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THE NUTRIENT COMPOSITION OF THE MEAL, COMBAT, INDIVIDUAL

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Interim Report  
June 1962



QUARTERMASTER FOOD AND CONTAINER INSTITUTE FOR THE ARMED FORCES  
QUARTERMASTER RESEARCH AND ENGINEERING COMMAND, U.S. ARMY  
CHICAGO 9, ILLINOIS

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 QM Food & Container Institute for the Armed Forces,  
 QM Research & Engineering Command, U. S. Army,  
 Chicago 9, QMFCIAF Rpt. No. 12-62  
 Date June 1962 Proj. No. 2210.8-4000  
 pp 23 tbl 8 fig. \_\_\_\_\_  
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 bat, Individual by Miriam H. Thomas  
 Components of Meal, Combat, Individual  
 have been analyzed for nutrient composi-  
 tion on a contractual basis. Data ob-  
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 Primary Field: Nutrition  
 Secondary Field(s): Meal, Combat, Individual

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 Rations  
 2. Nutrition  
 I. Thomas,  
 M.H.

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QMFCIAF 12-62

THE NUTRIENT COMPOSITION OF THE MEAL, COMBAT, INDIVIDUAL

Interim Report

by

Mirian H. Thomas

Nutrition Branch, Food Division

June 1962

Quartermaster Food and Container Institute for the Armed Forces

# THE NUTRIENT COMPOSITION OF THE MEAL, COMBAT, INDIVIDUAL

## INTRODUCTION

To provide hot meals for men in the Combat Zone presents a problem, especially if the soldier is in close combat. Under such circumstances, it is expected that a man will usually eat alone or in small groups. Field tests by the users have resulted in standardizing an individual packaged ration which is called Meal, Combat, Individual. Basically, it is the old C Ration modified to be issued by meals instead of full rations, to be more acceptable when heating is impossible, and to make use of technological progress of recent years. It consists of a random selection of canned and dry beverage items, which are combined to increase flexibility of use in the field. It can be issued in individual units, meal packets, or in multiples of three as a complete ration.

The Meal, Combat, Individual follows three distinct menu patterns which are described in Table 1. Each menu should supply one-third the ration requirement prescribed by AR 40-564. In order to evaluate the nutritional adequacy of the Meal, Combat, Individual, its components were analyzed for proximate, total vitamin E and B<sub>6</sub>, calcium, phosphorus, sodium, potassium, magnesium, and copper contents on a contractual basis.<sup>1/</sup> These values have been reported and are compared with the values previously obtained by the Institute.

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1. Foster D. Snell, Inc. P.O. No. 2099-Ser-60, Requisition No. 11-009-1848-60.

## Experimental

Components of the Meal, Combat, Individual were submitted by the Quartermaster Food and Container Institute for the Armed Forces to the Foster D. Snell, Inc. laboratories for nutrient analyses. Sample identification, supplier, and sampling procedure have been indicated in Table 2. Analyses performed and procedures employed are shown in Table 3.

## Results and Discussion

The average of several analyses by the Institute for nutrient content of components of the Meal, Combat, Individual has been compared with the data obtained from the contractor. The data are presented by item in Table 4, by menu, grouped according to the menu pattern described above, in Table 5, and summarized in Table 6.

In those cases where like analyses were performed by both laboratories, the data, in general, are in good agreement. The greatest consistent difference between laboratories occurred in the values reported for the calcium content of the various foods. Since the values reported by the Institute were in agreement with published data for similar items, the contractor was asked to recheck his values to determine if some factor had been omitted in the calculation for this mineral. However, no change in the data reported was indicated and no explanation can be offered for the results.

Until recently, no attempt had been made by the Institute to obtain analytical data on the vitamin B<sub>6</sub>, vitamin E, potassium, magnesium, copper, phosphorus, and sodium contents of individual ration items.

However, more complete data have been obtained by analyses of a composite consisting of the entire 12 menus. These data have been compared with the average of all menus in Table 7. As noted earlier, proximate data reported by the contractor are in agreement with those obtained previously by the Institute. However, the values reported for the mineral composition, are considerably higher than those obtained by the Institute. These differences cannot be explained.

Since the nutrient requirements prescribed by The Surgeon General's Office are based on the food supply for a day, the average nutrient content of the 12 menus has been compared with one-third the ration requirements set forth in AR 40-564. Table 8 indicates only the calories to be lower and the protein and calcium to be higher than the established requirement for these nutrients. Nevertheless the slight difference in the caloric value is not sufficient to be considered a deficiency.

#### Summary

The components of the Meal, Combat, Individual have been analyzed for their nutrient composition on a contractual basis. The data obtained have been reported and compared with data previously obtained by the Institute.

