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NUTRIENT CONTENT OF THE MEAL, READY-TO-EAT 1988 - 1999

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Doris E. Sherman

Military Nutrition Division

February 2002

U.S. Army Research Institute of Environmental Medicine Natick, Massachusetts 01760-5007

DISCLAIMER

The opinions or assertions contained herein are the private views of the author and are not to be construed as official or as reflecting the views of the Army or the Department of Defense.

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INTRODUCTION

The Meal, Ready-to-Eat (MRE) is the current standard operational ration for the individual U.S. military warfighter in the field. It contains food components that are ready to eat and require no preparation except for the reconstitution of the powdered beverages. Packaging is designed to be lightweight, flexible and suited for portability. MRE meals are packed 12 to a case to provide a variety of menus, interchangeable for breakfast, lunch and dinner. The first version of the ration, MRE I, was fielded in 1981, with other versions of the ration produced each following year.

Feedback obtained during field tests on MRE I - VII resulted in major changes being implemented in later components and menus. When MRE VIII was fielded, twothirds of the entrees found in MRE I - VII had been eliminated, including the two freezedried entrees (beef and pork patties). The weight of most of the combination entrees had also stabilized to 8 ounces by 1988, whereas in previous MREs (I - VII), many of the entrees began as 5-ounce servings. After MRE V, the freeze-dried potato patties had also been eliminated, leaving the fruits as the only freeze-dried items in MRE VIII -XV. After MRE VII, the candies were from commercial sources rather than military specification items. Through MRE XV, there were 12 menus in the ration. Beginning with MRE XVI, the number of menus increased to 16. MRE XVII had 20 menus, and all later versions of the MRE had 24 menus.

This paper will concentrate on the nutrient content of MRE VIII - XIX. As stated above, MRE VIII was quite different from earlier versions of the ration. Likewise, the nutrient data provided for MRE XX will be from a different source than earlier data because it will be provided by the manufacturers and generated from a computer program. In contrast, the nutrient data for components of MRE VIII - XIX were mainly obtained from laboratory analyses funded by the government. Thus, the data for this report consist of mainly laboratory-analyzed data, and the principles used in developing the nutrient database for this report were consistent. Finally, the same Nutritional Standard for Operational Rations (NSOR) has been used since 1985, and it is appropriate to compare these MRE data to this standard. Therefore, this report should be reliable for indicating trends in the nutrient content of the MRE from 1988 - 1999 and will recommend improvements for future versions of the ration. While the data presented in this paper evaluate the ration as planned, not as consumed, the paper will also point out why researchers must be aware of what nutrient database is being used to analyze reported studies.

NUTRIENT DATABASE

The nutrient data being presented were derived from the Natick/USARIEM Nutrient Database for Military Operational Rations, Third Edition, 1999 (7), developed as a joint effort between the Combat Feeding Directorate at the Natick Soldier Center (NSC) at the United States Army Soldier and Biological Chemical Command and the Military Nutrition Division at the United States Army Research Institute of Environmental Medicine (USARIEM). Over the years, NSC managed the contracts and the in-house laboratory used to determine the nutritional content of the MRE components. From 1971 - 1993, the Combat Feeding Directorate maintained a nutrient database on mainframe computers. In 1993, USARIEM converted the database to the database management system Paradox (4) on a personal computer. Fields were added to the old format (e.g., to identify the source of the information). After compilation, a committee reviewed the data for each component. Although only 31 nutrients were reviewed, other nutrients (e.g., selenium) were included in the database for future reference. A computerized nutritional analysis program (2,3) was used to analyze the formulations (recipes) for each food component, whether derived from the military specification for earlier components, or from the ingredient statement on the nutrition facts label for later components. If laboratory values were not available and therefore had not been entered into the database for one or more of a component's nutrients, a value was imputed for the missing value(s) to complete the profile of 31 nutrients. The following were used as guidelines for imputing the missing values: analyses which indicated values less than the laboratory's detectable limit; information generated from the computerized nutrient analysis of the component's formulation; data from the United States Department of Agriculture (USDA) and commercial databases for similar items and communications with the developers of the products. Using the formula generated from the computer analysis of the product, the calculated energy values were determined for each component using USDA values for energy (8).

Programs were written to generate the summarized data for each component of the MRE from the data in the database. In doing this, data were compiled for a newly produced component based on a random number of samples, representative of all manufacturers. To create the final nutrient profile for each component, several new fields were generated. Carbohydrate was determined by difference (carbohydrate = weight - [water + protein + fat + ash]), and energy was determined using the calculated energy values. For the vitamins, a value for total vitamin A (vitamin A and carotene) was compiled and converted from International Units to Retinol Equivalents. From the data on the individual fatty acids, the total saturated, monounsaturated and polyunsaturated fatty acids were determined.

The nutrient data in this report reflect the compilation of data for the individual components being procured at the time and not subjected to storage. Therefore, a formulation, fortification or weight change would be reflected in the data. Since there was less variability in the MRE VIII - XV components made using a military specification that included a formulation, the earlier nutritional data were considered more reliable. The more recent versions of the MRE (XVI and later) include food components that were not required to be prepared according to a formulation specified by the military. Therefore, manufacturers of products made after 1995 could be using a different formulation to produce dissimilar components with the same name. Data representative of all manufacturers were combined to provide a generic value for these later versions of the MRE.

DESCRIPTIVE DATA for MRE VIII - XIX

COMPONENTS and MENUS

Appendix A presents the components available in the various versions of the MRE. The summary at the end of Appendix A suggests that as the MRE evolved and the number of menus increased, there was a tendency toward fewer components per menu. However, the decline in the average number of components per menu in the later MREs was due in large part to the substitution of new beverage items in place of three components (coffee, cream and sugar) in approximately half of the Accessory Packets in MRE XVII, XVIII and XIX. In fact, by excluding the components in the accessory packet from the count, the variety of MRE items has more than doubled over the years. Varieties within some food components (fruits, cakes, candies and beverages) and the recently added snacks have considerably increased the consumers' choices. However, there have been exceptions to this trend. For example, there were fewer occurrences of fruits in the later versions of the ration due to weight considerations. A serving of the newer thermostabilized fruits was approximately nine to ten times heavier than the freeze-dried fruits.

Appendices B - J provide menus for MRE VIII - XIX, and Appendix K presents more detailed information on the nutrient content of the individual meals in MRE XIX.

WEIGHT

The data in Table 1 indicate the average weights of the MRE, without the packaging, for the different versions of the MRE over the past 12 years. While there have been some fluctuations, the weight has tended to increase since MRE VIII.

MRE Version	Weight+Std Dev
VIII & IX	473 <u>+</u> 47
Х	460±50
XI & XII	480 <u>+</u> 51
XIII & XIV	466 <u>+</u> 59
XV	475 <u>+</u> 40
XVI	511 <u>+</u> 60
XVII	514 <u>+</u> 54
XVIII	491 <u>+</u> 71
XIX	495+68

Table 1. Average Gram Weight of the MRE.

NUTRIENT CONTENT of MRE VIII - XIX

Analyses of Variance were run on the data for MRE VIII - XIX using SAS Statistical Software (5), with significant differences between means determined using Table 2. Meal, Ready-to-Eat Nutrient Content.

Meal, Ready-to-Eat XI & XII (12 menus) Meal, Ready-to-Eat XIII & XIV (12 menus) Meal, Ready-to-Eat XV (12 menus) Meal, Ready-to-Eat XVI (16 menus) Meal, Ready-to-Eat XVII (20 menus) Meal, Ready-to-Eat XVII (24 menus) Meal, Ready-to-Eat XIX (24 menus) <u>MRE Version</u> Meal, Ready-to-Eat VIII & IX (12 menus) Meal, Ready-to-Eat X (12 menus)

	<u>Water</u>	Energy	<u>Protein</u>	<u>Fat</u>	Carb	<u>D Fiber</u>	<u>Ash</u>	ଣ	리	BMG	0 .	ΣI	Na	님	3	୰
MRE	D	<u>kcal</u>	0	5	0	5)	01	<u>Bm</u>		ᇤ	<u>60</u>	<u>bu</u>	<u>6m</u>	핍	<u>6m</u>	0
MRE VIII & IX	209.91	1228	43.51	47.49	162.97	7.07	8.13	314	7.21	142	711	1215	1771	5.62	0.907	3.8
MRE X	210.27	1168 a	42.60	45.05	154.04	6.95	7.92	304	7.13	137	703	1152	1744	5.60	0.905	3.8
MRE XI & XII	213.24	1241	43.18	47.46	167.00	7.14	8.13	322	7.52	142	718	1169	1788	5.72	0.953	3.9
MRE XIII & XIV	214.39	1197	40.35	50.13	152.47 a	7.07	8.05	314	7.40	136	701	1186	1776	5.56	0.942	3.9
MRE XV	217.53	1235	40.70	53.22	155.03	7.49	8.18	328	7.49	142	727	1205	1797	5.45	0.978 a	3.9
MRE XVI	233.94	1299 b	38.22	50.73	179.50 b	7.54	8.04	304	7.31	133	673	1091	1838	5.21	0.956 a	4.1
MRE XVII	245.67	1270 b	39.34	51.97	168.50	7.68	8.26	296	7.27	136	639	1038	1943	5.17	0.861	4.5
MRE XVIII	232.82	1224	37.23	51.32	160.47	7.28	8.49	350	6.74	130	623	1043	2056	4.82	0.730 b	4.8
MRE XIX	233.85	1241	38.13	52.39	161.68	7.66	8.72	372	6.80	137	653	1086	2075	4.89	0.758	4.8
One-third NSOR *		1200	33.33	<53.33	146.67			267	6.00	133	267	625-1875	<1667-2333	5.00		

