and examples of each of the three stages of preparation: "maximum preparation," "partial preparation," and "ready-to-serve," were provided to guide the subject in recording the data.

Provision for recording the number of footsteps taken by both the food manager and her assistant in food preparation and cleanup activities by meal was made on page three of Section IV.

Data on frequency of use of seven selected pieces of equipment during the meal preparation were collected. The seven selected pieces of equipment were: range top, range (deep well), oven, broiler (oven), electric skillet, blender, and pressure saucepan.

Part two of Section IV was administered to the food managers at the close of each group's activities. The questions were developed to provide for reactions of the subjects to the experiment. The first question asked

the subject to identify the most difficult problem she incurred during her food management problem. Suggested responses were provided for checking with an optional "other" for a response not anticipated by the investigator. The second question asked the subject to rank those experiences she found most helpful in solving her food management problem. Data were collected on this question to provide the investigator with the sources of information or experiences each subject found to be most valuable.

The final question on the experiment forms gave the subject an opportunity to react to the food cost allowance on which she had managed. She could also select, by adding or subtracting from her money allowance, the food budget level she felt would have been most desirable.

Laboratory forms

The food management forms in Appendix A are currently in use in the home management laboratory.

The "Adaptation of Basic Four" (Appendix A-1) form was developed to aid the students in checking the nutrition of their menus. Each column was for one day. The students checked the appropriate foods which are included in each day's menus. They checked the servings provided with the Recommended Dietary Allowances to determine if all nutrients were provided in the day's menus. Eight columns were provided for revisions which might need to be made.

The "Market List" (Appendix A-2) form was developed as a worksheet to aid the student in estimating the amount and cost of each item which needed to be purchased. The foods were organized according to the food groups defined by Wright [22]. The students estimated the cost of the foods they needed to purchase and obtained a check for that amount of money.

The "Inventory" (Appendix A-3) form was used by each food manager to list the specific foods available in the kitchen, the amount and cost of each, so there was an accurate account of the food in the kitchen. The food manager checked the inventory before she purchased her groceries. The cost of foods used from the inventory was added to the cost of foods purchased and used in each food managers three-day problem. The foods which she had left-over were added to the inventory and the corresponding value subtracted from her food cost.

The food accounting procedure was recorded on the "Food Manager's Report" (Appendix A-4) and considered in the calculation of the actual cost per person per day. The food manager was responsible for handing to the advisor this account with any cash balance, supported with the ticket tapes from the grocery store.

The "Table Setting" (Appendix A-5) form was completed by the food managers during meal planning. This gave an opportunity to give written directions to the assistant.

The food managers completed the "Menus as Served" form (Appendix A-6) upon completion of their meals. This form provided a permanent record of the menus served and their corresponding cost.

Directions for the Experiment

The plan listed below was followed in giving directions and distributing experimental data forms (Appendix B) to each of the eight groups prior to management laboratory.

1. Student data sheets were distributed and completed.
2. Food budget allowance was assigned.
3. Food manager sequence was announced.

4. "Time Record Sheets" were distributed and explained.
5. An example of "Acceptability of Meal" form was distributed and directions on its use was given.
6. "Use of Management Factors" data sheets were distributed and explanation presented.
7. The footstep counter was modeled by the investigator and its operation explained.

The following plan was used to explain the laboratory forms (Appendix A) and facilities.

1. Food management forms were distributed.
2. Explanation of food management problem was presented.
 - a. planning meals
 - b. food buying procedure
 - c. meal preparation
3. A tour of the home management facilities was conducted.
 - a. kitchen equipment and storage
 - b. dining facilities
 - c. centerpiece storeroom

Limitations of Study

The food management problem was conducted for three consecutive days by each food manager; therefore, only 32 of the 37 subjects were able to be food managers during the semester.

The subjects may not have reacted as they would have in another experimental situation because of the desire to obtain a satisfactory grade in the class. For example, more time may have been spent in menu planning in order to come closer to the assigned food cost allowance than would have been spent under "home" conditions. The individual student variance in skills,

abilities, and interests in food management may have had an effect on the data collected. Although all were professionally interested in home economics education not all were equally skilled in performance. It is not known to what extent the subject's knowledge of the food budget level affected their acceptability rating of the meal. All subjects were enrolled in the home management lecture class so those participating in the experiment near the end of the semester may have been better prepared to apply the management process.

Statistical Analysis

The following null hypotheses were tested regarding time, footsteps, equipment, and acceptability of meals.

1. There is no significant difference in time required to plan meals at a limited and a liberal food budget allowance.
2. There is no significant difference in time used to purchase and store foods on a limited and a liberal food budget allowance.
3. There is no significant difference in time required to prepare meals and kitchen cleanup on two food budget allowances.
4. There is no significant difference in footsteps used in preparing meals and cleaning the kitchen at two food budget levels.
5. There is no significant difference in the frequency of use of equipment at two food budget levels.
6. There is no significant difference in the acceptability of meals prepared at two food budget levels.

The data were analyzed by the following methods of statistical analysis: one-way analysis of variance, chi-square, covariance, and three-way analysis of variance. One-way analysis of variance was applied to data collected on

time, footsteps, equipment, and acceptability ratings of color, flavor, texture, and satiety. The data met the criteria for normality and the measures achieved an internal scale. Chi-square analysis was used to test meal acceptability according to choice of menu for family serving, guest serving, and frequency of family serving.

The relationship between time required and footsteps taken was examined by covariance analysis. The source of variance in meal acceptability ratings of color, flavor, texture, and satiety was determined through a three-way analysis of variance.

The probability level $P > .05$ or less was chosen as significant.

RESULTS AND DISCUSSION

Food management at two food cost levels was studied with thirty-two of the thirty-seven students enrolled in home management laboratory. Results of the effect of food cost levels on management resources of time, foot-steps, and equipment follow the description of the subjects. Also reported is the acceptability of meals and the degree of success in matching food expenditure to allowance.

Description of Subjects

A summary of the biographical data collected on the thirty food managers is reported to describe the characteristics of the population. The results of the first two food managers were deleted because the data were not comparable after adjustments were made in the footstep counter.

The average (mean) age of the thirty food managers was 21.5 years and ranged from 20 to 24 years. Ten (33.3%) of the thirty food managers were married and twenty were single. A summary of the course work completed by the subjects prior to their participation in the experiment is presented in Table 2. All subjects had completed a course in nutrition but only 43 percent had taken the course in meal management. Transfer students who had taken foods courses at other colleges were not able to indicate their foods course backgrounds unless their courses were identified by the same name as those currently offered at Kansas State University, Department of Foods and Nutrition. It was assumed that identically named foods courses contained

similar curricula. All of the subjects were concurrently enrolled in the lecture section of home management during their laboratory course.

Table 2. Course work completed by food managers.

Course	Students	
	Number	Percentage n = 15
Food Science	29	96.6
Food for Man	25	83.3
Meal Management	13	43.3
The House	29	96.6
Nutrition	30	100.0
Household Equipment	4	13.3

A summary of the housing experiences of the subjects is presented in Table 3. Summer school was counted as 1/2 of the semester. In terms of experience of the group, dormitory living was the most utilized. However, 70 percent of the group had lived in an apartment for at least one-half semester.

Experience in food management prior to the home management laboratory experience is summarized in Tables 4-6. The degree of responsibility the subjects had assumed in meal planning is presented in Table 4. Two subjects had no previous experience, whereas fourteen had had full responsibility for an average of 334 days. These same fourteen subjects assumed full responsibility in meal planning, food buying, and food preparation (Tables 4-6). They had lived in an apartment and were responsible for meal management. Three students who had been married more than two years raised the mean

Table 3. College housing experiences of food managers.

Type of housing ever experienced in college	Number of students	Semesters of residence	
		Total	Mean n = 15
Dormitory	27	119.5	3.98
Sorority	7	36.0	1.20
Cooperative house	3	18.0	.60
Room	3	2.5	.08
Apartment	20	51.5	1.72
Mobile home	2	2.5	.60
Rent or own home	1	1.0	.03
Parents' home	9	22.5	.75
All	30	253.5	8.96

number of days of responsibility considerably. The median number of days was 302.5. Students who had assumed less than full responsibility had served a higher mean number of people because they had taken responsibility in their parents' homes.

Table 4. Student's prior responsibility for meal planning.