#### Acknowledgement

Appreciation is expressed to Mrs. Mabel Cavaiani, Mrs. Belle Rosler, and Mr. Lawrence Wills for their valuable assistance in the checking, calculating, and recording of data for these tables.

Table 1  
Meal, Combat, Individual Menu Pattern

Menu Patterns		
1	2	3
Mixed Meat Item	Mixed Meat Item	Mixed Meat Item
Fruit <sup>a</sup>	Dessert <sup>c</sup>	Bread
B-1 unit Crackers Peanut Butter Candy <sup>b</sup>	B-2 unit Crackers Cheese <sup>d</sup>	B-3 unit Cocoa Beverage Cookie <sup>e</sup> Jam <sup>f</sup>
Accessory Packet	Accessory Packet	Accessory Packet

- a. Apricots, pears, peaches, and pineapple are procured in equal quantities and randomly assembled into the meal packets to assure uniform distribution.
- b. Cocoanut, chocolate fudge, enriched sweet chocolate, and vanilla cream disks are procured in equal quantities and randomly assembled into the meal packets to assure uniform distribution.
- c. Date pudding, fruitcake, pecan cake roll, and pound cake are procured in equal quantities and randomly assembled into the meal packets to assure uniform distribution.
- d. Pimento, plain, caraway, and hickory smoke flavored cheese are procured in equal quantities and randomly assembled into the meal packets to assure uniform distribution.
- e. Chocolate and vanilla sandwich cookies procured in equal quantities, only one type to be assembled into the meals at random.
- f. Equal quantities of peach or apricot; grape or cherry; black raspberry or seedless blackberry; and pineapple are procured and randomly assembled for reasonably uniform distribution.

Table 2

## Samples, Suppliers, and Sampling Procedures

Item	Supplier	Procedure
Chicken, boned	Blue Star Foods, Inc.	Composite and homogenize total contents of 4 cans
Beef Steaks	Packers	Same as above
Ham & Eggs	Otoe	Same as above
Turkey Loaf	Blue Star Foods, Inc	Same as above
Beans w/Frankfurter Chunks	Stokeley-WanCamp	Same as above
Beef and Potatoes	Granite St. Canning Corp.	Same as above
Ham and Lima Beans	No. American Packing Co.	Same as above
Chicken and Noodles	Tony Downs	Same as above
Spiced Beef	Blue Star	Same as above
Ham, fried	Cudahy	Same as above
Pork Steaks	Blue Star	Same as above
Meat Balls	1 X L Food Co.	Same as above
Apricots	Otoe	Composite and homogenize total contents from each of 4 cans
Pears	Otoe	Same as above
Pineapple	Otoe	Same as above
Peaches	Otoe	Same as above
Pound Cake	Otoe	Composite and homogenize 12 cans
Pecan Roll	American Bread Co.	Composite and homogenize 6 cans
Bread	American Bread Co.	Composite and homogenize 14 cans
Fruit Cake	Otoe	Composite and homogenize 5 cans
Date Pudding	Crosse & Blackwell	Composite and homogenize 5 cans
Crackers	Not known	(0 crackers)
Cookies		
Chocolate filled	Not known	Composite and homogenize all vanilla and chocolate cookies together, 32 each flavor.
Vanilla filled	Not known	
Peanut Butter	Cinderella Foods	Composite and homogenize total contents from 16 cans
Cheese Spread	Foremost Dairies	Composite and homogenize total contents from each of 4 cans
Pimento		
Plain		
Caraway		
Hickory Smoke		
Coffee	American Instant, Inc	Composite and homogenize contents from 300 packets
Cream	M&R Dietetic Labs., Inc.	Same as above (175 packets)
Cocoa	Not known	Same as above (16 discs)
Chocolate Fudge Bars	Hershey Co.	Composite and homogenize 14 bars
Vanilla Creme Bars	Ziegler Co.	Composite and homogenize 14 bars
Sweet Enriched Chocolate	Ziegler Co.	Composite and homogenize 24 bars
Cocoanut Bars	Ziegler Co.	Composite and homogenize 16 bars
Yeast		

Table 3

## References for Analyses Performed

Analyses	Reference	Laboratory <sup>a</sup>
Moisture	A.O.A.C. 8th Edition	(1)
	A.O.A.C. 9th Edition para. 20.008, modified	(2)
Protein	A.O.A.C. 8th Edition	(1)
	A.O.A.C. 9th Edition para. 2.036, modified	(2)
Fat	A.O.A.C. 8th Edition	(1)
	A.O.A.C. 9th Edition para. 13.019, modified	(2)
Ash	A.O.A.C. 8th Edition	(1)
	A.O.A.C. 9th Edition para. 13.006	(2)
Calcium, Phosphorus, Sodium, Potassium Magnesium, and Copper	Harvey's semi-quantitative spectrographic method	(1)
Calcium	Anal. Chem. <u>21</u> , 525 (1949)	(2)

a.

