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FOOD HABITS OF UTAH FARM FAMILIES

ALMEDA PERRY BROWN

Agricultural Experiment Station

Utah State Agricultural College

LOGAN, UTAH

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FOOD HABITS OF UTAH FARM FAMILIES¹

ALMEDA PERRY BROWN

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WHAT THE REPORT IS

This report is merely an attempt to set forth the findings of the investigation without making claim to their being conclusive except for the families included in the study. While the study was carried into a relatively large portion of the state, the records are too few in number for any claim to be made that they represent community food conditions. It is believed, however, that the records which form the basis of this report are representative of the food situation in the homes from which they come.

THE PRELIMINARY INVESTIGATION

OBJECTIVES

Preliminary work in this project began at the first of the calendar year 1926. The objectives at that time were:

1. To learn what kinds of foods are raised on Utah farms for home use
2. To find average quantities in which the various kinds were produced
3. To determine whether kinds or quantities, or both, were markedly influenced by location of farming community or by type of farming.

Extent of Study and Methods Used.—With the assistance of county agricultural agents two general types of farming communities were selected in 11 counties, extending along the west side of the state from Cache and Boxelder on the north to Beaver on the south. The first type included: (1) Communities of general farms near towns

This publication completes the work done on Purnell Project No. 83, which was officially closed on June 30, 1929.

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where specialized food markets were located (there were 8 of these); and (2) communities of general farms ten miles or more from specialized food markets (there were 5 of these). The second type included communities of specialized farms: (1) Dry-land wheat farms, operated in connection with some irrigated land varying in amounts from a town lot to 25 acres (there were 4 of these); (2) alfalfa-seed farms on irrigation projects, but where in the opinion of most families interviewed there was insufficient water for vegetable gardening (there were 3 of these).

An attempt was made to secure cooperating families who would represent the upper, the medium, and the lower economic levels in their communities. It was found, however, that families in poor homes, and apparently not succeeding satisfactorily in the farm business, were generally unwilling to cooperate. "I'm afraid you'd find out how we live", admitted the mother of one such family. By July 1, 1926, six months after the project was begun, 124 farm homemakers had begun keeping record of both the kind and the quantity of home-furnished foods used. Out of this number, 34 completed a year's record. A less intensive method would probably have secured the same type of information from a larger number of families.

Results of Preliminary Investigation.—Twenty-three kinds of vegetables were reported: Asparagus, artichokes, beans, beets, cabbage, carrots, corn, cucumbers, cauliflower, celery, lettuce, mushrooms, onions, peas, parsnips, peppers, potatoes, radishes, spinach, squash, swiss chard, tomatoes, and turnips. Communities of general farms near markets raised 23 kinds; those remote from markets raised 20 kinds; communities of dry-land wheat farms raised 23 kinds; communities of alfalfa-seed farms raised 14 kinds.

There were 13 kinds of cultivated fruits: Apples, apricots, cherries, currants, dewberries, gooseberries, grapes, peaches, pears, plums, prunes, raspberries, and strawberries. Rhubarb, cantaloupes, citron, and watermelons were reported as fruits, bringing the total up to 17. Communities of general farms near markets raised 17 kinds; those remote from markets raised 15 kinds. Communities of dry-land wheat farms raised 11 kinds; communities of alfalfa-seed farms raised 2 kinds.

The meats reported were beef and veal; fowls, including chicken, duck, goose, pigeon, and turkey; lamb and mutton; pork; rabbit; trout and other fish; a total of 11 kinds.

Communities of general farms near markets reported 4 kinds of meat, 3 kinds of fowl, rabbit, and fish; a total of 9. Those remote reported 4 kinds of meat, 4 kinds of fowl, rabbit, and fish; a total of 10. Communities of dry-land wheat farms reported 4 kinds of meat, 2 kinds of fowl, and fish; a total of 7. Communities of alfalfa-seed farms reported 4 kinds of meat, 3 kinds of fowl; a total of 7.

