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AN ANALYSIS OF CONSUMER EVALUATIONS OF PROPOSED CHANGES IN A FOOD SERVICE SYSTEM

by

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August 1973

UNITED STATES ARMY
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13. ABSTRACT

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Results indicate that overall attendance rates could be significantly increased if the following changes were instituted:

1. Increase the quality of food offered
2. Allow carry-out service
3. Offer a special evening meal
4. Increase the variety of foods offered

Interview comments both confirm the importance of these changes and provide some clarification concerning the nature of the desired changes.

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FOREWORD

During FY 1973-74, the Operations Research and Systems Analysis Office is conducting an investigation of Air Force food service under Task 03, Project No. 1J662713AJ45, Analysis and Design of Military Feeding Systems, of the DOD Food Research, Development, Test and Engineering Program. The effort is directed primarily towards defining, developing and evaluating proposed modifications to the existing food service system and operations with the objectives of improving performance and effectiveness.

This report, one of several being published relating to the subject investigation, provides a preliminary analysis of consumer's evaluations of proposed changes in food service at Travis Air Force Base, California, which was selected as the primary study site. The purpose is to determine which changes are likely to have the greatest effect in terms of increasing the number of meals served by Travis food service facilities, thereby increasing the nutritional intake within these facilities and improving morale.

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ABSTRACT

In order to evaluate proposed changes to the food service system at Travis AFB, a consumer survey was conducted. Based upon results from interviews, a questionnaire was developed describing eighteen possible changes that could be made in the food service system as presently operating. The consumers were asked to report what effect, if any, each change would have in terms of increasing or decreasing the number of meals they would consume in or from existing and proposed food outlets.

Results indicate that overall attendance rates could be significantly increased if the following changes were instituted:

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3. Offer a special evening meal
4. Increase the variety of foods offered

Interview comments both confirm the importance of these changes and provide some clarification concerning the nature of the desired changes.

INTRODUCTION

One of the more apparent problems in current military food service systems is low attendance in dining halls. In many cases the military customers who receive meals as part of their pay have an attendance rate below forty percent. During the time that these consumer surveys were being conducted, the attendance rate among Travis subsistence-in-kind customers was approximately 33%.

Ascertaining reasons for non-attendance in military dining halls and finding the means to increase attendance is a complex problem. Individual's choices of where, when, and what to eat are influenced by many factors: job demands, group influences, and available facilities to name just a few. Compounding the problem is the fact that day to day variation in an individual's eating pattern is significant. Choices made on Monday may be reversed on Tuesday. The interaction of these factors does not mean that attempts to increase overall attendance at dining facilities will be doomed to failure. The complex nature of the problem does suggest that attempts to improve the performance of a food service system must be geared to specific meals and perhaps most importantly to specific consumer groups.

In the Air Force there are three rather distinct consumer groups. The largest group, in terms of dining hall users, are the "subsistence-in-kind" individuals who receive free meals as part of their pay. During the time of these consumer studies at Travis AFB, the "subsistence-in-kind" consumer group represented approximately 20% of the total enlisted population of the base. The remaining 80% were individuals who received a monetary allowance for food and thus were not entitled to eat in dining facilities unless they paid cash for each meal. These individuals comprise two distinct consumer groups. Some of these men and women are single, live in dormitories on base, and are thus potentially frequent users of the dining facilities. Married individuals who live in housing on or off post are less likely to utilize military food services, no matter what changes are made.

Consumer surveys are one means to obtain data by which to guide planned change. Consumers' comments are sometimes, however, dismissed as unsubstantiated or unfounded complaints — exaggerations or standard "gripes". There are indeed cases in which individuals will express "unwarranted" criticism and complaints. Food service appears particularly prone to such complaints. Even the best restaurant cannot escape at least occasional criticism for a poor meal, bad service, high cost, and so forth. But, perhaps in food service more than most other systems, consumers' comments must be continually solicited and carefully evaluated. Hamburger may for example, be called "greasy" even though the actual fat content is low. Perception, therefore, plays a crucial role in determining whether food is acceptable and whether consumers will return.

This report will summarize consumers' perceptions of military food service and their reactions to proposed changes to the food service system at one large Air Force installation.

METHOD

General: The costs involved in changing a food service system are large enough to warrant careful examination of consumer's expressed needs and suggestions. To assure that conclusions would be based on sound data, a multi-method approach to data collection was adopted.

Exhibit 1 summarizes the major steps taken in this study of consumer's reactions to possible changes in their existing food service system. Dining hall attendance records were analyzed so that interview comments or questionnaire responses could be evaluated against, or used as a basis to project participation rates. Approximately 300 individuals, who had previously completed food preference and consumer opinion surveys, comprised the basic sample in its present study.

Approximately 50 individuals were interviewed in unstructured group sessions so as to obtain consumers' opinions expressed in their own words and free of the structure inevitably imposed by questionnaires. Approximately 50 consumers were interviewed individually so as to pretest possible questionnaire items and weed out any statements that were ambiguous or which did not identify an important change as far as the consumers were concerned.

After eighteen changes had been formalized in a questionnaire, another group of 200 consumers estimated the increase or decrease each change would have on their present attendance.

All individuals participating in this study were enlisted personnel since officers normally eat in separate facilities which are not within the scope of this experiment.

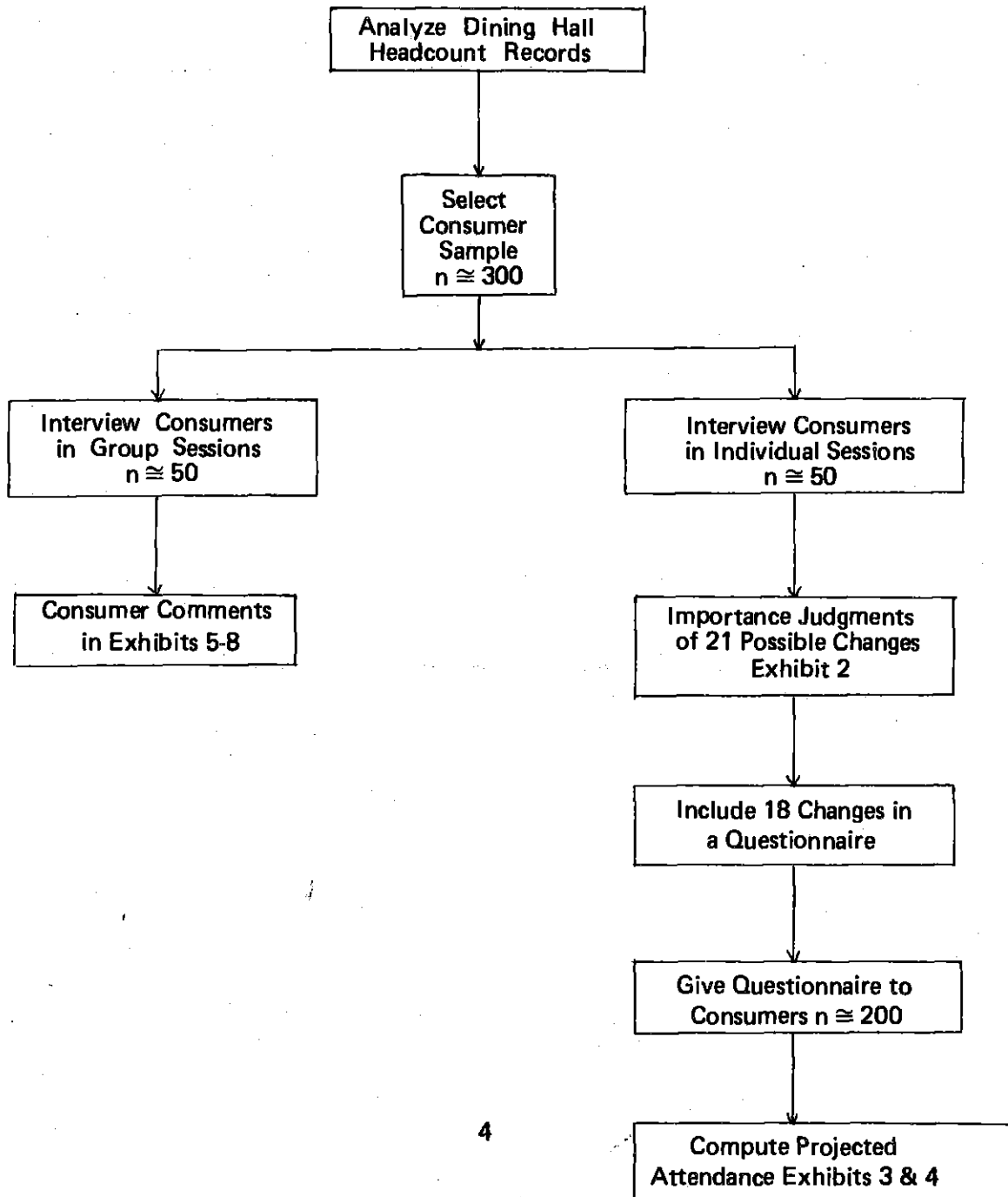
The data collection and analysis procedures were as follows:

- 1) analyze one week of dining hall headcount records to select a consumer sample.
- 2) interview some consumers in individual sessions to obtain ratings of twenty-one possible changes to the existing food service system. Analyze these ratings to select no more than eighteen statements for a questionnaire.

Interview Conditions: Group interview sessions were unstructured. Except for a few introductory remarks by the interviewers, group members did nearly all the talking. Participants were asked to discuss food service at Travis from their own viewpoint. From that point on, the interviewer simply transcribed what was said. Questions from the interviewer were restricted to requests for clarification or for specific examples. Although it was intended that each group would contain five members, some groups contained fewer than the five individuals notified of the meetings. This variation is due at least partially to a heavy workload on the flight line and maintenance shops.

