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FOOD PREPARATION AND PRESERVATION  
AMONG RURAL FAMILIES OF TEXAS

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Certain good practices in food preparation were found to be the general rule among 400 Texas rural families included in a survey made in 1942. Among these practices are use of milk for cooking as well as drinking, baking as the favorite method of cooking sweet potatoes, short time of cooking greens and cabbage, use of greens pot liquor, and eating cabbage in the raw state frequently. Some practices which may cause unduly great losses of minerals and vitamins are overcooking of greens and cabbage and use of soda in boiling greens and beans as done by some families, and extensive use of soda to make biscuit and cornbread which are usually eaten 2 or 3 times a day.

Canning of fruits and vegetables, done by 90% of the families, was the only widely used method of home preservation of food. The leading fruits canned were peaches, dewberries and blackberries, plums, pears, grapes, apples, figs, cherries, pineapple, and strawberries. Favorite vegetables for canning were tomatoes, string beans, corn, snap peas, and cucumber pickles. A greater proportion of these families did canning than of those in 45 counties representing the entire rural population of the U. S. in a federal survey made in 1942. Average amounts canned by the families in the two studies were similar.

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# FOOD PREPARATION AND PRESERVATION AMONG RURAL FAMILIES OF TEXAS

Jessie Whitacre

War time emphasis upon the conservation of the nutritive values of foods gives more than usual interest to customary cooking procedures and food preservation practices. Therefore, in a survey of the food supply of 400 rural families of Texas<sup>1</sup> in the spring and summer of 1942, inquiry was included as to the most common methods of preparing prominent foods and about the kinds and extent of food preservation. The families, selected at random, were distributed over 5 counties representing 3 agricultural regions of the state, East Central (Post Oak), Northeast (Northeast Sandy Lands), and Northwest (High Plains Cotton). Three tenure groups and 3 races were included—owners or operators, white and negro; renters, white and negro; and wage laborers, white, Mexican,<sup>2</sup> and negro. The total number of families according to tenure group and race, also the total for each region, are shown in Table 1. The information was secured through a personal visit to the home of each family. The findings reported here reveal much that should give encouragement to those interested in nutrition; also they indicate certain improvements needed and research that should be done to aid in making improvements.

## PREPARATION OF PROMINENT FOODS

### Common Methods With Comparison of Race and Tenure Groups

To determine the most common methods used in preparing foods which were prominent in the diet, the woman interviewed in each family was asked to tell how she used each food mentioned to her. The answers, summarized in Table 1 show the relative importance of the several methods used for each food. For cottage cheese, use of greens pot liquor and use of soda in cooking greens and beans, the figures in the table represent percentages of the families in each group. For all other foods the figures show the percentage distribution of preferences among the several methods, each family's mention of a given method having been counted as one preference for it. The sum of all methods thus weighted by the number of families employing each one was used as base in the calculation. The methods are listed in the order of their general popularity. Two averages were calculated, one for each region with tenure groups combined, the other for the 3 tenure groups, races kept separate, but regions combined.

**Milk.** Milk (exclusive of drinking) was used in the preparation of desserts more than any other way. Sauce and gravy were next popular and held similar places among methods used by all white groups and negro laborers, but negro wage laborers used milk to about  $\frac{1}{3}$  the extent for gravy as for sauce and no Mexican family made milk gravy. Milk for soup was least popular and was used less by negro owners and white and negro wage laborers than by other groups.

<sup>1</sup>This Bulletin, Bulletin 642, The Food Supply of Texas Rural Families, and Progress Report 854, Food Preferences among Rural Texans cover this survey.

<sup>2</sup>This designation is used to differentiate the group of Latin-American families from the others of the white race and called "white" in this study.