1. Contractor
2. QMFCIAF

Table 4  
Nutritive Values for Components of the Meal, Combat, Individual

	Weight oz	gm	Water gm	Energy cal	Carbo-			Vitamins			Minerals				
					hydrate gm	Fat gm	Protein gm	B <sub>6</sub> mg	E mg	Ca mg	P mg	Na mg	K gm	Mg mg	Cu mg
<u>Accessory Packet Components</u>															
Coffee, Instant	0.09 <sup>1</sup>	2.5	0.16	6	0.9	tr	0.6	0.001	0.05	16.0	3.0	0.01	0.17	32.0	0.2
Sugar	0.09 <sup>2</sup>	2.5	0.1	3	(0.9)	tr <sup>3</sup>	tr	NA <sup>4</sup>	NA	5	NA	NA	NA	NA	NA
Cream, dry	0.21	6.0	tr	24	6.0	(0)	(0)	NA	NA	NA	NA	NA	NA	NA	NA
	0.14	4.0	0.53	14	3.0	tr	0.4	0.002	0.09	27.0	3.0	0.04	tr	1.0	0.04
	0.14	4.0	tr	20	2.3	1.1	0.4	NA	NA	11.0	NA	NA	NA	NA	NA
Gum	0.12	3.4	0.1	10	2.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL															
	0.56	15.9	0.69	54	12.4	tr	1.0	0.003	0.14	43.0	6.0	0.05	0.17	33.0	0.24
	0.56	15.9	0.2	56	11.7	1.1	0.4	NA	NA	NA	NA	NA	NA	NA	NA
<u>Fruit Components, Menus 1-4 Incl.<sup>5</sup></u>															
Apricots	6.00	170.1	147.7	88	20.7	0.2	0.9	0.164	2.77	68.0	5.1	0.05	0.61	17.0	6.8
	6.00	170.1	130.8	146	37.4	0.2	1.0	NA	NA	19	NA	NA	NA	NA	NA
Peaches	6.00	170.1	134.0	143	34.7	0.2	0.7	0.164	2.55	17.0	1.4	0.02	0.31	8.5	0.3
	6.00	170.1	134.5	133	34.2	0.2	0.7	NA	NA	7	NA	NA	NA	NA	NA
Pears	6.00	170.1	141.7	114	27.6	0.3	0.2	0.155	2.13	17.0	0.7	0.02	0.20	7.0	0.2
	6.00	170.1	135.7	129	33.3	0.3	0.3	NA	NA	8	NA	NA	NA	NA	NA

Table 4  
continued  
Nutritive Values for Components of the Meal, Combat, Individual

	Weight oz	Water gm	Energy cal	Carbo-			Vitamins			Minerals					
				hydrate gm	Fat gm	Protein gm	B <sub>6</sub> mg	E mg	Ca mg	P mg	Na mg	K gm	Mg mg	Cu mg	
Pineapple	6.00 <sup>1</sup>	170.1	130.9	155	37.3	0.3	0.8	0.148	2.81	15	1.4	0.02	0.54	17	0.5
	6.00 <sup>2</sup>	170.1	135.4	129	33.5	0.2	0.7	NA <sup>4</sup>	NA	15	NA	NA	NA	NA	NA
Average value	6.00	170.1	134.6	125	30.1	0.2	0.6	0.158	2.56	29.2	2.2	0.03	0.42	12.4	2.0
	6.00	170.1	134.1	134	34.6	0.2	0.7	NA	NA	12	NA	NA	NA	NA	NA
<u>Fruit Components Menu 1A-4A Incl.</u>															
Apricots	8.75	248.1	215.5	129	30.1	0.3	1.3	0.239	4.04	99.0	7.4	0.07	0.89	24.8	9.9
	8.75	248.1	190.8	213	54.6	0.2	1.5	NA	NA	27	NA	NA	NA	NA	NA
Peaches	8.75	248.1	195.4	210	50.6	0.4	1.0	0.239	3.72	25.0	2.0	0.02	0.45	12.4	0.5
	8.75	248.1	196.3	194	49.9	0.2	1.0	NA	NA	10	NA	NA	NA	NA	NA
Pears	8.50	241.0	200.8	161	39.1	0.4	0.3	0.219	3.01	24.0	1.0	0.02	0.24	10.0	0.2
	8.50	241.0	192.0	182	47.2	0.4	0.4	NA	NA	12	NA	NA	NA	NA	NA
Pineapple	8.75	248.1	191.0	226	54.4	0.4	1.2	0.216	4.09	22.0	2.0	0.02	0.79	24.8	0.7
	8.75	248.1	196.9	188	48.9	0.2	1.0	NA	NA	22	NA	NA	NA	NA	NA
Average value	8.69	246.3	200.7	181	43.6	0.4	1.0	0.228	3.72	42.5	3.1	0.03	0.59	18.0	2.8
	8.69	246.3	194.0	194	50.2	0.3	1.0	NA	NA	18	NA	NA	NA	NA	NA

See footnotes at end of table.