Exhibit 1

Procedures Utilized in a Study of Proposed Changes



Structured interviews were conducted on an individual basis. Forty-eight individuals appeared in one-half hour sessions. Each individual was asked to evaluate a list of 21 proposed changes in the base food service system. Appendix A presents each statement together with a brief description of the nature of the change.

Each change (indicated in Bold Face Type) was typed onto a separate card. Interviewers were asked to place each card into one of seven piles. Each pile had to contain three cards when the task was complete. Changes were evaluated in terms of which were most important to the consumer. The three most important changes were placed into pile #1; the three least important into pile #7.

Questionnaire Sample: A list of 321 names were drawn from the sample defined for an earlier Consumer Opinions Survey¹, of which 223 individuals appeared to complete the "Proposed Changes Questionnaire". Appendix B presents a copy of the questionnaire and instructions.

The sample consisted of 99 individuals authorized a subsistence allowance (BAS) and 109 individuals on subsistence-in-kind (SIK). No determination could be made with respect to the meal status of fifteen participants. These cases were not utilized in computing projected attendance rates for SIK or BAS groups but were included when computing the overall projected attendance rate.

Questionnaire Conditions: The questionnaire asked individuals to evaluate the impact of proposed changes on their present attendance rates. Results from interviews indicated that of twenty-one possible changes evaluated in individual-structured interview sessions, three changes could be eliminated, thereby shortening the questionnaire and reducing administration time. Providing more parking space, eliminating the signature requirement, and removing cash collections were the three changes so eliminated. The average scores of the evaluations of these changes are significantly different from and lower than the scores for all other changes.

Verbal instructions to participants in each session were minimized: emphasis was placed upon the written instructions included with each questionnaire. Time during normal working hours was permitted to complete the questionnaire. Evening sessions were held to accommodate shift workers.

Respondents were instructed to provide three types of information in the proposed changes questionnaire. First, given attendance records covering a past one week period, individuals were asked to confirm their current attendance rates — correcting the past record if necessary. After establishing their current attendance rate, the respondent evaluated each of the eighteen proposed changes in terms of whether the change would increase, decrease or not effect his current attendance pattern. Finally, respondents were asked to choose and rank the five most important changes, disregarding to the extent

possible any effects on attendance. The order in which changes were presented within the questionnaire was varied so as to cancel any effects due to placement of questionnaire items.

RESULTS

Importance Judgments: Exhibit 2 presents the means and standard deviations for each of the twenty-one proposed changes evaluated in individual-structured interview sessions. Throughout this section we are summarizing results obtained from these interviews.

In terms of the overall ordering, changes to improve food quality, variety, cleanliness, service, and quantity appear to be the most important. Removing cash collections, eliminating signature requirements and providing additional parking space appear to be the least important changes.

The rank order of the proposed changes is of interest, but specific comparisons are perhaps more relevant. Obviously quality is more important than variety, but is the difference statistically significant? Can we conclude that improving food quality is more important to consumers than increasing the variety of food offered? The answer to these questions requires analysis of variance and comparison among means, which is provided in Appendix C.

Two comparisons were of particular interest. In the interest of shortening the proposed changes questionnaire, several of the changes included in the interview sessions were eliminated. The averages for cash collections, parking space, and signature headcount appeared to be relatively similar and much less important than other changes. The differences among these three means and any other mean was significant at the .01 level. To the extent that interview participants are representative of the total population the changes most important to consumers are:

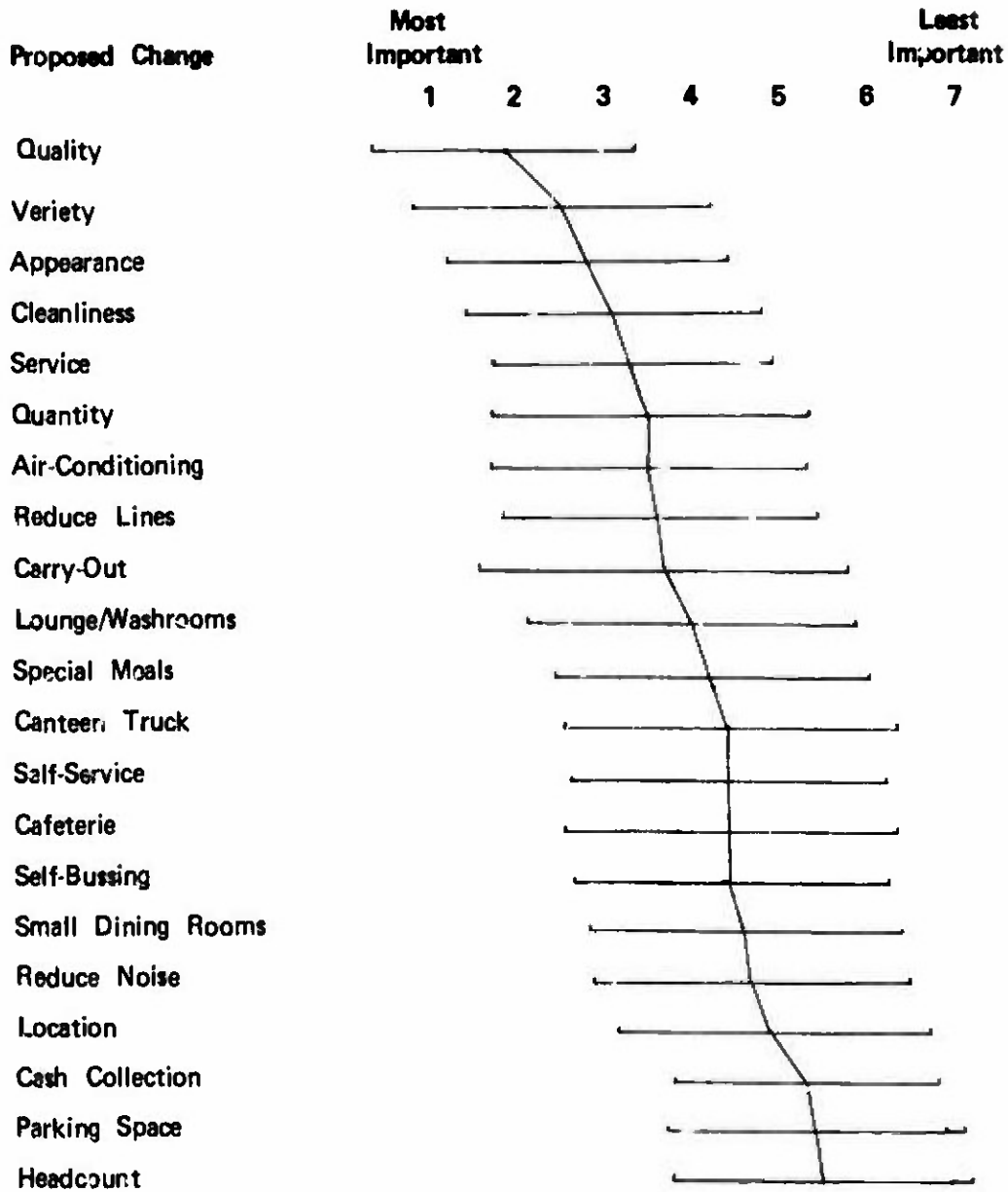
1. Improve the quality of food served.
2. Increase the variety of food offered.
3. Improve the appearance of dining halls.

Statistical tests show that the mean responses to these items are significantly different from those of the remaining eighteen changes. It is not, strictly speaking, true that improving food quality is the most important change in terms of consumer's judgments. There is no statistical basis in the data for concluding that the small observed differences in means associated with these changes are reliable differences. The observed differences could be due to chance alone.

While these changes are apparently the most important to the consumer, the projected attendance rates resulting from such changes do not follow the same pattern. Importance and attendance are not necessarily related.

Exhibit 2

Judgements of the Importance of Twenty-One Changes



NOTE: The numerical values of the means and standard deviations displayed graphically above can be found in Figure C-2

Projected Attendance Rates: Exhibit 3 presents the projected attendance rates associated with each range in the "Proposed Changes Questionnaire". Included for comparison is the overall attendance rate during the month of February 1973. Basewide estimates of attendance are reported as ranges in keeping with the tentative aspect of statistical projections.

If February 1973 represents a typical month, questionnaire responses suggest that making any one of several changes could effectively increase the overall attendance in Travis' dining facilities. Improving food quality, for example, could increase SIK attendance from 33% to 51% and BAS attendance from 4% to 11%. As stated earlier, the differences between specific changes may be of greater interest than the rank order. While improving food quality again heads the list, should it be considered significantly more important than offering a special meal? Or are these two changes likely to produce equal effects in terms of attendance increases? The analysis of variance and comparisons among means are presented in Appendix C.

Statistical tests show that the projected attendance rates associated with improving food quality, offering a special evening meal and allowing carry-out service must be considered equal and are, as a group, significantly higher than projected attendance rates for any other change.

These results appear to contradict the conclusions drawn from interview judgments. The inconsistency may, however, be inconsequential. Offering a special evening meal, is after all, one way to increase variety. Further, the pair-wise comparisons reported in Appendix C show that projected attendance rates associated with offering special evening meals and increasing variety are statistically equivalent.

The shift with respect to carry-out service can be understood by first noting that the largest variance in interview data occurred in judgments of the importance of carry-out service, (see Exhibit 2). This indicates that the variable was very important to some consumers and very unimportant to others. One explanation would be that the consumer sample utilized to complete the proposed changes questionnaire included a larger proportion of swing and grave shift workers than did the sample utilized in individual interviews.

Data summarized in Exhibit 3 also shows that there is a definite limit on the attendance rates that may be achieved. Even if all proposed changes were made, consumers as a group, may still prefer to eat three out of four meals outside Travis dining halls.