All communities supplied butter, cream, cottage cheese, whole milk, skimmilk, and buttermilk for home use. All produced eggs. All produced some white flour, some whole-wheat flour, and wheat cereals such as cracked wheat and germade.

The quantities in which these foods were produced during the year of record are shown for the different types of communities in Table 1.

TABLE 1. AVERAGE QUANTITIES PER FAMILY OF VARIOUS FOODS SUPPLIED FOR USE DURING ONE YEAR ON 34 UTAH FARMS

Kinds of Farm-Furnished Foods	Quantities Per Household			
	General Farms Near Markets	General Farms Remote	Dry-Land Wheat Farms	Alfalfa-Seed Farms
Vegetables				
Fresh (lbs.)	1433.4	1050.2	1222.3	620.3
Canned (qts.)	28.9	42.6	47.5	36.8
Pickled (qts.)	49.9	38.6	26.2	34.6
Dried (lbs.)	30.2	22.8	46.8	1.3
Fruit				
Fresh (lbs.)	537.6	223.6	85.8	413.0
Canned (qts.)	132.9	92.9	50.1	17.0
Jam, Preserves (qts.)	17.2	19.4	13.9	00.0
Jelly (qts.)	6.0	5.7	3.4	00.0
Dairy Products				
Whole Milk (qts.)	1320.6	1295.1	1523.5	1140.5
Cream (qts.)	113.4	140.3	389.5	110.3
Butter (lbs.)	116.8	88.2	141.6	114.7
Eggs	1747.4	2125.2	1550.0	1640.0
Cereal Products (lbs.)				
White Flour	1138.3	1006.4	800.0	540.0
Whole Wheat Flour	160.3	239.6	97.3	75.0
Wheat Cereal	73.6	178.3	10.0	19.7
Meat and Meat Products (lbs.)				
Pork	261.2	134.4	186.5	209.2
Chicken	96.5	76.4	67.8	112.6
Beef	66.6	13.3	188.3	7.0
Mutton and Lamb	83.0	47.0	552.2	60.0
Veal	44.3	43.6	98.0	110.0
Lard	84.5	32.8	60.8	41.8

The figures of Table 1 are comparable because the size of family was very nearly the same for all types of community. Those of general farms near markets averaged 6 individuals per family; communities of general farms remote from markets and those of alfalfa-seed farms averaged each 5.8 individuals; while the families on dry-land wheat farms averaged 5.75 members each.

It will be seen from the foregoing that a little greater variety in home-produced foods was found in those communities located near food markets. The dry-land wheat farms produced the same variety in vegetables, but fewer kinds of fruits. All but one of these communities were located on foothills near mountains where climate may have prevented raising the more tender fruits. The same may be said of

three out of the five communities of general farms remote from markets. According to statements of families in the alfalfa-seed district, irrigation water was the limiting factor there.

The communities of general farms near markets produced greater quantities of vegetables and fruits per family than did any of the others; the communities of dry-land wheat farms held quite a noticeable lead over the others in production of dairy products and meats, particularly of beef, mutton, and lamb. Their proximity to mountain grazing lands probably accounts for this lead. In both these products, general farms near markets took second place.

In quantity of eggs and of cereal products per family, the communities of general farms remote from markets took first place, those near markets taking second.

While the production of food for home use was a little more satisfactory, both as to variety and quantity, in those communities of general farms near to food markets, there is no information leading to the conclusion that this condition is due to such proximity. There was a greater number of these communities included in the study; on the average the farms were smaller than in the other communities. General home conditions may have been more desirable though there are at present no data available on that point. Any or all of these considerations may have influenced the food situation in these communities.

PLAN AND EXTENT OF MAIN INVESTIGATION

OBJECT

Following the preliminary study just discussed an investigation was started at the beginning of the fiscal year 1927-1928, having as its object an inquiry into the following aspects of farm home diet:

1. Kinds and quantities of foods consumed
2. Proportion of foods that might be raised on the farm that were actually so obtained
3. Adequacy of diet when compared with accepted measures.

