

# ATTITUDES OF CONSUMERS TOWARD MILITARY AND OTHER INSTITUTIONAL FOODS

Armand V. Cardello, Rick Bell & F. Matthew Kramer

Consumer Research Branch, Behavioral Sciences Division, U.S. Army Natick R,D&E Center, Natick, MA 01760-5020, U.S.A.

(Accepted 00 Month 1900)

## ABSTRACT

*In a series of studies, attitudes of military and civilian consumers toward military and other institutional foods, e.g. foods served in school cafeterias, hospitals, military dining halls, on airlines, etc., were examined. The goals of this research were to (1) quantify the extent and nature of these attitudes in terms of expected acceptability and expected quality of the food; (2) determine whether these attitudes can be classified as stereotypical; (3) assess the relative importance of presumed causes of poor quality and acceptability in institutional food, e.g. skills of food preparers, ingredient quality, consumption environment, etc.; (4) identify the specific aspects of perceived food quality, e.g. flavor, texture, nutritive value, etc., that most differentiate commercial from military institutional food; (5) quantify the relationship between expectations of acceptability and actual acceptability ratings of military institutional food; and (6) detail the empirical effect of institutional vs. brand name food labeling on hedonic acceptability ratings. The results of these studies showed broad and significant effects of institutional food stereotypes on food acceptance and food quality ratings. The results were interpreted within the context of a psychological model of the role of consumer expectations on food acceptability. The implications of the data for institutional and brand name food marketing are discussed.*

## INTRODUCTION

If you ask average consumers their opinion of foods served in hospitals, in the military, or in other institutional foodservices, their response will often reflect a negative attitude toward the quality and/or acceptability of these foods. Moreover, this negative attitude will often be found among individuals who have had no direct experience with the foodservice in question.

In these cases, this negative attitude may well be referred to as a 'stereotype.'

*Webster's Dictionary* defines a stereotype as 'a standardized mental picture held in common by members of a group and representing an oversimplified opinion, affective attitude or uncritical judgment.' Psychologists have studied the cognitive processes involved in stereotyping since the 1920s, when Walter Lippmann appropriated the word 'stereotype' from the printing trade. Although frequently associated with notions of social prejudice, stereotyping is, in fact, a normal process that can be classified as a form of categorical perception, i.e. the process of placing objects into categories based on minimal sensory data (Fox, 1992). Operationally, stereotypes can be defined as perceptions of objects in which (1) there is a consensus among a relatively large number of people that the object of the stereotype possesses some set of identifying characteristics, (2) that the object of the stereotype is typically categorized on the basis of these characteristics, while other individualized characteristics of the object are ignored, and (3) that the characteristics that are attributed to the object have little or no basis in fact (Goldenson, 1970).

Although a number of researchers and commentators over the past 30 years have drawn attention to the negative image and negative consumer attitude toward many institutional foods (Platt *et al.*, 1963; Glew, 1970; Moyer 1977; Beard, 1977; Cardello, 1993), most of the studies to date have focused on how to improve quality and customer satisfaction for a specific type of institutional foodservice (e.g. Branch and Meiselman, 1973; Werner, 1977; Eisele, 1983; Whitehall, 1985; Gormley and Walshe, 1991; Dube *et al.*, 1994). Little research has been aimed at investigating the generalized nature of these negative attitudes, how they differ across different foodservice systems, or the cognitive mechanisms by which these preconceived and, often, unfounded attitudes operate to influence actual perception, acceptance and/or consumption of institutional food.

Consumer attitudes and the expectations that they create have been recognized for their role in the acceptance (or rejection) of institutional foods for some time

(Feldman, 1962; Glew, 1981; National Restaurant Association, 1983*a,b,c*). Recently, the role of consumer expectations on food acceptance and consumption has been addressed in a series of studies examining alternative cognitive models of these effects (Cardello *et al.*, 1985; Cardello and Sawyer, 1992; Cardello, 1994; Tuorila *et al.*, 1994). In these studies, consumer expectations (both positive and negative) and their confirmation or disconfirmation have been examined for their effect on the sensory and hedonic responses to food. The results of this research have shown that pre-ingestional, negative expectations will decrease the acceptance (rated liking/disliking) of food when eaten, whereas positive expectations will increase acceptance. Effects of consumer expectations have also been reported in response to quality information (Escamilla-Santana & MacFie, 1993) and for their effect on sensory judgments (Cardello & Sawyer, 1992; Deliza *et al.*, 1993) and consumption (Hellemann *et al.*, 1993).

The studies reported here were conducted to provide data on (1) the nature and magnitude of negative attitudes, expectations and/or stereotypes of military and other institutional foods, (2) the factors that contribute to and/or otherwise characterize these attitudes, (3) the differences in these attitudes for different institutional foodservices, (4) the differences in attitudes between individuals who are exposed to a specific type of institutional foodservice and those who have not been exposed, and (5) the general relationships between consumer attitudes, expectations and actual liking of food. Although several of the studies examine a broad range of institutional foods and foodservices, others focus on U.S. military foodservice as a representative example from which generalizations can be made to other institutional foodservices.

---

## STUDY 1

---

The aim of this first study was to obtain quantitative data on attitudes and expectations toward a variety of institutional foods. In addition, in order to assess the extent to which negative attitudes toward institutional foods exist independently of actual experience with such foods, the attitudes of regular consumers of a typical institutional food, military food, were compared to those of individuals who had never consumed these foods.

### Methods

#### Subjects

Subjects consisted of three groups of military personnel and university students. One group comprised 57 male military personnel stationed at Ft. Devens, MA, ranging in age from 19 to 29 yr and in rank from Private to 1st Lieutenant. The second group comprised 84 male mili-

tary personnel stationed at Scofield Barracks, Hawaii, ranging in age from 19 to 35 yr and in rank from Private to Sergeant (E-7). The third group consisted of 121 students from the University of Massachusetts/Amherst, MA, ranging in age from 18 to 25 yr; 61 were males and 60 were females. Two geographically dispersed and operationally distinct military groups were used to examine potential attitudinal differences between different organizational units and to ensure that any observed similarities in the data for the two groups living in the Northeastern U.S. (Ft. Devens and UMass) were not attributable solely to regional attitudes (see Meiselman, 1973, for a discussion of regional differences in food preferences in the U.S.).

### Materials and procedure

Two questionnaires were developed to assess (1) the expected *acceptability* (like/dislike) and (2) the expected quality of 12 food items commonly served in institutional and other foodservice settings. Expected acceptability and quality were examined separately, because they have traditionally been viewed as separate constructs. The selected food items (scrambled eggs, toast, steak, hamburger, spaghetti and meatballs, french fries, baked beans, dinner rolls, apple pie, gelatin dessert (jell-o brand), coffee, and soft drinks) were chosen to represent common food items, some of which might be expected to vary greatly in quality and acceptability among the different foodservices (e.g. steak, spaghetti and meatballs) and some of which would not be expected to vary greatly (e.g. gelatin, soft drinks). For each food item, the questionnaires solicited ratings of the expected acceptability and/or expected quality of these items as served in seven different foodservice settings (traditional full service restaurant, school/college dining hall, at home, diner/fast food restaurant, military dining hall, airline foodservice, and hospital foodservice). Ratings of expected acceptability were made on a 9-point scale that ranged from 1 = 'dislike extremely' to 9 = 'like extremely' with 5 = 'neither like nor dislike'. Ratings of expected quality were made on a scale of 1 = 'extremely poor quality' to 9 = 'extremely good quality' with 5 = 'neither good nor poor quality'. In addition to rating the expected acceptability and quality of the test foods in the various foodservice settings, subjects completed several demographic items. Among these was 'time spent in service' for military personnel. Subjects completed the questionnaires while seated in lecture halls/amphitheaters at the test sites. Only the questionnaire on expected acceptability was administered to the group at Ft. Devens.