In order to translate these overall attendance rates into more concrete figures, and in keeping with the argument that there are in reality three distinct consumer groups, Exhibit 4 compares actual with projected meal attendance for SIK, BAS-single and BAS-married consumers. The data show that for a one month period (June 1973) approximately 72,000 meals were served at Travis AFB. This figure includes box lunches

Exhibit 3

Projected Attendance Rates if Each Proposed Change Were Made in Travis Food Service System

Change	Attendance Rates		
	BAS	SIK	Probable Base-Wide Attendance*
Quality	11.0%	51.0%	13.4 - 24.2%
Carry-out Service	11.1%	46.4%	12.6 - 23.4%
Variety	9.1%	46.9%	11.4 - 21.6%
Cafeteria	9.7%	43.8%	11.4 - 21.6%
Evening Meal	9.4%	44.4%	11.2 - 21.4%
Appearance	9.6%	43.5%	11.1 - 21.3%
Self-Service	9.6%	41.6%	10.6 - 21.0%
Location	9.3%	41.5%	10.6 - 20.6%
Quantity	8.3%	42.8%	10.1 - 20.1%
Reduce Lines	6.4%	42.3%	10.1 - 20.1%
Canteen Truck	9.6%	37.4%	10.0 - 20.0%
Lounge and Washroom	6.5%	41.5%	10.0 - 20.0%
Air Conditioning	8.0%	43.5%	10.0 - 19.8%
Self-Bussing	6.0%	43.5%	10.0 - 19.8%
Service	9.6%	41.1%	9.8 - 19.6%
Cleanliness	7.6%	40.4%	9.2 - 16.8%
Smaller Dining Areas	7.5%	39.7%	9.0 - 16.6%
Reduce Noise	7.2%	40.0%	8.6 - 18.4%
All Changes	14.1%	53.5%	16.0 - 27.4%
February 1973	3.9%	33.0%	

*The base-wide attendance rate for each change was computed by first adjusting questionnaire responses and then combining the SIK and BAS data in accordance with the base SIK and BAS population percentages.

To avoid giving point projections more exactitude than they usually warrant, the confidence interval has been reported. The interval was derived from the basic formula $SE = \sqrt{PQ/N}$; where P = Projected Attendance Rate, Q = 1-P, and N = number of subjects.

Exhibit 4

Actual and Projected Maals per Month for Three Travis Air Force Base Consumer Groups

	June 1973	Projected
SIK	56,070	73,800
*BAS—Single	4,929	15,404
*BAS—Married	<u>10,971</u>	<u>12,106</u>
TOTAL	71,970	101,310

*Since single and married BAS consumers are not differentiated routinely, the June figures represent adjusted meals. The signature sheets utilized to select individuals for interviews and questionnaires were used also to identify single and married BAS personnel. The June total of 15,900 meals was then divided according to the percentage of single and married BAS meals derived from the signature sheets.

The actual attendance rates in June, rather than February, were used in this analysis in order to provide the most current "Before" picture possible at the time this report was drafted.

for ground feeding. From the questionnaire data it appears that the number of meals/month might be increased to approximately 101,000 if changes to improve quality, increase variety, provide carry-out service, and improve dining hall appearance are made. Note that the largest expected increase would occur in the BAS single consumer group, while the SiK consumers would also show greater attendance. As expected, there appears to be very little that can be done to bring more of the BAS-married consumers into the Garrison dining facilities. Obviously unmarried SiK and BAS consumers might make use of food service facilities if desirable changes were made. But even the SiK personnel may not eat more than one of two (50%) meals on post.

Comments on Food Quality: As previously shown, improving food quality stands out as one of the most important proposed changes. But the quantitative results leave several questions. Are all foods poorly prepared or unattractively displayed? If not, then what particular food items evoke quality criticisms? Does "poor quality" mean food is too greasy, too cold, too hot, unattractive or unappetizing?

For at least a partial answer to these questions, we can examine comments recorded in the unstructured group interviews. Exhibit 5 summarizes some statements, which, in the authors' opinion, reflect comments regarding the quality of food served in the present system.

Cakes and meats appear to be the most prevalent instances of "poor quality". Cakes apparently are dried out or stale when served. Spaghetti is at times, greasy, as is hamburger.

While on balance, food quality is apparently a serious problem. It is important to note several positive comments. Two of the three dining halls at Travis were cited by several consumers as having good food.

Exhibit 6

Comments on Food Quality in the Present Food Service System

I have had caka in Dining Hall #7 that was two days old. It was hard and shriveled up.

Coffee tastes like it was four days old.

Bacon in the morning is either burnt or half raw. The eggs are the same way.

Poor food here is a major problem. Several of the SIK people in my office don't eat in the dining hall because they can't get a decent meal. That lousy food is on a lot of people's minds.

Overseas, food is better than CONUS'. McChord AFB has good food.

Quality of food at the midnight meal is lousy. It's a couple of days old; the meat is green.

Food quality is one of the top five problems here at Travis.

Quality of hamburgers here is poor. They're dry. There's very little attention paid to preparing it.

Moffatt NAS had a nice salad bar — peaches, cottage cheese, etc. It was presented better than they do here.

Desserts are bad. The caka is hard. I've had cookies that looked moldy on the bottom.

Quality of the food isn't that big a problem.

For good food and good service, I'm willing to wait in line. I do it at restaurants. People are willing to come and even wait a bit if you offer something excellent.

Food isn't too bad when you consider the number of people they're cooking for.

I won't eat their french fries anymore — they're soggy and stale. It seems like they never change the grease.

Vegetables are okay. Where you really notice the quality is in ham, chicken, fried steak, and roast pork. Cakes are almost always stale. Only four times during the last month have I had caka that wasn't stale.

Exhibit 5 (cont'd)

Nothing to complain about in breakfast — you can't hurt eggs too much.

Food in the Ranch House is good.

McClellan AFB has good food, carpets and nice appearance.

Last night I had a good meal — they really made good roast beef and gravy, but their gravies are usually terrible.

Good meals are few and far between. The cooks just luck out on those.

Breakfast is the only good meal in the mess hall.

Cold cuts are bad. The bottom of the pile is usually frozen or soggy.

We only get steaks when big wigs come — and then it's either burned or too rare.

On the late evening meals, we get leftover hamburgers made into greasy patties with soggy potatoes. I've had bones in the hamburger we get in these dining halls.

The bread is usually dried out. Why don't they use these bread dispensers that have those leaves to take off slices?

Chow halls are going the wrong way with this Soul food stuff. They should clean the place up and improve the food.

We get Swiss steak once a week. I've never had a good one.

Food in chow hall is as good as I've eaten.

Lots of the time I look at the food and don't feel like eating.

To me the problem isn't the food — it's pretty good.

In October I went into Dining Hall #1 and couldn't finish my meal it was so bad. I haven't been back.

About the only thing in the Air Force I look forward to is going downtown on payday and buying a steak. I can't get steaks the way I like them here.

Exhibit 5 (cont'd)

The hamburger I had today I picked up and watched the grease drip out.

Cheese omelet at breakfast is good. Eggs aren't bad — but how can you hurt an egg?

They have roast beef four times a week it seems — and it's usually cold and greasy.

Spaghetti is greasy.

Other problems are more important than food — foods rank very low because it's usually good.

Keesler AFB has good food.

Hospital dining hall has a friendly atmosphere — we get along well. I know everyone who serves by their first name and the food is good.

Ranch House has good quality food. I'd eat in other dining halls more often if quality of the food is improved.

I don't care too much what the dining hall looks like. But they could have better food.

I keep telling myself "this is free — it is good — you will eat."

Best way to increase attendance is to increase quality of meals.

Buns on hamburgers are grease soaked.

Field maintenance personnel prefer to get a sandwich because we know it's fresh. You don't get fresh foods in the dining hall.

I like food in #1 the best — #1 is best overall.

Chicken looks like it's been left in the open for six weeks. It takes three glasses of milk to wash it down.

On weekends you can't get a good meal after 4:00.

Comments on Dining Hall Appearance: Perhaps the most salient impression resulting from comments on dining facility appearance is that the military decor is not appealing to modern airmen. This notion is expressed in several ways. "Change the atmosphere so it doesn't look like a mess hall", and "Air Force decor turns me off" are exemplary comments. Exhibit 6 presents several similar remarks made by interviewees.

The most noticeable dining hall renovations appear to be rugs and paneling. At least these items are more frequently mentioned than draperies, lowered ceilings and lighting when changes in dining hall appearance are discussed.

Many comments point to the exposed dishwasher — garbage disposal area as a particular source of dissatisfaction with existing dining hall appearance. Renovations to isolate these areas would address a problem important to at least some consumers.

When potential renovations are discussed by food service management, concern over vandalism and careless abuse are expressed. The interview comments support this concern and indicate that it is shared by users of dining facilities.

One comment, however, indicates that the mistreatment of new facilities may be minimized if renovations are "advertised" carefully. If drops and music are presented as "special renovations", a negative consumer reaction (a.g. carelessness) may be the effect. Psychological research^{1,2} has demonstrated many times that a negative reaction follows violated expectations. If a pleasant dining area is expected by consumers, "special renovations" may well have a negative impact on consumer reactions since such attempts would be perceived as hypocritical.

Comments also appear to favor smaller rather than larger dining facilities. In only one case did a consumer recommend enlarging the dining area. Other instances indicate smaller areas were more attractive.

Comments on Variety: As shown in Exhibit 7, consumer criticisms with respect to variety are most often centered upon box lunches, a late evening meal, and weekend meals. Box lunches, according to some consumers always contain ham or bologna sandwiches, hardboiled eggs and milk. Late evening meals are described as leftovers from earlier meals or hamburgers, cheeseburgers and french fries. It should be pointed out that only one dining hall served late evening meals (from 1830-2030, and 2300-0100) and early breakfast (0230-0330). Offering greater variety at this meal may well be a costly undertaking relative to possible benefits such as higher attendance or increased consumer satisfaction.

Comments on Personnel Services: While a few consumers were sympathetic toward dining hall personnel behind the serving line, more consumers felt that service was a major problem. Exhibit 8 presents relevant comments made during the interview sessions.