	Vit C	<u>Thiamin</u>	<u>Ribo</u>	Niacin	Vit B6	<u>Folate</u>	<u>Vit B12</u>	Vit A tot	/it A tot	<u>Carotene</u>	<u>Vit E</u>	<u>SFA</u>	MFA	PFA	<u>Chol</u>
MRE	Bu	bu	ᇤ	<u>6</u> Ш	<u>5</u>	mcg	mcg	2	RE	RE	<u>60</u>	5	D)	Ø	
MRE VIII & IX	161.5	2.376	1.033	12.864	2.62	60 a	1.48	4828	1284	82.13	5.9	16.47	20.99	6.76	126
MRE X	146.5	2.367	0.999	12.475	2.64	58 a	1.49	4823	1283	82.04	5.7	15.31	20.17	6.41	124
MRE XI & XII	144.5	2.374	1.032	12.513	2.65	59 a	1.51	4920	1294	91.30	5.8	16.91	20.77	6.52	125
MRE XIII & XIV	133.0	2.408	1.009	12.070	2.63	57 a	1.42	4835	1284	83.37	5.0	18.42	21.92	6.42	128
MRE XV	134.5	2.487	1.007	12.931	2.72	56 a	1.38	5138	1359	91.24	4.9	19.31	23.43	6.93	108
MRE XVI	158.6	2.365	1.001	12.700	2.58	55 a	1.30	4785	1227	104.61	5.6	17.19	22.60	7.46	66
MRE XVII	134.3	2.304	0.990	13.482	2.55	59 a	1.29	4425	1145	91.65	5.8	16.33	23.12	8.68	101
MRE XVIII	91.4	2.382	1.022	12.917	2.53	62 a	1.12	4569	1189	91.29	5.8	15.85	22.48	8.94	92
MRE XIX	93.2	2.386	1.017	13.337	2.56	128 b	1.13	4677	1220	92.23	5.9	15.91	23.23	9.31	91
One-third NSOR	20.0	0.600	0.733	8.000 NE	0.73	133	1.00		333		3.3				

* NSOR = Nutritional Standard for Operational Rations For each nutrient, means with different letters are significantly different at p \leq 0.05 For each nutrient, means with no letters are not significantly different

Tukey's Studentized Range (HSD) Test, and reported in Table 2. The menu totals were averaged to provide the means for each version of the ration. See Appendix K for the MRE XIX data used for presentation in Table 2. The data for each nutrient were compared over the nine versions of the MRE. Because the menus were the same for MRE VIII and IX, as well as for XI and XII, and XIII and XIV, the data for these ration pairs were combined. One third of the daily NSOR is presented throughout this report as a basis for comparing the average meal to the requirements established for the military services in the Nutrition Allowances, Standards and Education, AR 40-25 (1).

PROXIMATES

<u>Water</u>

Although not statistically significant, it appears that there has been a tendency for the water (moisture) content of the MRE to increase over the years (Table 2). The addition of rice dishes in MRE XVI, and buttered noodles in MRE XVIII, contributed to the tendency for moisture content to rise. In addition, the fruits were converted from a freeze-dried product to thermostabilized fruits starting in MRE XIII and XIV, with the largest number of occurrences of thermostabilized fruits in MRE XVI and XVII (Appendix A). The water content of these components also affects the final weight of the ration. In correlating weight with the proximate nutrients that make up the weight of any component (water, protein, carbohydrate, fat and ash), water and weight had the highest correlation.

The moisture contained in ration components contributed to the warfighters' fluid intake, as does consumption of the MRE beverages. Many of the beverage components require rehydration, as shown in Table 3. The 2 fluid ounces of water sometimes used to reconstitute the freeze-dried fruits found in MRE VIII - XV is not included in Table 2 or 3. One reason for the decreased requirement for water in the later MREs is the substitution of one beverage that could be consumed either hot or cold for two beverages, one hot and one cold, in earlier versions of the ration.

Requirements	MRE	MRE	MRE	MRE	MRE	MRE	MRE	MRE	MRE
Requirements	VIII&IX	х	XI&XII	XIII&XIV	XV	XVI	XVII	XVIII	XIX
Average water req/menu	24	22	22	20	19	22	17	16	16
Range of water reg/menu	20 - 26	18 - 24	18 - 24	18 - 24	18 - 20	18 - 26	8 - 24	8 - 26	8 - 26

Table 3. Water Requirements (fluid ounces) to Reconstitute Beverages.

Energy

MRE X contained significantly less energy compared to MRE XVI and XVII, which contained the highest number of kilocalories. These three MREs were also the lightest (X) and heaviest (XVI and XVII) in weight. The broadest range of energy per menu within any given version of the MREs was in MRE XVI, which contained the two

menus in the different versions of the MREs in this report with the least and most energy (approximately 1084 kcal in Menu 11 and approximately 1555 kcal in Menu 5). The energy values will vary in proportion to the macronutrients, since energy is calculated from the protein, fat and carbohydrate content. The percentages (Table 4) of calories from protein, fat and carbohydrate have fluctuated slightly over the years, with the percentage of calories from protein showing the most consistent pattern of change.

MRE version	Protein	Fat	Carbohydrate
VIII & IX	14	34	52
X	14	34	52
XI & XII	14	34	53
XIII & XIV	13	37	50
XV	13	38	49
XVI	12	34	54
XVII	12	36	52
XVIII	12	37	51
XIX	12	37	51

Table 4. Percentage of Calories from Protein, Fat and Carbohydrate.

Protein

Table 2 indicates that the amount of protein in the MRE has tended to decline over the years. The same pattern is apparent when the protein content of the ration is expressed as a percentage of calories (Table 4). This tendency was mainly due to the lower levels of protein in the entrees, especially the vegetarian entrees in the later versions of the ration. For MRE VIII - XV, the main contributors of protein per serving were the entrees. For MRE XVI - XVIII, the top contributors of protein on a per serving basis were the non-vegetarian entrees, followed by peanut butter and then the vegetarian entrees. For MRE XIX (24 menus), there were 20 non-vegetarian entrees, which provided the most protein on a per serving basis, followed by nut raisin mix and peanut butter, which contributed more protein per serving than the four vegetarian entrees. On average, the four vegetarian meals in MRE XIX provided 29.78 grams of protein, which falls below one-third of the NSOR (33.33 grams). Yet, the average protein for the MRE (including MRE XIX) exceeded the nutritional standard.

Fat, Saturated Fatty Acids and Cholesterol

Of the groups of components described in Appendix A, the spreads contributed more fat on a per serving basis to the average ration than the entrees or any other group of components. Because there are more fat-containing spreads than fat-free spreads being offered as components in later versions of the MRE, the fat content of the MRE has shown a tendency to rise. Of the spreads offered in the menus (see Figure), the percentage of fat-containing spreads (peanut butter and cheese spreads) has increased from 67% of the spreads in MRE VIII - XIV to 75% - 85% for MRE XV -

XIX. Even with the addition of jam in MRE XVII, the percentage of jelly and jam in the spreads has decreased (see Figure). The average fat in the MRE versions considered in this report has met the nutritional standard.



Of all the components in MRE VIII - XII, cheese spread contributed the most saturated fat per serving. In MRE XIII - XIX, frankfurters and the cheese spreads contributed the most saturated fat on a per serving basis. As seen in Table 2, the cholesterol level appears to be higher in the earlier versions of the MRE. Before 1995, the Omelet with Ham component primarily affected the higher cholesterol content of the ration but was eliminated after MRE XIV. Since the 1985 NSOR did not have a standard for saturated fatty acids (SFA) or cholesterol, the MRE was not designed to meet any requirement.

Carbohydrate and Dietary Fiber

There was a significant difference found between the carbohydrate content of MRE XIII/XIV and XVI. The difference in carbohydrate content appears to be attributable to changes in the beverage components. There were more beverages offered in MRE XVI (1.9 per meal) versus MRE XIII/XIV (1.6 per meal). In addition, 50% of the beverages in MRE XIII/XIV were sweetened with aspartame rather than sugar. The aspartame-sweetened beverages, which only appeared in MRE XIII - XV, are no longer part of the ration. Despite these variations, the MRE consistently met the NSOR for carbohydrate.

Although changes did not achieve statistical significance, the data in Table 2 suggest a slight tendency for dietary fiber to increase over the years. The increasing occurrences of peanut butter in the later MREs contributed to the tendency for the dietary fiber content to increase. Since there is no military standard for dietary fiber in the rations, the rations were not designed to provide a specified amount.

MINERALS

<u>Calcium</u>

The calcium content of the MRE has been fairly consistent since 1988, with a slight tendency towards higher levels in MRE XVIII and XIX. The fortified crackers have had a large impact on the calcium content of the MRE because they were found in so many menus, but plain crackers with unsalted tops were not the largest contributors of calcium on a per serving basis. For MRE VIII - XVII, cheese spread was the largest contributor of calcium on a per serving basis. In MRE XVIII and XIX, the vegetable crackers, made according to the military specification, were contributing the most calcium on a per serving basis. In MRE XIX, cheese spread, wheat snack bread and the chocolate sport bar provided more than 100 mg calcium per serving.

Iron

While the data presented in Table 2 show that the iron content has met the NSOR, there seems to be a tendency for the iron content to be decreasing, possibly attributable to declining levels of iron in the individual entrees. For example, the iron content per serving of the entrees in MRE VIII ranged from 1.34 mg to 4.35 mg and for entrees in MRE XIX, from 0.42 mg to 3.67 mg.