Degree of responsibility	Number of subjects	Mean number of days	Mean number of persons served
Full	14 ¹	334	2.1
Partial	12	172	3.8
Assistant	2	135	3.5
None	2	00	0.0

¹Only highest degree of responsibility reported.

Table 5. Subject's prior responsibility for food buying.

Degree of responsibility	Number of subjects	Mean number of days	Mean number of persons served
Full	14 ¹	334	2.1
Partial	11	176	3.6
Assistant	5	108	6.2

¹Only highest degree of responsibility reported.

Table 6. Subject's prior responsibility for food preparation.

Degree of responsibility	Number of subjects	Mean number of days	Mean number of persons served
Full	14 ¹	334	2.1
Partial	13	170	3.5
Assistant	3	120	4.7

¹Only highest degree of responsibility reported.

The students rated on a 100 mm. line their own ability in food management, using the other members of the class as their standard. The data are summarized in Table 7. The range in scores for the three areas of food management, meal planning, food buying, and meal preparation was wide, but the means were very close.

Table 7. Student's assessment of food management ability.

Area	Number	Range	Mean
Meal planning	30	4-84	59.0
Food buying	30	4-90	59.0
Meal preparation	30	4-93	61.0

Time

The number of minutes used, by the thirty food managers and the differences between the fifteen managers at the two food cost levels were analyzed by one-way analysis of variance.

The mean times spent in food preparation by both \$0.80 and \$1.60 food managers appears in Table 8. The average amount of time spent in menu planning differed by 20 minutes, with more time spent by the \$1.60 subjects. This difference, however, was not significant. The limit of variety of foods available at a low cost may account for more time being spent by the \$0.80 managers.

The mean time spent for meal planning by the thirty food managers was 4.9 hours. Tallman [17] reported 8.0 hours spent in meal planning for the five days by home management students. The food managers at the \$0.80 food

Table 8. Time spent by food managers in meal planning by food cost allowance.

Task	Mean number of minutes		
	\$0.80 n=15	\$1.60 n=15	Difference*
Selection of foods	156.7	131.7	25.0
Selection of recipes	40.7	66.0	-7.7
Checking nutrition	25.0	26.3	-1.3
Checking color, flavor, and texture	18.3	21.7	-3.4
Compilation of market order	<u>45.2</u>	<u>60.0</u>	<u>-14.8</u>
Total	285.7	305.7	-20.0

* Not significant. $P > .05$.

cost allowance spent an average of 4.7 hours for three days compared to the 8.0 hours spent by Tallman's subjects.

Food managers time spent during food buying and storing is presented in Table 9. The difference in times spent in food buying and storing at two food cost levels was significant, with the \$1.60 level requiring more time. Likewise, a significant difference was found in the total time spent for food buying and food storing. The \$1.60 managers purchased more items which is indicated by their spending more time in these tasks.

The mean number of minutes used during food preparation and cleanup by food managers and assistants at both food cost allowances is recorded in Tables 10-13. The differences were not significant. Closer examination of Table 10 indicates a learning effect may have occurred at the \$0.80 food

Table 9. Time spent by food managers in food buying and storing by food cost allowance.

Task	Mean number of minutes		
	\$0.80 n=15	\$1.60 n=15	Difference
Grocery buying	84.3	124.7	-40.4*
Food storing	<u>19.9</u>	<u>38.3</u>	<u>-18.4*</u>
Total	104.2	163.0	-58.8*

*Significant. $P > .05$ ($t = 2.048$).

cost level. The time required in meal preparation for the first days tended to be greater, indicating that the subject "learned" to prepare meals in the kitchen. The location of equipment is better known after one becomes acquainted with the facilities.

The average time spent in meal preparation by the managers at the \$0.80 level was 2.6 hours per day. Tallman [17] reported that 4.69 hours per day were spent by managers on \$0.85 per person per day in food preparation.

The overall average time spent by all food managers in meal preparation was 2.6 hours per day. The students spent more time in food preparation than Walker [18] found homemakers to spend. Walker's employed homemakers spent an average of 1.6 hours per day and full-time homemakers spent an average of 2.3 hours per day. Manning [15] found that Indiana homemakers spent an average of 1.3 hours per day in food preparation. The homemakers worked under their own home conditions where they were well acquainted with the facilities. However, students in this study worked in unfamiliar kitchen

Table 10. Time spent by food managers in food preparation by meal and food cost allowance.

Meal	Day	Mean number of minutes		
		\$0.80 n=15	\$1.60 n=15	Difference [*]
Breakfast				
	1	42.0	37.3	4.7
	2	34.3	35.7	-1.4
	3	32.3	37.1	-4.8
	All	36.2	36.7	-0.5
Lunch				
	1	57.0	51.2	5.8
	2	48.0	53.3	-5.3
	3	47.0	53.0	-6.0
	All	50.6	52.5	-1.9
Dinner				
	1	69.0	62.7	6.3
	2	75.8	60.7	15.1
	3	57.7	70.2	-12.5
	All	67.5	64.5	2.0

* Not significant. $P > .05$.

Table 11. Time spent by assistants in food preparation by meal and food cost allowance.

Meal	Day	Mean number of minutes		
		\$0.80 n=15	\$1.60 n=15	Difference [*]
Breakfast				
	1	18.0	19.0	-1.0
	2	17.1	17.0	0.1
	3	13.4	15.7	-2.3
	All	16.2	17.2	-1.0
Lunch				
	1	19.3	24.1	-4.8
	2	18.9	21.7	-2.8
	3	17.6	22.4	-4.8
	All	18.6	22.7	-4.1
Dinner				
	1	21.7	25.5	-3.8
	2	28.2	21.0	7.6
	3	23.0	29.0	-6.0
	All	24.3	25.2	.9

* Not significant. $P > .05$.

Table 12. Time spent by food managers in cleanup by meal and food cost allowance.

Meal	Day	Mean number of minutes		
		\$0.80 n=15	\$1.60 n=15	Difference *
Breakfast				
	1	16.0	11.0	5.0
	2	18.8	13.9	4.9
	3	16.1	20.3	-4.2
	All	16.9	15.1	1.8
Lunch				
	1	21.0	16.7	4.3
	2	18.1	21.3	-3.2
	3	15.1	22.3	-7.2
	All	18.1	20.1	-2.0
Dinner				
	1	29.6	28.0	1.6
	2	27.6	22.9	4.7
	3	28.9	32.4	-3.5
	All	28.7	27.8	0.9

* Not significant. $P > .05$.

Table 13. Time spent by assistants in cleanup by meal and food cost allowance.

Meal	Day	Mean number of minutes		
		\$0.80 n=15	\$1.60 n=15	Difference *
Breakfast				
	1	14.7	12.7	2.0
	2	15.5	16.3	-0.8
	3	12.9	19.8	-6.9
	All	14.4	16.3	-1.9
Lunch				
	1	19.3	16.3	3.0
	2	18.3	22.0	-3.7
	3	16.9	20.7	-3.8
	All	18.2	19.7	-1.5
Dinner				
	1	31.2	24.3	6.9
	2	27.9	21.8	6.1
	3	29.0	33.2	-4.2
	All	29.4	26.4	3.0

* Not significant. $P > .05$.

facilities while under the pressure of an academic situation. Food managers spent an average of 1.5 hours per day in kitchen cleanup compared to 0.81 hours per day by homemakers studied by Manning [15].

Manning [15] reported the time spent by a family helper in food preparation and cleanup. The food managers assistants in this study would compare to a family helper. Manning found the average time spent by the helper was 0.81 hours per day in food preparation which compares to an average of 1 hour per day for the assistants in this study. The assistants spent 1.0 hours per day in cleanup compared to an average of 1.3 hours by homemakers in Manning's study.

Footsteps

Data on number of footsteps taken by food managers and assistants during food preparation and cleanup are summarized by meal and food cost allowance in Tables 14-17. The difference in number of footsteps taken by food managers and assistants in meal preparation and cleanup at the two food cost levels was analyzed by one-way analysis of variance (Tables 14-17). No significant differences were found. The data on the number of footsteps were scattered within each group of food cost managers, which indicated individual differences. There is evidence of the learning effect among the \$0.80 managers (Table 14). Breakfasts on the first day required more footsteps than on the second and third days. As the subjects became acquainted with the kitchen, less footsteps were taken. The \$0.80 menus contained a greater number of casseroles, which require collection of numerous items. This may account for the greater number of footsteps taken by the \$0.80 managers. The \$1.60 menus characteristically contained such items as a cut of meat, two separate vegetables, all of which could have been prepared at one location.