If one word can be used to characterize the consumer attitudes of dining hall personnel, it might be apathetic. Comments such as "they (food service) have a "no-care" attitude were fairly frequent. Instances of unfair treatment were cited, such as being refused second helpings when others had received them.

Exhibit 8, however, contains some instances wherein consumers blame themselves for negative attitudes. Failure to express appreciation was cited as contributing to one food service worker's attitude change from pleasant to indifferent.

The interview comments make at least one point abundantly clear. Efforts to encourage and develop professional service-oriented attitudes in personnel behind the serving line cannot be entirely successful without corresponding efforts to change consumer's attitudes, and vice-versa.

Exhibit 6

Comments on Dining Hall Appearance

#7 and #1 are bad. #3 is the best. They remodeled it. It's a completely different environment and it creates a different feeling. They cook your eggs while you wait — others don't.

Dining Hall in 1300 area is a terrible place. Both food and the place are terrible.

If the place was fixed up, it would be nice to bring my girl in.

Change the atmosphere so it doesn't look like a mess hall.

If the facilities were improved, I still wouldn't eat more than one meal a day — my usual breakfast. My chick fixes me supper and I usually skip lunch.

Dining hall #7 is odoriferous, hot, and greasy. You feel like holding your breath, running through and throwing your dishes down.

I would like to see you cut down on noise in the dining hall. Also add some decorations. But I can live without them.

Dining Hall #1 looks like a barn. And it's cold at times.

They should have a No Smoking section.

If the chow hall changed, I'd probably eat there at lunch. The decor is Air Force and it really turns me off.

#7 should be expanded. Knock out some walls and enlarge the eating area.

#1 is kind of drab. Walls are white and yellow and bare. You could put on paneling.

Most of us would keep a place neat if we enjoyed going to it.

I didn't like the atmosphere in #1. It wasn't well lit and the seats were all packed in. I won't eat there again.

Environment is a problem. Dining Halls are noisy and crowded.

Smaller dining rooms were better; cooks knew the guys and they could wait till after the meal to clean up.

Exhibit 6 (cont'd)

So far, the Air Force has gotten zero out of changes they've made in food service. They've made some feeble attempts; they've hung new drapes and put in new music. It had to be done anyway, but they said it was a "special renovation".

McClallan, I've heard, has good food, carpets, nice appearance. They should do that here.

We'd like to have curtains on windows.

I usually go downtown to eat (Smorgasbords). They've got a little more atmosphere there.

Ranch House (#3) is okay, if you like riding horses and listening to dime store music. All three dining halls are using old drab buildings. Don't know if fixing them up is going to help anything.

Hamilton AFB is good. They had paneling, clean long windows 10 ft. high. You could order what you wanted. They had civilian cooks.

Best thing they could have on this base is that you don't see dishwasher, steam or garbage cans. Would be nice to put your tray in a slot and not have to segregate silver, paper, etc.

The Ranch House looks nicest.

At Sheppard we never saw the clipper, garbage cans or things like that.

That room (dishwasher room) in 1300 is really bad. It's so steamy you can't see. If you look down you see the garbage.

Putting carpeting in Bldg. 1331 is foolish. Look at the cigarettes on floors in day rooms.

They should put rugs and paneling in — block it off so you can't see the serving line.

Getting away from your job is the most important thing on this base.

Most people in my barracks live like pigs, so putting a lounge and washroom in dining halls is a waste of money.

Exhibit 6 (cont'd)

Renovations might get me to bring my wife once in a while. Have paintings on the wall and smaller dining areas.

I don't care too much what dining halls look like, but they could have better food.

Exhibit 7

Comments on Variety

Box lunches are bologna sandwiches and hard boiled eggs — that's all.

They used to serve waffles, then they stopped. Also I'd like to know why they can't put a variety of syrups on the table.

Travis box lunches are the worst — both in terms of quantity and variety. All they have is a bologna sandwich and sour milk.

Variety is poor in Dining Hall #1 on weekends. Variety at late evening meal is poor. I've eaten there three times and each time they offered hamburgers, eggs, toast, cakes and cookies.

Three times last month, dining hall #7 had same menu at noon and at supper — chicken at both meals.

Every day we have whole or meshed potatoes, corn or peas and two meats. Haven't had scalloped potatoes since I've been here.

I only eat in Dining Hall #1 twice a day because I get tired of eating the same old thing.

Variety isn't necessarily the answer (to attendance problems) — better quality is.

Why do they have to call it Soul Night? Most of the brothers are in the Short Order line with us. Then they tried Chicano Night. Why don't they just call it food?

Overseas mess halls are better than over here. There you get five kinds of syrup with pancakes — not just the Aunt Jemima stuff you get here.

I'm getting tired of ham and bologna box lunches.

In the field machine shop, our box lunches aren't that bad.

You get fish on Friday no matter what religion you are. Sometimes you're lucky and you get shrimp. Most times it's a 3" x 5" fish patty.

They shouldn't serve as many potatoes. Seems like they're prepared the same way all the time.

Exhibit 7 (cont'd)

I've eaten a few late evening meals. It didn't seem like they had much variety -- they've gotten down to ham, cheeseburgers and french fries. They haven't had dessert in there the last few times I was there this month.

American's staple is potatoes, mine is rice. I can't ever get rice in these dining halls.

Had steak and eggs every Sunday morning in Germany. I used to get up just for breakfast.

All I ever hear about people eating in the chow hall is hamburgers. I won't go in there just for a hamburger.

They have roast beef every day in #7. Ground beef in hamburgers, meat loaf, or any other way you can make it, they've got it. When I go to #1 for late evening meal, they have leftovers from dinner.

When they serve lasagna, they also serve spaghetti -- everything is related. When they serve soul food, that's all they have -- if you don't like soul food, you might as well not go.

When they start having a better variety, I'll start going back to chow halls at least on weekends and at night.

Right after your survey (food preference) we've had Mexican food three times and we never had it before.

Same thing all the time. Menu never varied much in #7; always had hamburgers, cheeseburgers, meat loaf, and chicken every weekend.

We're still having fish every Friday even though Catholics got rid of the practice years ago.

Most of the time we don't go to the dining hall because it's the same old stuff and they didn't cook it long enough so it's cold.

I usually go downtown to eat (\$1.00 meal at SmorgasBobs). Got a little atmosphere there. I get the variety down there and I get as much as I want to eat.

Exhibit 8

Comments on Food Service Personnel

The basic problem is the food service people; nobody wants to be a cook or a cop. The worst assignments out of basic are to cook and ASP schools. Guys really fear them. The guys we have now are old Air Force. When I brought up a problem, they kept saying "Back when I was in your shoes..."

When cooks were part of the squadron, they really put out some good meals. Taking them out of the squadrons hurt their morale. They don't have the pride they had then.

I've gone to breakfast only a few times because when I ask for eggs, they come back in a hateful tone. I know it's hard to start work at 5:00 am, but why should they take it out on me?

I asked for seconds once and the server said no. She said yes to a guy who was five guys back of me, though.

Sometimes they rope off areas of the dining hall just to avoid cleaning them. Then we have to sit with some freak who blows smoke in our face.

They lack knowledge of how to cook. They grill pre-cooked ham slices when they should just warm it up. Grilling it dries out the ham.

I don't like to have civilian servers sweating in my food.

Silver, glasses and trays are usually very dirty. When I tell them "it's dirty, they just say "Okay". They don't take it back like they should.

There seems to be a "no-care" attitude. They are apathetic. People stand around waiting for milk and they don't fill the dispenser.

I can sense some antagonism in the chow hall because I'm white. I've been turned down on seconds. The server said "We're not serving seconds on shrimp". Then I sat down and another guy walked up with his plate and came back with shrimp.

They had a great black cook. We called him Supercook. He knew everyone by name and always had a chatter going with his customers.

You can't blame cooks for bad cakes. But you can blame them for the slop they serve — how it's prepared and how it's presented.

Exhibit 8 (cont'd)

You can't make good salads for 500 people. Yes you can. The problem is that Travis food personnel don't care. It's their poor attitude. Like everything else — if the mess hall people don't care, nothing will work.

Cooks look at the stripes on a guys arm. They give airmen the worst pieces. They just throw it on my plate. I don't like that.

Since civilians took over KP, the chow halls are filthy.

When you ask what's on the menu, the woman yells it at you. If you ask her to repeat it, she gets angry because she's got to repeat it.

When they serve gravy, you've got to be quick to say no because she'll put it on. And it's always one spoonful of peas even when you don't want that much.

One lady in Dining Hall #7 used to smile and say "Hello" or "Have a good day". But nobody was awake. We responded with "Huh". Finally she quit.

The server wouldn't give me food when I put my plate under sneeze guard. He made me put my plate on top. Then he said, "C'mon, hurry up, make up your mind".

Everybody's a human being and likes to be treated as one. Our attitude isn't that good sometimes. You tell your mom "Wow, that was a good meal", but it's corny to go up to the line and say thanks to them (servers).

We don't let food people have any dignity. People who mess up their career get put in Food Service or Air Police.

Attitude of civilians is bad. They throw stuff on your plate and argue when you ask for seconds. Yesterday a civilian told me to put one cheeseburger back after I'd taken two.

Serving people at midnight meal make you feel stupid. They look at you and say "What do you want".

When I ask for half portions they still give me full portions so I walk out of the dining hall stuffed and starched.

They're not doing a terribly bad job — it's just a matter of how they serve and how the food appears.

I've seen civilians take a milk glass with a ring on it, rinse it in dirty water, and put it through clipper. It still had the ring when it came out, but they put it in with clean glasses anyway.

Exhibit 8 (cont'd)

One guy is a real wise guy. Always has something smart to say.

At late evening meals, they drag in somebody off the street to serve the stuff in the pans. I haven't seen anybody back in the kitchen area doing anything.