TABLE 1

## Most Common Methods of Preparing Foods Which Were Prominent in the Diet

Food	Method of Preparing	Group and number of families, all regions						Region, county, and No. families all tenure and race groups			
		White			Mex. Wage Laborer	Negro			East Central Brazos	Northeast Nacogdoches Rusk	Northwest Lubbock Lamb
		Owner	Renter	Wage Laborer		Owner	Renter	Wage Laborer			
		455	93	55	11	20	32	34	153	122	125
Percentage each method is of sum of all methods											
Milk	Dessert	40.0	34.8	38.4	57.1	56.5	54.2	50.0	43.3	63.8	28.8
	Sauce	22.6	24.2	30.4	28.6	30.4	20.8	22.5	18.1	26.4	26.1
	Gravy	24.2	28.3	23.2	0	8.6	8.3	22.5	21.3	8.6	31.1
	Soup	13.2	12.6	8.0	14.3	4.3	16.7	5.0	17.3	1.2	14.0
Milk, for bread	Sour	85.2	88.8	82.4	25.0	94.4	96.5	84.4	78.9	95.7	85.5
	Sweet	8.7	5.6	11.8	50.0	5.6	0	6.3	10.5	1.7	10.5
	Either	6.0	5.6	5.9	25.0	0	3.4	9.4	10.5	2.6	4.0
Pork	Fry	44.0	45.2	47.3	57.9	46.5	45.5	52.5	49.6	45.9	42.4
	Boil	34.9	37.1	39.3	36.8	41.9	40.9	44.3	34.2	44.4	34.7
	Roast	21.1	17.8	13.4	5.3	11.6	13.6	3.3	16.2	9.7	22.9
Beef	Fry	38.3	41.0	42.6	37.0	33.3	37.0	35.2	36.4	35.4	44.3
	Roast	32.8	32.3	34.3	7.4	16.7	10.9	16.9	24.0	23.1	37.4
	Stew & boil	13.8	13.0	5.6	18.5	23.8	28.3	19.7	19.2	15.6	8.1
	Smother	5.9	1.9	5.6	3.7	11.9	10.9	9.9	5.8	12.4	1.2
	Ground	3.4	3.1	9.2	25.9	7.1	6.5	9.9	7.3	8.6	2.4
	Soup	2.1	2.5	0.9	7.4	4.8	6.5	7.0	5.4	2.7	0.4
Eggs	Loaf	2.8	5.6	1.9	0	2.4	0	0	1.0	1.1	6.1
	Broil	1.0	0.6	0	0	0	0	1.4	0.9	1.1	0
	Fry	44.4	45.2	48.0	45.0	45.9	56.0	62.0	46.8	55.3	41.8
	Boil	24.7	27.4	26.5	35.0	21.6	14.0	10.0	26.2	12.8	29.5
Potatoes, Irish	Scramble	24.7	23.1	22.4	20.0	24.3	24.0	24.0	19.1	27.7	25.8
	Poach	6.3	4.3	3.0	0	8.1	6.0	4.0	7.8	4.3	2.9
	Fry	24.0	25.4	29.2	44.0	28.1	27.2	31.6	26.7	28.0	25.5
	Boil	14.8	13.8	10.5	20.0	22.8	24.7	13.7	20.3	13.7	11.4
Potatoes, Sweet	Cream	20.1	18.0	18.1	8.0	21.1	11.1	12.6	15.2	20.2	18.9
	Salad	13.1	17.3	12.9	4.0	14.0	13.6	8.4	13.4	16.8	11.4
	Stew	9.0	11.0	13.5	8.0	3.5	12.3	17.8	7.8	13.0	11.8
	Mash	9.8	8.5	7.6	4.0	3.5	1.2	5.3	7.1	2.8	12.1
	Bake	8.1	4.2	5.8	0	1.8	1.2	5.3	4.9	4.7	7.1
	Soup	1.1	1.8	2.3	12.0	5.3	8.6	5.3	4.6	1.6	1.8
	Bake	41.6	40.9	43.8	56.3	38.3	45.3	38.2	41.2	44.0	40.4
Cabbage	Candy	28.7	31.5	30.5	0	29.8	18.8	22.5	23.3	25.1	34.5
	Fry	13.6	10.5	11.4	37.5	12.8	14.1	9.0	15.3	7.8	13.8
	Pie	11.0	8.3	10.5	0	10.6	10.9	16.9	10.3	19.8	3.3
	Boil & stew	5.0	8.8	3.8	6.3	8.5	10.9	13.5	10.0	3.3	8.0
Greens	Raw	55.2	56.9	53.4	30.8	42.3	37.5	22.6	65.5	43.7	50.4
	Boil 20 min. or less	21.4	21.2	22.7	7.7	11.5	20.0	16.1	10.3	19.5	26.3
	21-40 min.	15.2	13.1	14.8	7.7	19.2	20.0	32.3	12.9	21.6	13.1
	41-60 min.	4.8	2.9	2.3	30.8	19.2	15.0	19.4	4.3	10.0	4.2
	61-120 min.	3.3	5.8	5.7	7.7	3.8	2.5	9.7	2.6	5.3	5.5
Greens	121-180 min.	0	0	1.1	15.4	3.8	5.0	0	4.3	0	0.4
	Boil 30 min. or less	15.3	23.6	14.3	0	18.8	16.7	15.4	17.2	7.4	26.6
	31-60 min.	38.7	37.5	40.8	33.3	12.5	25.0	34.6	37.9	23.8	46.8
	61-90 min.	15.3	11.1	16.3	0	6.3	25.0	15.4	5.2	26.2	7.3
	91-120 min.	18.0	18.1	24.5	16.7	25.0	25.0	30.8	13.8	29.5	16.1
	121-180 min.	12.6	9.7	2.0	50.0	37.5	8.3	3.8	25.9	13.1	2.3
181-240 min.	0	0	2.0	0	0	0	0	0	0	0.8	
Percentage of families using											
Greens liquor	All eaten	66.7	48.8	74.1	40.0	80.0	90.3	76.5	53.7	95.9	52.0
	Part "	21.3	8.3	1.9	0	10.0	6.5	5.9	30.9	0.8	2.4
	None "	12.0	42.9	24.0	60.0	10.0	3.2	17.6	15.4	3.3	45.6
Greens	Soda to cook	15.0	15.7	18.2	20.0	40.0	43.7	32.4	19.2	23.8	20.0
Beans	Soda to cook	34.4	43.8	45.4	10.0	47.4	68.9	35.3	34.3	47.5	41.6
Milk	Cottage Cheese	32.9	28.0	16.4	0	10.0	3.1	5.9	26.1	12.3	28.8