Magnesium, Phosphorus and Potassium

For all versions of the MRE considered except MRE XVIII, the average amount of magnesium per meal met the NSOR. The MRE menus provide phosphorus well in excess of the NSOR. The potassium in the MREs was within the range stated in the NSOR.

<u>Sodium</u>

The data in Table 2 indicate that the sodium in the MREs was within the range stated in the NSOR, with MRE XVIII and XIX slightly exceeding 2000 mg in the average meal. The range for the MRE meals varied from a low of less than 1000 mg (Menu 10 in MRE XIV) to over 3000 mg (Menu 4 in MRE XVIII and XIX). The calculations of the sodium per meal DID NOT include the salt packet that would provide 1550 mg of sodium per 4-gram packet.

Zinc 2

While the differences in zinc content of the MRE have not achieved statistical significance, zinc values have tended to decline and are below the nutritional standard for the operational ration in MRE XVIII and XIX. Zinc is correlated with protein in most dietary assessments and, as mentioned above, there appears to have been a tendency toward less protein in the ration. After MRE XVII, the elimination of the oatmeal cookie

bar, which was fortified with a mineral premix containing zinc, has also contributed to the lesser amounts of zinc. While the fruit bar, which appeared in MRE XVIII and XIX, was fortified with zinc, this item contained only about 70% as much zinc as the oatmeal cookie bar. In addition, the fruit bar is a commercial item, and since there is no requirement (in the military document) that it contain added zinc, its fortification is at the discretion of the manufacturer.

Copper

The statistical analysis of the MRE showed that the copper content of MRE XVIII was significantly lower than the copper content of MRE XV and XVI. Again, the elimination of the oatmeal cookie bar, which was fortified with a mineral premix containing copper, contributed to this decrease. When ranked with all of the components for MRE VIII through MRE XVII, the oatmeal cookie bar consistently provided the most copper on a per serving basis. Copper is not one of the required nutrients in the NSOR.

VITAMINS

Vitamin C

Although not statistically significant, Table 2 suggests a tendency for a decline in the amount of vitamin C in the MREs over the years. MRE VIII and IX appear to have slightly more vitamin C than the other MRE versions, since the instant coffee was fortified with vitamin C in the earliest MREs. Applesauce, which has added ascorbic acid, was in only one menu in MRE XVIII and XIX (4% of 24 menus), whereas in MRE VIII - XVII, applesauce was in 15% - 19% of the menus. In MRE XVIII and XIX, spiced apples, which do not have ascorbic acid added, replaced applesauce. There are also fewer beverages fortified with vitamin C available in later versions of the MRE (XVI - XIX). All of these factors contributed to the tendency toward lower amounts of vitamin C available in the later versions of the ration.

Thiamin, Riboflavin, Niacin and Vitamin B₆

As Table 2 shows, each of the MRE versions contained amounts of four B vitamins (thiamin, riboflavin, niacin, vitamin B_6) that exceeded the NSOR. Part of the reason for this is the fortification (thiamin, riboflavin, niacin, vitamin B_6 and calcium) of the crackers in the MRE. In addition to the fortification required according to the military specification, the Food and Drug Administration (FDA) enrichment of grain products mandated the addition of thiamin, riboflavin and niacin. Cocoa, cheese spread, peanut butter, chocolate-covered cookies and chocolate-covered brownies were all fortified with vitamin B_6 . In Table 2, niacin equivalents used for the NSOR include the niacin available from the amino acid, tryptophan. Calculating niacin equivalents (NE) for the MREs would result in a range of 18.794 NE (for MRE XIV) to 20.116 NE (for MRE VIII), well in excess of one-third of the NSOR.

Folate

The folate content of the earlier MREs (VIII - XVIII) was consistently less than half of the NSOR. For MRE XIX, the folate data were calculated assuming that the manufacturers were enriching selected grain products with folic acid according to the 1998 FDA guidelines, and complying with the military documents, which require enrichment. Therefore, the statistical analysis shows a significant increase in the average folate value for MRE XIX when compared to the other versions of the MRE considered (Table 2). While the amount of folate available in MRE XIX was significantly higher than previous versions of the MRE, levels still remained slightly below the NSOR.

Vitamin B₁₂

Vitamin B_{12} is usually found to be associated with protein intake derived from animal sources. Therefore, it was not surprising that the amount of this vitamin tended to decline, especially with the introduction of the vegetarian entrees. Vitamin B_{12} was nonexistent or found in very small amounts (<0.15 mcg) in the four vegetarian meals in MRE XIX (Menus 11, 12, 13, 14). Therefore, any consumer who chooses to eat only the vegetarian meals would not be receiving adequate amounts of vitamin B_{12} to meet the military standard. Yet, unrestricted consumption of all components in each version of the MRE (including MRE XIX) would provide sufficient vitamin B_{12} to meet the NSOR.

Vitamin A and Vitamin E

The MREs met the NSOR for vitamin A because the vitamin was included as part of the fortification in cocoa, cheese spreads, peanut butter, chocolate-covered cookies and chocolate-covered brownies. Total vitamin A was derived from combining vitamin A and carotene. Vitamin E content of the MRE has been fairly consistent over the years and exceeded the requirement of the NSOR.

OTHER NUTRIENTS

Ash, chloride as NaCl, monounsaturated fatty acid (MFA) and polyunsaturated fatty acid (PFA) content of the rations presented in Table 2 will not be discussed. The ash content is presented for information only since these values are used to calculate carbohydrate by difference. Chloride generally parallels the sodium content and is reported because the food technologists use this as an indicator of the salt content of the products. The fatty acids (MFA and PFA) are presented because, along with the SFA, they make up the total fatty acids.

DISCUSSION

The composition of the MRE underwent many changes between 1988 and 1999. The numbers of menus and components increased, and there were more commercial

items added to the ration. Yet, the changes did not necessarily mean a pattern of improvement in the nutritional content of the ration. The military specifications for ration components have been replaced, in many cases, by documents leading to more variability in the components and, subsequently, in the nutrient content within the ration. Therefore, the ration designers cannot rely on the manufacturers to consistently provide a product with the same ingredients, fortification or weight in successive years. In January 1998, the FDA law that added folic acid to the required enrichment (thiamin, riboflavin, niacin and iron) for selected grains affected the military components and increased the overall folate content of the ration. In response to surveys of consumers' food preferences, the MRE now contains vegetarian meals, more fat-containing spreads and more commercial items. Yet, looking at MRE XIX, the four vegetarian meals on average contained less protein and vitamin B₁₂ than the non-vegetarian meals in that version of the ration. The increase in fat-containing spreads (cheese spreads and peanut butter) in the ration has resulted in a pattern of higher fat content in the MRE. While the fat-containing spreads are fortified (thiamin, vitamins A, B₆, and C), the total amounts of these four vitamins in MRE XIX menus are more than three times the NSOR. The use of aspartame to sweeten beverages in MRE XIII - XV resulted in a lower carbohydrate level, and the aspartame-sweetened beverages have been eliminated from later versions of the ration. Elimination of the oatmeal cookie bar, which contained a mineral premix, has contributed to the tendency toward lower levels of zinc, copper, magnesium and iron in the MRE. While the oatmeal cookie bar was replaced with a commercial item, popular with the warfighter, the nutrient content of this item may vary from one year to the next.

Fortification is the most common means employed to improve the nutrient content of the MRE. However, the need for fortification should be considered on a case-by-case basis in order to best utilize resources. Using MRE XIX as an example, the meals would meet the requirements for the B vitamins (thiamin, riboflavin, niacin and vitamin B₆) in AR 40-25 without the fortification currently required according to the military documents. Yet, vitamins A, C and calcium must be added in order to meet the standard in AR 40-25. Thus, there are some nutrients that are added to excess, some nutrients added in order to meet the NSOR, while others that do not meet the standard are not added. Zinc (in MRE XVIII and XIX) and folate, which were not part of the fortification, fell below the standard and should be added. There are other nutrients, such as magnesium, which only slightly exceed the NSOR in the menus as they were planned and may not meet the military standard if all components of every meal in the ration were not eaten. Since the distribution of nutrients among the components influences nutritional adequacy, nutrients, such as magnesium, should be considered as an addition to the fortification to insure compliance with the military standard.

The nutrient data in the Natick/USARIEM Nutrient Database for Military Operational Rations, Third Edition (7), are generally considered more accurate than the pre-1993 database, because more laboratory analyses on additional samples were available. Furthermore, the new database format provided a means to more easily review the data for accuracy and consistency. Moreover, recent USDA data were used for the calculations in the reported database. Therefore, readers of reports on the MRE should be aware of what nutrient database was used for analysis of the data. This will be a continuing concern, as the new nutrient data, based on the computer analyses generated by the MRE contractors, becomes the standard for MRE nutrient data, beginning with MRE XX. Nutrient data will seldom be a perfect match for the components being used for a study because of the variability in ingredients, formulations, production lots and storage of the products. Even if all components were analyzed, there may be problems when there are only limited laboratory analyses available and extensive analyses are generally cost prohibitive.

To use a 1995 technical report as an example, the "Nutrient Intakes and Nutritional Status of Soldiers Consuming the Meal, Ready-to-Eat (MRE XII) During a 30-Day Field Training Exercise" (6) was analyzed using the pre-1993 database. While the intake data were not reanalyzed, a comparison of the average MRE XII meal calculated from data in the older database (used in the 1995 report) was made with the average per meal data from the Natick/USARIEM Nutrient Database for Military Operational Rations presented in this paper. A t-test (5) revealed statistically significant differences (p<0.05) for seven nutrients. Dietary fiber, copper and the fatty acids (saturated, monounsaturated and polyunsaturated) were not compared because they were not reported in the pre-1993 database. As presented in Table 5, energy, protein and calcium were significantly less when calculated using the newer version of the database, and the amounts of the following nutrients significantly increased in the latest analysis of MRE XII menus: iron, zinc, vitamins B₆ and B₁₂. These data represent the average meal and must be multiplied by 3 to determine the average daily amount available. Thus, when looking at energy, for example, there could be as much as a 320 kcal difference in the daily meals as they were planned, depending on which database was used for the analysis.