Sign in the dining hall says "ask for ice cream". It doesn't work because we can't get the cooks attention.

These people here don't seem to care whether you eat their food or not.

SUMMARY

Using interviews and questionnaires, this study has focused on which of eighteen possible changes in food service would have the greatest impact on consumer's attendance. Attendance in this case is not restricted to meals eaten in dining halls since some changes involve carry-out service, canteen trucks and other mechanisms for providing food when personnel cannot or will not go to a dining facility.

Perhaps the most general summarization of the reported results is that attendance can be increased and that the upper limit of this increase approximates 54% for CMC and 14% for BAS personnel. On a combined basis, the upper limit would fall into the interval from 16% to 27%. These projections of course were based upon — and can only be extended to — situations where 80% of base personnel are on BAS.

The changes which appear to have the greatest impact are: improving food quality, introducing carry-out service, offering a special evening meal, and/or increasing the variety of foods offered.

Interview comments suggest that improving attitudes behind the serving line and maintaining cleaner dining facilities (particularly tableware) may also be important changes from the consumer's viewpoint. Interview comments also delimit food quality criticisms to a few items; e.g. hamburgers, spaghetti and some entrees. Criticisms involving the variety of foods offered are similarly "localized"; box lunches, potatoes and chicken appearing to be the items most often mentioned as appearing too frequently.

Rugs, paneling, and a partitioned-off dishwashing area appear in interviews to be the most salient features of attractive dining halls.

REFERENCES

1. Branch, L. G., and Meiselman, H. L., *The Consumer's Opinions of the Food Service System: The 1973 Travis AFB Survey*, Technical Report 73-52-PR, US Army Natick Laboratories.
2. Abelson, Robert P. (Ed.), *Theories of Cognitive Consistency*, Rand McNally, Chicago, 1968.
3. Berkowitz, Leonard (Ed.), *Advances in Experimental Social Psychology*, Vol. 3; Academic Press, New York, 1967.

APPENDIX A
PROPOSED CHANGES TO FOOD SERVICE SYSTEM

Proposed Changes to Food Service System

Reduce the level of noise in the dining hall: Changes will be introduced to eliminate or reduce the noise in the dining hall that originates from the kitchen, dishwashing and serving line areas.

Substitute cafeteria service for the dining hall: All airman will be put on separate rations. The dining hall will be replaced by a cafeteria in which you will pay for only those items selected, rather than paying for a total meal.

Provide carry-out service: Rather than eating in the dining hall, you will be permitted to carry-out short order items (such as hamburgers, cheeseburgers, hot dogs, and other sandwiches, french fries, carbonated beverages and desserts) to eat elsewhere.

Increase the quantity of food served: Larger portions of the foods, particularly meats and desserts, will be served. Sufficient amounts of food will be available so that the most desirable items will not run out before you are served.

Increase the variety of foods served: Offer a greater choice of each type of food (for instance, two or three different meats, potatoes, vegetables and desserts) at each meal.

Offer special evening meals: For instance, a specialty menu (such as Chinese, Italian, Mexican, or Soul food) will be offered each evening in one dining hall. It might also include such features as table service by waiters and waitresses, candlelight and table cloths. You will be allowed to invite family and friends to eat on certain occasions.

Improve personnel services in the dining hall: This change will include a more cheerful and pleasant attitude on the part of the headcounters, serving line personnel and those operating the dishwashing area.

Locate dining facilities nearer to your work and barracks: Short order foods and certain other items (such as soups and salads) will be offered at "snack bars" located more conveniently to your worksite and housing area than are the dining halls.

Improve the appearance of the dining hall: The appearance of the dining hall will be changed to be less military through the use of brighter colors, draperies, carpeting, different furniture and booths, lighting and other features to provide an atmosphere similar to the "better" cafeterias and restaurants in which you have eaten.

Improve the quality of meals: The quality and appearance of the food served in the dining hall will be improved to a level similar to that you can obtain from a "good cafeteria or restaurant".

Introduce canteen truck meal service: Meals will be delivered by canteen truck and served at your worksite instead of requiring you to attend a dining facility to eat.

Keep the dining hall cleaner: The floors, tables and chairs, beverage dispensers and other service areas will be kept clean, and flies and other pests will be eliminated.

Allow self-service: Instead of being served each item, as is now done in the dining halls, you will be permitted to serve yourself most items from a buffet-style service line.

Reduce waiting lines: The length of time required to wait for headcount in the serving line and at the dishwashing area will be reduced to a minimum by providing faster service.

Install airconditioning: Airconditioning will be installed to control temperature and humidity in the dining hall, particularly during hot weather.

Eliminate self-bussing: When finished eating, you are now required to remove your dishes and tray to the dishwashing area. Instead, either dining hall attendants will be provided to perform this service, or carts will be conveniently located near your table at which you may deposit your dishes and tray on leaving the dining facility.

Add lounge and washroom facilities: A lounge with washroom facilities for your use will be located at or near to the entrance to the dining hall.

Provide smaller dining rooms or areas: Presently, the dining hall provides a single, large eating space. This change will result in subdividing this space into smaller rooms or areas, each with fewer tables, in which to eat.

Provide additional parking space: The area back of Dining Hall #1 would be expanded to add more parking space during meal hours.

Remove cash collections: A credit card system such as Bank Americard could be installed so that you would not have to pay cash for each meal at the time you eat it.

Eliminate signature headcount: Machine readable plastic meal cards would be issued to SIK personnel. Your card would be inserted into a reader which would automatically record your card number — thus eliminating the need to sign your name at each meal.

APPENDIX B
PROPOSED CHANGES QUESTIONNAIRE

INSTRUCTIONS FOR ATTENDANCE QUESTIONNAIRE

This questionnaire is designed to find out what changes in the Air Force feeding system will actually increase your attendance at dining facilities. We know there are many factors which can cause people to skip meals. Some of these factors are not related to the performance of our feeding system, such as outside employment at a restaurant where meals are furnished free or even a generous girlfriend who consistently invites you over for supper. We are practical enough to know we can't compete with these arrangements and that meals skipped for these reasons would be skipped even if the Air Force had the finest restaurants. However, we believe that there are certain changes we could make which would increase your attendance at Air Force dining halls. If you give accurate answers on this questionnaire, we can discover the most important changes and can make these changes more quickly.

It is important to emphasize again that your cooperation and assistance is critical to our efforts to find out what changes we should make. We know some of the questions are difficult to answer, but we feel sure your effort will be valuable and will actually result in substantial improvement in the Air Force's feeding system.

OUR METHOD

Based on previous studies, we have narrowed down the possible changes to those listed in this questionnaire on the following pages. Each of these changes could possibly increase your attendance at the dining hall. Since your availability as potential customers is different on weekdays than on weekends, we will ask you separate questions about your dining hall attendance on weekdays and weekends. We can only determine which changes are most important by the effect each change will have on your attendance. The most important change for us to make is the change which will increase your attendance the most.

In order to assist you in answering questions about your attendance at Air Force meals, we have compiled your dining hall attendance records for the first week in December 1972. These are given on the sheet we have passed out to you. If these records approximate your normal attendance on weekdays (Monday thru Friday) and on weekends (Saturday and Sunday), you can use these numbers to help you estimate your new attendance for each of the proposed changes. For example, if the records show that you normally sign up for three lunches from Monday thru Friday (three out of the five lunches offered) and your recollection is that you normally sign for about three lunches out of the five offered, then these records are accurate enough to represent your behavior and you should use these records to answer the attendance questions that follow.

If for some reason you believe that our records do not reflect your normal dining hall attendance, we would like you to correct this information so that it more closely represents what you actually do. You should then use your corrected records as a basis to answer the attendance questions. In addition, we would also like you to tell us why you think the change was necessary. Do not make any changes until you are told to do so.

INSTRUCTIONS FOR REVIEWING MESS HALL ATTENDANCE RECORD SHEET

1. Examine the Attendance Record Sheet that we have passed out to you. This is our record of your attendance at dining halls in the first week in December.
2. Look first at the Weekday section. We have computed your average weekly attendance at each meal. Remember that during the weekdays (Monday thru Friday) you could eat five (5) breakfasts, five (5) mid-day meals, and five (5) evening meals.

If the numbers we have computed represent the typical number of meals that you eat, then you do not have to make any corrections. Simply transfer these numbers to the Corrected Attendance Sheet.

However, if the numbers we have computed do not represent the typical number of weekday meals that you eat in a week, then go to the Corrected Attendance Sheet and place the number of meals that you think you eat in the Weekday section. When you have done this, go back and read the next paragraph.

3. Look now at the Weekend section. We have computed the number of weekend meals that you signed for in a month. Remember that in a month there are eight (8) breakfasts (two breakfasts per weekend times four weekends), eight (8) mid-day meals, and eight (8) evening meals.

If the numbers we have computed represent the typical number of meals that you eat, then you do not have to make any corrections. Simply transfer these numbers to the Corrected Attendance Sheets.

However, if the numbers we have computed do not represent the typical number of weekend meals that you eat in a month, then go to the Corrected Attendance Sheet and place the number of meals that you think you eat in the Weekend section. When you have done this, go back to this page and read the next paragraph.

4. If you made corrections, please circle the numbers of the reasons for your corrections on the bottom of the Corrected Attendance Sheet.
5. Place your Corrected Attendance Record in front of you so that you can use it to help you answer the next set of questions.

The next set of questions contains proposed changes to the Air Force feeding system and asks what affect they would have on your attendance. To begin, go to the first question and read the first proposed changes then come back to these instructions.