Cottage cheese is conspicuous for its slight popularity; at best it was used by scarcely  $\frac{1}{2}$  of the white owners and renters. Very few families in other tenure groups and no Mexican family ate cottage cheese.

Preference for sour milk was far ahead of sweet for making the quick bread which was eaten usually twice and frequently three times a day by these families. Except for the Mexican families among whom sour milk got  $\frac{1}{4}$  of the preferences expressed, all groups showed preference of from 82% to 97% for sour milk. Negro families slightly exceeded those of the corresponding white groups in use of sour milk.

**Meats.** For cooking pork, frying was the favorite method, closely followed by boiling. Roasting, little used by any group, was more in favor with owners and renters than with laborers of the same race, and more with white than the corresponding negro groups.

For cooking beef, frying, roasting, and boiling were the methods preferred, in that order with some irregularities between roasting and boiling. They constituted approximately  $\frac{3}{4}$  of the preferences. All other methods together—smother, ground, soup, loaf, and broil—amounted to the remaining  $\frac{1}{4}$  of the preferences. Broiling beef, the least used method, was mentioned by only 3 white owners, 1 white renter, and 1 negro laborer.

**Eggs.** Eggs appeared on the table fried much more often than otherwise cooked. Boiling was used to about  $\frac{1}{2}$  the extent as frying by all owner groups and by white renters and laborers, but to a less extent by negro renters and laborers. The use of boiling and frying for eggs differed little in frequency among Mexicans. Scrambled eggs represented approximately  $\frac{1}{4}$  of the egg cookery preferences, but poaching was seldom done.

**Potatoes.** Irish potatoes were most commonly cooked by frying, next by boiling. Preference for these 2 methods was more pronounced among negro than white families; and among owners and renters than wage laborers of the same race. Mexican laborers showed greater preference for boiling Irish potatoes than did white and negro laborers. Creaming Irish potatoes (with white sauce) as third in frequency vied with boiling for some groups. Potato salad was common with all white families. Stewing, mashing, baking, and making soup were the less popular methods.

Sweet potatoes were most often baked; candied were next in popularity. Frying and in pie were about equally common ways to cook sweet potatoes, although Mexicans did not mention pie.

