

AD A082 226

TECHNICAL REPORT
NATICK/TR-80/009

CONSUMER OPINION OF EMERGENCY/ASSAULT
FOOD PACKET UNDER RIGOROUS FIELD
CONDITIONS IN A COLD WEATHER ENVIRONMENT

BY

WILLIAM C. WILKINSON
EUGENE T. CHAO
HERBERT L. MEISELMAN
AND
LAWRENCE E. SYMINGTON

DRDNA - YBH

JANUARY 1980

Approved for public release;
distribution unlimited.

UNITED STATES ARMY
NATICK RESEARCH and DEVELOPMENT COMMAND
NATICK, MASSACHUSETTS 01760



FOOD SCIENCES LABORATORY

Approved for public release; distribution unlimited.

Citation of trade names in this report does not constitute an official indorsement or approval of the use of such items.

Destroy this report when no longer needed. Do not return it to the originator.

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER NATICK/TR-86/009/1	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER (9)
4. TITLE (and Subtitle) CONSUMER OPINION OF EMERGENCY/ASSAULT FOOD PACKET UNDER RIGOROUS FIELD CONDITIONS IN A COLD WEATHER ENVIRONMENT	5. TYPE OF REPORT & PERIOD COVERED 17/1/1980	
7. AUTHOR(s) William C. Wilkinson, Eugene T. Chao, Herbert L. Meiselman, and Lawrence E. Symington	6. PERFORMING ORG. REPORT NUMBER	
9. PERFORMING ORGANIZATION NAME AND ADDRESS Food Sciences Laboratory US Army Natick Research & Development Command Natick, Massachusetts 01760	8. CONTRACT OR GRANT NUMBER(s) (2) EC 1	
11. CONTROLLING OFFICE NAME AND ADDRESS US Army Natick Research & Development Command ATTN: DRDNA-YBH Natick, Massachusetts 01760	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS 6.2 11L162724AH99/BEO36	
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)	12. REPORT DATE January 1980 10 14	
	13. NUMBER OF PAGES 39	
	15. SECURITY CLASS. (of this report) UNCLASSIFIED	
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE	
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES Service Requirement Identification: USMC 2-5, Emergency/Assault Packet		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number)		
ACCEPTABILITY	CONSUMER ATTITUDE SURVEY	FOOD PACKET
ASSAULT RATIONS	EMERGENCY RATIONS	FREEZE DEHYDRATED FOOD
COLD WEATHER FEEDING	FEEDING	MILITARY APPLICATIONS
CONSUMERS	FEEDING SYSTEMS	RATINGS
CONSUMER ACCEPTANCE	FIELD FEEDING	REVERSIBLY COMPRESSED FOOD
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)		
<p>In an effort to study the consumer acceptability of a field ration packet containing freeze-dehydrated, reversibly compressed food bars under relatively adverse field conditions, two groups of Marines undergoing routine mountain warfare training in an arctic environment were fed freeze-dehydrated field rations of two types respectively---one group received the Emergency/Assault (E/A) Food Packet, a reversibly compressed field ration, and the other group received the Long Range Patrol (LRP) Food Packet, a noncompressed control ration.</p>		

DD FORM 1473 EDITION OF 1 NOV 65 IS OBSOLETE

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

E 16 674

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)

cont.
An investigator assigned to each group recorded acceptance ratings for each item on a nine-point hedonic scale. Because some items of both ration packets were designed to be consumed either dehydrated, as packaged, or rehydrated with water, ratings were collected for both modes of consumption when appropriate. Following completion of the training exercise, both groups were administered a written survey to assess their overall reaction to each of the two field ration types.

In general, the responses of the two groups to the survey questions seemed to indicate a consistent preference for the Emergency/Assault (E/A) Food Packet over the Long Range Patrol (LRP) Food Packet, both in terms of convenience and overall quality of the product. The group issued the E/A Food Packet showed a significantly greater preference for that ration over the traditional MCI (Meal, Combat Individual) than did the control group for the LRP Food Packet over the MCI. Among the E/A items, the Date/Cherry bar suffered from unacceptable hardness under the severely cold conditions of the study and emerged clearly as the least preferred of the cereal/dessert bars. Of the entree bars in the E/A Packet, Chicken Stew and Chicken A-la-King emerged as highly preferred favorites. Although mean hedonic ratings for entree items in the LRP Packet nominally similar to those in the E/A Packet were significantly higher than the E/A ratings, this specific preference for the LRP entrees was apparently overshadowed by the greater convenience of the E/A Packet as a whole.

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)

ACKNOWLEDGEMENTS

The conduct of this study was a closely coordinated joint effort involving elements of both the Food Engineering Laboratory and the Food Sciences Laboratory at the US Army Natick Research and Development Command. Although the authors of this report are associated with the Behavioral Sciences Division of the Food Sciences Laboratory, they received a great deal of assistance from members of the Food Engineering Laboratory, including Mr. Justin M. Tuomy, Mr. Gary W. Shults, and most particularly from MAJ Paul L. Caron, Staff Veterinarian. MAJ Caron made most of the logistical preparations for the data collection phase of the study and acted as the third investigator in the field, helping the Behavioral Sciences personnel to collect the food acceptance data.

We would also like to express our deep appreciation to LTC John Guy, Base Commander, and to MAJ Nicholas Allen, Officer in Charge of the Instructor Branch, US Marine Corps Mountain Warfare Training Center, Bridgeport, CA, for their cooperation and assistance in solving the many practical problems associated with conducting the study. Most of all, however, we would like to thank the individual Marines who so graciously endured the many inconveniences imposed upon them by the data collection effort.

Table of Contents

	<u>Page</u>
List of Tables.	4
Introduction.	5
Method.	5
Results and Discussion.	6
<u>Demographic Characteristics.</u>	6
<u>Relative Preference Between the Emergency/Assault and Long</u>	
<u>Range Patrol Food Packets</u>	7
<u>Relative Preferences Among the Emergency/Assault Items</u>	11
<u>Cereal/Dessert Bars.</u>	11
<u>Beverage and Pudding Bars.</u>	11
<u>Entree Bars.</u>	14
<u>Problems of Rehydration.</u>	18
Appendix A.	21
Appendix B.	23
Appendix C.	25
Appendix D.	33

List of Tables

<u>Table No.</u>		<u>Page</u>
1	Demographic Characteristics of the Two Survey Samples.	6
2	Proportion of Respective Survey Samples Rating Convenience of Each Ration Overall and in Comparison to MCI.	8
3	Proportion of Respective Survey Samples Rating Quality of Each Ration Overall and in Comparison to MCI	9
4	Proportion of Respective Survey Samples Rating Adequacy of Quantity for Each Ration	10
5	Rank-Ordered Preference for Cereal/Dessert Bars in the Emergency/Assault Food Packet as Determined by Mean Ratings on the Nine-Point Hedonic Scale.	12
6	Rank-Order Preference for Beverage and Pudding Bars in the Emergency/Assault Food Packet as Determined by Mean Ratings on the Nine-Point Hedonics Scale	13
7	Preference for Entree Bars Eaten <u>DRY</u> in the Emergency/Assault Food Packet as Rank-Ordered by Survey Sample	15
8	Rank-Order Preferences for Entries Bars Eaten <u>DRY</u> in the Emergency/Assault Food Packet as Determined by Mean Ratings on the Nine-Point Hedonic Scale.	16
9	Rank-Order Preferences for Entree Bars Eaten <u>REHYDRATED</u> with <u>HOT</u> Water in the Emergency/Assault Food Packet as Determined by Mean Rating on the Nine-Point Hedonic Scale. . .	17