Table 4  
continued

Nutritive Values for Components of the Meal, Combat, Individual

	Weight oz	gm	Water gm	Energy cal	Carbo-			Vitamins			Minerals																								
					hydrate gm	Fat gm	Protein gm	B <sub>6</sub> mg	E mg	Ca mg	P mg	Na mg	K gm	Mg mg	Cu mg																				
Candy Components of B1 and B1a Units Menus 1-4 and 1A-4A																																			
Cocoanut Disk																																			
	1.50 <sup>1</sup>	42.5	CA <sup>6</sup>	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	143.0	21.0	0.02	0.08	0.08	34.0	0.20															
	1.50 <sup>2</sup>	42.5	2.9	185	30.4	7.5	1.2	NA <sup>4</sup>	NA	NA	NA	NA	NA	20	NA	NA	NA	NA	NA	NA	NA														
Chocolate Fudge Disk																																			
	1.75	49.6	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	185.0	50.0	0.04	0.08	0.08	65.0	0.50															
	1.75	49.6	3.0	212	36.3	7.9	1.9	NA	NA	NA	NA	NA	NA	50	NA	NA	NA	NA	NA	NA	NA														
Enriched Sweet Chocolate Disk																																			
	2.00	56.7	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	319.0	194.0	0.02	0.23	0.23	142.0	0.90															
	2.00	56.7	0.6	287	34.4	17.0	3.9	NA	NA	NA	NA	NA	NA	95	NA	NA	NA	NA	NA	NA	NA														
Vanilla Cream Disk																																			
	1.75	49.6	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	CA	260.0	45.0	0.04	0.06	0.06	30.0	0.40															
	1.75	49.6	3.0	216	35.6	8.0	2.3	NA	NA	NA	NA	NA	NA	62	NA	NA	NA	NA	NA	NA	NA														
Average value																																			
	1.75	49.6	2.83	226	34.8	8.4	2.8	0.018	0.38	0.018	0.38	0.018	0.38	226.8	77.5	0.03	0.11	0.11	67.8	0.50															
	1.75	49.6	2.4	225	34.2	10.1	2.1	NA	NA	NA	NA	NA	NA	57	NA	NA	NA	NA	NA	NA	NA														
Dessert Component, Menu 5-8 Incl.																																			
Date Pudding																																			
	4.75	134.7	42.3	415	72.9	10.6	7.1	0.096	0.54	0.096	0.54	0.096	0.54	418.0	4.0	0.51	0.32	0.32	91.0	0.81															
	4.75	134.7	39.6	407	74.5	10.9	7.0	NA	NA	NA	NA	NA	NA	92	NA	NA	NA	NA	NA	NA	NA														
Fruitcake																																			
	5.00	141.8	36.8	506	74.3	18.6	10.4	0.139	0.89	0.139	0.89	0.139	0.89	9.9	14.0	0.52	0.28	0.28	341.0	1.40															
	5.00	141.8	27.9	550	81.5	24.5	6.2	NA	NA	NA	NA	NA	NA	74	NA	NA	NA	NA	NA	NA	NA														

See footnotes at end of table.