AREA INCLUDED—COOPERATION

It was planned to conduct this investigation in the same area included in the preliminary study and, as far as possible, to include the same families. Satisfactory cooperation was not secured in Weber and Beaver Counties; consequently, the neighboring counties, Morgan and Iron, were included in their stead. Sixteen families of the previous study continued cooperating. In securing new cooperators only those were solicited who, from reputation and appearance, gave promise of carrying the work to completion. Ninety-four began; 43 finished a year's record.

FAMILY PERSONNEL

Each family group consisted of a husband and wife, and of children in all families except one. The total number of individuals was

261, averaging 6.07 per family. The number of children ranged from 1 to 9 per family, with an average of 4 each. All but 23 of the 175 children were under 18 years of age. The children of the largest group, numbering 55, were between 10 and 15 years of age. Seven babies were born to cooperating mothers during the record period. They are not included in the figures just quoted. It will be seen from the foregoing that the parents were mostly in early middle life and the majority of the children at an age when good nutrition is imperative.

METHOD OF SECURING INFORMATION

Cooperating homemakers were supplied with a dependable household scale and with two sets of record forms, one for home-raised foods and one for those purchased. All were carefully instructed in the method of keeping food-consumption records and the necessity of accuracy and completeness of record was emphasized. All foods were listed by weight as purchased or as brought into the farm house. The exceptions were milk, cream, and home-canned foods, which were listed by measure. Because of the year-long period to be covered by the records, housewives were not asked to keep track of food wastes; hence, in evaluating the diets, 10 per cent was subtracted to allow for wastes.

The fairness of this allowance may be questioned but is probably permissible in view of the small volume of available information on the subject. Rose, in her "Laboratory Handbook for Dietetics" (13), gives tables showing percentage of waste in preparing certain foods for the table. However, the range of foods is limited, and the problem of "leftovers" is not considered. An allowance of 10 per cent is made for this item in recent studies by Hawley (6), and by Dickins (2).

At the close of each week records were mailed to the office where they were carefully checked and any apparent inaccuracies taken up with the cooperator, either by means of correspondence or personal visit. While it is possible some foods may have been omitted from the records, it is believed that most of the 43 received present a reasonably accurate picture of the food situation in the homes from which they came, or at any rate for the period covered by the records.

RESULTS OF INVESTIGATION

NATURE OF THE DIET IN 43 UTAH FARM HOMES

Vegetables.—To the 23 vegetables raised on Utah farms, sweet potatoes and eggplant were added by purchase. Potatoes formed 55 per cent by weight of total vegetables used, which accords with the average for farm families as found by the Department of Agriculture survey (4). The so-called "leafy" vegetables formed 6.5 per cent of the total vegetables.

Fruits.—Bananas, citrus fruits, blackberries, figs, grapes, and pomegranates were added to the list of farm-furnished fruits.

Eggs.—The average number of eggs was three dozen per family per week, this figure exactly coinciding with the average for farm families as found by the Department of Agriculture survey (4).

Dairy Products.—Whole milk averaged 1.1 quarts per day for each child in the group between the ages of 1 and 18 years, thus meeting the requirement for growing children suggested by Rose (14) and Sherman (15) but falling below one quart per individual per day, the amount suggested as desirable by McCollum and Simmonds (11). Butter averaged 95.9 pounds per family for the year; the government report (4) gives "less than 150 pounds" as the average per family in the western states. Three families reported using skim milk, averaging 971.56 pounds each. Buttermilk was not generally used; 11 families reported averaging 57.49 pounds each. Cottage cheese and American cheese were both used rather sparingly, 11 families averaging 6.17 pounds each of the former, while less than $\frac{1}{2}$ pound per family per week was the average for American cheese for the group. Use of condensed milk and of butter substitutes was practically negligible; 12 families used 2 pounds each of the former, and 4 families used 2.5 pounds each of butter substitutes.

Meat.—Nearly half (49.8 per cent) of all meat eaten was pork; "nearly two-thirds" is the average reported by the Department of Agriculture (4). The other half consisted of beef, 20.3 per cent; poultry, 13.8 per cent; lamb and mutton, 7.9 per cent; fish and miscellaneous lunch meats, 6.5 per cent; veal, 1.7 per cent.

