WAKE COUNTY ORGANIZATION OF FOOD CONSERVATION PROGRAM

Leaders:

Mrs. Rober Wyatt, Chairman of Citizens Service Corps

Mrs. C. A. Sallinger, County Chairman under Mrs. Wyatt

Mrs. Warren Booker, Chairman Wake County Nutrition Committee

Mrs. Maude McInnes, Home Demonstration Agent

Pattern Made with Mrs. Wyatt, Miss Current, Mrs. Sallinger, Mrs. McInnes for Wake County Food Conservation Program:

1. Map of Raleigh according to Zone Sectors
2. Number Zone and Sector Leaders
3. Map of small towns Zone Sector Organization (number leaders)
4. Number trained home economics people in Raleigh; in small towns.
5. How organization will move after County Meetings are held:
   - Who will notify people of meetings?
   - Where will meetings be held?
   - Who will hold these meetings?
   - Where will cost of demonstration materials come from?
   - What materials will be needed?
     - (Equipment as listed to home agent for county meeeting
     - (Products to can
     - (If canned products will be used, can we get
     - (point coupons to buy the cans? Fresh things
     - (will not be on market this early.

NORTH CAROLINA
OFFICE OF CIVILIAN DEFENSE
R. L. McMillan, Director
Box 2748, Raleigh

February 1, 1943

COUNTY NUTRITION CHAIRMEN

COUNTY	CHAIRMAN	ADDRESS
Alamance	Mrs. ~~E. I.~~ Jerry F. Strader	Burlington
Alexander	Mrs. R. S. Ferguson	Taylorsville
Alleghany		
Anson	Mrs. Harry B. Covington	Wadesboro,
Ashe	Mrs. Ward Ray	Jefferson
Avery		
Beaufort	Miss Viola Alexander, Home Agent	Washington
Bertie	Miss Clara Robertson, Home Agent	Windsor
Bladen	Mrs. Clarence Stevens	Council
Brunswick	Miss Corrine Green	Shallotte
Buncombe	Mrs. Charles Fortune, 19½ Arlington Street	Asheville
Burke	~~Mrs. Marian H. Maddrey, 506 W. Union Street~~	*Morganton Mrs. W.F. Houck 106 Forest St. County Chrmn.
Cabarrus	Mrs. Geo. Mc Allister Home Agt.	Concord
Caldwell	Miss Atha Culberson, Home Agent	Lenoir
Carteret	Dr. C. P. Stevick, Health Officer	Beaufort
Caswell	~~Miss Louise Homewood, Home Agent~~ Mrs. Julia S. Mitchell	Yanceyville
Catawba	Mrs. Glenn Long	Newton
Chatham	Dr. G. W. Rogers, Health Officer	Pittsboro
Cherokee	Miss Mary Cornwell, Asst. Home Agent	Murphy
Chowan	Mrs. Roland H. Vaughan	Edenton
Clay	Mrs. Mattie Moss, Route 4	Hayesville
Cleveland	Mrs. M. A. Spangler, 502 N. LaFayette Street	Shelby
Columbus	Mrs. Roberta Britton	Whiteville
Craven	~~Miss Ella McDuffie, Home Agent~~	New Bern
Cumberland	Miss Elizabeth Gainey, Home Agent	Fayetteville
Currituck	Mrs. P. L. Hampton	Coinjock
Dare	Miss Sadie Hendley, Home Agent	Manteo
Davidson	~~Dr. C. C. Pambrell~~ Mrs. Jane N. Smith, H.M. Spvsr.	Lexington % F. S. A.
Davie	Mrs Leslie Daniels	Mocksville
Duplin	Miss Rachel Hurst, Home Agent	Kenansville
Durham	Miss Bessie Starling, National Dairy Council	Durham
Edgecombe	Dr. W. K. McDowell	Tarboro
Forsyth	Mrs. Elizabeth L. Tuttle, Home Agent	Winston-Salem
Franklin	Miss Lillie Mae Braxton, Home Agent	Louisburg
Gaston	Miss Lucile Tatum, Home Agent	Gastonia
Gates	Miss Ona Patterson, Home Agent	Gatesville
Graham	Miss Elizabeth H. Craft Home Agt.	Robbinsville
Granville	Mrs. Doshia R. Hall	Oxford
Greene	Mrs Tracy Mebane	"
Guilford	Miss Margaret Edwards, Womans College, U. N. C.,	Greensboro
Halifax	Mrs. F. W. M. White	Halifax
Harnett	~~Mrs. J. E. Dupree~~ Mrs E. H. Lassater, Rt. 1	~~Angier~~ Erwin
Haywood	Dr. C. N. Sisk	Waynesville
Henderson	~~Mrs. John McIlvin~~ Miss Ruth Hall Dicks - Home Agt.	Hendersonville
Hertford	Miss Lydia Doyton, Home Agent	Winton

*Mrs. L.C. Johnson,
Chairman for Rutherford College
Rutherford College, N.C.

(OVER)

COUNTY	CHAIRMAN	ADDRESS
Iredell	Mrs. Turner Page Home Agt	Statesville
Hoke	Mr. K. A. McDonald, Supt. Hoke Co. Schools	Raeford
Hyde	Miss Iberia Roach, Home Agent	Swan Quarter
Jackson	Miss Margaret Martin, Home Agent	Sylva,
Johnston	Mrs. W. G. Wilson	Smithfield
Jones	Mrs. Marianna Dixon, Home Agent	Trenton
Lee	Mrs. Hilda S. Blanton, Home Agent	Sanford
Lenoir	~~Dr. T. V. Moseley~~, Health Officer Dr. C. L. Williams	Kinston
√Lincoln *	Miss Elizabeth Francis (County Chrm) Home Agt-Lincolnton City	
McDowell	Mrs Zeno Martin	Marion
Macon	Miss Gladys Maxwell	Franklin
√Madison		
Martin	Miss Lora Sleeper Home Agt	Williamston
Mecklenburg	Dr. W. S. Rankin	Charlotte
Mitchell		
Montgomery	Miss Martha M. Harris Home Agt.	Troy
Moore	Miss Flora McDonald, Home Agent	Carthage
Nash	~~Dr. T. O. Coppedge, Health Officer~~ Mrs. Robt. Everett	Nashville Rt 1
New Hanover	Miss Virginia Ward, Dept. of Education, New Hanover County High School	Wilmington
Northampton	~~Miss Gertrude Orr Finch~~, ~~Home Agent~~ Miss Annie E. Harris Jackson Home Agt.	
Onslow	Miss Helen Sorrell	Hubert
Orange	Dr. W. P. Richardson, Health Officer	Chapel Hill
Pamlico	Miss Doris Shuler, Home Agent	Bayboro
Pasquotank	Mr. M. P. Jennings, Supt. of Schools	Elizabeth City
Pender	Mrs. C. L. Moore	Burgaw
Perquimans	Miss Frances Maness, Home Agent	Hertford
Person	Mrs. Philip Thomas	Roxboro
Pitt	Dr. N. T. Ennett	Greenville
Polk	Miss Gladys Hemrick H.A	Tryon
Randolph	Dr. G. H. Sumner.	Asheboro
√Richmond		
Robeson	Dr. E. R. Hardin	Lumberton
Rockingham	Mr. J. C. Cooley, Supt. of Schools	Reidsville
Rowan	Miss Margaret Jones H.A.	Salisbury
Rutherford	" Sue Bloom Home Agt.	Rutherfordton
Sampson	Dr. J. H. Williams	Clinton
√Scotland		
Stanly	Mrs. Red Troxler and Mrs. Pratt McSwain, Co-Chrmn.	Albemarle
Stokes	Mrs. Tom Preston	Pine Hall
Surry	Mrs. Grace P. Brown, Home Agent	Mt. Airy
Swain	Mrs Geraldine P. Hyatt, Home Agt.	Bryson City
Transylvania	Miss E. Annabel Teague Home Agt.	Brevard
Tyrrell	Miss Cornelia Simpson, Home Agent	Columbia
Union	~~Mrs. Ruth M. Ippolite~~, ~~Home Agent~~ Miss Izola F. Williams	Monroe % F.S.A.
Vance	Mrs. L. E. Barnes, Route 4	Henderson
Wake	Mrs. Warren H. Booker, 2105 White Oak Road	Raleigh
Warren	Miss Eleanor Barber, Home Agent	Warrenton
Washington	Dr. S. V. Lewis	Plymouth
Watauga	Miss Elizabeth Bridges Home Agt.	Boone
Wayne	~~Miss Alla Meredith~~ Mrs. Herman Weil	Goldsboro
Wilkes	Mrs. Annie H. Greene, Home Agent	Wilkesboro
Wilson	Mrs. R.C.D. Beaman	Stantonsburg
Yadkin	Mrs. Miles Shore	Cycle
Yancey	Mrs. Dover Fouts	Burnsville

* Mrs. L. E. McGuinn, City of Lincolnton Chairman for ####

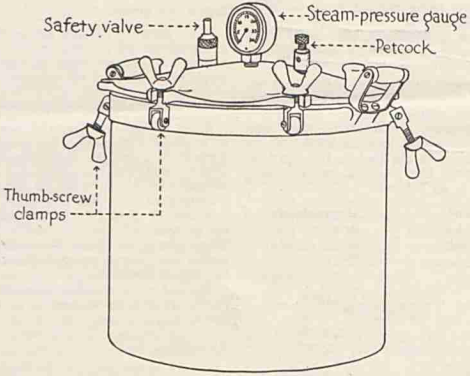
Bulletin 523 W.E. 37 June 1942

WAR EMERGENCY BULLETIN

NEW YORK STATE COLLEGE OF HOME ECONOMICS

Safe Use and Care of a Pressure Cooker

Elaine Knowles and Gertrude Henry



Cornell Bulletin for Homemakers

Safe Use and Care of a Pressure Cooker

ELAINE KNOWLES AND GERTRUDE HENRY

PUT your pressure cooker into good condition now, because there will be fewer on the market until the end of the war!

Here discussed are the pressure cookers used for canning, which hold twelve liquid quarts or more, but these suggestions apply also to pressure-cooker saucepans that hold from 1 to 4 quarts.

Pressure-cooker canning is safer than is the water-bath method because it is the only method whereby the heat-resistant spores that cause canned foods to spoil can be killed. These spores are found in meats, fish, and poultry, and in all vegetables except tomatoes, pimientos, peppers, and rhubarb.

Pressure cookers are so made that no steam can escape from the kettle. The steam then exerts a pressure that causes the temperature to rise higher than that of water boiling in an open kettle. If no air is present in the cooker, the relationship between the pressure and the temperature is as follows:

Pounds of pressure above atmospheric pressure at sea level	*Approximate temperature inside canner during processing*
0	212°F.
5	228°F.
10	240°F.
15	250°F.

Only when the pressure gauge is accurate can you be sure of these temperatures being reached.

ADVANTAGES

A PRESSURE cooker can save food, fuel, time, and human energy if used and cared for properly. In order to get the best service from the cooker, you must understand how to operate it correctly and how to use it intelligently. It is a safe piece of equipment if all the rules are followed.

CARE

Because new parts will be difficult to obtain for the duration of the war, place orders for worn or broken parts immediately. Parts may be obtained through a dealer who handles the make you have or directly from the manufacturer.

All owners should be willing and anxious to share their cookers with others, but this involves additional problems in care and use.

Know the material

Most pressure cookers are made either of aluminum or of steel coated with tin or porcelain enamel. The care needed depends upon the kind of material.

Aluminum cookers

Some cookers are made of heavy, cast or wrought aluminum. Cast aluminum is porous and, unless well cleaned, pits readily and absorbs odors and flavors. Wrought aluminum is harder and pits less readily than does cast aluminum.

Water or food left in the kettle pits the surface and makes it dark and rough. Deep pitting weakens the wall of the cooker and causes steam leakage around the top of the cooker.

Prevent sudden cooling of an aluminum cooker as this may cause it to warp or crack.

To clean

Wash the cooker with hot soapy water, scour it with fine steel wool, rinse and dry well. Never use strongly-alkaline, gritty scouring powders or soda; they darken and stain aluminum. Do not scrape the inside of an aluminum cooker with a knife or metal scraper.

To brighten the aluminum and remove stains after cleaning, pour in enough water to cover the stains, add 2 tablespoonfuls of vinegar for each quart of hot water. Following the directions for sealing and operating the cooker, bring the pressure to 5 pounds and hold it there for 5 minutes.

Tinned and enameled steel cookers

Tin and enamel coatings scratch easily. Careful cleaning and handling are necessary, because the steel base rusts if the coatings are removed.

If meat is seared at high temperatures in a cooker with tin coating, the tin may melt. Therefore, first sear meat in some other utensil.

Because porcelain enamel is a glass coating fused onto a steel base, treat this utensil as you would a glass one. Do not overheat the cooker or allow the food to boil dry, for this causes the coating to crack. Sharp blows or dropping may chip the coating and expose the steel base, which rusts easily, thus weakening the walls.

To clean

Wash the cooker with hot soapy water. Use only a very mild scouring powder, such as whiting. Never scour the cooker with steel wool or harsh abrasive powders.

The lid of the cooker

A steam-tight seal is necessary if the food is to be cooked under steam pressure. Keep the edges of the lid and the kettle free from food, rust, dents, and chipped spots; otherwise the seal between the lid and the kettle breaks, allowing steam to escape. If steam leakage occurs, be sure to add enough water to prevent the cooker from boiling dry. If the lid sticks or the cooker leaks steam, rub the edges of the lid and kettle with cooking oil before sealing.

Pressure gauge

The pressure gauge is one of the most important and delicate parts of the pressure cooker, and success in cooking and canning depends largely upon its accuracy. This part easily may get out of adjustment. If the gauge registers a pressure higher than it actually is, then the temperature may not be high enough to process the food inside properly. If the gauge registers a pressure lower than it actually is, then the temperature is too high, and the food inside may be overcooked.

The gauge should be checked for accuracy with a master gauge or a maximum thermometer at least once a year, or at any time the indicator on the gauge fails to return to *zero*. This service may be available through your county home demonstration agent. If not, the pressure gauge may be returned to the manufacturer for testing.

Care should be taken not to drop or strike the pressure gauge, or to allow water and food particles to get into it. The opening to the gauge should be cleaned with a toothpick.