### Results

Figure 1 shows mean expected acceptability ratings for all three test groups. Examination of the data shows a

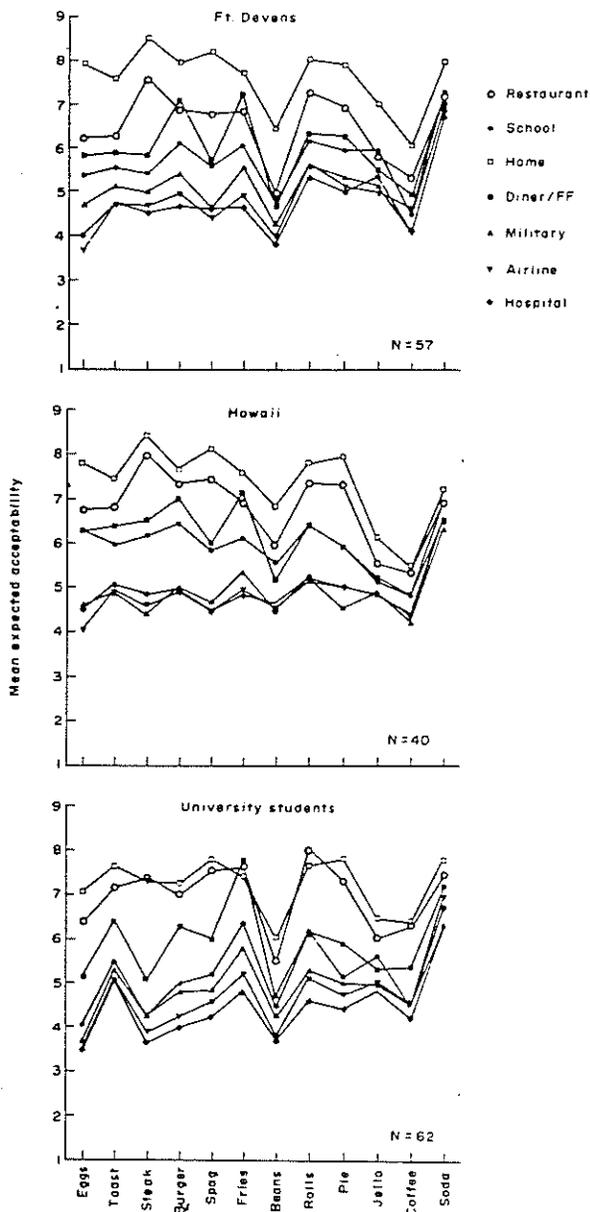


FIG. 1. Mean expected acceptability ratings for 12 food items as served in seven different foodservice settings. Data are for three groups of subjects: top — military personnel stationed at Ft. Devens, MA, middle — military personnel stationed at Scofield Barracks, HA, bottom — students enrolled at the University of Massachusetts/Amherst, MA.

similar rank ordering among all three subject groups for the expected acceptability of the 12 foods in the different foodservice settings. This general rank ordering is home > traditional full service restaurant > diner/fast food > school foodservice > military foodservice > airline foodservice  $\approx$  hospital foodservice. Table 1 shows the results of two-way ANOVAs conducted on the data to examine the effect of subject group and foodservice. As can be seen, the main effect of foodservice was significant for every food item. There were main effects of subject group for eggs, steak, and hamburger and group  $\times$  foodservice interactions for test five foods.

ANOVA's with Neuman-Keuls post-hoc tests conducted on the data for each group separately showed that, with few exceptions, foods served in military dining halls, airlines, and hospitals were perceived to be significantly lower ( $p < 0.05$ ) in expected acceptability than foods served at home, in a full service restaurant, and/or in a diner/fast food operation. The primary exceptions were for jell-o gelatin, soda, and coffee, which, as expected, had fewer overall mean significant differences among the foodservices.

Figure 2 shows expected quality ratings for the Hawaii military group and the university group. Examination of the data shows the same pattern of results as for expected liking, with the exception that university students rated the quality of school foodservice much lower than did military subjects. Expected acceptability and quality ratings were highly correlated for both groups of subjects (Pearson  $r = 0.92$  for students and  $0.94$  for military).

Since the student group was the only subject group that had both males and females, ANOVAs were conducted on the data from this group to examine the effect of gender on food item ratings. Results showed a main effect of gender (males > females) on ratings of the expected liking ( $F = 9.60$ ,  $df = 1,60$ ,  $p = 0.003$ ) and expected quality ( $F = 4.08$ ,  $df = 1,57$ ,  $p = 0.048$ ) of steak, and on the expected quality of eggs ( $F = 5.50$ ,  $df = 1,57$ ,  $p = 0.023$ ) and spaghetti ( $F = 6.20$ ,  $df = 1,57$ ,  $p = 0.016$ ). There was also a main effect of gender (females > males) for the expected liking of soda ( $F = 4.25$ ,  $df = 1,60$ ,  $p = 0.044$ ) and a foodservice  $\times$  gender interaction (females > males at home only) for the expected quality of spaghetti ( $F = 2.44$ ,  $df = 6,324$ ,  $p = 0.027$ ).

In order to determine whether attitudes toward military food change after repeated exposure, ratings of military personnel were examined as a function of time in service. There was no relationship between time in service and ratings of the expected acceptability or quality of military food.

## Discussion

The high correlation observed between expected acceptability ratings and expected quality ratings for both groups of respondents supports previous research showing that the concepts of food acceptability and food quality may not be separate attitudinal constructs, but rather, are highly associated (Pilgrim and Peryam, 1958; Stone *et al.*, 1991; Cardello, 1995). The data in Figs 1 and 2 show systematic differences in the expected acceptability and expected quality of institutional foods. The expected acceptability and expected quality of foods served in all four 'institutional' foodservices (hospital/military/airline/school) fell below those for the other foodservice settings (home/full service restaurant/fast food or diner), with only some minor exceptions. These exceptions may well be due to

TABLE 1. Results of Two-way ANOVAs Conducted on the Expected Acceptability Ratings for the 12 Test Food Items

Food	Main Effects		Interaction Effects
	Subject Group	Foodservice	
Eggs	$F(2,153) = 5.67 (p = 0.001)$	$F(6,918) = 122.4 (p < 0.001)$	$F(12,918) = 2.22 (p = 0.01)$
Toast	N.S.	$F(6,930) = 78.32 (p < 0.001)$	N.S.
Steak	$F(2,154) = 6.68 (p = 0.002)$	$F(6,924) = 159.6 (p < 0.001)$	$F(12,924) = 2.20 (p = 0.01)$
Hamburger	$F(2,154) = 4.23 (p = 0.016)$	$F(6,924) = 88.5 (p < 0.001)$	N.S.
Spaghetti	N.S.	$F(6,294) = 139.3 (p < 0.001)$	N.S.
French Fries	N.S.	$F(6,924) = 97.4 (p < 0.001)$	N.S.
Beans	N.S.	$F(6,918) = 63.4 (p < 0.001)$	N.S.
Rolls	N.S.	$F(6,924) = 101.1 (p < 0.001)$	$F(12,924) = 2.35 (p = 0.006)$
Pie	N.S.	$F(6,918) = 119.1 (p < 0.001)$	$F(12,918) = 2.02 (p = 0.020)$
Gelatin (Jell-o)	N.S.	$F(6,900) = 31.0 (p < 0.001)$	N.S.
Coffee	N.S.	$F(6,918) = 43.0 (p < 0.001)$	$F(12,918) = 2.39 (p = 0.005)$
Soda	N.S.	$F(6,924) = 19.8 (p < 0.001)$	N.S.