Table 14. Footsteps taken by food managers in meal preparation by meal and food cost allowance.

Meal	Day	Mean number of footsteps		
		\$0.80 n=15	\$1.60 n=15	Difference *
Breakfast				
	1	347.4	239.5	107.9
	2	190.6	229.4	-38.8
	3	211.7	220.8	-9.1
	All	249.9	229.9	20.0
Lunch				
	1	389.9	222.1	167.8
	2	224.4	265.2	-40.8
	3	267.6	343.3	-75.7
	All	293.9	276.9	17.0
Dinner				
	1	413.3	404.7	8.6
	2	426.0	256.0	170.0
	3	371.4	339.5	31.9
	All	403.6	333.3	70.3

* Not significant. $P > .05$.

Table 15. Footsteps taken by assistants in meal preparation by meal and food cost allowance.

Meal	Day	Mean number of footsteps		
		\$0.80 n=15	\$1.60 n=15	Difference *
Breakfast				
	1	159.7	217.8	-58.1
	2	162.1	205.3	-43.2
	3	155.1	183.8	-28.7
	All	158.9	202.3	-43.4
Lunch				
	1	188.0	226.0	-38.0
	2	244.3	221.1	23.2
	3	236.1	218.1	18.0
	All	222.8	221.7	1.1
Dinner				
	1	274.7	309.5	-34.8
	2	323.1	283.2	39.9
	3	287.9	197.3	90.6
	All	295.3	263.3	32.0

* Not significant. $P > .05$.

Table 16. Footsteps taken by food managers in cleanup by meal and food cost allowance.

Meal	Day	Mean number of footsteps		
		\$0.80 n=15	\$1.60 n=15	Difference *
Breakfast				
	1	108.0	102.1	5.9
	2	122.2	97.3	24.9
	3	93.9	124.8	-30.9
	All	108.0	108.0	0.0
Lunch				
	1	137.7	129.7	8.0
	2	132.8	110.9	21.9
	3	83.9	111.6	-27.7
	All	118.1	117.4	.7
Dinner				
	1	154.8	206.3	-51.5
	2	136.5	156.7	-20.2
	3	164.3	180.9	-16.6
	All	151.8	181.3	-29.5

* Not significant. $P > .05$.

Table 17. Footsteps taken by assistants in cleanup by meal and food cost allowance.

Meal	Day	Mean number of footsteps		
		\$0.80 n=15	\$1.60 n=15	Difference*
Breakfast				
	1	64.1	116.3	-52.2
	2	176.7	127.4	49.3
	3	91.9	123.6	-31.7
	All	110.9	124.3	-13.4
Lunch				
	1	104.8	125.7	-20.9
	2	114.0	126.6	-12.6
	3	109.5	141.1	-31.6
	All	109.4	131.1	-21.7
Dinner				
	1	144.9	181.1	-36.2
	2	147.5	182.3	-34.8
	3	164.1	153.9	10.2
	All	152.2	172.4	-20.2

* Not significant. $P > .05$.

Equipment

The total number of times each of seven pieces of equipment was used during each manager's three-day food management was recorded. The mean number of times each piece was used by \$0.80 and \$1.60 food managers is recorded in Table 18. Data on frequency of use of this equipment were analyzed by one-way analysis of variance. No significant difference in number of times used by managers at each food cost allowance was found in any of the seven pieces of equipment.

Table 18. Use of equipment during food preparation by food cost allowance.

Piece of equipment	Mean number of times used		
	\$0.80 n=15	\$1.60 n=15	Difference *
Range (top)	11.67	9.27	2.40
Deep well	0.33	0.07	.26
Oven	6.27	7.53	-1.26
Broiler (oven)	0.67	1.13	.46
Electric skillet	0.40	1.27	-.87
Blender	0.80	0.53	.27
Pressure saucepan	0.07	0.00	.07

* Not significant. $P > .05$.

Note that both groups of food managers used the range top and oven most frequently. These items in combination or separately would be the most expensive of those studied.

The use of the two small appliances included in this study compares favorably with White [21] who found that as income increased the use of

small electrical appliances increased. The frequency of use of the two small appliances by managers at the \$0.80 level was 1.27 while managers at the \$1.60 level was 1.80.

Acceptability of Meals

Eighteen meals were rated for acceptability by the first four subjects, whereas the remaining subjects rated approximately thirty-six meals. Occasionally a subject had to be excused from eating a meal.

The acceptability of meals was analyzed by chi-square and one-way analysis of variance. For analysis of responses to the question, "How often would you serve this meal to your family?", answers were grouped into two categories: (1) "more than once a month" and (2) "once a month or less."

Data on acceptability of meal to serve to the family, frequency of family serving, and guest serving were summarized in Table 19. The chi-square values for each subject appear in Table C-I in Appendix C. With the exception of one subject, the meals at both cost levels were found acceptable for family serving by all subjects. The frequency with which the subjects would serve the meals to their family showed only seven subjects finding a significant difference between the two cost levels. Two subjects chose to serve \$1.60 meals more frequently while six subjects indicated they would serve the \$0.80 meals significantly more often to their family. This information may be best interpreted in light of the fact that the population consisted entirely of students who may have been accustomed to eating low cost foods with limited variety. All eighteen subjects who found a significant difference between the \$0.80 and \$1.60 meals for serving guests found the \$1.60 meals to be more acceptable.

Table 19. Summary of comparisons tests of meal acceptability at two food cost allowances.

Acceptability for:	All	Number of comparisons tested for the significance of differences between meals at two cost allowances by probability levels ¹		
		P < .05 ²	P > .05	P > .01
Family serving, in general	37	36	1 ³	
Family serving, more than once a month	37	29	8 ⁴	1 ⁵
Guest serving, in general	37	19	18 ⁶	2 ⁷

¹ Chi-square test was used as the measure of statistical significance.

² Equivalent to not finding a significant difference at P > .05.

³ The \$0.80 menus unacceptable for family.

⁴ Two chose \$1.60 meals more frequently for family serving.
Six chose \$0.80 meals more frequently for family serving.

⁵ Chose \$0.80 meals more frequently for family serving.

⁶ The \$0.80 meals unacceptable for guest serving.

⁷ The \$0.80 meals unacceptable for guest serving.

A summary of the rating of acceptability of meals regarding variety of color, flavor, texture, and satiety (hunger satisfied or filling) is found in Table 20. Individual mean ratings of color, flavor, texture, and satiety appear in Appendix C (2-5). Fifteen subjects (41%) found significant differences between the \$0.80 and \$1.60 meals when rating the variety of color (Table 20). Only one of the fifteen preferred the variety of color in the \$0.80 meals, while fourteen preferred the \$1.60 meals. Twenty-two subjects (59%) found no significant difference in the variety of color. The variety of flavor was rated significantly different by twelve subjects (32%). Ten (27%) found the \$1.60 meals more flavorful while two (5%) preferred the flavor of the \$0.80 meals. Twenty-five of the subjects did not rate flavor of the meals at the two costs significantly different. Nine (24%) subjects found significant differences in the meals according to variety of texture while twenty-nine (78%) found no difference. Eight preferred the variety present in the \$1.60 meals while one rated the \$0.80 meals higher. The \$1.60 meals were found to be significantly more filling or hunger satisfying than the \$0.80 meals by fifteen subjects (40%). However, twenty-three (62%) could identify no significant difference in satiety.

It should be noted here that all the meals were served using a variety of table linens and centerpieces only limited by the degree of imagination and creativity of the assistant. This may have psychologically influenced the acceptability rate of the color, flavor, and texture of the foods in the menu.

Each subject's rating of color, flavor, texture, and satiety data were submitted to a three-way analysis of variance statistical test to determine the source of variance. The discriminatory power of the 100 mm. scale used to measure the rating of these characteristics was tested. The three

Table 20. Summary of comparisons of meal acceptability according to variety of color, flavor, texture, and satiety (hunger satisfied or filling).

Rating of:	All	Number of comparisons which tested for the significance of differences between meals at two cost allowances by probability levels	
		$P \leq .05$	$P > .05$ ¹
Variety of color	37	22	15 ²
Variety of flavor	37	25	12 ³
Variety of texture	37	29	9 ⁴
Satiety (hunger satisfied or full)	37	23	14 ⁵

¹One-way analysis of variance significant. ($t = 2.030$)

²One rated \$0.80 meals higher.
Fourteen rated \$1.60 meals higher.

