AN ABSTRACT OF THE THESIS OF

Mabel Townes Mack for the M. S. in Home Management
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Title A Study of the Kitchen Sink Center in Relation to Home Management

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(Major Professor)

A study of the kitchen sink center in relation to management was undertaken for the purpose of finding out how sink centers in Jackson County homes are now equipped and used, and determining how they might be improved as a basis for planning an Extension program in Home Management. Home visits were made and information obtained concerning 150 kitchens. Of the families included in the study, 64 per cent were located on farms, and 36 per cent were rural non-farm and village dwellers. The number in the household averaged 3.7 persons. Sixty-one per cent of the families had lived in their present houses under ten years. Fifty per cent of the houses were under 25 years of age. The houses averaged 5.8 rooms.

The kitchens were too small to provide adequately for all of the activities carried on in them. Three-fourths of the kitchens had areas less than the 180 to 200 square feet, which has been found to be the adequate or desirable space for a well equipped kitchen including a wood range and the dining area. The study also showed that the average farm kitchen did not have adequate space for sufficient storage cabinets, work surfaces of desirable length, or an electric refrigerator. Eighty-five per cent of the homes were equipped with kitchen sinks.

Over one-fourth of the sinks had surface drainage which is an unsatisfactory means of waste disposal. Eighty per cent were equipped with running cold water and 66 per cent with running hot water.

The type of sink most frequently found and preferred by the majority of the homemakers was the flat rim sink without a back, because of the precision possible in height of installation and in placement of faucets.

About one-third of the sinks were under 28 inches in length, which is considered inadequate for the usual activities at the

sink center. They were also installed too low in the majority of the homes, 62 per cent were 29 inches or less from the floor of the sink to the floor, which height is 3 inches lower than the height preferred by the average homemaker.

Eighty-five per cent of the homemakers considered the natural lighting at the sink satisfactory. All of the village homes, and 78 per cent of the farm homes were equipped with electric lights. Only 30 per cent of the kitchens equipped with electric lights had a light over the sink. Forty-four per cent of the kitchens had the light fixture placed so that shadows were cast on the work area. Twenty per cent of the kitchens had switches or pull chains which were shock hazards.

Practically all of the sinks were equipped with some type of adjacent work surface. Seventy-six per cent had work surfaces on both sides and 20 per cent had work surfaces on one side. One-half of the work surfaces were less than 98 inches in length.

The activities usually carried on at the sink center are clearing away and washing dishes and preparation of food where the use of water is involved. Frequently the sink and serving center are combined. In many small kitchens the mixing center is also a part of the cabinet space of the sink unit.

Activities centering about the sink require work surfaces on both sides, and cupboards above and below the work surfaces for the storage of articles and equipment used at the sink. About 40 per cent of the homes having sinks were equipped with this type of complete sink unit and 14 per cent of the substitute centers were also so equipped.

It was found that 125 families had definite plans for improving their kitchens. Fourteen per cent planned to rebuild the entire kitchen and 50 per cent planned to rebuild or enlarge kitchen storage areas. One-third planned improvement of the sink by the addition of water systems or other equipment. While 25 per cent of the homes had no provision for food storage, only 8 per cent planned installation of the food storage facilities. Sixteen per cent planned miscellaneous improvements.

As a result of this study it is recommended that an Extension Program be built up on four major phases of Home Management:

1. Kitchen Planning. To give assistance in planning new kitchens for those families that are planning to build new houses or planning to entirely rebuild the kitchens.

2. Cupboards and Storage Arrangements. To assist in planning the organization and improvement of storage areas.

3. Water Systems and Sink Installations. To assist in planning the installation of water systems and kitchen sink centers.

4. Food Storage. To develop through an educational program a realization of the need for improved food storage and to assist in planning these improvements.

5. Minor Changes. In addition to the four specified problems brought out by this study there are also a number of minor changes in relation to equipment or management that should be made. In order to accomplish this it will be necessary to develop through an educational program, a realization of the desirability of these improvements in and adjacent to the kitchen sink center.

A STUDY OF THE KITCHEN SINK CENTER IN RELATION TO HOME MANAGEMENT

by

MABEL TOWNES MACK

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Professor and Head of Department of Household Administration

In Charge of Major

Redacted for Privacy

Chairman of School Graduate Committee

Redacted for Privacy

Chairman of State College Graduate Council

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PART I

THE PROBLEM

A STUDY OF THE KITCHEN SINK CENTER IN RELATION TO HOME MANAGEMENT

PART I

THE PROBLEM

A study of the kitchen sink centers[1] in Jackson County homes in relation to management was undertaken for the purpose of finding out how kitchen sink centers are now equipped and used, and of determining how they might be improved, as a basis for planning a project in the Extension program in Home Management.

Management as used in this study may be interpreted as a way of thinking and analyzing a situation. The ultimate aim in the Extension program will be to help people set their own values, see their own problems, think through possible solutions, evaluate them and then make their own decisions.

This problem was selected because:

a. It was considered a major need in Jackson County homes. The Federal Housing Survey of 1932, made in 1365 Jackson County homes, revealed that 38 per cent of those homes did not have a kitchen sink.

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1. The sink center will be considered as including all area adjacent to the sink--the sink bowl, work surfaces to right and left of sink and storage spaces above and below and adjacent to the sink.

b. The homemakers were conscious of the importance of the problem, and desired to correct this situation by the installation of sinks and running water. According to the report of this Housing study 56.3 per cent specified the installation of a water system as their first preference for home improvement.

c. Efficiency is one of the most important factors in successful management. Efficiency in the performance of household tasks depends in part upon the satisfactory arrangement and equipment of work areas. An efficient kitchen is planned in terms of the activities to be carried on in it, and must provide for all these uses. A work area or unit should be provided for each type of work, and all small equipment should be grouped at the area where used. Large equipment should be arranged in a step-saving sequence, in a compact working area. Work surfaces should be placed at convenient heights from the floor in order to minimize the necessity for stooping and reaching.

d. In order that kitchens may be planned in terms of the activities to be carried out, studies are needed to determine how kitchens are equipped and used, and how they might be improved to meet satisfactorily the requirements for efficiency.

e. The sink center is probably the most import-

ant center in the kitchen from the standpoint of efficient management of time and energy, and the sink is probably the one piece of equipment which contributes most to convenience. The installation of the sink and running water in an old or new home presents a problem of careful planning of the location, working heights, storage areas, and work areas adjacent to the sink.

f. The Home Economics Extension and teaching programs in management have, for the past several years, been focused on the equipping of work areas. The report of the Federal Housing Survey[1] that over 56 per cent of the Jackson County families desire the installation of water systems indicates that this problem of kitchen sink centers will be of major importance in the Extension program.

In planning a program in Extension the projects are analyzed and selected on the basis of the needs of the group. Five factors are usually considered in this analysis. These are listed as a summary of the reasons for selecting this problem.

1. Is it a major need?

Do the majority of the families that will be reached need this improvement?

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1. Federal Housing Survey of Jackson County 1932. Appendix Table I)

Judging from the Federal Housing Survey, it is a major need in Jackson County.[1]

2. Is it a stated desire, or will interest develop?

The Federal Housing survey reports that over 56 per cent listed this as their first preference for Home Improvement.

3. Is it a program that will be possible?

This study on how kitchen sink centers are equipped and used will make it possible to plan an effective program on sink centers based on actual needs.

4. Is it related to what has gone before and to what may come in the future--related to a long-time fundamental project?

For the past several years, the program has included projects on water systems and sanitation, and kitchen planning. The problem is definitely related to this long-time program, and is flexible enough to meet the needs.

5. Is it important for the families involved?

It is of major importance in planning an efficient kitchen, and efficiency is one of the most important factors in successful management.

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1. Summary of Federal Housing Survey. (Appendix Table I)

Information Obtained

Information was obtained from 150 Jackson County homemakers on the location, age, and size of farm homes, water systems, heating facilities, type of sink and installation, type of work surfaces and storage areas and activities carried on at the sink center, and on management of sink centers, and on plans for improvement of sink centers or on improvement of the entire kitchen. Of the 128 homes surveyed that do have a sink, the information collected included the arrangement of the sink center, the equipment and uses of the sink center, and storage facilities and work spaces of the center.

Data collected on the 22 homes that do not have a sink included substitute equipment used for the sink center, and management of activities ordinarily carried on at the sink.

The information on activities included not only the major homemaking processes usually carried on at the sink center--food preparation, clearing away, dishwashing, and storage of equipment and supplies--but also other uses, such as use as a lavatory, for washing milk utensils, or for laundry.

PART II

PREVIOUS STUDIES OF KITCHENS AND MANAGEMENT

PART II

PREVIOUS STUDIES OF KITCHENS AND MANAGEMENT

A great deal of attention is now focused upon the housing conditions of urban and rural families and many valuable studies have been made of ways in which improvement might be brought about. These studies and analyses have served to emphasize the concept that an essential prerequisite in home building is a realization of the functional needs of the family that is to occupy the house. Needs for comfort, convenience, health, safety, recreation, beauty and family member development must be satisfied, and the needs of every member of the family should be considered in order to help achieve happy family relationships.

In the following paragraphs, a brief summary is given of the various studies made that pertain to the kitchen sink center. These studies were selected because the findings were valuable in the analysis of this study, and because the recommendations were pertinent to this study.

President's Conference on Home Building and Home Ownership

The committee on Farm and Village Housing of the President's Conference on Home Building and Ownership[1]--1932, report a survey made in 1931 of 2,585 farmhouses in 30 counties in 17 states. They found that 902, or 35 per

1. President's Conference on Home Building and Home Ownership. Vol. IX, p. 164-166. (13)

cent, had running water in the kitchen. In 774 of the 2,585 homes more detailed information was secured regarding kitchen equipment and arrangement. Of the 774 homes, 73 per cent were owned and 27 per cent were rented. Built-in cupboards were found in 82 per cent of the kitchens. One per cent had work tables as a part of the sink, 43 per cent had separate work tables, and 56 per cent had movable work tables.

Seventy-four per cent of the sinks were either enamel or porcelain. Eighteen per cent of the sinks had drainboards on both sides, and 40 per cent had no drainboards.

In answer to the question as to whether the sink was in reaching distance of the range, it was found that this was true in only 37 per cent of the kitchens. Forty-seven per cent reported the sink placed below the window, 49 per cent had the sink placed on a blank wall, and 15 per cent placed the sink in a corner.

In enumerating the questions which bring out some of the points which should be given careful consideration in house planning, the committee suggests the following questions pertaining to the kitchen[1]:

1. Is the larger equipment arranged to save steps in preparing, cooking, serving, and clearing up after meals?

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1. President's Conference on Home Building and Home Ownership. Vol. IX, p. 14-15. (13)

2. Are there storage facilities for supplies and small equipment located around the working centers where they are used?
3. Are the working surfaces and storage facilities at proper height to minimize stooping and stretching?
4. Is there sufficient working surface at each work center?
5. Is there toe room under all equipment at which the worker must stand?
6. Is there knee room under the work table, etc., so that the worker can sit comfortably?
7. Is the kitchen well lighted and ventilated?

In referring to its survey of housing conditions on farms and villages[1] the committee findings indicate that there is little need for more space in most of our farmhouses, that modern equipment and conveniences have received too little attention, and that much is to be desired in the adaptation of the farmhouse to the purely physical needs of the family. The universal needs in regard to the situation pertain to the setting, the landscape planning and planting, the room arrangement, the interior finish, furnishings and equipment, and the additional facilities for saving the labor and energy of the homemaker.....the solution of problems in the field of farm and village hous-

1. President's Conference on Home Building and Home Ownership. Vol. VII, p. 16-17. (12)

ing ultimately rests upon the education and tastes of the rural people.

The committee on Housing and Family Development of the President's Conference on Home Building and Home Ownership[1] reports a survey made on "The House as a Work Center" with 1,048 rural families in 40 states. The relation of the house as a work center to family life or mental health was the purpose of the study. Fifty-six per cent of the rural women reported they were pleased with their kitchens, 10 per cent were displeased, and 34 per cent would welcome improvements, or a total of 44 per cent should have their kitchens improved.

Some of the complaints on kitchens were: "The kitchen is dark and disagreeable," "The floor is hard to clean," "Poor ventilation," and "I travel miles working in my kitchen."

The question arises--are those who are satisfied with their kitchens sufficiently critical of their kitchens as work centers? The concrete evidence shows that many women are becoming conscious of how their time and tempers may be spared through more effective work space and tools.

The committee on Housing and Home Management of the White House Conference on Child Health and Protection[2] re-

1. President's Conference on Home Building and Home Ownership. Vol. X, p. 4-9. (14)
2. White House Conference on Child Health and Protection. Vol. III A, p. 54. (26)

commend that equipment be provided the pre-school age child so that he can help in the kitchen with certain tasks. A small table or some low working space can be provided for him, or a box or steps may be used to raise him to adult working levels. He should be allowed every opportunity to help because of the value to his development, sometimes physical, sometimes mental, sometimes social, and sometimes all three.

The Willamette Valley Farm Kitchen

A study of the Willamette Valley Farm Kitchen was made by Wilson in 1930 (29) to determine the size of an adequate kitchen for the farm dwelling including:

(1) The floor and wall space required for each of the various work centers with adequate provision for the activities and storage needs of a specific group of families.

(2) The dimensions of the kitchen that provides adequate floor and wall space for work centers, and that is arranged to permit efficient routing of activities.

Detailed information was secured from 14 selected families to determine the kitchen requirements for equipment, storage spaces for dishes, cooking utensils, food staples and perishable food, and work done in the kitchen. Based on the information obtained, detailed plans were made

for the procedure in planning each kitchen for the 14 cooperators by allocating each function to a center, by grouping articles to be stored with respect to convenience in use, and by finally making detailed plans for each center.

Following are excerpts from the section dealing with the planning of the sink and serving center which are of especial interest in this study:

Sink and Serving Centers[1]

"The sink center was considered jointly with the serving center because it is often advantageous to build a cabinet serving both functions. Activities centering about the sink require work surfaces on both sides, and in a well-managed farm kitchen one of these surfaces would usually be free to use as a serving table at the time it is needed for the purpose."

Articles for Which Storage Was Provided

Sink Center

Vegetable cutting board.
Dried fruits, vegetables, and uncooked cereals requiring washing or soaking.
Stew kettles; saucepans; double boilers.
Colanders; strainers.
Ice-cream dipper.
Paring knives; slicing knives; scissors.
Vegetable brushes.
Dishpan; rinse pan; dish drainer.
Pot cleaners; cleaning brushes; bottle brushes.
Sink strainer; dish scraper.
Dish towels, dishcloths, and hand towels in use.
Supply of dish towels, dishcloths, and hand towels.
Soap container.
Garbage container.
Drinking glasses.
Flower containers.

1. Wilson--Willamette Valley Farm Kitchen, p. 21-23. (29)

Cloth for wiping spilled water from floor.
Drain cleaner; scouring powder; soap.
Empty fruit jars, till taken to storeroom.
Milk buckets and crocks.
Butter-making equipment.
Medicines and first-aid equipment.
Hand lotion.

Serving Center

Bread; cake; cookies.
Ready-to-eat cereals, crackers, etc.
Loaf sugar; honey; candies; dried fruits served without cooking and not requiring washing.
Relishes not requiring low temperatures.
Bread and cake knives; bread board; cake rack.
Ladles and serving spoons; serving forks; butcher knives.
Dishes, silver, and linen used for everyday meals.
Seldom-used dishes.
Picnic supplies and equipment.
Keepsakes and decorative dishes.
Serving trays; mats for hot dishes.

Arrangement and Equipment of Center

The combined sink-and-serving unit was planned on the assumption that it would be located near the dining area of the kitchen.

It is assumed that the slope of the sink boards would not be such as to interfere with their use as tables.

The sink was placed at a height convenient for workers when standing. An open area below the sink, however, makes it possible to sit while at work, and provides a place for the stool.

The space above and below the work counters was utilized for storage cabinets. In some plans the space above the sink proper and part of the space below it were also so utilized.

Dishes were assigned to the upper cabinets. Where both company dishes and everyday dishes were stored in the combined sink-and-serving unit, the latter were allotted to the left-hand cabinet, as this is the more convenient location for dishes, and for that reason should be assigned to those most often used. Lower cabinets intended for the storage of utensils or food supplies were made into com-

partments with shelves.

Kettles, saucepans, etc., were allotted to the lower left cabinet. Food materials were stored in both upper and lower left cabinets.

Drawers were provided in the lower right-hand cabinet for kitchen textiles, silver, and small utensils that would not hang. Shelf space was also provided on this side for a bread-and-cake box.

Soap, scouring powder, vegetable and bottle brushes, etc., were stored either in a cabinet set between studding above the sink or in a pull-out rack below the sink.

Sink Center

A sink unit 8 feet 2 inches long, consisting of a 32 inch flat-rimmed sink, upper and lower cabinets at either side, and a shallow cabinet above the sink, was found to provide the counter space needed for the activities carried on at this center, and storage space for all supplies and equipment used in connection with them, with the exception of "company" dishes. In this plan the length of the left side is 32 inches and that of the right 36 inches. When the right and left sections were made of equal length, the unit was increased to eight feet six inches.

Where company dishes were stored at the sink, the total amount of supplies and equipment to be stored exceeded, for all cooperators, that which is available above and below work counters of minimum size. When all of this material was stored in the cabinets above and below the sink work counters, the unit averaged ten feet in length.

Farm Housing Survey in Jackson County[1]

In 1934, Jackson County was one of the seven counties in Oregon selected for the Farm Housing Survey made by the United States Department of Agriculture. One thousand, three hundred and sixty-five representative farm homes were surveyed. (5)

This study revealed that 62 per cent of the families

1. See footnote page 14.

have a kitchen sink, but only 54 per cent of them have piped cold water and 39 per cent piped hot water. About one-third of the families have satisfactory water and sewage disposal such as septic tank or cesspool. Fifty-six per cent of those reporting listed the installation of a water system as their first choice for major improvement and 31 per cent also listed sanitary facilities for waste disposal. (Appendix, Table I)

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1. Final Report Farm Housing Survey for Oregon, 1934. (5)

"Jackson County has many superior farm houses. Many of them are situated on pear, peach or apple orchards, and until the last few years the farmers have had very good incomes. Most of the people had a fair amount of money when they purchased the places and established their homes, consequently as a rule the houses are large, well built, equipped with piped water and electricity and have most of the modern conveniences. The farm land in this district is irrigated, and most of the farmers were so involved financially with the water system that they have been unable to borrow any money on their farms. The situation is being adjusted.

"The other division of farms surveyed in Jackson County are on side roads, many in the foothill districts bordering the valley. A smaller percentage of the land is tillable, in some instances only a garden spot cleared and the rest used for grazing and mining. A comparative few of the farms are irrigated, and these are used for growing alfalfa, dairying, etc., while the non-irrigated tillable land is used for small scale wheat farming. The houses are older, in poorer condition, and in most cases with very few, if any, conveniences. The income from these farms, even in prosperous times, was only moderate, and now it is very small indeed. Some are mortgaged to the fullest extent, and many are tax delinquent."

Use of Time by Oregon Farm Homemakers[1]

A study was made by Wilson on Use of Time by Oregon Farm Homemakers. The purpose of the study was to give homemakers and home economists some of the information needed for an understanding of the homemaker's problem and for a basis of judgment as to what changes are desirable and how they may be brought about.

This study, which was made of 288 farm homemakers, showed that farm homemakers worked an average of 63.7 hours per week. Of this time 81 per cent was given to household needs and 18 per cent to farm work.

The 51.6 hours per week devoted to homemaking activities included food activities, 47 per cent; house, 18 per cent; clothing and textiles, 22 per cent; care of members of household, 7 per cent; management 3 per cent; all other, 2 per cent. Seventy-two per cent of the homemaking time went to the routine activities of the household.

The amount of time spent on each activity serves as a basis for determining the relative importance of household activities in planning the saving of time and energy. Since 47 per cent of the homemaking time is devoted to food activities, the sink center and storage areas should be given early consideration in planning for efficient management.

1. Wilson--Use of Time by Oregon Farm Homemakers. Station Bulletin 256. (27)

From this study it was found that the desire to reduce hours of labor is not so strong as that to redistribute the work period, in order to add comfort and beauty, give more time to the children, or to add to the family income. Many of the time problems of farm homemakers are apparently due to the conflict between the desired standard and the time and money available for its attainment.

More than a third of the homemakers stated that they felt the need of more time for homemaking. The particular activities for which more time was desired were: sewing, child care and training, and family life. (Appendix Table II)

The connection between fatigue and dislike for specific tasks is shown (Appendix Table III). Homemakers reported dishes irksome but not tiring. Cooking is more irksome than fatiguing and laundry work is more tiring than tiresome.

Kitchen Equipment and Arrangement

A study of the time spent and the steps taken in kitchen work in relation to the kind and arrangement of equipment was made by Muse[1] in two Vermont farm kitchens and in an experimental laboratory kitchen. The findings illustrate clearly that much of the housewife's time may be released and many of her steps eliminated if improved equip-

1. Muse--Kitchen Equipment and Arrangement. Bulletin 375 (9)

ment is made available and is efficiently arranged.