**Leafy Vegetables.** The most popular leafy vegetables—cabbage and greens—represent this class. Cabbage was eaten both raw and boiled. Among white families raw constituted over  $\frac{1}{2}$  the preferences, but only about  $\frac{1}{3}$  among Mexican and negro. The most common length of time for cooking cabbage was for 20 minutes or less for white families, from 21 to 40 minutes for negro, and 41 to 60 minutes for Mexican. Approximately 5 to 7 times the proportion of negro as of white families in corresponding groups cooked cabbage for 41 to 60 minutes. Boiling more than 1 hour represented for most groups less than 10% of the preferences. Only 6 families out of the entire 400 boiled cabbage for 2 hours or more, and only 1 family as much as 3 hours.

Greens were cooked by only one general method—boiling and seasoning with fat or fat meat. However, 2 families mentioned eating greens

raw. The cooking time most frequently used for greens was 31 to 60 minutes for all white groups and the negro laborers, while among negro renters 3 cooking periods were equally common—31 to 60 minutes, 61 to 90 minutes, and 91 to 120 minutes. Negro owners and Mexican laborers cooked greens mostly for 121 to 180 minutes. No family in any group cooked greens more than 3 hours. From  $\frac{3}{4}$  to  $\frac{9}{10}$  of the families in the negro groups were accustomed to use all or part of the greens liquor, while this good habit was the rule for only about  $\frac{1}{2}$  to  $\frac{2}{3}$  of the white families. Forty percent of the Mexican laborers used all the liquor, but none a part of it. A very common practice was to let the cooking water evaporate while boiling till only a small portion remained and all this was served and eaten with the greens.

**Use of Soda.** Soda was employed chiefly for making the biscuits and cornbread which were eaten 2 or 3 times a day in nearly every home, but its use in preparing vegetables was not uncommon. A few families reported using soda only for washing greens. Soda in the cooking of greens was reported by about  $\frac{1}{5}$  of the white groups and the Mexicans, and over  $\frac{1}{3}$  of the negro. Soda in cooking dry beans was used by  $\frac{1}{3}$  to  $\frac{2}{3}$  of the families in the several groups. More negro owners and renters but fewer negro laborers than of white cooked beans with soda. Only 10% of the Mexicans used soda to cook beans.

### Comparison of Regions

As shown by the data in Table 1, likeness between regions was the rule and differences the exception in the general order of preference of the several methods of preparing the various foods. Differences which perhaps deserve mention are the following. The Northeast region exceeded the other 2 in the relatively greater use of sweet milk for desserts and lesser use for gravy and soup, in preference for sour milk to make quick breads, in the extent to which pot liquor of greens was consumed, and in use of soda for cooking beans and greens, while the other 2 regions each exceeded the Northeast in the use of cottage cheese. The East Central surpassed the other two regions in the extent to which cabbage was eaten raw as compared with cooked cabbage. The Northwest region led in short cooking of greens, for periods of 1 hour and less.

### Practices in Relation to Nutritive Values

An important question raised by this analysis of data is: what is the effect on the nutritive values of foods prepared by the most common methods? Praiseworthy practices are using milk to a considerable extent in cooking as well as for drinking, eating of much of the cabbage raw, and consumption of pot liquor from greens. The large proportion of families using short time for cooking leafy vegetables is surprising and encouraging. Extensive use of baking for potatoes is commendable. Such customs mean better diets respecting mineral and vitamin values in particular (4, 5).

Certain other practices occasion concern because of their likely detrimental effect on nutritive values. Important here is the extensive use of soda. Cooking in an alkaline medium (with soda) increases the destruction of both thiamine (vitamin B.) and ascorbic acid (vitamin C) (4, 5). Hence greens boiled with soda are less good for these vitamins than when cooked



without it. Hot breads made with sour milk and soda are in danger of undue loss of thiamine because the housewife cannot be sure how much soda to use to neutralize exactly the acid of the milk. Laboratory tests have shown that the cooking time for dry beans is cut approximately in half by soaking them in soda water or adding soda while boiling (1, 3, 7). But it is not known whether the shorter cooking time offsets the destruction of thiamine by the soda. Certain hard waters toughen rather than tender peas and beans (3, 7). Housewives have long used soda to soften water for cooking beans. But it should not be used unless it is known to be needed. Some housewives think soda intensifies the green color of cooked vegetables. But completely satisfying greenness results from short time cooking in an open or loosely covered pan (2). In general, the longer the cooking in the presence of air as in ordinary cooking utensils, the greater the destruction of vitamin A. Minerals are dissolved out of fruits and vegetables by cooking in water, or they may be lost through escape of the natural juice from the food. Therefore over-long cooking reduces nutritive values. Discarding cooking water is a waste of the minerals and vitamins dissolved in it.