CONSUMER OPINION OF EMERGENCY/ASSAULT FOOD PACKET UNDER RIGOROUS FIELD
CONDITIONS IN A COLD WEATHER ENVIRONMENT

The Emergency/Assault Food Packet was designed and developed for the Marine Corps by the Food Engineering Laboratory (FEL) of USANARADCOM to fill the need for a lightweight, highly compact field ration that would provide sufficient calories and nutrients to sustain the serviceman consumer for a period of 3 to 5 days with little or no loss of physical or mental efficiency due to malnutrition. The resulting food packets utilize freeze-dehydrated, reversibly compressed food bars to reduce weight and volume with minimal loss of nutrient potential. Some of these bars are intended to be eaten either dry, with drinking water on the side, or after rehydration with hot water. Other bars are intended to be eaten only as is--dry.

The reaction of the serviceman consumer to the new emergency field ration is important for at least two reasons: (a) Any field ration will provide adequate nutrition only if it is eaten; therefore any ration that is not accepted by the troop consumer is not going to provide adequate nutrition. (b) Acceptable, palatable food is an important factor in sustaining troop morale in the field under even the best of conditions; and all the more so as conditions become more adverse. The purpose of the current study, then, was to collect interview and survey data that would index the reaction of the serviceman consumer to the experimental Emergency/Assault Food Packet and provide some evidence of its acceptability under relatively adverse field conditions.

METHOD

For the purposes of the study one company was selected of a battalion of Marines from Camp Pendelton, CA, undergoing routinely programmed training at the USMC Mountain Warfare Training Center, Bridgeport, CA, during March 1979. The three-week training cycle was culminated by a 5-day, 4-night field maneuver exercise that would require the participants to backpack heavy loads over rugged mountain terrain on snowshoes by day and to bivouac in deep snow at subzero temperatures by night. The Weapons Platoon of Foxtrot Company served as the experimental group of 32, eating nothing but the Emergency/Assault Food Packet for the entire exercise. The First and Second Platoons of Foxtrot Company, together consisting of some 27 individuals, were issued only the Long Range Patrol Food Packet (LRP), a freeze-dehydrated but noncompressed ration believed to be highly acceptable to troops under field conditions, which would serve as a baseline control for the reversibly compressed Emergency/Assault bars.

At each scheduled meal break or whenever time permitted, an investigator assigned to each group interviewed as many individuals from his group as possible. The interview format asked each individual what food items he had tried since last interviewed, in what mode he had eaten each--dry, rehydrated cold, or rehydrated hot--and how much he had liked or disliked each item on the nine-point hedonic scale. A copy of the interview format for both experimental and control groups is attached as Appendices A and B, respectively.

Immediately following completion of the exercise and the return to base camp, both experimental and control groups were administered surveys designed to examine the relative preferences of each respondent for the items that he had eaten during

the exercise to surface any criticisms of the food packets and to elicit a comparison of the respective food packets to the more traditional MCI (Meal, Combat Individual) ration. Copies of the survey instruments for both experimental and control groups are attached as Appendices C and D, respectively.

RESULTS AND DISCUSSION

Demographic Characteristics

Perhaps because the experimental group receiving the Emergency/Assault Food Packet (E/As) consisted of the company weapons platoon, whereas the control group receiving the Long Range Patrol Food Packets (LRPs) consisted of two rifle platoons, there were some minor and statistically nonsignificant differences between the two groups on demographic variables of interest (See Table 1).

TABLE 1

Demographic Characteristics of the Two Survey Samples

	<u>E/A GROUP</u> (N = 32)	<u>LRP GROUP</u> (N = 27)	<u>TEST</u>
Mean Time in Marines (years)	3.04	1.96	$t(56)=1.13, p > .10$
Median Grade	E-4	E-3	
Percent Eaten MCIs	90.6	81.5	$\chi^2(1)=1.04, p > .10$
Percent Eaten LRPs (prior to this study)	15.6	14.8	$\chi^2(1)=0.01, p > .10$
Percent Moderate Eaters	59.4	59.3	
Percent Light Eaters	9.4	14.8	
Percent Heavy Eaters	31.3	22.2	$\chi^2(2)=0.79, p > .10$

In comparison to the LRP group, the Emergency/Assault group consisted of somewhat more senior enlisted personnel, who tended to have been in the Marine Corps slightly but not significantly longer and to have had experience with a wider variety of military rations. Of most potential importance for comparison purposes, 90.6% of the E/A group claimed to have had experience with MCI (Meal, Combat Individual) rations, whereas only 81.5% of the LRP group claimed such experience, but the difference was not statistically significant. About 15% of both groups claimed to have tried the Long Range Patrol Packet prior to the study. Presumably, the slightly greater rank and experience level of the weapons platoon is due to the need for more specialized skill levels required to properly deploy the crew-served weapons. Another interesting and potentially puzzling apparent difference between the two groups was the relative predominance of self-reported heavy over light eaters in the E/A group as compared to the LRP group. Perhaps the physical strain of having to carry heavy crew-served weapons during training exercises could account for slightly heftier appetites in the weapons platoon. The apparent difference in appetites between the two groups was, however, not statistically significant.

Relative Preference Between the Emergency/Assault and Long Range
Patrol Food Packets

In general, the responses of the two groups to the survey questions seem to indicate a consistent preference for the Emergency/Assault Food Packet over the Long Range Patrol Food Packet, both in terms of convenience and overall quality of the product. Table 2 shows the proportion of the respective survey samples rating the convenience of each ration overall and in comparison to the MCI (See next page). Nearly 63% of the experimental group gave the E/A Food Packet the maximum positive rating for convenience, in comparison to only 37% of the LRP controls. The overall mean convenience ratings for both rations was in the "moderately convenient" range, however, although the E/A scored significantly better. In comparison to the MCI, the E/A ration was scored as either "somewhat" or "much" more convenient than the MCI by 65% of the experimental group, whereas the LRP was similarly rated by only 41% of the control group. Again, the mean rating of the E/A ration in comparison to the MCI was somewhat better than that of the LRP, though the advantage for the E/A ration was not statistically significant.

Sheer convenience may not have been the only attribute contributing to the general preference for the E/A over the LRP. Table 3 shows the proportion of the respective survey samples rating the quality of each ration both overall and in comparison to the MCI. Due in part to some exceptionally poor ratings of the LRP by the control group, the mean rating for the E/A ration is more favorable than that of the LRP by over a full scale point, placing the E/A squarely in the "slightly good" category, vis a vis the merely "neutral" rating of the LRP. Because of the wide variance in LRP ratings, this apparently dramatic difference in perceived quality is only marginally significant at the .10 level (two-tailed), somewhat below the traditional criteria of significance. When both rations are compared to the MCI, the E/A is still perceived as the better ration relative to the LRP, but the difference is decidedly smaller and nonsignificant, causing both dehydrated rations to fall into the same "neutral" category.