Safety valve

The main purpose of the safety valve is to permit steam to blow off automatically if the pressure should rise beyond a safe point. It is a protection against overheating and explosion. Therefore the safety valve and its parts, especially the ball and socket, must be thoroughly cleaned after the cooker is used. Soaking them in vinegar or kerosene helps to remove food deposits and corrosion. A safety valve not well cleaned before and after the cooker has been used, may stick and fail to release the steam, thus allowing the pressure to go too high. Failure of the safety valve to open may cause a serious accident.

Sometimes the safety valve is combined with the petcock.

Petcock

When open, the petcock releases steam and air; when closed, it holds the steam. The petcock should be cleaned in order to work freely and to prevent steam from escaping when closed. Draw a piece of cloth through it occasionally, or clean it with a fine brush to remove food particles. Rusting weakens the petcock. If necessary, soak it in vinegar and wipe it dry.

Store in a dry place

When storing the cooker, make certain it is clean and thoroughly dry. Place the lid in a paper bag and turn it right side up on a shelf. Wadded newspaper placed in the kettle will absorb excess moisture and prevent corrosion.

OPERATION

IN OPERATING a pressure cooker, the directions of the manufacturer should be carefully followed. The same principle of operation is common to all.

Directions

1. Put from 1 to 2 quarts of boiling water into the cooker.

2. Place the cooker over heat.

3. Always use a rack when canning, to prevent the jars or cans from resting directly on the bottom of the cooker.

4. Arrange the jars or tins in the cooker so that they do not touch each other or the sides of the cooker.

5. Open the petcock in the cover.

6. Place the lid on the kettle. Make certain that there is good contact between the kettle and the lid. If the lid and kettle are to be matched, look for guiding marks.

7. Lock the sealing device.

8. Close the safety valve.

9. *Leave the petcock open from 7 to 10 minutes after the steam begins to escape.* This amount of time is required to force all air out of the cooker; otherwise, the gauge may not indicate the true temperature within the cooker because it would be registering air pressure as well as steam pressure. Then the inside temperature would be lower than it should be in relation to the number of pounds of pressure indicated.

10. Close the petcock.

11. Heat to the proper pressure for processing the food you are canning. This information will be found in the timetable in the instruction book that comes with the cooker. Unless indicated otherwise, the number of pounds pressure will be estimated at sea level. If the altitude is 2,000 feet or more above sea level, add 1 extra pound of pressure to the amount indicated in the tables for each 2,000 feet of elevation.

12. *Keep the pressure constant while processing.* Much of the success in canning depends upon a uniform pressure throughout the process. Therefore, keep the heat carefully controlled. The cooker requires constant watching. If the pressure varies as much as 2 pounds, liquid may be drawn from the jars, or the temperature needed for sterilization within the jars or tins may not be reached.

13. When processing is complete, remove the cooker from the source of heat and allow the pressure to decrease *gradually* until the pointer indicates *zero* if using glass jars or delicate foods. Do not open the petcock until the pointer reaches zero. If canning with tin cans, it is not necessary to let the pressure decrease gradually. It is better to open the petcock as soon as the processing is complete.

14. Open the petcock immediately but slowly when the gauge indicates *zero.* Never remove the lid before the pressure indicates zero. If a heavy stream of steam escapes, close it again for a minute; but if only a small amount escapes, continue opening the petcock so that the steam may be expelled. If the petcock is not opened at this time, a vacuum may be created which causes some of the liquid to be drawn from the jars and makes the lid of the cooker difficult to remove.

15. Remove the lid by tilting it toward you, in order that any steam left in the kettle may be directed away from you.

16. If glass jars are used, remove them carefully, and tighten the lids immediately. If tin cans are used, immerse them at once into cold water.

Prepared by the New York State College of Home Economics at Cornell University
and published by the New York State College of Agriculture at Ithaca, N. Y.
L. R. Simons, Director of Extension

Published and distributed in furtherance of the purposes provided for in the Acts of Congress
of May 8 and June 30, 1914.

Raleigh, N. C.
March 10, 1943

Dear Coworkers:

The Conservation Plan keeps growing and it now promises to be the most far reaching project undertaken by women in a long time. The College Home Economics teachers and the Home Economists who were at the State Meeting March 5 and 6 pledged their support. Please put your best efforts into making it a success in your county. Make sure that the following people have been consulted and their support and assistance secured:

1. County Civilian Defense Directors,
   " " " Coordinators,
   " " " Service Corps Directors.

These people should see to it that zone or sector leaders from all towns are asked to attend the second day's meeting in your county.

11. County Superintendent of Education - Superintendents are to make arrangements with principals so Home Economics teachers may be absent from school to attend the first day's demonstrations without having to pay a substitute.

111. Chairman of Nutrition Committee - The chairman will call the meeting and preside both days; he will ask all professional people in the county to the meeting the first day and all sector or zone leaders from Civilian Defense on the second day.

1V. County Home Demonstration Agent - Will secure place for meeting. Make sure all equipment listed is ready for use, a can opener should be added to the list, confer with everyone concerned and see that everybody who should be asked is given an opportunity to help.

Please wear a cotton uniform and be prepared to assist the demonstrator in charge both days.

Please have all of the equipment you assembled last year for drying fruits and vegetables on display.

Please see that the director of Civilian Defense or the Service Corps Director is asked to explain the purpose of the demonstration to both groups.

Please have your county map mounted on a suitable background to be easily accessible for use. Maps of town will help in the organization. Please get as many maps of towns in the county as are available.

Please secure point rationing certificates from your rationing board to purchase 1 can of corn--16 points, 1 can lima beans--14 points, 2 cans tomatoes--32 points. Have these points ready for the demonstrator coming to your county.

Sincerely yours,

Anamerle Arant
Northwestern District Agent

TELEPHONE BARRINGTON 706

Burpee Can Sealer Company

ORIGINATORS OF HOME TIN CAN SEALERS

128 WEST LIBERTY STREET
BARRINGTON ★ ILLINOIS

IMPORTANT PRESSURE CANNER ANNOUNCEMENT

There will be only 150,000 Pressure Canners manufactured by all manufacturers in 1943.

Through the efforts of the United States Department of Agriculture and the War Production Board, materials are being made available for these canners to the following companies:

Wisconsin Aluminum Foundry	25,000 canners
Burpee Can Sealer Company	55,000 canners
National Pressure Cooker Company	70,000 canners

In order to conserve vital materials, the War Production Board has requested that all of these canners be similar in the following respects: The complete canner is to be made of steel; the cover, to have a protective tin coating and the body, covered with vitreous enamel; the capacity is to be large enough to hold at least 7 quart jars. The cooker is to be equipped with a flat rack (no basket or pans).

The United States Department of Agriculture will control the distribution of these canners and is now developing distribution and possibly ration plans which will be announced soon. Probably the distribution plans will be based on the canning seasons, beginning in the South and moving North.

Under these circumstances, the Burpee Can Sealer Company will not accept any orders for canners and is not in a position to say what quotas the various areas might receive. As this program is late in getting started, it will be several months before we can deliver cookers because it will take some time to obtain and fabricate these materials.

The United States Department of Agriculture will tell you the necessary procedure to purchase your canner locally. The price, probably about $15.00, will be established by the local retailer.

BURPEE CAN SEALER COMPANY

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH ADMINISTRATION
BUREAU OF HOME ECONOMICS
WASHINGTON, D. C.

Miss Ruth Current
State Home Demonstration Agent
Extension Service
State College Station, Raleigh, North Carolina

MAR 18 1943

Dear Miss Current:

This is in response to your inquiry regarding oven canning.

As you no doubt know from reading our canning bulletin, copy enclosed, we recommend only the steam pressure method for canning nonacid vegetables and meat. We believe that the water bath method is the best for acid foods, although the oven may be used for processing them. The dry heat of the oven penetrates the contents of the jar more slowly than does heat from the boiling water. For this reason processing times for acid foods canned in an oven must be longer than when canned in a water bath. We have not issued processing times for this method, however. The temperature of food does not go high enough when processed in the oven to destroy some types of spoilage bacteria that may be present in nonacid foods.

There are some disadvantages to the oven method. Juice may boil out and unless the fruit is well covered with sirup or juice it has a tendency to discolor on the surface.

You are wondering about the research that has been done on water bath, pressure canning and oven canning regarding bacteria, color and quality. Much work has been done on rate of heat penetration in jars and cans of food and thermal death points of various types of spoilage organisms. In our material we have taken safety as our first criterion. Our recommendations are based on scientific facts. We realize the quality of home canned food may have to be sacrified in some degree in order to have the products safe.

Since we do not have a scientific publication on the subject you may wish to refer to the list of publications enclosed before your meeting. I feel sure your college library will have copies.

Please give Dept

Sincerely yours,

Dorothy E. Shank

Dorothy E. Shank, in Charge of
Food Utilization Investigations

Enclosure

BUREAU OF HUMAN NUTRITION AND HOME ECONOMICS
AGRICULTURAL RESEARCH ADMINISTRATION
U.S. DEPARTMENT OF AGRICULTU E
WASHINGTON, D.C.

PARTIAL LIST OF REFERENCES ON CANNING PROCESSES

Bacteriological problems in home-canning procedures
F.W. Tanner, Journal Home Econ. Vol. 26, No. 6,
June-July 1934

Home canning and public health
Fred W. Tanner. Am. Jr. of Public Health Vol. 25, No. 3 March 1935

Proper processes for home canner
F.W. Tanner. Jr. Am. Dietetics Association. vol. XI, No. 1 May 1935

Home canning of foods for family use
F.W. Tanner, Univ. of Illinois, College of Agr. & Agr. Expt. Sta.
Circ. 394. Urbana, Ill.

March 13, 1943

Raleigh, North Carolina
March 12, 1943

Dear "Demonstrators":

As yet Dr. Kendrick has not had a confirmation on the points - and I don't believe I would wait on them but make plans to get either fresh products or use some of your own points and when Dr. Kendrick does get them they will be passed on to you.

I hope this will not trouble you too much. Just wish we had forseen the problem before the rationing went into effect.

Sincerely yours,

Ruth Current

Ruth Current
State Home Demonstration Agent

COOPERATIVE EXTENSION WORK

IN

AGRICULTURE AND HOME ECONOMICS

STATE OF NORTH CAROLINA

STATE COLLEGE STATION, RALEIGH, N. C.

NORTH CAROLINA STATE COLLEGE OF AGRICULTURE AND ENGINEERING
NORTH CAROLINA COUNTIES AND
UNITED STATES DEPARTMENT OF
AGRICULTURE COOPERATING

EXTENSION SERVICE
HOME DEMONSTRATION WORK

March 12, 1943

Dear "Demonstrators":

Won't you please leave with the chairman of the County Nutrition Committee this questionnaire? The information should be collected right away because allocation of cookers for every county will be made, we think, on the number already in use in a county. We are not sure of this, of course.

Sincerely yours,

Ruth Current
State Home Demonstration Agent.

How many pressure cookers are being used by Home Demonstration Club women?..... _____

Could they be loaned or shared with other families?..... _____

How many more cookers would Home Demonstration Club members buy if they were available?..... _____

How many cookers have Farm Security Administration families?..... _____

Could they be loaned or shared with other families?..... _____

How many cookers are owned by Home Demonstration Clubs?..... _____

How many cookers are owned by the Home Agent's Office?..... _____

How many more would rural women need?..... _____

How many cookers are owned by city women?..... _____

How many more would city women need?..... _____
(The Office of Civilian Defense, Women's Division, could get this information through Block Leaders)

Perhaps churches and lunchrooms have cookers; if so, how many?..... _____

Ref. materials

REFERENCE MATERIAL ON FOOD CONSERVATION

Material Published by Agricultural Extension Service, North Carolina State College, Raleigh, N. C.

1. Ext. Folder #34 - Killing and Curing Meat on the Farm, December, 1941
2. Ext. Misc. Pamphlet #39 - Simplified Methods for Home and Community Canning, March, 1941
3. Ext. Folder #47 - Storage for Canned Foods, (Reprint) October, 1941
4. Ext. Folder #48 - Canning Meats, (Revised) November, 1942
5. Ext. Misc. Pamphlet #63 - Canning Budget for North Carolina, March, 1942
6. Ext. Circ. #113 - Jelly, Preserves, Jam, and Pickle, June, 1941
7. Ext. Circ. #223 - Canning Fruits and Vegetables, (Reprint) February, 1942
8. Ext. Circ. #232 - Home Drying of Fruits and Vegetables, August, 1942 (Reprint)

Material Published by Agricultural Extension Service, State College of Washington, Pullman, Washington

Ext. Bulletin #230 - Preservation of Farm Products by Freezing, (Revised) May, 1937

Material Published by United States Department of Agriculture, Washington, D. C.

1. Farmers' Bulletin #879 - Home Storage of Vegetables
2. Farmers' Bulletin #1424 - Making Vinegar in the Home and on the Farm
3. Farmers' Bulletin #1438 - Making Fermented Pickles
4. Farmers' Bulletin #1762 - Home Canning of Fruits, Vegetables and Meats
5. Farmers' Bulletin #1918 - Drying Foods for Victory Meals

EQUIPMENT FOR CANNING DEMONSTRATION

Canning Equipment E

Steam pressure canner (with pans, basket, rack, etc.) ✓

Hot-water canner ✓

Quart measuring cup ✓

Half-pint measuring cup ✓

2 paring knives ✓

2 tea spoons ✓

2 table spoons ✓

1 table knife

1 dish pan

1 tea kettle

2 small pans (8 to 10 inches in diameter)

½ dozen quart glass jars with tops

½ dozen pint glass jars with tops

2 dozen rubber rings

Clock or watch

Scales

2 yards cheese cloth (for blanching and wiping off rim of jars)

6 dish towels

4 hand towels

2 pounds dairy or meat salt (no table or iodized salt)

1 package paper napkins

Stove

Table

Running water

Ways of Using 48 Points

1 Grapefruit Juice	8 points	14 oz. to 1 lb. 2 oz.
1 "	8 points	"
1 Apple Sauce	8 points	"
1 Beets	8 points	"
1 Carrots	8 points	"
1 Beans Pork and Beans	8 points	"
	48 points	
3 Cans Pineapple	16 points	1 lb. 2 oz. to 1 lb. 6 oz.
	48 points	
1 Can Pineapple	16 points	
1 Can Apricots	16 points	
1 Can Tomatoes	16 points	
	48 points	
Apricots	13 points	14 oz. to 1 lb. 2 oz.
Pears	11 points	"
Pineapple	13 points	"
Corn	11 points	"
	48 points	
1 Green Beans	11 points	14 oz. to 1 lb. 2 oz.
1 Green Peas	13 points	"
1 Green Corn	11 points	"
1 Green Tomatoes	13 points	"
	48 points	

present, therefore, it was awkward and difficult to make plans for organizing Statesville and the small towns and villages in Iredell County to carry the program. The ward leaders pledged their support and committees were appointed to make definite plans and procedure.