Intensive studies need to be made under laboratory control to determine the extent of loss of nutritive values by cooking procedures common in rural homes and to devise methods of making cooked foods attractive and palatable but at the same time reducing the losses of nutritive values to the minimum.

### HOME PRESERVATION OF FOODS

So meager was the use of such methods as hilling, drying, and freezing of vegetables and fruits, and canning and freezing of meats as detailed in another report (8), that home food preservation by Texas rural families may well be thought of as canning of vegetables and fruits, and making of preserves, jams, jellies, and marmalades. (Hereafter the term preserves will be used to mean also jams, jellies, and marmalades, and preserving the process of making any of these 4 types of products).

#### Kinds of Fruits and Vegetables Canned

The 5 kinds of fruits most used for canning and preserving and the 5 vegetables for canning are shown in Table 2, with the foods numbered from 1 to 5 in order of descending importance for each of the 17 groups of families. No food was given a rank unless the group reported a total of at least 25 qt. of the canned fruit or vegetable and 25 pt. of the preserved. Most totals were much larger. It is realized that amounts of fruits used may vary somewhat with the crop harvested; hence rank of fruits and vegetables canned another year might differ from that in this report.

According to these data the kinds of fruits and vegetables canned and their rank in importance were practically the same for all race and tenure groups within each region. The East Central and Northeast regions resembled each other and differed somewhat from the Northwest region. Peaches were by far the most common fruit canned in the Northwest region. Here plums were in second place with apples, grapejuice, pears, and cherries following. Dewberries and blackberries (considered together since many families did not distinguish between them) held first place in the East Central and Northeast regions, followed by grapejuice, pears, plums,

TABLE 2  
Fruits and Vegetables Most Used for Canning and Preserving.  
Numbers indicate rank in order of importance.

Food	WHITE									MEX.	NEGRO							
	East Central			Northeast			Northwest			East Central	East Central			Northeast		North-west		
	Owners	Renters	Wage Laborers	Owners	Renters	Wage Laborers	Owners	Renters	Wage Laborers	Wage Laborers	Owners	Renters	Wage Laborers	Owners	Renters	Wage Laborers	Wage Laborers	
Fruits	Peaches	2	2	3	1	1	1	1	1	1	1	1	1	1	1	2	1	1
	Dewberries & blackberries	1	1	1	2	2	2					2	2	2	2	1	2	
	Grape juice	4	3	2	3	4	5	4	4	5		3	3					
	Pears	3	4	4	3	4		5	4		2	4	4		4	3	3	
	Plums	5	5	5	5	3		2	2	2					3	4	4	
	Apples							3	3	3								
	Cherries							5										
	Pineapple											5						
Preserves <sup>1</sup>	Pear	3	4 <sup>2</sup>		3	2	3	5	4	3	1	1	1	2	1	2	1	
	Fig	1	1	1	1	3	2					4	2		3	3	4	
	Plum	4	3				1	1	1		3	3						
	Dewberry & blackberry	2	2		2	1	4					5	3			1	3	
	Peach	5			4	5	5	2	2	2		2	4	1	2	4	2	
	Strawberry					1												
	Grape				5	4		4	3	4								
	Apple							3	5	5								
Tomato		4 <sup>2</sup>																
Vegetables	Tomatoes & juice	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1	2	
	Beans, string	2	4	2	4	3	2	2	4	2		3			3	5	1	
	Corn	3	3					5	5	4		2	2	2	2	5		3
	Snap peas (cowpeas in pod)							3	2	1			5				2	
	Cucumber pickles																	
	Other pickles		5	4	2	2	3	4	3	5		5	4	5	4	4	4	
	Soup				3	4									3	2	1	
	Sauerkraut														3	3		
	Beans, shelled	5	2	3														
	Peas, field shelled	4																
	Relish				5		5								4	4	5	3

<sup>1</sup>Includes jams, jellies, and marmalades.