Cereal Products.—Whole wheat and graham flours comprised 9.7 per cent of all flour used. Oatmeal was the leading uncooked breakfast cereal and cornflakes the favorite "ready-to-serve". The variety of breakfast cereals listed, indicated that personal inclination was the main consideration in their selection. Many of them were of refined varieties.

Sweets.—Sugar, honey, syrup, molasses, candy, and brown sugar, listed in the order of their importance on the records, together with a few pounds of jelly which could not be classified, made up this group. Granulated sugar and powdered sugar together averaged 360.31 pounds per family; honey averaged 47.85 pounds. Eight families produced all or part of their honey, averaging 25.9 pounds each. The other sweets were listed in small quantities, syrup averaging 17.5 pounds per family; molasses, 11.15 pounds; candy, 6.53 pounds; and brown sugar, 4.5 pounds.

Fats.—Outside of butter and lard, including Crisco and other lard substitutes, very little fat was used. The reports showed an average of 58.6 pounds per family of lard and a little less than 1 pound per family of all other fats, including oil, "drippings", mutton and beef fats, and purchased butter substitutes.

Miscellaneous Foods.—Under this heading were grouped all those foods not otherwise classified, such as nuts, peanut-butter, cocoa, chocolate, flavoring extracts, spices, tea, coffee, etc. Walnuts averaging 9.88 pounds per family and peanut-butter averaging 4.5 pounds

per family were the only ones having food value that existed in considerable quantities. Seventeen families averaged 9.17 pounds of coffee each. Only six of these families used more than 6 pounds, the other eleven reporting from 1 to 6 pounds each. Thirteen families averaged 2.8 pounds each of tea, only four of them using more than 1.5 pounds per family.

TABLE 2. AVERAGE QUANTITIES OF FOODS, EXPRESSED IN POUNDS PER DAY, CONSUMED BY 43 UTAH FAMILIES

Kind of Food	Average Quantity per Family (Avg., 6)	Average Quantity per Individual	Average Quantity per Adult Male Unit	
Vegetables	4.38	0.73	0.87	(5)
Fruits	2.87	0.48	0.57	(5)
Eggs	5.01eggs	0.83 egg	0.83 egg	(6)
Milk (quarts)	3.77	0.63	0.63	(6)
Butter	0.38	0.063	0.076	(5)
Cream (Quarts)	0.223	0.037	0.045	(5)
Meat and Fish	1.41	0.23	0.23	(6)
White Flour	1.95	0.32	0.39	(5)
Whole Wheat Flour	0.023	0.003	0.004	(5)
Other Cereal Products	0.33	0.055	0.066	(5)
Sweets	1.26	0.21	0.25	(5)
Miscellaneous Foods	0.093	0.015	0.018	(5)

FOOD QUANTITIES

Table 2 is arranged to show average quantities of these food groups consumed daily per family, per person, and per adult male unit. Hawley's double scale (7) was used for determining the adult male unit equivalent for these families. Anyone taking meals with the family for the equivalent of one month or more was included for the time present. Figures in column 4, Table 2, were obtained by dividing the average quantities per family by the adult male unit for energy (namely, 5), except in case of foods valuable primarily for protein and minerals, in which case the adult male unit for proteins and minerals "6" was used.

How average food quantities in this study compared with figures adapted from other studies is shown in Table 3. One study includes 1331 farm family diets in four different states (6); the other includes the diets of 73 farm families included in a total of 500 families of various occupations in 41 states (1). In Table 3 quantities are expressed per adult male unit per day.

The daily consumption of meat and fish in the present study is noticeably lower than in the others; use of eggs is much higher than in the one other study, giving definite quantities; milk consumption occupies an intermediate position; use of butter and cream and cheese is comparable in the three studies; the average fruit consumption by the 1331 farm families is higher than in the other two; the Utah

families fall below the other groups in use of cereal products and of vegetables, very noticeably so in the latter.