The County home economics teachers, Farm Security home supervisor, and Home Demonstration agents will carry the program to all home economics students and rural homemakers in the county through organized effort.

Mr. Ray Morrow, County Farm Agent, discussed the food production program goals with the group and urged the city women to grow a garden if suitable land was available. He offered his services and said garden bulletins could be had for the asking.

On this day, too, I drove from Statesville to Salisbury to present the Food Conservation Program to the Kiwanis Club. The plan met with favor. These men wished to have all who had a part in the program being/their endorsement and cooperation.

IREDELL COUNTY

HOME ECONOMICS TRAINED PERSONS

Name	Address	Present Position
Anne Dobbins	Cleveland, N. C., R. 2	Voc. teacher
Ruthmary McCall	Matthews, N. C., R. 6	Teaching
Martha Sample	236 N. Edgeworth St. Greensboro, N. C.	H. Ec. teacher
Annie C. Gaitley	Barium Springs, N. C.	H. Ec. teacher
Ernestine Haney	516 East Broad St. Statesville, N. C.	Teaching
Margaret E. Carrithers	Union Grove, N. C.	Science teacher
Christine Odum	Harmony, N. C.	H. Ec. teacher
Lucille Bowers	Box 54, Troutman, N. C.	H. Ec. teacher
Jessie West	Statesville, N. C., R. 6	H. Ec. & Science teacher
Mrs. Annie D. Rufty	Scotts, N. C.	H. Ec. teacher
Mrs. Connie K. Spicer,) (Col.))	524 South Tradd St. Statesville, N. C.	H. Ec. teacher
Mrs. Mary T. Knight	509 Church St. Mooresville, N. C.	Housekeeper
Mrs. Neel Stewart	N. Main St. Mooresville, N. C.	Housekeeper
Sarah Lewis	502 S. Mulberry St. Statesville, N. C.	Teacher
Eunice Sloop Gouge	809 Main St. Mooresville, N. C.	None
Mrs. W. B. Harris, Jr.	Mooresville, N. C., R. 1	Housekeeper
Mrs. H. B. Moore	Stony Point, N. C.	Housekeeper
Mary Davis Pou	Elmwood, N. C.	Junior W.C.U.N.C.
Julia Current	Olin, N. C., R. 1	Student W.C.U.N.C.

(over)

IREDELL COUNTY

HOME DEMONSTRATION TRAINED PERSONS

Name	Address	Present Position
(Mrs.) Anne T. Page	Statesville, N. C.	Home Dem. Agent
Miss Louise Cutting	812 Caldwell St. Statesville, N. C.	Housekeeper in own home
Martha Culp	Statesville, N. C., R. 2	Home Ec. teacher
(Mrs.) Emma A. Robertson	Union Grove, N. C.	Home Ec. teacher

Demonstrations will be started on a county-wide basis on April 15 and continue until all are given. The home economics teachers, Farm Security home supervisor, home agent and one trained homemaker will give the demonstrations.

Davie County 2nd Day

The chairman of Civilian Defense, Mr. E. C. Tatum, brought greetings to a group of 27 block leaders and home economics workers. Mr. Tatum's talk was one that would make you want to roll up your sleeves and work a little harder. He complimented the program and congratulated home economics workers offering their services and was pleased to have Civilian Defense and the State Nutrition Committee sponsor the program and give their support.

Mr. Rankin, Farm Agent, gave a most interesting and worthwhile talk on food production. He gave food facts and figures on a county, State, and national basis. His talk was given in a serious manner and was accepted in that way. Garden bulletins were discussed and given to those who desired copies.

The two day schools were held in the Cooleemee home economics laboratory. Miss Inez Hubbard, Home Economics Teacher, was a very thoughtful hostess. The school superintendent, Mr. R. S. Proctor, Mocksville, and principal, Mr. G. E. Smith, Cooleemee, greeted the group. Mrs. Mildred Seaber, Home Economist of the Duke Power Company is an asset to any meeting of this nature and she gave the demonstration on Dehydration of Fruits and Vegetables in a most practical way.

REPORT OF COUNTY FOOD CONSERVATION WORKSHOP

Name of Home Economics Worker: Ruth Current

County Meeting: Rowan County

Attendance: 1st Day 80
2nd Day 72

Cost of Dem. Materials $

CIVILIAN DEFENSE	Walter H. Woodson, Sr., Salisbury, Chairman Bryce Beard, " , Coordinator Erwin Lampert, " , Service Corps Director Mrs. William Kizziah C.S.C. (Co. Chairman)
NUTRITION COMMITTEE	, Chairman
FARM SECURITY HOME SUPERVISOR	Miss Margaret E. Jones
HOME ECONOMICS TEACHERS	Anna Hall, Salisbury Lavilla J. Britt, Salisbury Margaret Blair, China Grove Helen Kirk, Cleveland Mary Lillie Ray, East Spencer Mrs. Lester Slate, Spencer Dorothy Craven, Granite Quarry Elizabeth Pearsall, Landis Edith Staton, Mount Ulla Virginia McNeeley, Rockwell Mrs. Mary H. Patrick, Woodleaf
HOME DEMONSTRATION AGENTS	Mrs. Lorraine B. Redden, Home Agent None, Asst. Home Agent Mrs. Annie J. Johnston, Negro Home Agent
COLLEGE HOME ECONOMICS TEACHERS	Miss Cora E. Gray, Catawba College, Salisbury Miss Katherine French " " "
COMMERCIAL HOME ECONOMISTS	Mrs. Mildred Seaber, Duke Power Company

(OVER)

HOME ECONOMICS TRAINED HOUSEWIVES

REMARKS AND PLAN FOR CARRYING FOOD CONSERVATION WORKSHOP TO COMMUNITIES:

(OVER)

This meeting was held in the office of the home demonstration agent, Mrs. Roy Redden. Miss Margaret Jones, Farm Security Home Supervisor, and Mrs. Mildred Seaber, Duke Power Company home economist, were willing helpers and had all demonstration supplies and equipment ready when I arrived.

Mrs. Redden opened the meeting. She stated the purpose of the workshop and the place each group would take in the program in their respective work.

The county and city home economics teachers, white and Negro, dietitian from Catawba College, Negro Subject Matter Specialist of the Extension Service, both white and Negro home demonstration agents, Farm Security home supervisor, and Mrs.

(see page attached)

Mildred Seaber, Duke Power Company home economist, and two homemakers (uninvited) reported for this meeting.

The 2nd Day's Meeting was opened by Mrs. William Kizziah, Co-chairman, Citizens Service Corps. Mrs. Kizziah is a young enthusiastic worker and has a corps of excellent ward leaders. There were 72 in attendance. These were from Salisbury and Spencer.

The following plan was made for carrying the Food Conservation program: Beginning April 12 - May 5, eighteen (18) demonstrations will be given in Salisbury and Spencer by Mrs. Mildred Seaber, Duke Power Company home economist; Mrs. Roy Redden, Home Demonstration Agent; Miss Margaret Jones, Farm Security Home Supervisor; Miss Cora Gray, Head of Home Economics Department, Catawba College; Anna Hall and Lavilla Britt, Home Economics Teachers, Salisbury High School; Mary Lillie Ray, Home Economics Teacher, Spencer High school. I liked the way Mrs. Kizziah went about organizing the two towns. Her plans were presented to the Kiwanis Club on the following Friday and the members promised to grow gardens if the women would do the canning of the surplus.

Radio programs and exhibits for town store windows will be included in the follow-up program. Articles for the papers will be written by special committee members.

REPORT OF COUNTY FOOD CONSERVATION WORKSHOP

Name of Home Economics Worker: Ruth Current

County Meeting: Cabarrus County

Attendance: 1st Day _____ 2nd Day _____

Cost of Dem. Materials $ _____

CIVILIAN DEFENSE	R. E. Ridenhour, Jr., Concord, Chairman E. T. Bost, Concord, Coordinator J. A. Cannon, Concord, Service Corps Director Mrs. Bernard Fetzer - Women's Div. of Citizens Service Corps
NUTRITION COMMITTEE	Mrs. Mary Lee McAllister Chairman
FARM SECURITY HOME SUPERVISOR	Mrs. Virginia C. Miller
HOME ECONOMICS TEACHERS	Mildred Iley Green, Midland Sarah Robbins, Kannapolis Mary Neil Alexander, " Martha Morrow, Concord Elizabeth Raby, " Betty Beam, Harrisburg Mrs. Mabel Blume, R. F. D., Concord Ruth James, Mount Pleasant Mildred Pigg, Route 2, Concord Mildred Lloyd Hodges, Route 2, Concord Katie Jones - Logan High School Concord Elizabeth Raby - Concord High School Mary Neal Alexander - Kannapolis
HOME DEMONSTRATION AGENTS	Mrs. Mary Lee McAllister, Home Agent None, Asst. Home Agent ", Negro Home Agent
COLLEGE HOME ECONOMICS TEACHERS	
COMMERCIAL HOME ECONOMISTS	Mrs Seeber - Duke Power

(OVER)

HOME ECONOMICS TRAINED HOUSEWIVES

REMARKS AND PLAN FOR CARRYING FOOD CONSERVATION WORKSHOP TO COMMUNITIES:

(OVER)

The "kick off" meeting was the hardest one for me. The County Chairman of Civilian Defense, Mr. R. E. Ridenhour, Jr., and the County Superintendent of Schools, Mr. C. A. Furr, greeted the group of county home economics teachers, white and Negro, the Farm Security home supervisor, and the home demonstration agent. Both of these men spoke enthusiastically and wanted the girls to know that they would have their backing and support in developing the program and in putting it over in the county. Mr. Ridenhour observed the absence of the city teachers. He called immediately the principal of the City Schools and told him to send his teachers to the meeting. They came in the afternoon.

The school principal was a frequent visitor - he came in between classes on both

(see page attached)

days. This meeting was held in the laboratory of School. The home economics teacher, the Farm Security home supervisor, and the home demonstration agent assisted greatly in making this meeting a success.

The 2nd Day Meeting was attended by the ward leaders. Mr. Archie Cannon, Service Corps Director, not only gave an inspirational talk and offered his moral support but brought some of the women to the meeting and stayed through the demonstration. Concord Citizens Corps Service for Women's Work was just getting organized. The women seemed interested in the program and plans were made for complete county coverage by using the block system.

Mr. Cannon, Mr. Ridenhour, and Mr. Furr's support in launching the program was invaluable.

I presented the State-wide Food Conservation program on Wednesday, April 17, to the Concord Rotary Club. After the program the club voted to cooperate by providing canning equipment for a center or centers for the women of Concord.

Not only are we getting fine cooperation from the city, town, and village women but from the men, too. We do need their support.

I expect to follow up program progress from time to time.

CABARRUS COUNTY

Mrs. William Ritchie	363 S. Union St., Concord, N. C.	Homemaker
Mrs. A. T. Carper	65 Hillcrest Drive, Concord, N. C.	Homemaker
Mrs. M. N. Hennessee, Jr.	498 S. Union St., Concord, N. C.	Homemaker
Mrs. Ray Flowers	Harrisburg, N. C.	Homemaker
Mrs. A. B. Cook	17 Lafayette St., Concord, N. C.	Homemaker
Miss Mary Neil Alexander	Cannon High School, Kannapolis, N. C.	Teacher
Miss Helen Robbins	Cannon High School, Kannapolis, N. C.	Teacher
Mrs. C. E. Stout	209 N. Ridge St., Kannapolis, N. C.	Homemaker
Miss Ruby Morgan	~~Mary Ellis Hall~~, Kannapolis, N. C.	Dietitian
Mrs. Owen Hill	Hill and Wrenn, Kannapolis, N. C.	Homemaker
Mrs. D. A. Finger	211 Lee St., Kannapolis, N. C.	Homemaker
Mrs. Parker Hartsell	507 S. Ridge St., Kannapolis, N. C.	Homemaker
Miss Ruth James	Mt. Pleasant, N. C.	Teacher
Miss Betty Beam	Harrisburg, N. C.	Teacher
Mrs. Mildred I. Green	Midland, N. C.	Teacher
Mrs. Mable Blume	Concord, Route 1	Teacher
Mrs. Mildred Lloyd Hodges	Route 2, Concord, N. C.	Teacher
Miss Mildred Pigg	Route 2, Concord, N. C.	Teacher
Mrs. Virginia C. Miller	Concord, N. C.	Farm Security Supervisor
Mrs. Mary L. McAllister	Concord, N. C.	Home Demonstration Agent
Miss Sue Vance Gandy	Harrisburg High School, Harrisburg	Science Teacher
Mrs. Vivian Ludwig	Concord, N. C. Route 4	Grade Teacher
Mrs. R. Matt Patterson	Concord, N. C.	Homemaker

Ward Leaders Present at 2nd

Mrs. Mary Fetzer (1)
" Roy Hoover (2)
" W. H. Beberdite (3)
" Greenlee Caldwell (4)
" E. Sourvain (5)
" Kenneth Snead (6)
" William Ritchie (7)
" R. C. Williams (8)
" James L. Brown (9)
" H. C. Reid (10)
" Grady Faulkenberry (11)
" C. B. Fry (12)
" Quin Shinn (13)
" J. W. Linck (14)

STATE-WIDE FOOD CONSERVATION WORKSHOP

Raleigh, North Carolina
March 5 and 6, 1943

Friday, March 5, 10:00 a. m.