Another major issue on which the E/A does not emerge as favorably as the LRP is that of food quantity, or portion size. As shown in Table 4, the quantity of food provided by the E/A Food Packet is perceived by the consumers as slightly less adequate than that provided by the LRP, although the mean rating for both falls into the "neutral" category, and the difference between the two is nonsignificant.

The final question in the survey for both groups, representing the "bottom line" of the issue, asked the respondents to rank-order their preferences for carrying a ration into the field under conditions similar to those encountered in the study. There was, unfortunately, some asymmetry in possible responses for the two groups, since some of the more senior people in the experimental (E/A) group had prior experience with LRPs and considered them an option, whereas no one in the control (LRP) group had any corresponding experience with the E/As. The results, however, are still compelling, if somewhat surprising. Of the control group on LRPs, fully 69.2% would actually prefer to carry the heavier MCI rations in preference to the LRPs, and only 30.8% would voluntarily choose the LRP again under similar conditions. Of the experimental group on E/As, 44.8% would choose the Emergency/Assault Packet again, 27.6% would prefer the MCI, and 24.1% would like to carry the LRP. If the preference for either the same dehydrated ration as issued for the exercise or the MCI is crossed with the two groups

TABLE 2

Proportion of Respective Survey Samples Rating Convenience of Each
Ration Overall and in Comparison to MCI

OVERALL, ration is:	PROPORTION	
	<u>Emergency/Assault</u>	<u>Long Range Patrol</u>
1. Extremely CONVENIENT	.625	.370
2. Moderately CONVENIENT	.250	.333
3. Slightly CONVENIENT	.063	.074
4. Neutral	.063	.148
5. Slightly INCONVENIENT	0	.074
6. Moderately INCONVENIENT	0	0
7. Extremely INCONVENIENT	0	0
MEAN RATING:	1.56 (Moderately Convenient)	2.22 (Moderately Convenient)

$t(57)=2.30, p < .05$ (2-tailed)

RELATIVE TO MCI, ration is:

1. Much MORE Convenient	.452	.370
2. Somewhat MORE Convenient	.194	.037
3. Slightly MORE Convenient	.161	.111
4. Neutral	0	.222
5. Slightly LESS Convenient	0	.037
6. Somewhat LESS Convenient	.129	.074
7. Much LESS Convenient	.065	.148
MEAN RATING:	2.55 (Slightly MORE Convenient)	3.33 (Slightly MORE Convenient)

$t(56)=1.40, p > .10$

TABLE 3

Proportion of Respective Survey Samples Rating Quality of Each
Ration Overall and in Comparison to MCI

OVERALL, ration is:	PROPORTION	
	<u>Emergency/Assault</u>	<u>Long Range Patrol</u>
1. Extremely GOOD	.129	.037
2. Moderately GOOD	.258	.148
3. Slightly GOOD	.129	.296
4. Neutral	.290	.111
5. Slightly BAD	.065	.111
6. Moderately BAD	.097	.148
7. Extremely BAD	.032	.148
MEAN RATING:	3.03 (Slightly GOOD)	4.15 (Neutral)

$t(56)=1.81, p < .10$ (2-tailed)

RELATIVE TO MCI, ration is:

1. Much BETTER	.129	.074
2. Somewhat BETTER	.161	.222
3. Slightly BETTER	.129	.074
4. Neutral	.194	.185
5. Slightly WORSE	.226	.185
6. Somewhat WORSE	.065	.148
7. Much WORSE	.097	.111
MEAN RATING:	3.81 (Neutral)	4.07 (Neutral)

$t(56)=0.55, p > .10$

in a 2 x 2 Chi Square table, the experimental group shows a significantly greater preference for the E/A ration than does the control group for the LRP ration, both in comparison to the MCI ($\chi^2(1) = 4.56, p < .05$).

TABLE 4

Proportion of Respective Survey Samples Rating Adequacy of
Quantity for Each Ration

Ration is:	PROPORTION	
	<u>Emergency/Assault</u>	<u>Long Range Patrol</u>
1. Extremely ADEQUATE	.065	.148
2. Moderately ADEQUATE	.226	.185
3. Slightly ADEQUATE	.129	.111
4. Neutral	.161	.259
5. Slightly INADEQUATE	.226	.185
6. Moderately INADEQUATE	.129	.074
7. Extremely INADEQUATE	.065	.037
MEAN RATING:	3.90 (Neutral)	3.52 (Neutral)

$t(56) = 0.85, p > .10$

Relative Preferences Among the Emergency/Assault Items

Cereal/Dessert Bars

Within the E/A Packet, preferences are clearest among the cereal/dessert bars, since these items are designed to be eaten in only one way--dry, as packaged. The mean ratings on a nine-point hedonic scale are shown in Table 5, with the items rank-ordered by mean rating. Also shown in Table 5 is the actual order of preference in which the cereal/dessert bars were ranked by the post-exercise survey respondents. Although there is considerable divergence in the exact rank-orderings predicted by the two measures, both sets of judgments agree on the three least preferred items, with the Date/Cherry bar emerging in common as the least preferred cereal/dessert bar of all. The other two--the Date/Almond/Coconut and Raisin/Almond bars--trade off the second and third to last positions from measure to measure. The bottom ranked three items--Date/Cherry, Date/Almond/Coconut, and Raisin/Almond bars--all suffered to some degree from a texture problem that is probably specific to the cold weather environment in which this study was conducted: unacceptable density and hardness due to freezing of the moisture content in the bars. The Date/Cherry bar was apparently affected the most by this freezing, and its low rating at the bottom of the rank-order by both measures reflects the relative unacceptability of its hardness under these severely cold conditions.

Also shown in the upper panel of Table 5 are the statistical differences among the mean hedonic ratings given the various cereal/dessert bars. Those bars in the rank ordering connected by any single vertical line are not statistically different from one another in terms of mean hedonic rating at the .05 confidence level, whereas those bars not connected by the same line are statistically separable at that confidence level.

Beverage and Pudding Bars

Although the beverage and pudding bars were designed to be eaten either dry, as packaged, or rehydrated, theoretically with hot water, in actual practice most consumers actually used cold water to rehydrate both categories of bar. Inasmuch as there were only three recorded cases of pudding bars being rehydrated with hot water and no cases at all of beverage bars being so rehydrated, data will be presented only for the dry and rehydrated cold modes of consumption.

The relative preference based on mean hedonic ratings for both the beverage and pudding bars, either dry or rehydrated with cold water, is shown in Table 6, which also shows the order in which the beverage and pudding bars were ranked by the survey respondents, both dry and rehydrated. In the case of the beverage bars, the relative rank order remains the same whether consumed dry or rehydrated cold for either the field acceptance measure or the post-exercise survey measure--Orange is clearly preferred to Grapefruit. The difference in mean hedonic ratings between the two beverages is somewhat amplified by rehydration, reaching statistical significance only in the rehydrated mode ($t(53) = 2.01, p < .05$). In the case of the pudding bars, however, there is a rank-order reversal as a function of consumption mode for both the field acceptance measure and the post-exercise survey measure. Unfortunately the rank-orders also differ between the two measures. When eaten dry, Vanilla pudding is the favorite by the field acceptance measure, followed respectively by Chocolate and Banana; but when eaten rehydrated with cold water, Banana pudding becomes the first choice by the acceptance measure, Chocolate

TABLE 5

Rank-Ordered Preference for Cereal/Dessert Bars in the Emergency/Assault Food Packet as Determined by Mean Ratings on the Nine-Point Hedonic Scale*

RELATIVE ORDINAL RANK	CEREAL/DESSERT BAR	MEAN HEDONIC RATING	N
(Most Preferred) 1.0	Fudge Bar	8.53	19
2.0	Caramels	8.13	30
3.0	Oatmeal Cookie Bar	7.91	34
4.0	Granola Bar	7.60	70
5.0	Chocolate Bar	7.59	22
6.0	Starch Jellies	7.54	35
7.0	Raisin/Almond Bar	6.79	34
8.0	Date/Almond/Coconut Bar	6.12	34
(Least Preferred) 9.0	Date/Cherry Bar	5.40	35

*Items connected by any single vertical line next to the rank order column are not significantly different at the .05 confidence level. Items not so connected by a single line are statistically different at the .05 level.