Table 4  
continued

Nutritive Values for Components of the Meal, Combat, Individual

	Weight		Water gm	Energy cal	Carbo- hydrate			Fat gm	Protein gm	Vitamins			Minerals					
	oz	gm			gm	gm	gm			B <sub>6</sub> mg	E mg	Ca mg	P mg	Na mg	K gm	Mg mg	Cu mg	
Pecan Cake Roll	4.00 <sup>1</sup>	113.4	18.8	485	63.4	22.4	7.4			0.116	0.71	407.0	11.0	0.52	0.06	34.0	0.90	
	4.00 <sup>2</sup>	113.4	16.6	486	64.4	22.8	8.2			NA <sup>4</sup>	NA	56.	NA	NA	NA	NA	NA	
Pound Cake	2.20	62.4	10.0	297	29.9	18.0	3.7			0.080	0.56	87.0	25.0	0.34	0.01	6.0	0.40	
	2.20	62.4	9.0	305	29.6	19.3	3.8			NA	NA	16	NA	NA	NA	NA	NA	
Average value	4.00	113.0	27.0	426	60.1	17.4	7.2			0.108	0.68	230.5	13.5	0.47	0.17	115.5	0.88	
Bread	4.00	113.0	23.3	437	62.5	19.4	6.3			NA	NA	60	NA	NA	NA	NA	NA	
	1.75	49.6	15.9	150	25.7	3.4	4.3			0.034	0.65	5.0	2.0	0.45	0.10	10.0	0.40	
B-1 Unit	1.75	49.6	15.8	158	23.0	5.1	4.8			NA	NA	18	NA	NA	NA	NA	NA	
7 Crackers	1.75	49.6	1.7	220	36.3	6.3	4.6			0.051	0.34	55.0	2.5	0.69	0.10	25.0	0.60	
	1.75	49.6	1.7	223	34.8	7.0	4.6			NA	NA	11	NA	NA	NA	NA	NA	
Peanut Butter	1.50	42.5	0.5	267	7.4	20.7	12.8			0.042	0.36	38.0	4.6	0.56	0.31	168.0	0.70	
	1.50	42.5	0.6	252	7.0	21.9	11.6			NA	NA	11	NA	NA	NA	NA	NA	
Candy Disks (Average)	1.75	49.6	2.8	228	35.1	8.5	2.8			0.018	0.38	227.0	78.0	0.03	0.11	68.0	0.50	
	1.75	49.6	2.4	225	34.2	10.1	2.1			NA	NA	57	NA	NA	NA	NA	NA	
TOTAL	5.00	141.7	5.0	715	78.8	35.5	20.2			0.111	1.08	320.0	85.1	1.28	0.52	281.0	1.80	
	5.00	141.7	4.7	700	76.0	39.0	18.3			NA	NA	79	NA	NA	NA	NA	NA	

See footnotes at end of table.



Table 4  
continued

Nutritive Values for Components of the Meal, Combat, Individual

	Weight			Water			Energy			Carbo-			Vitamins			Minerals					
	oz	gm	gm	gm	gm	cal	gm	gm	gm	hydrate	Fat	Protein	B <sub>6</sub>	E	Ca	P	Na	K	Mg	Cu	
													mg	mg	mg	mg	mg	gm	mg	mg	mg
<b>B-3 Unit Menus 9-12 Incl.</b>																					
Cocoa Beverage Powder	1.50 <sup>1</sup>	42.5	5.0	150	26.6	1.2	8.2	0.012	0.43	791	163.0	0.06	0.32	108.0	1.30						
	1.50 <sup>2</sup>	42.5	0.8	154	30.4	1.2	7.7	NA <sup>4</sup>	NA	250	NA	NA	NA	NA	NA						
Cookie, Sandwich	2.28	64.8	1.8	325	44.7	15.1	2.6	0.035	0.42	318	2.6	0.19	0.07	13.0	0.40						
	2.28	64.8	1.3	329	44.2	16.0	2.7	NA	NA	6	NA	NA	NA	NA	NA						
Jam	1.50	42.5	11.9	118	30.1	0.1	0.2	NA	NA	5	NA	NA	NA	NA	NA						
TOTAL	5.28	149.8	18.7	593	101.4	16.4	11.0	0.047	0.85	1109	165.6	0.25	0.39	121.0	1.70						
5.28	149.8	14.0	601	104.7	17.3	10.6		NA	NA	261	NA	NA	NA	NA	NA						
<b>Meal Components</b>																					
Menu 1 Beef Steak	5.50	155.9	101.0	250	0	7.5	45.4	0.142	1.06	31.2	280.6	0.87	0.84	62.4	1.2						
	5.50	155.9	99.9	281	0	12.5	39.3	NA	NA	8	NA	NA	NA	NA	NA						
Menu 2 Chicken and Noodles	5.50	155.9	112.7	195	21.5	5.9	14.0	0.111	1.25	327.4	31.2	1.60	0.06	109.1	1.9						
	5.50	155.9	111.8	231	15.1	11.7	14.8	NA	NA	20	NA	NA	NA	NA	NA						
Menu 3 Ham, Fried	5.50	155.9	96.4	289	0.08	14.6	39.3	0.129	1.59	93.5	171.5	1.46	1.73	78.0	2.5						
	5.50	155.9	100.4	279	0.5	14.8	33.4	NA	NA	8	NA	NA	NA	NA	NA						
Menu 4 Turkey Loaf	5.75	163.0	103.8	282	8.2	12.2	34.8	0.148	0.24	65.2	309.7	0.72	1.11	81.5	1.3						
	5.75	163.0	104.8	297	6.5	13.2	35.2	NA	NA	28	NA	NA	NA	NA	NA						

See footnotes at end of table.