Catherine Dennis, State Department of Public Instruction, presiding

PURPOSE OF THE WORKSHOP.....Catherine Dennis, State Supervisor
Home Economics Education
State Department of Public Instruction

GREETINGS.....His Excellency J. Melville Broughton
Governor of North Carolina

FOOD CONSERVATION:

Canning and Freezing.....Mrs. Cornelia C. Morris
Economist in Food Conservation and Marketing
Agricultural Extension Service

INTRODUCTION OF GUESTS.....Dr. John F. Kendrick, Chairman
State Nutrition Committee
State Board of Health

LUNCH - 12:45 to 1:45 p. m.

FOOD CONSERVATION:

Dehydration, Brining and Storing.....Ruby Scholz
Economist in Food Conservation and Marketing
Agricultural Extension Service

Saturday, March 6, 10:00 a. m.

Dr. John F. Kendrick, Chairman of State Nutrition Committee, presiding

DEMONSTRATION:

Adequate Storage for Canned Products.....Elizabeth Williams
Specialist in Home Management and House Furnishings, Agricultural Extension Service

THE NORTH CAROLINA FOOD PRODUCTION PROGRAM.....John W. Goodman, Assistant Director
Agricultural Extension Service

(OVER)

FOOD DISTRIBUTION.....Hillman Moody, State Supervisor
Food Distribution Administration

O.P.A. REGULATIONS.....R. Bruce Roberts
State Rationing Officer
Office of Price Administration

ORGANIZATION FOR PUTTING PROGRAM ACROSS.....Mrs. Stella R. Cusick
State Home Management Supervisor
Farm Security Administration

WAKE COUNTY ORGANIZATION FOR FOOD CONSERVATION...Mrs. Robert Wyatt, Director
Wake County Service Corps
Office of Civilian Defense

SUMMARY.....Ruth Current
State Home Demonstration Agent
Agricultural Extension Service

(OVER)

Negro Schedule

Wilhelmina

Charlotte	March 16 - 17
~~Winston-Salem~~ Salisbury	March 18 - 19
Kinston	March 23 - 24
Goldsboro	March 25-26

Dazelle

~~Concord~~ Davidson	March 16-17
~~Graham~~	~~March 19 - 20~~
Lumberton	March 23 - 24

Provide Equipment

Lucy James

Wilmington	March 16 - 17
Fayetteville	March 18 - 19
Elizabeth City	March 23 - 24
Wilson	March 25 - 26

Dent

Durham	March 23 - 24

B. Ware

Greensboro	March 16 - 17

1st Training School
2nd Training School held separately for Sector and Block Leaders

Notify the local Chairman of Civilian Defense.

Place of meeting.

REPORT OF COUNTY FOOD CONSERVATION WORKSHOP

Name of Home Economics Worker: Mrs. Cornelia C. Morris

County Meeting: Wake County

Attendance: 1st Day
2nd Day

Cost of Dem. Materials $

CIVILIAN DEFENSE	Mr. Frank Daniels, Chairman Mr. Hunter Ellington, Coordinator Mrs. Robert Wyatt, Service Corps Director
NUTRITION COMMITTEE	Mrs. Warren Booker, Chairman
FARM SECURITY HOME SUPERVISOR	
HOME ECONOMICS TEACHERS	Mrs. Anna B. Triplett, Apex Mrs. W. L. Bowman, Raleigh Dorothy Phillips, Raleigh Sarah Cox, Cary Lucille Shearon, Fuquay Springs Mrs. Helen P. Yeargan, Garner Mrs. Eunice Hinton, Apex R-1 Grace Newell, Knightdale Mary Kathryn McQueen, Millbrook Mrs. Elizabeth Glass, Raleigh Madge Glazener, Raleigh Bertie Lee Whitesides, Raleigh Mrs. Lucile Jordon, Wake Forest R-3 Mary Lacy Palmer, Zebulon ** Elizabeth Bason, Raleigh Alice Williamson, Raleigh (School for Blind)
HOME DEMONSTRATION AGENTS	Mrs. Maude McInnes, Home Agent Marjorie Freeman, Asst. Home Agent Mrs. Bertha M. Edwards, Negro Home Agent
COLLEGE HOME ECONOMICS TEACHERS	* Miss Ellen Brewer, Meredith College * Miss Whitesides, Peace Junior College ** Miss Elizabeth Bason, St. Mary's Junior College Shaw University St. Augustine State College Extension Staff Farm Security State Staff State Staff, Home Economics Education
COMMERCIAL HOME ECONOMISTS	Mrs. Mary Johnson, Carolina Power and Light Company Miss Ada Williams, Raleigh Gas Company

(OVER)

*The same person.
** " " "

HOME ECONOMICS TRAINED HOUSEWIVES

REMARKS AND PLAN FOR CARRYING FOOD CONSERVATION WORKSHOP TO COMMUNITIES:

(OVER)

Promotional Schedule

FOOD CONSERVATION PROGRAM
of the
State Civilian Defense Nutrition Committee
cooperating with
The State Agricultural Extension Services,
The Farm Security Administration,
The State Department of Education, and
college and commercial nutritionists

*****

Week of Feb. 15 -- First announcement of program over 26 radio stations on "North Carolina Goes to War" program.

Feb. 18 -- Announcement through Press Associations and direct to papers through State College Agricultural News Service, which will follow up with stories throughout campaign.

*Mar. 4 -- Governor Broughton on Station WPTF, Raleigh (680 Kc).

*Mar. 11 -- Round table by R. L. McMillan, State Director of Civilian Defense; Dr. J. F. Kendrick, Executive Secretary State Nutrition Committee; Miss Ruth Current, State Home Demonstration Agent; Mrs. Stella R. Cusick, State Home Management Supervisor, FSA; Miss Catherine Dennis, State Supervisor Home Economics Education. (Station WPTF)
5:30-5:45

*The March 4 and 11 broadcast dates are tentative. Announcement will be made later of exact time.

SCHEDULE OF COUNTY MEETINGS

March 1943

	11-12	16-17	18-19	23-24	25-26	30-31	
Mrs. Stella Cusick		Stanly	Montgomery	Lenoir	Wayne		
Margaret Fuller	Madison	Yancey	Mitchell	Henderson	Buncombe		
Lena Bullard		Davidson	Forsyth	Surry	Yadkin		
Elsie Yarborough		Sampson	Cumberland	Hoke	Scotland		
Myra Scull		Warren	Northampton	Halifax	Hertford		
Mrs. Lucy P. Gentry		Granville	Vance	Franklin	Johnston		

	12-13	16-17	19-20	23-24	26-27	30-31	
Catharine Dennis		Nash	Chatham	Durham	Orange		
Sarah Jenkins		Cherokee	Clay	Graham	Macon		
Louise Lowe		Guilford	Alamance	Caldwell	Alexander		
Rosemary Codell		Moore	Richmond	Robeson	Bladen		
Maybel Lacy		Greene	Martin	Bertie	Edgecombe		
Virginia Ward		N. Hanover					

	11-12	16-17	18-19	23-24	25-26	30-31	Apr. 1-2
Ruth Current		Cabarrus	Rowan	Davie	Iredell		
Ruby Scholz		Randolph	Lee	Harnett	Wilson		
Julia McIver	Pamlico	Craven	Carteret	Onslow	Jones		
Mrs. Cornelia Morris		~~Wake~~			Wake		
Mrs. Esther Willis		Mecklenburg	Gaston	Union	Anson		
Verna Stanton		Duplin	Pender	Brunswick	Columbus		
Anna Rowe		Swain	Jackson	Haywood	Transylvania	Burke	Avery
Anamerle Arant		Person	Caswell	Rockingham	Stokes		
Pauline Smith		Beaufort	~~Pitt~~	Camden Pasquotank	Gates		
Willie Hunter		Watauga	Ashe	Alleghany	Wilkes		
Martha Smith	Washington	Chowan	Perquimans				
Rose Ellwood Bryan	Polk	Rutherford	McDowell	Catawba	Lincoln	Cleveland	
~~Cornelia Simpson~~		~~Washington~~	~~Tyrrell~~	~~Hyde~~			
Sadie Hendley		Currituck	Dare	Hyde	Tyrrell		

FOOD PRESERVATION WORK SHOP

Home Demonstration Laboratory - Old Rex Hospital

March 5 and 6, 1943

Conducted by: Mrs. Cornelia C. Morris, Extension Economist in Food Conservation and Marketing
Miss Ruby Scholz, Extension Economist in Food Conservation and Marketing

Purpose: To give uniform instruction in safe methods of food preservation to all agencies that are responsible for food preservation programs, to avoid wasteful duplication and to insure harmonious and effective working relationships.

Friday: 10:00 A. M.

Food Preservation: Mrs. Morris

1. Conservation of products from the Victory Garden
2. The canned foods budget
   a. Estimate number of jars needed to fill budget
   b. Check supplies and equipment on hand
   c. Clean and store supplies and equipment
3. Canning equipment - types and use.
   a. Non-acid products
   b. Fruits and tomatoes
4. Methods to use when equipment is scarce
   a. Canning
   b. Freezing
   c. Drying
   d. Brining and storing
5. Importance of safe methods
   a. Steam under pressure
   b. Hot-water canner
6. Demonstrate operation of pressure canner
   a. Safety valves and petcock
   b. Amount of water to use
   c. Care and cleaning
7. Demonstrate the canning of non-acid vegetables and fruits.
   a. Selection and grading
   b. Blanching and precooking
   c. Packing and head-space
   d. Processing
8. Discuss problems in canning
   a. Loss of liquid in jars
   b. Imperfect seal
   c. White deposit in jars
   d. Spoilage and causes
   e. Canning acids
   f. Unsafe methods - oven, open kettle, etc.
   g. Flat sour

(OVER)

Friday: 1:30 P. M. Miss Scholz

I. Home Drying of Fruits and Vegetables

Introduction:

1. The place of drying in the Food Preservation Program
2. Nutritional value of products
3. Advisability

Types of driers - their construction
Only simple equipment - pans, knives, steamer, towels, etc.
Selection, preparation, and treatment of products to be dried
Vegetables - steaming
Fruits - sulphuring and salt water bath
Operation and use of drier
Temperature and time
Packaging - storage - care
Rehydration

II. Preservation by Salting or Brining

When is it advisable?
Food value
Important details
a. Cleanliness
b. Quality products
c. Cool storage
Simple equipment
Salt proportions
a. Fermentation - kraut
b. No fermentation - cucumbers, peppers, corn, string beans, green tomatoes
Preparation for storage
How to use salted, brined, and fermented vegetables

III. Home Food Storage

Requirements for: Canned products
Dried products
Brined products
Fresh fruits and vegetables
a. What to store

1. Basement or cellar storage
a. Adequate shelves and bins or stacked crates
2. Cave cellar
3. Pit storage
4. Mound storage

1 safety valve - petcock - gauge

Safe Use and Care of Pressure

Put Pressure into good condition now.
Fewer on the market until the war is over.
150,000 to be released soon.

I - Pressure Cooker Canning is Safer than Water bath method.

1. Only method where by heat - resistent spores, (that cause canned food to spoil) can be killed.

2. These spores can be found in meat, fish, poultry and in all vegetables (except tomatoes, pimentoes, peppers and rhubarb.

II - Pressure Canners are so made that no steam can escape from the kettle.

1. Steam then exerts a pressure that causes the temperature to rise higher than that of water boiling in an open kettle. (If no air is present in the cooker, the relationship between the pressure and the temperature is as follows:

Pounds Pressure above atmospheric pressure at sea level	Temperature inside Canner during processing
0	212 degrees F
5	228 " "
10	240 " "
15	250 " "

Be sure pressure gauge is accurate -- for right temperature.

Advantages of a Canner

1. Can save food
2. Can save fuel
3. Can save time
4. Can save human energy if used and cared for properly

In order to get the best Service from the canner you must know how to operate it correctly and intelligently.
It is a safe piece of equipment if all rules are followed.

Care

New parts will be difficult to get for the duration - Place orders for worn or broken parts at once -- Manufacturers.

Owners - Share Canners with others.

Know the Materials

Materials made either of aluminum or steel coated with tin or porcelain enamel.

Aluminum Canners are made of heavy cast or wrought aluminum.

1. Cast aluminum is porus and unless well cleaned, pits readily, and absorbs odors and flavors.
2. Cast aluminum is harder and pits less readily.

Food should not be left in canner. Dark pitting weakens the walls and causes leakage around top of the cooker.
Do not cool canner suddenly. May cause cooker to warp or crack.

To Clean:

1. Wash cooker in hot soapy water and scour with a fine steel wool - Rinse and dry well.
2. Never use strongly - alkaline gritty scouring powder or soda. (They darken and stain aluminum)
3. Do not scrape.
4. To brighten pour in enough water to cover stains, add 2 T. vinegar for each quart of hot water. Seal as for canning and bring pressure to 5 pounds and hold there for 5 minutes.

Tinned and enameled steel Canners.

1. Scratch easily.
2. Careful cleaning and handling because the steel base will rust if the coatings are removed.

Do not sear meat in cooker at high temperature - (tin may melt)
(Treat this cooker as you would a glass one.
Do not over heat.
Do not allow food to boil dry (causes coatings to crack).
Sharp blows may cause chipping.

To Clean: Do not use steel wool or harsh abrasive powder. Use only a mild scouring powder.

The lid of the Cooker

Keep the edges of the lid free from food, rust, dents and chipped spots (to keep steam from escaping. If steam leakage occurs, be sure to add enough water to prevent the cooker from boiling dry. If lid sticks rub edges of the lid and the kettle with cooking oil before sealing.

Pressure Gauge

1. Most important and delicate part of the pressure canner - and success in canning and cooking depend largely upon its accuracy.

2. This part easily may get out of adjustment. If the gauge registers a pressure higher than it actually is then the temperature may not be high enough to process the food inside.

If the gauge registers a pressure lower than it actually is the temperature may be too high and products will be over cooked.

Guage checked for accuracy with a master guage or a maximum thermometer at least once a year.

Do not drop or strike the pressure guage or allow food particles to get into it.