Preference for Cereal/Dessert Bars in the Emergency/Assault Food Packet as Rank-Ordered by Survey Sample

RELATIVE ORDINAL RANK	CEREAL/DESSERT BAR	MEAN SCORED RANK	N
(Most Preferred) 1.0	Caramels	1.87	31
2.0	Chocolate Bar	3.19	31
3.0	Granola Bar	3.72	29
4.0	Starch Jellies	3.90	30
5.0	Fudge Bar	4.04	27
6.0	Oatmeal Cookie Bar	5.18	28
7.0	Date/Almond/Coconut Bar	5.60	30
8.0	Raisin/Almond Bar	6.54	26
(Least Preferred) 9.0	Date/Cherry Bar	7.85	27

TABLE 6

Rank-Order Preference for Beverage and Pudding Bars in the
Emergency/Assault Food Packet as Determined by Mean
Ratings on the Nine-Point Hedonic Scale

RELATIVE ORDINAL RANK	BAR	MEAN HEDONIC RATING (N)	
		Dry	Rehydrated
(Most Preferred) 1.0	BEVERAGE Orange	6.42 (24)	7.74 (34)
2.0	Grapefruit	6.05 (19)	6.62 (21)
	PUDDING		
1.0	Vanilla	7.80 (5)	
2.0	Chocolate	7.57 (7)	
3.0	Banana	7.50 (6)	
1.0	Banana		8.50 (6)
2.0	Chocolate		7.92 (24)
(Least Preferred) 3.0	Vanilla		7.45 (11)

Preference for Beverage and Pudding Bars in the Emergency/Assault
Food Packet as Rank-Ordered by Survey Sample

RELATIVE ORDINAL RANK	BAR	MEAN SCORED RANK (N)	
		Dry	Rehydrated
(Most Preferred) 1.0	BEVERAGE Orange	1.03 (31)	1.03 (30)
2.0	Grapefruit	1.96 (23)	1.95 (21)
	PUDDING		
1.0	Chocolate	1.68 (19)	
2.0	Vanilla	1.80 (15)	
3.0	Banana	1.93 (15)	
1.0	Banana		1.33 (21)
2.0	Vanilla		1.92 (25)
(Least Preferred) 3.0	Chocolate		2.00 (29)

retains its intermediate position, and Vanilla trails behind. The rank-order from the post-exercise survey measure shows Chocolate pudding to be the favorite eaten dry, followed respectively by Vanilla and Banana, with Banana becoming the favorite when rehydrated, followed by Vanilla and Chocolate. None of the differences among the pudding bars is statistically significant.

Entree Bars

The most difficult data to interpret is that from the entree bars, which were eaten either dry, as packaged, or rehydrated. As might be expected with such complex stimuli, relative preferences differed somewhat from mode to mode. There were also differences between the rank-ordering predicted by the field acceptance data and that obtained from the post-exercise survey, which asked the respondents to separately rank-order the entrees as eaten dry and again as eaten rehydrated. Tables 7 through 9 show the various rank-orderings obtained either directly from the post-exercise survey or as predicted by the relative mean hedonic ratings from the field acceptance interviews. All but one of the mean hedonic ratings in Table 8 are based on fewer than 10 observations, however, and their reliability is therefore suspect. Comparison of the various orderings does reveal some consistencies among the judgments. The overwhelming favorite entree appears to be Chicken Stew, which is rank-ordered first by the post-exercise survey respondents among entree bars when eaten either dry and/or rehydrated and received the second highest mean hedonic rating in the field acceptance interviews when rehydrated with hot water. Another apparently well-liked entree is the Chicken A-la-King, which received the highest mean hedonic ratings for both dry and rehydrated hot modes and was rank-ordered by the post-exercise survey respondents third and fifth respectively eaten rehydrated and dry.

At the other end of the spectrum were Pork and Escalloped Potatoes, Beef Hash, and perhaps Beef and Rice. Pork and Escalloped Potatoes and Beef Hash were ranked last and second to last, respectively, by the post-exercise survey respondents when eaten either dry or rehydrated. Pork and Escalloped Potatoes also received the third lowest mean hedonic rating eaten dry and an intermediate rating eaten rehydrated hot. The Beef Hash, on the other hand, received the third lowest mean hedonic rating when eaten rehydrated hot, but an intermediate score when eaten dry. The Beef and Rice received the lowest and second to lowest mean hedonic ratings eaten dry and rehydrated hot, respectively, but was rated intermediate by the post-exercise survey respondents.

As described above for the cereal/dessert bars, statistical differences among the mean hedonic rating given the entree bars, eaten either dry or rehydrated, are shown by the vertical lines beside the rank ordering. Again, those bars not connected by the same line are statistically different from one another at at least the .05 confidence level, while those bars connected by any single vertical line are not different by that criterion.

Of the eight entree bars found in the Emergency/Assault Food Packet, five are at least nominally similar to the freeze-dehydrated but noncompressed entree items found in the Long Range Patrol Food Packet. Although the LRP entrees are, at least theoretically, capable of being eaten dry, none of the field acceptance interviews reflected that mode of consumption. For purposes of comparison, then, Table 9 also shows the mean hedonic ratings given for the five LRP entrees nominally similar to E/A entrees eaten rehydrated with hot water. When rehydrated hot, however, all five of the common entrees are rated higher by the LRP group than by

TABLE 7

Preference for Entree Bars Eaten DRY in the Emergency/Assault Food Packet as Rank-Ordered by Survey Sample

RELATIVE ORDINAL RANK	ENTREE BAR	MEAN SCORED RANK	N
(Most Preferred) 1.0	Chicken Stew	2.83	13
2.0	Chicken and Rice	2.86	14
3.0	Beef and Vegetables	3.08	13
4.0	Beef and Rice	3.54	13
5.0	Chicken A-la-King	3.86	14
6.0	Pork Chop Suey	4.25	12
7.0	Beef Hash	4.33	12
(Least Preferred) 8.0	Pork and Escalloped Potatoes	5.00	13

Preference for Entree Bars Eaten REHYDRATED in the Emergency/Assault Food Packet as Rank-Ordered by Survey Sample