Table 4  
continued

Nutritive Values for Components of the Meal, Combat, Individual

	Weight				Energy				Carbo-				Protein				Vitamins				Minerals			
	Oz	gm	gm	gm	cal	gm	gm	gm	gm	gm	gm	gm	gm	B <sub>6</sub>	E	Ca	P	Na	K	Mg	Cu			
Menu 5 Beans w/Franks in Tomato Sauce	11.50 <sup>1</sup>	326.0	229.0	507	37.6	27.8	26.3	0.298	2.45	423.8	195.6	2.93	1.21	195.6	3.3									
Menu 6 Beefsteak & Potatoes w/Gravy	11.50 <sup>2</sup>	326.0	233.1	440	42.4	19.6	24.5	NA <sup>4</sup>	NA	111	NA	NA	NA	NA	NA									
Menu 7 Ham & Lima Beans	11.50	326.0	251.3	356	13.4	16.6	38.5	0.504	2.55	97.8	130.4	4.08	1.43	97.8	4.9									
Menu 8 Meat Balls w/Beans in Tomato Sauce	11.50	326.0	248.4	339	17.3	9.8	43.7	NA	NA	23	NA	NA	NA	NA	NA									
Menu 9 Beef, Spiced w/Sauce	11.50	326.0	243.9	386	24.5	17.4	32.8	0.271	1.14	195.6	97.8	3.49	1.40	65.2	3.9									
Menu 10 Chicken, Boned	11.50	326.0	219.1	564	24.4	35.2	39.1	NA	NA	46	NA	NA	NA	NA	NA									
Menu 11 Ham and Eggs, Chopped	12.00	340.2	240.4	464	37.0	18.2	38.0	0.327	3.58	136.1	102.1	2.48	2.89	136.1	4.1									
Menu 12 Pork Steak	12.00	340.2	239.2	469	40.8	18.7	34.7	NA	NA	126	NA	NA	NA	NA	NA									
1. Contractor	5.50	155.9	105.2	229	-	7.1	41.2	0.150	2.07	62.4	171.5	0.73	1.22	93.5	2.5									
2. Institute	5.50	155.9	93.1	329	4.2	17.2	37.1	NA	NA	12	NA	NA	NA	NA	NA									
3. trace	5.75	163.0	114.9	254	-	12.4	34.5	0.072	1.30	81.5	114.1	0.77	0.28	81.5	1.1									
4. not analyzed	5.75	163.0	105.6	329	0	20.1	34.7	NA	NA	37	NA	NA	NA	NA	NA									
5. U.S.D.A.	5.50	155.9	103.4	306	0.4	22.5	25.2	0.150	1.37	202.7	289.8	2.06	0.45	62.4	1.1									
6. Composite analyzed	5.50	155.9	102.1	334	1.7	25.7	22.0	NA	NA	50	NA	NA	NA	NA	NA									
	5.50	155.9	94.2	343	-	19.9	40.9	0.159	0.86	46.8	140.3	0.61	1.22	78.0	1.1									
	5.50	155.9	99.0	315	0	19.5	32.4	NA	NA	5	NA	NA	NA	NA	NA									