Now that you have read this change, make a decision whether this change would effect your attendance at the mess hall or not. If you think your attendance would change, go back to your Corrected Attendance Sheet and see what meals you are now eating. Decide whether the change in your attendance would occur on weekdays or weekends or both. Also, decide what meals would be affected. When you have decided, enter your new level of attendance in the appropriate spaces below the description of the change. For example, if the Corrected Attendance Sheet shows your normal attendance as three mid-day meals from Monday to Friday, you may think that the suggested change will increase your weekday attendance at the mid-day meal. Since there are only five mid-day meals available Monday thru Friday and you are now attending approximately three of five there would be only two possible answers you could give for your estimated new attendance, either four (4) or five (5) mid-day meals. Enter the number you choose in the appropriate space below the description of the change.

If you expect no change for any meal, then put in the numbers that are now in your Corrected Attendance Sheet.

After you have completed the first proposed change, go on to the following changes. Consider each change separately.

Please be sure you understand these instructions before you begin. If you have any questions at any time, raise your hand, and we will help you. Take your time and give these questions careful consideration.

Remember, It Is Important That You Keep In Mind The Following Numbers For Estimating Your Change In Attendance.

WEEKDAYS (Monday to Friday): There are five (5) breakfasts, five (5) mid-day meals, and five (5) evening meals, in a WEEK.

WEEKENDS (Saturday and Sunday): In a MONTH (assume four weeks per month), there are eight (8) weekend breakfasts (two breakfasts per weekend times four weekends), eight (8) mid-day meals, and eight (8) evening meals. Be sure to keep these numbers in mind when you are estimating your new attendance rates.

CORRECTED ATTENDANCE SHEET

Fill in the following blanks with the numbers from your Attendance Record Sheet if you feel they are correct, or if they are incorrect, with the numbers that you feel represent the number of meals that you eat at your mess hall.

WEEKDAYS (Monday thru Friday)

Average Number of Meals Attended During the Week

Breakfast

Mid-day

Evening

_____ of 5

_____ of 5

_____ of 5

WEEKENDS (Saturday and Sunday)

Average Number of Weekend Meals Attended During a Month

Breakfast

Mid-day

Evening

_____ of 8

_____ of 8

_____ of 8

REASONS FOR CORRECTION OF MESS HALL ATTENDANCE DATA

Please circle any reasons why you made corrections on your Mess Hall Attendance sheet.

1. I was on leave during part of the month of December and this month does not indicate my typical eating habits at my mess hall.

2. I was on a special work assignment during part of the month of December which did not permit me to eat all of my meals in my mess hall.

3. I was on a TDY assignment during part of the month of December which did not permit me to eat all of my meals in my mess hall.

4. Other unusual events occurred during the month of December which make this month not representative of my typical eating habits in my mess hall. Describe these events here: _____

5. The signature sheet simply does not accurately indicate how many meals I eat in my mess hall. I eat (fewer) (more) meals than I sign for.

IMPROVE THE APPEARANCE OF THE DINING HALL

The appearance of the dining hall will be changed to be less military through the use of brighter colors, draperies, carpeting, different furniture and booths, lighting and other features to provide an atmosphere similar to the "better" cafeterias and restaurants in which you have eaten.

YOUR ESTIMATED MEAL ATTENDANCE IF CHANGES ARE MADE

WEEKDAYS (Monday thru Friday)

Average Number of Meals Attended During a Typical Week

Breakfast

Mid-day

Evening

_____ of 5

_____ of 5

_____ of 5

WEEKENDS (Saturday and Sunday)

Average Number of Meals Attended During a Typical Month

Breakfast

Mid-day

Evening

_____ of 8

_____ of 8

_____ of 8

LOCATE DINING FACILITIES NEARER TO YOUR WORK AND BARRACKS

Short order foods and certain other items (such as, soups and salads) will be offered at "snack bars" located more conveniently to your worksite and housing area than are the dining halls.

YOUR ESTIMATED MEAL ATTENDANCE IF CHANGES ARE MADE

WEEKDAYS (Monday thru Friday)

Average Number of Meals Attended During a Typical Week
Breakfast _____ of 5 Mid-day _____ of 5 Evening _____ of 5

WEEKENDS (Saturday and Sunday)

Average Number of Meals Attended During a Typical Month
Breakfast _____ of 8 Mid-day _____ of 8 Evening _____ of 8

OFFER SPECIAL EVENING MEALS

For instance, a specialty menu (such as, Chinese, Italian, Mexican, or Soul food) will be offered each evening in one dining hall. It might also include such features as table service by waiters and waitresses, candlelight and table cloths. You will be allowed to invite family and friends to eat on certain occasions.

YOUR ESTIMATED MEAL ATTENDANCE IF CHANGES ARE MADE

WEEKDAYS (Monday thru Friday)

Average Number of Meals Attended During a Typical Week

Breakfast

Mid-day

Evening

_____ of 5

_____ of 5

_____ of 5

WEEKENDS (Saturday and Sunday)

Average Number of Meals Attended During a Typical Month

Breakfast

Mid-day

Evening

_____ of 8

_____ of 8

_____ of 8

IMPROVE PERSONNEL SERVICES IN THE DINING HALL

This change will include a more cheerful and pleasant attitude on the part of the headcounter, serving line personnel and those operating the dishwashing area.

YOUR ESTIMATED MEAL ATTENDANCE IF CHANGES ARE MADE

WEEKDAYS (Monday thru Friday)

Average Number of Meals Attended During a Typical Week
Breakfast _____ of 5 Mid-day _____ of 5 Evening _____ of 5

WEEKENDS (Saturday and Sunday)

Average Number of Meals Attended During a Typical Month
Breakfast _____ of 8 Mid-day _____ of 8 Evening _____ of 8

INTRODUCE CANTEEN TRUCK MEAL SERVICE

Meals will be delivered by canteen truck and served at your work site instead of requiring you to attend a dining facility to eat.

YOUR ESTIMATED MEAL ATTENDANCE IF CHANGES ARE MADE

WEEKDAYS (Monday thru Friday)

Average Number of Meals Attended During a Typical Week

Breakfast

Mid-day

Evening

_____ of 5

_____ of 5

_____ of 5

WEEKENDS (Saturday and Sunday)

Average Number of Meals Attended During a Typical Month

Breakfast

Mid-day

Evening

_____ of 8

_____ of 8

_____ of 8

IMPROVE THE QUALITY OF MEALS

The quality and appearance of the food served in the dining hall will be improved to a level similar to that you can obtain from a "good" cafeteria or restaurant.

YOUR ESTIMATED MEAL ATTENDANCE IF CHANGES ARE MADE

WEEKDAYS (Monday thru Friday)

Average Number of Meals Attended During a Typical Week

Breakfast	Mid-day	Evening
_____ of 5	_____ of 5	_____ of 5

WEEKENDS (Saturday and Sunday)

Average Number of Meals Attended During a Typical Month

Breakfast	Mid-day	Evening
_____ of 8	_____ of 8	_____ of 8

INCREASE THE QUANTITY OF FOOD SERVED

Larger portions of the foods, particularly meats and desserts, will be served. Sufficient amounts of food will be available so that the most desirable items will not run out before you are served.

YOUR ESTIMATED MEAL ATTENDANCE IF CHANGES ARE MADE

WEEKDAYS (Monday thru Friday)

Average Number of Meals Attended During a Typical Week
Breakfast _____ of 5 Mid-day _____ of 5 Evening _____ of 5

WEEKENDS (Saturday and Sunday)

Average Number of Meals Attended During a Typical Month
Breakfast _____ of 8 Mid-day _____ of 8 Evening _____ of 8

INCREASE THE VARIETY OF FOODS SERVED

Offer a greater choice of each type of food (for instance, two or three different meats, potatoes, vegetables and desserts) at each meal.

YOUR ESTIMATED MEAL ATTENDANCE IF CHANGES ARE MADE

WEEKDAYS (Monday thru Friday)

Average Number of Meals Attended During a Typical Week

Breakfast	Mid-day	Evening
_____ of 5	_____ of 5	_____ of 5

WEEKENDS (Saturday and Sunday)

Average Number of Meals Attended During a Typical Month

Breakfast	Mid-day	Evening
_____ of 8	_____ of 8	_____ of 8

KEEP THE DINING HALL CLEANER

The floors, tables and chairs, beverage dispensers and other service areas will be kept clean, and flies and other pests will be eliminated.

YOUR ESTIMATED MEAL ATTENDANCE IF CHANGES ARE MADE

WEEKDAYS (Monday thru Friday)

Average Number of Meals Attended During a Typical Week

Breakfast

Mid-day

Evening

_____ of 5

_____ of 5

_____ of 5

WEEKENDS (Saturday and Sunday)

Average Number of Meals Attended During a Typical Month

Breakfast

Mid-day

Evening

_____ of 8

_____ of 8

_____ of 8

PROVIDE CARRY-OUT SERVICE

Rether than eating in the dining hall, you will be permitted to carry-out short order items (such as, hamburgers, cheeseburgers, hot dogs and other sandwichas, french fries, carbonated beverages and desserts) to eat elsewhere.

YOUR ESTIMATED MEAL ATTENDANCE IF CHANGES ARE MADE

WEEKDAYS (Monday thru Friday)

Average Number of Maals Attended During a Typical Week
Breakfast _____ of 5 Mid-day _____ of 5 Evaning _____ of 5

WEEKENDS (Saturday and Sunday)

Average Number of Meals Attended During a Typical Month
Breakfast _____ of 8 Mid-day _____ of 8 Evening _____ of 8

ADD LOUNGE AND WASHROOM FACILITIES

A lounge with washroom facilities for your use will be located at or near to the entrance to the dining hall.

YOUR ESTIMATED MEAL ATTENDANCE IF CHANGES ARE MADE

WEEKDAYS (Monday thru Friday)

Average Number of Meals Attended During a Typical Week

Breakfast

Mid-day

Evening

_____ of 5

_____ of 5

_____ of 5

WEEKENDS (Saturday and Sunday)

Average Number of Meals Attended During a Typical Month

Breakfast

Mid-day

Evening

_____ of 8

_____ of 8

_____ of 8

INSTALL AIRCONDITIONING

Airconditioning will be installed to control temperature and humidity in the dining hall, particularly during hot weather.