TABLE 3. AVERAGE QUANTITIES OF COMMON FOODS CONSUMED PER DAY, PER ADULT MALE UNIT, AS SHOWN BY THREE STUDIES

Kind of Food	Study		
	43 Utah Farm Families	73 Farm Families in 41 States	1331 Farm Families in Selected Areas of 4 States ¹
Meat and Fish	3.68 oz.	5.4 oz.	6.88 oz.
Eggs	0.83 egg	.....	0.2 egg
Whole Milk	21.67 oz.	17.7 oz.	24.8 oz.
Cream and Cheese	1.63 oz.	2.0 oz.	2.4 oz.
Butter	1.22 oz.	1.3 oz.	1.42 oz.
Fruit	9.12 oz.	9.4 oz.	12.16 oz.
Vegetables	13.9 oz.	20.6 oz.	23.84 oz.
Cereal Products	7.62 oz.	12-13 oz.	11.84 oz.

¹These figures were obtained by dividing by 365, quantities given per adult male unit per year, page 28, "Average Quantity, Cost, and Nutritive Value of Food Consumed by Farm Families" (6).

PORTION OF FOOD SUPPLY FARM-FURNISHED

As has been previously stated, the foods supplied by the farm were listed on a separate record form; this was done for the purpose of determining the proportion of those food groups which could be farm-furnished that actually did come from the home farm. Table 4 gives the average percentage of such foods that were home-produced, calculated on the basis of number of pounds consumed.

Some vegetables were raised by all families; three families bought all the fruits used; none of the families raised all their vegetables, nor all their fruits. Thirty-three families produced all their milk and cream; sixteen families made all their own butter; two families did not make any. Twenty families produced all the eggs used; two families bought all they used. Ten families turned wheat into nearby grist mills, drawing out their entire flour supply as needed; one family did the same with all types of cereals used. Thirteen families bought all cereal products used. The average percentage of all foods furnished by these farms was 67.

ADEQUACY OF 43 UTAH FARM FAMILY DIETS

The food quantities indicated in Table 2 have little significance unless we know they supply food factors necessary for safe nutrition and in approved quantities. An attempt is here made to determine these points, at least with sufficient definiteness to indicate the avoidable errors in farm family diet as revealed by a study of the 43 food-consumption records received.

Method of Analysis.—Calculation of the energy, protein, calcium, phosphorus, and iron content of these diets individually, and of the

TABLE 4. AVERAGE PERCENTAGE OF VARIOUS FOOD GROUPS FURNISHED BY THE FARM
(Calculated on the basis of number of pounds consumed)

	Vege- tables	Fruits	Eggs	Dairy Products				Meats	Cereal Products	Average for All Groups
				Milk	Cream	Butter	Miscel. ¹			
Average for 43 Families	63.3	24.73	80.38	97.56	90.69	86.27	62.9	65.99	31.87	67.00
Highest Percentage	96.53	82.13	100.0	100.0	100.0	100.0	.....	96.64	100.0	88.08
Lowest Percentage	1.16	0.0	0.0	61.0	13.7	0.0	.....	15.16	0.0	35.81

¹Includes skimmilk, buttermilk, cheese, cottage cheese, and ice cream.

average diet, was made by Hawley's Short Method (9), tables from Rose's Laboratory Handbook (13) being used for analysis of foods not included in the Short Method. Comparison of results was then made with approved measures or standards of adequacy for good nutrition.

No attempt is made to discuss the vitamin adequacy of these diets since there has not yet been developed a method, practicable for studies of this type, for determining quantitatively the vitamin content of foods, nor of measuring individual vitamin requirements. There can be little doubt that the methods used in the laboratories of Sherman (15, 17) and others (3, 10) for determining the vitamin value of food substances quantitatively by their effect on the growth and physical well-being of laboratory animals will, in the near future, lead to quantitative determination of human vitamin needs.

Measure of Adequacy.—In Table 5 the nutritive value of the average diet per adult male unit per day is shown, and comparison is made with a standard of good nutrition suggested by Sherman (15). The table also shows the nutritive value of the highest and of the lowest individual family dietaries.