Safety Valve:

1. To permit steam to blow off if pressure should rise beyond safe point.

2. Protection against over heating and explosion.

Therefore the safety valve and its parts, especially ball and socket must be thoroughly cleaned after the cooker is used. (Soaking in vinegar or kerosene helps to remove food deposits and corrosion.
(Failure of safety valve to open may cause a serious accident)

Petcock

1. When open, releases steam and air; when closed, it holds the steam.
2. Should be clean in order to work freely and prevent steam from escaping when closed.
(draw a piece of cloth through it occasionally or fine brush - tooth pick.)
3. Rusting weakens petcock. May soak in vinegar - kerosene

Store in a dry place

1. Thoroughly dry - Cloth hood with draw string or

2. Place lid in a paper bag and turn it right side up on a shelf.
Wadded news paper placed in the kettle will absorb excess moisture and prevent corrosion.

Operation - Follow directions specifically - - Same principle of operation is common to all.

Directions:

1. Put from 1 - 2 quarts of boiling water into the cooker.

2. Place cooker over heat.

3. Use rack when canning to prevent the jars from resting directly on the bottom of the canner.

4. Arrange the jars or tins in cooker so they do not touch each other or the sides of the cooker.

5. Open the petcock.

6. Place lid on the kettle.
   a. Good contact between kettle and lid.
   b. Look for arrow - match.

7. Lock the sealing device.

8. Close the safety valve.

9. Leave petcock open 7 to 10 minutes after the steam begins to escape. (all air being forced out) May have air pressure and not steam pressure.

10. Close petcock.

11. Follow directions for canning from time table.

12. Keep Pressure Constant while processing. Success in canning depends on uniform control throughout the process.

Constant Watching

Why Constant

1. If pressure varies 2 pounds liquid may be drawn from the jar.
2. Temperature needed for sterilization within the jars or tins may not be reached.

13. When processing is complete
    1. Remove cooker from heat
    2. Allow pressure to decrease gradually until the pointer indicates Zero.
    3. Do not open the petcock until the pointer reaches zero (if canning in tin this is not necessary)
    4. Open petcock as soon as canning is complete.

14. Open Petcock immediately but slowly. Never remove the top before the pressure indicates zero.
If a heavy stream of steam escapes, close it again for a minute, but if a small amount escapes continue opening. All expelled. If petcock is not opened at this time a vacuum may be created which causes some of the liquid to be drawn from the jars and make the lid of the cooker difficult to open.

15. Remove lid by tilting it away from you.

16. If glass jars are used, remove them carefully - tighten the lids immediately -- Immerse them at <u>once</u> into cold water.

Present for Meeting held on March 18, 1943

Vocational Home Economic Teachers
Mrs. Helen Kirk Graham - Cleveland
Mrs. T. L. Patrick - Woodleaf
Mrs. Julia Slate - Spencer
Miss Mary Lillie Ray - East Spencer
Miss Dorothy Craven - Granite Quarry
Miss Virginia McNeely - Rockwell
Miss Elizabeth Pearsall - Landis
Miss Margaret Blair - China Grove

Negro Home Economic Teachers
Miss Iris Jefferis - East Spencer
Miss Mildred Jordon - Price High School
Miss Swannie Evans - Price High School

Miss Margaret Jones - Farm Security
Mrs. Mildred Seaber - Duke Power Company
Mrs. Lorraine B. Redden - Home Agent
Mrs. Annie J. Johnson - Negro Home Agent

Whilimena Laws - Negro State Subject Matter Specialist

Miss Lavilla Britt - Boyden High School
Miss Anne Hall - Boyden High School

Mrs. J. C. Umberger - Home Demonstration Club Member
Miss Brooke Umberger - Home Demonstration Club Member

COOPERATIVE EXTENSION WORK
IN
AGRICULTURE AND HOME ECONOMICS
STATE OF NORTH CAROLINA

NORTH CAROLINA STATE COLLEGE OF AGRICULTURE AND ENGINEERING
NORTH CAROLINA COUNTIES AND
UNITED STATES DEPARTMENT OF AGRICULTURE COOPERATING

EXTENSION SERVICE
HOME DEMONSTRATION WORK

Salisbury, N. C.
April 9, 1943

Miss Ruth Current
State Home Demonstration Agent
State College Station
Raleigh, N. C.

Dear Miss Current:

I am enclosing a copy of the schedule for Food Conservation meetings for Rowan County. This is not complete. We will mail you a complete copy of the schedule after next Wednesday, when the county teachers are meeting to complete it. You have the copy of our schedule for the city including Spencer and East Spencer.

Dr. Armstrong has appointed Miss Margaret Jones, Supervisor Farm Security, Rowan County, chairman of the Nutrition Committee and Mrs. Mildred Seaber, of Duke Power Company, assistant chairman.

Sincerely yours,

Lorraine B. Redden

Lorraine B. Redden
Home Demonstration Agent

COUNTY FOOD CONSERVATION MEETINGS

Meeting	Location	Date	Time	Demonstrators
Scotch Irish Community				
Mt. Vernon Home Demonstration Club	Mrs. Rob Lyerly	May 19	2 P. M.	Redden, Graham
Steele's Store				Graham, Patrick
Woodleaf Community				
Woodleaf Home Demonstration Club	Place to be announced or School	June 4	3 P. M.	Patrick, Redden
Woodleaf Home Economic Girls				Patrick
Fisher				Patrick
Dunn Town				Patrick
Franklin				Patrick
Cleveland Community				
Home Economic Girls				Graham
Barber Grange				Mrs. J.C.Barber, Graham
Cleveland Nutrition				Mrs. A. D. Davis Mrs. Graham
Cleveland Home Demonstration Club	Cleveland Club House	May 26	2:30 P.M.	Graham,Redden
Mt. Ulla Community				
Amity				Mrs. J. C. Umberger Miss Staton
Mt. Ulla Home Demonstration Club	Mt. Ulla School	June 3	2:30 P.M.	Staton, Redden
Centenary				Staton, Jones Mrs. Goodnight
Miranda	Mrs. W.D.Graham	June 2	2:30 P.M.	Staton, Redden
Ebenezer				Staton, Jones
Patterson-Mill Bridge	Patterson Grange Hall	June 11	2:30 P.M.	Staton, Redden, Blair
Lingle-Central-Sale	Home to be announced	May 25	2 P.M.	Staton, Redden

Meeting	Location	Date	Time	Demonstrators
Enochville Community				
Corriher Home Demonstration Club	Corriher Club House	June 10	2:30 PM.	Pearsall, Redden
Enochville Home Demonstration Club	To be announced	May 18	2:30 PM	Pearsall, Redden
Sandy Ridge				Pearsall
Landis				Pearsall
China Grove Community				
China Grove				Blair
Harris Chapel Home Demonstration Club	To be announced	May 29	2:30 pm	Redden, Blair
Mt. Zion H. D. Club	to be announced	May 21	7:30 pm	Redden, Blair
Oak Ridge H. D. Club	to be announced	May 17	2 PM	Redden, Blair
N. Kannapolis H.D.Club	to be announced	May 24	2:30 pm	Redden, Pearsall
Fink & Yost H.D.Club	to be announced	June 8	2 PM	Redden, Pearsall
Cress H. D. Club	to be announced	May 21	2:30 pm.	Redden, Blair
Sumner				Blair, Jones
Franklin Community				
Franklin-Ellis H.D.Club	Club House	May 20	2 PM	Slate, Redden
Ellis				Slate, Redden
Yadkin				S late, Redden
Dukeville				Slate, Ray, Redden
Granite Quarry Community				
St. Paul H.D. Club	Club House	June 1	2 PM	Felts, Redden
Granite Quarry				Felts, McNeely
Faith				Felts, McNeely
Providence-Craven				Felts

Meeting	Location	Date	Time	Demonstrations
Rockwell				
Rockwell H.D.Club and Schools	Rockwell School	June 7	3 P. M.	McNeely, Redden
Gold Hill				McNeely, Felts
Organ				McNeely, Felts
Lower Morgan				McNeely, Jones
Liberty Home Dem. Club	Liberty School	May 28	2 P.M.	Redden
Union				Ray
Bringle Ferry Rd.				Ray
Enon Home Dem. Club	Mrs. C. P. Barber's	May 12	2 P. M.	Redden

Schedule for Food Conservation Meetings

Rowan County

9:30 A. M. - 11:30 A. M.
1:30 P. M. - 3:30 P. M.

Date	Sector	Place	In Charge
April 12	Sector 1	Mobile Kitchen	Mrs. Seaber Mrs. Redden
April 13	Sector 9, 10, 11	Mobile Kitchen	Mrs. Seaber Mrs. Redden
April 14	Sector 12,13	Mobile Kitchen	Miss Jones Mrs. Seaber
April 14	Sector 20, 21	Home Demonstration Kitchen	Dr. Gray Miss Jones
April 15	Sector 5, 6, 7	Home Demonstration Kitchen	Miss Jones Miss Hall Miss Britt
April 15	Sector 14, 15, 16	Mobile Kitchen	Mrs. Redden Mrs. Seaber
April 16	Sector 8,35,22	Home Demonstration Kitchen	Miss Hall Miss Britt
April 16	Sector 17,18	Mobile Kitchen	Mrs. Seaber Mrs. Redden
April 19	Sector 23, 24	Mobile Kitchen	Dr. Gray Mrs. Seaber
April 20	Sector 27,28	Mobile Kitchen	Miss Jones or Dr.Gray Mrs. Seaber
April 22	Sector 25, 26	Mobile Kitchen	Miss Jones Mrs. Seaber
April 27	Ward 1 & 2	Mobile Kitchen	Miss Ray Mrs. Seaber
April 28	East Spencer	Mobile Kitchen	Miss Ray Mrs. Seaber
April 29	Ward 1 & 2	Mobile Kitchen	Miss Ray Mrs. Seaber
April 30	Negro-E.Spencer (Contact Bessie Smith)	Mobile Kitchen	Miss Ray Miss Seaber

Date	Sector	Place	In Charge
May 3	Sector 29, 30	Mobile Kitchen	Mrs. Redden Mrs. Jones
May 4	Sector 32,33,34	Mobile Kitchen	Mrs. Redden Miss Jones
May 5	Sector 3, 31	Mobile Kitchen	Mrs. Redden Miss Jones

Chairman - Mrs. Ed. Ketchie
Assistant Chairman - Mrs. E. H. Clapp
Assistant Chairman - Mrs. J. A. Hutchins
Chairman Speaker's Staff - Mrs. T. P. Fowler
Chairman Training Staff - Mrs. Lester Slate
Chairman Publicity - Mrs. George B. Albright

Ward Leaders Service - Ward 1
Mrs. R. P. Lemmon - Chairman
Mrs. P. Stoudemire - Assistant
Mrs. P. E. Thompson - Assistant

Ward Leaders Service - Ward 2
Mrs. H. C. Swanson - Chairman
Mrs. R. H. Bingham - Assistant
Mrs. F. S. Cain - Assistant

Ward Leaders Service - Ward 3
Mrs. W. D. Hutchinson - Chairman
Mrs. G. A. Palmer - Assistant
Mrs. Ben Brandon - Assistant

Ward Leaders Service - Ward 4
Mrs. C. L. Mock - Chairman
Mrs. George Miller - Assistant
Mrs. Clyde Andrews - Assistant

Block Leaders Service - Ward No. 1
Mrs. Milton Faust
Miss Louise Younce
Mrs. E. F. Cahill
Mrs. A. L. Frick
Mrs. M. M. Mask
Mrs. Cecil Garvin
Mrs. James Butner
Mrs. J. H. Harrison
Mrs. E. O. Eubanks
Mrs. B. P. Moore
Mrs. Odell Livengood
Mrs. J. B. Parker
Mrs. C. A. Fink
Mrs. M. N. Eller
Mrs. Grady Withers
Mrs. H. L. Cline
Mrs. R. L. Morgan Myers
Mrs. J. M. Liles
Mrs. J. I. Scruggs
Mrs. Myrtle Davis

Block Leader's Service - Ward # 2

Mrs. Ben Cornelison
Mrs. S. A. Foltz
Mrs. B. J. Wessinger
Mrs. Ted Weant
Mrs. H. C. Renfro
Mrs. Albert Newcomb
Mrs. J. S. Upton
Mrs. Oscar Ketchie
Mrs. W. H. Shannon
Mrs. J. L. Brown
Mrs. Henry Suggs
Mrs. G. A. Broady
Mrs. H. A. Brendle
Mrs. R. C. Pickler
Mrs. E. L. Rankin
Mrs. J. M. Burton
Mrs. R. E. McKinney
Mrs. Joe Brown
Mrs. J. H. Bowers
Mrs. W. A. Hatley
Mrs. Hugh Young
Mrs. A. C. Hunter
Mrs. J. M. Crowell
Mrs. L. D. Holleman
Mrs. Stokes Devereux
Mrs. J. C. Fuller
Mrs. Charles Withers
Mrs. W. L. Kelley

Block Leader's Service - Ward # 3

Mrs. Joe Albright
Mrs. C. H. Simms
Mrs. George Sides
Mrs. Ray Loflin
Mrs. J. S. Pipkin
Mrs. F. G. Sigman
Mrs. Lois Campbell
Mrs. R. J. O'brien
Mrs. J. S. Turner
Mrs. L. H. Talbert
Mrs. R. W. Hutchins
Mrs. Guy Miller
Mrs. C. O. Spencer
Mrs. Fred Brinkley
Mrs. R. C. Bell
Mrs. C. H. Harrison
Mrs. E. P. Hughes
Mrs. W. J. Burton
Mrs. A. G. Duncan
Mrs. J. H. Gobble
Mrs. W. D. Spake
Mrs. J. W. Bean
Mrs. C. G. Gobble
Mrs. H. H. Henderson
Mrs. J. M. Moore
Mrs. S. M. Bryant
Mrs. John Cornelison
Mrs. J. F. Smith
Mrs. J. H. Pickett

Block Leader's Service - Ward # 4

Mrs. R. H. Strayhorn
Mrs. C. W. Kirby
Mrs. Marvin Roan
Mrs. G. A. Davis
Mrs. E. B. Farmer
Mrs. J. H. Benton
Mrs. O. C. Sharpe
Mrs. J. T. Bolton
Mrs. J. H. Kennerly
Mrs. J. A. Cahill
Mrs. G. A. Cauble
Mrs. David Geekie
Mrs. H. A. Williams
Mrs. H. H. Hair
Mrs. W. V. Towsen
Mrs. L. H. French
Mrs. M. T. Owen
Mrs. George Brandt
Mrs. W. C. Slate
Mrs. Wilbur Clarke
Mrs. William Headinger
Mrs. Dave Miller
Mrs. M. A. Agner
Mrs. W. G. Grubb
Mrs. B. C. Miller
Mrs. M. I. Moser

CITIZEN'S SERVICE CORPS.