³Two rated \$0.80 meals higher.
Ten rated \$1.60 meals higher.

⁴One rated \$0.80 meals higher.
Eight rated \$1.60 meals higher.

⁵All rated \$1.60 meals higher.

sources of variance which were identified and tested were individual student, characteristic (color, flavor, texture, and satiety) and food cost level.

The equation defining the analysis of variance is as follows:

$$Y_{ijke} = \mu + S_i + C_j + M_k + e_{ijk}$$

where Y = meal rating

μ = mean

S = student (1, 2 . . . 37)

C = characteristic (1, 2, 3, 4)

M = money (1, 2)

e = error

The results of this analysis are presented in Table 21. The greatest amount of variance can be attributed to the food cost allowance, which has an F-ratio of 172.003. Variance due to rating of the four characteristics was the next highest source with an F-ratio of 50.639. Individual differences of subjects accounted for the least amount of variance. The scale on which this data was collected had the power to discriminate. The results of this test indicates that the scale used was a valid method of measurement.

Table 21. Sources of variance in acceptability rating of color, flavor, texture, and satiety of meals.

Source	Degree of freedom	Mean squares	F-ratio	Probability
Individual subjects	36	5959.43	23.075	0.00
Characteristic	3	13078.16	50.639	0.0000
Food cost level	1	44422.34	172.003	0.0000
Error	4879	258.26		

Time and Footsteps

A test for correlation between time and footstep data from food managers and assistants for the food preparation and cleanup tasks within each food cost level is summarized in Tables 22-25. This was done to test for the degree of association between the two variables. Significant positive correlations (i.e., greater than zero) at the $P > .01$ level for food managers at the \$0.80 food cost allowance for breakfast, lunch, and dinner were found (Table 22). Highly significant ($P > .01$) correlations at the \$1.60 food cost allowance occurred for breakfast and lunch with significant ($P > .05$) correlation for dinner. Highly significant correlations ($P > .01$) were found for assistants in food preparation of lunch at the \$0.80 food cost allowance and for breakfast and lunch at the \$1.60 food cost allowance (Table 23).

The use of time and footsteps during cleanup was also analyzed for a correlation relationship (Table 24). Time and footsteps were highly significantly ($P > .01$) correlated for food managers for breakfast and dinner at the \$0.80 food cost allowance and for breakfast and lunch at the \$1.60

food cost allowance. Significant ($P > .05$) correlation between time and footsteps occurred for lunch at the \$0.80 food cost allowance and for lunch and dinner at the \$1.60 food cost allowance. Correlations at $P > .05$ level occurred for assistants during lunch at the \$0.80 food cost allowance and breakfast at the \$1.60 food cost allowance.

These correlations are weak even though they are significant at $P > .01$ or $.05$.

Table 22. Comparison of time and footsteps required by food managers by meals and food cost allowance.

Meal	Correlation coefficients	
	\$0.80 n=15	\$1.60 n=15
Breakfast	.5107**	.4153**
Lunch	.6496**	.5037**
Dinner	.4175**	.3748*

*Significant. $P > .05$.

**Significant. $P > .01$.

Table 23. Comparison of time and footsteps required by assistants by meal and food cost allowance.

Meal	Correlation coefficients	
	\$0.80 n=15	\$1.60 n=15
Breakfast	.0917	.5991**
Lunch	.5806**	.4163**
Dinner	.2539	.1507

* Significant. $P > .05$.

** Significant. $P > .01$.

Table 24. Comparison of time and footsteps required by food managers in cleanup by meal and food cost allowance.

Meal	Correlation coefficients	
	\$0.80 n=15	\$1.60 n=15
Breakfast	.4346**	.4264**
Lunch	.3293*	.5346**
Dinner	.4186**	.2457

* Significant. $P > .05$.

** Significant. $P > .01$.

Table 25. Comparison of time and footsteps used by assistants in cleanup by meal and food cost allowance.

Meal	Correlation coefficients	
	\$0.80 n=15	\$1.60 n=15
Breakfast	.4439**	.3095*
Lunch	.3471*	.6466**
Dinner	.2209	.4446**

*Significant. $P > .05$.

**Significant. $P > .01$.

Experimental Controls

Other data collected provide additional information concerning the subjects and their experiences which may contribute to an explanation of the use of the time, footsteps, and equipment resources. These results were not subjected to statistical analysis, and, only summaries are presented. These other data collected from the food managers include the following: actual cost of meals, problems encountered during food management, valuable experiences in food management, recipe sources, information used in food buying, number of foods per menu, forms of foods purchased and reaction to food cost allowance.

Actual cost of meals

A summary of the food managers cost per person per day is presented in Table 26. At both food cost levels the same number of subjects met the food cost assigned within the 5 percent tolerance, below the 5 percent tolerance, and above the 5 percent tolerance. The lowest actual cost per person per

day was \$0.71. The highest actual cost per person per day was \$1.69 per person per day. Forty-seven percent of the manager's actual cost in both groups fell within the 5 percent tolerance. The subjects appeared to spend less than the allowance if they did not meet it as 40 percent in both groups were below the 5 percent tolerance level.

Table 26. Food cost per person per day of managers at \$0.80 and \$1.60 food cost allowances.

Food cost allowance	Number of subjects (n=30)	Percentage
Managers at \$0.80		
Within $\pm$ 5% of \$0.80	7	47
Below 5%	6	40
Above 5%	2	13
Managers at \$1.60		
Within $\pm$ 5% of \$1.60	7	47
Below 5%	6	40
Above 5%	2	13

Problems encountered during food management

Use of money was the greatest problem faced by managers in both food cost allowances as noted in Table 27. Two-thirds of those who managed at \$0.80 identified "staying within the food allowance" while over one-half of the \$1.60 managers identified "spending all the money" as their greatest food management problem. These results may indicate that managing on a specific food cost allowance, whatever the amount, is the real problem. Only one subject, at \$0.80 food cost identified "planning nutritious meals" as the most difficult.

Table 27. Greatest problem identified by subjects in food management.

Problem	Number of food managers		
	\$0.80	\$1.60	Total
Spending all the money	1	8	9
Selecting a variety of foods	3	2	5
Planning nutritional meals	1	0	1
Staying within the food allowance	10	2	12
Food purchasing	0	1	1
Finding time to prepare meals	<u>0</u>	<u>2</u>	<u>2</u>
Total	15	15	15

Valuable experiences in food management

The experiences which aided in solving the food management problem were identified by managers at both cost levels and are presented in Tables 28 and 29. Those most often included were: "past experience" 11 times, "home management laboratory discussions" 11 times, and "understanding home management theory" 10 times. "Past experience in food management" was ranked highest by managers at both food cost levels. Ten \$0.80 managers and nine \$1.60 managers ranked past experience first.

Table 28. Rank of experiences recognized by \$0.80 food cost managers.

Experience	Ranks							Total
	1	2	3	4	5	6	7	
Past experience in food management	10	.	.	1	.	.	.	11
Understanding home management theory	.	1	5	4	.	.	.	10
Watching Mother	2	.	2	1	1	.	.	5
Use of work simplification techniques	.	.	.	4	2	2	.	8
Classmate's shared experience	1	4	1	1	.	.	1	8
Home management laboratory discussion	2	3	3	1	1	1	.	11
Use of time schedules	.	5	1	.	2	1	.	9
Use of equipment	.	2	2	1	1	.	2	8
Other--managing own home	.	.	.	1	.	.	.	1
Total	15	15	14	13	7	4	3	

Table 29. Rank of experiences recognized by \$1.60 food cost allowance managers.

Experience	Ranks								Total
	1	2	3	4	5	6	7	8	
Past experience in food management	9	3	1	.	.	.	.	.	13
Understanding home management theory	1	.	3	2	.	1	1	.	8
Watching mother	1	2	1	1	1	.	1	1	8
Use of work simplifications techniques	2	2	2	1	1	1	1	.	10
Classmate's shared experience	2	2	1	3	1	3	.	.	12
Home management laboratory discussion	.	1	3	4	3	.	.	.	11
Use of time schedules	.	3	1	.	3	.	.	1	8
Other--managing own home	.	1	3	2	2	2	1	.	11
Total	15	14	14	13	11	7	4	2	

Recipe sources

The sources of recipes which were utilized by the food managers is summarized in Table 30. Managers at the \$0.80 level used recipes from cookbooks most often with personal recipes ranking second in number used. In contrast, managers at the \$1.60 level used more recipes from their personal recipe files. Cookbooks were the second ranking sources of recipes for the managers at the \$1.60 level.