RELATIVE ORDINAL RANK	ENTREE BAR	MEAN SCORED RANK	N
(Most Preferred) 1.0	Chicken Stew	3.46	28
2.0	Chicken and Rice	3.54	26
3.0	Chicken A-la-King	3.83	30
4.0	Beef and Vegetables	4.00	26
5.0	Beef and Rice	4.06	31
6.0	Pork Chop Suey	4.17	24
7.0	Beef Hash	4.74	27
(Least Preferred) 8.0	Pork and Escalloped Potatoes	5.28	25

TABLE 8

Rank-Order Preferences for Entree Bars Eaten DRY in the Emergency/Assault Food Packet as Determined by Mean Ratings on the Nine-Point Hedonic Scale*

RELATIVE ORDINAL RANK	ENTREE BAR	MEAN HEDONIC RATING	N
(Most Preferred) 1.0	Chicken A-la-King	6.25	8
2.0	Beef and Vegetable	5.40	5
3.0	Chicken and Rice	5.25	8
4.5	Chicken Stew	5.17	6
4.5	Beef Hash	5.17	6
6.0	Pork and Escalloped Potatoes	5.00	8
7.0	Pork Chop Suey	4.88	8
(Least Preferred) 8.0	Beef and Rice	4.14	14

*Items connected by any single vertical line next to the rank order column are not significantly different at the .05 confidence level. Items not so connected by a single line are statistically different at the .05 level.

TABLE 9

Rank-Order Preferences for Entree Bars Eaten REHYDRATED with HOT
Water in the Emergency/Assault Food Packet as Determined by
Mean Rating on the Nine-Point Hedonic Scale*

RELATIVE ORDINAL RANK	ENTREE BAR	MEAN HEDONIC RATING (N)	
		E/A	LRP
(Most Preferred) 1.0	Chicken A-la-King	7.12 (34)	
2.0	Chicken Stew	6.91 (35)	7.13 (15)
3.0	Beef and Vegetables	6.77 (26)	
4.0	Pork and Escalloped Potatoes	6.00 (35)	6.57 (7)
5.0	Pork Chop Suey	5.75 (24)	
6.0	Beef Hash	5.68 (31)	7.08 (13)
7.0	Beef and Rice	5.60 (45)	6.75 (16)
(Least Preferred) 8.0	Chicken and Rice	5.49 (37)	7.59 (27)

*Items connected by any single vertical line next to the rank order column are not significantly different at the .05 confidence level. Items not so connected by a single line are statistically different at the .05 level.

the E/A group, two of them significantly so (Beef Hash, $t(42) = 2.41$, $p < .02$, and Chicken and Rice, $t(62) = 4.16$, $p < .001$), despite the apparent general preference for the E/A Food Packet as a whole over the LRP mentioned earlier. None of the other differences between items common to the two food packets besides the two mentioned above were statistically significant, however.

Aside from the two clear "winners" and three apparent "losers," opinions of the other entrees were sufficiently mixed and mode dependent that no clear overall rank order can be assigned. Past experience with the nine-point hedonic rating scale has shown, however, that items scoring below 6.00 have the potential of becoming acceptance problems, at least in a garrison situation feeding A-ration items. Of the Emergency/Assault items, none of the beverages or puddings and only the Date/Cherry bar among the cereal/dessert items received ratings that would place them in such a potentially problematic category. Among the E/A entree items, however, four of eight fall into this arbitrarily defined "problem category" when rehydrated hot, and seven of eight when eaten dry. Again, for comparison purposes, none of the five common LRP entrees received a rating below 6.00 when rehydrated hot.

Problems of Rehydration

Overall, the most serious problem to emerge during the course of the study was the scarcity of drinking water. Each individual was issued two 1-quart canteens with which to begin the exercise. Water was resupplied in 5-gallon cans either very early or very late in the day. Water left overnight in the 5-gallon cans or in individual canteens not placed in or under a sleeping bag was usually frozen by morning and remained useless in the plastic canteens until midday. Physiological symptoms of dehydration, such as thick mucus and extremely dark urine, were nearly universal. The amount of water needed to rehydrate the dehydrated rations was probably not very large in an absolute sense; but relative to the maximum 2-quart supply that often had to last for more than 12 hours, that amount certainly seemed subjectively significant to many individuals. When asked afterward whether they were able to get enough water either to rehydrate the food items or to satisfy thirst, 68.8% of the E/A group and 66.7% of the LRP group reported getting insufficient water to rehydrate the food, and 65.6% of the E/A group and 59.3% of the LRP group reported going thirsty.

There was general agreement that the pudding and beverage bars were notably easier to rehydrate than were the entree bars, but the differences among the pudding/beverage bars as one category and among the entree bars as another category were very slight and nonsignificant.

Four survey respondents from the E/A group reported difficulties with the inner zip-lock bag used for rehydrating the E/A rations. Apparently some of the bags either leaked at the seams or did not seal very well along the zip lock at the top, enabling the contents to leak out and create a mess. No one in either the experimental (E/A) or control (LRP) groups reported any difficulty understanding the directions for rehydration, although there were some constructive suggestions for improvement. One person suggested that more emphasis in the instructions be placed on using hot water if at all possible to rehydrate both types of dehydrated ration. Another person suggested that the E/A beverages, in particular, be packaged as a loose powder or as granules rather than as a bar, since the preferred mode of use was to simply crumble the bar (or several bars) directly into a canteen of cold water. Presumably the beverage could still be consumed dry by

shaking the loose contents of the bag directly into the mouth. Very few people were observed actually rehydrating the beverage bars in the zip-lock bags, which could possibly be eliminated for that particular item. It was also suggested that the plastic spoons supplied with the E/A Food Packet were too short to easily spoon the contents out of the zip-lock bags without getting food from the bag on the fingers. The bags containing the LRP entrees were large enough to fold down so that spoon length was not a problem to nearly the same degree.

The complaints most frequently cited in the comments section of the post-exercise survey by the experimental (E/A) group were the need for matches (cited by 27.6%) and toilet paper (cited by 24.1%) in the Emergency/Assault Food Packets.

APPENDIX A
EMERGENCY/ASSAULT FOOD PACKET
ACCEPTANCE INTERVIEW

EMERGENCY/ASSAULT FOOD PACKET
Acceptance Interview (in the field)

DATE: _____ WEATHER: _____
We are interviewing personnel in the field to find out just what they think about the food bars they are eating:

TIME:	SAT:	W:	MODE	FLAVOR									TEXTURE									VALENCE		
				Like					Dislike				Like					Dislike						
				E	V	M	S	N	S	M	V	E	E	V	M	S	N	S	M	V	E			
1.	Beef & Rice	D	C H	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
2.	Beef Hash																							
3.	Beef & Vegetables	D	C H	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
4.	Chicken A-La-King																							
5.	Chicken & Rice	D	C H	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
6.	Chicken Stew																							
7.	Pork Chop Suey	D	C H	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
8.	Pork & Escal Pots																							
9.	Caramels	D		1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
10.	Chocolate Bar																							
11.	Date/Almond/Cocon	D		1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
12.	Date/Cherry																							
13.	Fudge	D		1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
14.	Granola																							
15.	Oatmeal Cookie	D		1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
16.	Raisin/Almond																							
17.	Starch Jelly	D		1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
18.	Banana Pudding	D	C H	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
19.	Chocolate Pudding																							
20.	Vanilla Pudding	D	C H	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
21.	Coffee	D	C H	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
22.	Grapefruit Bev																							
23.	Orange Beverage	D	C H	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=