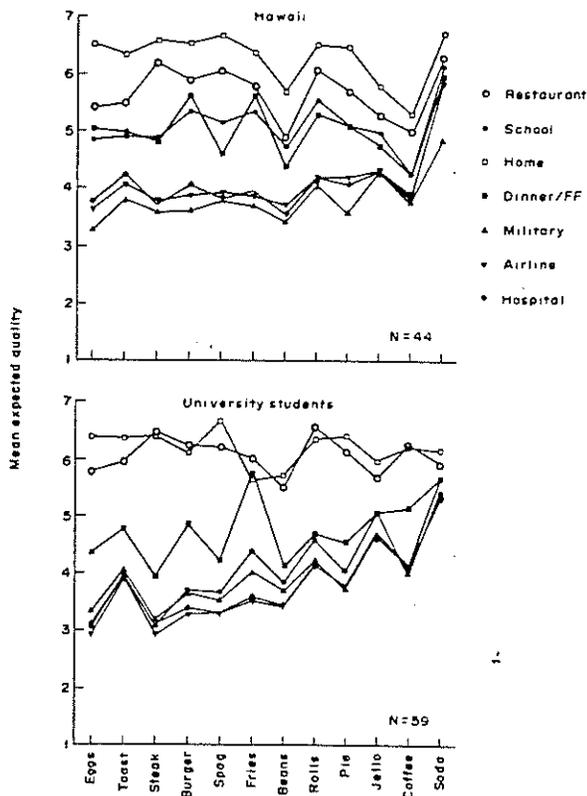


FIG. 2. Mean quality ratings for 12 food items as served in seven different foodservice settings. Data are for military personnel stationed at Scofield Barracks, HA (top) and students enrolled at the University of Massachusetts/Amherst, MA (bottom).

perturbations resulting from differences in the gender composition of the groups, although the gender effects found in the student data were limited to a small number of food/attribute combinations.

Although most of the subjects in the three test groups had been exposed to the various foodservices at some point in their lives, the test groups were

specifically chosen to differ in their familiarity/exposure to military foodservice. Examination of the ratings of military food by university students who had no prior exposure to this form of institutional food shows uniformly low ratings. These ratings may be considered evidence of a stereotypical attitude toward military food, since they reflect the existence of a commonly held belief among people who have no direct knowledge or experience with the object of the attitude.

Interestingly, the ratings of military food by students did not differ significantly from those of military subjects. However, neither did their ratings of expected acceptability and quality differ for other foodservices, with the possible exception of school food, which, as noted, was rated lower in expected quality by university students. This leaves open two possible explanations for the data. The first is that a negative, stereotypical attitude toward military food (and very likely, other institutional foods) is formed by exposure to negative information/communications about the food from media and other sources. This attitude formation may occur prior to any exposure to the food itself (see Study 3). Once established, this negative attitude may color subsequent exposure to that food (e.g. by military enlistees), so that even if the food were quite high in acceptability/quality, the negative attitude could lower the perceived acceptability/quality to make it consistent with the attitude. This 'self-fulfilling prophecy' explanation is consistent with an 'assimilation model' (Hovland *et al.*, 1957; Sherif & Hovland, 1961; Olshavsky & Millers, 1972; Olson & Dover, 1976, 1979) of the effect of expectations on food acceptance and could account for the low expected acceptability and expected quality of military food among both consumers and non-consumers of these foods. An alternative explanation for these data is based on the assumption that military food is, indeed, poor, and that this information is accurately communicated by the media and other informational sources. This information creates negative attitudes

toward the food, even among those who have never eaten it. Upon exposure to the food, consumers perceive its poor quality, which confirms the previously held attitude. This explanation may be referred to as the 'justified true belief' explanation.

Regardless of which of the above explanations is responsible for the present data, it is reasonable to conclude that the expressed attitudes have characteristics similar to those found in other, more familiar forms of stereotyping. These characteristics are (1) that the expressed attitude reflects a commonly held belief about important identifying characteristics of the object(s) (quality/acceptability in this case), (2) that the expressed attitude reflects judgments based on minimal direct knowledge or information about the object(s), and (3) that the expressed attitude has no demonstrated basis in fact. Although the last issue may be disputed, it is certainly not the case that all school food is bad, nor is all hospital, military, or airline food as poor as the present data suggest. Unfortunately, what these data do suggest is that institutional foodservices must contend with the fact that their average consumer expects the acceptability and quality of their food to be poor. This raises several critical questions. First, do these negative expectations affect actual liking for the food? Secondly, if so, what are the critical characteristics of institutional foods/foodservice that underlie these negative expectations? Thirdly, how are these negative expectations and attitudes formed? And lastly, what can be done to improve both the image and acceptance of institutional food?

## STUDY 2

In order to better understand the nature of the institutional food stereotypes observed in the first study, this second study was designed to measure civilian and military consumers' opinions about the causes of poor acceptability/quality in institutional foodservice. This was accomplished by assessing attitudes toward underlying characteristics of the foodservice (e.g. ingredients, food preparation, etc.) and determining how these characteristics contribute to the perceived differences between the foodservices.

### Methods

#### Subjects

Ninety-seven civilian employees and 26 U.S. Army military personnel stationed at the U.S. Army Natick RD&E Center served as subjects. Subjects were recruited from a pool of volunteer employees ranging in age from 18 to 65, 50% male and 50% female. Both civilian and military subjects were chosen to ensure that their job positions did not involve direct knowledge of military food or foodservice.

### Materials and procedure

A questionnaire was developed and administered to subjects. The questionnaire items asked respondents to rate the perceived quality of the 'ingredients', 'food preparation', 'food presentation', 'physical dining setting', 'variety', 'cleanliness', 'service' and 'expertise of cooks' for a variety of foodservices. The rated characteristics were chosen on the basis of past data showing them to be likely factors in the perceived quality of institutional foodservice, e.g. Branch *et al.*, 1973, 1974; Cardello, 1982. These characteristics are not presumed to be orthogonal, but rather, represent the most common reasons cited by consumers for poor institutional food quality. The civilian group rated the same seven foodservice operations examined in Study 1, with the exception that 'school food' was sub-classified into 'public school' foodservice and 'college' foodservice. The military group rated these same foodservice operations, as well as those of the other specialized branches of the military (i.e. Navy, Air Force, Marine and Army). All responses were made on 9-point scales ranging from 1 = 'poor' to 9 = 'excellent.' All surveys were administered in a quiet conference room.

### Results

The mean ratings of perceived quality for the various underlying characteristics of the foodservices common to the two subject groups are shown in Fig. 3. As can be seen, there were few differences between the data for civilian and military subjects. In both cases, 'home' and 'traditional full service restaurant' food rated significantly higher than the other foodservice operations on virtually all characteristics. Moreover, examination of the characteristics rated lowest among the more 'institutional' foodservice operations (school, college, military, airline, and hospital) showed that those scoring lowest were 'manner of food presentation', the 'physical setting' and the 'variety' of food items.