Table 30. Recipe sources for menus by food cost allowance.

Recipe source	Mean number of recipes	
	\$0.80 n=15	\$1.60 n=15
Cookbook	6.13	3.60
Personal recipe file	2.26	4.73
Laboratory file	0.06	0.00
Other sources		
classmate's recipes	0.13	0.26
product wrapper	1.67	2.80
periodical	0.06	0.06
another class	0.00	0.06

Information used in food buying

Data on the use of five specific types of information used in food buying by the \$0.80 and \$1.60 food managers are presented in Tables 31 and 32. Managers at the \$0.80 cost level utilized the various types of information 182 times in their food purchases. Cost/unit, size, or weight was utilized by the greatest number of times in selecting fresh meat, poultry,

or fish by the \$0.80 managers. This information was used most frequently (42%) by the managers at the \$1.60 food cost allowance. Brand name, the second ranking type of information used by the \$1.60 managers was used on food purchases 21 percent of the time (Table 32). It should be noted that the \$1.60 managers used the various types of information twelve more times than did the managers using the low food cost allowance. This is accounted for by the fact that they purchased more food items for their menus. Cost/unit, size, or weight takes more time to use than brand buying because this information has to be calculated in most cost comparisons. The greater use of this type of information by the managers at \$1.60 may explain the greater time used by them in food buying.

Table 31. Number of times specific information was used in food buying by managers at \$0.80 food cost allowance.

Food item	Type of information (n = 15)					
	Advertised "Specials"	Cost/unit size or weight	Brands	Quality (grades)	Cost/ serving	Did not buy
Meat, poultry and fish						
-fresh	5	14	•	4	4	•
-frozen	2	1	•	•	1	11
-canned	3	5	1	1	•	7
Fruits and vegetables						
-fresh	5	8	•	6	3	•
-frozen	5	3	1	•	2	7
-canned	6	8	4	3	4	•
Milk						
-fresh	•	1	•	•	•	14
-dry	1	•	4	•	3	8
Cheese	1	7	1	1	4	6
Eggs	5	4	•	6	2	2
Bread	5	9	2	•	2	1
Flour	•	2	•	•	•	13
Sugar	2	5	2	•	•	9
Fats and oils	1	9	3	•	1	4
Total	41	76	18	21	26	82

Table 32. Number of times specific information was used in food buying by managers at \$1.60 food cost allowance.

Food item	Type of information (n = 15)					
	Advertised "Specials"	Cost/unit size or weight	Brands	Quality (grades)	Cost/ serving	Did not buy
Meat, poultry and fish						
-fresh	5	11	•	8	5	•
-frozen	•	4	•	•	2	8
-canned	1	8	4	1	•	2
Fruits and vegetables						
-fresh	7	9	1	3	5	•
-frozen	4	7	3	•	2	3
-canned	3	10	6	1	2	•
Milk						
-fresh	•	3	6	2	2	4
-dry	•	•	1	•	1	13
Cheese	•	8	4	1	2	1
Eggs	2	9	2	6	•	1
Bread	3	9	3	•	1	1
Flour	1	1	1	•	•	12
Sugar	•	2	2	•	•	11
Fats and oils	2	4	7	•	1	2
Total	28	81	40	22	23	58

Number of foods per menu

The number of items included in each menu was compiled for the \$0.80 and \$1.60 managers and the mean number of items per meal is recorded in Table 33. Each food on the menu was counted except for butter and jelly. More food items were included in the lunch and dinner menus than were included in the breakfast menus (Table 33). The Russian style of table service, which calls for more menu items, was used frequently by the \$1.60 food managers, but not by the \$0.80 managers. This style of service was usually used on the \$1.60 level manager's third dinner and may account for the greater time spent on that meal. Another explanation for the differences in mean time of food preparation may be the number of foods per menu as shown in Table 33. The average times spent in food preparation varied directly with the number of items per menu. The dinners included more food items than did the breakfasts and lunches. The menus prepared by the managers at the \$1.60 level included more items than those prepared by the managers at the low cost allowance without exception.

Table 33. Mean number of foods per meal.

Meal	Day	Mean number of menu items		
		\$0.80 n=15	\$1.60 n=15	Difference
Breakfast				
	1	4.07	4.33	-.26
	2	4.40	4.67	-.27
	3	4.53	4.53	.00
	All	4.33	4.51	-.18
Lunch				
	1	4.60	4.67	-.07
	2	5.00	5.07	-.07
	3	4.87	5.03	-.47
	All	4.82	5.03	-.21
Dinner				
	1	5.47	6.80	-1.33
	2	5.67	6.53	-.86
	3	5.73	6.73	-1.00
	All	5.62	6.69	-1.07

Forms of foods purchased

The forms of food in regard to stage of preparation prior to meal preparation were identified as "maximum" preparation, "partially prepared," and "ready-to-serve." A summary of the mean number of items of each form were included in the menus of both the \$0.80 and \$1.60 food cost allowances is presented in Table 34. "Partially prepared" foods were included the greatest number of times in both the \$0.80 and \$1.60 menus. The foods which required maximum preparation by the food managers ranked second with the "ready-to-serve" foods being included the least number of times. A higher percentage of foods which require maximum preparation tends to increase the time spent in the food preparation task. The greater inclusion of partially and ready-to-serve foods by the managers at the \$1.60 level compares with the findings of White [21]. She found that homemakers with larger incomes tended to use more convenience foods.

Table 34. Number of foods per meal by three stages of preparation.

Meal	Mean number of foods	
	\$0.80 n=89	\$1.60 n=88
Breakfast		
Maximum preparation	1.18	1.14
Partially prepared	2.16	2.05
Ready-to-serve	0.62	1.14
Lunch		
Maximum preparation	1.39	1.51
Partially prepared	1.80	2.17
Ready-to-serve	1.16	1.37
Dinner		
Maximum preparation	2.22	2.40
Partially prepared	1.93	3.45
Ready-to-serve	1.16	1.13

Reaction to food cost allowance

Food manager's reaction to the food cost allowance on which she managed is summarized in Table 35. Eight managers (53%) on the \$0.80 cost level found this amount adequate to meet their food needs. Seven managers (47%) found the \$0.80 level too small and indicated they would add an average of \$0.27 to the \$0.80 which would provide \$1.07 per person per day food allowance. Ten subjects (67%) of the managers on the \$1.60 food cost allowance found this figure adequate for meals. Five subjects (33%) found the \$1.60 level too great and preferred to reduce this figure by an average of \$0.26 per person per day which would allow \$1.34 food cost allowance.

Table 35. Subjects' reaction to their food cost allowance.

Managers:	Subjects responses			Mean amount needed ¹
	Adequate	Too little	Too much	
At \$0.80 food cost allowance	8	7	•	+ \$0.27
At \$1.60 food cost allowance	10	•	5	- \$0.26

¹ Amount more or less needed to meet student's desired food cost allowance per person per day.

SUMMARY AND RECOMMENDATIONS

No statistical difference was found in the time required, footsteps taken, and equipment used in food management allowances of \$0.80 and \$1.60 per person per day. Therefore, the null hypotheses relating to use of these management resources were not rejected by the results. Food cost allowance did not significantly effect the amount of time required to plan menus, prepare meals and clean the kitchen after the meal. The food cost allowance did significantly effect the time required to purchase and store foods with the \$1.60 level requiring more time. Food cost allowance did not effect the number of footsteps taken in food preparation and cleanup. The level of food cost did not effect the use of equipment in food preparation.

The meals provided were well-balanced under conditions of this experiment. The results as stated above support the conclusion that it is possible to provide nutritionally well-balanced meals at either food cost level provided meals are planned to meet the food cost allowance.

A significant but weak degree of association was found between time required and footsteps taken. Those food managers who spent more time also took more footsteps.

No significant difference between meals at two food cost levels for family serving was found. The number of times a year meals at either cost level would be served to the family would depend upon the family's likes and dislikes of the menus. Serving \$0.80 meals to guests is questionable due to the fact that 49 percent of the subjects found the \$0.80 meals not acceptable for guest serving.

No conclusive evidence was obtained in regard to acceptability of meals related to variety of color, flavor, texture, and satiety (hunger satisfied or filling).

Further investigation is recommended with examination of other resources utilized in food management such as knowledge, attitude, material resources other than equipment, and community services. Recognition of management resources in addition to money is essential in dealing with families with low incomes. Greater understanding of the relationship of all management resources may help those persons involved in dealing with the hunger problem.

This study has provided some insight into the use of time, footsteps, and equipment as they were effected by two food cost levels. There is need for a more comprehensive study of all resources affected by the money resource. A study of this type should be made with low income families to determine their use of the management resources with emphasis on the nutritional value, planning at a specific food cost allowance, and acceptability of the meals.

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ADAPTATION OF BASIC FOUR

[illegible]

MARKET LIST

ITEM	Est. Amt.	Cost	Weight
Meat, poultry and fish			
Fruits and vegetables			
Dairy products			
Flour, cereal, and bakery products			
Beverages			
Eggs			
Sugar and sweets			
Fats and oils			
Miscellaneous foods			

Food Inventory

Outgoing Food Manager _____

Incoming Food Manager _____

Date Taken _____

Article	Weight or Measure	Unit Price Unit Price	Value on hand
MEATS, POULTRY, AND FISH			
Bacon			
Ham			
Sausage			
Others			
			TOTAL _____
FRUITS AND VEGETABLES			
Canned Vegetables			
Dried Vegetables			
Fresh Vegetables			

Article	Weight or Measure	Unit Price Unit Price	Value on hand
Frozen Vegetables			
Dried Fruits			
Fresh Fruits			
Canned Fruits			
Frozen Fruits			
			TOTAL _____
DAIRY PRODUCTS			
Butter			
Canned Milk			
Fresh whole milk			
Fresh skimmed or 2%			
Buttermilk			
Cheese			

Article	Weight or Measure	Unit Price	Value on hand
Cream			
Ice Cre			
Ice Cream			
Sherbert			

TOTAL

FLOUR, CEREAL, BAKERY PRODUCTS

Flour			
Cake flour			
Cornmeal			
W. wheat or Graham flour			
Ready to eat cereal			
Cooked cereals			
Others			
			TOTAL
BEVERAGES			
Coffee			
Tea			
Others			

Article	Weight of Measure	Unit Price	Value on hand
			TOTAL _____
EGGS			
			TOTAL _____
SUGAR AND SWEETS			
Corn Syrup			
Maple Syrup			
Marshmallows			
Molasses			
Sugar			
---Others			
			TOTAL _____
FATS AND OILS			
Vegetable and animal shortening			
Vegetable oil			
Mayonnaise			
Salad Oil			
Used Fat			
Salad dressing			
Others			

TOTAL _____

Article	Weight of Measure	Unit Price	Value on hand
MISCELLANEOUS FOODS			
Gelatin -----			
Gelatin dessert			
Nuts			
Baking powder			
Chocolate			
Cocoa			
Cocoanut			
Corn Starch			
Others			

Condiments _____ Value on hand

Value of any products added in your
problem. _____

_____ Total Value

Cost of condiments used during your problem

\$.05 X _____ day ==day _____

Value on hand _____

Comparison of Present with Previous Inventory Value

Inventory (Date) _____

Inventory (Date) _____

Difference in Value _____

FOOD PREPARATION MANAGER'S REPORT

(Laboratory)

(Name)

74

From _____, 196_

Thru _____, 196_

ITEM	ACTUAL	COST ANALYSIS																																				
INCOME		____ Number in group																																				
Cash																																						
Check # _____		Number of meals served:																																				
TOTAL INCOME		<table border="1"> <thead> <tr> <th></th> <th>M</th> <th>T</th> <th>W</th> <th>TH</th> <th>F</th> <th>S</th> <th>S</th> <th>TOTAL</th> </tr> </thead> <tbody> <tr> <td>Breakfast</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Lunch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Dinner</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		M	T	W	TH	F	S	S	TOTAL	Breakfast									Lunch									Dinner								
	M	T	W	TH	F	S	S	TOTAL																														
Breakfast																																						
Lunch																																						
Dinner																																						
EXPENDITURES*																																						
Food		\$ ____ Total cost of food																																				
Meat, Poultry and fish		\$ ____ Cost per day per person																																				
Fruits and vegetables																																						
Dairy products																																						
Flour, cereal, bakery prod.																																						
Beverages																																						
Eggs																																						
Sugar and sweets																																						
Fats and oils																																						
Miscellaneous food																																						
Household Supplies																																						
Entertainment Supplies																																						
TOTAL EXPENSES																																						
BALANCE																																						
Balance plus expenditures (should equal total income)		Approved: _____ (Instructor)																																				

*Receipts for all expenditures are required. Place in envelope and clip to report.

-2-

Food Cost During My Problem

Total Expenditure for Food in Lab \$ _____

Food Inventory Beginning \$ _____

Food Inventory End \$ _____

Difference in Inventories \$ _____

Total Cost of Food Used in Lab \$ _____

Budget for Food at \$ _____ per person per day in lab.

PERSON-DAY CALCULATION

<u>Meal Allowance</u>	<u>Amount</u>	<u>Fraction of Total</u>
Breakfast	\$ _____	0.20
Lunch	\$ _____	0.32
Dinner	\$ _____	0.48
TOTAL	\$ _____	1.00

<u>Meal</u>	<u>Total Number of Meals Served</u>	<u>Person-Days</u>
Breakfast X _____	X .20 = _____	
Lunch X _____	X .32 = _____	
Dinner X _____	X .48 = _____	
TOTAL PERSON-DAYS = _____		

Cost per person per day = $\frac{\text{Total Cost of Food}}{\text{Number of Person-Days}}$

Cost Per Person Per Day \$ _____

Place asterisk by food to be prepared by Assistant.
 Turn in to instructor before meal preparation problem begins.

TABLE SETTING CHART

Menu	References	Number Served	Type of Service	Service China	Silver	Glass	Serving Dishes	Special Suggestions

Menus As Served

Record menus as served and
cost per meal.

Name _____

Date _____

Menu

Menu

Cost of Meal \$ _____

Cost of Meal \$ _____

Menu

Menu

Cost of Meal \$ _____

Cost of Meal \$ _____

APPENDIX B-1
STUDENT DATA SHEET

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SECTION I.

Age ____ Single ____ Married ____ Name _____

Course background: Check appropriate blanks.

	Completed course	Did not take or complete course
Food Science - - - - -	_____	_____
Food for Man - - - - -	_____	_____
Meal Management - - - - -	_____	_____
The House - - - - -	_____	_____
Nutrition - - - - -	_____	_____
Household Equipment - - - - -	_____	_____

Housing: Residence during your college years.
(Count summer school as 1/2 semester.)

	Number of semesters
Dormitory - - - - -	_____
Sorority house - - - - -	_____
Cooperative house - - - - -	_____
Room - - - - -	_____
Apartment - - - - -	_____
Mobile home - - - - -	_____
Rent or own home - - - - -	_____
Parent's home - - - - -	_____

Total (If more than 8, explain under comments.) _____

Comments: _____

SECTION I.

page 2

Food preparation background: To what extent have you been responsible for food management?

	Food management		
	tasks		
	meal planning	food buying	meal preparation
Involvement			
fully responsible	_____	_____	_____
partially responsible	_____	_____	_____
assisted	_____	_____	_____
was not responsible	_____	_____	_____
Length of responsibility			
number of days	_____	_____	_____
Time			
number of months ago	_____	_____	_____

How many persons were served? (average number) _____

What were the circumstances?

parent's family _____ own family _____ apartment _____

babysitter _____ other (specify) _____

SECTION I.

page 3

Food preparation ability:

How would you rate your ability, in relation to others in your class at the present time, in the following tasks? (Mark along the line where you feel your competency lies.)

meal
planning well below average average well above average



food
buying well below average average well above average



meal
preparation well below average average well above average



APPENDIX B-2

SECTION II.

TIME RECORD SHEET

Food allowance \$ _____ per person per day. Name _____

Instructions: Record number of minutes spent in each of the listed activities.