Mr. Ervin Lampert .....Director Rowan County

Mrs. William D. Kizziah .....Assistant Director Rowan County

Mrs. Reid Goodson .....Director Block Leader Service, Salisbury

Frank B. John District.

Mrs. Wm. F. Robertson, Jr.....District Leader

Sector "A"

Mrs. Ervin Lampert.....Sector Leader

Mrs. W. H. Woodson, Jr. .....Co-Sector Leader

Mrs. H. W. Petterson Mrs. J. R. Trotter

Sector # 1

Mrs. J. C. Hadley.....Sector Leader

Mrs. Gordon Kirkland .....Co-Sector Leader

Block Leaders:

Mrs. Donald Dearborn Mrs. Merle Dye

Mrs. Raymond Jenkins Miss Janie Anderson

Mrs. Fred Young Mrs. J. Z. Whirlow

Mrs. John L. Rusher Mrs. I. L. Hoffner

Mrs. B. C. Newsom

Sector # 2

Mrs. Douglas Loflin.....Sector Leader

Mrs. Joe Gardner .....Co-Sector & Block Leader

Block Leaders:

Mrs. C. L. Kincaid Mrs. William Sealey

Mrs. F. L. Lewellyn Mrs. William Baker

Mrs. Ted Ritchie

CITIZEN'S SERVICE CORPS

BOYDEN DISTRICT

Mrs. W. Gettys Buille .....District Director

Mrs. J. R. Cabell.....Assistant District Director

Sector # 5

Mrs. S. P. Purvis .....Sector Leader

Block Leaders:

Mrs. James Pfaff	Mrs. Lawrence Haynes
Mrs. G. M. Smith	Mrs. Hugh Palmer
Mrs. Cameron	Mrs. F. B. Spencer
Mrs. J. D. Foreman	Mrs. C. R. Walters

Sector # 6

Mrs. J. H. Knox .....Sector Leader

Block Leaders:

Mrs. Stahle Linn	Mrs. Miles Smith
Mrs. Frank Marsh	Mrs. Luther Miller
Mrs. Donald Clement	Mrs. Carl King
Mrs. Gregory Peeler	Mrs. Carl Wheeler
Mrs. H. C. Petrea	

Sector # 7

Mrs. Charles Coggins.....Sector Leader

Block Leaders:

Mrs. Temple Snyder, Jr.	Mrs. J. S. Shuford
Mrs. J. L. Williams	Mrs. O. R. Pinkston
Mrs. Clay Swain	Mrs. J. E. Smith
Mrs. J. D. Cress	Mrs. Wm. Campbell, Jr.
Mrs. W. G. McFarland	Mrs. D. C. Butcher
Mrs. J. H. McKenzie	Mrs. H. A. Safrit

CITIZEN'S SERVICE CORPS

Sector # 8

Mrs. Francis Murdoch.....Sector Leader

Block Leaders:

Mrs. Walter J. Miller
Mrs. W. B. Poe
Mrs. R. L. Bernhardt
Mrs. J. H. Krider
Mrs. Gordon Hunt
Mrs. Charles Woodbridge
Mrs. George T. Fitz
Mrs. David Hanson
Mrs. David Woodward
Mrs. Donald Farshing
Mrs. Leake Bernhardt

Sector # 9

Mrs. Henry Weisiger.....Sector Leader

Block Leaders:

Mrs. Harry Goodman
Mrs. James Elium
Mrs. Myron Goodman
Mrs. James Bennett

WILEY DISTRICT

Mrs. W. L. Tatum.....District Leader

Sector # 10

Mrs. O. D. Cruse.....Sector Leader

Block Leaders:

Mrs. F. H. Still
Mrs. K. V. Epting
Mrs. Ralph Peeler
Mrs. Lester Jackson
Mrs. R. R. Powlas
Mrs. H. G. Prebble

Sector # 11

Mrs. C. C. Owen.....Sector Leader

Mrs. Paul Hinson .....Co-Sector Leader

Block Leaders:

Mrs. J. P. Thomason
Mrs. Grover Arney
Mrs. Edward Wicker
Mrs. Clyde Peeler

Mrs. Phillip Miller

CIVILIAN SERVICE CORPS.

Sector # 11 - continued

Mrs. C. W. Faggart — Mrs. Leonard

Mrs. J. A. Kennedy — Mrs. Harry Fisher

Mrs. Kenneth Wagoner — Mrs. Paul Phillips

Sector # 12

Mrs. Herman Kenerly.....Sector Leader

Block Leaders:

Mrs. Wm. Sherrill — Mrs. J. S. Youngblood

Mrs. Glenn Kenner — Mrs. James Leslie

Mrs. Ross W. Garrison — Mrs. E. W. Wagoner

Mrs. Roger Davidson — Mrs. C. B. Hunt

Miss Sadie Jenkins

Sector # 13

Mrs. John Davis.....Sector Leader

Block Leaders:

Mrs. Charles Malone — Mrs. J. E. Haynes

Mrs. J. L. Logan — Mrs. W. H. Hambly

Mrs. Fred Burke — Mrs. Howard Cline

Mrs. George Maynard — Mrs. Gurney Holshouser

Mrs. Sam Carter, Sr. — Mrs. A. B. Lackey

Mrs. Herman Peeler — Mrs. R. O. Bradley

Sector # 14

Mrs. Odell Naile ,.....Sector Leader

Block Leaders:

Mrs. Frank Fuller — Mrs. John Burdette

CIVILIAN SERVICE CORPS

Sector # 15

Mrs. Tom Lindsay..... .....Sector Leader

Block Leaders:

Mrs. W. C. Thompson — Mrs. Everett Thompson

Mrs. Charles Bessent — Mrs. Hoy Bame

Mrs. L. W. Gillespie

Sector # 16

Mrs. Zeb Morgan.....Sector Leader

Block Leaders:

Mrs. R. L. Winecoff — Mrs. W. L. Waller

Mrs. H. I. Chilson — Mrs. Tom Whitman

Miss Clara Bridges

Sector # 17

Mrs. Arthur Kluttz.....Sector Leader

Block Leaders:

Mrs. G. M. Eller — Mrs. Fred Leader

Mrs. Leonard — Mrs. Lee Brady

Mrs. Oran Hartman — Mrs. Arthur Shipton

Mrs. Penley

Sector # 18

Mrs. D. G. Safrit.....Sector Leader

Block Leaders:

Miss Pauline Safrit — Mrs. W. C.Mesimer

Miss Stanley Gudger — Mrs. G. L. Hillard

Miss Hazel McCormick — Miss Margaret Kesler

Miss Ruth Butler — Mrs. Annie Linder

Mrs. E. F. Weddington

CITIZEN'S SERVICE CORPS

A. T. ALLEN DISTRICT.

Mrs. P. E. Weant .....District Director

Mrs. B. D. Arey.....Assistant Director

Sector # 20

Mrs. E. J. Wagoner.....Sector Leader

Block Leaders:

Mrs. John W. Kesler	Mrs. Arthur Pinkston
Mrs. Geo. H. Lyerly	Mrs. J. A. Hood
Mrs. E. A. Powell	Mrs. W. B. Juilan
Mrs. Robert Lee	Mrs. E. E. Cruse
Mrs. L. H. Earnhardt	Mrs. M. H. Rozzelle
Mrs. Ernest Cook	Mrs. J. S. Phelps

Sector # 21

Mrs. B. W. Barger.....Sector Leader

Block Leaders:

Miss Daisy Kesler	Mrs. Carl Sells
Mrs. J. W. Clements	Mrs. John Marley
Mrs. B. B. Barringer	Mrs. L. E. Sloop
Mrs. Kerr Mowery	Mrs. Hattie Bradsher
Mrs. S. L. Miller	Mrs. J. D. Hege, Jr.
Mrs. Thomas Miller	Mrs. Tom Cornelison
Mrs. J. R. Williams	Mrs. J. M. Small

Sector # 22

Mrs. T. E. Dry.....Sector Leader

Block Leaders:

Mrs. J. P. McAdams	Mrs. J. H. Bernhardt
Mrs. Katharine Grimes	

CITIZEN'S SERVICE CORPS

Sector # 23

Mrs. A. E. Kirkner .....Sector Leader

Block Leaders:

Mrs. Thurman Wise	Mrs. S. A. Kesler
Mrs. Paul Whitlock	Mrs. W. R. Phillips
Mrs. N. N. Durant	Mrs. J. R. Haithcock
Mrs. A. J. Crowell	Mrs. W. A. Roseman
Mrs. J. C. Fulmer	Mrs. J. A. Canup
Mrs. I. W. Roberts	Mrs. A. J. Holshouser
Miss Meatta Bringle	

Sector # 24

Mrs. M. E. Britton.....Sector Leader

Block Leaders:

Miss Lois Hansell	Mrs. R. B. Davis
Mrs. J. A. Summers	Mrs. W. M. Ruble
Mrs. C. E. James	Mrs. G. L. Morris
Mrs. S. A. Barger	Mrs. Thomas B. Camp
Mrs. J. C. Eagle	Mrs. C. H. Fink
Mrs. L. Willett	Mrs. W. L. Holshouser
Mrs. T. H. Swofford	Mrs. F. H. Everhardt
Mrs. Myrtle Sprinkle	

Sector # 25

Mrs. J. R. Eldum.....Sector Leader

Block Leaders:

Miss Pauline Linn	Miss Kate Whittaker
Mrs. W. A. Rufty	Mrs. Harold Hellard
Mrs. C. E. Rimer	Mrs. Wilbert Rimer
Mrs. C. S. Lisk	Mrs. S. J. Lentz
Mrs. Harold Isenhour	

CITIZEN'S SERVICE CORPS

HENDERSON DISTRICT

Mrs. R. L. Davis.....District Leader

Sector # 26

Mrs. Hoy L. Fisher.....Sector Leader

Block Leaders:

Mrs. E. B. Powell
Mrs. A. M. Pinkston
Miss Louise Ramsey
Mrs. Fred Luther
Mrs. Coy L. Poole
Mrs. C. A. Misenheimer
Mrs. J. L. Artz
Mrs. Thurston Hoggart
Mrs. James Moose

Sector # 27

Mrs. John S. Whitman.....Sector Leader

Block Leaders:

Mrs. John Soods
Mrs. L. C. Poole
Mrs. Marvin Upton
Mrs. D. W. Miller
Mrs. James Penninger
Mrs. G. T. Pharis
Mrs. O. B. Skipper
Mrs. A. M. Barnes
Mrs. A. L. Jarrell

Sector # 28

Mrs. Arthur D. Mathewson.....Sector Leader

Block Leaders:

Mrs. T. R. Doby
Mrs. Z. W. Morris
Mrs. J. L. Harvey
Mrs. J. G. Pope
Mrs. W. R. Spry
Mrs. Raymond Wilhoit
Mrs. W. C. Hoffner
Mrs. Lucy Sink
Mrs. C. J. Tarleton
Mrs. Lottie Wiles
Mrs. F. C. Satterwhite

CITIZEN'S SERVICE CORPS

Sector # 29

Mrs. Gilbert Q. Miller.....Sector Leader

Block Leaders:

Mrs. H. C. Daniels
Mrs. R. L. Chandler, Jr.
Mrs. H. C. Stout
Mrs. G. E. Beeker
Mrs. S. O. Sowers
Mrs. Frank C. Cain
Mrs. L. A. Charles

FRANK B. JOHN DISTRICT.

Mrs. Wm. F. Robertson, Jr.....District Leader

Sector # 29

Mrs. E. D. Buckner.....Sector Leader

Mrs. J. C. Surratt.....Co-Sector Leader

Block Leaders:

Mrs. S. H. Plexico
Mrs. L. M. Boyd
Mrs. C. R. Lomax
Mrs. W. E. Curlee

Sector # 30

Mrs. John C. Tatum.....Sector Leader

Mrs. R. S. Gobble.....Co-Sector & Block

Block Leaders:

Mrs. E. H. Harrison
Mrs. J. F. Hurley
Mrs. John McCanless
Mrs. T. C. Fisher, Jr.
Mrs. A. A. Sawyer
Mrs. Tom Coneley
Mrs. C. G. Myers

Sector # 31

Mrs. Marvin Snider.....Sector Leader

Block Leaders:

Mrs. Hayden Holmes
Mrs. Charles Wentz
Mrs. M. B. Mattocks
Mrs. Julian Carpenter
Mrs. Ketchie

CIVILIAN SERVICE CORPS

Sector # 32

Mrs. J. B. Pridgen.....Sector Leader

Mrs. Clifford Peeler.....Co-Sector Leader

Block Leaders:

Mrs. Wm. Howard — Mrs. R. D. Blackwelder

Mrs. E. M. Hobson — Mrs. W. H. Myers

Mrs. W. T. Workman — Mrs. George Floyd

Sector 33

Mrs. Harry Bridenthal.....Sector Leader

Mrs. C. S. Morris, Jr.....Co-Sector Leader

Block Leaders:

Mrs. Dee M. Johnson — Mrs. C. V. Roberts

Mrs. Kent Goley — Mrs. Earl Charles

Mrs. Walker Harris — Mrs. W. P. Moore

Mrs. Frank Cline — Mrs. John Milholland

Mrs. C. W. Somers

Sector # 34

Mrs. Charles Parker .....Sector Leader

Mrs. J. D. Justice.....So-Sector Leader

Block Leaders:

Mrs. P. D. Roseman — Mrs. Jake Rendleman

Mrs. Frank McRae — Mrs. B. B. Gafford

Mrs. Powell Newsome — Mrs. W. F. Fleming, Jr.