The experimental laboratory kitchen was representative of Vermont farm kitchens. The kitchen, which was large, was equipped with a wood range, supplemented by an oil stove. The sink, which was large enough to hold two dish pans, had neither a stacking surface nor a drainboard. The only work surface was located in the pantry, 14 feet from the range and 10 feet from the sink.

A simple family meal for five persons was prepared and served in this laboratory kitchen. The preparation, serving, and clearing up after the meal consumed 3 hours and 46 minutes and required 1516 steps. The majority of these steps were necessitated by the scattered arrangement of equipment. More than one-half of the total steps were taken in transportation during the clearing up process. The addition of a metal top table on casters for stacking purposes saved 139 steps, and 14 minutes of the worker's time in dishwashing. The addition of a drainboard and the rearrangement of the storage of utensils and food were the most important step saving improvements that were made. (Appendix Table IV)

Standards for Working Surface Heights and Other Space Units of the Dwelling

A study of working surface heights and other space units was made by Roberts, Wilson and Thayer (17) for the

purpose of supplying some of the information required in setting up standards for the dimensions of the parts of the house that are mainly used by women. Included in this study were optimum heights of kitchen sinks and work tables, the worker standing. The decisions concerning heights of working surface were based on the choices of cooperators (312 Oregon and 250 Washington women) of which 57.3 were from rural homes.

As a result of this study it was found that the average homemaker prefers a sink set so that its floor is 32½ inches from the floor of the room. However, when the sink is set at a height of 32½ inches the counters level with the sink rim are too high to be ideal for mixing and beating processes. Therefore, a work surface lower than the sink rim is recommended, preferably at a height of 32 inches.

The difference between the home and preferred heights of working equipment of cooperators indicates the need for better planning of installations, and the need for readjusting the heights in a large number of kitchens. Ninety-two per cent of the cooperators preferred height greater than the home equipment height for dishwashing, which is the height of the bottom of the sink. (Appendix Table V)

Kitchen Storage Spaces

A study of kitchen storage spaces was made by Jonas[1]

1. Jonas--Kitchen Storage Spaces. (8, 9)

in New York in 1938. This study emphasizes the principles of management, as applied to problems of remodeling kitchens. The study includes the results of experiences of families themselves and of experiences at Cornell in analyzing the problems that had caused 298 homemakers to seek advice in improving their kitchens. "The results show that kitchen problems may be due to storage facilities inconveniently placed, poorly planned, or universally used. The study included 70 families that had made cupboard improvements in connection with the Extension work of the college. It was indicated that these families profited by the organization of supplies and equipment at work centers where used and by flexibility in the construction of storage spaces to accommodate equipment of various sizes and shapes."

Photographs are used to illustrate the details of storage arrangements in some of the improved kitchens.

The Development of a Successful Kitchen

Cushman[1] gives recommendations on management and remodeling problems as applied to the development of a successful kitchen, based on kitchen improvements made through experimentation by the homemakers. Photographs of improved kitchens are used to illustrate the improvements that have been based on individual family needs. The

1. Cushman--Development of a Successful Kitchen, p. 5. (4)

successful kitchen is described as obtainable by anyone who is willing to work for it and that it does not belong to the homemaker alone, but to the family so that all may enjoy using it.

> "A homemaker may never have thought that improving her kitchen might be important or desirable, and perhaps it may not be. But, if in her day's work she is habitually tired and often irritable, if the eternal round of meals and dishwashing takes half her joy out of life, if it seems that she never has time to do the things she wants to do, if the children are uninterested in kitchen work and do it poorly, if at all, and if her husband is cross, she would do well to look impersonally at her kitchen to see whether she can discover there a cause for any of her difficulties."

PART III

PLACE OF STUDY

PART III

PLACE OF STUDY

This study was made in Jackson County, Oregon, where the investigator has served for several years as County Home Demonstration Agent, and where the Home Economics Extension program has been carried on continuously for the past 21 years, 1918-1939.

During the past ten years, the Home Management project has held a minor place in the Extension program, whereas major attention has been given projects in Foods and Nutrition, Clothing and Textiles, Parent Education and Recreation. In the Home Management program emphasis has been placed on living room arrangement. Kitchens and water systems have received very little attention since 1930 (Appendix Table VI) but the families in this county are conscious of their need for improvement, and desire a program that will aid them in kitchen arrangement, and specifically in planning the sink center and the installation of water systems.

Location of County

Jackson County is located in the extreme southern part of the state, bordering California. It is situated on the west slope of the Cascade mountains. The agricultural section is centered in the Rogue River Valley.

It is 300 miles south of Portland and 400 miles north of San Francisco, the nearest market centers.

Climate and Topography[1]

Due to its location west of the Cascade Mountains, Jackson County has a mild climate considering its latitude, which is 42°23' N.

The average annual mean temperature of Medford, which is located near the center of the Rogue River Valley, is 53.7° F.

The weather in winter is usually very mild with bright sunny days and cold crisp nights. The average minimum temperature in winter is 32.5° and maximum is 48.1° with an average of 7 days with temperature below 32.5°. The average maximum temperature in summer is 85.6°, and the average number of days in the summer when the temperature reaches 90° or above is 58. The nights are usually cool.

Records of the past 27 years show that the average precipitation is 16.92 inches of rainfall and 7.9 inches of snowfall. The greater proportion of precipitation comes in the winter months (November to February).

The average number of days clear	135
The average number of days partly cloudy	84
The average number of days cloudy	146
Total	365

1. U. S. Department of Agriculture Weather Bureau Summary. (22)

Average relative humidity for summer (4:30 P.M., 120 meridian) 29.5 per cent

The growing seasons are long, averaging 163 days. The average date of the latest killing frost in the spring is May 2, and the average date of the earliest killing frost in autumn is October 14.

The prevailing winds are from the northwest. Average velocity is 5.0--highest velocity is 44.

The Rogue River and Applegate River Valleys comprise practically all the farming land. These valleys are surrounded by non-agricultural mountainous tracts. Cascade and Klamath mountains are to the north and east, and the Siskiyou mountains to the southwest.

The elevation of the floor of the valley is 1,000 to 2,000 feet, and on the mountains, 3,000 to 4,000 or more feet.

Soils and Farm Enterprises

The numerous soils (23) of the county fall principally into two classes, residual and alluvial. The common soil of the mountains and foothills is a clay loam. When of sufficient depth, and when the topography is not too rough, many of these clay loam variations are among the most valuable soils in the area.

The soils on the uniformly sloping floor of the valley are usually alluvial and range in texture from fine sandy loams to clay adobes. The texture most prevalent is a

heavy loam. The larger part of these soils is under cultivation.

The area of the county is 1,781,031 acres, of which 302,775 acres (17 per cent) are in farms (24). The farm acreage from which crops were harvested in 1934 were 73,641 acres. An average of 32,127 acres (43 per cent) of this land was under irrigation for the production of tree fruits, small fruits, alfalfa, forage crops, and truck crops.

There are 2901 farms in the county, which is 16 times as many farms as in 1860 (Appendix Table VII), and the acreage in farms has increased six fold. The average acreage per farm is 104.6 acres (Appendix Table VIII). Over four-fifths of these farms are operated by the owners.

Population

Statistics show that the growth of the county has been rapid and steady. The population has increased nine times over the total population in 1860, or a total of 32,918 of which 53.2 per cent are on farms. Four-fifths of the population is of native parentage and there is practically no illiteracy.

Twenty-nine per cent of the families have a cash income under $600, and another 17 per cent have an income between $600 and $1,000 (Appendix Table IX).

A brief statistical summary of the county situation is

given in (Appendix Table VIII). Only items pertinent to this study have been listed. Figures were taken from the 1935 agricultural census.

PART IV

PROCEDURE

PART IV

PROCEDURE

Method Used in Gathering Data

The method used in gathering data was an interview in the kitchen of each home studied. All of the home visits were made by the investigator to insure uniformity. A form was used as an interview guide and for recording the information. (See appendix)

The time devoted to the home visits extended over a six month period. An average of one hour was devoted to each interview in securing the data for the study. In over one-half of the homes, the women took the opportunity to ask for individual help in planning rearrangement, remodeling the kitchen, or other management problems. This prolonged home visits from one to two hours and often resulted in scheduling kitchen conferences to give further assistance as a compensation to cooperators.

Information Obtained

The interview form was prepared to include general information on the size and composition of families; the location, tenure of farm, and chief income crops; the size and age of the house; water supply; kitchen sink center installation, work surfaces and storage spaces; activities

at the sink; attitudes of families; and management devices. The complete interview form is given in the Appendix.

Selection of the Families Included in this Study

The families included in this study were carefully selected in order to secure a representative group. The choice of the communities was given first consideration, and then the individual families within these communities were selected.

The communities in the county were classified on the basis of income levels, distance from county seat, and location. The twenty-three communities selected may be classified thus: income levels--35 per cent low, 39 per cent average, and 26 per cent superior.

Eleven communities were within a radius of 10 miles from the County Seat, and 12 communities were over 10 miles from the County Seat. Eighty-eight per cent were located in rural areas, and 12 per cent in villages. The location in the county, of the communities selected, is shown on Plate I, page 28.

The families within these communities were chosen with respect to farm ownership--owner, tenant; tenure--full-time farmers, part-time farmers, and rural non-farmers; income levels--superior, average, low.

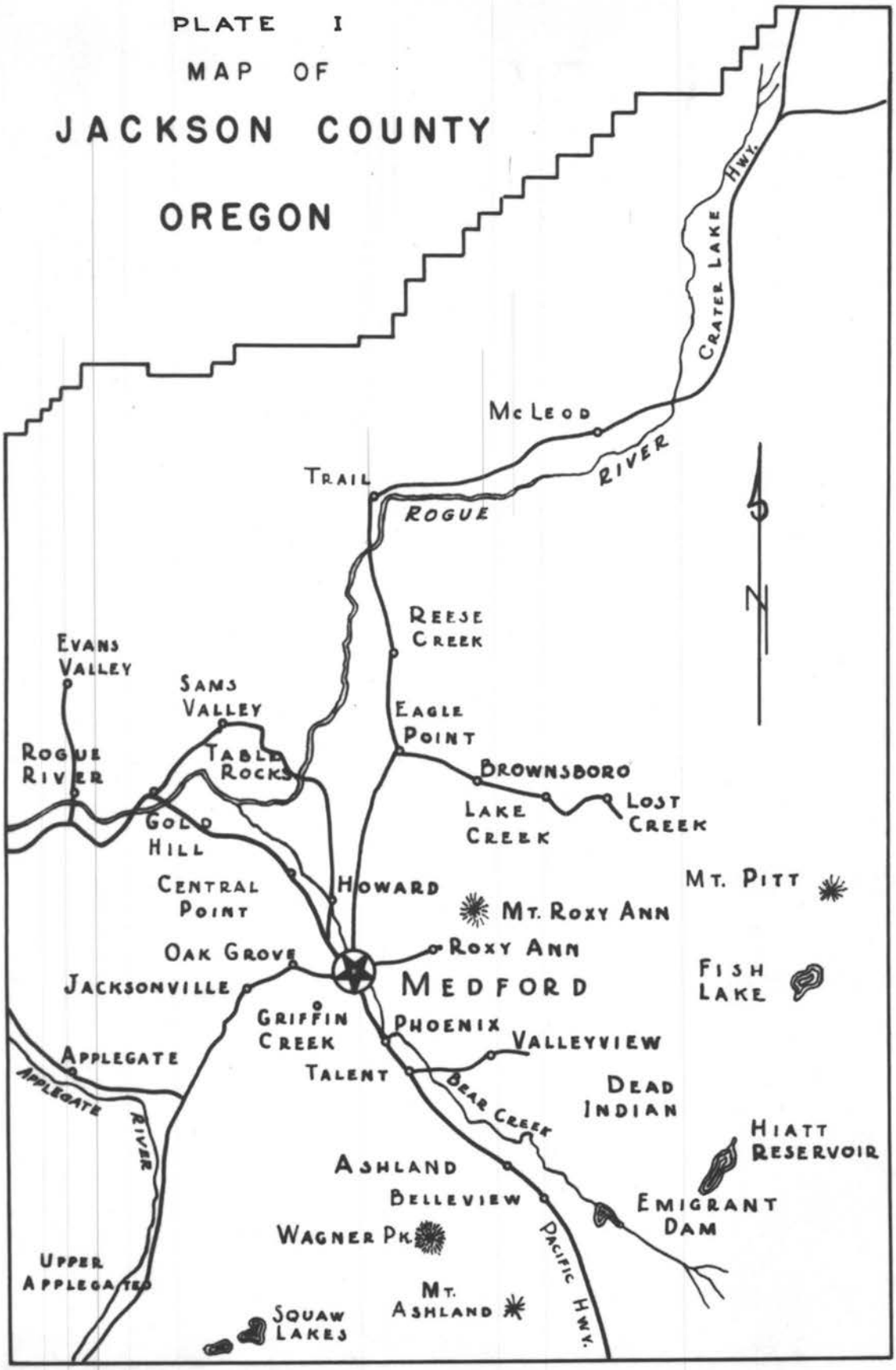
The families represented both members and non-members of Extension groups. The non-members that were included

PLATE I

MAP OF

JACKSON COUNTY

OREGON



were families that could reasonably be expected to enroll in an Extension group if the community would organize or if other local barriers could be removed.

Nearly three-fourths of the families cooperating in this study were members of Home Extension units.

Reasons given by non-members for not belonging to a group were: too busy; have to stay at home to care for small children; no transportation; distance too great; and, have to cook for men at noon. (Table 1, pages 30 and 31)

TABLE 1

DISTRIBUTION OF FAMILIES STUDIED WITH RESPECT TO COMMUNITIES IN WHICH HOMES ARE LOCATED, AND WITH RESPECT TO MEMBERSHIP IN HOME EXTENSION UNIT

Community in which Home is Located			Number Families Included in Study	Distribution of Families with Respect to Membership in Home Extension Unit			Home Extension Unit to which Member Belongs
	Miles from Trading Center						
Name	0-10	over 10		Member	Non-Member	Former Member	
Applegate		X	8	6	1	1	Applegate
Ashland	X		6	4	2		Ashland
Belleview	X		7	6	1		Belleview
Brownsboro		X	2	1		1	Lost Creek
Central Point	X		7			7	
Eagle Point		X	10	7	1	2	Eagle Point
Evans Valley		X	9	7	1	1	Evans Valley
Gold Hill		X	4		4		
Griffin Creek	X		9	9			Griffin Creek
Howard	X		8	6	2		Howard
Jacksonville	X		8	8			Jacksonville

TABLE 1--Continued

Community in which Home is Located			Number Families Included in Study	Distribution of Families with Respect to Membership in Home Extension Unit			Home Extension Unit to which Member Belongs
	Miles from Trading Center						
Name	0-10	over 10		Member	Non-Member	Former Member	
Lake Creek		X	11	10		1	Lost Creek
McLeod		X	4	4			McLeod
Oak Grove	X		7	6		1	Oak Grove
Phoenix	X		7	7			Phoenix
Reese Creek		X	3		2	1	
Roxy Ann	X		8	5	3		Roxy Ann
Rogue River		X	2			2	
Sams Valley		X	6	5	1		Sams Valley
Talent	X		6	4	2		Talent
Trail		X	10	10			Trail
Upper Applegate		X	6	4	2		Applegate
Valleyview	X		2	1		1	Talent
Total	11	12	150	110	22	18	
Per Cent			100.0	73.3	14.7	12.0	

PART V

INFORMATION OBTAINED FROM 150 HOME VISITS

PART V

INFORMATION OBTAINED FROM 150 HOME VISITS

Description of Families

Size and Composition

A representative sampling of rural and village families was desired for this study, therefore no restriction was made regarding size and composition of families with the exception that no home was included which had fewer than two members. The largest family surveyed had nine members. The average number of members per family was 3.73, which was slightly higher than the comparable figure in the Federal Farm Housing Survey[1] of 3.6, and lower than that of the 1930 United States Population Census[2] of 4.5.

TABLE 2

COMPOSITION OF FAMILIES STUDIED

Persons	Number
Adults Male	215
Adults Female	197
Children under 15	148
Total number in families	560
Average number per family	3.73

1. Farm Housing Survey (Appendix Table I).
2. United States Population Census (Appendix Table IX).

The distribution with respect to number of persons in the family showed that three-fourths of the families had fewer than five members. This distribution was practically the same as that of the 1930 census data for the county for two-to-nine-person families.

TABLE 3

DISTRIBUTION, WITH RESPECT TO NUMBER OF PERSONS IN FAMILY, OF FAMILIES STUDIED, AND OF ALL JACKSON COUNTY FAMILIES HAVING TWO TO NINE MEMBERS (1930 CENSUS)

	Families			
	Kitchen Study		1930 Census	
Number of Persons	Number	Per Cent	Number	Per Cent
2	39	26.0	2596	31.5
3	36	24.0	2103	25.4
4	38	25.3	1603	19.5
5	15	10.0	932	11.2
6	10	6.7	517	6.3
Over 6	12	8.0	498	6.1
Total	150	100.0	8249	100.0

Children under 15 years of age were found in slightly over half of the families studied. Children over 15 years of age were classified as adults, because their housing needs and practices would be similar. Thirty-one per cent of the families had children over fifteen living at home; only 25 families of the 150 families had no children.

TABLE 4

NUMBER OF FAMILIES THAT HAVE CHILDREN UNDER AND OVER FIFTEEN YEARS OF AGE

Children in Family	Families	
	Number	Per Cent
Under 15 years	78	52.0
Over 15 years	47	31.3
No children	25	16.7
Total	150	100.0

Table 5 gives the distribution of families with respect to the number of children under 15 years of age. Forty per cent of the families had one or two children under that age. Seven families had four or more children under 15.

TABLE 5

DISTRIBUTION OF FAMILIES ACCORDING TO NUMBER OF CHILDREN UNDER FIFTEEN YEARS OF AGE

Number of Children under 15	Families	
	Number	Per Cent
0	72	48.0
1	28	18.7
2	32	21.3
3	11	7.3
4 or more (average 4.75)	7	4.7
Total	150	100.0

Location and Tenure

Of the 150 families surveyed, all but 18 live in the country; about half are full-time farmers; 16.7 per cent are part-time farmers. Twenty-four per cent are non-farmers who live in rural areas, but have full-time employment away from home. Twelve per cent live in villages.

TABLE 6

LOCATION AND TENURE OF FAMILIES STUDIED

	Number of Families				
Community	Full-Time Farms	Part-Time Farms	Rural Non-Farm Homes	Village Homes	Total
Applegate	6	1	1		8
Ashland				6	6
Belleview	6		1		7
Brownsboro	3	1	1		5
Central Point	5		1	1	7
Eagle Point	6	1	1	2	10
Evans Valley	6	1	2		9
Gold Hill	2	1			3
Griffin Creek	2	7			9
Howard		1	7		8
Jacksonville	1	1	1	5	8
Lake Creek	9				9
McLeod	2		2		4
Oak Grove	3	3	1		7
Phoenix	4	1		3	8
Reese Creek	2	2	1		5
Roxy Ann	1	1	3		5
Rogue River	3				3
Sams Valley	5		1		6
Talent	1	2	2	1	6
Trail	1	1	7		9
Upper Applegate	2		4		6
Valleyview	1	1			2
Total	71	25	36	18	150
Per Cent of Total	47.3	16.7	24.0	12.0	100.0

Sources of Income of the Family

In the order of importance as sources of income, the chief crops reported by the 96 farm families studied were: hay and forage crops, dairy products, livestock, poultry and eggs, and truck and garden crops.

TABLE 7

CHIEF INCOME CROPS OF NINETY-SIX FARM FAMILIES

Income Crops	Number Families listing in order of importance			Total Number Families	Per Cent of the 96 Families Producing the Crop
	1st	2nd	3rd		
Hay and Forage Crops	23	16	1	40	41.6
Dairy Products	20	9	4	33	34.3
Livestock and Products	14	4	4	22	23.9
Poultry and Eggs	8	10	3	21	21.8
Truck Crops	4	3		7	7.2
Garden	10	5	3	18	18.7
Field Crops	5	8	3	16	16.6
Tree Fruit and Nuts	8	2		10	10.4
Small Fruits	4	1		5	5.2
Total	96	58	18	--	----

Various occupations were reported as income sources by the 54 rural non-farm and village families studied. (See Table 8, page 37)

TABLE 8

OCCUPATIONS OF FIFTY-FOUR RURAL NON-FARM AND VILLAGE FAMILIES

Occupation	Number of Families	Occupation	Number of Families
Forestry		Transportation and Commerce	
Forest Rangers	4	Garage owners	2
Manufacturing and Mechanical Industries		Mail carrier	1
		School-bus driver	1
Builders and Building Contractors	3	Trade	
		Barber	1
Fish Fly Manufacturing	1	Retail Storekeepers	5
Printer	1	Store manager	1
Watchmaker	1	Lunch room operators	2
Laborers		Service station operators	3
Not specified	16	Tourist camp operators	1
Wood cutter	1		
Mill workers	2	Professional	
		School principal	3
Pension or Retirement		Civil engineer	1
Retired (Private Income)	2		
Pension (County)	2		

Home Ownership and Tenancy

Homes were owned by 89 per cent of the farm families studied. This is a slightly higher per cent than that shown by the 1935 agricultural census data on ownership (Table 9, page 38).

TABLE 9

HOME OWNERSHIP BY FAMILIES STUDIED

Farm Ownership	Families Studied 96 Farms		1935 Agricultural Census 2901 Farms	
	Number	Per Cent	Number	Per Cent
Owners	86	89.5	2306	79.5
Tenants	10	10.5	595	20.5
Total	96	100.0	2901	100.0

Description of Houses

Age of Houses

Ages of houses included in this study ranged from less than one year to 100 years, but over one-half of them were under twenty-five years of age. The decrease in home building of the past few years is evident from the smaller percentage of homes under the 25-year classification in this study as compared with the same classification in the Farm Housing Survey data of 1934 (Table 10). See page 39.

TABLE 10

AGE OF HOUSES INCLUDED IN THE KITCHEN SINK STUDY AND OF THOSE INCLUDED IN THE FARM HOUSING SURVEY (5)

Age of House	Number of Homes: Kitchen Sink Study 150 Homes		Farm Housing Survey 1365 Homes	
	Number	Per Cent	Number	Per Cent
0- 9	35	23.3	506	37.1
10-24	50	33.3	463	33.9
25-49	48	32.0	303	22.2
50 and over	17	11.4	93	6.8
Total	150	100.0	1365	100.0

Number of Years Occupied by Present Family

The maximum length of time the house had been occupied by the present family was found to be 67 years. The average time was nine years per family (Table 11).

TABLE 11

NUMBER OF YEARS FAMILIES HAVE OCCUPIED THEIR PRESENT HOUSES

Number of Years	Families	
	Number	Per Cent
0- 9	92	61.3
10-24	43	28.7
25-49	14	9.3
50 and over	1	0.7
Total	150	100.0

Sizes of Houses

The number of rooms in the houses included in this study varied from one to fifteen, with an average of 5.8 rooms. About one-third of the families had five-room houses, and 19 per cent had six-room houses (Table 12).

TABLE 12

THE NUMBER OF ROOMS IN HOUSES STUDIED

Number of Rooms in House	Houses	
	Number	Per Cent
1	1	0.6
2	3	2.0
3	6	4.0
4	21	14.0
5	46	30.6
6	29	19.3
7	15	10.0
8	18	12.0
9	6	4.0
10	4	2.9
15	1	0.6
Total	150	100.0
Average number of rooms per family	5.8	

The size of the house in relation to the size of the family is an important factor to be considered in providing for comfort, health, and happy family relationships.

The minimum comfort standard of one room per person and three-fifths of a bedroom per person (exclusive of bath) is recommended by the Farm and Village Housing Com-

mittee.[1] This standard is based on a study[2] of twenty cities selected at random, and including all families scheduled regardless of income. Those families living in houses averaged 1.007 rooms per person. It was decided that the standard health and decency budget must provide, at the very least, as many rooms per person as the average family was found to occupy.

The Home and Child Committee of the White House Conference[3] recommend a higher standard for sleeping rooms. They report:

> "Sleeping arrangements should be made with due regard to uninterrupted sleep, health, and reasonable privacy, and the individuality of the child. Generally a sleeping room for each person is advisable. It is undesirable to have two children occupy the same bed whatever their age."

In this study it was found that 13 per cent of the families lived in houses which provided less than one room per person. Three-fourths of the families lived in houses of one or two rooms per person while 11 per cent lived in houses of from three to five rooms per person (Table 13, page 42).

The sizes of houses when compared to the sizes of families occupying them showed that the larger families were more frequently housed sub-standard than the smaller families. Fifty per cent of the six-member families, 66

1. President's Conference on Home Building and Home Ownership. Vol. VII, p. 8. (12)
2. Bureau of Applied Economics, Bulletin 7, p. 15. (25)
3. White House Conference, Section III, p. 24. (26)

TABLE 13

CLASSIFICATION OF HOUSES ACCORDING TO NUMBER OF ROOMS PER PERSON IN FAMILY

Rooms per Person	Houses	
Number	Number	Per Cent
Less than one	20	13.3
One	56	37.4
Two	57	38.0
Three	11	7.3
Four	5	3.3
Five	1	0.7
Total	150	100.0

per cent of the seven-member families, and 50 per cent of the eight-member families were living in houses smaller than the standard of one room per person; whereas 8 per cent of the two-member families, 10 per cent of the four-member, and 13 per cent of the five-member families were living in houses below the standard size (Table 14, page 43).

TABLE 14

SIZES OF HOUSES WITH RESPECT TO PER CENT OF VARIOUS SIZES OF FAMILIES OCCUPYING THEM

Number of Rooms in House	Per Cent of Various Sizes of Families Occupying Them Number in Family							
	2	3	4	5	6	7	8	9
2 or less	7.7		2.7					
3	2.6	5.6	7.9					
4	10.2	16.6	13.1	13.3	10.0	33.3		
5	41.0	19.5	28.9	26.7	40.0	33.3	25.0	100.0
6	15.4	25.0	13.2	40.0	20.0		25.0	
7	7.7	19.9	5.7	6.7	20.0			
8	12.8	6.7	14.3	13.3			37.5	
9			11.4		10.0		12.5	
10	2.6	6.7	2.8					
15						33.4		
Total Per Cent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total Number Families	39	36	38	15	10	3	8	1

Sizes of Kitchens

The sizes of the kitchens studied varied from 54 to 324 square feet. The smallest kitchen was found to be 6 by 9 feet, and the largest 18 by 18 feet. Short dimensions varied from 6 to 18 feet, and long dimensions from 9 to 22 feet (Table 15, page 44).

Agan[1] classifies kitchens into small, medium, and large according to dimensions:

1. Agan--The House, p. 280. (1)

TABLE 15

SIZES AND SHAPES OF 150 KITCHENS STUDIED

Dimensions	Number	Dimensions	Number	Dimensions	Number
6 x 9	3	9 x 16	3	12 x 13	4
		9 x 18	2	12 x 14	15
7 x 12	1			12 x 15	2
7 x 14	1	10 x 10	1	12 x 16	2
		10 x 11	2	12 x 17	1
8 x 10	6	10 x 12	18	12 x 18	2
8 x 12	4	10 x 13	1	12 x 22	1
8 x 13	3	10 x 14	5		
8 x 14	1	10 x 15	2	13 x 14	4
8 x 15	1	10 x 18	3	13 x 15	2
8 x 16	1	10 x 19	1		
8 x 18	1	10 x 20	2	14 x 16	7
8 x 19	1			14 x 18	1
		11 x 13	3	14 x 22	1
9 x 9	2	11 x 14	3		
9 x 10	5	11 x 15	1	15 x 16	1
9 x 11	2	11 x 16	1	15 x 18	1
9 x 12	4	11 x 17	3		
9 x 13	3	11 x 18	1	16 x 18	3
9 x 14	5				
9 x 15	3	12 x 12	3	18 x 18	1
Total number	47		55		48

Small Kitchens 8 x 10 feet to 10 x 10 feet

Medium Kitchens 10 x 10 feet to 10 x 12 feet

Large Kitchens 10 x 12 feet and over.

According to this classification of kitchen sizes about two-thirds of the kitchens studied are large, about one-sixth are small, and one-fifth are medium size. See Table 16, page 45.

The kitchen should be large enough to serve all the functions which need to be carried on there. The farm

TABLE 16

CLASSIFICATION OF KITCHENS WITH RESPECT TO SIZE

Area in Square Feet	Kitchens	
	Number	Per Cent
Less than 100	25	16.7
100 to 120	33	22.0
Over 120	92	61.3
Total	150	100.0

kitchen is often called upon to serve in many capacities, such as milk room, dining room, sewing room, part-time nursery, office or laundry, in addition to its use as a meal-preparation center. Therefore, the farm kitchen is frequently planned larger than the urban kitchen. The kitchen area should be large enough to allow sufficient cupboard and counter space so that constant rearranging of contents is unnecessary, and to permit persons to pass easily between equipment. In homes where there are small children the kitchen should be large enough to provide table and floor space for them so that there will be as little interference as possible with activities at work areas. Provision should also be made for storage space for the child's play equipment that is used in the kitchen.

Studies of sizes of rural kitchens were reported by the committee on Household Management and Kitchens as

follows:[1]

> "State Studies by Extension workers indicate that in rural kitchens in 3,857 dwellings nearly 50 per cent of those studied had a floor space 13 feet by 14 feet; nearly 24 per cent had kitchens 10 x 22 feet or less; and 26 per cent had kitchens whose size was somewhat between the larger and the smaller."

A study of 774 rural kitchens in Indiana reported by Redfield[2] showed that Indiana rural kitchens vary in size from 6 by 7 feet to 24 by 24 feet. A kitchen 12 by 14 or fifteen feet was the most representative in size. About 40 per cent were larger than this size.

An Oregon study on the requirements of farm kitchens for families living in the Willamette Valley was made by Wilson[3], 1938, to determine the size of an adequate kitchen for the farm dwelling. Plans were first developed for the various kitchen work centers, based on the functions assigned to each center, and the articles to be stored there. Kitchen plans were developed from these plans of work centers with the aim of determining the kitchen arrangements having the least possible area, and requiring the least possible travel in doing routine work.

The size of the minimum adequate kitchen was found to vary with the type of range used (whether wood or electric),

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1. President's Conference on Home Building and Home Ownership. Vol. IX, p. 171. (13)
2. Redfield--Efficient Kitchen Arrangements. Bulletin Number 418, p. 2. (16)
3. Wilson--The Willamette Valley Farm Kitchen, p. 7-9, 43-63. (29)

inclusion of dining area, separation of working area from rest of room, and number of doors. Four specific situations were selected as problems in which these variations were considered.

The first problem considered was a kitchen equipped with a wood range and where the kitchen included a dining area. It was found that where nearly square, an adequate kitchen can be planned with less than 200 square feet, including wood range and dining area, but the smallest kitchen was only 179 square feet. If rectangular, kitchens require 200 to 210 square feet.

The second problem was that of a kitchen equipped with an electric range as the only cooking device, and where the dining area was included. The smallest area recommended for this kitchen was 153 square feet, and the average was 173 square feet. It was found that the smallest kitchen where the electric range was used was 20 to 26 feet smaller than the smallest kitchen of the same type that was equipped with a combination wood and electric range.

The kitchen in problem three provided for a wood range, but the dining area was not included. The minimum width recommended was 9 feet, which would allow 42 inches between the front of the range and a built-in on the opposite wall. The smallest kitchen developed was 148 square feet and the average was 154 square feet.

The fourth kitchen planned was that with an electric

range only, and no dining area. The smallest kitchen developed was 115 square feet. It was found that the narrowest kitchens were the smallest. The narrowest kitchen planned was 8 feet wide. The average area planned was 127 square feet.

The distribution of kitchens studied with respect to type of range and inclusion of dining area--two of the most important factors in planning the kitchen sizes--disclosed the fact that over 60 per cent of the kitchens were equipped with wood ranges only, and that including the kitchens equipped with both wood and electric ranges, a total of 80 per cent of the kitchens had wood ranges. Seventy-two per cent of the kitchens having wood ranges also included a dining area.

TABLE 17

PERCENTAGE DISTRIBUTION OF 150 KITCHENS WITH RESPECT TO TYPE OF RANGE AND INCLUSION OF DINING AREA

Type of Range	Inclusion of Dining Area	Kitchens	
		Number	Per Cent
Wood only	With Dining Area	82	54.7
Wood only	Without Dining Area	9	6.0
Electric	With Dining Area	25	16.6
Electric	Without Dining Area	4	2.7
Both Types	With Dining Area	26	17.3
Both Types	Without Dining Area	4	2.7
Total		150	100.0

It was found that 88 per cent of the kitchens included dining areas. Of the 17 families who had made no provision for dining in the kitchen, several had no desire for kitchen dining space because of the size of the family. Other kitchens were too small to provide space for dining. Irrespective of types of ranges used, the majority of the families eat in the kitchen (Table 18).

TABLE 18

KITCHENS WITH AND WITHOUT DINING AREAS CLASSIFIED ACCORDING TO TYPE OF RANGE

Inclusion of Dining Area	Kitchens							
	Wood Range only		Electric Range only		Both		Total	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
With	82	90.1	25	86.2	26	86.7	133	88.6
Without	9	9.9	4	13.8	4	13.3	17	11.4
Total	91	100.0	29	100.0	30	100.0	150	100.0

The classification of kitchens studied according to area, types of ranges, and inclusion of dining area shows that over one-half of the kitchens were equipped with wood range only, and that 20 per cent had both wood and electric ranges.

Over 80 per cent of the kitchens that are equipped with a wood range and that make provision for a dining area have a floor area of less than 200 square feet. One-third

of this group have a floor space of less than 140 square feet (Table 19, page 51).

The low mileage kitchens developed in the Wilson[1] study varied, as has been shown, from about 150 square feet to 210 square feet. According to these recommendations, over two-thirds of the Jackson County farm kitchens studied are small, or have an area less than 140 square feet, and about one-tenth have kitchens larger than the 210 square feet.

The shape of the kitchen is also important in relation to the type of arrangement it permits. The rectangular shape has generally been considered the most practical, because it permits a compact working area while permitting sufficient provision for other functions. In Wilson's[2] study it was found that, in general, the kitchens most nearly square, varying not more than 3 feet between length and width, required less floor area than the rectangular type.

Over 60 per cent of the kitchens included in the Jackson County study were nearly square, or varied 3 feet or less between width and length. Seventeen per cent were rectangular, with a variation of 6 to 11 feet. For about 35 per cent of the kitchens studied the shortest dimension

1. Wilson--The Willamette Valley Farm Kitchen, p. 43-63. (29)
2. Wilson--Planning Willamette Valley Farmhouse, p. 48. (28)

TABLE 19

KITCHENS STUDIED CLASSIFIED ACCORDING TO AREA IN SQUARE FEET, TYPE OF RANGE AND INCLUSION OF DINING AREA

Area in Square Feet	Kitchens Equipped with: Wood Range only — With Dining Area	Wood Range only — Without Dining Area	Electric Range only — With Dining Area	Electric Range only — Without Dining Area	Both Electric and Wood — With Dining Area	Both Electric and Wood — Without Dining Area	Total
Less than 60			1	2			3
60- 79							
80- 99	7	6	3	1	1	3	21
100-119	3	1	5	1	3		13
120-139	20		6		3	1	30
140-159	15	1	5		4		25
160-179	11		3		5		19
180-199	11	1	2		4		18
200-219	3				2		5
220-239	7						7
240-259	2						2
260-279					2		2
280-299	2				1		3
300-319	1						1
320-339					1		1
Total	82	9	25	4	26	4	150

was 9 feet or less.

TABLE 20

DISTRIBUTION OF SIZES OF KITCHENS WITH RESPECT TO VARIATIONS IN DIMENSIONS

Variations in feet between width and length	Kitchens	
	Number	Per Cent
0	4	2.6
1	16	10.7
2	56	37.4
3	17	10.7
4	16	10.7
5	13	9.7
6	9	6.0
7	6	4.0
8	5	3.3
9	3	2.0
10	4	2.7
11	1	0.1
Total	150	100.0

In general it was found that the larger kitchens, 220 to 260 square feet, varied little in dimensions. Seventy-five per cent of this size were approximately square, having a variation of less than 3 feet. Over 50 per cent of the smaller kitchens, from 60 to 140 square feet, were also practically square.

It appears that the kitchens studied are not large enough to provide adequately for all functions, and are not the right shape for good arrangement. Because of the small kitchens, many pieces of equipment which should have been

in the kitchen were stored elsewhere. This frequently was the situation where an electric refrigerator had recently been purchased. Many homemakers stated that they had postponed the purchase of a refrigerator until they could remodel the kitchen in order to provide a place for it. See Table 21, page 54.

Water Supply for the Kitchen

According to the Farm Housing Survey of 1934, in which 1,365 homes of Jackson County were surveyed, 32 per cent of the homemakers carry water an average distance of 190.7 feet, in spite of the fact that water systems can be installed in this area at a comparatively low cost. Only 54 per cent of the homes had piped cold water, and only 35 per cent had adequate sanitation. Forty-six per cent of those reporting in the housing survey listed the installation of water systems as their first choice for major improvement. (Appendix Table I)

Since 1934, the percentage of homes with piped water has increased. It was found from this study of 150 families that only 20 per cent carried water for household purposes and of those who still carry water, the average distance was less. Three-fourths of them carried the water less than 40 feet (Table 22, page 55).

In Wilson's[1] Study of the Use of Time by Homemakers

1. Wilson--Laundry Work as a Cause of Fatigue. Unpublished Data. (31)

TABLE 21

DISTRIBUTION OF KITCHENS STUDIED ACCORDING TO THE TWO DIMENSIONS AND ACCORDING TO AREA

Difference between the Two Dimensions Feet	Area of Kitchens						
	Less than 100 Square Feet	100-139	140-179	180-219	220-259	260 and over	Total
0	2	1				1	4
1	5	2	4	4	1		16
2	8	18	18	2	7	3	56
3	3	5	6	2	-	1	17
4	4	3	6	2	1		16
5	1	8	3	1			13
6		4		5			9
7		2	3	1			6
8		1		3		1	5
9			2	1			3
10			1	2		1	4
11			1				1
Total	23	44	44	23	9	7	150

TABLE 22

DISTRIBUTION OF KITCHENS WITH RESPECT TO METHOD OF BRINGING WATER INTO THE KITCHEN FOR HOUSEHOLD PURPOSES

Method Used	Kitchens	
	Number	Per Cent
Piped to kitchen	115	76.7
Carried:		
Less than 20 feet	11	7.3
20- 39	14	9.3
40- 59	4	2.7
60- 79	2	1.3
80- 99	0	0.0
100-139	1	0.7
140 and over	2	1.3
Hauled	1	0.7
Total	150	100.0

the reply of farm homemakers with respect to laundry work as a cause of fatigue showed little variation in the households in which water had to be carried. Washing was listed as a cause of fatigue only a little more often by the homemakers who did not have water piped into the kitchen than by those who did. One may infer that the carrying of water was often done by the children or men. (Appendix Table XI)

Leading authorities in the field of Public Health stress the importance of a pure and adequate water supply.

The report of the committee on the Home and the Child of the White House Conference on Child Health and Protection[1] emphasizes the importance of having a water supply for the home that is adequate in amount, clean, and free from pollution. In rural districts or those beyond the reach of municipal water supply, the well or spring should be so situated and protected as to avoid contamination. The water should be piped into the house, and if necessary, provision should be made for adequate protected storage. An ample supply of hot water is essential.

In a recent discussion of health standards in housing, C. E. A. Winslow[2] said,

> "The provision of facilities for maintenance of cleanliness of the dwelling and of the person is justified in part by the sanitary importance of clean hands, but on a wider basis may be considered essential to self-respect from a psychological standpoint. It calls for a supply of at least 20 gallons of water per capita per day with facilities for heating water when desired. Anything short of a pressure supply available within the dwelling is a substandard compromise, and a hot-water heater is a basic element in satisfactory housing."

The report of the committee on Hygiene of Housing sets up the following standard:[3]

> "The water supply system should be so located, constructed, and operated that the water supply will not be a means of conveying

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1. White House Conference, Home and the Child. Vol. III A, p. 25. (26)
2. Winslow--7th International Management Congress, p. 101. (33)
3. American Association of Public Health, p. 358. (2)

> disease, and the water should be devoid of objectionable chemical and physical characteristics. In some localities it may be impossible to obtain water that meets all of these requirements, but in any case only water that is safe from a Public Health point of view should be used. Where individual supplies are the only ones obtainable, a properly protected spring or well is ordinarily the best solution of the problem. Surface supplies cannot practically be made safe for the individual household."

The study of the source of supply indicated that three-fourths of the families included in the kitchen sink study secured water for household purposes from wells. The purity of the water supply is a distinct problem in certain areas of the districts studied because of the prevalence of shallow wells on irrigated land. Four houses had irrigation ditch water piped into the kitchen.

About 23 per cent of the families had city water. These homes were located on small acreages adjacent to Medford, or in small villages within a radius of 12 miles of Medford. The Medford city water system has been extended to include a number of these districts (Table 23, page 58).

About one-third of the families reported having very hard water, which caused difficulty in maintenance of the hot water system and required the use of a water softener. Fifty-seven families reported having soft water, and 31 medium hard water.

About one-third of the families used electric pumps for power for supplying water for the kitchen. Thirty-

TABLE 23

SOURCE OF HOUSEHOLD WATER SUPPLY

Source	Houses	
	Number	Per Cent
Well	87	58.0
City	35	23.3
Springs	23	15.3
Ditch	4	2.7
Other	1	0.7
Total	150	100.0

three families had two types of power.

TABLE 24

POWER USED FOR SUPPLYING WATER FOR HOUSEHOLDS

Kind	Houses		
	Farm	Other	Total
Electric pump	46	11	57
Hand pump	21	6	27
Gravity	17	2	19
Gasoline pump	4	-	4
Windmill	2	1	3
Ram	2	-	2
Bucket and pulley	1	2	3
City system	13	24	37
Total	106	46	202*

*52 families were equipped with two kinds of power for pumping.

Pressure systems were found in about one-half of the homes having water systems, 17 per cent used the gravity system, and 5 per cent used elevated tanks.

TABLE 25

TYPE OF SYSTEM FOR HOUSES WHERE KITCHENS HAVE RUNNING COLD WATER

System	Kitchens	
	Number	Per Cent
Gravity	20	17.4
Elevated tank	6	5.1
Pressure tank	54	47.0
City system	35	30.5
Total	115	100.0

About three-fourths of the families have piped cold water in the kitchen, but only 56 per cent have piped hot water. The desire for a water system that provides hot as well as cold water is evident from the comments of homemakers interviewed in this study. When asked regarding the plan of the families to install a water system, a variety of answers was given: "when we build a new house," "this summer," "next fall," "city water is piped into house but turned off because of lack of finances," "this spring," "in June," "spring--system not satisfactory so plan to fix soon," "next year," "no plans--can't afford it," and "this year."

The method of supplying the running hot water used in three-fourths of the homes was coils in the wood stove. Thirty families used electricity for heating water, and 12 families used both coils and electricity.

The fuel most frequently used for cooking was wood. Fifty-seven per cent of the families used wood ranges, and 22 per cent used both wood and electric ranges.

TABLE 26

FUEL USED FOR KITCHEN PURPOSES

Kind of Fuel	For Cooking		For Heating Kitchen	
	Number	Per Cent	Number	Per Cent
Wood range	86	57.4	120	80.0
Electric	29	19.4		
Both wood and electric	34	22.4		
Wood heater			10	6.7
Trash burner			15	10.0
Furnace			3	2.0
Gasoline	1	0.8		
Oil			2	1.3
Total	150	100.0	150	100.0

The Kitchen Sink

The kitchen sink piped with hot and cold water and supplied with a drain is undoubtedly the one piece of kitchen equipment which contributes most to convenience.

Practically all homemakers recognize the relatively high value of a kitchen sink as compared to other modern improvements for their home. It is indicated as the first item for improvement by rural homemakers in recent studies.

In a study of the comparative evaluation placed upon space and equipment reported by Wilson[1] it was found that homemakers considered a kitchen sink with drain as second in importance only to the first bedroom. This report states:

> "Apparently the large house with little or no mechanical equipment is not wanted. Families are willing to forego the luxury of privacy for the sake of more convenient and more easily kept homes. Cooperators in the Farm Housing Survey of 1934 were asked whether construction of a new house was contemplated within the next three years, and if so, what number of rooms it would contain. The average for the 20,000 reports on this point was 4.6 rooms.
>
> "How, in the opinion of farm people, does the utility of specific mechanical features compare with that of specific rooms?
>
> "The comparative evaluation placed upon space and equipment was studied by a committee of the American Home Economics Association in 1935-36; farm women and home demonstration agents to the number of 400 were asked to rank in order of importance the various features which characterize the completely desirable farmhouse in contrast to a two-room, totally unequipped structure. The women replying to the questionnaire placed a kitchen sink with drain as second in importance only to the first bedroom and, before including a second bedroom, they would pipe cold water to the kitchen. They ranked an indoor toilet and septic tank as only slightly less important than the second bedroom, and placed wiring for electricity

1. Wilson--Housing for Living--Rural Housing, p. 97. (32)

and a completely equipped bathroom ahead of the third bedroom and the dining room."

It was also found in the Farm Housing Survey[1] in Jackson County that homemakers ranked the kitchen sink and running water high. Water systems with complete installation including a kitchen sink were listed as the first item for improvement by about 58 per cent of the 1,365 families surveyed. Thirty-eight per cent of the families did not have a kitchen sink.

Since 1934, the percentage of homes with kitchen sinks has increased. It was found from this study of 150 kitchens, that only 14.7 per cent did not have a kitchen sink.

Age of House and Presence of Sink

The age of the house was found to have a definite relationship to the presence of the kitchen sink in the house. All of the houses over 40 years old were equipped with sinks, whereas only 84 per cent of the houses under 10 years old had sinks. The older homes tend to be better constructed, while many of the new homes are built very inexpensively, as more or less temporary abodes. It is often necessary for the family to continue living in these so-called temporary quarters for a number of years. See Table 27, page 63.

1. Farm Housing Survey--Unpublished Data. (4) (Appendix Table I)

TABLE 27

AGE OF HOUSE AND PRESENCE OF SINK

Age of House Years	Total Number	Homes with Sinks	
		Number	Per Cent
0-10	45	38	84.4
11-20	32	27	84.3
21-30	35	28	80.0
31-40	20	17	85.0
over 40	18	18	100.0
Total	150	128	85.3

Residence and Presence of Sink

There is a definite relationship between the place of residence (farm, rural non-farm, village) and the presence of the sink in the home. One hundred per cent of the village homes were equipped with kitchen sinks, whereas only 82 per cent of the farm homes had sinks. This was probably due to the fact that piped city water was available for village homes, therefore the installation cost of running water was low. See Table 28, page 64.

TABLE 28

PLACE OF RESIDENCE AND PRESENCE OF SINK

Place of Residence	Total Number	Homes with Sinks	
		Number	Per Cent
Farm	96	79	82.2
Rural non-farm	36	31	86.1
Village	18	18	100.0
Total	150	128	85.3

Home Ownership and Presence of Sink

Sinks were found approximately as often in owned as in non-owned homes. Only 3 per cent more of the owned than of the non-owned farm and rural non-farm homes were equipped with sinks.

Eighty-five per cent of both owned and non-owned homes in all locations were equipped with sinks.

TABLE 29

LOCATION OF HOMES EQUIPPED WITH SINKS IN RELATION TO OWNERSHIP

Location of Home	Owned Homes			Rented Homes		
	Total Number	Number having sinks	Per Cent having sinks	Total Number	Number having sinks	Per Cent having sinks
Farm	86	71	82.5	10	8	80.0
Rural non-farm	30	26	86.6	6	5	83.3
Village	13	13	100.0	5	5	100.0
Total	129	110	85.2	21	18	85.7

Size of Family and Presence of Sink

Although the need for a sink and other labor saving equipment would naturally increase with the size of the family, there was found to be little variation in the proportion of families having sinks, in relation to the number in the family.

TABLE 30

SIZE OF FAMILY AND PRESENCE OF SINK

Number in Family	Total Families	Number having sinks	Per Cent having sinks
2	39	34	87.2
3	36	31	86.1
4	38	32	84.2
5	15	13	86.6
6	10	7	70.0
over 6	12	11	91.6

Installation of the Sink

The Location of Sink

The location of the kitchen sink on an outside wall, in front of a window was practically a unanimous preference of the homemakers. Some of the reasons given were: the view of the landscape, view of the farm yard, view of the children's playground, better light, a feeling of spacious-

ness rather than of being hemmed in.

Eighty-five per cent of the sinks in the homes studied were located in front of a window. Principle reasons for location elsewhere were: installation in an old house with no other space available, proximity to hot water tank or source of water, installation in a pantry, lack of thought in planning the installation.

TABLE 31

LOCATION OF SINK IN HOMES STUDIED

Location	Homes	
	Number	Per Cent
In front of window	109	85.2
On outside wall (no windows)	2	1.5
On inside wall	17	13.3
Total	128	100.0

Water Supply and Drain for the Sink

The sinks in homes studied were generally equipped with drains (98 per cent), but only 66 per cent were equipped with piped hot water, and only 80 per cent with cold water.

There were slight variations in this equipment according to location of home. The sinks in the village homes were all equipped with drains, and running cold

water, but 17 per cent did not have hot water. Lack of hot water was also a problem in 29 per cent of the rural non-farm and 37 per cent of the farm homes.

Only three-fourths of the farm families had sinks equipped with running cold water, whereas all of the village homes were so equipped (Table 32, page 68).

Means of Waste Disposal for the Kitchen Sink

The standards and objectives of housing as set up by the Housing Objectives and Program Committee[1] specify the use of septic tanks of approved design for use in rural areas, and adequate sewer systems in towns and villages.

The Farm and Village Housing Committee[2] reports that sanitary sewage disposal is a vital part of the plumbing system; that the discharge of the sewage onto the surface of the ground or into a small stream is very objectionable and is very dangerous to the health of the community; and that the cesspool should be prohibited where there is danger of contaminating the water supply.

In this study it was found that over one-half of the kitchen sinks drained into a septic tank. Only six sinks drained into cesspools, and three of these homes were also equipped with septic tanks for bathroom and other drainage.

1. President's Conference--Housing Objectives and Standards, Vol. XI, p. 176. (15)
2. President's Conference--Farm and Village Housing. Vol. VII, p. 180. (12)

TABLE 32

WATER SUPPLY AND DRAIN FOR THE KITCHEN SINK IN HOMES, CLASSIFIED ACCORDING TO LOCATION

Equipment	Location of Homes							
	Farm		Rural Non-Farm		Village		Total	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
Number of Cases	79		31		18		128	
With drain	76	96.2	31	100.0	18	100.0	125	98.1
Running cold water	59	74.7	26	90.3	18	100.0	103	80.5
Running hot water	50	63.3	20	71.0	15	83.3	85	66.4
Pump at sink	2	2.5	--	----	--	----	2	1.5

These installations were made several years ago when it was frequently thought to be impractical to run soapy dish water into the septic tank.

Over one-fourth of the sinks were equipped with surface drain; 1 per cent drained into streams, and 2 per cent were not equipped with drain. Usually the waste from these sinks was poured upon the surface, therefore they were a health menace as well as an inconvenience. A total of 35 per cent of the sinks were equipped with unsatisfactory means of waste disposal. The classification according to location of the home showed that the means of waste disposal for the kitchen sink was unsatisfactory in 40 per cent of the farm homes; 35 per cent of the rural non-farm homes; and 11 per cent of the village homes (Table 33, page 70).

TABLE 33

MEANS OF WASTE DISPOSAL FOR THE KITCHEN SINK IN HOMES, CLASSIFIED ACCORDING TO LOCATION

Means of Waste Disposal	Location of Homes							
	Farm		Rural Non-Farm		Village		Total	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
Septic Tank	46	58.2	17	54.9	9	50.0	72	56.2
Surface	25	31.6	9	29.0	0	----	34	27.2
Sewer	1	1.2	3	9.7	7	38.8	11	8.4
Cesspool	4	5.2	1	3.2	1	5.6	6	4.5
Stream	2	2.5	0	----	0	----	2	1.4
No Drain	1	1.3	1	3.2	1	5.6	3	2.3
Total	79	100.0	31	100.0	18	100.0	128	100.0

Description of Sinks

Design and Materials

Sinks are available in several materials, and in many sizes and designs. The material most commonly used for a kitchen sink is enameled iron, because it is reasonable in price, easily cleaned, acid resistant, and durable. The Committee on Household Management and Kitchens[1] reports that the selection of sinks is a difficult problem, and that since the average home can afford only one sink, it must be an all-purpose sink, which will serve the needs of the kitchen for the preparation of vegetables, as a source of water for stove and foods, and for the washing of kitchen and table dishes. This Committee recommends that a sink which is adapted to the need for washing table dishes will meet all these demands for other uses.

Beeman[2], in a study made in Indiana of preferences of 100 urban homemakers for kitchen conveniences, reports that the types of sinks most frequently preferred were: the cabinet sink with two drainboards by 50 per cent; the flat rim sink with basin built into work surface, 35 per cent; and the sink with mixing faucets by 77 per cent.

In this kitchen study it was found that 67 per cent of

1. President's Conference on Home Building and Ownership. Vol. IX, p. 187. (13)
2. Beeman--Preferences Expressed by Urban Homemakers for a Convenient Kitchen. Unpublished Thesis. (3)

the homes were equipped with the flat rim sink without a back, and built into the work surface. Twenty-eight per cent of the sinks were flat rim with integral back, all other types of sinks represented only 5 per cent of the cases.

The majority of the homemakers preferred the flat rim sink without a back, when it is well installed with sufficient work surface.

Three homemakers of the 36 who had sinks with integral backs expressed dissatisfaction because the faucets were so low that they interfered with the filling of a bucket in the sink and in the washing of milk utensils. They would prefer to buy the sink without a back, so that the faucets could be placed at a convenient height to meet the needs of each family.

There was practically no interest in the cabinet sink because of the cost and because of the dislike for metal work surface and metal drawers (Table 34, p. 73).

Nearly 50 per cent of the sinks had single faucets; about one-third had swing mixing faucets; and one-fifth had no faucets at all.

White enameled iron sinks were found in 94 per cent of the kitchens and were preferred by practically all of the homemakers. Other materials found were blue enameled iron, zinc, and wood. None of these were considered satis-

TABLE 34

DESCRIPTION OF SINKS STUDIED

Description	Kitchens							
	Farm		Rural Non-Farm		Village		Total	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
Kind of Sink								
Flat rim sink without back	54	68.3	21	65.6	11	61.1	86	67.1
Flat rim sink with integral back	21	26.5	9	28.1	6	33.3	36	28.1
Sink with integral back and left drain board	1	1.3	1	3.1	1	5.6	3	2.4
Sink with integral back and right drain board	1	1.3	-	----	-	----	1	0.8
Two compartment sink	1	1.3	-	----	-	----	1	0.8
Cabinet sink	1	1.3	-	----	-	----	1	0.8
Total sinks	79	100.0	31	100.0	18	100.0	128	100.0
Type of Faucets								
Single	35	44.3	14	45.1	13	72.2	62	48.5
Swing mixing	24	30.4	11	35.6	5	27.8	40	31.2
Stationary mixing	--	----	1	3.2	-	----	1	0.8
No faucets	20	25.3	5	16.1	-	----	25	19.5
Total sinks	79	100.0	31	100.0	18	100.0	128	100.0
Kind of Material in Sink								
White enameled iron	73	92.5	31	100.0	17	94.4	121	94.5
Blue enameled iron	3	3.8	-	----	-	----	3	2.3
Zinc	1	1.2	-	----	1	5.6	2	1.6
Wood	2	2.5	-	----	-	----	2	1.6
Total	79	100.0	31	100.0	18	100.0	128	100.0

factory. See Table 34.

Standard Sink Installation and Age of House

A satisfactory sink installation should include certain equipment which is generally considered standard installation. This equipment includes: a drain, sanitary means of sewage disposal, piped hot and cold water, and a swing mixing faucet. Lack of specified sink equipment was not associated with the age of the house, as Table 35, page 75, shows.

Sizes of Sinks

The size of the sink is important in relation to the activities for which the sink will be used. Wilson[1], in her study of minimum dimensions of areas required to make adequate provision for the kitchen needs of Willamette Valley Farm Families recommends the use of a sink 30 inches in length, upper inside dimensions. It was found that a one-compartment sink of this length permitted the handling of utensils of the sizes used by the majority of the cooperators, and that both a dish pan and a rinse pan could be used in it.

The lengths of sinks ranged from 22 inches to 45 inches. The majority of the sinks in this study were found to be shorter than 30 inches. Fifty-eight per cent were 28

1. Maud Wilson--Willamette Valley Farm Kitchen. Bulletin 356, p. 23. (29)

TABLE 35

STANDARDS OF SINK INSTALLATION WITH RESPECT TO AGE OF HOUSE

Age of House	Number Houses with Sinks	Houses Having Specified Sink Equipment: Drain		Septic Tank, Cesspool or Sewer		Running cold water		Running hot water		Swing Faucet	
		Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
0-10	38	38	100.0	27	71.0	27	71.0	24	63.1	21	55.3
11-20	27	26	96.3	18	66.0	22	81.5	14	51.8	5	18.5
21-30	28	27	96.4	22	78.5	25	89.3	20	71.4	7	25.0
31-40	17	17	100.0	11	64.7	15	88.2	14	82.3	3	17.6
Over 40	18	17	94.4	11	61.1	14	77.8	13	72.2	4	22.2
Total	128	125	97.6	89	69.5	103	80.5	85	66.4	40	31.2

inches in length; 31 per cent were under 28 inches; and only 10 per cent were 30 inches and over. The shortest length was found in a sink practically square--16 x 18 inches.

TABLE 36

DISTRIBUTION OF LENGTHS OF SINKS--UPPER INSIDE DIMENSIONS

Length of Sink Bowl in Inches	Kitchen Sinks		
	Number	Total by Groups	Per Cent
18	1		
20	7		
22	5		
24	6		
26	21	40	31.3
28	75	75	58.5
30	4		
32	2		
34	2		
36	3		
38	0		
40 and over	2	13	10.2
Total	128	128	100.0

The sinks were not only shorter than the recommendations but were also narrower; widths ranged from 14 to 22 inches. Forty-six per cent were 16 inches or less in width. See Table 37, page 77.

TABLE 37

DISTRIBUTION OF SIZES OF SINKS--UPPER INSIDE DIMENSIONS

Inside Dimensions	Number Sinks	Inside Dimensions	Number Sinks
14 x 22	2	17 x 22	2
14 x 24	1	17 x 26	4
14 x 28	1	17 x 28	19
		17 x 32	2
15 x 20	6	17 x 40	1
15 x 26	3		
15 x 28	12	18 x 24	1
		18 x 26	2
16 x 18	1	18 x 28	28
16 x 20	1	18 x 30	4
16 x 22	1	18 x 34	1
16 x 24	4	18 x 36	2
16 x 26	12	18 x 45	1
16 x 28	14		
16 x 36	1	20 x 34	1
		22 x 28	1

Heights of Sinks

The sinks were found to be not only smaller than the recommended standard, but also to be installed lower than 32 inches which is the standard recommendation based on preferences of cooperators in the Oregon-Washington Study.[1] Ninety-three per cent of the sinks were found to measure 30 inches or less from floor of sink to floor, whereas only 11 per cent of the cooperators in the study of preferences actually chose a height of 30 inches or under.

1. Roberts, Wilson, Thayer--Standards for Working Surface Heights. Bulletin 348, p. 14. (17)

Assuming that the cooperators in this study were average in height as were those of the sink study, the comparison of actual sink heights with those of specified chosen heights shows that if the homemakers were given a choice, they would prefer higher sinks for dishwashing. See Table 38, page 79.

Comments of homemakers in this study show that the majority would prefer to have the sinks higher. (However, one new sink and complete work surface and cabinet unit had just been installed with floor of sink 26 inches from floor.) The 62 per cent of homemakers whose sinks were 29 inches or less, were practically unanimous in the opinion that they were much too low. Those whose sinks were 30 inches or more considered the height satisfactory.

Small sinks are sometimes installed at a low height because they are too small to use for dishwashing, therefore the adjacent work surface is built at the correct height for this activity.

A scatter diagram of height of sinks in relation to length shows that there is no direct relationship between length and height. The smaller sinks varied as much in height as the larger ones. Apparently the sink bowls are rather generally used for dishwashing, regardless of size or height of installation. The low installations were evidently due to lack of information or to lack of careful

TABLE 38

DISTRIBUTION OF HEIGHTS OF SINKS INCLUDED IN KITCHEN STUDY, AND DISTRIBUTION OF HEIGHTS CHOSEN FOR DISHWASHING IN THE OREGON-WASHINGTON STUDY OF STANDARDS FOR WORKING SURFACE HEIGHTS

Height in Inches	Sinks of Specified Heights: Top of Sink to Floor — Number	Top of Sink to Floor — Per Cent	Bottom of Sink to Floor — Number	Bottom of Sink to Floor — Per Cent	Cooperators Choosing Specified Height for Dishwashing[1] Per Cent
24	--	----	1	0.8	----
25	--	----	3	2.3	----
26	--	----	10	7.8	----
27	--	----	16	12.5	----
28	--	----	22	17.0	0.4
29	--	----	28	21.8	3.2
30	1	0.8	29	22.7	7.6
31	5	4.0	11	8.8	18.2
32	11	8.8	7	5.5	30.2
33	17	13.2	--	----	26.3
34	20	15.6	1	0.8	10.5
35	22	17.0	--	----	2.3
36	38	29.6	--	----	1.1
37	9	7.0	--	----	----
38	5	4.0	--	----	0.2
Total	128	100.0	128	100.0	

planning (Plate II, page 80).

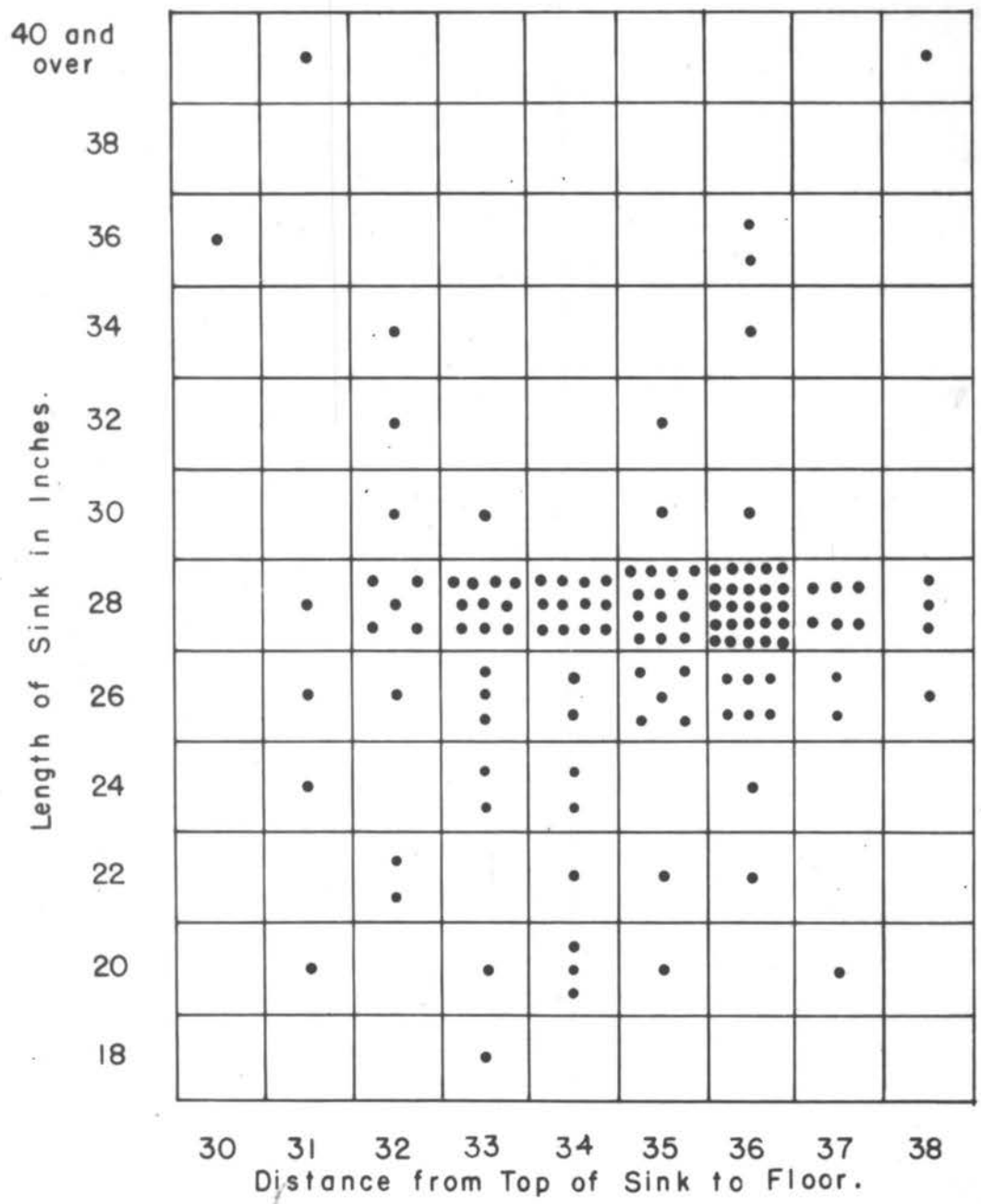
Lighting at the Sink

The light at the sink was considered satisfactory for day time purposes by 85 per cent of the homemakers

1. Oregon-Washington Study--Standards for Working Surfaces. Oregon Experiment Station Bulletin 348, p. 14; June, 1937. (17)

PLATE II

SCATTER DIAGRAM OF HEIGHT OF SINK
IN RELATION TO LENGTH OF SINK.



having sinks. Eighty-eight per cent reported having no problem because of glare. Those reporting glare had sinks located on the outside wall in front of a window, usually on the south or west side of the house. Several had installed awnings as protection from the intense sunlight and some had grown vines on a trellis in front of the window.

The age of the house had a direct relationship to satisfactory day-time lighting. Houses under ten years of age were 97 per cent satisfactory, while those over 40 years of age were only 77 per cent satisfactory. This difference was probably due to the change in exterior design of the house and to the light interior finish now being used on kitchen walls and ceilings. The older houses tend to have large porches, on two or three sides of the house, with low kitchen ceilings, painted dark (Table 39, page 82).

Standards for artificial lighting are set up under basic principles of healthful housing by the Committee[1] which recommends, "that provision be made in all homes for adequate artificial illumination; that artificial illumination of six foot-candles be generally available in all occupied rooms; and that glare effects should be avoided in design and location of fixtures; and that the maintenance of this specified illumination and the avoidance of accident hazards due to oil lamps, can only be attained by

1. American Association of Public Health, Committee on Hygiene of Housing, p. 358. (2)

TABLE 39

SATISFACTORY LIGHTING AT SINK IN RELATION TO AGE OF HOUSE

Age of House	Total Number	Houses with Sinks: Satisfactory Lighting at Sink: At Night: Number	At Night: Per Cent	Daytime: Number	Daytime: Per Cent	Have no Glare: Number	Have no Glare: Per Cent
0-10	38	29	76.3	37	97.4	32	84.2
11-20	27	19	70.4	23	85.2	23	85.2
21-30	28	21	74.9	21	74.9	27	96.4
31-40	17	13	76.5	14	82.3	15	88.2
Over 40	18	11	61.1	14	77.8	16	88.9
Total	128	93	72.6	109	85.1	113	88.3

the use of electricity." He further recommends that electric lighting be considered "a minimum requirement for the healthful American home."

It is not possible for all rural homes to have electricity, however over four-fifths of the homes included in the study were so equipped. All of the village homes had electricity but only 78 per cent of the farm homes were so equipped. About 20 per cent of the farm homes did not have access to a power line.

Of the kitchens equipped with electricity, approximately three-fourths of them were equipped with a plain unshaded center light and only 30 per cent had a light over the sink. In 44 per cent of the kitchens the lighting

fixture was so placed that the shadow cast by the worker was thrown on the sink and work area.

As a safety factor, the Committee[1] report recommends that in kitchens or other spaces where the hands are likely to become wet, electric lights should be controlled by wall switches or by pull chains containing insulating links, and that any lamp sockets within reach should have non-metallic shells. Convenience outlets in such places should be located so as to minimize the probability of touching plumbing fixtures while using electric appliances.

One-half of the kitchens that had electric lights were equipped with a wall switch. Twenty-one per cent were equipped with a socket switch, 9 per cent of which had non-metallic shells. Twenty-eight per cent were equipped with pull chains, one-half of which contained insulating links. A total of 17 per cent of the kitchens had switches or pull chains that may be called shock hazards.

No definite check was made of convenience outlet hazards, but one husband stated that his wife had received several shocks in using the outlet on the electric range which was located adjacent to the sink. See Table 40, page 84.

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1. American Association of Public Health, p. 371. (2)

TABLE 40

ARTIFICIAL LIGHTING EQUIPMENT AT SINK CENTER

Lighting Equipment	Location of Home: Farm Number	Farm Per Cent	Rural Non-Farm Number	Rural Non-Farm Per Cent	Village Number	Village Per Cent	Total Number	Total Per Cent
Kind of Light								
Electric	62	78.5	28	90.3	18	100.0	108	84.4
Kerosene	16	20.2	3	9.7	0	----	19	14.8
Gasoline	1	1.3	0	----	0	----	1	0.8
Total	79	100.0	31	100.0	18	100.0	128	100.0
Light Fixtures in Kitchen								
Number houses having electricity	62		28		18		108	
Shaded center light	16	25.8	8	28.6	5	27.7	29	26.8
Unshaded center light	46	74.2	20	71.4	13	72.2	79	73.1
Light over sink	21	33.7	6	21.4	6	33.3	33	30.5
Kind of Switch*								
Wall switch	30	48.4	17	60.7	7	38.8	54	50.0
Socket switch	17	27.4	2	7.1	4	22.2	23	21.3
Socket switch with non-metallic shell	7	11.3	1	3.6	2	11.1	10	9.2
Pull chain	15	24.2	9	32.1	7	38.8	31	28.7
Pull chains with insulating links	7	11.3	5	17.8	3	16.6	15	13.9

*For Houses Having Electricity

The Work Surface at Sink Centers and at Substitute Centers

All except two of the 128 sinks were equipped with some type of adjacent work surface. Ninety-eight sinks had work surfaces on both sides and 20 per cent had work surface on one side only. Approximately one-half of the work surfaces were drain boards and 42 per cent were flat work surfaces with built-in cabinets. Five tables and 1 kitchen cabinet were used for work surfaces on one side of the sink. These tables would have been a more satisfactory substitute if they had been raised to upper sink level.

Spar Varnish was used as a finish on 42 per cent of the work surfaces. Linoleum, enamel, and masonite were the three next most popular finishes and were used by 13, 12, and 11 per cent respectively.

In the 22 homes not having sinks, a check was made of the surface which was used as a substitute work center for activities usually carried on at the sink. Some homes had very convenient and well equipped substitute centers, whereas in other homes very little thought had been given to planning, or little effort expended in preparing a satisfactory substitute. About one-half of these centers were of the flat work surface, built-in cabinet type. See Tables 41 and 42, pages 86 and 87 respectively.

These cabinet units may be further classified into a complete unit of work counter and 2 upper and 2 lower cup-

TABLE 41

TYPE OF WORK SURFACE AT 128 SINK CENTERS AND 22 SUBSTITUTE CENTERS STUDIED

Work Surface	Kitchen Sink Centers Having			Total		Substitute Sink Center*	
	Left only Number	Right only Number	Both Sides Number	Number	Per Cent	Number	Per Cent Having
Kind							
Drain Boards	16	4	45	65	51.6	0	----
Flat Work Surface		2	52	54	42.8	10	45.5
Shelf			1	1	0.8	1	4.5
Table	3	2		5	4.0	10	45.5
Kitchen Cabinet		1		1	0.8	1	4.5
Total	19	9	98	126	100.0	22	100.0
Covering							
Linoleum	2	4	11	17	13.4	0	----
Enamel	5		11	16	12.6	1	4.5
Oilcloth	1		2	3	2.4	11	50.0
Zinc			1	1	0.7	0	----
Tile			1	1	0.7	0	----
Masonite	1		14	15	11.7	0	----
Wood Finish							
Varnish	4	4	45	53	42.2	4	18.2
Oil	2	1	2	5	4.0	0	----
Paint	1		3	4	3.7	0	----
No finish	3		.8	11	8.6	6	27.3
Total	19	9	98	126	100.0	22	100.0

*Substitute sink center is work area used for activities that are usually carried on at the sink center, in homes not having a sink.

TABLE 42

CLASSIFICATION OF SUBSTITUTE SINK CENTERS IN 22 KITCHENS NOT EQUIPPED WITH SINKS WITH RESPECT TO SIZE, TYPE, AND SATISFACTION

	Substitute Sink Centers				
				Judged unsatisfactory by Investigator	
Description	Number	Per Cent	Sizes	Number	Per Cent
Complete unit built in (2 upper and 2 lower cupboards and a work surface. Built for use when sink is installed.	5	22.7	20 x 64 18 x 80 22 x 96 20 x 120 24 x 120	0	0.0
Work counters and lower cupboards only.	7	31.8	30 x 45 20 x 61 29 x 62 30 x 65 22 x 72 36 x 96 20 x 132	1	4.5
Kitchen Cabinet Table	5	22.7	22 x 36 (2) 24 x 40 (2) 24 x 44	5	22.7
Plain Kitchen Table	3	13.6	24 x 30 28 x 36 30 x 40	3	13.6
Dining Table in Kitchen	1	4.6	34 x 36	1	4.6
Flour Chest	1	4.6	30 x 45	1	4.6
Total	22	100.0		11	50.0

boards; and work counters with lower cupboards only.

Twenty-two per cent were the complete unit type, and about

one-third were of the latter type. Twenty-two per cent used kitchen cabinets and the remaining 22 per cent used plain kitchen or dining tables. The tables were unsatisfactory partly because they did not provide any storage space for equipment to be used at the center. Very few shelves or other conveniences were added to make the use of the tables more convenient.

Fifty per cent of the work surfaces were covered with oil cloth, about 20 per cent were finished with varnish, and 27 per cent had no finish or covering. The oil cloth was used on the temporary type of center which was neither well built nor well equipped.

The lengths of the sink centers, including the length of the sink bowl, outside dimensions and the total work surface length, ranged from 30 to 166 inches. Two 30-inch lengths were of sinks with no work surface. Three other kitchens had sink center lengths of less than 44 inches.

A minimum standard for the combined length of work surfaces and sink is set up by Wilson[1] as a result of her study to determine the equipment, arrangement, and minimum dimensions that would make adequate provision for the kitchen needs of Willamette Valley farm families. The minimum length recommended is 98 inches, consisting of a 32-inch flat rim sink, 32-inch left work surface and a

1. Wilson--The Willamette Valley Farm Kitchen, p. 4. (29)

36-inch right work surface; this will provide adequate counter space and storage space for all supplies and equipment used at the sink. When the right and left sections were made of equal length, the unit was increased to 102 inches.

The frequency distribution of sink-center lengths shows that there are 16 sink centers that fall in the range of 98-103 inches or approximately that recommended by Wilson. Two cases were 103, which leaves 14 centers or 11 per cent that were the recommended standard length. Sixty-three cases or approximately 50 per cent of the centers were under 98 inches in length, and 38 per cent (49 cases) were above 103 inches. Over 30 per cent of the sink centers were under 80 inches in length. See Table 43, page 90.

The 98-inch standard as set up by Wilson provided space for stacking as well as washing and draining the dishes. If these kitchens with work surfaces under 98 inches in length were also equipped with a kitchen table, preferably on casters, that could be used for stacking the dishes, there would be adequate space for dishwashing. No record was taken of the actual number of kitchens so equipped.

The substitute centers ranged in length from 30 to 132 inches, but one-half of them were under 44 inches and four-

TABLE 43

DISTRIBUTION OF LENGTHS OF SINK CENTERS AND SUBSTITUTE CENTERS*

Length in Inches	Sink Center		Substitute Center	
	Number	Per Cent	Number	Per Cent
Under 44	5	3.9	11	50.0
44- 49	0	---	1	4.5
50- 55	2	1.6		
56- 61	10	7.8	1	4.5
62- 67	9	7.0	2	9.2
68- 73	6	4.7		
74- 79	7	5.5		
80- 85	10	7.8	1	4.5
86- 91	11	8.6	1	4.5
92- 97	3	2.3	2	9.2
98-103	16	12.5		
104-109	6	4.7		
110-115	7	5.5		
116-121	8	6.3	2	9.1
122-127	4	3.1		
128-133	4	3.1	1	4.5
134-139	5	3.9		
140-145	3	2.3		
146-151	4	3.1		
152-157	2	1.6		
158-163	1	0.8		
164-169	3	2.3		
170 and over	2	1.6		
Total	128	100.0	22	100.0

*Length includes length of sink bowl, outside dimensions, and the total work surface length.

fifths were under 98 inches. These lengths would necessarily limit the storage space around the work center. Since it would be necessary for the kitchen without a sink

to have as much space for the work surface and for the storage of equipment at the substitute center as the kitchen equipped with a sink, the substitute centers as a whole were inadequate in size.

The distribution of the lengths of working surfaces (sink lengths not included) segregated according to whether there is surface on left side only, right side only, or on both sides shows that 76 per cent have work surface on both sides of the sink.

TABLE 44

DISTRIBUTION OF LENGTHS OF WORKING SURFACES AT THE SINK WHERE THERE IS SURFACE ON LEFT SIDE ONLY, ON RIGHT SIDE ONLY, AND ON BOTH SIDES

Length in Inches	Kitchen Sink Center*			
	Surface on Left only	Surface on Right only	Surface on Both Sides	
			Left	Right
	Number	Number	Number	Number
Under 25	3	1	12	18
25-34	10	2	22	17
35-44	2	3	28	28
45-54	2	3	15	15
55-64	1	0	11	16
65-74	1	0	4	4
75 and over	0	0	6	0
Total	19	9	98	98

*126 sinks with work surfaces--2 sinks with no work surface.

About one-third of the left work surfaces were under 32 inches in length, the recommended standard. In 13 of these cases there was no right work surface. Twenty-nine per cent of the right work surfaces were 34 inches or less or below the standard of 36 inches.

One-third of the work surfaces at the kitchen sink centers and over two-thirds of the substitute sink centers were judged unsatisfactory by the investigator, for various reasons.

A few of the most unsatisfactory features of work surfaces in individual homes were: drainboard grooved or corrugated for drainage, impossible to clean and make attractive; drainboards warped beyond repair; drainboard built too wide and sink too small leaving a 7-inch board space in front of sink to reach over for dishwashing and other work; doorways interfere with installation of work surface by sink on one or both sides; work surface too narrow; drainboard leaks water; and work surfaces too small.

Of the work surfaces at sink centers judged unsatisfactory, two-thirds were judged too small; one-third had work surface on one side only; 30 per cent were too low; 30 per cent were generally unsatisfactory; and 16 per cent of the drainboards were too sloping.

The finishes that were most unsatisfactory were var-

nish, enamel, oilcloth, and lack of any finish. Frequently the varnish was unsatisfactory because good quality spar varnish had not been used; it had not been applied properly; it had not been repeated frequently enough, and the wood of the work surface had become darkened.

The most satisfactory finishes used on the work surfaces where properly applied and cared for were: linoleum, masonite, and spar varnish on sugar pine.

The enamel and paint were generally unsatisfactory because the former peeled, and the latter wore off very quickly.

Of the substitute centers two-thirds were also judged too small; 40 per cent were too low; about one-fourth were only temporary installations; and 13 per cent were too narrow.

Oilcloth was the most unsatisfactory covering. It was not practical for these substitute sink centers because it was necessary to keep water there and oilcloth deteriorates rapidly under these conditions. See Table 45, page 94.

TABLE 45

WORK SURFACES JUDGED UNSATISFACTORY BY INVESTIGATOR, CLASSIFIED ACCORDING TO MAIN CRITICISMS

Main Reasons	Work Surfaces Judged Unsatisfactory by Investigator			
	128 Sink Centers		22 Substitute* Centers	
	Number	Per Cent	Number	Per Cent
Total Number Judged Unsatisfactory	43	33.6	15	68.1
Installation				
Too small	29	67.4	10	66.6
No work surface on one side	15	34.8		
Too low	13	30.2	6	40.0
Generally unsatisfactory	13	30.2	9	60.0
Too sloping	7	16.2		
Temporary installation	5	11.6	4	26.6
Left work surface too small	5	11.6		
Too high	4	9.3		
Too narrow	3	7.0	2	13.3
Not waterproof	3	7.0		
Covering				
Enamel peels off	14	32.5	1	6.7
Oilcloth--not waterproof	5	11.6	8	53.3
Paint unsatisfactory	4	9.3		
Linoleum uncemented	2	4.6	1	6.7
Printed linoleum wears off	1	2.3		
Composition, pits and stains	1	2.3		
Varnish				
Varnish unsatisfactory	20	46.5		
No finish	12	27.9		
Oil--unsightly	4	9.3		
Generally unsatisfactory	3	7.0		

*Substitute work area for sink center.

Lavatory Arrangements

In the 128 homes equipped with kitchen sinks, 63 per cent were also equipped with lavatories, of which 77 were located on the first floor, 6 on the second floor, 40 per cent were located in unheated rooms. Although only 45 homes with sinks had no lavatories, 57 families used the kitchen sink for lavatory purposes. These families used the kitchen sink the majority of time for lavatory purposes. This was due to inconvenience of location of the lavatory and to family habits rather than to the heating facilities. In the homes where sinks were not used for lavatory purposes, 55 per cent of the lavatories were in unheated rooms on the first floor.

The lavatory arrangements provided in the 45 homes having kitchen sinks but no lavatory, varied from the use of kitchen sink to wash benches and sink on back porch. Seventy-three per cent of these families used the kitchen sink and made no effort to provide a satisfactory substitute lavatory center despite conflicts, inconveniences at meal time, and unsanitary features. Eleven per cent provided a work bench on the back porch to be used during summer months and used the kitchen sink during winter months. (Table 46, page 96)

Nine per cent had a more satisfactory management plan of locating a lavatory center in the kitchen during the

TABLE 46

LAVATORY ARRANGEMENTS IN HOUSES HAVING KITCHEN SINK

Arrangement	Sink used for Lavatory Purposes		Sink not used for Lavatory Purposes	
	Number	Per Cent	Number	Per Cent
Number of Cases	57		71	
Sink on back porch or work room	6	10.5	14	19.7
Lavatory first floor in unheated room	9	15.8	39	54.9
Lavatory first floor in heated room	1	1.7	28	39.4
Lavatory second floor in unheated room	3	5.3	0	----
Lavatory second floor in heated room	0	----	3	4.2
Wash Stand	7	12.3	3	4.2
None	40	70.2	0	----

winter, away from the work area, moving this lavatory center to the porch during the summer months, thus avoiding the necessity of using the kitchen sink during any season of the year. (Table 47, page 97)

The distribution of the sizes of sinks in relation to the presence of the second sink or lavatory equipment shows that there is no definite relationship between size and equipment. A larger percentage of the homes having sinks 18 x 26 inches and over were also equipped with lavatories.

TABLE 47

LAVATORY ARRANGEMENTS PROVIDED IN 45 HOMES HAVING KITCHEN SINKS BUT NO LAVATORY

Description of Lavatory Arrangements	Number Homes Using	Comments
Kitchen sink only	33	No effort made to provide a substitute--despite conflicts.
Wash bench on back porch	5	Use during summer months. Use kitchen sink in winter.
Wash bench in kitchen	4	Located away from sink center and work area. These are moved to the back porch during summer months. Satisfactory arrangements.
Wash stand and bowl in bathroom	2	Used in bathrooms that were equipped with tub only. Satisfactory arrangement.
Sink on back porch	1	Back porch protected from the weather. Can be used all year by men. Perhaps three-fourths of year by family.
Total	45	

Therefore, the smaller sinks were more frequently used for all purposes, despite the inconvenience. See Table 48, page 98.

The lavatory arrangements provided in the 22 homes not having a kitchen sink included the use of wash benches in various locations, a sink on the back porch, and the work

TABLE 48

DISTRIBUTION OF SIZES OF SINKS IN RELATION TO PRESENCE OF SECOND SINK OR LAVATORY EQUIPMENT

Inside Dimensions of Sinks in Inches		Number of Sinks	Other Equipment		
			Second Sink	Lavatory	Having other Equipment
Range in Width	Range in Length		Number	Number	Per Cent
14-15	Under 26	10	0	6	60.0
	26-30	15	2	7	60.0
	Over 30	0	-	-	----
16-17	Under 26	9	0	6	66.6
	26-30	49	3	36	79.5
	Over 30	3	1	1	66.6
18-19	Under 26	1	0	1	100.0
	26-30	31	5	21	83.8
	Over 30	8	4	4	100.0
20 and over	Under 26	0	-	-	----
	26-30	1	0	1	100.0
	Over 30	1	1	0	100.0
Total		128	16	83	

surface in the kitchen.

About 50 per cent used a wash bench in the kitchen; 18 per cent had a wash bench on the back porch; and 14 per cent had wash benches located both on the back porch and in the kitchen. The latter was the most satisfactory arrangement because it provided a place for all seasons of the year and also provided a separate place for small children and for men to wash, thus relieving conflicts and congestion at meal time.

The substitute lavatory centers in homes with or without sinks were as a whole poorly planned, practically unequipped, and not well managed. Perhaps this is because the arrangements are considered only temporary, therefore convenience is sacrificed. Only 3 of the 22 homes had a lavatory arrangement that was well equipped, well located, and well managed and satisfactory in general. In 4 homes where there were small children, no provision was made for them to reach the high wash stand except to stand on a chair. See Table 49, page 100.

TABLE 49

LAVATORY ARRANGEMENTS PROVIDED IN 22 HOMES NOT HAVING A KITCHEN SINK

Description of Equipment	Number Homes Using	Comments
Wash bench on back porch	4	Wash benches were generally unsatisfactory--due to lack of management and care. They were not well equipped.
Wash bench in kitchen	10	Generally unsatisfactory because kitchens were too small to provide adequate space away from work centers.
Wash benches both on back porch and in kitchen	3	A very satisfactory arrangement which provided for all seasons of the year, and also relieved congestion at meal times. Need better planning and equipment.
Wash bench in separate room	1	A good arrangement but not well managed.
Sink on back porch	3	Excellent arrangement for the summer months only.
Work surface in kitchen	1	Unsatisfactory because of congestion at meal time and because of difficulty in keeping sanitary.
Total	22	

Activities at the Sink Center

The activities usually carried on at the sink center are clearing away and washing dishes; food preparation, where use of water is involved; and frequently the sink center also serves as a serving center, because the cabinets and work surface may serve both functions. In many small kitchens, the mixing center is also a part of the cabinet space of the sink unit. Other activities at the sink include the washing of milk utensils, and the use of the sink for lavatory and hand laundry purposes.

A check on the activities carried on at the sink in relation to location shows that all of the village families wash dishes at the sink but that only 92 per cent of the farm families use the sink for this activity. However, a higher percentage of the farm families prepare food there and use the sink center for serving food.

Three-fourths of the farm families wash milk utensils at the sink whereas only 27 per cent of the village families use the sink for this purpose. The use of the sink for washing milk utensils limits the type of sink that will give the most satisfaction. The one-piece flat rim sink without a back was practically the unanimous choice of homemakers who had to wash tall milk buckets. This type of sink permits the location of the faucets at a convenient height.

The use of the sink for a lavatory by 57 families has been discussed under lavatory equipment. Classification of these families according to location of home shows that about half of the farm and rural non-farm families use the kitchen sink as a lavatory, as compared to 28 per cent of the village families.

The lavatory uses of the sink most common in all locations were: to wash face and hands, to brush teeth, to shampoo hair, and to shave. Sixty-three per cent of all families used the sink for hand laundry purposes. See Table 50, page 103.

TABLE 50

ACTIVITIES AT SINK WITH RESPECT TO LOCATION OF HOME

Activities at Sink	Homes in which Specified Activity is Done at the Sink Center							
	Farm		Rural Non-Farm		Village		Total	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
Number having sinks	79		31		18		128	
Meal Preparation								
Wash dishes	73	92.4	29	93.5	18	100.0	120	93.7
Prepare foods	77	97.5	29	93.5	17	94.4	123	96.1
Serve foods	65	82.3	28	90.3	13	72.2	106	82.8
Wash Milk Utensils	61	77.2	17	54.8	5	27.7	81	63.2
Lavatory Uses	38	48.1	14	45.2	5	27.7	57	44.5
Wash face and hands	42	53.2	13	41.9	5	27.7	60	46.8
Brush teeth	36	45.5	13	41.9	5	27.7	54	42.2
Shampoo Hair	35	44.3	12	38.7	5	27.7	52	40.6
Sponge bath	29	36.7	8	25.8	0	----	37	28.9
Shave	37	46.8	11	35.5	4	22.2	52	40.6
Comb hair	27	34.2	8	25.8	4	22.2	39	30.4
For Hand Laundry	48	60.7	18	58.0	12	66.6	78	63.3

Storage Facilities at Sink Center

Activities centering about the sink require work surfaces on both sides and cupboards above and below the work counters for the storage of articles and equipment used at the sink, according to standards set by Wilson[1].

About 40 per cent of the homes having sinks had a complete sink unit as described above, and 14 per cent of the substitute centers were also so equipped. In about one-fourth of the cases there were two lower cupboards only and in 13 per cent, two lower and one upper cupboard. The remaining 23 per cent had very inadequate storage facilities; 9 per cent had no storage cupboards at sink center and 8 per cent had only one small cupboard. Forty-six per cent of the substitute centers had inadequate storage space. See Table 51, page 105.

Of the 128 families having sinks, all except eight washed dishes at the sink. Six families used a table or built-in surface for dishwashing, one used the stove, and one a kitchen cabinet. The reasons for not using the sink were: installed too low; no work surface adjacent; located too far from other work areas; drainboard too sloping; lack of running hot water.

In the homes without a kitchen sink 63 per cent washed dishes at a table or built-in work counter. About

1. Wilson--The Willamette Valley Farm Kitchen, p. 4. (29)

TABLE 51

LOCATION OF CUPBOARDS AT SINK OR SUBSTITUTE SINK CENTER

Location of Storage Cupboard	Sink Center		Substitute Center	
	Number	Per Cent	Number	Per Cent
Number of Cases	128		22	
Cupboards				
Complete unit of two uppers, two lowers	51	39.8	3	13.6
Two lowers only	30	23.5	9	40.9
Two lowers, one upper	17	13.3	0	----
One lower, one upper	7	5.5	1	4.6
Two uppers only	2	1.6	3	13.6
Upper right only	1	0.8	0	----
Upper left only	1	0.8	0	----
Lower right only	3	2.3	1	4.6
Lower left only	4	3.1	0	----
None	12	9.3	5	22.7
Total	128	100.0	22	100.0

one-third washed dishes at the stove. The main reasons for using the stove were: to keep dishwater hot and lack of waterproof surface on table or work counter. See Table 52, page 106.

When utensils and supplies used at the sink center are stored in cupboards or on shelves at the center, the homemaker can save both time and energy. A check on the

TABLE 52

PLACE DISHES ARE WASHED

Place	128 Homes with Sink		22 Homes without Sink	
	Number	Per Cent	Number	Per Cent
Sink	120	93.8	0	----
Stove	1	0.8	7	31.8
Table or built-in surface	6	4.6	14	63.7
Kitchen cabinet	1	0.8	1	4.5
Total	128	100.0	22	100.0

place and convenience of storage of dishwashing equipment shows that 32 per cent of the families did not store the dish pans in a convenient place. Seventy-four of the families stored the dish pans in places that required stooping, and 49 storage spaces were generally inconvenient. Only 7 per cent of the dish drainers were stored inconveniently. This may be accounted for by the fact that the use of a dish drainer involves management, therefore those 45 families using dish drainers applied management to the storage problems.

Forty-nine per cent of the families stored the supply of dish towels away from the sink or dishwashing center; 37 per cent were inconveniently stored.

Over one-fifth of the families stored soaps and cleansers in an inconvenient place with respect to use.

TABLE 53

STORAGE OF DISHWASHING EQUIPMENT WITH RESPECT TO LOCATION AND CONVENIENCE

Equipment	Number of the 150 Kitchens							
	Where Article is Used at Sink	Where Articles are Stored			Where Storage is Inconvenient			
		Near Sink	At dishwashing Center*	Other Place	Requires Stooping	Requires Reaching	Generally Inconvenient	Per Cent Inconvenient
Dish Pans	120	97	14	39	74	8	49	32.6
Drainers	45	32	1	12	11	2	11	7.3
Rinse Pans	106	89	13	48	45	2	53	35.3
Supply of Dish Towels	120	75	12	63	10	4	36	37.3
Soaps and Cleansers	128	109	15	26	42	8	34	22.6
Brushes	26	23	2	1	0	0	6	4.0
Garbage Pail	74	32	3	85	0	1	65	43.3

*In cases where there was no sink.

Garbage pails were also very inconveniently placed. Only 32 homemakers kept a small garbage pail at the sink center, and the majority of these were in village or rural non-farm homes. This meant many unnecessary trips to the garbage pail in the back yard, which was an average distance of 20 feet from the kitchen.

Additional storage space was provided by 15 families by means of shelves over the kitchen sinks. Twenty-one families used hooks and nails to hang small equipment conveniently at the sink.

In about two-thirds of the kitchens the dishes were stored at the sink or dishwashing centers; in the other one-third of the kitchens the storage available for dishes required reaching or stacking of dishes or was inconvenient as to location of cupboard. In the kitchens where cupboards were conveniently located, about 60 per cent needed reorganization of shelf space, and the addition of half-width shelves to make the dish cupboard more convenient and efficient.

In 79 of the kitchens the company dishes were stored away from the sink center, but this was considered a convenience feature except in a few homes where the cupboards were not well located. Thirty-six cupboards required reaching to remove the company dishes. About one-fourth of the cupboards for company dish storage were

considered inconvenient.

The cooking utensils were usually stored at the sink center, particularly the kettles. In 65 of the cupboards stooping was necessary to remove the articles from the shelves.

In about two-thirds of the kitchens the sinks were enclosed underneath. Dish pans, soaps and other cleansers, and frying pans were articles most frequently stored there. In about 30 cases the kitchen stool and garbage can were kept there. The storage of dish pans and soap could have been improved if a shelf had been added, to eliminate the necessity of stooping. Only about one-fifth of the sinks were so equipped. See Table 54, page 110.

TABLE 54

STORAGE OF DISHES AND COOKING UTENSILS WITH RESPECT TO LOCATION AND CONVENIENCE

Article	Number of the 150 Kitchens							
	Where Article is Handled at Sink	Where Articles are Stored			Where Storage is Inconvenient			
		Near Sink	Near dish-washing center*	Other	Requires Stooping	Requires Reaching	Generally Inconvenient	Per Cent Generally Inconvenient
Dishes and Silver								
Every day dishes	120	96	11	43	0	28	47	31.3
Company dishes	120	65	6	79	2	36	40	26.6
Silver	120	98	13	39	1	1	30	20.0
Cooking Utensils								
Kettles	128	98	14	38	65	1	55	36.6
Frying pans	120	94	13	43	62	1	50	33.3
Coffee pots	128	86	13	51	28	3	54	36.0
Small equipment	128	94	13	43	46	2	63	42.0
Baking utensils	120	100	12	38	15	0	37	24.6

*In cases where there was no sink.

Storage of Foods

The use of the sink center as a food preparation and serving unit makes it desirable to provide facilities for adequate storage of food convenient to the sink center.

Fifty-three of the 150 homes studied were equipped with electric refrigerators for food storage. However, only 68 per cent of these refrigerators were located in the kitchen. This was because the kitchens were too small, and had been built before provision for refrigerator space was an item. The location of the refrigerator in any room other than the kitchen may be considered inconvenient.

Twenty-two of the kitchens were equipped with draft coolers only and 6 per cent had both draft cooler and refrigeration. Many of the draft coolers were unsatisfactory because they were not well constructed and had no air shafts to the outside of the building. Four homemakers were disappointed in the efficiency of their draft coolers during the very hot weather. Some of the trouble may be traced to the improper use of the coolers. Many were used for storage of canned goods and various staple articles which completely filled two or three shelves, making air circulation almost impossible. See Table 55, page 112.

Fifteen homes were equipped with well built insulated storage rooms. They were built as separate buildings which meant steps down from the kitchen and out into the

TABLE 55

FACILITIES FOR STORAGE OF PERISHABLE FOODS IN HOMES STUDIED WITH RESPECT TO LOCATION OF EQUIPMENT

Storage Facilities	Number Homes Having	Location of Equipment: In Kitchen	Location of Equipment: Other Place	Per Cent in Kitchen
Electric Refrigerator only	53	36	17	67.9
Draft Cooler only	22	17	5	77.2
Both Refrigerator and Draft Cooler	9	4	5	44.4
Ice Box*	15	2	13	13.3
Insulated storage room	15	-	15	----
Cellar	8	-	8	----
Unventilated Kitchen Cupboards	38	-	-	----
Total	150	59	62	39.3

*Used only during summer months.

yard. They were satisfactory for storage in large quantities, but were not a satisfactory substitute for a food storage space in the kitchen. Forty per cent of the families did not have adequate food storage space in the kitchen. In these homes table food was stored either in unventilated kitchen cupboards or in a separate cabinet type of kitchen cupboard with screened sides on the lower section (which did not give adequate protection from dust)

or often on pantry shelves, or in a cupboard on the back porch, or in separate storage rooms.

The classification of foods stored in refrigerators, coolers, ice boxes, or insulated rooms shows that meat storage was provided for in about 75 per cent of the homes and dairy products in about 70 per cent. About two-thirds of the families used these special storage facilities for vegetables or fruits[1].

Forty-four homes had no special provision for milk storage, except in a warm cupboard or at a spring or well far from the kitchen.

TABLE 56

STORAGE OF PERISHABLE FOOD WITH RESPECT TO SPECIAL STORAGE FACILITIES

	Number of the 150 Homes Using Special Facility				
Food	Electric Refrigerator or Ice Box	Draft Cooler	Cellar or Insulated Room	Total Number of Homes	Per Cent of Homes
Meat	62	35	15	112	74.6
Dairy Products	62	29	15	106	70.6
Eggs	45	31	23	99	66.6
Vegetables and Fruits	48	26	23	97	64.6

1. Study was made late in the spring when very few vegetables or fruits were stored.

Observations on Management

The storage spaces were judged unsatisfactory by the homemaker in 106 or 70 per cent of the homes studied. The majority lacked sufficient storage space, and about 60 per cent needed reorganization of supplies and equipment stored, according to frequency of use and place of use. The storage of supplies for the mixing center lacked efficiency in organization more frequently than other types of storage at the sink center.

In several homes where the mixing center was an integral part of the sink unit, the storage included a flour bin located at the extreme right end of the work surface and the sugar bin at the extreme left end, from five to seven feet apart. This arrangement was planned by the designing of the exterior of the cabinets rather than by functional planning. The spice shelf was frequently found in the stove cupboard across the kitchen from the work surface and other mixing supplies. These could have been moved easily by the installation of an open shelf above the mixing surface, but there was objection to open shelves by many homemakers.

Too many of the homemakers were willing to accept the storage arrangements or the equipment at sink center and "get along some way" until the entire kitchen could be remodeled. For example, one homemaker would not have a sink

and pump at sink in kitchen, but preferred to "get along" until she could have a water system installed and everything "fixed right". Another homemaker who is using an old wooden sink without drain said that a nice new porcelain sink had been given her ten years before but she had not installed it because she wanted a new kitchen floor and a water system before using the sink. Another family did not have running hot water, because for six months they had neglected to purchase a twenty-five cent connection for the range coils, which the husband could install.

Apparently these homemakers did not consider the saving of time and energy important enough to warrant arrangement of temporary storage spaces or equipment at the sink center. In contrast one homemaker who has done practically all of the interior finishing and built-in cabinet work in her new home, has one of the most convenient and least expensive in money cost of all kitchens surveyed. The only article purchased for the kitchen was a sink.

The storage space could have been improved in 50 per cent of the cases by the addition of half shelves in the cupboards.

In 65 per cent of the kitchens the reorganization of equipment to be stored at centers would have relieved crowded cupboard conditions and would have solved many storage problems.

Although the storage of articles was not well organized according to work centers and use, the cupboards and shelves in the majority of the homes were well kept and orderly.

Seventy-three per cent of the sinks were built so that the worker could sit at them comfortably, but only 32 per cent of the homemakers used stools. Some said, "I might if I had one;" others said, "I have just never used one;" and others stated that they had never learned to sit while working. Eighty-seven per cent of the kitchen floors were covered with a resilient rug or linoleum. Several families were waiting to install a new floor before using linoleum.

A few of the management features that were indicative of thoughtful and functional planning were: storage of all articles near place of use; drawer for children's dishwashing and baking equipment at sink center; low stool for small children to stand on; careful planning of a substitute lavatory center or substitute sink center; use of zinc covered table on casters for stack table and for serving table; installation of open shelves above cabinet table for mixing center; hooks and shelf at sink for storage of brushes and small equipment; shelf under sink for storage of dish pans; and half shelves or adjustable shelves in dish cupboards.

Plans of Homemakers for Remodeling or Improvement of Kitchens

One hundred and twenty-five homemakers planned to improve their kitchens, and nine homemakers had just completed remodeling them. The improvements planned may be classified into: plans for building entire kitchen; improvement of storage areas; improvement of food storage; improvement of water systems and sinks; and miscellaneous improvements.

Fourteen per cent planned to build new kitchens or enlarge their present kitchens. Over one-half of the 125 homemakers planned to rebuild kitchen storage areas, or to build additional cupboards or shelves. One-third of them planned the improvement of the sink itself, or the addition of water systems or additional equipment. Ten families planned the installation of a complete water system. Other minor improvements varied from digging a well to installing a water heater.

Although it was found that 25 per cent of the homes did not have adequate provision for food storage, only 8 per cent planned installation of food storage facilities; such as a refrigerator, a draft cooler, or an insulated fruit room.

Seventeen electric refrigerators were located outside of the kitchen, but only three families planned to move the

refrigerator into the kitchen.

Sixteen per cent of the families planned to refinish walls and woodwork, to refinish or recover work surfaces, to add a zinc topped utility table on casters, or to install a shelf under the sink. See Table 57, page 119.

TABLE 57

PLANS OF 125 FAMILIES FOR IMPROVEMENT OF KITCHENS

Item	Number
Entire Kitchen	
Build new kitchen	10
Rebuild kitchen	5
Enlarge kitchen	3
Total number improving entire kitchen	18
Total Percentage	14.4
Storage Areas	
Build cabinets and eliminate pantry	4
Rebuild all cabinets	10
Additional cupboard space at sink	19
Pan cupboards--stove center	4
Add half shelves	7
Add spice shelves	10
Build mixing centers	16
Total number improving storage	70
Total Percentage	56.0
Food Storage	
Improve location of refrigerator	3
Install new refrigerator	2
Build draft cooler	5
Build fruit room	3
Total number improving food storage	13
Total Percentage	10.4
Water System and Sinks	
Install water system	10
Install electricity	2
Install pump back porch	1
Dig a well	1
Install new sink	5
Build new sink center	4
Install lavatory	2
Raise height of work surface	2
Increase window space over sink	5
Lower windows over sink	1
Install water heater	3
Install swing mixing faucet	1
Raise height of faucet	1
Total improvements water system or sink	42
Total Percentage	33.6
Miscellaneous Improvements	
Refinish walls and woodwork	4
Move stove	1
Add coasters to kitchen table	2
Install linoleum on work surface	3
Raise table to sink height	2
Varnish work surface	2
Build back porch	3
Add shelf under sink	3
Add zinc table top	1
Total number miscellaneous improvements	21
Total Percentage	16.8

PART VI

THE PLANNING OF THE EXTENSION PROGRAM FOR JACKSON COUNTY IN HOME MANAGEMENT AS IT CONCERNS THE KITCHEN SINK CENTER

PART VI

THE PLANNING OF THE EXTENSION PROGRAM FOR JACKSON COUNTY IN HOME MANAGEMENT AS IT CONCERNS THE KITCHEN SINK CENTER

The study of kitchen sink centers in Jackson County homes has provided factual information regarding the present condition, equipment, and use of sink centers which may be used as a basis for planning the Extension program in Home Management as it concerns the sink center.

The ultimate aim of the Extension program is to help people set their own values, see their own problems, think through possible solutions, evaluate them and then make their own decisions.

In order that the homemakers may set their own values regarding the equipment and management at the kitchen sink center, it will be necessary for them to know and to develop standards for an adequate kitchen sink center that will be equipped for all activities to be carried on at the center; that will provide adequate storage spaces; and that will meet the requirements of the family.

Judging from observations and information obtained in this study, it is estimated that approximately three-fourths of the homemakers need background assistance in acquainting them with the desirable standards of design, construction, and equipping of the kitchen sink center.

These standards will aid the homemakers in setting their own values and in making their own choices.

It is estimated that about 30 per cent of the communities included in this study will need an educational program. Judging by the sample chosen, about 45 per cent of the communities of the entire county would be included in this classification. The majority of these communities are located either in outlying districts or in villages. They could probably be reached through home visits, demonstrations, tours or district meetings, or by the kitchen-conference method.

To help people see their own problems is also a major need. It was found in this study that storage facilities at the sink centers were inadequate. Space is necessarily limited at sink centers, and many centers lacked sufficient cupboard space. The problem was further complicated because in many homes utensils and pieces of equipment that were seldom or never used were stored at the sink center. Storage facilities could have been greatly improved by sorting the equipment according to place and frequency of use, and by the use of a pantry or other auxiliary storage space for seasonal or seldom used equipment, and by the discarding of equipment never used.

This problem was discussed at the annual Extension Program Planning day in Jackson County this year, but the

homemakers present were not conscious of the problem, or of the value of improved storage space, therefore the problem was not included in the program for the year. This is further evidence of the need for helping homemakers to develop a consciousness of their own problems.

In order to set up standards for the kitchen sink center it is necessary to set up general standards for the entire kitchen and specific standards for the sink center.

Wilson[1] set up standards for the Willamette Valley farm kitchen based on a study of the requirements of families living in the Willamette Valley. These standards should be applicable to Jackson County homes with a few changes to meet the local needs. The agricultural activities in the two communities are very similar, but the climatic conditions vary. The climate in southern Oregon is considerably warmer in the summer and winter than that of the Willamette Valley. The rainfall is considerably lower, and southern Oregon has more sunny winter days.

The relatively high summer temperature makes it necessary to provide better facilities for food storage in Jackson County. The standards set up for the Willamette Valley farmhouse are listed below and evaluated for practical use in Jackson County homes.

Standards for kitchen planning are based on the pro-

1. Wilson--Willamette Valley Farm Kitchen, p. 11-16. (29)

vision for work units, and the equipment and supplies used at each center for all functions. The work units are divided into six centers: sink and serving center, stove center, mixing center, food storage center, dining center, and planning center. The sink and serving center are usually combined in one center. It consists of:

Sink proper
Dishwashing tables or work surfaces
Sink food table
Place for: garbage container; stool
Storage space for: dishes, dishwashing supplies and small equipment
Food supplies kept on shelves
Equipment used at sink center
Clean dish towels and hand towels
Storage space for food supplies; bread, cakes, cookies; board for cutting bread
Draft cooler and refrigeration adjacent to serving center.

This method of planning work centers could be used for all homes regardless of location.

The standards for the sink equipment were: A flat-rim sink equipped with drain and piped hot and cold water.

This standard should be followed, but the type of drain is also very important in Jackson County and should be specified as to either cesspool or septic tank.

It was assumed in the Willamette Valley standards that electricity would be available for heat, power and light, because farmhouses of the better type in that section are so equipped. This means that these standards are set higher than would be possible for a general cross section

of all Jackson County homes, including low income levels. It would be helpful if a study could be made in Jackson County to set up standards for planning kitchens for low income groups.

In the Wilson study, the recommended size of the kitchen which include both wood and electric range and dining area was from 180 to 209 square feet. This is larger than the average Jackson County kitchen, but is a desirable size to provide for refrigeration, other storage facilities, and activities carried on in the kitchen. The standards for sizes of sink centers were from 98 to 102 inches in length, by 24 inches in width, which included flat-rim sink 30 inches; left counter 32 inches; and right counter 36 inches. This combined length may be shortened by the addition of a table on casters to be used for stacking dishes. This would be necessary in approximately one-fourth of the kitchens in Jackson County.

The sink heights recommended are 32 inches from floor of sink to floor, and 37 inches from counter to floor (allowing a 3-inch toe space). This is an average height which may be varied according to the height of the individual homemaker.

The cabinets at the sink center were planned as a unit of four or five: two upper and two lower, and one shallow cupboard above the sink, if not located in front of window.

Lower cabinets to be 34 inches high and 22 inches wide, and length of work counter--upper counters--placed from 12 inches above work surface to ceiling, and were 11 inches wide. The cabinet above the sink was only 4 inches deep.

These storage spaces would be adequate in Jackson County kitchens if a pantry or other cupboards in another room were used as auxiliary storage space for seldom used equipment. The chief problem would be in planning the kitchen sink center to provide space for these cupboards, rather than the problem of adequacy of the standard.

Standard facilities for food storage include a draft cooler and a refrigerator. Due to the warm climate in Jackson County this standard should be followed, with the addition of an insulated storage room for large quantity storage. This room should be readily accessible from the kitchen.

Other standards that are desirable for certain situations are: removable and adjustable shelves; sliding shelves for lower cabinets; deep drawers for use as bins.

Because of the importance of good ventilation in Jackson County kitchens, and because of the preference of Jackson County women for a window and a view over the sink, the cabinet above the sink would not be considered in county standards. Cross ventilation in the kitchen should be set up as an important standard.

The time to start planning the sink center is when the family plans to install a water system; build a new house; or remodel the kitchen. It is not always possible to reach families just at that stage of development in their plans, and often they are not contacted until just before the carpenter or plumber is hired. It is important that women become conscious of the necessity for long-time, deliberate, thoughtful planning. It is also important that a feeling of confidence in the wife's judgment and planning be developed in the household.

Planning kitchen sink centers or kitchens is a time consuming task especially on the basis of individual help, which is necessary when the Home Demonstration Agent makes home visits to assist with each individual planning problem. One way of reducing the amount of personal service would be by holding district meetings for a limited number of enrollees who are planning kitchen improvements. The techniques of planning could be given this small group. Another successful method of reducing personal service is by holding kitchen conferences. By this method the Home Demonstration Agent meets in the home of the cooperator desiring to plan the kitchen improvement, with the homemaker and about six friends who also plan to improve their kitchens. The entire group assists in planning the kitchen changes, thus all learning the technique of planning. An

annual tour to visit improved kitchens would be held to develop a consciousness of need in other homemakers, and to assist in setting their values.

In carrying out the program, the Home Demonstration Agent should seek opportunities to acquaint local carpenters, cabinet makers, and builders with good standards of design and construction. That carpenters need help is evident from mistakes noted in kitchens recently built. One common mistake is to place the flour and sugar bins at opposite ends of the work surface in order to balance the exterior of the lower cupboards. The drawers in the lower cabinet are often spaced four to six inches apart, wasting considerable space. The board under the sink is often as much as six inches wide, which makes it impossible to sit at the sink comfortably. The mixing center surface is often built the same height as sink work surfaces.

Material available from Oregon State College which would be useful in aiding carpenters includes working drawings of the demonstration kitchen truck; and the station circular 131, Planning the Kitchen, which is based on the study of the Willamette Valley Farmhouse. Exhibit material which would be helpful would be models of construction details.

The larger mail order houses feature inexpensive unpainted kitchen cupboards and storage units. These, how-

ever, are not well designed for the purpose. Storage spaces and shelving are unsatisfactory. Shelving is too far apart, and drawers are too deep. Frequently a large, deep drawer is placed just below the work surface with cabinets beneath it. The cabinets are used more frequently and would require stooping to place or remove all articles. If the designs of cabinets were improved, these companies would fill a real need for inexpensive ready-built storage facilities.

Kitchen stack tables and utility tables are well designed and low in price. Awnings may also be purchased inexpensively. These are often necessary to prevent glare when sink is located under a window. Practically all homemakers prefer to have the sink under a window because of the view: of the landscape; the highway; or of the children's playground; and because of the necessity for good ventilation. Therefore, it is necessary to use some aid in the prevention of glare. The awning, commercial or home-made (of siding), or vines on a trellis are excellent aids in reducing heat as well as glare.

The flat-rim sink, which was the preferred type, may be installed with a pine drainboard over the top. This makes the sink about one and one-half inches deeper, or it may be installed flush with the work surface. The latter is more satisfactory because the shallow sink is

more efficient.

The finish for the work surface is selected on the basis of cost versus durability. The sugar pine board which is varnished is not as inexpensive as the flooring which is covered with Masonite. Linoleum is probably the most expensive of the popular finishes. Aids in selection of the type of work surface would be a demonstration kit of all types of surfaces and finishes commonly used with the cost per square foot of each kind, and method of installation.

One of the most satisfactory aids in assisting the cooperators in the planning of the correct height for sink and work surface installation is a set of step-down table tops. These may be secured from the state office or made in the county, and could be used in the Home Demonstration Kitchen. The office secretary could assist homemakers in using this equipment when the agent was doing field work.

In summary, the pieces of work that could be included in the extension program in home management by way of improving sink centers in Jackson County may be classified under two headings: (1) an educational background program to help the people to develop a consciousness of their own problems, and to help them set their own values; (2) specific information which is intended to help people make their own decisions, and to solve their individual prob-

lems.

A few specific design problems revealed by this study are: Sinks too low; work-surface finishes unsatisfactory; storage facilities inadequate, including food storage; mixing center surface too high, when included in the sink center; front ledge of sink too wide; lavatory equipment lacking, or a substitute lavatory arrangement.

Several homemakers have already satisfactorily solved some of these problems. If the sink is installed too low, a wooden rack is made and oiled to prevent becoming water soaked, and is used under the dish pan to adjust height. Another homemaker solved the problem of a mixing center which was a part of the sink center and was too high by making a low, broad stationary step. The step was covered with linoleum to match the kitchen floor, and was very inconspicuous. The same principle could be used in making a pull-out step for this center.

In many cases, the lack of money to spend for improvements is a limiting factor, rather than the lack of knowledge of standards and values. The Extension program must be planned to assist the families that have limited finances. In fact, it is often a real opportunity for long-time thoughtful planning.

For these families, many changes in the reorganization of equipment and storage at the sink center can be made at

practically no cost. Additional cupboards may be made from packing boxes or crates. Another suggestion for solving this problem is to have the son of the family enroll in a 4-H Club woodworking project, or enroll in a high school manual training class, and learn to make the built-in kitchen equipment. It would help to stimulate interest if a 4-H woodworking project could be prepared on kitchens.

In assisting families who plan to install water systems, the Home Demonstration Agent can secure the co-operation and assistance of the agricultural engineer. This has been done in Jackson County during the past nine years. Demonstrations have been given by districts on the installation of water systems and septic tanks. This work could be made more effective by combining kitchen planning demonstrations with the installation of water systems because the planning and choice of the locations, size, height, and installation of the kitchen sink center should be made at the time the water is installed in the kitchen.

PART VII

SUMMARY AND CONCLUSIONS

PART VII

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Summary

A study of the kitchen sink center in relation to management was undertaken for the purpose of finding out how sink centers in Jackson County homes are now equipped and used, and determining how they might be improved as a basis for planning an Extension program in Home Management. Home visits were made and information obtained concerning 150 kitchens. Of the families included in the study, 64 per cent were located on farms, and 36 per cent were rural non-farm and village dwellers. The number in the household averaged 3.7 persons. Sixty-one per cent of the families had lived in their present houses under ten years. Fifty per cent of the houses were under 25 years of age. The houses averaged 5.8 rooms.

The kitchens were too small to provide adequately for all of the activities carried on in them. Three-fourths of the kitchens had areas less than the 180 to 200 square feet, which has been found to be the adequate or desirable space for a well equipped kitchen including a wood range and the dining area. The study also showed that the average farm kitchen did not have adequate space for sufficient storage cabinets, work surfaces of desirable length, or an

electric refrigerator. Eighty-five per cent of the homes were equipped with kitchen sinks. The older homes were found to be better equipped than the newer homes.

The sinks were usually equipped with drains. Over one-fourth of the sinks had surface drainage which is an unsatisfactory means of waste disposal. Eighty per cent were equipped with running cold water and 66 per cent with running hot water.

The type of sink most frequently found and preferred by the majority of the homemakers was the flat rim sink without a back, because of the precision possible in height of installation and in placement of faucets.

About one-third of the sinks were under 28 inches in length, which is considered inadequate for the usual activities at the sink center. They were also installed too low in the majority of the homes, 62 per cent were 29 inches or less from the floor of the sink to the floor, which height is 3 inches lower than found by Roberts, Wilson, and Thayer (17) to be preferred by the average homemaker.

Eighty-five per cent of the homemakers considered the natural lighting at the sink satisfactory. All of the village homes, and 78 per cent of the farm homes were equipped with electric lights. Only 30 per cent of the kitchens equipped with electric lights had a light over the

sink. Forty-four per cent of the kitchens had the light fixture placed so that shadows were cast on the work area.

Fifty per cent of the kitchens having electricity were equipped with a safe type of wall switch. Twenty per cent of the kitchens had switches or pull chains which were shock hazards.

Practically all of the sinks were equipped with some type of adjacent work surface. Seventy-six per cent had work surfaces on both sides and 20 per cent had work surfaces on one side. One-half of the work surfaces were less than 98 inches in length, which is the minimum recommended by Wilson (29).

The activities usually carried on at the sink center are clearing away and washing dishes, and preparation of food where the use of water is involved. Frequently the sink and serving center are combined. In many small kitchens the mixing center is also a part of the cabinet space of the sink unit.

Activities centering about the sink require work surfaces on both sides, and cupboards above and below the work surfaces for the storage of articles and equipment used at the sink. About 40 per cent of the homes having sinks were equipped with this type of complete sink unit and 14 per cent of the substitute centers were also so equipped.

All except eight of the 128 families having kitchen

sinks washed dishes at the sink. The reasons for not using the sink for this activity were: installed too low; no work surface adjacent; located too far back from other work areas; drainboard too sloping, and lack of running hot water. In the homes without a kitchen sink, 63 per cent washed dishes at a table or built-in work counter. About one-third washed dishes at the stove.

Thirty-five per cent of the families did not store the dishwashing equipment in a convenient place. In about one-third of the kitchens the dish storage was inconvenient, requiring reaching, stacking of dishes, and transportation across the kitchen. Cooking utensils were usually stored at the sink center, and in 65 of the kitchens stooping was necessary to remove them from the shelf. Very few half shelves were used.

The use of the sink center as a food preparation and serving unit makes it desirable to provide facilities for adequate storage of food in the sink center or adjacent to it. Sixty-two of the 150 homes studied were equipped with electric refrigerators, 31 with draft coolers, and 53 were not equipped with any facilities for food storage.

It was found that in over one-half of the kitchens the mixing center was a unit of the sink center or substitute center and that in 3 per cent of the kitchens, the mixing center was a separate cabinet adjacent to the sink center.

Fifty per cent of the kitchens provided inconvenient storage arrangements for mixing supplies.

It was found that 125 families had definite plans for improving their kitchens. Fourteen per cent planned to rebuild the entire kitchen and 50 per cent planned to rebuild or enlarge kitchen storage areas. One-third planned improvement of the sink by the addition of water systems or other equipment. While 25 per cent of the homes had no provision for food storage, only 8 per cent planned installation of the food storage facilities. Sixteen per cent planned miscellaneous improvements.

Conclusions

The purpose of this study was to determine how Kitchen Sink Centers in Jackson County Homes are now equipped and used and to determine how they might be improved, as a basis for planning an Extension Program in Home Management.

As a result of this study it was found that an Extension Program should be built up on four major phases of Home Management:

1. Kitchen Planning

   To give assistance in planning new kitchens for those families that are planning to build new houses or planning to entirely rebuild the kitchens.

2. Cupboards and Storage Arrangements

To assist in planning the organization and improvement of storage areas.

3. Water Systems and Sink Installations

To assist in planning the installation of water systems and kitchen sink centers.

4. Food Storage

To develop through an educational program a realization of the need for improved food storage and to assist in planning these improvements.

5. Minor Changes

In addition to the four specified problems brought out by this study there are also a number of minor changes in relation to equipment or management that should be made. In order to accomplish this it will be necessary to develop through an educational program, a realization of the desirability of these improvements in and adjacent to the kitchen sink center.

PART VIII

REFERENCES

PART VIII

REFERENCES

1. Agan, Tessie. The house. Philadelphia, J. B. Lippincott, 1939.

2. American Association of Public Health. Basic principles of healthful housing. Committee on Hygiene of Housing, American Journal of Public Health. Vol. 28, No. 3, March, 1938.

3. Beeman, Margaret Elizabeth. The preference expressed by one hundred homemakers of West LaFayette, for a convenient urban kitchen. Purdue University, LaFayette, Indiana. Unpublished Thesis, 1937.

4. Cushman, Ella H. The development of a successful kitchen. Cornell Bulletin No. 354. New York State College of Home Economics, Cornell University, Ithaca, New York. Revised Ed., 1937.

5. Farm Housing Survey. Jackson County C. W. A. Project F. 28. Unpublished Data, 1934.

6. Halbert, Blanche E. The better homes manual. Chicago, Illinois, University of Chicago Press, 1931.

7. Henderson, Ruth Elaine. A study of dishwashing as a routine household task. Cornell University, Ithaca, New York. Unpublished Thesis, 1938.

8. Jonas, Clara E. Kitchen storage spaces in relation to management. Cornell University, Ithaca, New York. Unpublished Thesis, 1939.

9. Jonas, Clara E. Kitchen storage spaces. Cornell Bulletin No. 398. New York State College of Home Economics, Cornell University, Ithaca, New York, 1938.

10. Muse, Marianne. Kitchen equipment and arrangement. Vermont Agricultural Experiment Station Bulletin No. 375, 1934.

11. Pond, Esther. Planning the efficient kitchen. Washington Extension Service Bulletin No. 247. State College of Washington, Pullman, Washington, 1939.

12. President's Conference on Home Building and Home Ownership. Farm and village housing. Washington, D. C. Vol. VII, 1932.

13. President's Conference on Home Building and Home Ownership. Household management and kitchens. Washington, D. C. Vol. IX, 1932.

14. President's Conference on Home Building and Home Ownership. Homemaking, home furnishing, and information services. Washington, D. C. Vol. X, 1932.

15. President's Conference on Home Building and Home Ownership. Housing objectives and programs. Washington, D. C. Vol. XI, 1932.

16. Redfield, Gail M. A study of efficient kitchen arrangements. Agricultural Experiment Station Bulletin No. 418. Purdue University, LaFayette, Indiana.

17. Roberts, Evelyn H; Wilson, Maud; Thayer, Ruth. Standards for working surface heights and other space units of the dwelling. Agricultural Experiment Station Bulletin No. 348. Oregon State College, Corvallis, Oregon, 1937.

18. U. S. Department of Agriculture. Modernizing farmhouses. Farmer's Bulletin No. 1749. Washington, D. C., Government Printing Office, 1936.

19. U. S. Department of Agriculture. Farm house plans. Farmer's Bulletin No. 1738. Washington, D. C., Government Printing Office, 1935.

20. U. S. Department of Agriculture. Housing requirements of farm families in the United States. (U. S. Dept. of Agriculture Miscellaneous Publication No. 322.) Washington, D. C., Government Printing Office, 1939.

21. U. S. Department of Agriculture. The well planned kitchen. (U. S. Dept. of Agriculture Circular No. 189.) Washington, D. C., Government Printing Office.

22. U. S. Department of Agriculture. Weather Bureau Annual Meteorological Summary with comparative date, Medford, Oregon. Washington, D. C., Government Printing Office, 1938.

23. U. S. Department of Agriculture, Bureau of Soils. Summary of the "Soil Survey of Medford Area," Oregon. Washington, D. C., Government Printing Office, 1913.

24. U. S. Department of Commerce, Bureau of the Census. Fifteenth Census of the United States. Agricultural Census, Oregon. Washington, D. C., Government Printing Office, 1935.

25. U. S. Department of Agriculture, Bureau of Applied Economics. Standards of living. Bulletin No. 7. Washington, D. C., Government Printing Office, Revised Edition, 1920.

26. White House Conference on Child Health and Protection. The home and the child. Section III. Education and training. New York, The Century Company, 1931.

27. Wilson, Maud. Use of time by Oregon farm homemakers. Agricultural Experiment Station Bulletin No. 256. Oregon State Agricultural College, Corvallis, Oregon, 1929.

28. Wilson, Maud. Planning the Willamette Valley farm house for family needs. Agricultural Experiment Station Bulletin No. 320. Oregon State Agricultural College, Corvallis, Oregon, 1933.

29. Wilson, Maud. The Willamette Valley farm kitchen. Agricultural Experiment Station Bulletin No. 356. Oregon State Agricultural College, Corvallis, Oregon, 1938.

30. Wilson, Maud. Planning the kitchen. (Agricultural Experiment Station Circular No. 131.) Oregon State Agricultural College, Corvallis, Oregon, 1939.

31. Wilson, Maud. Laundry work as a cause of fatigue. Oregon State Agricultural College, Corvallis, Oregon. Unpublished Data.

32. Wilson, Maud. Housing for living--Rural Housing Seventh International Management Congress, Washington, D. C. Baltimore, Maryland, Waverley Press Inc., 1938.

33. Winslow, C. E. A. Seventh International Management Congress, Washington, D. C. Baltimore, Maryland, Waverley Press Inc., 1938.

PART IX

APPENDIX

TABLE I

SUMMARY OF FARM HOUSING SURVEY[1] DATA
PERTINENT TO KITCHEN STUDY

Items	Number	Per Cent
Number homes surveyed	1,365	
Number farms included	1,315	
Average number acres per farm (96.6)		
Age of House		
0- 9 years	506	37.1
10-24 years	463	33.9
25-49 years	303	22.2
50 and over	93	6.8
Size of House		
One story house	813	59.6
Two story house	552	40.4
Average number rooms (5.2)		
Average number persons per family (3.6)		
Storage space for fresh fruits and vegetables	857	62.8
Wash room for farm help	81	5.9
Water Supply and Sewage Disposal		
Source of Water		
Well	1,086	79.5
Spring	225	17.6
Cistern	11	0.8
Stream	41	3.0
Water System--House Supply		
Water Carried (Average 190.7 feet)	436	31.9
Hand Pump in House	92	6.7
Piped, Cold	747	54.0
Piped, Hot	539	39.0
Equipment		
Lavatory	401	29.4
Kitchen Sink with Drainboard	851	62.0

1. Farm Housing Survey--Jackson County 1934. C. W. A. Project F-28. Unpublished Data. (5)

Table I--Continued

Item	Number	Per Cent
Disposal of Sewage		
Septic Tank	461	33.8
Cesspool	65	4.7
Stream	31	2.3
Surface	292	21.4
Lighting		
Kerosene or Gasoline	407	29.8
Electric--Home Plant	12	0.9
--Power Line	935	68.5
Heating		
Fireplaces	374	27.4
Stoves	1,047	76.7
Circulating Heater	114	8.3
Pipeless Furnace	13	0.9
Piped Furnace	46	3.3
Laundry		
Where Done		
Out of Doors	436	31.9
In Kitchen	565	41.4
In Basement	36	2.6
Laundry Room--first floor	406	29.7
Cooking Facilities		
Wood Stove	1,209	88.6
Kerosene or Gasoline Stove	34	2.5
Gas Stove	4	0.2
Electric Stove	279	20.4
Refrigeration		
Ice	217	15.9
Mechanical	114	8.3
How would $500 be spent in improving home:		
Water System and Bathroom Equipment	769	56.3
Sanitary System	692	50.7
Laundry Facilities	487	35.6
Built-in Equipment	149	10.9

Table I--Continued

Item	Number	Per Cent
How would $250 be spent?		
Water System	649	47.5
Sanitary Facilities	422	30.9
Bathroom Equipment	414	30.3
Laundry Facilities	154	11.2
Built-in Equipment	31	2.2
Lighting System	28	2.0
How would $100 be spent?		
Water System	448	32.8
Sanitary Facilities	175	12.6
Bathroom Facilities	125	9.1
Laundry Facilities	60	4.4

TABLE II

HOMEMAKING ACTIVITIES FOR WHICH COOPERATORS EXPRESSED THE NEED OF MORE TIME, AND PROPORTION OF FARM AND NON-FARM HOMEMAKERS SPECIFYING EACH[1]

Activity	Homemakers* Farm Per Cent	Non-Country--Non-Farm Per Cent
Housework	5.1	2.2
Cleaning and keeping house in order	8.2	4.3
Cooking	4.0	---
Canning	---	2.2
Laundry	3.1	---
Mending	7.1	4.3
Sewing	33.7	37.0
Making home more convenient and attractive	8.2	4.3
Management of household	2.0	4.3
Care and training of children	33.7	50.0
Family life	10.2	6.5
Other replies	---	---

*Proportion of the homemakers who answered the question.

1. Wilson--Use of Time by Oregon Farm Homemakers, p. 45. (27)

TABLE III

PROPORTION OF FARM AND NON-FARM HOMEMAKERS EXPRESSING DISLIKE FOR SPECIFIC TASKS AND EXPERIENCING FATIGUE FROM THEM[1]

Activity	Homemakers*					
	Farm			Non-Country Non-Farm		
	Spending time during week studied	Expressing dislike	Experiencing fatigue	Spending time during week studied	Expressing dislike	Experiencing fatigue
	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent
Cooking	99.7	11.8	1.7	99.4	12.3	2.3
Dishes	100.0	22.3	2.2	97.4	21.3	1.1
Canning	36.1	2.4	0.6	20.1	0.0	1.1
Cleaning and straightening	100.0	34.1	31.1	99.4	52.5	48.3
Carrying water	20.1	0.5	2.8	5.2	0.0	0.0
Laundry**	0.0	12.3	43.5	0.0	4.1	33.3
Washing	96.9	12.8	26.0	96.8	13.9	15.0
Ironing	92.0	9.5	7.9	94.2	9.8	11.5
Laundry total	0.0	34.6	77.4	0.0	27.8	59.8
Sewing	71.2	3.3	1.7	79.9	9.0	2.3
Mending	82.3	6.6	0.0	85.7	3.3	0.0
Care of children	65.3	0.5	0.6	81.2	0.0	5.8

*Proportion of the homemakers who answered the questions.
**Not specified, or washing and ironing.

1. Wilson--The Use of Time by Oregon Farm Homemakers, p. 46. (27)

TABLE IV

SUMMARY OF TIME SPENT AND STEPS TAKEN IN EACH ARRANGEMENT OF LABORATORY KITCHEN[1]

	Time			Steps		
		Amount Saved Over			Number Saved Over	
	Amount Time Spent	Preceding Plan	First Plan	Number Steps Taken	Preceding Plan	First Plan
I. Original layout	3:46:17	----	----	1,516	----	----
II. Stack table added	3:32:14	14:03	14:03	1,377	139	139
III. Drain board added	3:11:25	20:49	34:52	1,143	234	373
IV. Wheel tray added	3:04:06	7:19	42:11	754	389	762
V. Utensils rearranged	2:59:09	4:57	47:08	586	168	930
VI. Food rearranged	2:53:41	5:28	52:36	368	218	1,148
VII. As VI; oil stove	2:44:31	9:10	1:01:46	306	62	1,210
VIII. Compact arrangement	2:27:52	16:39	1:18:25	152	154	1,364
IX. As VIII; electric range	2:25:02	2:50	1:12:15	140	12	1,376
X. Electric mixer added	2:05:35	19:27	1:40:42	131	9	1,385

1. Muse--Kitchen Equipment and Arrangement. Bulletin 375, p. 1. (9)

TABLE V

DIFFERENCE BETWEEN HOME AND PREFERRED HEIGHTS OF HOMEMAKERS INCLUDED IN ROBERTS, WILSON, AND THAYER STUDY[1]

Distribution of cooperators in respect to difference between preferred height and height of home equipment: (a) rolling, and pastry board, (b) beating, and work table, (c) dishwashing, and bottom of sink, (d) ironing, and ironing board.

Difference in inches between preferred height and height of equipment at home	Percentage of cooperators classified as to difference			
	(a) Rolling and Pastry Board	(b) Beating and work table	(c) Dishwashing and Bottom of Sink	(d) Ironing and Ironing Board
	Per Cent	Per Cent	Per Cent	Per Cent
Preferred height greater by--				
9-11 inches	----	----	0.7	----
7- 9 inches	----	----	8.0	----
5- 7 inches	2.8	1.1	19.2	0.4
3- 5 inches	17.4	3.7	32.4	4.5
1- 3 inches	31.0	20.4	28.9	24.5
0- 1 inch	6.3	10.4	3.5	12.3
Preferred height same as home equipment--				
Difference zero	9.8	11.2	3.8	15.2
Preferred height lesser by--				
0-1 inch	7.7	8.2	2.1	10.4
1-3 inches	19.8	21.6	1.4	30.1
3-5 inches	4.2	15.6	----	2.6
5-7 inches	1.0	7.1	----	----
7-9 inches	----	0.7	----	----
Summary:				
Preferred height greater than home equipment	57.5	35.6	92.7	41.7
Preferred height less than home equipment	32.7	53.2	3.5	43.1
Difference none, or less than 1 inch	23.8	29.8	9.4	37.9

1. Roberts, Wilson, Thayer--Standards for Working Surface Heights and Other Space Units of the Dwelling. Bulletin No. 348, p. 18. (17)

TABLE VI

TEN YEAR SUMMARY OF HOME ECONOMICS EXTENSION PROJECTS IN HOME MANAGEMENT--JACKSON COUNTY, OREGON*

Home Management and Home Furnishings	Year of 27	28	29	30	31	32	33	34	35	36
Better Home Demonstration House	x									
Furniture Arrangement (5)		x								
Color (5)		x								
Lamp Shades (3)		x		x						
Living Room Improvement (Color, Design, Arrangement)			x	x						
Home Study Tour			x							
Jr. Class Homemaking			x							
Gift Suggestions			x	x	x	x		x		
Block Printing				x						
Farm Housing Survey								x		
House Plans (Home Visits)										x
Home Furnishing Day (Color)										x
Household Account Demonstrators--10 in 1931, 10 in 1932, and 5 in 1933					x	x	x			
Wise Spending						x				
Planned Kitchens and Routing					x					
Short Cuts Kitchen Letters					x					
Come Into Kitchen Program					x	x	x	x	x	x
Living Room Arrangement					x	x	x	x	x	x
Table Setting					x					

*Prepared from annual reports of Home Demonstration Agents.

TABLE VII

COMPARISON OF JACKSON COUNTY CENSUS OF 1860 AND 1930 TO SHOW GROWTH

Item	1860	1930	Per Cent Increase
Population	3,736	32,918	881.1
Number of Farms	174	2,901	1,666.6
Total Acreage of Farms	50,861	302,775	595.2

TABLE VIII

LAND OWNERSHIPS AND VALUATIONS OF JACKSON COUNTY
(1935 CENSUS)

Item	Total	Per Cent
County Area	1,781,031 Acres	
Publicly owned lands	933,260 Acres	52.4
Privately owned lands	847,771 Acres	47.6
Land in Farms	302,775 Acres	17.0
Average number acres per farm	104.6	
Total number farms	2,901	
Value of farm lands and buildings	$19,004,382.00	
Average value per farm	$6,551.00	
Land Ownership		
Number full owners	2,135	73.6
Number part owners	171	5.9
Number managers	65	2.2
Number tenants	530	18.3

TABLE IX

POPULATION AND CASH INCOMES OF JACKSON COUNTY
(1930 CENSUS)

Item	Number	Per Cent of Total
County Population	32,918	
Farm	17,637	53.5
Non-Farm	14,281	46.5
Native White Population	31,208	94.8
Native Parentage	26,800	81.4
Foreign Mixed	4,408	13.4
Foreign Born	1,486	4.5
Number Illiterates	18	0.3
Average Size Families	4.5	
Cash Farm Incomes		
Under $600		29.5
$600-$1,000		16.9
$1,000-$1,500		12.9
$1,500-$2,500		15.4
$2,500-$4,000		9.9
$4,000 and over		15.4
Average Cash Total Income	$5,154,000	

TABLE X[1]

LAUNDRY AS A CAUSE OF FATIGUE WITH FARM HOMEMAKERS IN RELATION TO MEANS OF OBTAINING WATER AND DISPOSING OF WASTE

Equipment	Farm Households with the Equipment Listed		
	Total Number	Proportion listing "laundry" or "washing and ironing" or "washing" as a cause of fatigue Per Cent	Proportion listing only "washing" Per Cent
Water carried	141	48.2	15.6
Water not carried	118	34.7	13.5
Waste carried out	138	47.8	15.9
Waste not carried out	115	34.8	12.2

1. Wilson's Study of the Use of Time in Households by Homemakers. Laundry Work as a Cause of Fatigue. Unpublished Data.

INTERVIEW RECORD FORM

HOME ECONOMICS EXTENSION SERVICE
OREGON STATE COLLEGE

Survey of
The Kitchen Sink Center in Relation
to Management Problems
in
Jackson County Homes

Number____ Date_____ Name_____

Address_____

I. Family Total _____ II. Unit _____

___a. Adults, male
___b. Adults, female
___c. Children (under 15)

Ages: Boys_____

Girls_____

___a. Member
___b. Non-member
___c. Former member

III. Description of Farm

1. Tenure

___a. Full time
___b. Part time
___c. Rural (non-farm)

2. Chief Income Crops

a. _____
b. _____
c. _____

IV. Description of House

a. Location: 1. Farm__; 2. Village__; 3. City__.

b. 1. Owned_____; 2. Rented_____.

c. Age of house _____.

d. No. of years occupied by present family _____.

e. Total no. rooms _____.

f. Approximate size of kitchen _____.

V. Water Supply for Kitchen Use

1. Source of Water Supply _____.

2. Water Carried

a. Distance (feet) _____

b. By whom _____

3. Water System

___a. Gravity
___b. Elevated tank
___c. Pressure tank

4. Power

___a. Windmill
___b. Hydraulic Ram
___c. Gasoline Pump
___d. Electric Pump
___e. Ram

5. Running Water for House

___a. Cold
___b. Hot

6. Plan to Install Water System

a. When _____

b. Kind _____

c. Extent of Installation Planned _____

7. Hardness of Water

_____a. Hard
_____b. Soft
_____c. Medium

VI. Water Heated by:

1. Method

___a. Tea kettle
___b. Reservoir
___c. Hot Water Tank

2. Fuel--For Heating Water

___a. Gas
___b. Electric
___c. Range coils
___d. Heater

3. Fuel for Cooking

_____a. Wood
_____b. Electric
_____c. Oil

VII. Kitchen Heated by:

_____a. Wood range
_____b. Trash burner
_____c. Wood heater
_____d. Furnace
_____e. Other

Comments _____

_____

VIII. Kitchen Sink

1. Installation

___a. With drain
___b. Without drain
___c. Running cold water
___d. Running hot water
___e. Pump at sink
___f. Approximate cost of installing water at sink

2. Kind of Drainage

___a. Septic tank
___b. Cesspool
___c. Stream
___d. Surface

3. Type of Sink

___a. Cabinet Sink
___b. Sink and tub combination
___c. Sink without back
___d. Sink with back and right drainboard
___e. Sink with back and left drainboard
___f. Double Sink
___g. Single sink with back
___h. Sink in one piece with back and two drainboards
___i. Other _____

4. Type of Faucets

___a. Single
___b. Double
___c. Swing
___d. Spray
___e. Other

5. Size of Sink

a. Inside Dimensions __

_____

b. Outside Dimensions _

_____

6. Height of Sink

a. Top to floor _____
b. Bottom of sink to floor _____

Comments

_____

_____

7. Location of Sink — Comments

___a. On outside wall _____

___b. In front of window _____

___c. On inside wall _____

___d. In a corner _____

___e. Between two openings _____

___f. Other _____ _____

IX. Lighting at Sink

1. Kind

___a. No light
___b. Electricity
___c. Gasoline
___d. Kerosene

2. Location of Light

___a. Shaded center light
___b. Plain center light
___c. Light over sink
___d. Other _____

3. Kind of Switch Used

___a. Wall switch
___b. Socket Switch
___c. Chain

4. Insulation

___a. Is pull chain insulated?
___b. Other hazards _____

5. Is Light at Sink Satisfactory

___a. At night? _____
___b. In day time? _____
___c. Is sunlight at sink glaring? _____

X. Kind and Care of Sink

1. Kind of material in sink:

___a. White enameled iron
___b. Blue enameled iron
___c. Gray enameled iron
___d. Iron
___e. Zinc
___f. Wood
___g. Other _____

2. Care of Sink — Comments

___a. Kind of cleaner used _____

___b. Is it difficult to clean _____

___c. Is surface stained _____

___d. Is surface rough _____

XI. Work Surface at Sink

1. Type of surface next to sink	Right	Left	Satis.	Un-Satis.	Size Right Sur.	Size Left Sur.
a. Drain boards						
b. Shelf						
c. Flat surface						
d. Table						
e. Commode or Kitchen Cabinet						
f. Other type						

2. Covering for Work Surface	Comments
a. Enamel	
b. Zinc	
c. Linoleum	
d. Stainless Steel	
e. Oilcloth	
f. Tile	
g. Other	
h. No covering	

3. Finish for Drain Board or Work Surface

a. Varnish

b. Liquid Bakelite

	Right	Left	Satis.	Un-Satis.	Comments
c. Oil					
d. Paint					
e. Other finish					
f. No finish					

XII. Activities at Sink — Comments

___1. Dishwashing _____

___2. Wash Milk Utensils _____

___3. Prepare Vegetables and Other Foods _____

___4. Food Serving _____

___5. As Lavatory

___a. Wash face and hands _____

___b. Brush teeth _____

___c. Shampoo hair _____

___d. Sponge bath _____

___e. Shave _____

___f. Comb hair _____

___6. As Laundry

___a. Hand Laundry _____

___b. Household Laundry _____

XIII. Sink and Lavatory Equipment

1. Do you have two sinks? _____

a. Sink 1--where located? _____

b. Sink 2--where located? _____

c. Sink 1--how used? _____

d. Sink 2--how used? _____

e. If no sink, what provision is made for substituting? _____

_____

2. Do you have a lavatory--

a. On first floor _____
b. On second floor _____
c. Is lavatory room heated? _____
d. If no lavatory, what provision is made for substituting? _____

_____

XIV. Family Attitudes

1. Do you have conflicts over sink? _____

a. When _____

b. What _____

XV. Storage Facilities of Sink Center:

1. Cupboards:

___a. Above right
___b. Above left
___c. Below right
___d. Below left
___e. Shelf over sink
___f. Hooks and nails at sink for utensils

2. Is sink enclosed underneath?

___a. Yes
___b. No
___c. What stored there? _____

3. Are storage spaces and shelving satisfactory?

___a. Yes

___b. No

Comments _____

_____

XVI. Management

1. Storage or Shelf Management

___a. Good
___b. Fair

Comments _____

___c. Poor Comments _____

2. Can you sit at sink comfortably?

___a. Yes Comments _____

___b. No _____

3. Do you use a stool at sink?

___a. Yes Comments _____

___b. No _____

4. Is there a resilient floor covering or rug at sink?

___a. Yes Comments _____

___b. No _____

5. Do young children use the sink? _____

a. Equipment for them to stand on _____

b. How used by them _____

6. Observations on Management _____

_____

_____

7. Plans for remodeling or improving of kitchen _____

_____

_____

_____

XVII. Study of One Task--Dishwashing

1. Are dishes washed at sink? _____

2. Where are dishes washed if not at sink?

___a. Stove
___b. Table
___c. Work surface
___d. Kitchen cabinet
___e. Other _____

3. Why are dishes not washed at sink? _____

_____

XVII STUDY OF ONE TASK--DISHWASHING (Continued)

6. Storage of Dishwashing Equipment

Article	Is it used in the sink?	Which of these articles are stored close to the sink?	If no sink are they stored in dishwashing center?	Stoop	Reach	Convenient	Inconvenient	Reason--Comments
a. Dish pans								
b. Drainers								
c. Dish mops								
d. Rinse pans								
e. Dish clothes								
f. Soap and cleansers								
g. Brushes								
h. Garbage pail								
i. Every-day dishes								
j. Company dishes								
k. Silver								
l. Kettles								
m. Frying pans								
n. Coffee pots								
o. Baking utensils								
p. Cutlery								

XVII. STORAGE OF FOOD USED AT SINK CENTER IN FOOD PREPARATION AND SERVING

	Is it used at the sink center?	Which of these foods are stored close to the sink center?	Which are stored in substitute center?	Stoop	Reach	Convenient	Inconvenient	Reason--Comments
Food								
a. Vegetables								
b. Fruit								
c. Breads, Cakes, and Pastries								
d. Meats								
e. Dressed Poultry								
f. Beverages								
g. Cereals								
Mixing Supplies								
h. Flour								
i. Sugar								
j. Spices								
k. Milk								
l. Butter								
m. Eggs								