Table 5. Comparison of Nutrients from MRE XI - XII Using Two Datab	ases.
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Database	Energy (kcal)	Protein (g)	Ca (mg)	Fe (mg)	Zn (mg)	Vit B ₆ (mg)	Vit B12 (mcg)
Pre-1993	1348	49.17	513	6.08	3.35	1.91	0.88
Natick/USARIEM	1241	43.18	322	7.52	5.72	2.65	1.51

RECOMMENDATIONS

Review of the nutrient content of MRE VIII - XIX suggests that improvements could be made. The amounts of magnesium, zinc and folate in MRE XIX were very close to the NSOR and should be increased in future versions of the MRE. In order to reverse the pattern of increasing fat (which is approaching the NSOR), a reduction in the package weight of the fat-containing spreads or a decrease in the number of these spreads in the MRE should be considered.

In addition to the nutrients which should continue to be added (calcium, vitamin A and C) to meet the NSOR, magnesium, zinc and folate should be considered as

nutrients to be added via fortification. In changing fortification of MRE components, new documents should specify an upper as well as a lower tolerable limit for each nutrient added, since several nutrients (thiamin, vitamins A, B₆ and C) contribute more than three times the standard set in AR 40-25.

Finally, when evaluating research reports and subsequently establishing ration policy, the reliability and accuracy of the nutrient database used for analyzing data must be considered. Changes in trends over time may be attributable to the nutrient database used rather than actual changes in the composition or consumption of the ration.

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APPENDIX A Components in MRE VIII - XIX

	VIII&IX	Х	XI&XII	XIII&XIV	XV	XVI	XVII	XVIII	XIX
Entree	(12 menus)	(16 menus)	(20 menus)	(24 menus)	(24 menus)				
Prk Rice BBQ	1	1	1	1	1	1	1		
Crn Beef Hsh	1	1	¦ 1	¦ 1		 	1		
Chicken Stw	1	1	¦ 1	¦ 1	1	¦ 1	¦ 1	1	1
Omlet w/Ham	1	1	1	¦ 1	t 1	l t	 	l	
Spag Mt Sce	1	¦ 1	¦ 1	1	¦ 1	¦ 1	¦ 1	1	1
Chick ala king	1	¦ 1	¦ 1	1	 	 	 	1	1
Beef Stew	1	¦ 1	¦ 1	¦ 1	¦ 1	¦ 1	¦ 1	¦ 1	1
Ham Slice	1	ំ 1	1	¦ 1	1	2	¦ 1	¦ 1	1
Mtballs in Sce	1	; 1	1	1	t I	l I	I I	 	
Tuna Noodle	1	1	1	1	1	¦ 1	¦ 1	1	1
Chicken Rice	1	i 1	i 1	1	¦ 1	1	¦ 1	1	1
Esc Pot Ham	1	. 1	i 1	1	i 1	1	1	t	1
Franks		ł	l l	1	1	1	i 1	1	1
Pk Chow Mein		1	1	1	į 1	1	i 1	i 1	1
Chili Mac		1	1	1	i 1	1	i 1	1	1
Grilled Chicken		1	1	1	. 1	1	່ 1	1	1
BeefSteak		1	1	1	1	1	1	1	1
Pasta w/veg (v)	-	1		1	1	1	1	1	1
Cheese Tortellini (v)		1	1	1		1	1	<mark> 1</mark>	1
Pork Chp Noodles		1	1	1	1	1	1	<mark> 1</mark>	1
Chicken Noodles		1 1	l t	1	l l	1	1	¦ 1	1
Chicken Cavatelli		i I	1	1	1	1	¦ 1	1	1
Beef Ravioli		1	I I	1	1 I	1	¦ 1	1	¦ 1
Turkey Potatoes		I I	1	l l	I , I	1	1	1	1
Beef Mshrm		l I	I I	l I	1	1	¦ 1	¦ 1	¦ 1
Beef Teriyaki		1	1	1	1	1	1	¦ 1	1
Chicken Salsa		1	1	1	1	l I	l l	¦ 1	1
Bn&Rce Burrito (v)		1	1	T T	1	1	1	¦ 1	¦ 1
Pasta Alfredo (v)		1	1	1	1	1	1	¦ 1	1
Chicken Thai Sce		1	1	1	1	1	1	1	¦ 1
Meatloaf		1	1	1	1	1	1	1	¦ 1

(v) Vegetarian entree

Fruit									
Fruit dry 3 - 4 varieties	5	5	4	3	2	1	1	1	1
Appiesauce	2	2	2	2	2	3	3	1	¦ 1
Fruit wet 3 - 4 varieties		1	l l	¦ 1	2	5	7	¦ 4	4
Spiced Apple		E I	1	1	l ł	1	1	2	2
Starch Cracker	12	12	12	12	12	16	20	12	11
Chw Mein Nd	2			. 1	- 	1	. 1	. 1	1
Mexican Rice		1	1 1			2	2	2	3
White Rice		1	1	1	1	2	¦ 3	4	¦ 3
Vegetable Cracker		1	1	1	l I	1	1	12	¦ 11
Noodles in Sce		1	1	1	1	l l	1	2	2
Wht Snack Bread		1	1	 	1	l i	1	1	2

Components in MRE VIII - XIX (continued)

	VIII&IX	Х	XI&XII	XIII&XIV	XV	XVI	XVII	XVIII	XIX
Spread	(12 menus)	(12 menus)	(12 menus)	(12 menus)	(12 menus)	(16 menus)	(20 menus)	(24 menus)	(24 menus)
Cheese Sprd	4	4	4	4	5	1	4	5	4
Peanut Butter	4	4	4	4	4	7	10	12	12
Jelly	4 ⁱ	4	4	4	3	3	2	2	2
Jalapeno Chse Spr		t s	1	l t	1	5	¦ 3	3	4
Jam		 	 	ł	1	1	1	2	2
D	<u> </u>	· · · · · · · · · · · · · · · · · · ·	,	<u>.</u>		·	•	·	
Dessert	2	<u> </u>	· •	1	r	i	<u>)</u>	ı	·
Cake, nut 3 varieties	3	1 3 1 9	1 3 1 0		' a	' o	, , ,	1	
Oat cookie bar	2		· 2	· Z	· Z	· 2	· · ·	' n	
	2			. 2	· Z	1 Z	1 Z	1 Z	
Brownie chcv	2		1 Z				 -	 -	
Pound cake 5 - 6 varieties		i I	i I	3	4	5	· /	· /	
Fudge Brownie		1	1	1	1	2	2	2	2
Fig bar		1	1	1	 	1	3	2	1
Shrtbrd Cookies		1	ł 	I I	r 1	 	I 	<u> 1 </u>	1
Snack		r .			r	1			
Potato Stck		 	, 	1	; 1	i 1	i 1	i 1	1
Peanuts		, ,	1	1	; 1	1	2	i 1	1
Pretzels		1	1	1	I I	1	1	1	1
Granola bar		 	1	1	1	¦ 1	¦ 1	2	3
Beef Jerky		1 I	1	1	I I	1	1	1	1
Corn Chips		 	1	1	I I	1 1	1	1	l I
Frt-filled bar		 	1	1	 	 	\$ }	2	2
Choc Sport bar		l 1	1		1	1	1	1 1	1
Toaster Pastry		1	t I	1	1	1	l I	¦ 1	¦ 1
Cracker w/pb		1	1	1	t t	l l	1	1	2
Nut raisin Mix]	l l	l I	1	1	1	1	 	1
Candy	1	1	1			I			
Candy meal bag*	4	1	3	6	6	1 7	1 7	4	4
Peanut bar		I I	1	1	1	1	1 1	3	2
Hard Candy***		1	I		1	l	I	1	2
Beverage									
Bev base sug 3 - 4 varieties	12	12	12	6	5	16	11	10	10
Сосоа	7	7	7	7	7	7	7	9	10
Bev base asp 3 varieties		l I	 	6	7	I I	1	ł ł	l I
Hot Sauce	1	1		1	1	1	1	1	1
Tabasco		1	12	1	1	1	1	I	1

Components in MRE VIII - XIX (continued)

	VIII&IX	Х	XI&XII	XIII&XIV	XV	XVI	XVII	XVIII	XIX
Acc Pkt	(12 menus)	(12 menus)	(12 menus)	(12 menus)	(12 menus)	(16 menus)	(20 menus)	(24 menus)	(24 menus)
Coffee	12	12	12	12	12	9	10	9	11
Cream	12	12	12	12	12	16	10	11	13
Sugar	12	12	12	12	12	16	10	11	13
Gum	12	12	12	12	12	16	20	24	24
Tabasco	4	4	1	12	12	16	20	24	24
Candy**		4	4	2	2	2	2	4	2
Lemon tea w/sugar		1	1	1	1	7	10	13	¦ 11
Apple cider	· ·		1	1	1	1	3	7	5
Tea bag		i I	I I	; ; ;	 	, I	1	2	2
Count	33	31	30	36	37	41	54	64	68
Total	129	129	139	142	144	186	209	243	247
Components/menu	11	11	12	12	12	12	10	10	10

VIII&IX

* M&Ms plain, vanilla caramels or Charms in meal bag

Х

** M&Ms plain, Tootsie Roll, vanilla caramels or Charms in Acc Pkt C

XI&XII

- * Heat stable chocolate bar, M&Ms plain or Charms in meal bag
- ** Tootsie Roll or vanilla caramels in Acc Pkt B