In order to identify those perceived foodservice characteristics that best discriminated among the foodservices, direct discriminant analyses were applied to the data seen in Fig. 3 for each of the two subject groups separately. Tables 2 (civilian group) and 3 (military group) show the pooled, within-groups correlations between predictor variables and discriminant functions (top), and the functions evaluated at the group means (bottom). The tables show only the first four functions, which in both cases accounted for 97% of the variance in the data sets. As can be seen in Table 2 for civilians, with the exception of 'cleanliness', all examined characteristics were significant contributors to the discrimination of 'home' and 'traditional restaurant' food from the other foodservices (ref. Function 1, top and bottom). The first discriminant function accounted for 68% of the variance in scores among the different

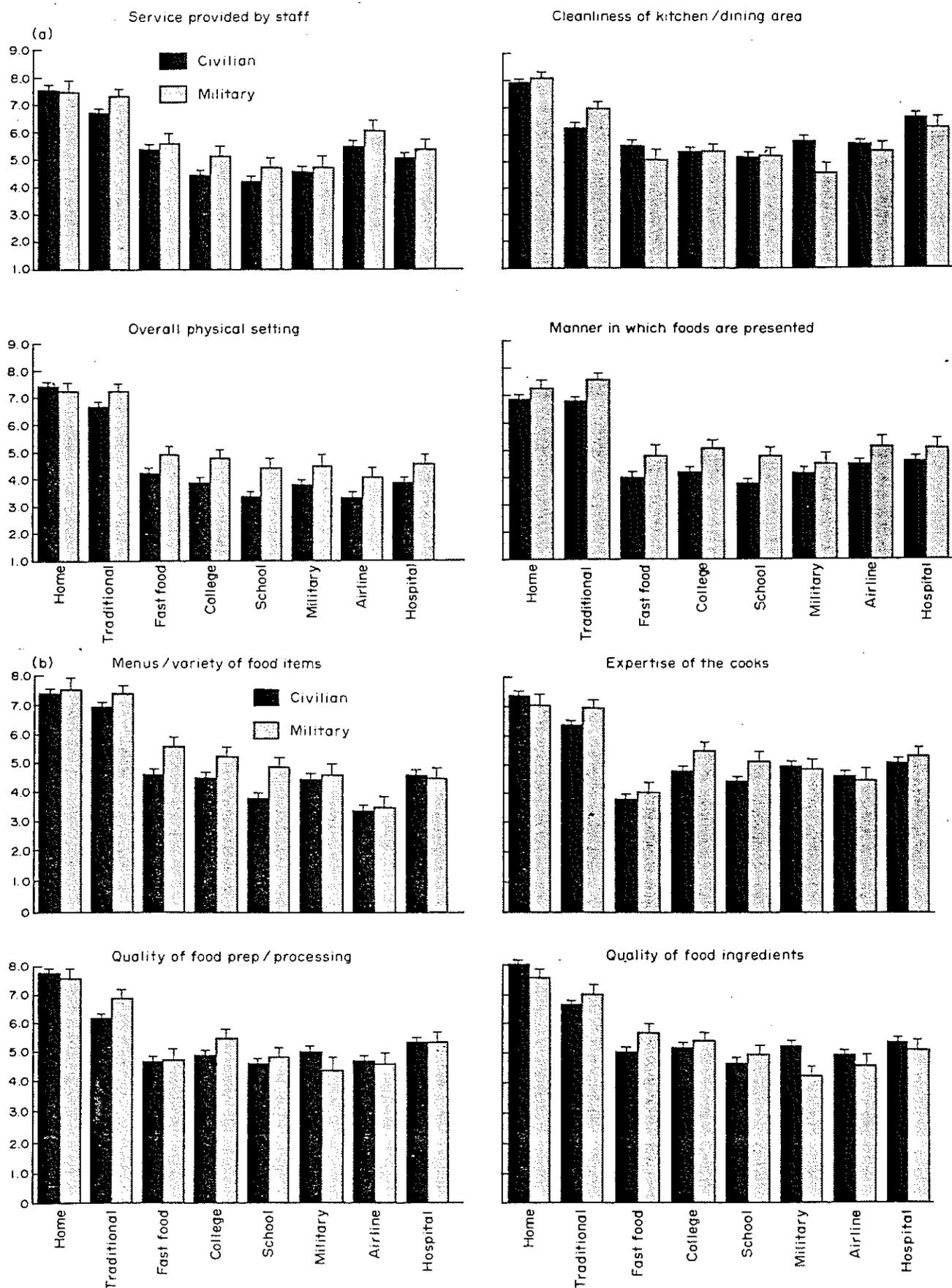


FIG. 3. Bar graphs showing means and standard errors of the mean for both civilian and military subjects' ratings of the quality of seven characteristics of foodservice for eight different foodservice settings.

TABLE 2. Results of Discriminant Analysis for the Civilian Subjects in Study 2

Pooled-within-groups correlations between discriminating variables and canonical discriminant functions				
Discriminating variables	Discriminant Functions			
	FUNC 1	FUNC 2	FUNC 3	FUNC 4
Physical Setting	0.91*	-0.05	-0.14	0.01
Variety of Foods	0.77	-0.12	0.05	-0.17
Food Ingredients	0.70*	0.20	0.24	0.24
Food Presentation	0.66*	0.45*	-0.09	-0.03
Food Preparation	0.66*	0.25	0.39	0.28
Expertise of Cooks	0.65*	0.60*	0.37	-0.11
Service	0.55*	0.25	-0.38	0.52*
Cleanliness	0.41	0.24	0.40	0.55*
Canonical Discriminant Functions evaluated at Groups Mean (Group Centroids)				
Foodservices	Discriminant Functions			
	FUNC 1	FUNC 2	FUNC 3	FUNC 4
Own Home	2.08	0.06	0.35	0.41
Fast Food Restaurant	-0.34	-0.86	-0.42	0.41
Traditional Restaurant	1.42	0.15	-0.57	-0.57
School Cafeteria	-0.86	-0.09	0.13	-0.25
College Dining Hall	-0.42	-0.17	0.17	-0.37
Airline Foodservice	-0.93	0.78	-0.48	0.38
Hospital Foodservice	-0.46	0.25	0.45	0.16
Military Foodservice	-0.45	-0.06	0.35	-0.21

\* $p < 0.05$ .

TABLE 3. Results of Discriminant Analysis for the Military Subjects in Study 2

Pooled-within-groups correlations between discriminating variables and canonical discriminant functions				
Discriminating variables	Discriminant Functions			
	FUNC 1	FUNC 2	FUNC 3	FUNC 4
Physical Setting	0.79*	0.25	0.24	0.32
Variety of Foods	0.86*	0.00	0.14	0.11
Food Ingredients	0.69*	0.33	0.06	-0.06
Food Presentation	0.55*	0.41	0.31	0.41
Food Preparation	0.58*	0.35	0.40	-0.05
Expertise of Cooks	0.49	0.22	0.70*	0.16
Service	0.46	0.57*	0.00	0.36
Cleanliness	0.55*	0.59*	0.43	-0.21
Canonical Discriminant Functions evaluated at Groups Mean (Group Centroids)				
Foodservices	Discriminant Functions			
	FUNC 1	FUNC 2	FUNC 3	FUNC 4
Own Home	1.43	0.66	0.19	-0.36
Fast Food Restaurant	0.36	-0.36	-1.25	-0.18
Traditional Restaurant	1.20	0.12	0.24	0.72
School Cafeteria	-0.38	-0.58	0.31	-0.17
College Dining Hall	-0.19	-0.48	0.25	-0.30
Airline Foodservice	-1.33	1.15	-0.29	0.36
Hospital Foodservice	-0.56	0.43	0.39	-0.46
Military Foodservice	-0.53	-0.90	0.17	0.40

\* $p < 0.05$ .

foodservices. The second discriminant function separates fast food restaurants and airline foodservice from the others, primarily on the basis of 'expertise of cooks' and 'food presentation'. For military subjects (Table 3),

46% of the variability among foodservices was accounted for by the first discriminant function. As with the civilian data, the first discriminant function separated 'home' and 'traditional restaurant' food

from the other foodservices. While there was no obvious breakpoint in the correlations between the discriminating variables and this function, 'expertise of cooks' and 'service' failed to reach significance. However, the second function clearly discriminates airline food from the others on the basis of 'cleanliness' and 'service', while function 3 separates 'fast food' on the basis of 'expertise of cooks'. The overall discriminant analyses correctly classified the type of foodservice on the basis of judged characteristics in 43% of the civilian cases and 47% of the military cases, as compared to an a priori probability of 12.5%. These classification percentages are highly significant ( $p < 0.001$ ).

## Discussion

The data in Fig. 3 show that ratings for a wide variety of foodservice characteristics are significantly more positive for 'home' and 'traditional full-service restaurants' than they are for other types of foodservice operations. In addition, the low quality ratings for 'food presentation', 'food variety' and 'physical setting' for the institutional foodservices suggest that these characteristics are the primary factors contributing to consumers' negative perception and attitudes toward institutional food.