While the average diet for the present study compares favorably with the standard in energy and protein, only 9 per cent of the daily calories are derived from protein which is one less than the minimum—10 to 15 per cent, suggested by Sherman (15) as the safe proportion for growing children. Since the majority of the children in the group are at an age period when the food supply must furnish ample material for growth, it would be well to increase the protein. Milk is already adequate, furnishing more than one quart per day for each child between 1 year and 18 years of age; there is 0.8 egg per individual per day; both phosphorus and iron are below standard (Table 5); an increase in the use of lean meat is doubtless, then, the best means of increasing protein since it would at the same time help to bring up the phosphorus and iron to standard without greatly increasing calcium, which is already 135 per cent of the Sherman standard. McCollum states that the optimal amount of calcium in the adult diet is still unknown, but believes it is determined in part by the phosphorus and vitamin D content of the diet, since his studies of experimental rickets have brought to light the importance of a quantitative relationship between calcium and phosphorus in safeguarding bone formation. He says: "The most favorable relationship between these two elements demands a considerable excess of calcium over phosphorus in per cent of diet" (12). The opposite is true in the diets of the present study, though not to so great degree as in the 224 American diets (15), as will be seen by referring to Table 8.

As a result of a study of the mineral metabolism of a group of children 3 to 13 years of age, Sherman and Hawley (16) recommend one gram or more of calcium per man per day for groups including children. Though the daily average in the present study falls 0.03 gram below this recommendation, more than one-half the total calcium is supplied by milk, thus assuring its optimal utilization (16).

TABLE 5. AVERAGE NUTRITIVE VALUE OF 43 UTAH FARM FAMILY DIETS IN TERMS OF ADULT MALE UNIT PER DAY, COMPARED WITH SHERMAN'S STANDARDS

	Calories	Per-centage of Standard	Protein		Calcium		Phosphorus		Iron	
			Grams	Per-centage of Standard	Grams	Per-centage of Standard	Grams	Per-centage of Standard	Grams	Per-centage of Standard
Standard	3000	100.0	67.0	100.0	0.68	100.0	1.32	100.0	0.015	100.0
Average for 43 Utah Families	3049	101.6	68.7	102.5	0.92	135.3	1.24	93.9	0.0108	71.2
Protein and Mineral Maintenance Requirements			44.0		0.45		0.88		0.01	
Highest Record in Present Study	4983	166.0	99.9	146.0	1.58	233.0	1.83	139.0	0.0157	105.0
Lowest Record in Present Study	2026	67.5	45.9	68.5	0.43	63.0	0.86	65.0	0.0071	47.0

It is probable that if fruit and vegetable consumption could be brought up to what is considered satisfactory (Table 5), the daily calcium would meet the Sherman-Hawley recommendation without bringing milk calcium below one-half the total.

Greaves and Hirst (5) found that Utah grains are unusually high in mineral content and that wheat grown on irrigated land is superior in this respect to that raised on dry-farms. That the latter is not deficient in minerals is shown by the fact that all but seven of the nineteen varieties of wheat analyzed from the Nephi Dry-farm Substation carried a higher phosphorus content than did the wheat reported by Sherman. These investigators also found that the iron content of wheat, of oats, and of barley grown in Utah soils is four to six times the amount reported by Sherman.

In view of these findings and in consideration of the fact that almost one-third of the cereal products used by the families of the present study came direct from the farm, through a local grist mill to the farm home table, it is probable that further investigation may show these families to be better supplied with phosphorus and iron than would appear from the analysis of their diets made by the Hawley method (9).

As a further guide to determining desirable changes in the diet, the average distribution of daily calories among the various food groups was determined, and the percentage of daily energy derived from each group was compared with a standard used by the U. S. Bureau of Home Economics in its analysis of 1331 farm family diets (6), also with the percentage of caloric distribution among various food groups in Rose's high-cost, moderate-cost, and low-cost dietaries (14). The results are shown in Table 6.