XIII&XIV

- * Heat stable chocolate bar, M&Ms plain or Charms in meal bag
- ** Tootsie Roll or vanilla caramels in Acc Pkt B

XV

- * M&Ms plain or Charms in meal bag
- ** Tootsie Roll or vanilla caramels in Acc Pkt B

XVI

- * M&Ms plain or Charms in meal bag
- ** Tootsie Roll or vanilla caramels in Acc Pkt B

XVII

- * M&Ms plain, Charms, Skittles or Jolly Rancher candy in meal bag
- ** Tootsie Roll or vanilla caramels in Acc Pkt B

XVIII

- * M&Ms plain, Charms, Skittles or Jolly Rancher candy in meal bag
- ** Tootsie Roll or vanilla caramels in Acc Pkt B

XIX

- * M&Ms plain or Skittles candy in meal bag
- ** Tootsie Roll or vanilla caramels in Acc Pkt B
- *** Charms or Jolly Rancher candy in meal bag

APPENDIX B Menus for Meal, Ready-to-Eat VIII and IX

Pot Ham		Apple sauce	Cracker	Jelly	Brownie chcv		Сосоа	Bev base sugar	Acc Pkt A
Rice		Fruit dry	Cracker	Cheese Sprd	Cookie chcv	Candy		Bev base sugar	Acc Pkt A
Noodle			Cracker	Cheese Sprd	Choc nut cake			Bev base sugar	Acc Pkt A
in Sce		Fruit dry	Cracker	Peanut Butter	Cookie chcv			Bev base sugar	Acc Pkt A
Slice	Potato au Grat		Cracker	Jelly	Brownie chcv		Сосоа	Bev base sugar	Acc Pkt A
Stew		;	Cracker	Peanut Butter	Cherry nut cake			Bev base sugar	Acc Pkt B
ala king		Fruit dry	Cracker	Peanut Butter		Candy	Сосоа	Bev base sugar	Acc Pkt A
Mt Sce			Cracker	Cheese Sprd	Maple nut cake			Bev base sugar	Acc Pkt B
w/Ham	Potato au Grat		Cracker	Cheese Sprd	Oat cookie bar		Cocoa	Bev base sugar	Acc Pkt A
Stw		Fruit dry	Cracker	Peanut Butter		Candy	Cocoa	Bev base sugar	Acc Pkt B
Hsh		Fruit dry	Cracker	Jelly	Oat cookie bar		Cocoa	Bev base sugar	Acc Pkt A**
BBQ		Apple sauce	Cracker	Jelly		Candy*	Cocoa	Bev base sugar	Acc Pkt B**
	BBQ Hsh Stw w/Ham Mt Sce ala king Stew Slice in Sce Noodle Rice Pot Ham	BBQ Hsh Stw w/Ham Mt Sce ala king Stew Slice in Sce Noodle Rice Pot Ham au Grato au Grato au Grat	BBQ Hsh Stw w/Ham Mt Sce ala king Stew Slice in Sce Noodle Rice Pot Ham Apple Fruit dry Potato Potato Potato Potato au Grat au Grat Potato Potato Apple Fruit dry Fruit dry Fruit dry Fruit dry Fruit dry Fruit dry Sauce	BBQ Hsh Stw w/Ham Mt Sce ala king Stew Slice in Sce Noodle Rice Pot Ham Apple Fruit dry Potato Potato Potato Potato au Grat au Grat Potato Po	BBQ Hsh Stw w/Ham Mt Sce ala king Stew Slice in Sce Noodle Rice Pot Ham Apple Fruit dry Fruit dry Pruit dry Apple Pruit dry Fruit dry Pruit dry Pr	BBQ Hsh Stw w/Ham Mt Sce ala king Stew Slice in Sce Noodle Rice Pot Ham Apple Fruit dry Fruit dry Fruit dry Fruit dry Fruit dry Apple Rice Noodle Rice Pot Ham Apple Fruit dry Fruit dry Fruit dry Fruit dry Fruit dry Fruit dry Sce Sce Noodle Rice Pot Ham Jelly Fruit dry Fruit dry Fruit dry Fruit dry Fruit dry Fruit dry Sce Sce Pot Sce Sc	BBQ Hsh Stw W/Ham Mt Sce ala king Stew Slice in Sce Noodle Rice Pot Ham Apple Fruit dry Sauce Sauce Sauce Potato Potato Rice Pot Ham Apple Fruit dry Fruit dry Fruit dry Fruit dry Fruit dry Prese Cracker Lacker Cracker	BBQ Hsh Stw W/Ham Mt Sce ala king Stew Slice in Sce Noodle Rice Pot Ham Apple Fruit dry Potato au Grat Potato au Grat Potato Rice Pot Ham Apple Fruit dry Fruit dry Fruit dry Fruit dry Potato au Grat Potato au Grat Potato Pota Potato Potato	BBQ Hsh Stw w/Ham Mt Sce ala king Stew Slice In Sce Noodle Rice Pot Ham Apple Furit dry Furit dry Furit dry Potato au Grat Potato au Grat Apple Fruit dry Apple Ruit dry Fruit dry Apple Potato au Grat Potato au Grat Apple Ruit dry Apple Ruit dry Potato Ruit dry Apple Ruit dry Apple Sauce Potato Ruit dry Sauce <

* M&Ms plain, vanilla caramels, or Charms

** Acc Pkt A: Coffee, cream, sugar, chewing gum Acc Pkt B: Coffee, cream, sugar, chewing gum, Tabasco APPENDIX C Menus for Meal, Ready-to-Eat X

12		E		U U	er	<u> </u>	jie	g	ase	άA
Menu	Esc	Pot Hi		Appl sauc	Crack	Jell	Browi	00 00 00	Bev bi sugé	Acc PI
Menu 11	Chicken	Rice		Fruit dry	Cracker	Cheese Sprd	Cookie chcv		Bev base sugar	Acc Pkt C
Menu 10	Tuna	Noodle			Cracker	Cheese Sprd	Choc nut cake		Bev base sugar	Acc Pkt B
Menu 9	Mtballs	in Sce		Fruit dry	Cracker	Peanut Butter	Cookie chcv		Bev base sugar	Acc Pkt A
Menu 8	Ham	Slice	Potato au Grat		Cracker	Jelly	Brownie chcv	Сосоа	Bev base sugar	Acc Pkt A
Menu 7	Beef	Stew		;	Cracker	Peanut Butter	Cherry nut cake		Bev base sugar	Acc Pkt A*
Menu 6	Chick	ala king		Fruit dry	Cracker	Peanut Butter		Cocoa	Bev base sugar	Acc Pkt C
Menu 5	Spag	Mt Sce			Cracker	Cheese Sprd	Maple nut cake		Bev base sugar	Acc Pkt B
Mènu 4	Omlet	w/Ham	Potato au Grat		Cracker	Cheese Sprd	Oat cookie bar	Сосоа	Bev base sugar	Acc Pkt B
Menu 3	Chicken	Stw		Fruit dry	Cracker	Peanut Butter		Cocoa	Bev base sugar	Acc Pkt C
Menu 2	Crn Beef	Hsh		Fruit dry	Cracker	Jelly	Oat cookie bar	Сосоа	Bev base sugar	Acc Pkt B*
Menu 1	Prk Rice	BBQ		Apple sauce	Cracker	Jelly		Cocoa	Bev base sugar	Acc Pkt C*

* Acc Pkt A: Coffee, cream, sugar, chewing gum

Acc Pkt B: Coffee, cream, sugar, chewing gum, Tabasco Acc Pkt C: Coffee, cream, sugar, chewing gum, candy (M&Ms plain, Tootsie Roll, vanilla caramels or Charms)

APPENDIX D Menus for Meal, Ready-to-Eat XI and XII

-		Apple sauce	ker Cracker Cracker	se Cheese Jeliy d Sprd	nut Cookie Brownie e chcv chcv	Candy	Сосоа	ase Bev base Bev base ar sugar sugar	sco Tabasco Tabasco	kt A Acc Pkt A Acc Pkt A
i Sce Nooc		uit dry	racker Crac	eanut Chee lutter Spr	ookie Choc chcv cak			v base Bev b ugar sug	ibasco Taba	c Pkt A Acc P
Ham Slice ir	Potato au Grat	لگ 	Cracker C	Jelly E	Brownie chcv 6		Cocoa	Bev base Be sugar s	Tabasco Te	Acc Pkt A Ac
Beef Stew			Cracker	Peanut Butter	Cherry nut cake			Bev base sugar	Tabasco	Acc Pkt A
Chick ala king		Fruit dry	Cracker	Peanut Butter		Candy	Cocoa	Bev base sugar	Tabasco	Acc Pkt A
Spag Mt Sce			Cracker	Cheese Sprd	Maple nut cake	Candy*		Bev base sugar	Tabasco	Acc Pkt A**
Omlet w/Ham	Potato au Grat		Cracker	Cheese Sprd	Oat cookie bar		Cocoa	Bev base sugar	Tabasco	Acc Pkt B
Chicken Stw	~	Fruit dry	Cracker	Peanut Butter			Cocoa	Bev base sugar	Tabasco	Acc Pkt B
Crn Beef Hsh		Fruit dry	Cracker	Jelly	Oat cookie bar		Cocoa	Bev base sugar	Tabasco	Acc Pkt B
Prk Rice BBQ		Apple sauce	Cracker	Jelly			Cocoa	Bev base sugar	Tabasco	Acc Pkt B**

* Heat stable chocolate bar, M&Ms plain or Charms

** Acc Pkt A: Coffee, cream, sugar, chewing gum Acc Pkt B: Coffee, cream, sugar, chewing gum, candy (Tootsie Roll or vanilla caramels) APPENDIX E Menus for Meal, Ready-to-Eat XIII and XIV

Menu 12	Esc	Pot Ham		Apple sauce	Cracker	Cheese Sprd	Brownie chcv			Cocoa	Bev base asp	Acc Pkt A
Menu 11	Chicken	Rice			Cracker	Cheese Sprd	Cookie chcv		Candy		Bev base sugar	Acc Pkt A
Menu 10	Tuna	Noodle			Cracker	Jelly	Pound cake		Candy		Bev base sugar	Acc Pkt A
Menu 9	Pk Chow	Mein	Chw Mein Nd	Fruit dry	Cracker	Peanut Butter	Cookie chcv				Bev base sugar	Acc Pkt A
Menu 8	Ham	Slice	Potato au Grat		Cracker	Cheese Sprd	Brownie chcv			Cocoa	Bev base sugar	Acc Pkt A
Menu 7	Beef	Stew			Cracker	Peanut Butter	Pound cake				Bev base sugar	Acc Pkt A
Menu 6	Franks			Fruit dry	Cracker	Peanut Butter		Potato Stck	Candy	Cocoa	Bev base asp	Acc Pkt A
Menu 5	Spag	Mt Sce			Cracker	Cheese Sprd	Pound cake		Candy	Cocoa	Bev base asp	Acc Pkt A
Menu 4	Omlet	w/Ham	Potato au Grat		Cracker	Jelly	Oat cookie bar		Candy	Сосоа	Bev base asp	Acc Pkt A
Menu 3	Chicken	Stw		Fruit wet	Cracker	Peanut Butter			Candy*		Bev base sugar	Acc Pkt A**
Menu 2	Crn Beef	Hsh		Fruit dry	Cracker	Jelly	Oat cookie bar			Cocoa	Bev base asp	Acc Pkt B
Menu 1	Prk Rice	BBQ		Apple sauce	Cracker	Jeily				Cocoa	Bev base asp	Acc Pkt B**

* Heat stable chocolate bar, M&Ms plain or Charms

** Acc Pkt A: Coffee, cream, sugar, chewing gum, Tabasco Acc Pkt B: Coffee, cream, sugar, chewing gum, Tabasco, candy (Tootsie Roll or vanilla caramels)

APPENDIX F Menus for Meal, Ready-to-Eat XV

						••••				
Esc Pot Ham		Apple sauce	Cracker	Cheese Sprd	Brownie chcv			Cocoa	Bev base asp	Acc Pkt A
Chicken Rice			Cracker	Cheese Sprd	Brownie chcv		Candy		Bev base sugar	Acc Pkt A
Tuna Noodle		Fruit dry	Cracker	Cheese Sprd	Pound cake		Candy		Bev base sugar	Acc Pkt A
Pk Chow Mein	Chw Mein Nd		Cracker	Peanut Butter	Cookie chcv		Candy		Bev base sugar	Acc Pkt A
Ham Slice	Potato au Grat		Cracker	Cheese Sprd	Pound cake			Сосоа	Bev base asp	Acc Pkt A
Beef Stew			Cracker	Cheese Sprd	Cookie chcv		Candy	Cocoa	Bev base asp	Acc Pkt A
Franks		Fruit wet	Cracker	Peanut Butter		Potato Stck	Candy	Cocoa	Bev base asp	Acc Pkt A
Spag Mt Sce			Cracker	Jeily	Oat cookie bar		Candy*	Cocoa	Bev base asp	Acc Pkt A
Grilled Chicken	Potato au Grat		Cracker	Peanut Butter	Pound cake			Cocoa	Bev base asp	Acc Pkt B
Chicken Stw		Fruit wet	Cracker	Jelly	Pound cake			Сосоа	Bev base asp	Acc Pkt A
Chili Mac		Fruit dry	Cracker	Jelly	Oat cookie bar				Bev base sugar	Acc Pkt B**
Prk Rice BBQ		Apple sauce	Cracker	Peanut Butter		Peanuts			Bev base sugar	Acc Pkt A**

M&Ms plain or Charms

** Acc Pkt A: Coffee, cream, sugar, chewing gum, Tabasco Acc Pkt B: Coffee, cream, sugar, chewing gum, Tabasco, candy (Tootsie Roll or vanilla caramels)

APPENDIX G Menus for Meal, Ready-to-Eat XVI

	_											
Menu 16	Esc Pot	Ham		Apple sauce	Cracker	Jalapeno Chse Spr	Fudge Brownie			Cocoa	Bev base sugar	Acc Pkt A
Menu 15	Grilled	Chicken	Mexican Rice		Cracker	Jelly	Pound cake			Сосоа	Bev base sugar	Acc Pkt A
Menu 14	Ham	Slice	White Rice		Cracker	Cheese Sprd	Pound cake		Candy		Bev base sugar	Acc Pkt A
Menu 13	Prk Rice	BBQ		Apple sauce	Cracker	Peanut Butter					Bev base sugar	Acc Pkt C
Menu 12	Cheese	Tortellini		Fruit wet	Cracker	Peanut Butter		Granola Bar			Bev base sugar	Acc Pkt A
Menu 11	Pasta	m/veg		Apple sauce	Cracker	Peanut Butter			Candy		Bev base sugar	Acc Pkt C
Menu 10	Chili Mac			Fruit wet	Cracker	Jelly	Oat cookie bar			Cocoa	Bev base sugar	Acc Pkt B
Menu 9	Pk Chow	Mein	Chw Mein Nd		Cracker	Peanut Butter	Cookie chcv		Candy		Bev base sugar	Acc Pkt A
Menu 8	Chicken	Rice			Cracker	Jalapeno Chse Spr	Fudge Brownie		Candy		Bev base sugar	Acc Pkt A
Menu 7	Beef	Stew			Cracker	Jalapeno Chse Spr	Cookie chcv		Candy	Сосоа	Bev base sugar	Acc Pkt C
Menu 6	Franks			Fruit wet	Cracker	Peanut Butter		Potato Stck	Candy		Bev base sugar	Acc Pkt C
Menu 5	Spag	Mt Sce			Cracker	Peanut Butter	Oat cookie bar		Candy*	Cocoa	Bev base sugar	Acc Pkt C
Menu 4	Ham	Slice	White Rice		Cracker	Jalapeno Chse Spr	Pound cake			Cocoa	Bev base sugar	Acc Pkt C
Menu 3	Chicken	Stw		Fruit wet	Cracker	Jelly	Pound cake			Cocoa	Bev base sugar	Acc Pkt C**
Menu 2	Tuna	Noodle		Fruit wet	Cracker	Jalapeno Chse Spr	Pound cake				Bev base sugar	Acc Pkt A**
Menu 1	Beef-	Steak	Mexican Rice	:	Cracker	Peanut Butter					Bev base sugar	Acc Pkt B**

* M&Ms plain or Charms

** Acc Pkt A: Coffee, cream, sugar, chewing gum, Tabasco Acc Pkt B: Coffee, cream, sugar, chewing gum, Tabasco, candy (Tootsie Roll or vanilla caramels) Acc Pkt C: Lemon tea w/sugar, cream, sugar, chewing gum, Tabasco APPENDIX H Menus for Meal, Ready-to-Eat XVII

Menu 20	Spag	Mt Sce					Cracker	Peanut	Butter	Fig Bar				Candy	Сосоа			Acc Pkt	ပ
Menu 19	Beef	Mushrm	White	Rice			Cracker	Peanut	Butter			Corr	Chips			Bev Base	sugar	Acc Pkt	8
Menu 18	Turkey	Potatoes					Cracker	Peanut	Butter	Pound	cake			Candy		Bev Base	sugar	Acc Pkt	v
Menu 17	Beef	Ravioli			Fruit		Cracker	Cheese	Sprd	Fudge	Brownie	Beef	Jerky					Acc Pkt	υ
Menu 16	Tuna	Noodle			Fruit		Cracker	Peanut	Butter	Pound	cake			Candy		Bev Base	, sugar	Acc Pkt	A
Menu 15	Grilled	Chicken	Mexican	Rice			Cracker	Jelly		Pound	cake				Coccoa	Bev Base	sugar	Acc Pkt	A
Menu 14	Chicken	Cavatelli	White	Rice			Cracker	Cheese	Sprd	Pound	cake					Bev Base	sugar	Acc Pkt	۲
Menu 13	Prk Rice	BBQ			Apple	sauce	Cracker	Jalapeno	Chse Spr			Peanuts				Bev Base	sugar	Acc Pkt	۲
Menu 12	Cheese				Apple	sauce	Cracker	Peanut	Butter	Fig Bar		Granola	bar					Acc Pkt	0
Menu 11	Pasta	6ən/m			Fruit		Cracker	Peanut	Butter			Pretzels		Peanut bar				Acc Pkt	0
Menu 10	Chili Mac				Fuit		Cracker	Jam		Oat cooki	par				Сосоа			Acc Pkt	* D
Menu 9	Beef	Stew					Cracker	Jalapeno	Chse Spr	Ch Cov	Cookies			Candy	Cocoa			Acc Pkt	ပ
Menu 8	Chicken	Rice					Cracker	Jalapeno	Chse Spr	Fudge	Brownie	~		Candy		Bev Base	sugar	Acc Pkt	۷
Menu 7	Pk Chow	Mein	Chw Mein	P			Cracker	Peanut	Butter	Ch Co Ch	Cookies			Candy	=	Bev Base	sugar	Acc Pkt	۷
Menu 6	Franks				Fruit		Cracker	Peanut	Butter			Potato	Stck	Candy*		Bev Base	sugar	Acc Pkt	۷
Menu 5	Chicken	Noodles			Fruit		Cracker	Peanut	Butter	Fig Bar					Cocoa			Acc Pkt	0
Menu 4	Ham	Slice	White	Rice			Cracker	Cheese	Sprd	Pound	cake				Cocoa			Acc Pkt	<u>с</u>
Menu 3	Chicken	Stw			Fait		Cracker	Jelly		Pound	cake				Coccoa			Acc Pkt	ţ
Menu 2	Pork Chp	Noodles			Apple	sauce	Cracker	Cheese	Sprd	Pound	cake					Bev Base	sugar	Acc Pkt	**A
Menu 1	Beef-	Steak	Mexican	Rice			Cracker	Peanut	Butter			Peanuts				Bev Base	w/sugar	Acc Pkt	:
	-											-							

* M&Ms plain, Charms, Skittles or Jolly Rancher candy

** Acc Pkt A: Coffee, cream, sugar, chewing gum, Tabasco

Acc Pkt B: Coffee, cream, sugar, chewing gum, Tabasco, candy (Tootsie Roll or vanilla caramels)

Acc Pkt C: Lemon tea w/sugar, chewing gum, Tabasco

Acc Pkt D: Lemon tea w/sugar, apple cider, chewing gum, Tabasco

APPENDIX I Menus for Meal, Ready-to-Eat XVIII

lenu 24	Aeatloaf		Voodles	in Sce			egetable	Cracker	Cheese	Sprd			Toaster	Pastry			 	lev Base	sugar	Acc Pkt	0
Menu 23 A	Chicken N	Cavatelli	White	Rice			_Ž	Cracker 1	Jam - (Pound -	cake					 	Bev Base	sugar	Acc Pkt	Ā
Menu 22	Pk Chow	Mein	Chw Mein	PZ			, Vegetable	Cracker	Peanut	Butter	Cookies I	chcv					 	Bev Base	sugar	Acc Pkt	ш
Menu 21	Chicken j	Stw	_•				_~	Cracker	Jelly		Pound	cake	Pretzels I				2000			Acc Pkt	с U
Menu 20	Spag	Mt Sce					regetable	Cracker	Peanut	Butter	Pound	cake					Cocoa			Acc Pkt	8
Menu 19	Beef	Mushrm	White	Rice				Cracker	Peanut	Butter							 	Bev Base	sugar	Acc Pkt	A
Menu 18	Turkey	Potatoes					Vegetable	Cracker	Cheese	Sprd	Pound	cake	Choc	Sport bar			 	Bev Base	sugar	Acc Pkt	
Menu 17	Beef	Ravioli			Fruit	(Apple)		Cracker	Cheese	Sprd	- Fudge	Brownie	Beef	Jerky			 			Acc Pkt	ບ
Menu 16	Chicken	Thai Sce	White	Rice			Vegetable	Cracker	l Jalapeno	Chse Spr					Candv*		C000			Acc Pkt	U -
Menu 15	Franks							Cracker	Peanut	Butter			Potato	Stck			 	Bev Base	sugar	Acc Pkt	B
Menu 14	Pasta	Alfredo			Foit		Vegetable	Cracker	Peanut	Butter			 Frt-filled	bar	1 1 1 Peanut	bar	 			Acc Pkt	0
Menu 13	Cheese	¹ Tortellini			Apple	sauce		Cracker	Peanut	Butter			Granola	bar	Candv*		 			Acc Pkt	<u>م</u>
Menu 12	Bn&Rce	Burrito			Fruit		Vegetable	Cracker	Peanut	Butter			- - - Frt-filled	bar	Feanut	bar	 			Acc Pkt	0
Menu 11	Pasta	6ev/w			Fruit		6 5	Cracker	Peanut	Butter			 Granola	bar	Feanut	bar	 			Acc Pkt	ں
Menu 10	Chili Mac				-		Vegetable	Cracker	- - Di Peanut	r Butter	 Fia Bar	, 					 Cocoa			Acc Pkt	٥
Menu 9	Beef	Stew					or	Cracker	 Jalapenc	r¦Chse Spi			1 1 1 Peanuts		- Candv*	[Cocoa	<u>n</u> -		Acc Pkt	ں ۔ ۔
Menu 8	Chicken						Vegetabl	Cracker	i Jalapeno	Chse Sp	- - Fudae	Brownie					 	Bev Bas	sugar	Acc Pkt	A
Menu 7	Chicken	Salsa					o	Cracker	- - - Peanut	Butter	 Shrtbrd	Cookies			 Candv*	ĵ 	 Cocoa		1	Acc Pkt	A
Menu 6	Chicken	Naodles					Vegetabl	Cracker	- Peanut	Butter	 Fio Bar						 Cocoa			Acc Pkt	1 ш
Menu 5	Grilled	Chicken	Mexican	Rice			o	Cracker	Jeliv		Poind	cake					 Cocoa			Acc Pkt	*
Menu 4	Ham	Slice	Noodles	in Sce			Vegetabl	Cracker	- - - Cheese	Sprd	Poilind	cake					 Cocoa	o-		Acc Pkt	ŧ.
Menu 3	o, Beef	Teriyaki	White	Rice			o	Cracker			- Cookies	chcv					 	 e Bev Basi	sugar	Acc Pkt	е
Menu 2	Pork Ch	Noodies		_ ~	Fruit	(Apple)	Vegetabl	Cracker	- Cheese	Sprd		cake		~			 	e Bev Bas	l sugar	Acc Pkt	** •
Menu 1	Beef-	Steak	Mexicar	Rice				Cracket	Peanut	Butter								Bev Bas	sugar	Acc Pkt	*

* M&Ms plain, Charms, Skittles or Jolly Rancher candy

** Acc Pkt A: Coffee, cream, sugar, chewing gum, Tabasco

Acc Pkt B: Coffee, cream, sugar, chewing gum, Tabasco, candy (Tootsie Roll or vanilla caramels)

Acc Pkt C: Lemon tea w/sugar, chewing gum, Tabasco Acc Pkt D: Lemon tea w/sugar, apple cider, chewing gum, Tabasco Acc Pkt E: Tea bag, cream, sugar, chewing gum, Tabasco

APPENDIX J Menus for Meal, Ready-to-Eat XIX

Menu 24	Meatloaf		Noodles	in Sce			Vegetable	Cracker	Jalapeno	Chse Spr				Toaster	Pastry					Bev Base	- Logi	0 70 70	Acc Pkt	٥
Menu 23	Chicken	Cavatelli						Cracker	Jam		1	- Pounor	cake			Candv*				Bev Base	ennar		Acc Pkt	A
Menu 22	Pk Chow	Mein	Chw Mein	PZ			Vegetable	Cracker	Peanut	Butter		DUNOL	cake							Bev Base	enter		Acc Pkt	с
Menu 21	Chicken	Stw						Cracker	Cheese	Sprd		DUNO	cake	Pretzels I					Cocoa				Acc Pkt	υ
Menu 20	Spag	Mt Sce					/egetable	Cracker	Cheese I	Sprd				Toasted	b crackrs	Candv*			Cocoa				Acc Pkt	A
Menu 19	Beef	Mushrm	White	Rice			-~	Cracker	Jelly						_ 14 _	Candv [*]				Bev Base	encor		Acc Pkt	A
Menu 18	Turkey	Potatoes			Fruit		Vegetable	Cracker	Peanut	Butter		Cookles	chcv	Choc	Sport bar					Bev Base	Jenia		Acc Pkt	۲
Menu 17	Beef	Ravioli			Fruit	(Apple)		Cracker	Cheese	Sprd	l	Fuage	Brownie						Cocoa				Acc Pkt	۲
Menu 16	Chicken	Thai Sce	White	Rice			Vegetable	Cracker	Jalapeno	Chse Spr				Nut raisin	Mix				Cocoa				Acc Pkt	ш
Menu 15	Franks						Wht snck	Bread	Peanut	Butter				Potato	Stck					Bev Base			Acc Pkt	В
Menu 14	Pasta	Alfredo			Fruit		Vegetabl	Cracker	Peanut	Butter				Grnla br	Frt-filld br								Acc Pkt	٥
Menu 13	Cheese	Tortellini			Apple	sauce		Cracker	Peanut	Butter				Granola	bar	Hard	Candv ⁺⁺						Acc Pkt	ပ ၂
Menu 12	Bn&Rce	Burrito			Fruit		Vegetable	Cracker	Peanut	Butter				Frt-filled	bar	 Peanut	bar						Acc Pkt	٥
Menu 11	Pasta	6ev/w			Fruit			Cracker	l Peanut	Butter				Granola	par	Peanut	bar						Acc Pkt	с Г
Menu 10	Chili Mac						l Vegetable	Cracker	Peanut	Butter	2	Found	cake						Cocoa				Acc Pkt	
Menu 9	Beef	Stew						Cracker	Jalapeno	Chse Spr				Peanuts		Candv*			Cocoa				Acc Pkt	ပ
Menu 8	Chicken	Rice					i Vegetable	Cracker	Peanut	Butter	i	- Fudge	Brownie							Bev Base	-	ipfine .	Acc Pkt	A
Menu 7	Chicken	Salsa	Mexican	Rice			:	Cracker	Peanut	Butter		Shribrd	Cookies						Cocoa		~ -		Acc Pkt	۲
Menu 6	Chicken	Noodles					Wht snd	Bread	Peanut	Butter	i i	- Fig Bar							Cocoa		~ •		Acc Pkt	<u>م</u>
Menu 5	Grilled	Chicken	Mexican	Rice			- 67	Cracker	Jelly			Pound	- cake						Cocoa				Acc Pkt	1 0
Menu 4	Ham	Slice	Noodles	in Sce			Vegetable	Cracker	Jalapenc	Chse Spi		Pound	cake		- 0-				Cocoa	6	_		Acc Pkt	IJ
Menu 3	Beef	Teriyaki	White	Rice			o	Cracker	Jam					Cheese	pb crackr	Погд	Candv**	<u></u>		j Bev Bas∈		- sugar	Acc Pkt	۲
Menu 2	Pork Chp	Noodles			Fruit	(Apple)	Vegetable	Cracker	Cheese	Sprd	·	Pound	cake							 a,Bev Basc	-	sugar	Acc Pkt	Α.
Menu 1	Beef-	Steak	Mexican	Rice				Cracker	Peanut	Butter				Beef	Jerky					Bev Bast		sugar	Acc Pkt	# 8