YOUR ESTIMATED MEAL ATTENDANCE IF CHANGES ARE MADE

WEEKDAYS (Monday thru Friday)

Average Number of Meals Attended During a Typical Week

Breakfast	Mid-day	Evening
_____ of 5	_____ of 5	_____ of 5

WEEKENDS (Saturday and Sunday)

Average Number of Meals Attended During a Typical Month

Breakfast	Mid-day	Evening
_____ of 8	_____ of 8	_____ of 8

ALLOW SELF-SERVICE

Instead of being served each item, as is now done in the dining halls, you will be permitted to serve yourself most items from a buffet-style service line.

YOUR ESTIMATED MEAL ATTENDANCE IF CHANGES ARE MADE

WEEKDAY (Monday thru Friday)

Average Number of Meals Attended During a Typical Week

Breakfast

Mid-day

Evening

_____ of 5

_____ of 5

_____ of 5

WEEKENDS (Saturday and Sunday)

Average Number of Meals Attended During a Typical Month

Breakfast

Mid-day

Evening

_____ of 8

_____ of 8

_____ of 8

REDUCE THE LEVEL OF NOISE IN THE DINING HALL

Changes will be introduced to eliminate or reduce the noise in the dining hall that originates from the kitchen, dishwashing and serving line areas.

YOUR ESTIMATED MEAL ATTENDANCE IF CHANGES ARE MADE

WEEKDAYS (Monday thru Friday)

Average Number of Meals Attended During a Typical Week

Breakfast

Mid-day

Evening

_____ of 5

_____ of 5

_____ of 5

WEEKENDS (Saturday and Sunday)

Average Number of Meals Attended During a Typical Month

Breakfast

Mid-day

Evening

_____ of 8

_____ of 8

_____ of 8

PROVIDE SMALLER DINING ROOMS OR AREAS

Presently, the dining hall provides a single, large eating space. This change will result in subdividing this space into smaller rooms or areas, each with fewer tables, in which to eat.

YOUR ESTIMATED MEAL ATTENDANCE IF CHANGES ARE MADE

WEEKDAYS (Monday thru Friday)

Average Number of Meals Attended During a Typical Week

Breakfast

Mid-day

Evening

_____ of 5

_____ of 5

_____ of 5

WEEKENDS (Saturday and Sunday)

Average Number of Meals Attended During a Typical Month

Breakfast

Mid-day

Evening

_____ of 8

_____ of 8

_____ of 8

ELIMINATE SELF-BUSSING

When finished eating, you are now required to remove your dishes and tray to the dishwashing area. Instead, either dining hall attendants will be provided to perform this service, or carts will be conveniently located near your table at which you may deposit your dishes and tray on leaving the dining facility.

YOUR ESTIMATED MEAL ATTENDANCE IF CHANGES ARE MADE

WEEKDAYS (Monday thru Friday)

Average Number of Meals Attended During a Typical Week

Breakfast

Mid-day

Evening

_____ of 5

_____ of 5

_____ of 5

WEEKENDS (Saturday and Sunday)

Average Number of Meals Attended During a Typical Month

Breakfast

Mid-day

Evening

_____ of 8

_____ of 8

_____ of 8

REDUCE WAITING LINES

The length of time required to wait for headcount, in the serving line and at the dishwashing area will be reduced to a minimum by providing faster service.

YOUR ESTIMATED MEAL ATTENDANCE IF CHANGES ARE MADE

WEEKDAYS (Monday thru Friday)

Average Number of Meals Attended During a Typical Week

Breakfast

Mid-day

Evening

_____ of 5

_____ of 5

_____ of 5

WEEKENDS (Saturday and Sunday)

Average Number of Meals Attended During a Typical Month

Breakfast

Mid-day

Evening

_____ of 8

_____ of 8

_____ of 8

SUBSTITUTE CAFETERIA SERVICE FOR THE DINING HALL

All airmen will be put on separate rations. The dining hall will be replaced by a cafeteria in which you will pay for only those items selected, rather than paying for a total meal.

YOUR ESTIMATED MEAL ATTENDANCE IF CHANGES ARE MADE

WEEKDAYS (Monday thru Friday)

Average Number of Meals Attended During a Typical Week

Breakfast	Mid-day	Evening
_____ of 5	_____ of 5	_____ of 5

WEEKENDS (Saturday and Sunday)

Average Number of Meals Attended During a Typical Month

Breakfast	Mid-day	Evening
_____ of 8	_____ of 8	_____ of 8

IMPROVE PERSONNEL SERVICES IN THE DINING HALL

This change will include a more cheerful and pleasant attitude on the part of the headcounter, serving line personnel and those operating the dishwashing area.

What effect, if any, would this change have in your attendance. Fill in the blanks below indicating your estimated attendance. *Remember, base your estimate on your current attendance as shown on your attendance record sheet.* If you expect the change to have no effect on your attendance, write in the numbers from your attendance record sheet.

YOUR ESTIMATED MEAL ATTENDANCE IF THIS CHANGE IS MADE

WEEKDAYS (Monday thru Friday)

Average Number of Meals Attended During a Typical Week

Breakfast

Mid-day

Evening

_____ of 5

_____ of 5

_____ of 5

WEEKENDS (Saturday and Sunday)

Average Number of Meals Attended During a Typical Month

Breakfast

Mid-day

Evening

_____ of 8

_____ of 8

_____ of 8

SUMMARY OF ALL PROPOSED CHANGES

If all the changes were made in your mess hall that you would like to see made, what would your maximum attendance be in the mess hall?

Tell us what effect, if any, that all the changes you would like to see made will have on your attendance at the mess hall. Remember that there will probably be certain meals that you will skip no matter how good the food or service is. Fill in the blanks below giving us your *maximum* attendance in the mess hall, if all the changes you want to see are made. *Remember, base your estimate on your current attendance as shown on your attendance sheet.* If you expect this change to have no effect on your attendance write in the numbers from your present attendance record.

YOUR ESTIMATED MEAL ATTENDANCE IF CHANGES ARE MADE

WEEKDAYS (Monday thru Friday)

Average Number of Meals Attended During a Typical Week

Breakfast	Mid-day	Evening
of 5	of 5	of 5

WEEKENDS (Saturday and Sunday)

Average Number of Meals Attended During a Typical Month

Breakfast	Mid-day	Evening
of 8	of 8	of 8

Reproduced on the following page are the possible changes that could be made in your dining hall. Look over the list again and circle the numbers of the *five* (5) changes you would most like to see made in your dining facility.

REDUCE THE LEVEL OF NOISE IN THE DINING HALL

Changes will be introduced to eliminate or reduce the noise in the dining hall that originates from the kitchen, dishwashing and serving line areas.

SUBSTITUTE CAFETERIA SERVICE FOR THE DINING HALL

All airmen will be put on separate rations. The dining hall will be replaced by a cafeteria in which you will pay for only those items selected, rather than paying for a total meal.

PROVIDE CARRY-OUT SERVICE

Rather than eating in the dining hall, you will be permitted to carry-out short order items (such as hamburgers, cheeseburgers, hot dogs and other sandwiches, french fries, carbonated beverages and desserts) to eat elsewhere.

INCREASE THE QUANTITY OF FOOD SERVED

Larger portions of the foods, particularly meats and desserts, will be served. Sufficient amounts of food will be available so that the most desirable items will not run out before you are served.

INCREASE THE VARIETY OF FOODS SERVED

Offer a greater choice of each type of food (for instance, two or three different meats, potatoes, vegetables and desserts) at each meal.

OFFER SPECIAL EVENING MEALS

For instance, a specialty menu (such as, Chinese, Italian, Mexican, or Soul food) will be offered each evening in one dining hall. It might also include such features as table service by waiters and waitresses, candlelight and table cloths. You will be allowed to invite family and friends to eat on certain occasions.

IMPROVE PERSONNEL SERVICES IN THE DINING HALL

This change will include a more cheerful and pleasant attitude on the part of the headcounter, serving line personnel and those operating the dishwashing area.

LOCATE DINING FACILITIES NEARER TO YOUR WORK AND BARRACKS

Short order foods and certain other items (such as, soups and salads) will be offered at "snack bars" located more conveniently to your worksite and housing area than are the dining halls.

IMPROVE THE APPEARANCE OF THE DINING HALL

The appearance of the dining hall will be changed to be less military through the use of brighter colors, draperies, carpeting, different furniture and booths, lighting and other features to provide an atmosphere similar to the "better" cafeterias and restaurants in which you have eaten.

IMPROVE THE QUALITY OF MEALS

The quality and appearance of the food served in the dining hall will be improved to a level similar to that you can obtain from a "good" cafeteria or restaurant.

INTRODUCE CANTEEN TRUCK MEAL SERVICE

Meals will be delivered by canteen truck and served at your worksite instead of requiring you to attend a dining facility to eat.

KEEP THE DINING HALL CLEANER

The floors, tables and chairs, beverage dispensers and other service areas will be kept clean, and flies and other pests will be eliminated.

ALLOW SELF-SERVICE

Instead of being served each item, as is now done in the dining halls, you will be permitted to serve yourself most items from a buffet-style service line.

REDUCE WAITING LINES

The length of time required to wait for headcount, in the serving line and at the dishwashing area will be reduced to a minimum by providing faster service.

INSTALL AIRCONDITIONING

Airconditioning will be installed to control temperature and humidity in the dining hall, particularly during hot weather.

ELIMINATE SELF-BUSSING

When finished eating, you are now required to remove your dishes and tray to the dishwashing area. Instead, either dining hall attendants will be provided to perform this service, or carts will be conveniently located near your table at which you may deposit your dishes and tray on leaving the dining facility.

ADD LOUNGE AND WASHROOM FACILITIES

A lounge with washroom facilities for your use will be located at or near to the entrance to the dining hall.

PROVIDE SMALLER DINING ROOMS OR AREAS

Presently, the dining hall provides a single, large eating space. This change will result in subdividing this space into smaller rooms or areas, each with fewer tables, in which to eat.

Now place the numbers of these five changes *in the order of their importance to you* on the five lines below.

1. ____ (Most important of the five changes selected)
2. ____ (Second most important of the five changes selected)
3. ____ (Third most important of the five changes selected)
4. ____ (Fourth most important of the five changes selected)
5. ____ (Fifth most important of the five changes selected)

You have now finished the questionnaire. If we have overlooked anything about your mess hall that you would like to call to our attention, write it in the space below.

Thank you again for your cooperation and assistance.

APPENDIX C
STATISTICAL TABLES AND SUMMARIES

The following four figures present the analysis of variance-Figures C-2 and C-4, and Newman-Keuls tests for ordered means on Figures C-3 and C-5.

The ANOVA design is a single factor repeated measures experiment with 21 (in interviews) and 18 (in questionnaires) levels. In each ANOVA table, the total variance is broken down into three orthogonal components: Factor (ICHGI or CHGAR), Factor by UNIT (subject) and UNIT (subject). Variance between subjects is the UNIT component. Variance within subjects — which is to say differences in interview judgements or questionnaire responses — are due to the experimental treatment (Proposed Changes) and the interaction between treatment and subjects. The ANOVA design is graphically represented in Figure C-1.

The Newman-Keuls test for ordered means displays each of the possible pair wise comparisons. Cells in which the difference between means is greater than the required critical value are statistically significant ($1-\alpha = .01$). Cells with no numerical entry indicate that the respective means are not significantly different from each other.

FIGURE C-1
Experimental Design for the Analysis of Proposed
Changes Evaluations

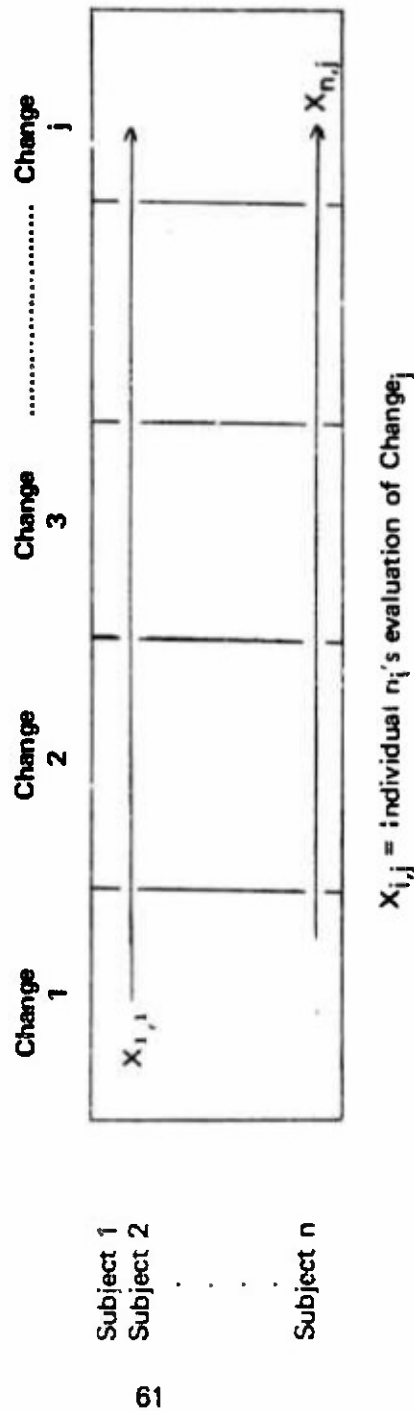


Figure C-2

ANALYSES OF INTERVIEW PROPOSED CHANGES EVALUATIONS

BASIC STATISTICS

VARIABLE DESCRIPTION	NAME	MEAN	SD	N	VARIANCE
	SIGHDCNT	5.458	1.683	48	2.832
	RDCNOISE	4.687	1.828	48	3.340
	SHLRDNRN	4.646	1.797	48	3.229
	SLPRBUSSG	4.437	1.790	48	3.204
	CARRYOUT	3.708	2.071	48	4.290
	WRLOUNGE	3.958	1.881	48	3.540
	AIRCONDIT	3.542	1.767	48	3.123
	SLFSERVIC	4.417	1.824	48	3.326
	CASHCOLL	5.312	1.502	48	2.257
	CANTRUCK	4.375	1.889	48	3.568
	PKNGSPCE	5.375	1.691	48	2.859
	QUALITY	1.896	1.503	48	2.260
	QUANTITY	3.458	1.848	48	3.415
	VARIETY	2.500	1.671	48	2.792
	DHAPPEAR	2.812	1.616	48	2.611
	CLFANER	3.062	1.651	48	2.725
	NEARWKLV	4.875	1.844	48	3.401
	SPEVEMEL	4.208	1.779	48	3.165
	PERSONEL	3.271	1.642	48	2.697
	RDCWTGLN	3.583	1.824	48	3.326
	CAFETRIA	4.417	1.913	48	3.660

TOTAL NUMBER OF UNITS ACCEPTED

=

48

Figure C-2 (cont'd)

ANALYSES OF INTERVIEW PROPOSED CHANGES EVALUATIONS

ANALYSIS OF VARIANCE TABLE FOR MEASURE (1)

CLASSIFYING FACTORS		INTRV PROP CHGE IMPORT		SUBJECTS OR DNITS OF ANALYSIS		MEAN SQUARE	F-TEST	SIGNIFICANCE	PERCENT OF TOTAL SUM OF SQUARES
SOURCE	SUM OF SQUARES	DF							
ICRGI	882.248	20				44.112	13.165***	UNDER 0.001	21.88
ICRGI X DNIT	3149.748	940				3.351	NOT TESTED		78.12
DNIT	0.031	47				0.001	NOT TESTED		0.00
TOTAL	4032.026	1007				4.004			100.00

AN ASTERISK (*) MARKS THE EFFECT USED IN TESTING THE PRECEDING EFFECTS

48 UNITS WERE READ IN FOR THIS ANALYSIS.
48 DNITS WERE USED IN THIS ANALYSIS.

Figure C-3

Newman-Keuls Test for Ordered Means - 21 Proposed Changes
Evaluated in Individual Interviews

	Quality	Variety	Appearance	Cleanliness	Service	Quantity	Aircond.	Waiting Lines	Carry-out Serv.	Washrm/Lounge	Spec. Ev. Meal	Canteen Truck	Self-Service	Cafeteria	Self-Bussing	Sm. Dining Rms	Noise	Location	Cash Col.	Parking	Sig. Headcount	CV
91	1	120	135	147	157	166	170	172	178	190	202	210	212	212	213	223	225	234	255	258	262	72.92
120																						72.29
135																						71.65
147																						71.01
157																						70.39
166																						69.75
170																						69.12
172																						68.48
178																						67.85
190																						67.09
202																						66.33
210																						65.44
212																						64.42
212																						63.26
213																						61.89
223																						60.37
225																						58.34
234																						56.80
255																						52.25
258																						
262																						

(1) $CV = (q_{(r,df)}(1-\alpha)(\sqrt{nMS_{res}})$ where $1-\alpha = .01$
 r = number of steps apart
 df = degree of freedom for MS_{res}

(2) $\sqrt{nMS_{res}} = \sqrt{(43)(3.35)} = 12.68$

FIGURE C-4

ANALYSIS OF VARIANCE TABLE FOR MEASURE (1)

CLASSIFYING FACTORS
CHGAR
UNIT

CHANGE ATTENDANCE RATES
SUBJECTS OR UNITS OF ANALYSIS

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-TEST	SIGNIFICANCE	PERCENT OF TOTAL SUM OF SQUARES
CHGAR	3.835	17	0.226	12.655***	UNDER 0.001	1.14
CHGAR X UNIT	67.271	3774	0.018	NOT TESTED		20.03
UNIT	264.767	222	1.193	NOT TESTED		78.83
TOTAL	335.873	4013	0.084			100.00

AN ASTERISK (*) MARKS THE EFFECT USED IN TESTING THE PRECEDING EFFECTS

707 UNITS WERE READ IN FOR THIS ANALYSIS.

223 UNITS WERE USED IN THIS ANALYSIS.

484 THROWN OUT DUE TO BLANKS ON DEPENDENT VARIABLES

Figure C-5

Newman-Keuls Test for Ordered Means - 18 Proposed Changes
on Proposed Changes Questionnaire

	Quality	Sp. Ev. Meal	Carry-out	Variety	D.H. Appeal.	Cafeteria	Self-Service	Quantity	Self-Bussing	Aircond.	Proximity	Reduce Lines	Lounge/Washrm	Services	Cleanliness	Can. Truck	Smir. Dngrms	Noise	CV
Quality	92.6	91.2	88.3	83.4	80.7	79.4	76.9	76.9	76.3	76.3	75.8	75.2	74.7	72.7	70.7	70.2	69.6	69.4	
Sp. Ev. Meal																			11.2
Carry-out																			11.1
Variety																			11.0
D.H. Appeal.																			10.9
Cafeteria																			10.8
Self-Serv.																			10.7
Quantity																			10.6
Self-Bussing																			10.5
Aircond.																			10.4
Proximity																			10.2
Reduce Lines																			10.0
Lounge/Washrm																			9.8
Service																			9.5
Cleanliness																			9.2
Can. Truck																			8.6
Smir. Dngrm																			8.3
Noise																			

(1) $CV = (q_{(r,d)}(1-\alpha)^{1/\sqrt{nMS_{res}}})$ where $1-\alpha = .01$
 $r =$ number of steps apart
 $df =$ degree of freedom for MS_{res}

(2) $\sqrt{nMS_{res}} = \sqrt{(223)(.018)} = 2.003$