As in Study 1, the overall pattern of expressed attitudes of military and civilian subjects did not differ in any significant way.

The results of the discriminant analysis, identifying specific factors that distinguish individual foodservice systems from others, is visually supported by the mean ratings in Fig. 3. It can be seen in this figure that the ratings of 'home' and 'traditional' restaurant food are consistently higher than all other foodservices on all variables. In addition, other sources of discrimination, e.g. 'expertise of cooks' for fast food restaurants are readily observable in these figures.

Although this study employed a convenience sample of civilian and military subjects from the northeastern U.S., the results of this study provide important information on the likely factors responsible for the negative attitudes and expectations for institutional foods found in Study 1. The civilian data are especially useful for commercial foodservice managers and others interested in addressing the potential causes of negative attitudes toward institutional foods. However, developing effective strategies for overcoming these attitudes requires additional information about the way in which these attitudes affect actual perception of the food and an analysis of the likely sources of origin of these attitudes.

## STUDY 3

In this study, attitudes of users and non-users of a typical institutional foodservice (military feeding) were assessed to determine if differences existed in their

perception of specific sensory or other attributes (nutritive value, etc.) of military and commercial food. In addition, the sources of origin for the development of attitudes toward military food were examined for both user groups.

## Methods

### Subjects

Subjects were 225 military personnel from three U.S. Army posts ranging in age from 19 to 27 and in rank from Private to 1st Lieutenant, and 195 civilian college students enrolled at Northeastern University and Framingham State College in Massachusetts (U.S.A.), ranging in age from 18 to 23; 101 were males and 94 were females.

### Materials and procedure

A questionnaire was designed to examine specific aspects of military food and to compare them to commercially available foods. A 5-point bipolar scale (1 = much less than commercially-available foods, 3 = equal to commercially-available foods, and 5 = much more than commercially-available foods) was used to rate the following five attributes: (1) nutritive content, (2) level of flavor, (3) amount of variety available, (4) how appetizing the foods are, and (5) the degree to which the foods appear to be processed. Subjects completed the questionnaire while seated in lecture halls/amphitheaters.

After completing the first questionnaire, respondents completed a second questionnaire designed to assess the source and place of origin of their current opinion of military foods. Responses to this questionnaire were categorical in nature and reflected options that would be familiar both to civilian and military personnel. Subjects were allowed to indicate more than one source and place of origin when responding to these questions.

## Results

Figure 4 shows mean responses for each of the five attribute comparisons for both civilian and military subjects. As can be seen in Fig. 4, as compared to commercial foods, both subject groups perceived military foods to be lower in flavor (military:  $t = 5.31$ ,  $df = 1,224$ ,  $p < 0.001$ ; civilians:  $t = 7.42$ ,  $df = 1,194$ ,  $p < 0.001$ ), to be less appetizing (military:  $t = 5.85$ ,  $df = 1,224$ ,  $p < 0.001$ ; civilians:  $t = 12.17$ ,  $df = 1,194$ ,  $p < 0.001$ ), and to provide less variety (military:  $t = 6.24$ ,  $df = 1,224$ ,  $p < 0.001$ ; civilians:  $t = 6.19$ ,  $df = 1,194$ ,  $p < 0.001$ ). In addition, differences were found between responses of military and civilian groups. Civilians perceived military food to be significantly less full of flavor ( $t = 4.04$ ,  $df = 1,224$ ,  $p < 0.001$ ) and significantly less appetizing ( $t = 4.78$ ,  $df = 1,194$ ,  $p < 0.001$ ) than did military subjects.

Differences in the self-reported places of origin (Fig. 5) and sources of origin (Fig. 6) of attitudes toward military food were found between the two groups. Civilians more frequently reported that they developed their attitude toward military food from television ( $X^2 = 38.84$ ,  $df = 1$ ,  $417$ ,  $p < 0.0001$ ) and movies ( $X^2 = 101.96$ ,  $df = 1$ ,  $417$ ,  $p < 0.0001$ ), especially those seen during

elementary school ( $X^2 = 87.31$ ,  $df = 1$ ,  $417$ ,  $p < 0.0001$ ) and high school ( $X^2 = 100.06$ ,  $df = 1$ ,  $417$ ,  $p < 0.0001$ ) years. However, a substantial proportion of military personnel reported that they developed their attitude toward rations from direct experience with the foods, either during basic training or while on their first military assignment. No comparative analyses to civilians are made for these two sources of origin, since they are irrelevant sources for civilians.

Discussion

The data from the first part of this study demonstrate that both civilian and military subjects perceive military foods to be much poorer in sensory quality than commercial foods. Military food was perceived to be less appealing, less full of flavor and offering less variety than commercial foods. Interestingly, subjects perceived no difference in non-sensory characteristics of the food, i.e. the degree of processing or the nutrient content of the foods.

The fact that, when compared with military personnel, civilians perceived military foods to be lower in

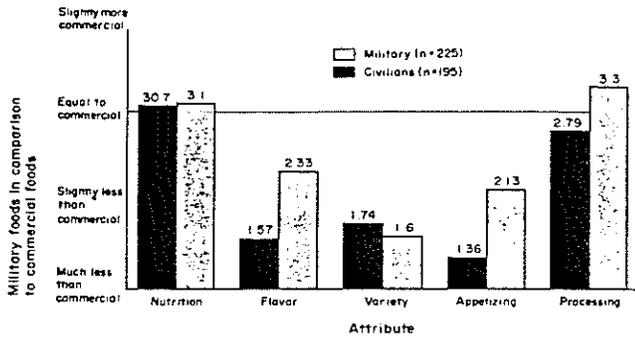


FIG. 4. Mean ratings of the perceived attributes of military foods compared with those of commercial foods. The horizontal line indicates a rating of 'Equal to Commercial'.

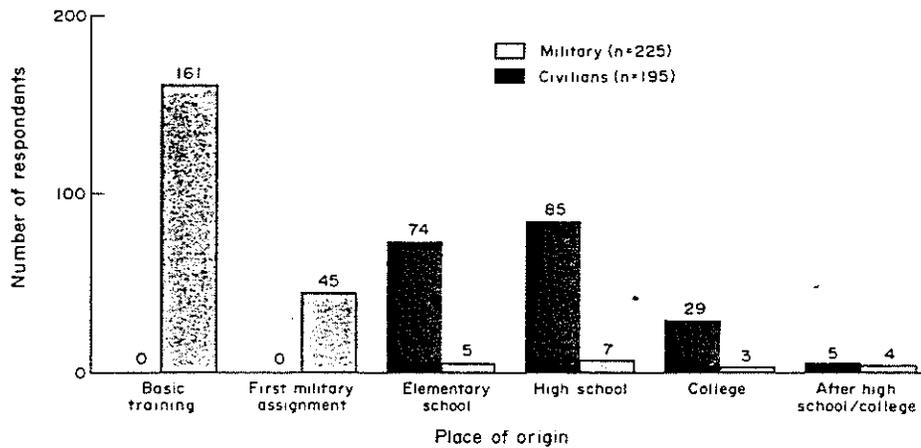


FIG. 5. Frequency of self-reported places of origin for subjects' current attitudes toward military rations.