REC#:	TIME:	SAT:	A or R	W:	FLAVOR									TEXTURE									VALENCE		
					Like					Dislike				Like					Dislike						
					E	V	M	S	N	S	M	V	E	E	V	M	S	N	S	M	V	E			
1.	Beef & Rice	D	C H		1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
2.	Beef Hash																								
3.	Beef & Vegetables	D	C H		1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
4.	Chicken A-La-King																								
5.	Chicken & Rice	D	C H		1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
6.	Chicken Stew																								
7.	Pork Chop Suey	D	C H		1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
8.	Pork & Escal Pots																								
9.	Caramels	D			1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
10.	Chocolate Bar																								
11.	Date/Almond/Cocon	D			1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
12.	Date/Cherry																								
13.	Fudge	D			1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
14.	Granola																								
15.	Oatmeal Cookie	D			1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
16.	Raisin/Almond																								
17.	Starch Jelly	D			1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
18.	Banana Pudding	D	C H		1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
19.	Chocolate Pudding																								
20.	Vanilla Pudding	D	C H		1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
21.	Coffee	D	C H		1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
22.	Grapefruit Bev																								
23.	Orange Beverage	D	C H		1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=

APPENDIX B
LONG RANGE PATROL FOOD PACKET
ACCEPTANCE INTERVIEW

LONG RANGE PATROL FOOD PACKET
Acceptance Interview (in the field)

DATE: _____ WEATHER: _____

We are interviewing personnel in the field to find out just what they think about the LRPs they are eating:

REC#:	SAT:	W:	FLAVOR										TEXTURE										VALENCE			
			Like					Dislike					Like					Dislike								
			E	V	M	S	N	S	M	V	E	F	V	M	S	N	S	M	V	E						
TIME:	A or R	MODE																								
1.			D	C	H	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
2.																										
3.			D	C	H	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
4.																										
5.			D	C	H	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
6.																										
7.			D	C	H	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
8.																										
9.			D			1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
10.																										
11.			D			1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
12.			D			1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
13.			D			1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
14.																										
15.			D	C	H	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
16.			D	C	H	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
17.																										
18.			D	C	H	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=

REC#: _____ TIME: _____ SAT: _____ A or R W: _____

1.			D	C	H	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
2.																										
3.			D	C	H	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
4.																										
5.			D	C	H	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
6.																										
7.			D	C	H	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
8.																										
9.			D			1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
10.																										
11.			D			1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
12.			D			1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
13.			D			1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
14.																										
15.			D	C	H	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
16.			D	C	H	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=
17.																										
18.			D	C	H	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	F	T	=

APPENDIX C
EMERGENCY/ASSAULT FOOD PACKET
CONSUMER SURVEY

EMERGENCY/ASSAULT FOOD PACKET CONSUMER SURVEY (Post-Exercise)

For the field exercise just completed, you were issued samples of a new type of food ration packet utilizing compressed food bars. Some of these bars are intended to be eaten either dry, with drinking water on the side, or after rehydration with either hot or cold water. Your experience with these bars and your reactions to them are important to their future development.

Please answer all questions by circling ONE letter or number unless otherwise indicated. Your responses on this survey are confidential and will not be identified with you individually.

1. How long have you been in the Marine Corps? _____ years, _____ months.
2. What is your rank? _____
3. Which of the following military rations have you eaten before this exercise?
Please circle ALL THAT APPLY:
 - a. A-ration (regular dining facility food on base)
 - b. B-ration (canned food, no fresh food)
 - c. C-ration (Meal, Combat Individual (MCI)---canned combat ration)
 - d. MREs (Meal, Ready to Eat---combat ration in a pouch)
 - e. LRPs (Long Range Patrol Food Packet)
 - f. Emergency/Assault Food Packet (prior to this exercise)
 - g. K-ration (older C-ration)
4. Would you characterize yourself as a (Circle ONE):
 - a. LIGHT
 - b. MODERATE
 - c. HEAVYeater (on the average)?

Please answer the following questions based on your experience with those food bars that you ate DRY (without rehydration), including bars that were not intended for rehydration.

5. Please rank-order your preferences for the ENTREE BARS that you ate DRY by placing the number "1" in the blank next to the entree bar that you liked the MOST (your #1 favorite) eaten dry, the number "2" next to your second most favorite, "3" next to your third, etc. If you did not eat one of the entree bars dry, just leave it blank. If you did not eat ANY of the ENTREES DRY, skip to Question #6:

- ___ BEEF & RICE
- ___ BEEF HASH
- ___ BEEF & VEGETABLES
- ___ CHICKEN A-LA-KING
- ___ CHICKEN & RICE
- ___ CHICKEN STEW
- ___ PORK CHOP SUEY
- ___ PORK & ESCALLOPED POTATOES

6. Next, please rank-order your preferences for the CEREAL/DESSERT BARS that you ate by placing the number "1" in the blank next to the cereal/dessert bar that you liked the MOST (your #1 favorite), the number "2" next to your second most favorite, "3" next to your third, etc. If you did not eat one of the cereal/dessert items, just leave it blank. If you did not eat ANY of the CEREAL/DESSERT BARS, skip to Question #7:

- ___ CARAMELS
- ___ CHOCOLATE BAR
- ___ DATE/ALMOND/COCONUT BAR
- ___ DATE/CHERRY BAR
- ___ FUDGE BAR
- ___ GRANOLA BAR
- ___ OATMEAL COOKIE BAR
- ___ RAISIN/ALMOND BAR
- ___ STARCH JELLY BAR

7. Next, please rank-order your preferences for the PUDDING BARS that you ate DRY by placing the number "1" in the blank next to the pudding bar that you liked the MOST (your #1 favorite) eaten dry, etc. If you did not eat one of the pudding bars dry, just leave it blank. If you did not eat ANY of the PUDDING BARS DRY, skip to Question #8:

___ BANANA PUDDING
___ CHOCOLATE PUDDING
___ VANILLA PUDDING

8. Next, please rank-order your preferences for the BEVERAGE BARS that you ate DRY by placing the number "1" in the blank next to the beverage bar that you liked the MOST (your #1 favorite) eaten dry, etc.:

___ GRAPEFRUIT BEVERAGE
___ ORANGE BEVERAGE

Please answer the following questions based on your experience with those food bars that you ate REHYDRATED (with water added):

9. Please rank-order your preferences for the ENTREE BARS that you ate REHYDRATED by placing the number "1" in the blank next to the entree bar that you liked the MOST (your #1 favorite) rehydrated, the number "2" next to your second most favorite, "3" next to your third, etc. If you did not eat one of the entree bars rehydrated, just leave it blank. If you did not eat ANY of the ENTREES REHYDRATED, skip to Question #10:

___ BEEF & RICE
___ BEEF HASH
___ BEEF & VEGETABLES
___ CHICKEN A-LA-KING
___ CHICKEN & RICE
___ CHICKEN STEW
___ PORK CHOP SUEY
___ PORK & ESCALLOPED POTATOES

10. Next, please rank-order your preferences for the PUDDING BARS that you ate REHYDRATED by placing the number "1" in the blank next to the pudding bar that you liked the MOST (your #1 favorite) rehydrated, etc. If you did not eat one of the pudding bars rehydrated, just leave it blank. If you did not eat ANY of the PUDDINGS REHYDRATED, skip to Question #11:

___ BANANA PUDDING
___ CHOCOLATE PUDDING
___ VANILLA PUDDING

11. Next, please rank-order your preferences for the BEVERAGE BARS that you drank REHYDRATED by placing the number "1" in the blank next to the beverage bar that you liked the MOST (your #1 favorite) rehydrated, etc.:

___ GRAPEFRUIT BEVERAGE
___ ORANGE BEVERAGE

12. a. Did you have any difficulty in understanding or following the instructions for rehydration printed on the labels? (Circle ONE):

YES NO

b. If you circled YES, please explain the difficulty: _____

c. Can you think of any changes that would improve the instructions?