Mrs. Charles Price — Mrs. E. O. Milligan

Sector # 35

Mrs. J. O. Sparks.....Sector Leader

Mrs. R. W. Hill.....Co-Sector Leader

Block Leaders:

Mrs. Kern Carlton — Mrs. M. L. Rufty

Mrs. Charles Shaver — Mrs. W. C. Taylor

Mrs. Paul Lentz — Mrs. G. C. Cooper

Mrs. W. L. Ross — Mrs. Raymond Dean

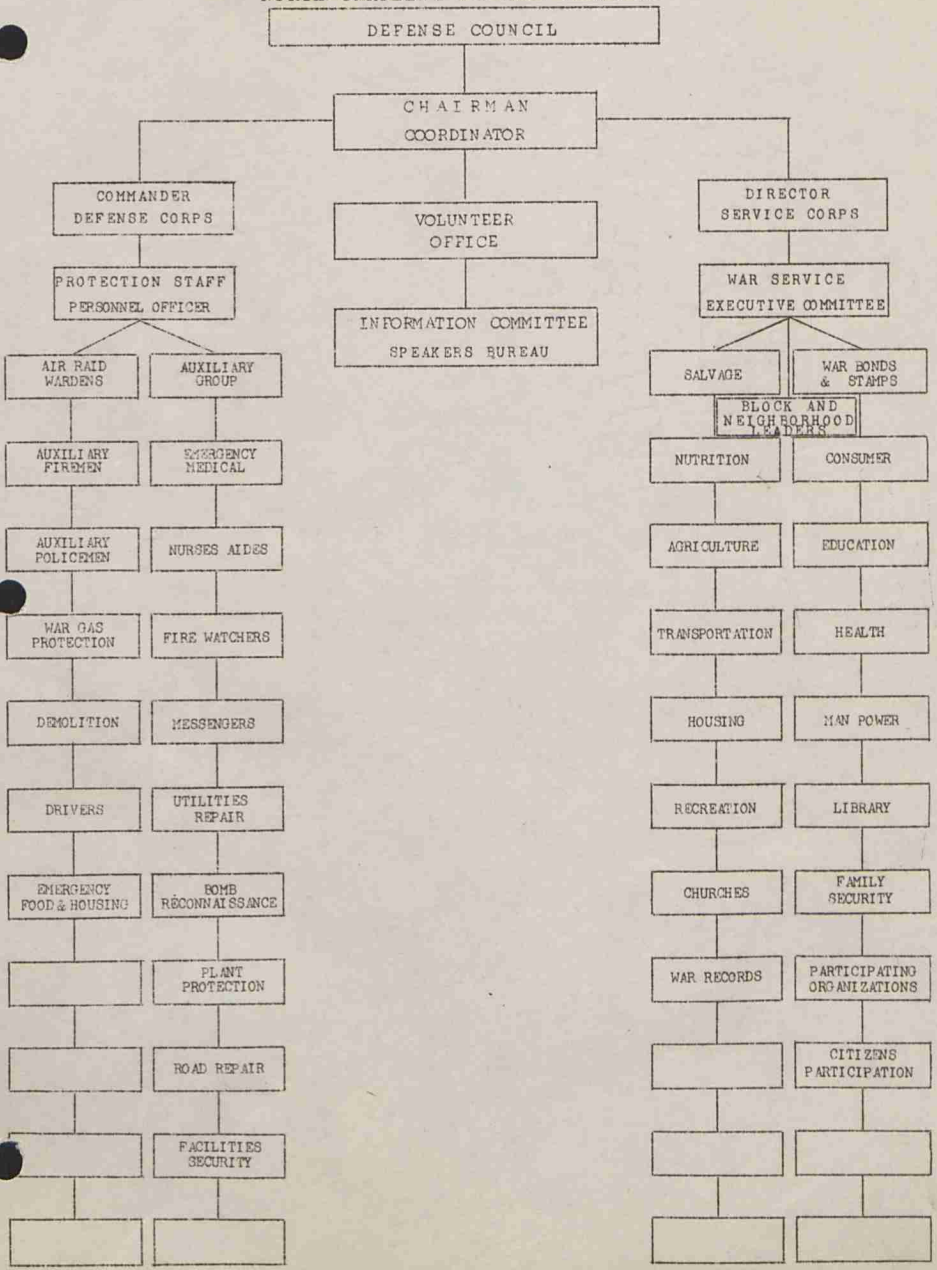
Present for Meeting Held on March 19, 1943

Name	Title
Mrs. J. C. Hadley	Sector Leader
Louise Younce	Block Leader
Mrs. Julia Slate	Vocational Home Ec. Teacher
Mrs. H. C. Swanson	Leader Sector - Spencer
Mrs. W. D. Hutchins	Sector Leader - Spencer
Mrs. Ben Cornelison	Block Leader - Spencer
Mrs. Ed Ketchie	Chr. C. S. C. - Spencer
Mrs. M. J. Eagle	Yadkin
Mrs. A. B. Martin	Yadkin
Mrs. Hugh Patrick	Sector Leader - Yadkin
Mrs. William Kizziah	Ass't Rowan Co. Chairman C.S.C.
Mrs. Charles L. Coggin	Sector Leader - Salisbury
Mrs. J. O. Sparks	Sector Leader - Salisbury
Mrs. Walter L. Tatum	Division Leader - Salisbury
Mrs. John Davis	Sector Leader - Salisbury
Mrs. Baxter Jordon	Ass't Leader - Hurley PTA
Mrs. R. H. Owen	Leader- Hurley PTA
Mrs. J. C. Barber	President Cleveland Home Dem. Club
Mrs. A. D. Davis	Food Con. Leader Cleveland H. D. Club
Mrs. Helen K. Graham	Voc. Home Ec. Teacher
Mrs. P. E. Thompson	Ass't Sector Leader - Spencer
Mrs. C. A. Fink	Block Leader - Spencer
Mrs. G. A. Palmer	Ass't Sector Leader - Spencer
Mrs. G. W. Miller	Ass't Sector Leader - Spencer
Mrs. R. H. Bingham	Ass't Sector Leader - Spencer
Mrs. B.H. Miller	Ass't Block Leader - China Grove
Mrs. Tom Lindsay	Sector Leader - Salisbury
Mrs. C. E. Brown	Food Con. Leader Rockwell H. D. Club
Mrs. Eugene Buckner	Sector Leader - Salisbury
Mrs. W. F. Robertson, Jr.	District Leader - Salisbury
Mrs. R. Reid Goodson	Chief of Block Leader Service,Salisbury
Mrs. Robert Davis	District Leader - Salisbury
Mrs. Hoy Lee Fisher	Sector Leader, Salisbury
Mrs. Arthur D. Matheson	Sector Leader, Salisbury,
Mrs. G. Q. Miller	Sector Leader - Salisbury,
Miss Bessie Julian	Food Con. Leader Rowan County H.D. Clubs
Mrs. C. L. Mock	Block Leader - Spencer
Mrs. F. C. Stoudemire	Ass't Block Leader - Spencer
Mrs. W. G. Grubb	Sector Leader - Salisbury
Mrs. J. M. Burton	Block Leader - Spencer
Mrs. R. S. Gobble	Sector Leader - Salisbury
Mrs. E. J. Wagner	Sector Leader - Salisbury
Mrs. T. E. Dry	Sector Leader - Salisbury
Mrs. P. E. Weant	District Leader - Salisbury
Mrs. H. I. Chilson	Block Leader - Salisbury
Mrs. J. R. Felts, Jr.	Home Ec. Teacher - Granite Quarry
Mrs. Ben Brandon	Ass't Sector Leader - Spencer
Mrs. J. M. Moore	Ass't Sector Leader - Spencer
Miss Anne Hall	Home Ec. Teacher - Salisbury
Miss Lavilla J. Britt	Home Ec. Teacher - Salisbury

Name	Title
Miss Edith Staton	Home Ec. Teacher - Mt. Ulla
Miss Mary Ray	Home Ec. Teacher - East Spencer
Mrs. Harold Sides	Sector Leader - East Spencer
Mrs. P. G. McDowell	Block Leader - East Spencer
Mrs. Gettys Guille	Director - Salisbury
Mrs. J. R. Cabell	Co-Director - Salisbury
Mrs. C. W. Hall	Mt. Ulla
Mrs. Mildred Seaber	Duke Power Co.
Mrs. Lorraine B. Redden	Home Demonstration Agent

59

STANDARD PLAN OF ORGANIZATION
FOR
NORTH CAROLINA DEFENSE COUNCILS



DEFENSE COUNCIL CHAIRMEN

Alamance, Thomas D. Cooper, Burlington
Alexander, J. Hayden Burke, Taylorsville
Alleghany, R. F. Crouse, Sparta
Anson, H. P. Taylor, Wadesboro
Ashe, Ira T. Johnston, Jefferson
Avery, John V. Bowers, Newland
Beaufort, Fonner T. Paul, Washington
Bertie, J. A. Pritchett, Windsor
Bladen, J. H. Clark, Elizabethtown
Brunswick, Dr. E. D. Bishop, Shallotte
Buncombe, Robt. F. Phillips, Asheville
Burke, T. Earl Franklin, Morganton
Cabarrus, R. E. Ridenhour, Jr., Concord
Caldwell, E. F. Allen, Lenoir
Camden, W. I. Halstead, South Mills
Carteret, Dr. K.P.B. Bonner, Morehead City
Caswell, Holland McSwain, Yanceyville
Catawba, Donald S. Menzies, Hickory
Chatham, J. S. Waters, Pittsboro
Cherokee, John C. O'Dell, Murphy
Chowan, E. W. Spires, Edenton
Clay, J. Walter Moore, Hayesville
Cleveland, George W. Wray, Shelby
Columbus, Dr. T. FormyDuval, Whiteville
Craven, Ray Henderson, New Bern
Cumberland, J. Scott McFadyen, Fayetteville
Currituck, F. B. Aycock, Jr., Currituck
Dare, Martin Kellogg, Manteo
Davidson, J. Lee Wilson, Lexington
Davie, E. C. Tatum, Cooleemee
Duplin, Faison W. McGowen, Kenansville
Durham, Col. Sidney C. Chambers, Durham
Edgecombe, W. G. Clark, Tarboro
Forsyth, Fred Hutchins, Winston-Salem
Franklin, E. H. Malone, Louisburg
Gaston, Forrest C. Roberts, Gastonia
Gates, L. C. Hand, Gatesville
Graham, John B. Smith, Robbinsville
Granville, Mayor T. C. Jordan, Jr., Oxford
Greene, Sen. K. A. Pittman, Snow Hill
Guilford, Stark Dillard, Greensboro
Halifax, A. Leonidas Hux, Halifax
Harnett, Earl McD. Westbrook, Dunn
Haywood, Jonathan H. Woody, Waynesville
Henderson, Monroe Redden, Hendersonville
Hertford, W. Dare Boone, Winton
Hoke, H. L. Gatlin, Jr., Raeford
Hyde, Mrs. Seth M. Gibbs, Engelhard
Iredell, H. P. Grier, Jr., Statesville
Jackson, Dan Tompkins, Sylva
Johnston, James R. Pool, Smithfield
Jones, John W. Creagh, Trenton
Lee, Warren Williams, Sanford
Lenoir, C. A. Kramer, Kinston
Lincoln, W. E. Garrison, Lincolnton
McDowell, Zeno Martin, Marion
Macon, Guy Houck, Franklin
Madison, E. D. Wilson, Marshall
Martin, Hugh Horton, Williamston
Mecklenburg, Martin L. Cannon, Charlotte
Mitchell, J. B. Deyton, Bakersville
Montgomery, O. H. Broadway, Troy
Moore, James W. Tufts, Pinehurst
Nash, Thos. J. Pearsall, Rocky Mount
New Hanover, Louis J. Poisson, Wilmington
Northampton, Archie Gay, Jackson
Onslow, John D. Warlick, Jacksonville
Orange, A. H. Graham, Hillsboro
Pamlico, E. S. Askew, Bayboro
Pasquotank, J. Henry LeRoy, Elizabeth City
Pender, W. H. Robbins, Burgaw
Perquimans, Chas. Whedbee, Hertford
Person, L. C. Bradsher, Roxboro
Pitt, June H. Rose, Greenville
Polk, Charles J. Lynch, Tryon
Randolph, C. C. Cranford, Asheboro
Richmond, W. H. Eubanks, Rockingham
Robeson, O. L. Henry, Lumberton
Rockingham, Clarence Stone, Stoneville
Rowan, Walter H. Woodson, Sr., Salisbury
Rutherford, Oscar J. Mooneyham, Forest City
Sampson, D. V. Carter, Clinton
Scotland, O. L. Moore, Laurinburg
Stanly, R. R. Ingram, Albemarle
Stokes, Lawrence MacRae, Walnut Cove
Surry, John W. Comer, Dobson
Swain, McKinley Edwards, Bryson City
Transylvania, Ralph Ramsey, Jr., Brevard
Tyrrell, W. S. Carawan, Columbia
Union, J. Hampton Price, Monroe
Vance, Judge R. E. Clements, Henderson
Wake, Frank Daniels, Raleigh
Warren, John H. Kerr, Jr., Warrenton
Washington, P. Bruce Bateman, Plymouth
Watauga, Wade E. Brown, Boone
Wayne, Ray Armstrong, Goldsboro
Wilkes, Judge J. A. Rousseau, N.Wilkesboro
Wilson, Charles McLean, Wilson
Yadkin, Fred C. Hobson, Yadkinville
Yancey, Dover R. Fouts, Burnsville
High Point, O. A. Kirkman, High Point
Rocky Mount, Millard F. Jones, Rocky Mount
Chapel Hill, Mayor R. W. Madry, Chapel Hill

February 1, 1943

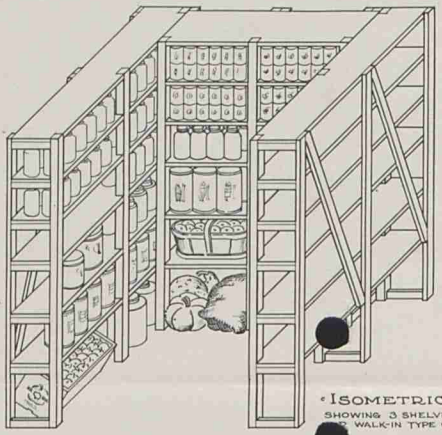
October, 1941 (Reprint) Extension Folder No. 47

Storage for Canned Foods

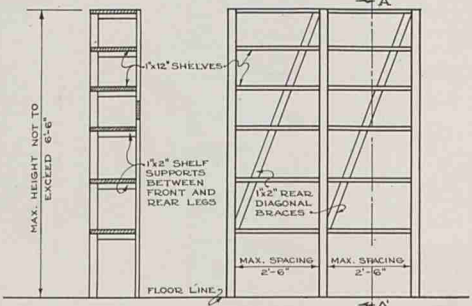
NORTH CAROLINA
STATE COLLEGE OF AGRICULTURE AND ENGINEERING
OF THE
UNIVERSITY OF NORTH CAROLINA
U. S. DEPARTMENT OF AGRICULTURE, CO-OPERATING
N. C. AGRICULTURAL EXTENSION SERVICE
I. O. SCHAUB, DIRECTOR
STATE COLLEGE STATION
RALEIGH

DISTRIBUTED IN FURTHERANCE OF THE ACTS OF CONGRESS OF MAY 8 AND JUNE 30, 1914

SHELVES FOR CANNED AND BULK FOOD STORAGE

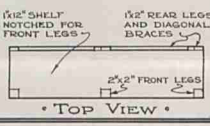


ISOMETRIC VIEW
SHOWING 3 SHELVES ARRANGED FOR WALK-IN TYPE OF STORAGE SPACE.