<sup>2</sup>Same rank for pears and tomatoes.

and pineapple. For preserving, much the same fruits were used as for canning, although for one or more groups in the East Central and Northeast regions figs, strawberries, and tomatoes were included among the 5 kinds most used. Tomatoes had a decided lead among vegetables canned in all regions. Other vegetables much used for canning differed less definitely between the 3 regions than did the fruits. String beans, corn, and snap peas (cowpea pods) filled most of the second and third places; cucumber pickles were among the 4 foods which followed tomatoes in 14 of the 17 groups.

Fruits which were canned other than those listed in Table 2 included apricots, figs, grapes, and rhubarb; others used for preserves, apricots, cherries, mayhaw, pineapple, prunes, rhubarb, and watermelon. Other vegetables canned were green lima beans, shelled field peas, English peas, Irish potatoes, sweet potatoes, cabbage, greens, asparagus, carrots, okra, pumpkin, peppers, beets, pimentos, squash, and turnip roots.

### Extent of Canning and Preserving

Data respecting the extent of canning are summarized in Table 3.

Out of the total 400 families, 369 or 92% canned fruit, 365 or 91% canned vegetables, and 324 or 81% made preserves. With exception of the Mexican families few of whom did canning, the proportion of families that canned and preserved fruits and vegetables is remarkably high and strikingly similar among all groups in the 3 regions.

TABLE 3  
Extent of Canning

Item for Each Region	White			Mexican	Negro		
	Owners	Renters	Wage Laborers	Wage Laborers	Owners	Renters	Wage Laborers
% Families Canning							
Vegetables							
East Central	88	100	86	36	83	87	65
Northeast	98	95	100		100	94	90
Northwest	98	100	93				71
Fruits							
East Central	94	100	100	9	100	87	71
Northeast	100	95	100		100	94	100
Northwest	98	96	89				71
Preserves							
East Central	69	46	71	27	75	73	71
Northeast	98	95	100		88	100	100
Northwest	95	87	86				29
No. kinds canned							
Vegetables							
East Central	21	20	12	6	21	20	17
Northeast	23	18	19		18	15	14
Northwest	22	23	22				6
Fruits							
East Central	8	6	4	2	7	5	5
Northeast	11	6	7		7	6	5
Northwest	12	11	10				4
Preserves							
East Central	8	7	5	3	7	8	6
Northeast	9	9	10		6	6	6
Northwest	12	14	13				3
Average volume per person							
Vegetables, qt.							
East Central	28	27	13	6	28	10	8
Northeast	46	40	38		16	14	18
Northwest	59	37	39				9
Fruits, qt.							
East Central	20	17	9	*	18	10	7
Northeast	25	25	21		15	11	12
Northwest	40	23	25				5
Preserves, pt.							
East Central	23	10	7	7	15	9	6
Northeast	22	13	16		11	9	9
Northwest	26	15	14				13

\*Only 1 family, average not calculated.

In total number of kinds of fruits and vegetables canned, the Northwest region exceeded the other 2 in each tenure group. Owners, renters, and laborers in the Northwest region differed less from each other than in the other 2 regions where for the most part owners surpassed renters, and renters in turn the laborers. Differences between race groups in number of kinds of fruits and vegetables canned and preserved were neither marked nor consistent, except that the Mexicans canned fewest kinds.

The number of quarts of fruits and vegetables canned by individual families varied greatly. Among white families, the volumes ranged from 1 to 1326 qt. of fruit and from 1 to 833 qt. of vegetables. Extreme values for negro families were 4 and 324 qt. of fruit, 2 and 269 qt. of vegetables.

The average volume canned per person was greatest among white owners of the Northwest region, being about twice the average for white owners of the East Central region and  $\frac{1}{2}$  more than for owners of the Northeast. But among white renters the Northeast region led, followed closely by the Northwest, while the averages for white laborers of these 2 regions were comparable with those of the renters. The volume of fruits and vegetables canned by white laborers of the East Central region was about  $\frac{1}{3}$  that of the owners and renters.

