

THE INDIVIDUAL FOOD CONSUMPTION OF SIX NEGRO
WOMEN LIVING IN A COOPERATIVE HOUSE

by

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TABLE OF CONTENTS

	Page
INTRODUCTION	1
REVIEW OF LITERATURE	1
PROCEDURE	8
RESULTS	11
SUMMARY	33
ACKNOWLEDGMENT	34
LITERATURE CITED	35

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INTRODUCTION

Many studies have been made to check the adequacy of the diets of college women, but none are available for Negro women in this group. The need for such information is apparent when it is necessary to set up standards for Negro women.

This study was conducted to determine the kind and amount of food eaten by a group of Negro women living in a cooperative house at Manhattan, Kansas. It was also desired to check the adequacy of the diets by comparing them with commonly accepted standards.

REVIEW OF LITERATURE

Atwater (1902) investigated the dietaries of certain public institutions in America and as a result of his studies, recommended that dietary standards be based on the estimated physiological demands of persons of different ages, sex, and occupation. For a man doing active work, he suggested a daily intake of 115 to 125 grams of digestible protein and 3400 Calories. For a man doing hard work, Atwater recommended 1.2 times these amounts, and for one at light labor, only 0.9 as much. His standard for the average

woman and the moderately active man was 0.8 that of the active man, while the woman doing light work and the man taking little exercise were allowed 0.64 as much as the active man. Atwater also set up tentative standards for those living under unusual or abnormal conditions. He concluded that dietetics in public institutions was worthy of much more careful study than it had received previous to that time.

According to Sherman (1932), a moderately active man weighing 70 kilograms, designated as the adult male unit, needs daily 3000 Calories, 1 gram of protein per kilogram of body weight, 0.68 gram of calcium, 1.32 grams of phosphorus, and 0.015 gram of iron. In later work Sherman (1937), recommended that this iron standard be lowered to 0.012 gram per day for the adult male unit.

Daniel and Munsell (1937) added standards for vitamins, recommending 4500 Sherman-Munsell units of vitamin A, 600 Sherman-Chase units of vitamin B₁, 30-100 Sherman units of vitamin C, and 600 Sherman-Bourquin units of vitamin G for the adult male unit. No standard was suggested for vitamin D for the adult.

A dietary study of the inventory type was made by Ryder (1932) of the food served at the women's residence hall at Kansas State College of Agriculture and Applied

Science before it became a cooperative group. She found the daily average per capita food consumption for these subjects to be 1821 Calories, 56.1 grams of protein, 0.792 gram of calcium, 1.197 grams of phosphorus, and 0.0123 gram of iron. She made no estimate of the vitamin intakes. An analysis of the edible waste showed 25 per cent loss in energy and 19 per cent loss in protein. The diets were apparently adequate in protein, calcium, phosphorus, and iron, according to the new Sherman standard, but low in energy.

Working with Ryder, Littleford (1932) was interested in the quality and cost of the food served to the women living in the residence hall at Kansas State College of Agriculture and Applied Science. According to her findings, the meat served was United States Choice in quality, milk was grade A, pasteurized, first and second choice eggs were used, and with few exceptions, standard choice fruits and vegetables were purchased. The expenditure for food averaged \$0.45 per day per capita or \$0.57 per adult male unit. She concluded that the diets were slightly low in energy and iron, (old standard), but adequate in protein, and above the Sherman standard for calcium and phosphorus.

Schermerhorn (1936) made another study of the food consumption at the women's residence hall at the Kansas State College of Agriculture and Applied Science. This was

four years after Ryder's investigation, and involved a group of students doing cooperative housekeeping. This worker noted a somewhat higher energy and protein consumption than Ryder had observed, the average being 2088 Calories and 65 grams of protein. The minerals were slightly lower with a mean of 0.75 gram of calcium, 1.13 grams of phosphorus, 0.0095 gram of iron per capita daily. The diets furnished 7548 units of vitamin A, 105 units of vitamin C, and 603 units of vitamin G per capita per day. Schermerhorn concluded that the caloric and iron intakes were low for this group, the phosphorus adequate, and the calcium and the protein above the standard.

Studying student dietaries in Michigan, Mitchell (1935) found the protein intake adequate, while the calcium and phosphorus were low, due to the small amount of milk, cheese, and eggs used. Iron was also low which she credited to a dislike for vegetables.

Kramer, Evers, Fletcher, and Gallemore (1934) determined by analysis of excreta of college women in the fall and again in the spring, that the mean protein intake was above the 70-kilogram requirement of 44.4 grams per day, as established by Sherman (1932), but below the standard of 1 gram per kilogram of body weight. Calcium and phosphorus intakes for a few individuals were above the Sherman

standard during both periods studied, but for the most part, they were lower than the standard, although above the requirement for both of these periods. No seasonal differences were noted.

In North Dakota, Latzke (1934) evaluated the diets selected by students eating in a cafeteria in both the fall and spring seasons. A total of 1665 trays were observed of which 785 were for men and 880 for women. The men consumed more milk, bread, and meat, while the women ate more fruits and desserts. All the meals, as a rule, were poorly balanced. When compared with the standards of Sherman (1937) and Rose (1937) the energy, protein, and vitamins were low for both men and women, but calcium was high for the men and iron was low for the women.

Wheeler and Mallay (1935) made a study of the foods selected by a group of 28 college women, consisting of seniors, juniors, and sophomore students, doing cooperative house-keeping at Vassar College. The meals were planned to satisfy the food preferences of the group. Protective foods accounted for 59 per cent of the cost, cereals for 20 per cent, while only 9 per cent of the food money was expended for animal foods.

The cost per capita in the Vassar study was \$0.43 per day. Analysis showed that the average intake per person

daily was 70 grams of protein, 0.92 gram of calcium, 1.32 grams of phosphorus, 0.0118 gram of iron, 6616 units of vitamin A, 227 units of vitamin C, and 2397 Calories. A gain in weight was noted by 25 per cent of the students and the health and eating habits were excellent. The young women used little meat and only a moderate amount of cereals, but liberal quantities of milk, fruits, and vegetables.

Hawley (1929) investigated the diets of college students using the results of studies made in a total of 250 institutions. According to the Sherman standard, these diets were slightly high in energy and contained considerably more protein, calcium, phosphorus, and iron than necessary.

When these studies were compared with earlier work reported by 12 other investigators involving 93 diets, Hawley found that the later studies were lower in energy, protein, calcium, and iron, and about the same for phosphorus. She concluded that college students received more energy, at least two-thirds more protein, 7 per cent more calcium, phosphorus, and iron than they actually needed. The cost was proportional to the value received, being \$0.40 to \$0.45 per day per capita, based on prices for 1926.

A one-week dietary study of the survey type for 100

college women in Utah was made by Morris and Bowers (1939). The students were classified into four groups according to where they ate, i.e., home, boarding house, bachelor quarters, or dormitories. As the young women were not required to live in the dormitories at the institution, it was possible to compare the food consumption on the basis of living conditions. Standards for comparison were developed from recommendations by Sherman (1937), Rose (1937), and Daniel and Munsell (1937).

These authors found that the diets of all the groups were generally lower than the standards. The dietaries of the students living in the dormitory were consistently superior in quantity and quality while the food of those living in homes was the most inferior. The dietaries of all the groups were comparable and showed consistent deficiencies in phosphorus, iron, B₁, and ascorbic acid.

The nutritive value of the food consumed by a group of six Negro college women living in a cooperative house in Manhattan, Kansas was investigated by Robinson (1939). She found the caloric and vitamin B₁ intakes of half the subjects to be below their calculated needs, while all other nutrients for these three were higher than were believed necessary. The nutritive value of the diets of the other half of the group was in excess of their calculated require-

ments in all respects.