M&Ms plain or Skittles candy

** Charms or Jolly Rancher candy

*** Acc Pkt A: Coffee, cream, sugar, chewing gum, Tabasco Acc Pkt B: Coffee, cream, sugar, chewing gum, Tabasco, candy (Tootsie Roll or vanilla caramels)

Acc Pkt C: Lemon tea w/sugar, chewing gum, Tabasco

Acc Pkt D: Lemon tea w/sugar, apple cider, chewing gum, Tabasco Acc Pkt E: Tea bag, cream, sugar, chewing gum, Tabasco

APPENDIX K Summary of Nutrient Values for Meal, Ready-to-Eat XIX

0	5.7	5.5	7.5	0.0	4.3	5.4	3.4 1	4.0	4 4	4 C	0 C		 	- u F u	, r , t	4 1	46	u U	0.4	5,0	3.4	6.4	4.8	÷	loh0		<u>1</u> 2	177	54	195	110	ទ	57	471	109	9	10		6 2	2 2	2 C F F	71	06	103	152	108	150	105	91	20
20	0.655	0.637	0.572	0.720	0.742	0.797	0.995	0.959	1.031	0.000	0.000	0.140	0.010	0.873	0.995	0 762	0.548	0.730	0.910	0.796	0.678	0.468	0.758	0.149	DFA		4 10.24	5.48	8.17	7.69	5.66	10.72	13.34	7 28	10.28	13.83	12.65	10.56	10.63	11.19	67.CL	0.00	4.81	4.54	5.54	14.29	4.94	8.49	9.31	3.33
디	8.8 8.8	5.04	5.08	5.01 2.23	3.26	3.31	4.29	7.49	6.51		4.04 A A A	44.0 44.0	0.40 6.30	60.9 90.8	4.58	4 06	787	5 37	3.82	4.38	2.41	4.63	4.89	1.61	MFA		20.52	23.60	19.29	25.98	16.30	20.50	25.06	10.12	27.83	22.24	21.53	17.46	20.59	26.12	30.22 25 10	10 87	16.99	26.66	24.01	31.49	21.09	21.98	23.23	4.09
Na	2190 2190	2547	2937	3046	1806	2088	1483	1923	1689		1431	1044	0601	7817	2453	1820	1885	2410	2351	2000	1378	2928	2075	509	SEA	5	ч 12.85	20.97	10.04	21.66	10.05	10.91	12.38	14.U1 24.57	16.21	9.32	9.94	7.37	11.37	20.79	21.98	24.UO	13 93	27.01	21.67	16.59	12.32	19.90	15.91	5.52
Ъ	<u> 1179</u>	683	1565	983 1165	1129	1781	1037	1340	1500	0001	901 906	070	310	1324	1145	1001	805	1256	1142	832	564	619	1086	296																										
۵l	E S	593	443	928 676	636 636	787	623	878	688		4/4 452	5 T C U	170		764	769	2007 773	0.59	867	446	430	621	653	161	1 45/	11/	56	3.7	4.5	4.5	2.8	5.5	7.6	2.7 2.2	7.5	10.4	8.9	7.7	8.4	10 10 10	7.3	0.0	0.6	4.2	3.1	6.4	3.7	4.1	5.9	2.1
ВW	15 IG	68	82	97 101	163	189	167	148	172		1/3		475	174	134	51	76	120	110	131	83	78	137	42	Caratone		61 45 61 45	32.44	22.52	41.89	61.89	15.54	124.26	CC.CZ	132.29	341.69	94.29	51.81	171.54	14.01	63.22	40.00	00.04	102.47	322.26	25.35	14.49	42.41	92.23	102.88
e.	<u>195</u>	5.83	6.03	6.59	6.17 6.17	7.01	7.35	7.01	8.44	0.00	7.48 6.24	0.21	1.03	0.50	77 8	6 60	0.00	5.0	7 49	6.59	6.14	7.25	6.80	0.87	1/14 A 4m4		2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1007	86	2076	1077	1684	1796	7261	1826	1044	1034	743	1161	693	2054	2002	3 12 86	2022	2263	730	40	1209	1220	869
S	mg 235	466	189	499	325	339	288	443	354	102	040 041	007	040 770	221	160		010	212	423	304	211	518	372	131	Vit A tot		2874 2874	3567	436	7191	4001	5711	6809	1/92	5042 6964	5753	4070	2808	5010	2400	7260	0020	0200 438	7417	9687	2600	230	4310	4677	2719
Ash	<u>9</u> 8.76	9.29	10.28	11.16 6 00	8.03	10.42	6.29	9.53	8.25	CB./	6.3/	01.7	95.7 90	0.30	70.01	010	0.00	10.04	0.70	7.86	5 89	9.94	8.7.9	1.61	1/4 013		4 01	0.89	2.00	1.18	0.44	0.40	0.82	0.50	2 18 2 18	0.0	0.00	0.08	0.12	1.08	0.56	1.02	20.0	1 98	1.33	0.40	0.58	1.81	1.13	1.00
D Fiber	<u>9</u> 6.92	3.04	5.25	3.93 F 60	9.64	10.16	5.76	7.95	9.46	14.40	12.43	10.47	6/.FT	0.0	60.6 60.0	04.0	01.10 77		6.27 6.27	6.93 6.93	4 14	2.51	7 66	3.14	Coloto	TUAL	<u>81</u> 21 22	19	144	115	117	114	146	<u>10</u>	140	130	175	145	167	82	160	140	108	119	152	114	127	165	128	26
<u>Carb</u>	<u>9</u> 138 74	166.53	205.30	134.12	150.24	148.17	137.64	135.32	138.55	10.461	174.46	1/3.81	182.11	123.31	07.101	20.101	01:0/1	10.02	156.01	158.07	202.89	168.56	161 68	22.97	144 DC		5 4 2 4 2 4 2	196	0.76	3.22	2.31	3.27	4.00	2.18	3.50	2.36	2.86	2.24	2.79	1.78	3.48	02.5	2.02	3.28	3.45	2.25	0.76	1.90	2.56	0.90
Fat	48.30 48.30	54.09	41.18	58.91	34.39 44.96	54.37	56.01	56.39	58.64	02.26	50.79	37.98	45.82	74.32	10.11		40.07	00.00 60.00	50.03 54 87	04:01 66 70	41 15	54.57	E7 29	9.51		NIACIT	18 187	7 401	11.460	9.451	16.203	14.611	21.442	18.287	12:321	13.652	18.914	10.817	16.495	13.990	13.678	7.008	112.01	9.130 9.775	14 044	12.443	9.937	8.086	13,337	3.811
Prot	9 48 72	35.12	34.03	42.09	30.09 38.76	46.39	53.76	49.19	44.35	31.79	30.18	27.81	29.34	35.25	44.33	14.70	01.43	20.07	20.05	36.14	76.85	32.10	78 42	7.83		200	<u>명</u> 원	0.0.0	1.280	1.144	1.037	0.654	1.134	0.886	1.035	0.846	1.466	0.848	1.512	0.478	0.973	1.249	10/.0	0.002	1 270	0.906	0.842	1.056	1 017	0.242
Energy	kcal 15	1277	1325	1219	1182	1239	1232	1213	1221	1161	1226	1117	1217	6/11	1314	0001	1322	2121	1303	1245	1040	1277	****	299 62	Ī	I NIAMIN	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1001	1 053	3,188	2.149	2.451	3.241	1.825	406.7	2.127	2.441	2.050	2.414	1.250	2.996	3.134	2.220	100.1	3.046	2.206	1.040	4.254	2 386	0.803
Water	172 AD	304.28	269.44	223.04	1/6./1 210.01	290.61	188.03	200.03	185.87	292.01	176.05	287.76	288.90	84.23	302.50	5/ CDC	292.84	2/2.41	190.83	10.001	132.04	309.16	20 666	60.63			<u>1</u>	00.1 66 3	39.5	79.4	88.3	108.8	98.8	71.5	94.2 04 6	819	99.2	341.6	99.2	85.1	79.4	79.4	113.9	1.10	24-2 79.4	71.5	53.9	90.4	93.7	33.4 65.7
	MENU MENU	MENU 2	MENU 3	MENU 4	MENU 5 MENI 6	MENU 7	MENU 8	MENU 9	MENU 10	MENU 11	MENU 12	MENU 13	MENU 14	MENU 15	MENU 16	MENU 1/	MENU 18	MENU 19			MENU 22	MENU 24		Std Dev			MENU		MENU 2	MENU 4	MENU 5	MENU 6	MENU 7	MENU 8	MENU 9	MENU 11	MENU 12	MENU 13	MENU 14	MENU 15	MENU 16	MENU 17	MENU 18	MENU 19	MENU 20	MENU 22	MENU 23	MENU 24	Average	Average Std Dev