13. a. Did you have any problems using the inner zip-lock bag for rehydration? (Circle ONE):

YES NO

b. If you circled YES, please explain the problem: _____

14. Please circle the number below that indicates how difficult it was to rehydrate each item. Skip those items that you did not try to rehydrate:

	Very EASY	Moderately EASY	Slightly EASY	Neutral	Slightly HARD	Moderately HARD	Very HARD
BEEF & RICE	1	2	3	4	5	6	7
BEEF HASH	1	2	3	4	5	6	7
BEEF & VEGETABLES	1	2	3	4	5	6	7
CHICKEN A-LA-KING	1	2	3	4	5	6	7
CHICKEN & RICE	1	2	3	4	5	6	7
CHICKEN STEW	1	2	3	4	5	6	7
PORK CHOP SUEY	1	2	3	4	5	6	7
PORK & ESCAL POTS	1	2	3	4	5	6	7
BANANA PUDDING	1	2	3	4	5	6	7
CHOCOLATE PUDDING	1	2	3	4	5	6	7
VANILLA PUDDING	1	2	3	4	5	6	7
GRAPEFRUIT BEV	1	2	3	4	5	6	7
ORANGE BEVERAGE	1	2	3	4	5	6	7

15. Can you suggest any changes that would make rehydration easier? _____

16. Did you eat your rations (Circle ONE):

- a. At regular meal intervals.
- b. Throughout the day as time permitted.
- c. Both of the above.

17. a. Were you able to get enough water to rehydrate the food items that you wanted to rehydrate? (Circle ONE):

YES NO

b. Were you able to get enough water to satisfy your thirst? (Circle ONE):

YES NO

18. How adequate was the QUANTITY (Amount) of the food ration issued to you for the conditions of the exercise? (Circle ONE):

Extremely ADEQUATE	Moderately ADEQUATE	Slightly ADEQUATE	Neutral	Slightly INADEQUATE	Moderately INADEQUATE	Extremely INADEQUATE
1	2	3	4	5	6	7

19. Overall, all things considered, how would you RATE the new emergency/assault food ration packet? (Circle ONE):

Extremely GOOD	Moderately GOOD	Slightly GOOD	Neutral	Slightly BAD	Moderately BAD	Extremely BAD
1	2	3	4	5	6	7

20. How CONVENIENT was the emergency/assault food ration packet to carry with you into the field? (Circle ONE):

Extremely CONVENIENT	Moderately CONVENIENT	Slightly CONVENIENT	Neutral	Slightly INCONVENIENT	Moderately INCONVENIENT	Extremely INCONVENIENT
1	2	3	4	5	6	7

21. In comparison to the following rations (if you have ever carried them into the field), how CONVENIENT was the emergency/assault food packet to carry with you into the field?

Emergency/Assault Food Packet was (Circle ONE for each):

Much MORE	Somewhat MORE	Slightly MORE	Neutral	Slightly LESS	Somewhat LESS	Much LESS	convenient than the MCI (Meal, Combat Individual).
1	2	3	4	5	6	7	

Much MORE	Somewhat MORE	Slightly MORE	Neutral	Slightly LESS	Somewhat LESS	Much LESS	convenient than the MRE (Meal, Ready to Eat).
1	2	3	4	5	6	7	

Much MORE	Somewhat MORE	Slightly MORE	Neutral	Slightly LESS	Somewhat LESS	Much LESS	convenient than the LRP (Longe Range Patrol Rat.).
1	2	3	4	5	6	7	

22. In comparison to the following rations (if you have ever carried them into the field), how much better or worse was the QUALITY of the emergency/assault food packet?

Emergency/Assault Food Packet was (Circle ONE for each):

Much BETTER	Somewhat BETTER	Slightly BETTER	Neutral	Slightly WORSE	Somewhat WORSE	Much WORSE	than the MCI (Meal, Combat Individual).
1	2	3	4	5	6	7	

Much BETTER	Somewhat BETTER	Slightly BETTER	Neutral	Slightly WORSE	Somewhat WORSE	Much WORSE	than the MRE (Meal, Ready to Eat).
1	2	3	4	5	6	7	

Much BETTER	Somewhat BETTER	Slightly BETTER	Neutral	Slightly WORSE	Somewhat WORSE	Much WORSE	than the LRP (Long Range Patrol Eat.).
1	2	3	4	5	6	7	

23. All things considered, please rank-order your preference for carrying the following rations with you on maneuvers similar to the exercise just completed. That is, place the number "1" in the blank next to the ration you would MOST prefer to be issued for field maneuvers (your #1 favorite), the number "2" next to your second most favorite, etc. If you are completely unfamiliar with one of the rations, just leave it blank:

- ___ MEAL, COMBAT INDIVIDUAL (MCI)
- ___ MEAL, READY TO EAT (MRE)
- ___ EMERGENCY/ASSAULT FOOD PACKET
- ___ LONG RANGE PATROL FOOD PACKET (LRP)

24. Please feel free to use the space below to comment on any issued not adequately addressed above:

APPENDIX D
LONG RANGE PATROL FOOD PACKET
CONSUMER SURVEY

LONG RANGE PATROL FOOD PACKET CONSUMER SURVEY (Post-Exercise)

For the field exercise just completed, you were issued samples of the Long Range Patrol Food Packet (LRP). Some of the LRP components are intended to be eaten either dry, with drinking water on the side, or after rehydration with either hot or cold water. Your experience with these items and your reactions to them are important to their future development.

Please answer all questions by circling ONE letter or number unless otherwise indicated. Your responses on this survey are confidential and will not be identified with you individually.

1. How long have you been in the Marine Corps? _____ years, _____ months.
2. What is your rank? _____
3. Which of the following military rations have you eaten before this exercise?
Please circle ALL THAT APPLY:
 - a. A-ration (regular dining facility food on base)
 - b. B-ration (canned food, no fresh food)
 - c. C-ration (Meal, Combat Individual (MCIs)---canned combat ration)
 - d. MREs (Meal, Ready to Eat---combat ration in a pouch)
 - e. LRPs (prior to this exercise)
 - f. Emergency/Assault Food Packet
 - g. K-ration (older C-ration)
4. Would you characterize yourself as a (Circle ONE):
 - a. LIGHT
 - b. MODERATE
 - c. HEAVYeater (on the average)?

Please answer the following questions based on your experience with those food items that you ate DRY (without rehydration), including items that were not intended for rehydration.