Table 5

Nutritive Values for Menus of the Meal, Combat, Individual

	Weight oz	Water gm	Energy cal	Carbo-			Vitamins			Minerals					
				hydrate gm	Fat gm	Protein gm	B <sub>6</sub> mg	E mg	Ca mg	P mg	Na mg	K gm	Mg mg	Cu mg	
<u>Total Components Menus 1-4</u>															
Menu 1	17.06 <sup>1</sup>	483.7	245.3	1144	121.3	43.2	67.2	0.414	4.84	423.4	373.9	2.23	1.95	366.8	5.24
Menu 2	17.06 <sup>2</sup>	483.7	238.9	1171	122.3	52.8	58.7	NA <sup>3</sup>	NA	115	NA	NA	NA	NA	NA
Menu 3	17.06	483.7	257.0	1089	142.8	41.6	35.8	0.383	5.03	719.6	124.5	2.96	1.17	415.5	5.94
Menu 4	17.06	483.7	250.8	1121	137.4	52.0	34.2	NA	NA	127	NA	NA	NA	NA	NA
	17.06	483.7	240.7	1183	121.4	50.3	61.1	0.401	5.37	485.7	264.8	2.82	2.84	384.4	6.54
	17.06	483.7	239.4	1169	122.9	55.1	52.8	NA	NA	115	NA	NA	NA	NA	NA
	17.31	490.8	248.1	1176	139.5	47.9	56.5	0.420	4.02	457.4	403.0	2.08	2.22	387.9	5.34
	17.31	490.8	243.8	1187	128.8	53.5	54.6	NA	NA	135	NA	NA	NA	NA	NA
	17.12	485.4	247.8	1148	131.2	45.7	55.2	0.404	4.81	521.5	291.6	2.52	2.04	389.2	5.76
	17.12	485.4	243.2	1162	127.9	53.4	50.1	NA	NA	123	NA	NA	NA	NA	NA
<u>Total Components Menus 1A-4A</u>															
Menu 1A	19.00	538.6	306.7	1103	118.9	40.6	65.6	0.462	5.85	412.7	373.7	1.93	2.62	363.4	5.74
Menu 2A	19.00	538.6	298.1	1136	123.0	49.9	57.0	NA	NA	117	NA	NA	NA	NA	NA
Menu 3A	19.00	538.6	318.4	1048	140.4	39.0	34.2	0.431	6.04	708.9	124.3	2.66	1.84	410.1	6.44
Menu 4A	19.00	538.6	310.0	1086	138.1	49.1	32.5	NA	NA	129	NA	NA	NA	NA	NA
	19.00	538.6	302.1	1142	119.0	47.7	59.5	0.449	6.38	475.0	264.6	2.52	3.51	379.0	7.04
	19.00	538.6	298.6	1134	123.6	52.2	51.1	NA	NA	117	NA	NA	NA	NA	NA
	19.25	545.7	309.5	1135	127.1	45.3	55.0	0.468	5.03	446.7	402.8	1.78	2.89	382.5	5.84
	19.25	545.7	303.0	1152	129.5	50.6	52.9	NA	NA	137	NA	NA	NA	NA	NA
	19.06	540.4	309.2	1107	128.4	43.2	53.5	0.453	5.82	510.8	291.4	2.22	2.71	383.8	6.26
	19.06	540.4	302.4	1127	128.5	50.5	48.4	NA	NA	125	NA	NA	NA	NA	NA
1. Contract															
2. Institute															
3. Not analyzed															

Table 5  
continued

Nutritive Values for Menus of the Meal, Combat, Individual

	Weight oz	Water g <sup>m</sup>	Energy cal	Carbo- hydrate g <sup>m</sup>	Fat g <sup>m</sup>	Protein g <sup>m</sup>	Vitamins			Minerals								
							B <sub>6</sub> mg	B <sub>12</sub> mg	E mg	Ca mg	P mg	Na mg	K g <sup>m</sup>	Mg mg	Cu mg			
<b>Total Components Menu 5-8</b>																		
Menu 5	18.35 <sup>1</sup>	520.3	272.9	12.56	132.2	62.0	42.1	0.464	3.71	1301.3	279.5	4.42	2.16	382.1	5.22			
	18.35 <sup>2</sup>	520.3	272.5	1212	137.4	58.6	38.6	NA <sup>3</sup>	NA	334	NA	NA	NA	NA	NA			
Menu 6	18.35	520.3	295.2	1105	108.0	50.8	54.3	0.670	3.81	975.3	214.3	5.57	2.38	284.3	6.82			
Menu 7	18.35	520.3	287.8	1111	112.3	48.8	57.8	NA	NA	246	NA	NA	NA	NA	NA			
	18.35	520.3	287.8	1135	119.1	51.6	48.6	0.437	2.40	1073.1	181.7	4.88	2.35	231.7	5.82			
Menu 8	18.35	520.3	258.5	1336	119.4	74.2	53.2	NA	NA	269	NA	NA	NA	NA	NA			
	18.95	534.5	284.6	1213	131.6	52.4	53.8	0.493	4.84	1013.6	186.0	3.97	3.84	322.6	6.02			
	18.95	534.5	278.9	1241	135.8	57.7	48.8	NA	NA	349	NA	NA	NA	NA	NA			
<b>Average Menu 5-8</b>	18.50	523.9	285.1	1177	122.7	54.2	49.7	0.516	3.69	1090.8	215.4	4.74	2.68	310.2	5.97			
	18.50	523.9	274.4	1225	126.2	59.8	49.6	NA	NA	300	NA	NA	NA	NA	NA			
<b>Total Components Menu 9-12</b>																		
Menu 9	13.1	371.3	140.5	1026	139.5	26.9	57.5	0.234	3.71	1219.4	345.5	1.48	1.88	257.5	4.80			
	13.1	371.3	123.0	1144	143.6	40.7	52.9	NA	NA	307	NA	NA	NA	NA	NA			
Menu 10	13.3	378.4	150.2	1051	139.5	32.2	50.8	0.156	2.84	1238.5	288.1	1.52	0.94	245.5	3.40			
	13.3	378.4	135.5	1144	139.4	43.6	50.5	NA	NA	332	NA	NA	NA	NA	NA			
Menu 11	13.1	371.3	138.7	1103	139.9	42.3	41.5	0.234	3.01	1359.7	563.8	2.81	1.11	226.4	3.40			
	13.1	371.3	132.0	1149	141.1	49.2	37.8	NA	NA	345	NA	NA	NA	NA	NA			
Menu 12	13.1	371.3	129.5	1140	139.5	39.8	57.2	0.243	2.50	1203.8	314.8	1.36	1.88	242.0	3.40			
	13.1	371.3	128.9	1130	139.4	43.0	48.2	NA	NA	300	NA	NA	NA	NA	NA			
<b>Average Menu 9-12</b>	13.2	373.0	139.7	1080	139.6	35.3	51.7	0.217	3.04	1255.4	378.0	1.79	1.45	242.8	3.75			
	13.2	373.0	129.9	1142	140.9	44.1	47.3	NA	NA	321	NA	NA	NA	NA	NA			