This comparison serves to emphasize some points already discussed in connection with the diets of the present study, namely, the low consumption of fruits and vegetables and of fat as well as the need for a small increase in the use of lean meat. The high consumption of milk and cream is emphasized; part of the fat deficiency is compensated for in this way, doubtless though, there is still a need for increased use of butter.

Other points brought out by Table 6 are the excess above standard of daily calories derived from sweets as well as from cereal products. The former excess is so small that it is probably not significant. In view of the fact that the percentage of calories derived from cereals coincides with Rose's moderate-cost diet, it is suggested here that the change be one of substituting a larger proportion of whole grain cereal products for some of the refined ones, rather than a decrease in total cereals.

TABLE 6. AVERAGE PERCENTAGE DISTRIBUTION OF DAILY CALORIES IN THE PRESENT STUDY, COMPARED WITH A STANDARD OF GOOD NUTRITION AND WITH ROSE'S "DIETARIES ON THREE COST LEVELS" (14)

Study	Meat, Eggs, and Cheese		Milk and Cream		Fatty Foods		Sweets		Cereal Products		Vegetables and Fruits	
	Calories per man per day	Per cent of Total	Calories per man per day	Per cent of Total	Calories per man per day	Per cent of Total	Calories per man per day	Per cent of Total	Calories per man per day	Per cent of Total	Calories per man per day	Per cent of Total
Standard	460	14-15	360	10-12	620	20-17	350	10-11	880	28-25	630	18-20
Average for Present Study	388.9	12.7	615.3	20.1	369.7	12.1	398.1	13.0	937.6	30.6	352.6	11.5
Average for 1331 Families in 4 States	713	16	661	15	764	18	476	11	1195	27	561	13
Rose's High Cost Diet		16		16		18		10		20		20
Rose's Moderate Cost Diet		15		13		17		10		30		15
Rose's Low Cost Diet		8		18		12		10		40		12

COMPARISON OF NUTRITIVE VALUE OF DIETS IN DIFFERENT COUNTIES

While the 43 food-consumption records which form the basis of this discussion were received from a comparatively large area of the state, there is not noticeable a very marked difference in nutritive value of diets from different sections. Table 7 is arranged to show the differences that exist.

TABLE 7. COMPARISON OF AVERAGE NUTRITIVE VALUE OF DIETS
IN DIFFERENT COUNTIES INCLUDED IN THE STUDY¹

County	Number of Records	Average Nutritive Value Per Adult Male Unit Per Day				
		Calories	Grams Protein	Grams Calcium	Grams Phosphorus	Grams Iron
Boxelder	6	3605	80.33	1.06	1.46	0.013095
Cache	7	3021	65.46	0.88	1.17	0.009945
Iron	5	3077	69.28	1.09	1.314	0.01016
Juab	5	2787	66.63	0.855	1.09	0.010521
Millard	6	2737	73.62	1.044	1.314	0.010557
Sevier	4	2789	66.15	0.918	1.206	0.00999
Utah	6	3079	66.78	0.837	1.233	0.01116

¹The counties from which only one record was obtained are not included in this table.

Boxelder County, on the extreme north, averages above standard in energy, protein, calcium, and phosphorus; iron is below standard but higher than the average from any other county. The only dietary in the 43 which is above standard in iron comes from Boxelder County.

The cooperating communities from this county are comparatively old well-established ones, where conditions are favorable for general farming. This probably accounts for the average percentage of farm-furnished foods being high (70.55 per cent). The only county averaging higher in this respect is Utah (73.89 per cent).

Iron County, the extreme southern one of the group, averages next to Boxelder, having energy, protein, and calcium above standard, with phosphorus at nearly standard level and iron below. The cooperating community in Iron County is relatively new, consisting of scattered farms, where soil and climate are favorable to general farming but irrigation water is limited to spring flood waters. The average of farm-furnished food here is 61.26 per cent.

COMPARISON OF RESULTS WITH THOSE OF SIMILAR STUDIES

One more table, No. 8, is added here to show how the nutritive value of the average family diet in the present study compares with averages from the four states included in the 1331 farm family diets (6) and with some other recent studies.