5. Please rank-order your preferences for the ENTREE items that you ate DRY by placing the number "1" in the blank next to the entree item that you liked the MOST (your #1 favorite) eaten dry, the number "2" next to your second most favorite, "3" next to your third, etc. If you did not eat one of the entree items dry, just leave it blank. If you did not eat ANY of the ENTREES DRY, skip to Question #6:

___ BEEF HASH
___ BEEF & RICE
___ BEEF STEW
___ CHICKEN & RICE
___ CHICKEN STEW
___ CHILI CON CARNE
___ PORK & ESCALLOPED POTATOES
___ SPAGHETTI & MEAT SAUCE

6. Next, please rank-order your preferences for the CEREAL/DESSERT items that you ate by placing the number "1" in the blank next to the cereal/dessert bar that you liked the MOST (your #1 favorite), the number "2" next to your second most favorite, "3" next to your third, etc. If you did not eat one of the cereal/dessert items, just leave it blank. If you did not eat ANY of the CEREAL/DESSERT items, skip to Question #7:

___ CHOCOLATE CRUNCH DISK
___ CHOCOLATE FUDGE DISK
___ COCONUT DISK
___ CORNFLAKE BAR
___ FRUITCAKE BAR
___ VANILLA FUDGE DISK

7. Next, please rank-order your preferences for the BEVERAGE items that you ate DRY by placing the number "1" in the blank next to the beverage item that you liked the MOST (your #1 favorite) eaten dry, etc. If you did not eat one of the beverage items dry, just leave it blank. If you did not eat ANY of the BEVERAGE items DRY, skip to Question #8:

___ COCOA BEVERAGE
___ LEMON BEVERAGE
___ ORANGE BEVERAGE

Please answer the following questions based on your experience with those food items that you ate REHYDRATED (with water added):

8. Please rank-order your preferences for the ENTREE items that you ate REHYDRATED by placing the number "1" in the blank next to the entree item that you liked the MOST (your #1 favorite) rehydrated, the number "2" next to your second most favorite, "3" next to your third, etc. If you did not eat one of the entree items rehydrated, just leave it blank. If you did not eat ANY of the ENTREES REHYDRATED, skip to Question #9:

___ BEEF HASH
___ BEEF & RICE
___ BEEF STEW
___ CHICKEN & RICE
___ CHICKEN STEW
___ CHILI CON CARNE
___ PORK & ESCALLOPED POTATOES
___ SPAGHETTI & MEAT SAUCE

9. Next, please rank-order your preferences for the BEVERAGE items that you drank REHYDRATED by placing the number "1" in the blank next to the beverage item that you liked the MOST (your #1 favorite) rehydrated, etc. If you did not drink one of the beverage items rehydrated, just leave it blank. If you did not drink ANY of the BEVERAGE items REHYDRATED, skip to Question #10:

___ COCOA BEVERAGE
___ LEMON BEVERAGE
___ ORANGE BEVERAGE

10. a. Did you have any difficulty in understanding or following the instructions for rehydration printed on the labels? (Circle ONE):

YES

NO

b. If you circled YES, please explain the difficulty: _____

c. Can you think of any changes that would improve the instructions?

11. a. Did you have any problems using the inner open-top bag for rehydration? (Circle ONE):

YES

NO

b. If you circled YES, please explain the problem: _____

12. Please circle the number below that indicates how difficult it was to rehydrate each item. Skip those items that you did not try to rehydrate:

	Very EASY	Moderately EASY	Slightly EASY	Neutral	Slightly HARD	Moderately HARD	Very HARD
BEEF HASH	1	2	3	4	5	6	7
BEEF & RICE	1	2	3	4	5	6	7
BEEF STEW	1	2	3	4	5	6	7
CHICKEN & RICE	1	2	3	4	5	6	7
CHICKEN STEW	1	2	3	4	5	6	7
CHILI CON CARNE	1	2	3	4	5	6	7
PORK & ESCAL POTS	1	2	3	4	5	6	7
SPAGHETTI & MEAT	1	2	3	4	5	6	7
COCOA BEVERAGE	1	2	3	4	5	6	7
LEMON BEVERAGE	1	2	3	4	5	6	7
ORANGE BEVERAGE	1	2	3	4	5	6	7
(COFFEE)	1	2	3	4	5	6	7

13. Can you suggest any changes that would make rehydration easier? _____

14. Did you eat your rations (Circle ONE):

- a. At regular meal intervals.
- b. Throughout the day as time permitted.
- c. Both of the above.

15. a. Were you able to get enough water to rehydrate the food items that you wanted to rehydrate? (Circle ONE):

YES NO

b. Were you able to get enough water to satisfy your thirst? (Circle ONE):

YES NO

16. How adequate was the QUANTITY (Amount) of the food ration issued to you for the conditions of the exercise? (Circle ONE):

Extremely ADEQUATE	Moderately ADEQUATE	Slightly ADEQUATE	Neutral	Slightly INADEQUATE	Moderately INADEQUATE	Extremely INADEQUATE
1	2	3	4	5	6	7

17. Overall, all things considered, how would you RATE the Long Range Patrol Food Packet? (Circle ONE):

Extremely GOOD	Moderately GOOD	Slightly GOOD	Neutral	Slightly BAD	Moderately BAD	Extremely BAD
1	2	3	4	5	6	7

18. How CONVENIENT was the Long Range Patrol Food Packet to carry with you into the field? (Circle ONE):

Extremely CONVENIENT	Moderately CONVENIENT	Slightly CONVENIENT	Neutral	Slightly INCONVENIENT	Moderately INCONVENIENT	Extremely INCONVENIENT
1	2	3	4	5	6	7

19. In comparison to the following rations (if you have ever carried them into the field), how CONVENIENT was the Long Range Patrol Food Packet to carry with you into the field?

Long Range Patrol Food Packet was (Circle ONE for each):

Much MORE	Somewhat MORE	Slightly MORE	Neutral	Slightly LESS	Somewhat LESS	Much LESS	convenient than the MCI (Meal, Combat Individual).
1	2	3	4	5	6	7	

Much MORE	Somewhat MORE	Slightly MORE	Neutral	Slightly LESS	Somewhat LESS	Much LESS	convenient than the MRE (Meal, Ready to Eat).
1	2	3	4	5	6	7	

20. In comparison to the following rations (if you have ever carried them into the field), how much better or worse was the QUALITY of the Long Range Patrol Food Packet?

Long Range Patrol Food Packet was (Circle ONE for each):

Much BETTER	Somewhat BETTER	Slightly BETTER	Neutral	Slightly WORSE	Somewhat WORSE	Much WORSE	than the MCI (Meal, Combat Individual).
1	2	3	4	5	6	7	

Much BETTER	Somewhat BETTER	Slightly BETTER	Neutral	Slightly WORSE	Somewhat WORSE	Much WORSE	than the MRE (Meal, Ready to Eat).
1	2	3	4	5	6	7	

21. All things considered, please rank-order your preference for carrying the following rations with you on maneuvers similar to the exercise just completed. That is, place the number "1" in the blank next to the ration you would MOST prefer to be issued for field maneuvers (your #1 favorite), the number "2" next to your second most favorite, etc. If you are completely unfamiliar with one of the rations, just leave it blank:

- ___ MEAL, COMBAT INDIVIDUAL (MCI)
- ___ MEAL, READY TO EAT (MRE)
- ___ LONG RANGE PATROL FOOD PACKET (LRP)

22. Please feel free to use the space below to comment on any issues not adequately addressed above:
