

TECHNICAL REPORT

75-13-OR/SA

**AN EXPERIMENTAL EVALUATION OF
THE SPECIALTY MEAL SERVICE AT TRAVIS AFB**

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July 1974

**UNITED STATES ARMY
NATICK LABORATORIES
Natick, Massachusetts 01760**



Operations Research and Systems Analysis Office

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ABSTRACT

A brief description and preliminary results of the evaluation of a new meal service are discussed, including concept, menu, and performance. It is concluded that this new service offers the potential for achieving the desired objectives of increased customer satisfaction and attendance in the dining halls. It is recommended that the Air Force consider this concept for application to their food service requirements at other installations.

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INTRODUCTION

During FY 1973-74, the Operations Research and Systems Analysis Office conducted an investigation of Air Force food service under Task 03, Project Number 1J662713AJ45, Analysis and Design of Military Feeding Systems, of the DOD Food Research, Development, Testing and Engineering program. The purpose of this project was to define, develop and evaluate broad improvements to the existing Air Force food service system, as characterized by food service operations at Travis AFB. In particular, the objectives were to obtain increased customer satisfaction, with a consequent increase in attendance and utilization of the dining facilities, and to identify possible cost reductions. Several new innovations in military food service evolved during this project, including the specialty meal. This service provides another meal option in the dining hall, offering ethnic and specialty foods on a regular basis, at times more convenient to the customer than, perhaps, the normal meal schedule. It was implemented and evaluated in a food service system experiment at Travis AFB between 1 November, 1973 - 31 January 1974. This report contains a description of the operation and its performance during the experiment.

OBJECTIVES

The specialty meal service was designed to meet the following objectives, as determined by preliminary consumer surveys and systems studies:

1. Provide an alternative choice to the supper meal, conveniently located to both RIK (rations-in-kind) and BAS (basic allowance for subsistence) customers living in the dormitories.
2. Offer popular, high preference ethnic and specialty food items and meals, providing for greater variety, and ensuring adequate nutritional levels consistent with established requirements.
3. Serve an additional approximately 200 meals per day in the dining hall with a minimum increase in labor requirements.

OPERATIONS

In effect, this new service was another meal added to the normal operating schedule in Dining Hall 7, which was situated in the largest enlisted dormitory area at Travis AFB. The hours of service began an hour after the regular supper meal was completed (1830-2030 hours on weekdays and 1600-1800 hours on weekends and holidays), which allowed the customers an opportunity to eat at a later time, more consistent with their own preferences, and offered another choice of supper menus, hence more variety. Meals were served at no cost to RIK customers, and those persons receiving a BAS were required to pay the standard supper meal charge.

A mobile serving line, with heated and refrigerated units, was provided the dining hall for this meal, and is pictured in Figure 1. Two advantages were gained -- a part of the labor typically required on the serving line was eliminated by placing the mobile units in the dining room for customer self-service, and further, permitted the customer to select items in whatever portion-size wanted and to obtain additional servings as desired. (Prior to the experiment, a frequent customer complaint of service in the dining halls was being given too small or too large servings of certain food item and that second servings were not available). Self-service items were prepared in bulk prior to the start of the meal, and maintained at proper temperatures in a heated holding cabinet until needed on the serving line. Items cooked-to-order were prepared and served from the regular line, which not only preserved quality but afforded better portion and cost control of higher priced foods, such as shrimp which was included on the seafood platter.

Overall responsibility for the operation was assigned to the dining hall supervisor. Total staffing consisted of a cook (for an eight-hour shift each day); four food service workers (each for four hours daily) to set up and supply the serving lines, maintain the dining hall and to clean-up following the meal; and, a member of the military food service staff to perform the headcount and cash collection function (for a maximum of three hours every day). Standard accounting, control and reporting procedures, as used in the dining halls, applied to this meal as well, except that informal records as to the number of meals served, net cost of issues and income earned were maintained in the Food Service Staff Office so that performance could be continually monitored and evaluated during the experiment.

MENU

Results from comprehensive consumer surveys at Travis AFB in December 1972 -- January 1973, by the Behavioral Sciences Division of these Laboratories, revealed that the most desired ethnic or specialty foods were Italian, Mexican and seafood. Detailed food preference data were then examined to determine the specific items in each of these categories most popular with the consumers. From this list, a tentative menu was established, which was then considered in terms of raw food costs, labor requirements and equipment.

a. Raw food costs were, of course, constrained by the amount of the basic daily food allowance (BDFA) allocated to the supper meal. Utilizing a constant menu from day to day, and preparing some foods to order (particularly the higher priced items) reduced losses normally occurring from leftovers.

b. To keep labor requirements to a minimum, menu items were selected that could be prepared in advance of the meal and held for 2-3 hours with only slight degradation in quality, procured in a ready-to-use form (frozen or canned) and needed little or no additional preparation before serving, or that were normally used in the other meals in the dining hall and, therefore, did not have to be prepared separately.

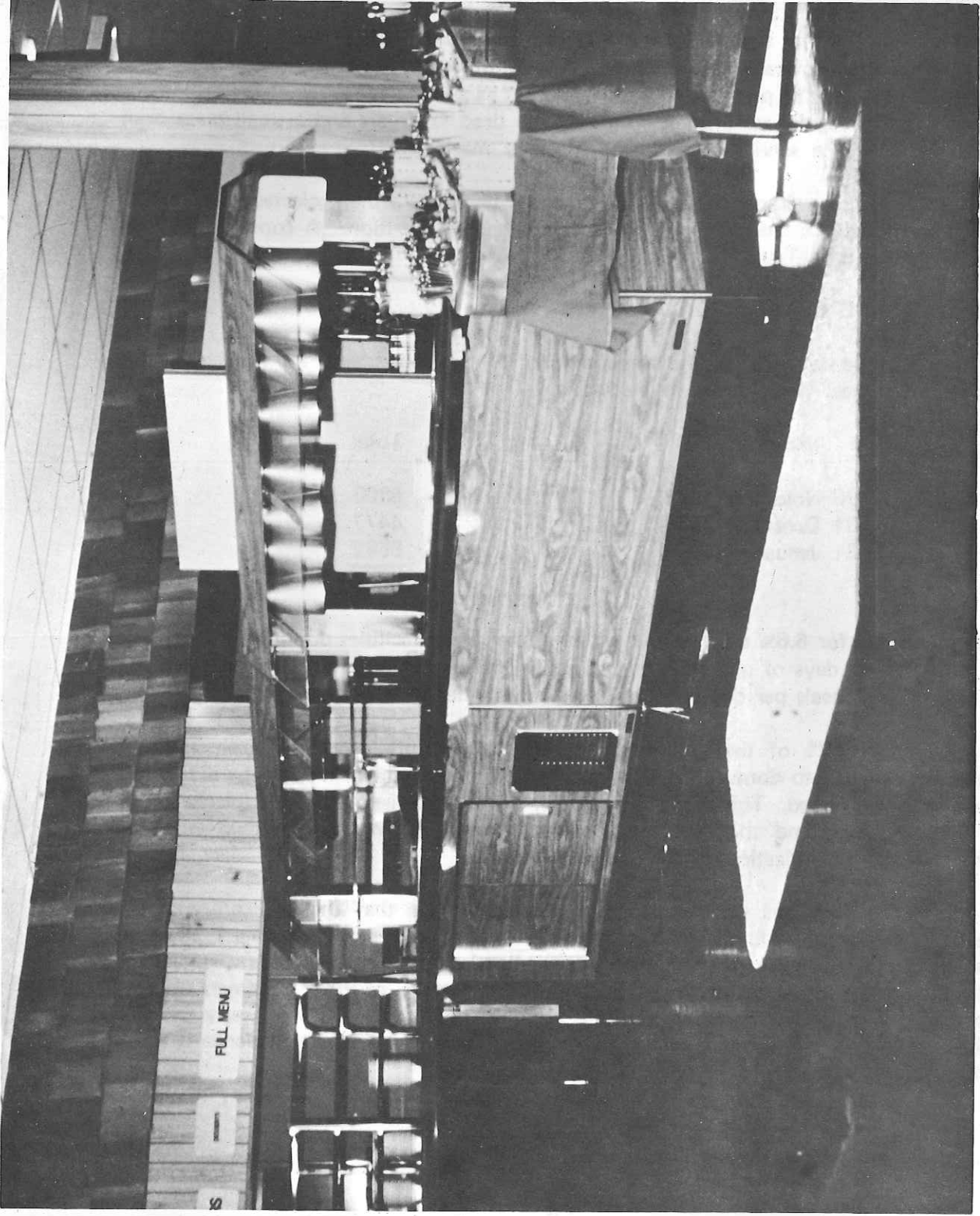


Figure 1. Specialty Meal Serving Line

c. The heated unit of the mobile serving line could accommodate only eight half-size steam table pans, four to each side, which limited the number of hot items for self-service. It was determined that the Italian and Mexican foods were best suited for this purpose, and that four items of each kind should be served from each side of the line. The number of items that were to be prepared to order could not exceed the capacities of the equipment installed on the regular serving line--primarily the deep fat-fryers and a small pizza oven installed behind the serving line for the specialty meal.

Other salad, beverage, dessert and accessory items were then selected to complete the meal, to balance the menu and to ensure adequate nutrition. A copy of the final menu is inclosed as Table 1.

PERFORMANCE EVALUATION

a. Attendance. During the three months of the experiment, the headcounts for the specialty meal were as shown below:

Month	Total
1-30 November 1973	5360
1-31 December 1973	4477
1-31 January 1974	<u>5592</u>
	15429

which accounts for 5.6% of all meals served in the dining facilities during this time. For the total of 88 days of operation (the specialty meal was not offered on holidays), an average of 175 meals per day were served, of which nearly 90% were to RIK customers.

Less than 10% of the total customers at the specialty meal were from units or squadrons assigned to dormitories in other than the immediate vicinity of the dining hall in which it was served. This is one indicator of the importance of the convenience factor to the consumer, and the need to consider it, when promoting increased customer participation and utilization of the dining facilities.

Some concern was expressed during the experiment that the availability of the specialty meal, in addition to the regularly scheduled meals encouraged excessive attendance. An analysis of more than 6,000 attendance patterns (records of individual daily attendance at all facilities) reveals that, on the average, of those customers utilizing the specialty meal service, about one-third attended only that meal and nearly 64% ate only one or two other meals on any given day. Therefore, excess attendance is not a problem when this type of service is offered.

TABLE 1

SPECIALTY MEAL MENU

SALADS

Tossed Salad
Cole Slaw

ITALIAN SELF-SERVICE

Spaghetti with Meat Sauce
Lasagna
Ravioli
French Fries

MEXICAN SELF-SERVICE

Chili Con Carne with Beans
Enchiladas
Fried Rice
Refried Beans

COOKED TO ORDER

Pizza
Tacos or Burritos
Fish and Chips
Seafood Platter

ADDITIONAL ITEMS

Rolls and Butter
Assorted Pickles
Choice of Salad Dressings
Tartar Sauce

BEVERAGES

Milk
Coffee
Milk Shake
Carbonated Beverages

DESSERT

Dessert of the Day
Fresh Fruit or Fruit Cocktail

b. **Food Costs.** Monthly food costs are summarized in the following table:

Month	Net Cost of Issues
1-30 November 1973	\$4,576.40
1-31 December 1973	4,212.67
1-31 January 1974	5,419.97
Total	<u>\$14,209.04</u>

These costs result in an average cost per meal served of \$0.921 as compared to the average \$0.811 meal allowance. Although food costs were higher throughout the experiment, it was demonstrated that with a slight change in menu and by exercising proper portion control, they could be reduced to within allowable levels.

c. **Labor Costs.** Estimated labor costs are based on the additional assigned staffing to this dining hall for the specialty meal operation.

Assigned Personnel	Hours per Week	Wage Rate ¹ (per hour)	Cost per Week
Military Supervisor (E-7)	8	\$5.48	\$ 43.84
Military (E-3) ²	21	2.96	62.16
Cook (WG-5)	56	5.76	322.56
Food Service Workers (WG-2)	112	4.98	557.76
Total	197	--	<u>\$986.32</u>

¹Includes salaries and benefits.

²For headcount function.

This is equivalent to \$140.90 per day labor costs, or \$0.804 per meal served. Productivity, or meals per man hour, is calculated as 6.23, as compared to 4.3 meal/man hour* for typical dining hall operations prior to the experiment.

d. **Total Meal Costs.** Allowing another 10% of raw food and labor costs for utilities, laundry, trash collection, transportation, etc., the total meal costs during the experiment were:

*Based on estimated average manning levels and food costs (i.e., net cost of issues) for June - August 1973, where actual food costs were increased by 2.1% to reflect higher BDFA values.

Cost Component	Cost/Meal
Raw Food	\$0.921
Labor	0.804
Other	0.173
Total	\$1.898

These costs were considerably less than the \$2.05 for regular dining hall operations, in spite of the higher food costs for the specialty meal. If, in fact, raw food costs decreased to the allowed values, the total meal costs would be further reduced to approximately \$1.78.

NUTRITION EVALUATION

During the experiment, the food items selected by each of 296 randomly chosen customers were recorded. Nutritional values were calculated for each item using the Armed Forces Recipe Service formulations and USDA Handbook No. 8 food composition data. Then, the nutritional values of all food items comprising an individual meal were summed, averaged for all meals, and compared to the daily dietary allowance. Since seconds, multiple servings and plate waste could not be accurately accounted for in the data collection process, these values should be interpreted as gross estimates of the average values for the specialty meal. They do, nonetheless, indicate that the meals served (i.e., selected by the customers) are nutritionally adequate by established standards.

Nutritional Components	DDA ¹	Average Meal Values	% of DDA
Energy, Cal	3400	1331	39
Protein, g	100	69	69
Fat ² , g	152	48	32
Calcium, mg	800	669	84
Iron, mg	14	11	76
Vitamin A, IU	5000	2702	54
Thiamine, mg	1.7	0.6	37
Riboflavin, mg	2.0	1.1	56
Niacin, mg	22	13	59
Ascorbic Acid, mg	60	54	91

¹Daily dietary allowances for male personnel as prescribed by AFR No. 160-95, Medical Services Nutritional Standards, 10 August 1972.

²Should not exceed 40% of total caloric intake.

CONSUMER EVALUATION

A random sample of 50 customers was selected for direct face-to-face interviews, over a fifteen day period in November – December 1973, to obtain their opinions and comments regarding the performance and acceptability of this service.

Three different measures of food acceptance were solicited from each respondent. Food items included in the meal selected by the individual at the time of the interview were rated on a nine point scale ranging from 1 (disliked it extremely) to 5 (neither liked it nor disliked it) to 9 (liked it extremely). These were tabulated and summarized by mean values for the food categories as follows:

Category	RIK	BAS	Total Sample
Entrees	6.2	6.3	6.2
Soups	4.0*	—	4.0
Salads & dressings	6.9	7.6	7.0
Potatoes & starches	6.2	5.4	6.1
Vegetables	6.2	7.0	6.3
Breads	7.1	8.2	7.3
Beverages	7.9	8.2	8.0
Desserts	6.5	7.8	6.7

*Only three responses

Using the same scale, the overall meal ratings were 6.2 for the RIK group and 5.7 for the BAS group, or 6.1 for the entire sample. Finally, the meal was compared to other meals eaten in the Air Force, with the following results:

Rating	RIK	BAS	Total Sample
Much Worse	13%	18%	14%
Little Worse	20	36	24
About Same	44	18	38
Little Better	20	9	18
Much Better	3	18	6

These data, in total, suggest that the customers considered the specialty foods as slightly above average, but no better than other Air Force food service experience.

Each person participating in the interview was also asked for their reactions to the specialty meal service, and to the experimental food service system as a whole. The responses are tabulated below:

Response	Reaction to Service			Reaction to System		
	RIK	BAS	TOTAL	RIK	BAS	TOTAL
Like	86%	67%	82%	87%	73%	84%
Dislike	11	22	13	5	18	8
Indifferent	3	11	5	8	9	8

Although food ratings tended to be near average, a large majority of the customers utilizing this service responded favorably towards it, --- which is generally attributed to the improved dining hall environment, the food, and more importantly, the convenient meal hours. Of those persons who stated that they liked the specialty meal, the changes eliciting the most positive comments were:

Category	% of Comments*
Atmosphere	16.7
Cleanliness	15.2
Quality of food	13.6
Remodelling	12.1

*From a total of 66 comments

More than 75% of this same group also stated that there were no changes that they did not like, but some further changes were also desirable:

Category	% of Comments*
Improve service	17.0
Increase variety	17.0
Better quality food	14.6
No changes	14.6

*From a total of 41 comments

The responses to these questions by the five persons indicating that they disliked the system and the two who expressed indifference were too varied and diverse to allow any general conclusions.

DISCUSSION

It has been our experience, in this and other similar projects, that there is a strong tendency for military food service systems to be operated for the convenience of the food service personnel rather than for the customer. In certain situations and/or missions, this approach is understandable and even necessary. However, in normal base/level operations, such as at Travis AFB, the customer should be of paramount concern. Operating the system for customer convenience and service is the only way to insure that sufficient workloads are created to justify military staffing adequate to support mobilization requirements. The specialty meal service was an inconvenience to the dining hall staff, and was the subject of continuous criticism by them throughout the experiment. However, it did generate an additional headcount of 175 meals per day, or an additional 5,000 meals per month. Nevertheless, this service was discontinued immediately on conclusion of the experiment (which, in our opinion, was motivated by the highly negative attitudes and opinions of the operating personnel), resulting in a loss of the total headcounts attributable to the meal. ✓

SUMMARY AND CONCLUSIONS

The specialty meal is an innovative concept of military food service responsive primarily to the customer. All of the following factors, considered in total, clearly indicate the potential for achieving the objectives of improved food service operations and greater customer participation.

a. Attendance, approximately 5,000 meals per month for the total experiment, was nearly as high, or higher, than for either the breakfast or supper meals in any of the dining halls. ✓

b. Although raw food costs were slightly higher than the meal allowance (which were shown could easily be reduced to acceptable levels), the overall meal costs were 7.5% less than for conventional dining hall operations. This was obtained by increasing productivity from 4.3 to 6.2 meals per man hour.

c. Estimated nutritional values for the meals selected by customers utilizing this service equalled or exceeded prescribed standards.

d. The customers rated the foods and meals served as just above average (about the same as for other Air Force meals), but a very large proportion, over 80%, stated that they liked the new service and changes.

Therefore, it is recommended that the Air Force consider the specialty meal concept for application to their food service requirements at other installations.

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