Table 8 shows the Utah diet lower than all the others in nutritive value. This may mean that these families are really not so well-fed as the others; or the difference in results may be due to the method of obtaining information. In the Mississippi study (2), results of which approach the Utah study more nearly than do any of the others, information was obtained by means of food-consumption records covering periods of 2 weeks during each season of the year. In the other state studies, estimates by the housewife of foods used during the preceding year formed the basis of information.

TABLE 8. NUTRITIVE VALUE OF AVERAGE FAMILY DIET IN THE PRESENT STUDY COMPARED WITH RESULTS OF SOME OTHER RECENT STUDIES

State	Calories per Adult Male Unit per Day	Grams per Adult Unit per Day				Number of Families
		Pro- tein	Cal- cium	Phos- phorus	Iron	
Utah	3049	68.7	0.92	1.24	0.0108	43
Mississippi (2)	3223	79.198	1.119	1.353	0.0124	75
Vermont (8)	3830	103.0	1.16	1.78	0.0193	86
Kansas (6)	4385	131.0	1.32	2.21	0.022	406
Kentucky (6)	4390	116.0	1.13	1.89	0.019	365
Missouri (6)	4989	137.0	1.50	2.38	0.024	178
Ohio (6)	4045	109.0	1.08	1.87	0.021	382
224 American Diets (15)	3256	106.0	0.74	1.63	0.0179	224

Recently reported food-consumption studies by the record or accounting method in Ohio (18) and in Georgia (18) also show a lack of iron in the diet of rural families.

SUMMARY AND CONCLUSIONS

Information made available by this study indicates that remoteness of farm homes from food markets does not result in stimulating production of food for home use, since those communities located within easy access of food markets produced, on the whole, a little larger variety of foods and averaged larger quantities per family than did the other communities studied. Indications are that factors other than location with respect to food markets enter into the problem, but there is at present no definite information on this point.

Type of farming seemed not to influence food production in communities having an adequate supply of irrigation water.

Apparently, the families from whom the 43 food-consumption records were obtained have a reasonably varied diet. The quantities per man per day are on the whole comparable with those of some similar groups except in the case of vegetables; here both quantity and percentage of daily calories are low.

Of the foods that could be supplied by the farm, nearly seven-tenths were so furnished.

Comparison with the Sherman standard showed the average nutritive value of these diets to be just over the requirement considered adequate for the adult male in energy and protein, well above the requirement in calcium, and low in phosphorus and in iron.

Total protein furnishes less than the minimum percentage of daily calories required for growing children and should be increased, preferably by greater use of lean meat since the milk used supplies more than one quart per day per child and since egg consumption is high.

The mineral content of the average diet, especially the iron, should be increased by much greater use of fruit and vegetables, particularly the latter, as well as by use of whole grain cereal products in place of some of the refined ones. Further study of the mineral content of Utah food plants may modify this conclusion.

No marked difference is apparent in nutritive value of the average diet from different sections of the state.

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LIST OF AVAILABLE BULLETINS

- 122—Nature of the Dry Farm Soil of Utah.
 128—Blooming Periods and Yields of Fruit in Relation to Minimum Temperatures.
 132—Minor Dry-land Crops at Nephi Experiment Farm.
 134—Nitric Nitrogen Content of Country Rock.
 137—Quality of Home-grown Wheat vs. Imported Wheat.
 139—Movement of Soluble Salts with Soil Moisture.
 141—Variation in Minimum Temperatures due to Topography of a Mountain Valley in Relation to Fruit-growing.
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 190—Corn Silage in the Dairy Ration.
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 203—Cattle Ranching in Utah.
 204—Sheep Ranching in Utah.
 205—The Beet Leaf Hopper in Utah.
 206—Treehopper Injury in Utah Orchards.
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 208—An Economic Study of the Apple Industry of Utah, 1926 and 1927.
 209—Biennial Report of Experiment Station, 1926-28.
 210—The Mineral Contents of Grains.
 211—Silage Corn Varieties for Utah.
 213—Food Habits of Utah Farm Families