Among negro groups, owners in the East Central region resembled the white in average volume of canned vegetables and fruits; but negro owners in the Northeast, and renters and laborers in both the Northeast and East Central regions canned about  $\frac{1}{2}$  as much as corresponding white groups, while negro laborers in the Northwest canned less than  $\frac{1}{4}$  as much as white laborers there.

Of preserves, the white owners in the 3 regions had similar averages which were usually considerably greater than the averages of corresponding renters and laborers. White renters and laborers of the Northeast and Northwest regions and the negro laborers of the Northwest had similar averages for preserves. Most white groups exceeded corresponding negro in average volume of preserves, but the differences between race groups were not as great as with the canned vegetables and fruits.

The extent of canning of fruits and vegetables by the families in this study is of interest in comparison with the findings in the recent report of a federal survey of wartime spending and saving by rural families (6) representing the entire rural population of the United States. Among the 45 counties in that survey, 2 in Texas were included, neither of them in this survey by the Texas Station. According to the federal survey 77.7% of the families canned home produced vegetables, 71.5% pickles and relishes, 69.9% preserves, jams, and jellies, 65.7% other fruit. Of purchased food, 9.7% of the families canned pickles, vegetables, and relishes, 22.3% preserves, jams, and jellies, and 43.8% other fruit. Average quantities per family (average number of persons 4.03) for the year 1941 in the 45 counties were: vegetables, 102 qt.; fruits, 88 qt.; preserves, jams, and jellies, 27 qt. A larger proportion of the families in the Texas Station study did canning, 92% of them canning fruits, 91% vegetables, and 81% preserves. Record was not made of the source of the foods canned, but it is known that the great bulk of all fruits and vegetables consumed were home produced. The total volume canned expressed on the family basis (1715 persons, 400 fami-

lies, average number persons 4.3 per family) was equivalent to 127 qt. of vegetables, 83 qt. of fruit, and 25 qt. of preserves, amounts comparable with those reported by the federal survey.

Assume that each family member is to average from home production at least 2 servings daily (1 cup or  $\frac{1}{2}$  pint) of vegetables other than potatoes. Then for 3 months, with no garden supplying fresh vegetables, a minimum of 23 qt. of vegetables per person would be needed. This amount or more was reported canned by all groups of white owners and renters, and also by negro owners in the East Central region and by white wage laborers of the Northeast and the Northwest regions. On the same basis, the canned vegetables reported by 4 negro groups (1 owner, 1 laborer, 2 renters) and by white laborers in the East Central region would constitute a supply for 6 to 8 weeks. The 3 remaining wage groups reported amounts equivalent to a supply for 3 or 4 weeks.

Each rural family should plan to can enough fruits and vegetables to give an ample supply when fresh products are not available.

#### Factors Influencing Home Canning

Several factors probably had a share in making the differences observed between regional, tenure, and race groups, in both the variety of fruits and vegetables canned and the average volume per person. Naturally figs, dewberries, and blackberries should be much more prominent in the East Central and Northeast regions where these fruits are cultivated and berries also grow wild, than in the Northwest where they are not grown. Figs do not bear transportation well. Strawberries are grown extensively only in the Northeast region. It is likely that there is more money for purchase of fruits and vegetables to can among the families of the Northwest region where there are more beef cattle raised, a larger number of cows, and larger poultry flocks are kept than in the other 2 regions where smaller scale farming is the rule. Perhaps the good wages in oil fields and lumber mills of the Northeast region enabled white laborers there to can as much of fruits and vegetables as the renters; perhaps white laborers of the Northwest region profited in a measure by the prosperity of their employers and followed their example in canning.

Other things being equal, an ample acreage (including orchards) for food production and two gardens per year would reduce the family budget of canned fruits and vegetables necessary to insure a plentiful supply of these foods. Families with both spring and fall gardens in the East Central and Northeast regions usually had products from them over a period of 9 months to the year round, while in the Northwest region the two gardens provided products for 6 to 9 months.

Analyses were made to determine whether either the food acreage or number of gardens per year was related to the amount of canned fruits and vegetables. Regions were combined, but tenure and race groups kept separate.

The data in Table 4 show that among owners and renters but not wage laborers, larger food acreages (more than 1 acre compared with  $\frac{1}{2}$  acre or less) were associated with greater volume per person of canned fruits and vegetables. However, negro renters were an exception respecting canned

TABLE 4  
Volume of Canned Fruits and Vegetables in Relation to Food Acreage

Food Acreage <sup>1</sup> $\frac{\text{A}}{\text{A}}$		Average quarts per person							
		Fruits				Vegetables			
		None	$\frac{1}{2}$ A or less	Over $\frac{1}{2}$ A to 1 A	Over 1 A	None	$\frac{1}{2}$ A or less	Over $\frac{1}{2}$ A to 1 A	Over 1 A
White	Owner	—	22.2	23.8	28.9	—	30.2	37.9	45.3
	Renter	—	18.5	20.6	22.9	—	31.9	31.2	37.2
	Wage laborer	18.8	24.1	13.1	23.7	30.6	40.3	30.3	28.5
Negro	Owner	—	10.4	11.0	21.2	—	10.0	27.0	24.4
	Renter	—	12.1	8.2	10.7	—	9.1	8.2	13.5
	Wage laborer	8.2	7.3	16.0	11.6	11.6	7.7	*	*

\*Number persons too small to calculate average.

<sup>1</sup>Includes orchards.

TABLE 5  
Volume of Canned Fruits and Vegetables in Relation to Number of Gardens Per Year

Gardens $\frac{\text{A}}{\text{A}}$		Average quarts per person			
		Fruits		Vegetables	
		Spring only	Spring and fall	Spring only	Spring and fall
White	Owner	30.7	47.2	23.2	29.6
	Renter	31.3	39.7	20.6	23.0
	Wage laborer	38.1	35.0	20.6	24.0
Negro	Owner	*	23.5	*	18.3
	Renter	13.5	11.6	10.5	9.7
	Wage laborer	7.8	17.8	9.4	7.1

\*Number of persons too small to calculate average.

fruit. In Table 5 it will be seen that white owners and renters with 2 gardens per year canned more of both fruits and vegetables than did those with one garden, and white wage laborers with 2 gardens more vegetables. But volume canned by negro families was not influenced in any tenure group by number of gardens. It may be that many negro families depended more upon fresh vegetables than did white, for a larger proportion of negro owners than of white had 2 gardens per year.

### SUMMARY AND CONCLUSIONS

From a survey by personal visit to the homes of 400 rural families in 3 regions of the state, information has been secured regarding the most common methods of preparing prominent foods and the place of home preservation in the family food supply. Three tenure groups, owners or operators, renters, and wage laborers, and three races, white, Mexican and negro were included.

Preferred methods of preparing prominent foods were strikingly similar for all groups of families. Commendable practices among most families

were use of milk for cooking as well as drinking, baking as the favorite method of cooking sweet potatoes, short time of cooking greens and cabbage as done by most families, the common custom of consuming greens pot liquor, and frequent use of cabbage in the raw state. Among some families, practices which may lower nutritive values of cooked foods more than need be are too long boiling of greens and cabbage, use of soda in cooking beans and greens, and preference for sour milk and soda to make biscuit and cornbread which are eaten usually 2 or 3 times a day. Research should be done to determine to what extent cooking procedures common in rural homes affect the nutritive values of foods.

The only method of food preservation used extensively was canning of fruits and vegetables. Fruits were canned by 92%, vegetables by 91%, and preserves (including jams, marmalades, and jellies) were made by 81% of the families. Peaches were the leading fruit canned in the Northwest region, blackberries and dewberries in the East Central and Northeast. Other prominent fruits were plums, pears, and grapes in the 3 regions; apples, cherries, and pineapple also in the Northwest region; and in the East Central and Northeast regions peaches, figs, and strawberries. Tomatoes were the leading vegetable in all regions. String beans, corn, snap peas, and cucumber pickles also were favorite vegetables for canning. Average amount canned per person was 29 qt. of vegetables, 19 qt. of fruit, and 12 pts. of preserves. Special attention needs to be given to the family canning budget in relation both to the total amount of fruits and vegetables the family should have and the amount of fresh products that can be expected particularly from home production.

The proportion of the families in this study who canned fruits and vegetables was greater than that of rural families in 45 counties representing the entire rural population of the United States as found in a federal survey made in 1942. The amounts canned by the families in the two studies were similar.

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