The means for the food nutrients consumed by the subjects studied by Robinson were above the standard for the adult male unit. The average intake per capita per day was 2508 Calories, 76 grams of protein, 0.84 gram of calcium, 1.39 grams of phosphorus, 0.014 gram of iron, 8783 Sherman-Munsell units of vitamin A, 519 Sherman-Chase units of vitamin B₁, 84 Sherman units of vitamin C, 35 International units of vitamin D, and 788 Sherman-Bourquin units of vitamin G. The mean cost per capita per day was 24.7 cents.

PROCEDURE

The interest of the house director and housemother was secured, after which the students living in the cooperative house were acquainted with the plan and their cooperation obtained. The group included five women students and the housemother. Personal data were secured from each member of the group to aid in interpretation of the results. The subjects weighed themselves before dressing each morning on bathroom scales.

The study covered a seven-day period, beginning with breakfast February 19, and ending before breakfast February 26, 1939. A one-day preliminary period insured the proper collection of data and familiarized the group with the pro-

cedure. The meals were planned and the foods purchased by the investigator. In planning the menus, variety in color, flavor, texture, and consistency were stressed, as well as nutritive value. One hundred and twenty meals were provided during the week.

The food eaten by the group was prepared, weighed, and served by the investigator and her assistant, another graduate student making a similar study. The amount of food eaten at each meal and the day's water intake were determined for each subject throughout the seven days of the study. All food purchased to be eaten between meals was brought to the house and weighed so the nutritive value might be properly calculated.

Two Hanson dietetic scales with a capacity of 500 and 1000 grams, respectively, were used for weighing small quantities of food. These scales were checked for accuracy in the Department of Household Physics of Kansas State College of Agriculture and Applied Science before the study began and were found to be reasonably correct. They made it possible to do the weighing rapidly and thus avoid undue cooling of hot dishes. Larger quantities of food and water were weighed on a scale of 12-pound capacity.

The writer and her assistant, working together, weighed all the ingredients used in preparing the food to be cooked.

The finished products were again weighed and the loss noted. Individual servings of the finished foods were weighed by the investigator and recorded by her assistant. Rubber scrapers were used to remove refuse from plates, cocoa from cups, and milk from glasses, thus avoiding loss. All table refuse was weighed and the amount subtracted from that served so that the actual intake of food consumed was determined for each individual.

All foods used were charted for energy, protein, minerals, and when possible for vitamins. Calculations were made from tables of food composition by Rose (1937), supplemented by those from Chaney and Ahlborn (1939) as necessary. The vitamin calculations were based on Daniel and Munsell's tables (1937). Sherman standards (1932) for the moderately active man weighing 70 kilograms (the adult male unit) were used to determine the adequacy of the diets served this group of women. These standards were 3000 Calories, 70 grams of protein, 0.68 gram of calcium, 1.32 grams of phosphorus, and 0.015 gram of iron. The higher standard of 15 milligrams of iron was chosen in preference to the later 12-milligram recommendation of Sherman (1937), as a high iron intake was believed desirable for this group.

The vitamin standards per 70 kilograms of body weight (Daniel and Munsell, 1937) consisting of 4500 Sherman-

Munsell units of vitamin A, 600 Sherman-Chase units of vitamin B₁, 30-100 Sherman units of vitamin C, and 600 Sherman-Bourquin units of vitamin G were used. The above amounts were scaled for each subject according to her weight to measure the adequacy of the individual diets.

The nutritive value and cost of the diets were compared with the results of studies made with other groups of college women. The foods used were divided into five groups according to Gillet's plan for expenditure as noted by Chaney and Ahlborn (1939), and the percentage spent for each group calculated.

RESULTS

The group studied ranged from 20 to 61 years of age (Table 1) and averaged 31 years. If the oldest subject, M.C., be excluded, the mean age of the college group was 24.8 years. The average height was 64 inches, the subjects ranging from 61 to 66 inches (Table 1). The weight of the group varied from 44.4 to 67.3 kilograms with a mean of 56.3 (Table 2). Three subjects gained during the week of the study, one lost, and two remained stationary in weight (Table 3).

The foods served during the period investigated (Table 4) contained a liberal supply of fruits and vege-

Table 1. Record of personal data.

Subject	Subject					
	J.S.	A.O.	V.A.	M.C.	E.M.	J.R.
Age in years to nearest birthday	28	20	30	61	22	24
Height in inches	61	66	64	65.5	62	66
Weight in pounds (beginning of study)	122	120	149	139.75	98	114
Weight in pounds (end of study)	124	120	146	139.75	99	116
Activity	Moderate	Moderate	Moderate	Light	Active	Moderate
Chief form of exercise	Laboratory: dietary study	Walking	Walking	Sewing	Walking	Laboratory: dietary study
Average number hours sleep	7.5	7	7	7	7	6

Mean age, all subjects, 31 yrs.
 Mean age excluding subject M.C., 24.8 yrs.
 Mean height, 64 in.
 Mean weight, 124.1 lbs.
 Mean sleep, 6.9 hrs.

Table 2. Weight record.

Date	Day	Subject					
		J.S.	A.O.	V.A.	M.C.	E.M.	J.R.
		kg.	kg.	kg.	kg.	kg.	kg.
Feb. 19, 1939	Sunday	55.3	54.4	67.6	63.3	44.4	51.7
Feb. 20, 1939	Monday	55.3	54.4	67.6	63.3	44.4	51.7
Feb. 21, 1939	Tuesday	55.8	54.9	67.1	63.3	44.4	52.1
Feb. 22, 1939	Wednesday	55.8	54.9	67.1	63.3	44.4	52.1
Feb. 23, 1939	Thursday	56.2	54.7	67.1	63.3	44.4	52.6
Feb. 24, 1939	Friday	56.2	54.9	67.6	63.5	44.8	52.6
Feb. 25, 1939	Saturday	56.2	54.4	67.1	63.3	44.8	52.6
Mean		55.7	54.4	67.3	63.3	44.4	52.1
Weight							
Beginning of study		55.3	54.4	67.6	63.3	44.4	51.7
End of study		56.2	54.4	67.4	63.3	44.5	52.6
Range		55.3- 56.2	54.4	67.1- 67.6	63.3	44.4- 44.5	51.7- 52.6
Mean for group:	56.3 kg.						

Table 3. State of nutrition related to caloric and protein intakes and gain in weight.

Subject	Age	Height	Mean weight	State of nutrition	Change in weight	Intake per kg.	
					during experiment	Calories	Protein
	yr.	cm.	kg.		kg.		gm.
J.S.	28	154.9	55.7	Normal	+ 0.9	37.6	1.19
A.O.	20	167.6	54.4	Underweight	+ 0.0	43.8	1.37
V.A.	30	162.6	67.3	Overweight	- 0.5	35.2	1.11
M.C.	61	166.4	63.3	Normal	+ 0.0	35.0	1.09
E.M.	22	157.5	44.4	Underweight	+ 0.1	53.4	1.66
J.R.	24	167.6	52.1	Underweight	+ 0.9	48.3	1.48
Mean	31		56.3		+ 0.2	42.2	1.31

tables. Some citrus fruit or tomato was included each day, and milk in some form was offered as a beverage at least once daily. All subjects were present at each meal. Two individuals reported eating twice between meals, the others, only once (Table 4). A wide variety of foods were eaten between meals including candy, cookies, sandwiches, and fruit.

The nutritive value of the food consumed at each meal by each subject is shown in Tables 5 to 10 inclusive. The mean energy intake per day for the group was 2,325 Calories which was 97 below the standard for the 56.3 kilogram woman, the average weight for the six subjects (Table 11).

The average number of calories per capita ranged from 2096 to 2517, a difference of 421. This may be accounted for by variations in body build, state of nutrition, and kind and amount of activity (Tables 1,3). The energy intakes per kilogram varied from 35.0 to 53.4 Calories, the highest being for subject E.M. who was the smallest member of the group, and the lowest for M.C., the housemother, who was the oldest and least active (Table 3).

Dinner furnished the greatest part of the energy of the diets for all subjects, while lunch supplied the smallest percentage (Tables 5-10 inclusive). Between-meal eating accounted for a small proportion of the total calories.

Table 4. Food served during week of study.

16

Date and day	Breakfast	Lunch	Dinner	Between meals	
				Food	Subject using
Feb. 19, 1939 Sunday	Shredded wheat Banana Milk Sugar Egg omelet White toast Butter Cocoa Coffee		Swiss steak Tomato sauce Mashed potato Buttered turnips Buttered spinach White bread Butter Pineapple pie Milk	Chocolate candy Grapes Fruit Chocolate candy Peanuts Ham sandwich Cookies Chocolate candy Ham sandwich Cookies Orange Apple Bread Butter Tea Chocolate candy Banana	J.S. 1 A.O. 1 E.M. 1 M.C. 1 V.A. 1 J.R. 1
Feb. 20, 1939 Monday	Orange Sugar Bacon Eggs White toast Butter Cocoa Coffee	Carrot strips Corn chowder Corn muffins Chocolate pudding Sauce	Hashed brown potatoes Boiled cabbage Creamed onions White bread Butter Canned peaches Lemon juice ²		
Feb. 21, 1939 Tuesday	Tomato juice Malto-meal Cream Sugar Cheese toast Cocoa Coffee	Baked apple Creamed egg White toast	Liver Tomato sauce Shredded lettuce Peas and carrots Candied sweet potatoes Bread Butter	Cheese toast Cocoa	J.S. 3

Table 4 -- Continued

Date and day	Breakfast	Lunch	Dinner	Between meals	
				Food	Subject using
Feb. 22, 1939 Wednesday	Grapefruit juice Sugar Bacon Preserves Muffins Butter Tea Coffee Milk ⁴	Scalloped potatoes Buttered string beans Apple, banana salad W.W. bread Butter	Meat loaf Navy beans Buttered spinach W.W. bread Butter Bread pudding Milk		
Feb. 23, 1939 Thursday	Prunes Orange ⁵ Cheese toast Cocoa Coffee	Meat loaf (left-over) Cornmeal dressing Apple sauce W.W. bread	Salmon loaf Boiled cabbage Mashed potatoes Head lettuce W.W. bread		
Feb. 24, 1939 Friday	Grapefruit juice Egg omelet Preserves W.W. toast Butter Cocoa Coffee	Oyster stew Croutons White bread Vegetable casserole W.W. bread	Fried fish Fried corn Boiled potatoes Sliced tomato W.W. bread Butter Pineapple gelatin		
Feb. 25, 1939 Saturday	Prunes Cream Crisp bacon Muffins Butter Cocoa Coffee	Deviled eggs Celery and carrot strips Spinach (left-over) W.W. bread Butter	Hamburger Slice tomato Relish W.W. bread Punch Meat loaf) ⁶ Salmon loaf) Pineapple gelatin) Coffee)	Coco Cola	M.C. :V.A.,M.C. :A.D.,J.R. :M.C.,J.R. :M.C.

1. The foods listed between meals on Sunday, were served as a light lunch.
2. Only subject J.S. used lemon juice.
3. Subject J.S. ate the food indicated between lunch and dinner.
4. Milk was substituted for coffee by subject J.S.
5. Subject J.S. ate an orange for breakfast as indicated.
6. Left-overs for dinner eaten by different subjects.

Table 5. Daily food intakes (Subject, J.S.).

Date	Day	Meal	Calories	Protein gm.	Fat gm.	Carbohydrates gm.	Calcium gm.	Phosphorus gm.	Iron gm.	Vitamin units					Cost
										Sherman-Munsell	Sherman-Chase	Sherman	International	Sherman-Bourquin	
2/19/39	Sun.	Bkfst.	556.0	16.28	15.89	100.95	0.1937	0.1322	0.0019	1,114	45.4	4.5	20.5	132.6	\$0.203
		Dinner	1,046.0	40.00	47.95	110.72	0.6401	0.5862	0.0076	28,614	194.4	61.8	7.5	388.1	0.306
		Between	91.9	1.62	5.68	8.83	0.0229	0.0017	0.0000	---	17	44.2	---	34	0.016
		Total	1,693.9	57.90	69.52	220.50	0.7457	0.7201	0.0095	29,728	256.8	110.5	28.0	554.7	0.526
2/20/39	Mon.	Bkfst.	90.0	22.51	46.93	109.19	0.3433	0.4371	0.0028	1,291	111.2	49.4	25.2	200.0	0.074
		Lunch	422.4	18.14	21.75	124.35	0.2158	0.3688	0.0029	6,599	106.5	15.4	8.6	148.9	0.072
		Dinner	436.8	10.93	15.73	154.07	0.1451	0.2238	0.0027	1,407	142.7	41.9	24.0	145.1	0.095
		Total	2,516.2	51.58	84.41	387.61	0.7042	1.0297	0.0084	9,298	360.7	106.7	57.9	494.1	0.241
2/21/39	Tues.	Bkfst.	579.2	15.71	34.60	50.26	0.3667	0.3412	0.0012	2,498	47.2	20.4	14.3	110.6	0.083
		Lunch	458.1	19.41	10.50	71.50	0.1907	0.3833	0.0030	1,006	89.2	2.1	45.3	123.7	0.057
		Dinner	719.3	30.47	37.72	64.48	0.1095	0.4497	0.0098	5,898	165.4	14.2	30.3	964.7	0.119
		Between	334.6	13.78	15.75	34.43	0.3712	0.3269	0.0008	730	27.9	---	27.9	123.8	0.028
		Total	2,091.2	79.37	98.57	222.67	1.0381	1.5011	0.0148	10,133	329.8	36.7	117.9	1,323.1	0.287
2/22/39	Wed.	Bkfst.	774.2	17.14	38.08	90.73	0.3996	0.3697	0.0015	747	76.3	---	15.6	199.2	0.085
		Lunch	604.2	12.27	33.01	64.51	0.1676	0.2192	0.0028	409	87.7	15.9	38.5	53.0	0.042
		Dinner	895.3	40.11	33.64	108.03	0.4166	0.6814	0.0094	18,960	211.0	29.1	9.8	307.1	0.099
		Total	2,273.7	69.52	104.73	262.27	0.9838	1.2703	0.0137	20,117	375.1	45.0	64.0	559.4	0.226
2/23/39	Thurs.	Bkfst.	501.8	12.56	13.16	83.30	0.3667	0.3130	0.0020	1,406	100.7	41.8	7.5	126.9	0.037
		Lunch	924.1	34.98	46.53	91.35	0.3490	0.5248	0.0017	7,148	128.0	9.2	18.4	218.7	0.102
		Dinner	493.0	19.12	22.61	53.23	0.1771	0.2079	0.0028	320	148.9	82.2	12.8	92.7	0.043
		Total	1,918.9	66.66	82.30	227.88	0.8928	1.0457	0.0065	8,875	377.7	133.2	38.7	438.3	0.183
2/24/39	Fri.	Bkfst.	534.6	17.70	17.68	76.14	0.2611	0.3442	0.0018	992	115.4	31.2	18.7	154.5	0.065
		Lunch	446.0	18.59	16.60	55.56	0.2063	0.3090	0.0029	700	176.3	13.7	6.0	79.9	0.057
		Dinner	969.6	53.90	41.56	95.00	0.0777	0.5591	0.0046	789	89.5	30.6	.0	30.1	0.176
		Total	1,950.2	90.19	75.84	226.70	0.5041	1.2123	0.0073	2,489	381.2	75.5	24.7	264.5	0.299
2/25/39	Sat.	Bkfst.	1,233.4	17.52	59.70	156.50	0.3575	0.4408	0.0049	2,572	39.2	3.6	84.7	103.9	0.065
		Lunch	459.2	15.36	28.71	34.84	0.1827	0.3896	0.0049	3,365	325.9	29.4	8.4	199.3	0.070
		Dinner	537.5	19.27	16.95	76.96	0.0905	0.2882	0.0049	869	249.6	57.2	---	97.9	0.074
		Total	2,230.1	52.15	105.36	268.30	0.6305	1.1186	0.0147	6,833	614.8	90.2	93.1	401.2	0.209
Daily average			2,096.3	66.76	88.67	259.41	0.7856	1.1282	0.0101	12,496	385.1	85.4	60.6	576.4	0.282
Sherman Standard (55.7 kg.)			2,387	55.7	---	---	0.54	1.05	0.0119	3,580	477	47	---	477	0.348

Table 6. Daily food intakes (Subject, A.O.).

P.19

Date	Day	Meal	Calor- ies	Pro- tein gm.	Fat gm.	Carbo- hydrates gm.	Cal- cium gm.	Phos- phorus gm.	Iron gm.	Vitamin units					Cost
										Sherman- Munsell	Sherman- Chase	Sherman- Sherman	Inter- national	Sherman- Bourquin	
2/19/39	Sun.	Bkfst.	655.2	20.28	20.28	97.91	0.2112	0.1962	0.0023	1,416	64.3	8.6	25.0	146.4	\$0.246
		Dinner	1,236.3	40.00	63.07	127.17	0.3948	0.5164	0.0093	17,760	162.1	58.3	19.9	288.8	0.211
		Between	784.6	31.39	45.26	53.93	0.0573	0.3661	0.0030	---	208.0	---	---	64.0	0.150
		Total	2,676.1	91.67	128.84	279.01	0.6633	1.0787	0.0146	19,176	434.4	66.9	45.9	499.2	0.607
2/20/39	Mon.	Bkfst.	641.8	18.09	41.06	49.95	0.2208	0.3235	0.0019	1,043	84.5	40.3	21.9	146.3	0.055
		Lunch	1,050.0	25.58	31.98	164.99	0.2922	0.4990	0.0021	5,136	108.2	12.1	9.9	176.7	0.089
		Dinner	1,012.8	23.22	39.00	142.22	0.2315	0.3959	0.0020	1,837	262.4	87.2	21.0	251.3	0.115
		Total	2,704.6	66.89	112.00	357.16	0.7445	1.1984	0.0060	8,017	455.1	139.6	52.9	574.4	0.259
2/21/39	Tues.	Bkfst.	897.6	25.25	45.76	96.21	0.5840	0.5104	0.0017	3,192	54.6	26.4	20.7	159.9	0.091
		Lunch	552.3	25.05	13.50	82.65	0.2600	0.3211	0.0035	1,290	100.5	2.4	98.0	113.9	0.066
		Dinner	1,262.2	30.61	70.44	126.46	0.1723	0.4656	0.0080	588	216.4	36.6	33.8	905.2	0.146
		Total	2,712.1	80.91	129.70	305.32	1.0163	1.2991	0.0132	5,071	371.5	65.6	152.5	1,179.2	0.303
2/22/39	Wed.	Bkfst.	582.5	9.12	21.69	87.71	0.1136	0.1437	0.0010	255	28.3	57.7	7.5	52.9	0.062
		Lunch	468.5	12.85	21.62	55.63	0.1625	0.1440	0.0028	671	170.1	12.8	45.5	52.0	0.172
		Dinner	1,563.7	55.01	61.90	196.65	0.6378	0.9606	0.0125	19,656	346.8	41.5	13.9	366.9	0.150
		Total	2,614.7	76.98	105.21	339.99	0.9139	1.2483	0.0151	20,583	545.3	111.0	69.9	471.8	0.384
2/23/39	Thurs.	Bkfst.	583.0	13.99	15.34	97.47	0.3364	0.3625	0.0025	1,607	94.1	3.9	5.8	104.0	0.035
		Lunch	816.9	34.28	35.82	89.34	0.3538	0.5702	0.0022	824	119.7	1.7	6.2	52.1	0.037
		Dinner	474.5	13.82	13.51	74.66	0.1823	0.3105	0.0041	1,159	183.0	65.2	9.1	111.0	0.066
		Total	1,874.4	62.09	64.67	261.47	0.8795	1.2432	0.0088	3,591	396.8	80.8	21.1	267.1	0.138
2/24/39	Fri.	Bkfst.	522.5	19.64	25.77	77.99	0.2783	0.2966	0.0033	104	173.8	---	23.6	140.0	0.072
		Lunch	343.7	18.51	16.47	55.37	0.2157	0.3027	0.0027	692	214.2	15.2	6.0	79.1	0.074
		Dinner	757.0	17.63	25.87	113.43	0.0876	0.4555	0.0066	1,125	149.4	40.7	7.6	35.5	0.184
		Total	1,623.2	55.78	68.11	246.79	0.5816	1.0548	0.0126	1,922	540.4	55.9	37.2	292.6	0.330
2/25/39	Sat.	Bkfst.	1,177.0	14.40	55.07	155.96	0.3724	0.4453	0.0019	2,592	42.1	3.6	28.2	112.0	0.064
		Lunch	495.7	23.44	21.78	51.47	0.2136	0.4436	0.0019	7,389	200.1	31.6	11.7	170.6	0.091
		Dinner	818.1	28.08	25.33	119.44	0.1310	0.3711	0.0067	1,067	229.6	80.4	.5	127.9	0.097
		Total	2,490.8	66.92	102.18	326.87	0.7170	1.2000	0.0105	11,049	471.8	114.6	40.4	411.4	0.252
Daily average			2,385.1	71.46	101.53	302.37	0.7880	1.0342	0.0115	9,915	459.3	90.6	59.9	527.9	0.324
Sherman Standard (54.4 kg.)			2,331	54.4	---	---	0.52	1.02	0.0116	3,497	466	46	---	466	0.315

Table 7. Daily food intakes (Subject, V.A.).

P. 20

Date	Day	Meal	Calories	Protein	Fat	Carbohydrates	Calcium	Phosphorus	Iron	Vitamin units					Cost
										Sherman-Munsell	Sherman-Chase	Sherman	International	Sherman-Bourquin	
										A	B ₁	C	D	G	
2/19/39	Sun.	Bkfst.	534.2	16.84	8.72	97.08	0.2178	0.1764	0.0020	1,024	60.1	5.4	14.6	143.9	\$0.217
		Dinner	1,192.3	43.22	61.05	117.47	0.3936	0.4913	0.0101	20,799	177.8	55.0	13.9	335.6	0.208
		Between	280.1	2.73	5.45	30.03	0.0155	0.0234	0.0001	132	---	---	4.8	---	0.013
		Total	2,006.6	62.79	75.22	244.58	0.6269	0.6911	0.0122	23,955	237.9	60.4	33.4	479.5	0.438
2/20/39	Mon.	Bkfst.	500.4	9.18	28.07	52.78	0.0834	0.1628	0.0015	818	69.1	49.4	10.3	78.3	0.057
		Lunch	1,059.7	24.74	28.76	175.49	0.3110	0.4728	0.0019	5,733	84.9	9.1	11.0	176.5	0.088
		Dinner	686.7	17.13	21.41	106.37	0.1645	0.2782	0.0031	1,355	185.2	58.1	12.0	179.9	0.082
		Total	2,246.8	51.05	79.24	334.64	0.5589	0.9138	0.0065	7,908	339.2	116.6	33.3	436.7	0.237
2/21/39	Tues.	Bkfst.	516.0	23.17	24.73	60.18	0.5600	0.4862	0.0015	2,571	50.2	24.0	8.6	156.3	0.046
		Lunch	541.3	18.81	12.67	88.03	0.2020	0.2551	0.0029	1,018	86.2	2.2	46.6	123.1	0.057
		Dinner	1,488.3	39.84	80.33	151.72	0.1869	0.6941	0.0086	846	244.1	36.9	51.5	1,298.0	0.137
		Total	2,545.6	81.82	117.73	299.93	0.9489	1,4354	0.0130	4,366	380.5	73.1	106.7	1,577.4	0.240
2/22/39	Wed.	Bkfst.	666.0	2.45	23.66	110.83	0.0791	0.0118	0.0010	1,308	28.1	1.9	10.6	15.3	0.078
		Lunch	870.4	19.12	44.28	98.85	0.2754	0.3883	0.0052	635	146.2	25.8	48.4	88.8	0.062
		Dinner	1,120.1	49.50	29.79	163.49	0.6022	0.8442	0.0141	20,457	164.8	30.9	7.9	117.2	0.064
		Total	2,656.5	71.07	97.73	373.17	0.9567	1.3474	0.0203	24,400	339.1	58.6	66.9	221.3	0.204
2/23/39	Thurs.	Bkfst.	518.3	14.11	20.46	69.45	0.3637	0.3677	0.0018	1,392	76.2	2.3	9.0	114.5	0.036
		Lunch	933.6	48.31	38.38	98.76	0.3540	0.5735	0.0019	6,189	149.0	8.1	6.1	155.3	0.088
		Dinner	774.0	35.91	36.79	74.82	0.2205	0.3417	0.0048	1,262	195.6	84.0	9.3	129.6	0.077
		Total	2,225.9	98.33	95.63	243.03	0.9382	1.2829	0.0085	8,844	420.8	94.4	24.7	399.4	0.201
2/24/39	Fri.	Bkfst.	737.2	19.46	30.39	96.47	0.4090	0.4191	0.0030	976	133.8	35.4	18.9	217.4	0.078
		Lunch	498.5	21.52	20.92	56.03	0.1588	0.4443	0.0015	1,043	157.9	20.5	8.6	119.3	0.100
		Dinner	1,441.8	58.41	46.97	196.38	0.1266	0.7400	0.0063	819	154.8	39.3	.4	33.4	0.166
		Total	2,677.5	99.39	98.28	348.88	0.6944	1.6034	0.0108	2,828	546.5	95.2	27.9	370.1	0.344
2/25/39	Sat.	Bkfst.	695.3	11.46	32.64	88.92	0.3645	0.2281	0.0031	1,251	33.7	1.3	11.9	92.3	0.045
		Lunch	428.5	20.06	16.48	50.00	0.1593	0.2816	0.0041	2,045	144.9	30.5	10.6	130.3	0.189
		Dinner	978.0	30.62	40.21	123.40	0.1383	0.4888	0.0118	756	403.2	70.2	1.8	175.9	0.085
		Total	2,101.8	62.14	89.33	262.32	0.6621	0.9985	0.0190	4,053	581.8	102.0	24.3	398.5	0.319
Daily average			2,372.2	75.22	93.87	300.95	0.7694	1.1817	0.0129	10,193	406.6	85.7	45.3	554.7	0.283
Sherman Standard (67.3 kg.)			2,888	67.3	---	---	0.65	1.27	0.0144	4,332	577	57	---	577	0.363

p.21

Table 8. Daily food intakes (Subject, M.C.).

Date	Day	Meal	Calories	Protein gm.	Fat gm.	Carbohydrates gm.	Calcium gm.	Phosphorus gm.	Iron gm.	Vitamin units					Cost
										Sherman-Munsell	Sherman-Chase	Sherman	International	Sherman-Bourquin	
2/19/39	Sun.	Bkfst.	528.2	16.73	12.30	87.65	0.2079	0.6884	0.0020	1,049	60.7	5.8	18.6	144.6	\$0.213
		Dinner	1,143.9	36.66	62.23	109.29	0.3993	0.4840	0.0091	27,996	192.1	64.5	20.4	342.1	0.179
		Between	113.5	.95	.83	25.56	0.0221	0.0258	0.0007	146	60.9	25.4	---	43.7	0.019
		Total	1,785.6	54.34	75.36	222.50	0.6293	0.6782	0.0118	29,191	313.7	85.7	39.0	530.4	0.411
2/20/39	Mon.	Bkfst.	425.9	12.36	31.39	33.24	0.1139	0.2114	0.0026	1,340	68.8	44.2	21.2	85.4	0.084
		Lunch	845.4	20.58	26.49	131.17	0.2667	0.4338	0.0035	5,719	105.6	14.2	6.5	159.5	0.091
		Dinner	852.9	19.69	37.87	108.33	0.2407	0.3439	0.0034	1,729	238.2	81.2	30.0	231.6	0.103
		Total	2,124.2	52.63	95.75	262.74	0.6213	0.9891	0.0095	8,798	412.6	139.6	57.7	476.5	0.278
2/21/39	Tues.	Bkfst.	633.2	21.64	34.97	57.98	0.4616	0.3813	0.0010	2,226	14.0	12.0	9.6	80.8	0.044
		Lunch	502.4	15.96	11.06	84.77	0.1673	0.2134	0.0026	713	75.5	1.9	37.0	93.4	0.051
		Dinner	1,461.4	39.07	69.42	170.08	0.1891	0.6468	0.0077	854	244.6	39.3	44.3	1,139.9	0.145
		Total	2,597.0	76.67	115.45	312.83	0.8180	1.2415	0.0113	3,793	334.1	53.2	87.9	1,314.1	0.240
2/22/39	Wed.	Bkfst.	731.9	9.02	28.64	109.51	0.1409	0.1626	0.0009	582	25.9	53.6	8.2	48.6	0.091
		Lunch	668.0	14.05	36.22	71.44	0.2054	0.2860	0.0037	610	156.8	20.0	40.0	66.8	0.050
		Dinner	1,287.0	52.60	44.33	169.40	0.6223	0.8732	0.0158	25,053	286.4	41.7	18.7	380.2	0.131
		Total	2,686.9	75.67	109.19	350.35	0.9686	1.3218	0.0204	26,245	469.1	115.3	66.9	495.6	0.272
2/23/39	Thurs.	Bkfst.	362.6	5.46	10.85	60.77	0.1204	0.1533	0.0017	1,287	45.0	2.4	4.8	12.0	0.031
		Lunch	894.2	37.75	43.91	86.99	0.3553	0.5788	0.0019	8,018	166.1	11.1	17.4	178.5	0.097
		Dinner	706.1	24.81	28.47	87.68	0.2025	0.3056	0.0046	840	224.1	101.2	3.9	143.9	0.112
		Total	1,962.9	68.02	83.23	235.44	0.6782	1.0377	0.0082	10,145	435.2	114.7	26.1	334.4	0.240
2/24/39	Fri.	Bkfst.	473.3	10.77	25.69	49.75	0.1020	0.0914	0.0062	975	74.7	41.6	20.8	85.2	0.072
		Lunch	281.5	12.51	13.26	28.04	0.1657	0.2194	0.0052	531	153.7	8.4	6.1	62.9	0.060
		Dinner	1,442.1	76.37	65.33	137.14	0.1213	0.3803	0.0076	1,097	147.1	47.1	---	53.8	0.189
		Total	2,196.9	99.65	104.28	214.93	0.3890	1.1911	0.0190	2,603	375.5	97.7	27.9	201.9	0.321
2/25/39	Sat.	Bkfst.	966.5	8.04	52.37	115.74	0.1767	0.2519	0.0041	1,254	9.1	2.5	29.7	13.0	0.091
		Lunch	397.6	13.57	17.32	46.86	0.1634	0.2590	0.0041	245	118.7	27.6	7.4	142.1	0.051
		Dinner	788.1	36.67	32.20	87.90	0.1272	0.4672	0.0056	1,285	244.9	73.5	5.9	226.6	0.125
		Total	2,152.2	58.28	101.89	250.53	0.4673	0.9781	0.0138	2,785	372.7	103.6	43.0	381.7	0.267
Daily average			2,215.1	69.32	97.87	264.18	0.6531	1.0625	0.0134	11,722	381.0	101.4	48.3	533.5	0.289
Sherman Standard (63.3 kg.)			2,712	63.3	---	---	0.61	1.19	0.0135	4,069	542	54	---	542	0.375

Table 9. Daily food intakes (Subject, E.M.)

Date	Day	Meal	Calor- ies	Pro- tein	Fat	Carbo- hydrates	Cal- cium	Phos- phorus	Iron	Vitamin units					Cost
										Sherman- Munsell	Sherman- Chase	Sherman- Sherman	Inter- national	Sherman- Bourquin	
										A	B ₁	C	D	G	
2/19/39	Sun.	Bkfst.	570.9	19.08	18.78	81.41	0.2469	0.2072	0.0021	1,173	66.0	15.8	13.4	156.7	0.231
		Dinner	1,254.2	40.73	63.97	128.89	0.3981	0.4125	0.0086	23,517	179.8	57.0	23.2	312.6	0.218
		Between	650.4	25.18	34.93	58.82	0.0585	0.2893	0.0028	188	---	---	---	58.0	0.094
		Total	2,475.4	84.99	117.68	269.12	0.7035	0.9090	0.0135	24,878	245.8	72.8	36.6	526.3	0.543
2/20/39	Mon.	Bkfst.	670.8	16.82	44.06	51.76	0.2276	0.3091	0.0033	726	97.1	53.3	26.1	154.4	0.059
		Lunch	1,042.1	25.18	31.35	164.79	0.2932	0.4944	0.0034	398	121.5	15.5	4.5	157.4	0.109
		Dinner	807.4	17.15	33.95	108.29	0.2135	0.3097	0.0034	1,711	219.0	73.1	30.0	217.0	0.059
		Total	2,520.3	59.15	109.36	324.84	0.7343	1.1132	0.0101	2,836	435.6	141.9	60.6	528.8	0.227
2/21/39	Tues.	Bkfst.	768.0	19.99	42.82	75.90	0.4456	0.4194	0.0014	1,293	53.0	---	20.9	133.0	0.088
		Lunch	462.3	15.68	10.39	76.53	0.1644	0.2088	0.0024	809	68.7	3.4	64.2	67.3	0.047
		Dinner	1,340.2	35.31	75.72	129.37	0.1742	0.6102	0.0083	538	232.9	55.5	44.3	1,054.9	0.134
		Total	2,570.5	70.98	128.93	281.80	0.7842	1.2384	0.0120	2,587	334.6	58.9	129.4	1,255.2	0.269
2/22/39	Wed.	Bkfst.	638.9	7.92	13.91	120.50	0.1024	0.1265	0.0009	270	27.5	58.2	10.6	46.6	0.130
		Lunch	592.7	13.11	30.96	65.43	0.1624	0.2544	0.0034	638	170.6	17.5	99.9	50.1	0.046
		Dinner	1,343.7	61.47	44.05	175.32	0.6572	1.0592	0.0149	7,947	340.3	35.5	12.5	355.2	0.141
		Total	2,575.3	82.50	88.92	361.25	0.9220	1.4401	0.0192	8,857	538.4	111.2	123.0	451.9	0.317
2/23/39	Thurs.	Bkfst.	549.9	18.68	15.62	83.65	0.2247	0.2830	0.0020	1,152	74.5	1.8	9.9	83.8	0.054
		Lunch	832.6	35.59	37.74	87.62	0.3606	0.5642	0.0022	6,535	186.4	9.8	6.5	148.1	0.093
		Dinner	916.6	32.32	38.60	109.98	0.0061	0.4317	0.0055	885	284.1	87.0	11.3	132.8	0.067
		Total	2,299.1	86.59	91.96	281.25	0.7914	1.2789	0.0097	8,573	545.0	98.6	27.7	364.7	0.214
2/24/39	Fri.	Bkfst.	697.3	19.09	28.34	91.46	0.2665	0.2936	0.0026	1,096	153.1	45.7	21.3	184.1	0.084
		Lunch	364.9	15.20	15.71	40.68	0.1815	0.2492	0.0017	659	171.2	19.6	6.0	76.2	0.067
		Dinner	853.7	51.61	19.26	118.49	0.1110	0.6233	0.0062	1,585	167.5	33.3	10.1	38.2	0.156
		Total	1,915.9	85.90	63.31	250.63	0.5590	1.1661	0.0105	3,342	491.8	98.6	37.4	298.5	0.307
2/25/39	Sat.	Bkfst.	1,126.1	16.43	65.46	117.83	0.4360	0.5132	0.0058	5,134	50.5	4.8	34.7	137.9	0.079
		Lunch	309.6	8.96	15.50	33.58	0.1715	0.2844	0.0045	3,320	124.6	31.1	4.5	143.8	0.055
		Dinner	795.4	21.91	26.39	117.57	0.1133	0.3534	0.0070	617	230.6	81.7	---	130.7	0.087
		Total	2,231.1	47.30	107.35	268.98	0.7208	1.1510	0.0173	7,072	405.7	117.6	39.2	412.4	0.221
Daily average			2,369.2	73.91	101.07	291.12	0.7450	1.1852	0.0131	8,305	428.1	100.6	64.8	550.8	0.299
Sherman Standard (44.4 kg.)			1,902	44.4	---	---	0.43	0.64	0.0095	2,854	380	38	---	380	0.151

7.23

Table 10. Daily food intakes (Subject, J.R.).

Date	Day	Meal	Calories	Protein gm.	Fat gm.	Carbohydrates gm.	Calcium gm.	Phosphorus gm.	Iron gm.	Vitamin units					Cost
										Sherman-Munsell	Sherman-Chase	Sherman-Sherman	International	Sherman-Bourquin	
2/19/39	Sun.	Bkfst.	740.5	18.73	23.43	113.68	0.2131	0.1800	0.0023	1,360	64.8	7.7	28.2	149.5	\$0.237
		Dinner	1,180.1	37.43	62.79	116.33	0.3604	0.4598	0.0081	22,864	163.3	44.9	20.0	274.4	0.186
		Between	116.0	1.62	4.51	17.22	0.0040	0.0153	0.0003	140	15.3	8.2	---	17.8	0.041
		Total	2,036.6	57.78	90.73	247.23	0.5775	0.6551	0.0107	24,364	243.4	60.8	48.2	441.7	0.464
2/20/39	Mon.	Bkfst.	773.1	17.32	37.28	92.08	0.1940	0.3021	0.0020	1,709	102.5	42.2	60.7	223.9	0.069
		Lunch	1,286.6	30.74	35.16	211.80	0.4252	0.6256	0.0028	1,365	135.4	21.1	11.9	221.3	0.112
		Dinner	828.8	24.82	13.27	152.53	0.1838	0.2895	0.0031	1,670	129.1	43.9	---	113.2	0.093
		Total	2,888.5	72.88	85.71	456.41	0.8030	1.2172	0.0079	4,744	363.0	107.2	72.6	558.4	0.274
2/21/39	Tues.	Bkfst.	792.0	13.79	32.80	110.41	0.2493	0.2498	0.0007	992	24.1	12.4	17.6	72.4	0.091
		Lunch	438.3	17.70	9.00	71.62	0.1757	0.2181	0.0025	853	77.5	2.0	38.0	106.1	0.052
		Dinner	1,407.8	35.60	85.88	123.12	0.1626	0.6099	0.0080	937	228.0	117.1	44.3	1,135.2	0.138
		Total	2,638.1	67.09	127.68	305.14	0.5876	1.0778	0.0112	2,782	329.6	131.5	99.9	1,313.7	0.281
2/22/39	Wed.	Bkfst.	791.1	8.04	24.92	133.64	0.1066	0.1319	0.0009	336	29.2	61.4	10.6	54.9	0.072
		Lunch	859.0	18.04	47.12	90.68	0.2429	0.1594	0.0045	798	211.1	20.9	47.4	73.7	0.065
		Dinner	1,517.0	86.25	36.56	210.75	0.6574	0.7201	0.0143	21,075	274.7	60.5	11.4	272.2	0.122
		Total	3,167.1	112.33	108.60	435.07	1.0069	1.0114	0.0197	22,210	515.0	142.8	69.4	400.8	0.259
2/23/39	Thurs.	Bkfst.	588.3	11.35	16.28	99.10	0.2210	0.2794	0.0020	1,171	93.3	1.9	35.3	81.9	0.036
		Lunch	987.3	37.71	45.72	106.28	0.3851	0.6089	0.0024	6,787	192.3	8.9	6.7	166.5	0.103
		Dinner	569.8	21.84	28.71	56.01	0.1601	0.2356	0.0032	684	200.0	91.9	19.2	1,046	0.082
		Total	2,145.4	20.90	90.71	261.39	0.7662	1.1239	0.0076	8,642	485.6	102.7	61.2	353.0	0.221
2/24/39	Fri.	Bkfst.	561.8	19.93	19.86	75.61	0.2855	0.2753	0.0027	1,097	136.8	40.0	21.3	184.5	0.083
		Lunch	437.5	21.19	18.86	45.74	0.0911	0.3825	0.0024	417	173.6	11.7	23.8	571.9	0.952
		Dinner	1,289.3	66.35	61.31	118.02	0.1218	0.7532	0.0063	1,595	164.6	39.0	10.1	37.5	0.174
		Total	2,288.6	107.47	100.03	239.37	0.4982	1.4110	0.0114	2,498	475.0	90.7	55.2	793.9	0.309
2/25/39	Sat.	Bkfst.	1,224.3	15.74	62.87	148.87	0.4020	0.4735	0.0044	2,498	46.7	2.5	33.5	125.5	0.081
		Lunch	393.3	9.59	16.22	52.23	0.1729	0.2924	0.0045	2,925	163.6	32.4	7.9	147.9	0.074
		Dinner	842.3	28.62	26.91	121.40	0.1330	0.4336	0.0062	714	340.5	74.5	---	142.7	0.093
		Total	2,459.9	53.95	106.00	322.50	0.7079	1.1995	0.0151	6,137	550.8	109.4	41.4	416.1	0.248
Daily average			2,517.7	77.48	101.35	323.01	0.7067	1.0865	0.0119	10,196	423.2	106.4	63.9	611.0	0.294
Sherman Standard (52.1 kg.)			2,232	52.1	---	---	0.51	0.98	0.0111	3,349	447	44	---	447	0.275

Table 11. Mean nutritive value of diets of all subjects.

:Subjects	:Calor- :ies	:Pro- :tein	:Fat	:Carbo- :hydrates	:Cal- :cium	:Phos- :phorus	:Iron	:Vitamin units					:Cost
								:Sherman- :Munsell	:Sherman- :Chase	:C :Sherman	:D :national	:G :Bourquin	
J.S.	: 2,096	: 66.8	: 88.6	: 259.4	: 0.786	: 1.128	: 0.0101	: 12,496	: 385.1	: 85.4	: 60.6	: 576.4	: \$0.282
A.O.	: 2,385	: 74.7	: 101.5	: 302.4	: 0.788	: 1.034	: 0.0115	: 9,915	: 459.3	: 90.6	: 59.9	: 527.9	: 0.324
V.A.	: 2,372	: 75.2	: 93.9	: 300.9	: 0.769	: 1.182	: 0.0129	: 10,193	: 406.6	: 85.7	: 45.3	: 554.7	: 0.283
M.C.	: 2,215	: 69.3	: 97.9	: 264.1	: 0.653	: 1.063	: 0.0134	: 11,722	: 381.0	: 101.4	: 48.3	: 533.5	: 0.289
E.M.	: 2,369	: 73.9	: 101.1	: 291.1	: 0.745	: 1.185	: 0.0131	: 8,305	: 428.1	: 100.6	: 64.8	: 550.8	: 0.299
J.R.	: 2,517	: 77.5	: 101.4	: 323.0	: 0.707	: 1.087	: 0.0119	: 10,196	: 423.2	: 106.4	: 63.9	: 611.0	: 0.294
Mean	: 2,325	: 72.9	: 97.4	: 290.1	: 0.738	: 1.113	: 0.0121	: 10,287	: 413.8	: 95.0	: 57.1	: 559.0	: 0.295
Sherman Standard (56.3 kg.)	: 2,412	: 56.3	: ---	: ---	: 0.55	: 1.061	: 0.015	: 3,619	: 482	: 48	: ---	: 482	: 0.321
Per 70 kg.	: 2,751	: 91.0	: ---	: ---	: 0.92	: 1.383	: 0.015	: 12,790	: 514	: 118	: ---	: 695	: 0.367
Per 3000 cal.	: 3,000	: 99.4	: ---	: ---	: 1.00	: 1.508	: 0.016	: 13,945	: 561	: 128	: ---	: 757	: 0.400

The average amount of protein consumed daily ranged from 66.8 to 77.5 grams with a mean of 72.9 for the six subjects. This was 29.5 per cent above the standard of 56.3 grams allowed for each person. The mean per capita protein intake per kilogram was 1.31 grams (Table 11), again somewhat higher than the suggested standard of one gram per kilogram of body weight. Dinner, the heavy meal of the day, furnished the largest amount of the protein intake for all subjects. The quality of protein eaten was fairly good due to the moderate use of animal foods which contained proteins of high biological value. The chief sources of protein in the diet were meat, cheese, eggs, and to a lesser extent, dried beans which were served twice during the week studied.

The mean per capita calcium intake for the group was 0.738 gram per day which was 0.19 above the 0.55 gram standard. The fact that calcium was rather high in the diets was probably due to the fairly liberal use of dairy products. While the subjects consumed as a beverage an average of only 0.4 pints of milk daily, the amount used in cooking increased the mean consumption to 0.73 pint per capita per day. In addition, cheese was served three and carrots four times during the study, both good sources of this mineral.

Subject A.O.'s diet was slightly below the standard

for phosphorus, but all the others at least met or exceeded their calculated needs (Table 11). The mean intake for the group was 1.11 grams phosphorus per day compared with the standard of 1.06 grams. The best sources of this mineral in the diets were muscle meat, liver, milk, eggs, corn, and whole wheat breads.

The mean daily consumption of iron was 0.012 gram per capita which was comparable with studies reported by Ryder (1932), Wheeler and Mallay (1935), and Schermerhorn (1936). The iron consumption for this group met the new Sherman standard of 0.012 gram daily, but fell somewhat below the old standard of 0.015 gram set up for this study. The foods furnishing most of the iron in these dietaries were liver, muscle meat, eggs, navy beans, spinach, and other green vegetables.

The average consumption of vitamin A was 10,287 Sherman-Munsell units per capita daily which was 6,568 above the standard of 3,619 for the 56.3 kilogram woman. The high vitamin A intake may be accredited to the liberal use of liver, green, leafy and yellow vegetables, and dairy products (Table 4). All the diets were somewhat low in vitamin B₁ possibly because of the large use of highly refined cereals and the inability to calculate some foods, due to lack of information concerning their vitamin B₁ con-

tent. Half of the diets were low in vitamin C and three-fourths were deficient in vitamin G. Due to the fact that vitamin C is heat labile, only half of the determined values for the cooked foods were used in the dietary calculations. This reduction factor was chosen arbitrarily but was thought to represent more accurately the vitamin C value of the food.

The mean daily water intake for each subject varied from four to six glasses (Table 12) with a mean of five which was below the accepted standard of six to eight glasses. All subjects received more than the suggested number of servings of the various foods per week except for milk (Table 13). Citrus fruit or tomatoes occurred in the diet at least once daily while other fruits, either raw or cooked were served ten times during the week studied (Table 4). One raw vegetable and potatoes were always served daily and the mean for the week was an average of two vegetables daily other than potatoes. The egg consumption during the period studied averaged 1.7 per capita per day. About half of these were used in cooking, the remainder were served as such.

A comparison of the results of the present study with those of similar ones (Table 14) showed that the caloric intake for this investigation was higher than that of the

Table 12. Mean daily consumption of liquid during study.

Subject	Water	Water	Milk		Coffee and tea
	gm.	equivalent glasses 1 day	gm.	pt.	gm.
J.S.	1,432	6	260	0.53	---
A.O.	1,439	6	194	0.40	39
V.A.	1,232	5	139	0.39	74
M.C.	1,171	4	93	0.28	176
E.M.	1,121	4	201	0.43	38
J.R.	1,555	6	198	0.41	41
Mean-all subjects	1,325	5	155	0.40	52
Standard		6-8 daily	488	1.00	Not more than one cup daily

Table 13. Frequency of occurrence of certain foods in the diet.*

Foods	Standard:	Mean	Actual number of servings (subjects)					
	number :servings:	size of :servings:	J.S.:	A.O.:	V.A.:	M.C.:	E.M.:	J.R.:
		gm.						
Milk	14	226	9	6	4	2	7	6
Vegetables:								
Potatoes	7	100	7	10	7	8	10	10
Other cooked vegetables:	7	110	14	14	10	10	14	15
Raw, or tomatoes	7	75	12	10	10	10	12	13
Fruits:								
Cooked	7	70	8	9	8	8	8	9
Raw	7	80	9	7	7	7	7	8
Whole grain cereal	14	20	14	18	14	14	15	19
Meat, eggs, cheese	14	75	19	20	19	19	20	20

*Milk was measured in cups; other foods in servings.

Table 14. Comparison of the mean daily per capita nutritive value and cost of dietaries of college women.

Study	Year	Location	Method	Calor- ies	Pro- tein	Cal- cium	Phos- phorus	Iron	Vitamin units				Cost					
									A	B ₁	C	G	Total	Fruits	Meat	Dairy	Sweets	
									per	per	per	per	per	per	per	per	per	per
MacLeod Griggs	1918	Vassar College	Inventory (Waste analyzed)	2,698	141	1.11	1.95	0.0121					\$0.42	15	51	12	15	7
Scher- merhorn	1935	Kansas State College	Inventory (Waste analyzed)	2,088	65	0.75	1.13	0.0095	7,548		105	603						
Little- ford	1931	Kansas State College	Inventory (Waste analyzed)	1,821	89	1.26	1.90	0.0190					0.45	30	25	19	16	7
Wheeler et al	1933	Vassar College	No ex- planation	2,397	70	0.92	1.32	0.0118	6,616		227		0.43	28.7	19.5	26.3	5.5	20
Robinson	1939	Kansas State College	Weighed individual	2,525	76.7	0.84	1.39	0.0130	12,284	519	79	788	0.25	31	25	20	8	16
Present mean	1939	Kansas State College	Weighed individual	2,325	72.9	0.74	1.113	0.0121	10,287	423	106	611	0.29	31	19.3	19.5	10.7	19.5

group studied by Littleford (1932) and Schermerhorn (1936), but lower than the amounts reported by MacLeod and Griggs (1918), Wheeler (1935), and the recent study by Robinson (1939) for this identical group. The latter emphasized variation in the same individual from time to time.

In order to obtain a well-balanced diet, Gillett recommended the division of the food dollar as follows: one-fifth, more or less, for fruits and vegetables; one-fifth, or less, for meat, fish, and eggs; one-fifth, or more, for dairy products; one-fifth, or more for bread and cereals; one-fifth, or less, for fats, sugar, and food adjuncts. The percentage of expenditure for fruits and vegetables and meat, fish, and eggs was comparable with Gillett's plan (Table 15). A larger percentage spent for dairy products and less for fats, sugar, and food adjuncts would have made a better diet with no increase in cost. Had a higher percentage been spent for bread and cereals, increasing the use of whole grain products in the diet, the vitamin B₁ content would have been more adequate.

The 120 meals were served at a mean cost of \$0.098 per meal, \$0.295 per capita daily or \$0.013 per 100 Calories (Table 11).

Table 15. Distribution of food cost compared with Gillet's recommendation.

Food group	This study		Gillet's recommendation
	Cost	Per cent	Per cent
Fruits and vegetables	\$ 3.18	31.0	20 more or less
Meat, fish, and eggs	1.98	19.3	20 or less
Dairy products	2.00	19.5	20 or more
Bread and cereals	1.10	10.7	20 or more
Fats, sugar, and food adjuncts	2.00	19.5	20 or less
Total	\$10.26	100.0	100.0

SUMMARY

1. A weighed individual seven-day dietary study of six Negro women indicated, according to accepted standards for the adult male unit, that the diets were satisfactory in protein, calcium, phosphorus, possibly iron, and vitamins A and C. They were somewhat low in energy and vitamins B₁ and G. Phosphorus was below the standard for one subject but above her calculated needs. Iron was satisfactory according to Sherman (1937) but low if the old standard be accepted (Sherman, 1932).

2. The cost of the food was \$0.295 per capita daily, or \$0.013 per 100 Calories. This was not directly proportional to the nutritive value as a more adequate diet could have been purchased for the same money.

3. Although the caloric intake was higher than that reported by some other investigators making similar studies, the findings confirm the belief that the present-day college woman has a lower energy and protein intake than one of a few years ago.

4. Before definite conclusions can be made concerning the adequacy of this diet and the requirements for Negro women, more information upon their nutritional status and dietary habits is necessary.

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