Menu planning:

- _____ selection of foods for meals
- _____ selection of recipes for food preparation
- _____ checking menus for nutritional content
- _____ checking menus for color, flavor, and texture of foods
- _____ compilation of market order

Food buying:

- _____ grocery buying
- _____ storing foods

Meal preparation:

cooking		meal	day	clean-up	
manager	assistant			manager	assistant
_____	_____	breakfast,	first day	_____	_____
_____	_____	lunch,	" "	_____	_____
_____	_____	dinner,	" "	_____	_____
_____	_____	breakfast,	second day	_____	_____
_____	_____	lunch,	" "	_____	_____
_____	_____	dinner,	" "	_____	_____
_____	_____	breakfast,	third day	_____	_____
_____	_____	lunch,	" "	_____	_____
_____	_____	dinner,	" "	_____	_____

APPENDIX B-3

SECTION III.

ACCEPTABILITY OF MEAL

Your name _____ Food manager's name _____

Meal: breakfast _____ lunch _____ dinner _____

Cost Per Person Per Day: \$.80 _____ \$1.60 _____

Meal rating: (Answer the following questions by checking the appropriate blank.)

yes no

____ Would you prepare this meal for your family?

If yes, how often would you serve it?

____ several times a week

____ once a week

____ several times a month

____ once a month

____ several times a year

____ Would you prepare this meal for guests?

Rate the meal according to the following criteria. (Mark along the line to indicate your rating of the meal.)

variety of ...

color

inferior _____ average _____ superior

flavor

inferior _____ average _____ superior

texture

inferior _____ average _____ superior

satiety (hunger satisfied or filling)

inferior _____ average _____ superior

SECTION IV. USE OF MANAGEMENT FACTORS IN FOOD MANAGEMENT

Food budget allowance \$ _____ per person per day. Name _____

Meal planning: Record number of recipes used from each source.

<u>number</u>	<u>source</u>
_____	Cookbooks (list those used) _____
_____	_____
_____	Personal recipe file
_____	Laboratory file
_____	Other (list) _____

Food buying: Check those categories you used in buying your food.

Food	Type of information					
	Advertized "Specials"	Cost/unit size or weight	Brands	Quality (grades)	Cost/ serving	Did not buy
Meat, poultry and fish						
-fresh	_____	_____	_____	_____	_____	_____
-frozen	_____	_____	_____	_____	_____	_____
-canned	_____	_____	_____	_____	_____	_____
Fruits and vegetables						
-fresh	_____	_____	_____	_____	_____	_____
-frozen	_____	_____	_____	_____	_____	_____
-canned	_____	_____	_____	_____	_____	_____
Milk						
-fresh	_____	_____	_____	_____	_____	_____
-dry	_____	_____	_____	_____	_____	_____
Cheese	_____	_____	_____	_____	_____	_____
Eggs	_____	_____	_____	_____	_____	_____
Bread	_____	_____	_____	_____	_____	_____
Flour	_____	_____	_____	_____	_____	_____
Sugar	_____	_____	_____	_____	_____	_____
Sugar	_____	_____	_____	_____	_____	_____
Fats and oils	_____	_____	_____	_____	_____	_____

SECTION IV.

page 2

Food preparation: Forms of foods used in menus.*

<u>Meal</u>	<u>Day</u>	<u>Number of foods (menu items)</u>		
		max.-prep	part.-prep	ready-to-serve
breakfast,	first day	_____	_____	_____
lunch,	" "	_____	_____	_____
dinner,	" "	_____	_____	_____
breakfast,	second day	_____	_____	_____
lunch,	" "	_____	_____	_____
dinner,	" "	_____	_____	_____
breakfast,	third day	_____	_____	_____
lunch,	" "	_____	_____	_____
dinner,	" "	_____	_____	_____
Total		=====	=====	=====

*Definitions of categories:

Max.-prep =foods which are prepared in the home beginning with the individual raw ingredients. Examples: fresh meats, fruits, and vegetables; "homemade" cakes and cookies; "old-fashioned" oatmeal; tuna casserole.

Part.-prep. =Foods, cooked or uncooked, which require additional ingredients and/or mixing before serving. Examples: frozen meats, fruits, and vegetables; cake mixes; "quick-cook" oatmeal; T.V. dinner.

Ready-to-serve=foods which may be served directly from the kitchen to the table with only cooling or warming or no preparation for serving. Examples: canned meats, fruits, and vegetables; bakery products; prepared dry cereal.

Footsteps used: Record the number of footsteps required during food preparation and clean-up.

Meal preparation		Clean-up	
manager	assistant	manager	assistant
_____	_____	_____	_____
	breakfast, first day		
_____	_____	_____	_____
	lunch, " "		
_____	_____	_____	_____
	dinner, " "		
_____	_____	_____	_____
	breakfast, second day		
_____	_____	_____	_____
	lunch, " "		
_____	_____	_____	_____
	dinner, " "		
_____	_____	_____	_____
	breakfast, third day		
_____	_____	_____	_____
	lunch, " "		
_____	_____	_____	_____
	dinner, " "		

Equipment used: Record number of times (frequency) you used the following equipment during food preparation.

Number	Did not use	Equipment
_____	_____	range top
_____	_____	range (deep well)
_____	_____	oven
_____	_____	broiler
_____	_____	electric skillet
_____	_____	blender
_____	_____	pressure saucepan

SECTION IV.

page 4

Name _____

Check the statement which describes the most difficult problem incurred while managing your food problem.

- _____ spending all the money
- _____ selecting a variety of foods
- _____ planning nutritional meals
- _____ staying within the food budget allowance
- _____ food purchasing
- _____ finding time to prepare meals
- _____ other (specify) _____

Rank the following experiences which you feel were helpful in management of your food problem. (Number only those which are appropriate and use 1 as the highest rank.)

- _____ past experience in food management
- _____ understanding home management theory
- _____ watching mother
- _____ use of work simplification techniques
- _____ classmate's shared experience
- _____ home management laboratory discussions
- _____ use of time schedules
- _____ use of equipment
- _____ other (specify) _____

You had \$.80 ____ or \$1.60 ____ per person per day food allowance.

Do you think the amount of money allotted to you was ...

____ too much

____ too little

____ adequate

If you did not check adequate above, how much money per person per day do you feel you would need for adequate meal management? (Use your allowance and add or subtract to obtain the desired amount.)

____ more (circle amount more) \$.10 .20 .30 .40 .50 .60 .70 .80 .90 1.00

____ less (circle amount less) \$.10 .20 .30 .40 .50 .60 .70 .80 .90 1.00

Why did you feel that your food budget allowance was too much, too little, or adequate? _____

APPENDIX C-1

Table C-1. Acceptability of meal: family serving, frequency, and guest serving.

Student number	Chi-square values		
	Family ¹	Frequency ²	Guest ³
1	0.00	0.01	5.14*
2	1.28	0.11	6.92*
3	0.00	0.25	2.49
4	1.05	0.50	5.14*
5	0.00	0.53	2.55
6	1.03	3.07	2.06
7	0.00	7.93*	3.23*
8	0.97	0.56	0.00
9	1.03	4.50*	0.13
10	0.00	4.20*	0.18
11	0.00	4.20*	0.55
12	1.02	1.39	0.00
13	0.92	0.27	0.97
14	1.03	0.36	5.46*
15	1.13	0.54	3.70*
16	0.00	0.00	8.34*
17	0.92	0.00	4.48*
18	1.13	3.02*	4.21*
19	0.97	2.06	6.80*
20	1.03	4.80*	2.12
21	0.00	2.86	0.80
22	0.00	0.71	8.00*
23	0.00	1.08	1.00
24	0.00	0.08	3.50
25	0.00	1.94	0.31
26	0.00	1.13	0.64
27	0.81	0.53	0.00
28	0.00	0.00	5.67*

Table C-1.(continued)

Student number	Chi-square values		
	Family	Frequency	Guest
29	4.57*	0.32	0.02
30	0.37	0.01	7.56*
31	1.27	1.03	10.30**
32	1.03	11.49**	7.77*
33	0.00	0.17	0.00
34	1.03	0.06	7.20*
35	2.00	0.01	10.38**
36	0.00	1.28	9.26*
37	0.07	0.07	2.69

* Significant. $P > .05$.

** Significant. $P > .01$.

¹Choice, yes or no, to serve menu to family.

²For purposes of analysis, data were grouped into (1) "more than once a month" and (2) "once a month or less".

³Choice, yes or no, to serve menu to guests.

APPENDIX C-2

Table C-2. Acceptability of meal according to variety of color.