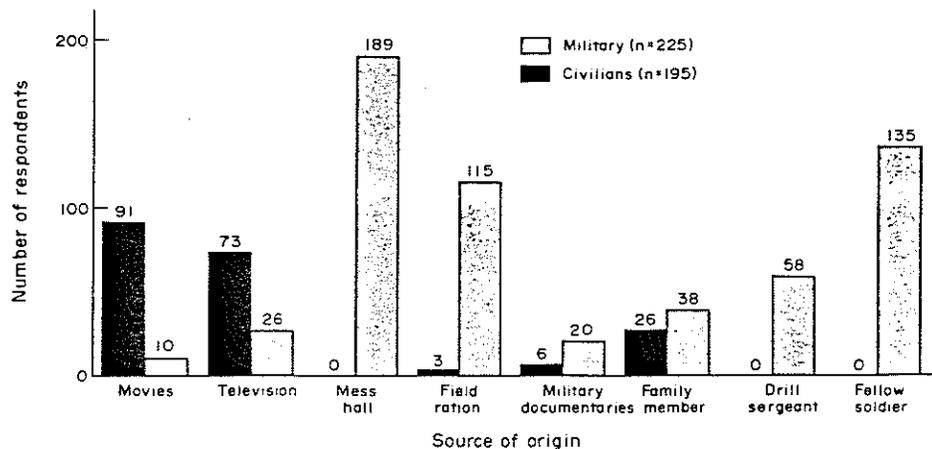


FIG. 6. Frequency of self-reported sources of origin for subjects' current attitudes toward military rations.

flavor and less appetizing than commercial foods is perplexing, at least as it relates to the results of Studies 1 and 2, where few differences in attitudes toward military food were found between military and civilian subjects. However, it should be kept in mind that Studies 1 and 2 involved direct judgments of attitudes toward military and other foods. In this study, judgments were made relative to commercial foods. Thus, the differences found here may pertain more to the attitudes toward commercial foods.

Additional insights may be gained by examining the sources of origin for the military food stereotype. For civilians, their image of military food appears to form early, without benefit of product experience. For military personnel, their experiences and interpersonal communications at the time of their first exposure to military food seem to be critical elements in the formation of their attitudes. Previous studies of the effects of media exposure on attitudes (Mitchell & Olson, 1977; Sawyer, 1981; Fazio *et al.*, 1983) have shown that attitudes developed through media exposure can be similar to those formed on the basis of direct experience with the attitude object. Since military personnel were once civilians, the data suggest that attitudes about rations and their relationship to commercial foods held prior to entering the military may be modified upon initial exposure. As evidenced by the civilians' significantly lower ratings of the 'flavor' of the food and how 'appetizing' it is, initial experience with the product may function to lessen the severity of this negative attitude. However, as found in Study 1, repeated exposure appears to have little further effect. More research is needed to understand the relative effects of direct experience and information/media exposure on attitude formation and attitude change for all forms of institutional foodservice.

In the present study, civilians more frequently reported that their attitudes toward military food were formed between the ages of 6 and 18 (during elementary school and secondary school years). One limitation of this experiment was that these retrospective responses could not be validated, i.e. that the attitudes of 6-18 year-old subjects was not obtained. Although one may challenge the idea that a stereotype for an institutional food could form by the age of 6, the possibility is supported by previous research. Bahn (1986) showed that attitude formation based on attributes is evident in children as early as age 2; and Rozin *et al.* (1986) showed that by the age of 5, children already can conceptualize foods into rejectable and acceptable categories. Since television is a frequent source of information for children, and certain popular shows, e.g. *M\*A\*S\*H*, *Gomer Pyle*, *USMC*, *McHale's Navy*, *Sgt. Bilko*, *Major Dad*, communicate the negative aspects of military and other forms of institutional feeding, it is possible that television contributes profoundly to a young child's image of institutional food.

---

## STUDY 4

---

This study was designed to determine the relationships among (1) stated likes/dislikes for foods, (2) expectations of liking/disliking for these same foods if served as part of an institutional (military) foodservice system, and (3) actual like/dislike (acceptance) of these foods when eaten.

### Methods

#### *Subjects*

One-hundred and sixty-seven infantry soldiers participating in a 7-day ration field test at the Pohakuloa Training Area in Hawaii.

#### *Materials and procedure*

Prior to the start of the test, soldiers were asked to complete a food preference questionnaire in which they indicated their general like/dislike for 30 common foods never previously served as part of their military rations. These items were embedded within a longer list of food items, and subjects were asked to rate them on a standard 9-point hedonic scale for how much they 'normally like/dislike each food when served either at home or in a restaurant, or are bought in a supermarket'. In addition to rating how much they normally liked/disliked these foods, subjects were also asked to rate their like/dislike for each of these foods 'if they were included in your MRE (military ration)'. After completing these initial questionnaires, subjects participated in a field test in which they were issued the new items as part of their regular rations at breakfast, lunch and dinner. At the end of the 7-day field exercise, subjects completed a questionnaire in which they were asked to rate their actual like/dislike of each of the 30 food items, using the same hedonic scale used in pre-testing.

### Results

Figure 7 shows the data for the 30 food items, listed as a function of decreasing mean acceptance (liking/disliking) in the 'unlabeled' condition. As can be seen, for almost every food item, subjects' expected liking of the food items as part of a military ration ('labeled as institutional') were lower than their like/dislike rating of that same food when normally served at home, in a restaurant, etc. ('unlabeled'). Moreover, subjects' post-consumption, like/dislike ratings of the food ('actual taste test ratings') were, in almost all cases, higher than their anticipated like/dislike of the item if incorporated into a military ration, and in the vast majority of cases, were even higher than their general rating of like/dislike for the item as normally served at home, etc.

## Discussion

The data in Fig. 7 confirm the results found in Studies 1-3, showing a more negative attitude and lower expectation for the acceptability of foods served as part of a military foodservice system than foods served at home, in a restaurant, or commercially purchased. The data also suggest that (1) simple association of a food with an institutional foodservice system (in this case, military), lowers the expected liking for the product, and (2) that actual like/dislike for foods when tasted, rarely attains the cognitive extremes reflected in attitude ratings. The latter conclusion is based on the fact that the anticipated liking of the majority of foods when 'labeled as institutional' fell below their level of liking when unlabeled, yet when actually consumed, subjects did not perceive them to be that unacceptable. The latter results confirm earlier findings of Cardello and Maller (1982), in which it was shown that hedonic ratings obtained in response to food items tasted in a laboratory setting showed a regression toward the mean relative to hedonic ratings obtained in response to the food name only.

The fact that the actual taste test ratings for the foods were not only higher than their anticipated liking for the foods as part of a military ration, but even higher than their rating in the unlabeled condition, raises the question of whether these higher ratings upon consumption were due to a 'contrast' effect (Sherif & Hovland, 1961) resulting from a lower expectation than the actual intrinsic quality of the foods presented. Although this is a possibility, an adequate test requires that a 'baseline' liking/ disliking rating be obtained prior to presentation of the food in the condition for which the effect of the expectation is anticipated to occur

(Cardello, 1994). Since this was not done in the present experiment, it is not possible to comment on whether the higher post-consumption ratings were due to the reduced levels of expected liking. However, Study 5 was designed to address this issue directly.

## STUDY 5

The purpose of the last experiment was to directly manipulate expectations for a food item by labeling it as either a commercial or institutional food and to examine the effect of this expectation manipulation on the change in acceptability rating for the food from a baseline.

### Methods

#### Subjects

Subjects were 40 civilian consumers, drawn randomly from the same subject pool used in Study 2. Subjects were between the ages of 18 and 65.

#### Materials and procedure

Test samples consisted of canned, whole kernel corn (Green-Giant niblet corn). In a pre-test conducted approximately 1-month prior to the main part of the experiment, subjects rated the acceptability of the corn without benefit of labeling. Samples of corn (1 oz) were served to subjects on white plastic plates in standard light and sound-controlled sensory testing booths. The corn was rated for acceptability using the same 9-point hedonic scale used in previous testing.

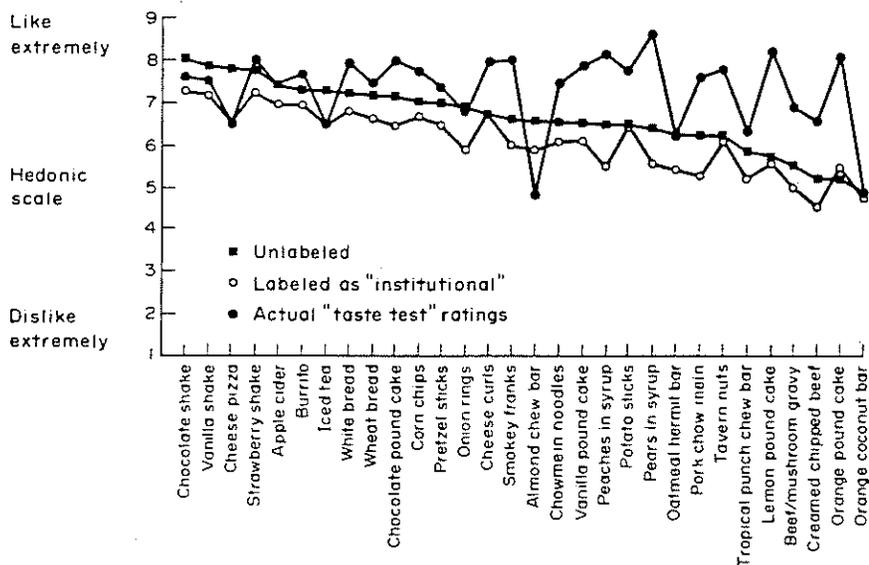


FIG. 7. Mean acceptability (like/dislike) ratings for 30 different food items when rated 'as normally served at home or in a restaurant, or bought in a supermarket' (unlabeled), when rated as part of a military ration system (labeled as institutional), and when rated after actual tasting/consumption of the food (actual taste test ratings).

In the test phase of the study there were two experimental conditions. In one condition, subjects were provided with written information and other visual cues that identified the corn as being produced by a national brand leader (Green Giant). The information consisted of leaving unopened cans of Green Giant brand corn on the counter from which samples were served and wording the hedonic question to read 'how much do you like/dislike this sample of Green Giant corn.' In the second condition, this information was modified to identify the corn as a military ration item (MRE- Meal Ready to Eat). In this case, military ration packages were left in plain view of subjects and the wording of the hedonic question was changed to read 'this sample of MRE corn.' Prior to tasting the corn, subjects rated their expected like/dislike for it, and after tasting the corn, rated how much they actually liked/disliked it. Subjects were exposed to both conditions in counterbalanced fashion, and a 6-week interval was allowed to elapse between conditions.

## Results

ANOVAs applied to the data showed no effect of order of presentation. Figure 8 shows the results. The arrows indicate the level of expected acceptability for the corn when labeled as either institutional (military) or commercial (Green Giant). As can be seen, expected acceptability was significantly higher ( $t = 5.63$ ,  $df = 39$ ,  $p < 0.001$ ) when the corn was labeled as commercial. The solid bars show the actual acceptability ratings of the corn under the two experimental conditions. As can be seen, the corn, when labeled as 'Green Giant,' rated significantly higher ( $t = 1.96$ ,  $df = 39$ ,  $p = 0.058$ ) than when labeled as 'MRE' (military). As importantly, the acceptability ratings changed from the baseline rating in the direction of the expectation, i.e. in the military condition the acceptability rating fell from 6.8 to 6.6, whereas in the Green Giant condition it moved from 6.8 to 7.0.

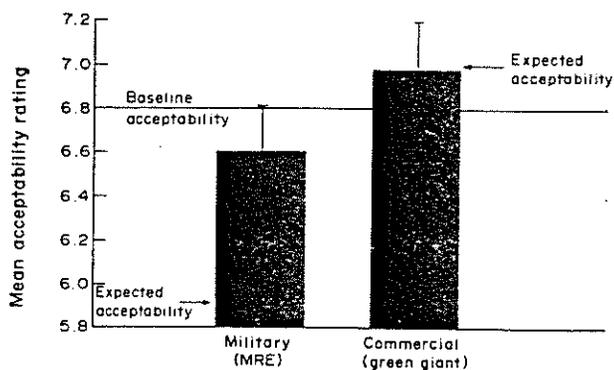


FIG. 8. Mean baseline acceptability ratings (horizontal line), expected acceptability ratings (arrows), and actual acceptability ratings for the same corn product when labeled as either a military (MRE) product or as a commercial brand product.

## Discussion

The direction of movement in the acceptability ratings from their baseline value in Fig. 8 is consistent with an assimilation model of the effect of disconfirmed expectations on food acceptability. In essence, these data show that when consumer expectations for the acceptability of a product are high, actual acceptance of the product 'assimilates' (moves in the direction of) the higher expectation. Similarly, when expectations are low, regardless of how that expectation is created (bad prior experience, negative stereotype, etc.), actual acceptance of the product assimilates toward the lower expectation. Such results are consistent with the vast majority of previous studies that have examined the role of disconfirmed consumer expectations on product acceptance and satisfaction (Olshavsky & Miller, 1972; Anderson, 1973; Olson & Dover, 1976; Oliver, 1977; Bearden & Teel, 1983; Cardello & Sawyer, 1992; Tuorila *et al.*, 1994).

The implications of an assimilation model of the effect of consumer expectations on food acceptance are especially significant for institutional foodservices. As demonstrated in Studies 1-4, consumer attitudes toward and expectations for a broad range of institutional foods are quite poor. The assimilation model predicts that these low expectations will drive the actual acceptance of the food down, regardless of its actual intrinsic quality. In essence, institutional foodservices are working against a tide of negative attitudes and expectations when it comes to trying to improve the perceived quality and acceptability of their food.

What is the solution to this problem? The solution that manifests itself in the predictions of the assimilation model is that institutional foodservices must find ways to improve the image and, in turn, consumers' expectations for the quality and acceptability of institutional food. The latter is not best achieved by additional time and effort being spent on trying to improve the actual quality and acceptability of the food, because in many cases it is already quite high. Rather, time and research effort should be spent on developing better consumer marketing strategies for institutional foods. Such strategies need to be based on a thorough understanding of the nature of the negative consumer attitudes and expectations, and of their source(s) of origin. Using such data, a variety of traditional marketing approaches (information, advertising, brand labeling, etc.) can then be used to dispel misconceptions, modify consumer attitudes and expectations, and, hopefully, end the negative stereotyping of institutional foods and foodservices.

## CONCLUSIONS

The following conclusions are drawn from the studies reported here: (1) consumers hold strong negative

attitudes about both the quality and acceptability of institutional foods; (2) these negative attitudes have characteristics that classify them as 'stereotypes'; (3) the primary causes of poor attitudes toward institutional foods are poor variety, poor food presentation, and poor physical dining setting, (4) when compared to more traditional commercial food, institutional (military) food is perceived by consumers to be much poorer in sensory, as opposed to non-sensory, characteristics; (5) the sources of origin for these negative attitudes are reported by civilian subjects to be due to negative media exposure at an early age, although initial exposure to the food can modify or reinforce these attitudes; (6) simple association of a food with a common institutional foodservice will decrease its expected liking, although actual acceptance ratings of the food rarely match established expectations; and (7) consumer expectations of acceptability can affect actual like/dislike for the food when eaten; lowering its acceptance when expectations are low and raising its acceptance when expectations are high. Institutional foodservices may be better served by addressing the causes and potential solutions to poor consumer attitudes and expectations for institutional food, than by continued efforts to improve the intrinsic quality of foods that may already be quite high.