1. Contract 2. Institute 3. Not analyzed

Table 6

Summary of Average Nutritive Values for Menus of the Meal, Combat, Individual

	Weight		Water gm	Energy cal	Carbo-		Vitamins			Minerals					
	oz	gm			hydrate gm	Fat gm	Protein gm	B6 mg	E mg	Ca mg	P mg	Na mg	K gm	Mg mg	Cu mg
Average values when menus 1-4 inc. are procured															
Menu 1-4	17.12 <sup>1</sup>	485.4	247.8	1148	1312	45.7	55.2	0.404	4.81	521.5	291.6	2.52	2.04	389.2	5.76
Menu 1-4	17.12 <sup>2</sup>	485.4	243.2	1162	127.9	53.4	50.1	NA <sup>3</sup>	NA	123	NA	NA	NA	NA	NA
Average values when menu 1A-4A incl. are procured															
Menu 1A-4A	19.00	540.4	309.2	1107	126.4	43.2	53.5	0.453	5.82	510.8	291.4	2.22	2.71	383.8	6.26
Menu 1A-4A	19.00	540.4	302.4	1127	128.6	50.5	48.4	NA	NA	125	NA	NA	NA	NA	NA
Menu 5-8	18.50	523.9	285.1	1177	122.7	54.2	49.7	0.516	3.69	1090.8	215.4	4.74	2.68	3102	5.97
Menu 5-8	18.50	523.9	274.4	1225	126.2	59.8	49.6	NA	NA	300	NA	NA	NA	NA	NA
Menu 9-12	13.15	373.0	139.7	1080	139.6	35.3	51.7	0.217	3.04	1255.4	378.0	1.79	1.45	242.8	3.75
Menu 9-12	13.15	373.0	129.9	1142	140.9	44.1	47.3	NA	NA	321	NA	NA	NA	NA	NA
Average menu 1-12	16.26	460.8	224.2	1135	131.2	45.1	52.2	0.379	3.85	955.9	295.0	3.02	2.06	314.1	5.16
Average menu 1-12	16.26	460.8	215.8	1176	131.7	52.4	49.2	NA	NA	248	NA	NA	NA	NA	NA
Average menu 1A-12	16.88	479.1	244.7	1121	129.5	44.2	51.6	0.395	4.18	953.3	294.9	2.92	2.28	312.3	5.33
Average menu 1A-12	16.88	479.1	235.6	1165	131.9	51.5	48.4	NA	NA	249	NA	NA	NA	NA	NA

1. Contractor
2. Institute
3. Not analyzed

Table 7

Comparison of Average Analyses on Individual Components  
with Composite Analysis

Nutrient	Contractor's Average		Composite <sup>1</sup>
	Menu 1-12	Menu 13-12 Per 100 gms	
Moisture, gm.	48.6	51.1	48.6
Energy, cal.	246	234	265
Carbohydrate, gm	28.5	27.1	23.3
Fat, gm.	9.8	9.2	11.8
Protein, gm.	11.3	10.8	11.4
Calcium, mg.	207.4	198.8	57.6
Phosphorus, mg.	64.0	61.6	13.26
Sodium, gm.	0.65	0.61	0.46
Potassium, gm.	0.45	0.48	0.40
Magnesium, mg.	68.2	65.2	43.28
Copper, mg.	1.12	1.11	1.80

1. Institute analyses

Table 8

Comparison of Meal, Combat, Individual with AR 40-564<sup>1</sup>

	Calories	Protein gm	Calcium mg
Average Menus 1-12	1135 <sup>2</sup>	52.2	956
	1176 <sup>3</sup>	49.2	248
Average Menus 1A-12	1121	51.7	952
	1165	48.4	249
AR-40-564	1200	33.3	233

1. Values represent one-third of the ration requirements
2. Contractual data
3. Institute data

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