Subject	Mean rating		
	\$0.80	\$1.60	Difference
1	69.55	83.33	13.78*
2	60.33	77.00	16.66*
3	78.11	77.67	0.44
4	67.89	79.11	11.22
5	49.73	58.17	8.44
6	57.12	63.47	6.35
7	56.24	65.94	9.70*
8	63.00	64.22	1.22
9	65.56	72.00	1.44
10	77.61	75.94	1.67
11	65.28	70.28	5.00
12	60.39	77.50	17.11*
13	68.94	69.67	0.73
14	52.78	76.83	24.05*
15	62.39	70.00	7.61
16	67.18	74.00	6.82
17	65.06	76.78	11.72*
18	65.06	69.39	4.33
19	62.67	71.53	8.86
20	69.72	77.67	7.95
21	52.78	65.12	12.34
22	62.06	75.61	13.55*
23	78.67	79.28	0.61
24	75.00	87.41	12.41*
25	55.33	73.89	18.56*
26	66.06	84.00	17.94*
27	71.61	69.88	1.73
28	66.31	76.56	10.25*

Table C-2. (continued)

Subject	Mean rating		
	\$0.80	\$1.60	Difference
29	62.29	62.00	0.29
30	75.06	67.29	7.77
31	63.76	65.06	1.30
32	64.76	68.65	3.89
33	91.35	83.61	7.74*
34	70.22	85.44	15.22*
35	68.00	77.44	9.44
36	60.11	74.56	14.45*
37	57.44	74.80	17.36*

* Significant. $P > .05$ ($t = 2.030$)

APPENDIX C-3

Table C-3. Acceptability of meals according to variety of flavor.

Subject	Mean rating		
	\$0.80	\$1.60	Difference
1	72.22	81.33	9.11
2	67.78	83.33	15.55*
3	79.44	85.11	5.67
4	73.44	76.22	2.78
5	71.39	76.20	4.81
6	66.18	63.24	2.94
7	68.94	73.50	4.56
8	70.06	66.11	3.95
9	65.44	67.78	2.34
10	69.50	75.56	6.06
11	72.11	77.28	5.17
12	65.94	76.61	10.67
13	74.25	75.61	1.36
14	67.72	74.89	7.17
15	68.83	65.83	3.00
16	79.12	73.33	5.79
17	66.13	67.61	1.49
18	67.94	77.72	9.78*
19	67.56	77.00	9.44*
20	68.94	83.72	14.78*
21	60.67	69.18	8.51
22	64.50	79.50	15.00*
23	78.44	76.78	1.66
24	72.50	83.35	10.85
25	76.72	87.11	10.39*
26	79.11	87.44	8.33*
27	80.00	71.68	8.32
28	66.56	75.22	8.66*

Table C-3. (continued)

Subject	Mean rating		
	\$0.80	\$1.60	Difference
29	63.00	66.56	3.56
30	75.76	66.94	8.82*
31	62.41	69.33	6.92
32	64.29	71.71	7.42
33	94.94	77.78	17.16*
34	93.22	92.06	1.16
35	79.78	85.24	5.46
36	63.11	74.06	10.95*
37	71.83	88.33	16.50*

* Significant. $P > .05$ ($t = 2.030$)

APPENDIX C-4

Table C-4. Acceptability of meals according to variety of texture.

Subject	Mean rating		
	\$0.80	\$1.60	Difference
1	74.44	78.55	4.11
2	64.33	79.55	14.42
3	74.78	87.11	12.33*
4	71.11	76.33	5.22
5	66.93	68.72	1.70
6	61.71	64.12	2.41
7	66.41	69.06	2.65
8	68.36	65.11	3.25
9	55.83	60.78	4.95
10	65.44	71.94	6.50
11	69.28	74.22	4.94
12	45.22	71.78	26.56*
13	65.19	69.39	4.20
14	56.17	65.72	9.55
15	62.28	56.17	6.11
16	74.59	76.56	1.97
17	66.63	72.94	6.31*
18	57.89	66.78	8.89*
19	70.44	71.41	0.97
20	71.33	79.44	8.11
21	64.17	63.82	0.35
22	64.44	78.28	13.84*
23	76.17	79.83	3.66
24	75.39	84.47	9.08
25	60.00	80.11	20.11*
26	73.06	85.22	12.16*
27	73.50	76.25	2.75
28	52.56	67.39	14.83*

Table C-4. (continued)

Subject	Mean rating		
	\$0.80	\$1.60	Difference
29	56.18	65.56	9.38*
30	78.88	75.12	3.76
31	60.94	69.22	8.28
32	67.53	69.12	1.59
33	93.35	77.50	15.85*
34	88.94	87.33	1.61
35	83.18	79.67	3.51
36	62.39	70.17	7.78
37	69.89	79.87	9.98

* Significant. $P > .05$ ($t = 2.030$)

APPENDIX C-5

Table C-5. Acceptability of meals according to satiety (hunger satisfied or filling).

Subject	Mean rating		
	\$0.80	\$1.60	Difference
1	80.11	84.44	4.33
2	86.22	85.55	0.67
3	84.22	80.89	3.33
4	84.00	85.22	1.22
5	56.17	58.00	1.83
6	68.59	65.82	2.77
7	73.76	73.44	0.32
8	75.06	73.72	1.34
9	68.67	68.11	0.56
10	96.83	96.83	0.00
11	74.56	86.06	11.60*
12	70.11	87.11	17.00*
13	77.44	80.89	3.45
14	39.89	61.50	21.61*
15	62.39	79.28	16.89*
16	74.18	82.22	8.04
17	67.06	79.11	12.05
18	74.44	88.00	13.56*
19	71.11	77.76	6.65
20	69.50	81.67	12.17
21	65.56	73.41	7.85
22	62.28	68.67	6.39
23	79.78	79.28	0.50
24	86.94	89.06	2.12
25	83.11	90.00	6.89
26	86.39	91.94	5.55*
27	72.78	76.37	3.59
28	57.50	81.61	24.11*

Table C-5. (continued)

Subject	Mean rating		
	\$0.80	\$1.60	Difference
29	60.35	76.78	16.43*
0	69.94	81.65	11.71*
31	56.53	78.56	22.03*
32	57.88	75.41	17.53*
33	93.41	87.28	6.13
34	79.17	98.28	19.11*
35	91.52	89.50	2.02
36	73.56	80.17	6.61
37	89.33	86.67	2.66

*Significant. $P > .05$ ($t = 2.030$)

THE EFFECT OF FOOD COST ALLOWANCE ON
OTHER MANAGEMENT RESOURCES

by

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B. S., Kansas State University, 1966

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Use of management resources, time, footsteps and equipment, at two food cost levels was investigated in this study. The population was limited to thirty-seven senior women enrolled in home management laboratory. Thirty of these women served as food managers and planned and prepared meals in the home management house on either \$0.80 or \$1.60 per person per day.

Time required for menu planning, purchasing and storing foods, preparing meals, and that required for kitchen cleanup was reported by the food managers. Subjects assisting in food preparation and cleanup also reported their times. The number of footsteps taken by the managers and assistants was recorded by an experimental footstep counter. Frequency of use of seven pieces of equipment during food preparation was recorded by each subject.

The data were analyzed by comparing the use of three resources by managers and assistants at each cost level. No significant difference in time used by food managers was found in planning menus. The managers at \$1.60 level required significantly more time to purchase and store foods than those at the \$0.80 food cost level.

During meal preparation no significant difference was found in time required, footsteps taken, or equipment used. A relationship between time required and footsteps taken was shown by significant positive correlations in 66.6 percent of the cases at both food cost levels.

After the meals were eaten, each subject indicated whether the menu would be acceptable for family serving, number of times a year she would serve it (if acceptable), and whether she would serve it to guests. The variety of color, flavor, texture, and satiety (hunger satisfied or filling) was also rated by each subject.

Thirty-six of thirty-seven subjects (97%) found no significant difference between meals at either food cost level when asked if they would

serve them to their families. Twenty-six (70%) indicated no preference in choosing to serve meals at either cost level more or less than once a month during a year. Eighteen subjects (49%) found meals at the \$0.80 level not acceptable for guest serving. No significant difference in variety of color was found by 59 percent of the subjects, flavor by 68 percent of the subjects, and texture by 78 percent of the subjects. Rating of satiety results showed 62 percent of the subjects finding no difference and 38 percent indicating a significant preference for the \$1.60 meals. Variance in ratings of the characteristics color, flavor, texture, and satiety was due mainly to the difference in the two food cost levels.

This research should be extended to include the use of all management resources identified as they are applied to food management by low income families.