## REFERENCES

- Anderson, R. F. (1973). Consumer dissatisfaction: The effect of disconfirmed expectancy on perceived product performance. *Journal of Marketing Research*, 10, 38-44.
- Bahn, K. D. (1986). How and when do brand perception and preference first form? A cognitive developmental investigation. *Journal of Consumer Research*, 13, 382-93.
- Beard, J. (1977). Hospital food is chronically sick. *Boston Globe*, Aug. 31.
- Bearden, W. O. & Teel, J. H. (1983). Selected determinants of consumer satisfaction and complaint reports. *Journal of Marketing Research*, 20, 21-8.
- Branch, L. (1974). A consumer evaluation of alternative contractor concepts in government foodservice. Technical Report #75-59-FSL, U. S. Army Natick Laboratories: Natick, MA.
- Branch, L. & Meiselman, H. (1973). The consumer's opinions of the foodservice system, Travis Air Force Base. Technical Report #73-52-PR, U. S. Army Natick Laboratories: Natick, MA.
- Branch, L. G., Symington, L. E. & Meiselman, H. L. (1973). The consumer's opinions of the food service system: The 1973 Minot Air Force Base survey. Technical Report #74-7-PR, U. S. Army Natick Laboratories, Natick, MA.
- Branch, L. G., Waterman, D., Symington, L. E. & Meiselman, H. L. (1974). The consumer's opinions of the food service system: The 1973 Fort Lee survey. Technical Report #74-49-PR, U. S. Army Natick Laboratories, Natick, MA.
- Cardello, A. V. (1982). Patients' perceptions of meal acceptability. In *Hospital Patient Feeding Systems*. National Academy Press, Washington, D.C.
- Cardello, A. V. (1993). The role of ration image, stereotypes, and expectations on acceptance and consumption. Paper presented at the National Academy of Sciences/National Research Council Workshop on Strategies to Overcome Underconsumption of field Rations. Natick, MA, November, 1993.
- Cardello, A. V. (1994). Consumer expectations and their role in food acceptance. In *Measurement of Food Preferences*, eds D. Thomson and H. Macfie. Blackie Academic, London, pp. 253-97.
- Cardello, A. V. (1995). Food quality: Relativity, context and consumer expectations. *Food Quality and Preference*, 6, 163-70.
- Cardello, A. V. & Maller, O. (1982). Relationships between food preferences and food acceptance ratings. *Journal of Food Science*, 47, 1553-61.
- Cardello, A. V., Maller, O., Bloom-Masor, H., Dubose, C. & Edelman, B. (1985). Role of consumer expectancies in the acceptance of novel foods. *Journal of Food Science*, 50, 1707-14, 1718.
- Cardello, A. V. & Sawyer, F. M. (1992) Effects of disconfirmed consumer expectations on food acceptability. *Journal of Sensory Studies*, 7(4), 253-78.
- Deliza, R., Macfie, H. & Hedderley, D. (1993). The effects of expectation on ability to rate sweet and bitter solutions. Paper presented at Food Preservation 2000 Conference. Natick, MA, October, 1993.
- Dube, L., Trudeau, E. & Belanger, M. (1994). Determining the complexity of patient satisfaction with foodservices. *Journal of the American Dietetic Association*, 94(4), 394-401.
- Eisele, J. (1983). College students' perceptions of their meal attendance. *NACUFS J.*, 9(1), 5-8.
- Escamilla-Santana, C. & Macfie, H. (1993). Effect of sensory quality information on the acceptance of fresh oranges. Paper presented at Food Preservation 2000 Conference. Natick, MA, October, 1993.
- Fazio, R. H., Powell, M. C. & Herr, P. M. (1983). Toward a process model of the attitude-behavior relation: Accessing one's attitude upon mere observation of the attitude object. *Journal of Personality and Social Psychology*, 44(4), 723-35.
- Feldman, J. J. (1962). Patients' opinions of hospital food. *Journal of the American Dietetic Association*, 40, 325.
- Fox, R. (1992). Prejudice and the unfinished mind: a new look at an old failing. *Psychological Inquiry*, 2(3), 137-52.
- Glew, G. (1970). Food preferences of hospital patients. *Proceedings of the Nutrition Society*, 29, 339-43.
- Glew, G. (1982). Overview of issues in the catering and foodservice industries. In *The Role and Application of Food Science and Technology in Industrialized Countries. Proceedings of an IVF/ST/OECD Symposium*. Valtion teknillinen tutkimuskeskus: Helsinki, 189-93.
- Goldenson, R. M. (1970). *The Encyclopedia of Human Behavior: Psychology, Psychiatry and Mental Health*, Vol. 2. Doubleday, New York.
- Gormley, T. R. & Walshe, T. (1991). Assessment of school meals and of weights/heights of primary school children in inner city Dublin schools. *Irish Journal of Food Science and Technology*, 15, 1-15.
- Helleman, U., Aaron, J. I., Evans, R. E. & Mela, D. J. (1993). Effect of expectations on the acceptance of a low-fat meal. Paper presented at Food Preservation 2000 Conference. Natick, MA, October, 1993.

- Hovland, C. I., Harvey, O. J. & Sherif, M. (1957). Assimilation and contrast effects in reactions to communication and attitude change. *Journal of Abnormal and Social Psychology*, 55, 244-52.
- Meiselman, H. L. (1973). Regional differences and consumers, in Proceedings of the 28th Conference of the Society for the Advancement of Food Service Research, Society for the Advancement of Food Service Research, West Lafayette, Indiana.
- Mitchell, A. A. & Olson, J. C. Cognitive effects of advertising repetition. In *Advances in Consumer Research*, Vol. 4, ed. W. D. Pereault, Jr. Association for Consumer Research, Atlanta, pp. 213-20.
- Moyer, A. (1977). *Better Food for Public Places: A Guide for Improving Institutional Food*. Emmaus, Rodale Press.
- National Restaurant Association. (1983a). *Consumer Expectations with Regard to Dining at Family Restaurants*. National Restaurant Association: Chicago.
- National Restaurant Association (1983b). *Consumer Expectations with Regard to Dining Fastfood Restaurants*. National Restaurant Association, Chicago.
- National Restaurant Association (1983c). *Consumer Expectations with Regard to Dining at Atmosphere Restaurants*. National Restaurant Association, Chicago.
- Oliver, R. L. (1977). Effect of expectation and disconfirmation on postexposure product evaluations: an alternative interpretation. *Journal of Applied Psychology*, 62(4), 480-6.
- Olshavsky, R. W. & Miller, J. A. (1972). Consumer expectation, product performance, and perceived product quality. *Journal of Marketing Research*, 9, 19-21.
- Olson, J. C. & Dover, P. (1976). Effects of expectation creation and disconfirmation on belief elements of cognitive structure. In *Advances in Consumer Research*, Vol. 3, ed. B. B. Anderson. Association for Consumer Research, Atlanta, pp. 168-75.
- Olson, J. C. & Dover, P. (1979). Disconfirmation of consumer expectations through product trial. *Journal Applied Psychology*, 64, 179-89.
- Platt, B. S., Eddy, T. P. & Pellet, P. L. (1963). *Food in Hospitals*. Oxford University Press, London.
- Rozin, P., Hamner, L. Oster, H., Horowitz, T. & Marmora, V. (1986). The child's concept of food: Differentiation of categories of rejected substances in the 16 months to 5 year age range. *Appetite*, 7, 141-51.
- Sawyer, A. G. (1981). Repetition, cognitive responses, and persuasion. In *Cognitive Responses and Persuasion*, eds R. E. Petty et al. Lawrence Erlbaum Associates, Hillsdale, pp. 237-61.
- Sherif, M. & Hovland, C. I. (1961). *Social Judgement: Assimilation and Contrast Effects in Communication and Attitude Change*. Yale University Press, New Haven.
- Tuorila, H., Cardello, A. V. & Leshner, L. (1994). Antecedents and consequences of expectations related to fat-free and regular-fat foods. *Appetite*, 23, 247-63.
- Werner, R. (1977). *Schulverpflegung aus der Sicht von Schülern und Eltern*. Bundesministerium für Ernährung, Landwirtschaft und Forsten, Bonn.
- Whitehall, B. (1985). New techniques in mass catering. *Caterer and Hotelkeeper*, 176, 77-86.