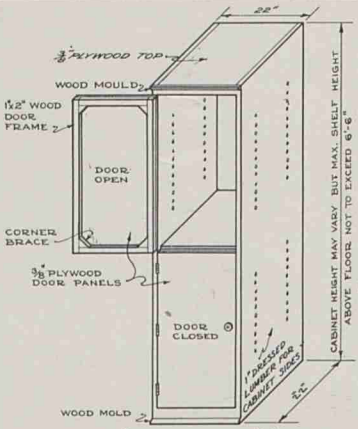
SECTION A-A

FRONT VIEW



TOP VIEW

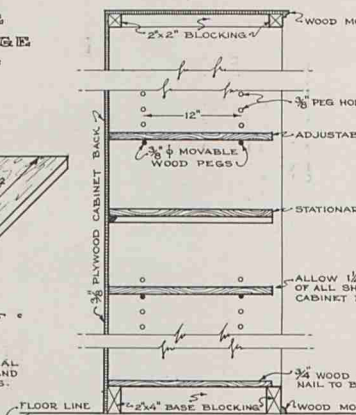
PORTABLE TYPE STORAGE CABINET



ISOMETRIC VIEW

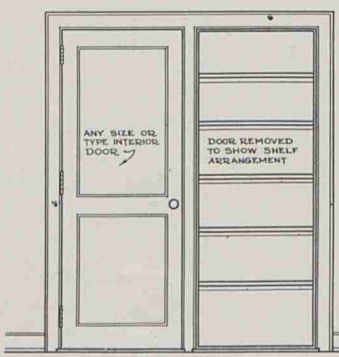
DETAIL OF SHELF

NOTE:
CONSTRUCTION IDENTICAL FOR BOTH ADJUSTABLE AND STATIONARY TYPE SHELVES.

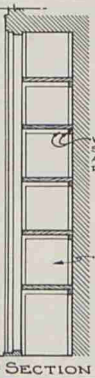


SECTION

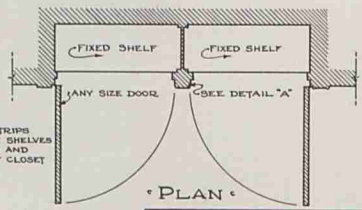
SHALLOW TYPE CLOSET STORAGE



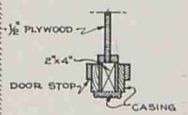
ELEVATION



SECTION



PLAN



DETAIL "A"

COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS
STATE OF NORTH CAROLINA
NORTH CAROLINA STATE COLLEGE
AND
U.S. DEPT. OF AGRICULTURE COOPERATING
EXT. AGR. ENGINEER - RALEIGH, N. C.

FOOD STORAGE

N.C. | NO. 400 | SHEET 1 OF 1

NOVEMBER - 1939

STORAGE FOR CANNED FOODS

Prepared by Home Demonstration Specialists of the N. C. Agricultural Extension Service

A well planned storage space for canned foods whether in a closet, a cellar, or an outside building, is a good investment of time and money. Not only is it possible to reduce the cost of meals by using home grown and home conserved foods but the satisfaction of having a good supply and variety on hand at all times means much to the home maker for she knows that the health and happiness of the family depend on well balanced meals. Every farm home can have adequate storage space for food with just a little work and initiative.

Objectives in the Storage Program are:

1. To provide an adequate place for conserved products, sufficient in quantity to meet budget requirements.

2. To arrange products for convenience according to food value.

3. To improve the quality and variety of canned meats and of jellies, preserves, and pickles.

4. To improve the quality and care of dried, brined, and stored products.

Location

The storage room should be accessible to the kitchen. It should be so constructed that it will be as cool as possible in summer, frost proof in winter, and always dry and well ventilated. Tight floors and walls, reinforced with some insulating material, aid in preventing extremes in temperatures. A window may be used to provide light and ventilation. The window, however, should be equipped with an opaque shade to prevent fading of foods in glass containers. If the room is an inside one, it should have ventilators and be provided with some means for lighting. Canned goods, kraut, vinegar, pickles, cured meats, lard, fruits for ripening as peaches, pears, grapes, etc., require the type of storage described above. Large amounts of long keeping fruits and vegetables, such as apples and root vegetables, require a moist atmosphere and should be kept elsewhere.

Shelves

Twelve inch boards for shelves for small containers are desirable. This width accommodates 2 rows of glass jars or tin cans or 3 rows of bottles or jelly glasses. Wider shelves (about 18 inches) will be needed for stone jars and for shallow containers, such as crocks or flat pans. To prevent shelves from sagging supports are needed about every 30 inches. The area of comfortable reach is 18 inches from the floor for the lowest shelf and 6 feet for the top shelf.

The lower shelves should be used for the heavier and larger containers and will have more space between than the upper shelves where the smaller containers are placed. To estimate the distance between

shelves, add 2 inches to the height of small containers and 8 inches to those too heavy to move easily. For estimating amount of shelving, the following is a good working basis:

Pint and quart jars—19 feet per hundred jars, stored 2 rows to the shelf.

Half gallon jars—20 feet per hundred jars, stored 2 rows to the shelf.

Tin cans, No. 2½—9 feet per hundred cans, stacked 2 deep, and stored 2 rows to the shelf.

Pint glass bottles—9 feet per hundred bottles, stored 3 rows to the shelf.

Storing Foods

Satisfactory ways of storing the various products are:

Glass jars and tin cans—2 rows to a shelf.

Bottles and small jelly glasses—3 rows to a shelf.

Tin cans—stacked two deep—2 rows to a shelf.

Heavy articles as large stone jars, kegs, bins and crates on slatted platforms set on casters.

Cured meats hung on hooks in ceiling.

Space Arrangement

Labels on shelves rather than on jars make a more attractive appearance and call for much less effort on the part of the housewife. No two homes will have the same conditions, hence each homemaker should study her own situation and plan for a convenient arrangement that will best suit her needs.

Orderly grouping of foods is advised. Meal planning and meal preparation is made easier for the homemaker by grouping foods on shelves and in the bins and crates. The following plan is suggestive:

Juices	Jellies, Pickles,	Relishes	Miscellaneous
Fruits	Preserves	Leafy vegetables	Other vegetables
Fruits	Meats	Starchy vegetables	Other vegetables

Label bins or crates for temporary supply of potatoes, dried beans, peas and nuts which are kept in the house.

An emergency shelf containing some of the choicest canned products and other food needed for a quickly prepared meal will aid greatly when unexpected company arrives. If there is a baby in the family a section of the shelves set aside for small containers of tomato juice, vegetable purees, and other foods will be found convenient. A school lunch shelf in homes where lunches are packed daily will aid in preparing better lunches for the members of the family who must eat a cold lunch.

Dispose of unnecessary articles in the storage room. Have a place for everything and keep everything in its place.

AUGUST, 1942 (REPRINT) EXTENSION CIRCULAR NO. 232

Home Drying
of
Fruits and Vegetables

NORTH CAROLINA STATE COLLEGE OF AGRICULTURE AND ENGINEERING
OF THE
UNIVERSITY OF NORTH CAROLINA
AND
U. S. DEPARTMENT OF AGRICULTURE, CO-OPERATING
N. C. AGRICULTURAL EXTENSION SERVICE
I. O. SCHAUB, DIRECTOR
STATE COLLEGE STATION
RALEIGH

DISTRIBUTED IN FURTHERANCE OF THE ACTS OF CONGRESS OF MAY 8 AND JUNE 30, 1914

Food Will Win the War and Write the Peace.

—Secretary Claude R. Wickard.

Home Drying of Fruits and Vegetables

By Ruby Scholz
Extension Economist in Food Conservation and Marketing

Drying is a satisfactory method of preserving certain fruits and vegetables. Used to supplement canning and storage, it will reduce the cost of the total budget and provide an adequate variety of foods for winter use.

Drying or dehydration has several advantages. The product's weight is only one-fourth to one-ninth that of the fresh materials; there is a considerable reduction in bulk; storage is possible for long periods without the use of hermetically sealed special containers; and very little special equipment is needed. There are some fruits and vegetables that it is not advisable to dry, either because drying decreases their palatability or because they deteriorate rapidly after drying. Many vegetables are kept for long periods in storage, either in outdoor pits or in an ordinary cellar.

Drying is more than merely removing enough water to insure the product against spoilage. Drying must be done in such a way as to preserve food value, natural flavor and cooking quality of the raw material.

The rate of drying will depend upon the temperature of the air and the rate with which the air circulates about the product to be dried. Rapid drying is believed to preserve flavor and cooking quality. The temperature must not be so high as to cause bursting of cells and loss of juices, or scorching of that which has lost most of its water.

Types of Dryers

1. *Outdoor*—Place the product in pans of wire netting, cheese cloth covered, slanted to the direct sun. Cover with glass or mosquito netting to protect from dirt and flies. Drying can be done on canvas or non-resinous boards on a slanting roof.

2. *Screen Tray*—The trays are made so that they may be tilted to the proper angle of the sun. (Figure 1.)

3. *Oven*—Fruits and vegetables may be dried with the door left open. Very little fire is required to dry the product.

4. *Stove Dryer*—The suspended stove dryer is one of the simplest and least expensive to build. (Figure 2.)

FRUITS

Begin drying as soon as the fruit is two-thirds ripe, and continue as long as it can be handled without mashing the pulp.

Caution: In drying, cleanliness of product and equipment cannot be over-emphasized.

FRUITS BEST SUITED TO HOME DRYING

Apples

Select firm, slightly acid fall and winter apples for drying. Soft summer fruit is not good for this purpose. Wash, pare, core, and cut in slices ⅛ to ¼ inch in thickness. Drop at once in cold salt water to prevent discoloring. Use ½ teaspoon of salt to 1 quart of water if fruit is to be left in the bath for sometime—or a stronger solution (1 ounce of salt to 1 gallon water) is used if the fruit is dipped only for 1 or 2 minutes. Drain well, spread on drying trays in single layers, edges slightly overlapping. If the fruit is dried in an evaporator, begin drying at 110 degrees to 120 degrees F., increasing gradually up to 175 degrees to 180 degrees F., or start drying at about 200 degrees F. and reduce temperature to 175 degrees F. Dry until no juice can be pressed out of cut surface when rubbed between fingers. The rings should not be dried hard, but should be spongy when broken.

If the fruit is to be sun-dried, it should be spread much more thinly, not much more than two slices in depth, and the trays should be immediately exposed to the full sun. If conditions are favorable for stack drying, the trays may be stacked after 1 or 2 days of full exposure to the sun.

If the fruit is to be sulphured, it should be spread upon the trays to a uniform depth of 1 to 1½ inches as rapidly as it is sliced, and immediately placed in the sulphuring box for 20 to 30 minutes, after which it is transferred to the evaporator.

Peaches

Take ripe, firm peaches, peel, cut from the seed if cling stones, break open if free stone. Quarter or cut in slices. Treat with sulphur 20 to 30 minutes. Spread in the sun or dry in the oven. The peelings may be left on if desired.

Pears

Select varieties with fine grain flesh, fairly high sugar content, and distinct flavor, Bartlett and others. Peel, core, quarter

or slice. Treat halves with sulphur 3-4 hours. Small pieces require less time. Dry the same as for peaches.

Berries and Figs

Berries and figs are found to be more palatable when canned in syrup by hot water bath method or made into preserves. These products do not dry successfully in this climate.

SULPHURING FRUIT

Wrap one teaspoonful of sulphur in paper and place it in a pan in the bottom of a large barrel or box. Hang the fruit in trays or in a basket from a cross-piece at the top of barrel or box. Light the paper. Cover barrel or box tightly and leave fruit exposed to the sulphur fumes for 20 minutes. There is some objection to sulphured fruit, but no proof that it is injurious to human beings in the small quantity used in the drying process.

After the fruit is sulphured, it should be placed in the drier. Begin drying at 120 degrees F. and increase gradually to 180 degrees F. as the drying proceeds. Sulphured fruit should be washed well before it is cooked.

VEGETABLES

Drying is advised for a limited number of products, since dried vegetable materials are prone to deterioration in flavor and table quality. This is especially true of those selected very young as asparagus, spinach, cauliflower and green peas. Vegetables to be dried require partial cooking before they undergo the drying process. This precooking should be done in steam rather than water, to preserve food value.

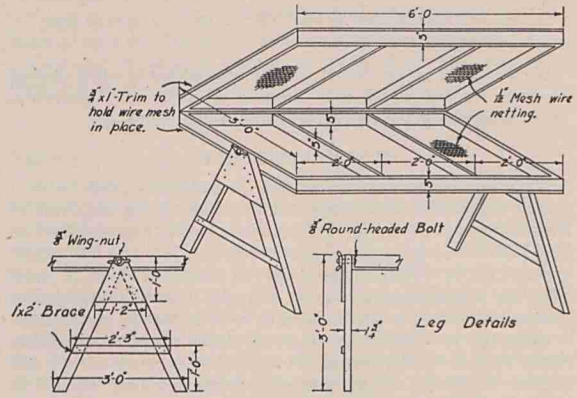
Corn

Corn is delicious when dried. Gather only young, fresh, tender corn. Prepare immediately. Precook 8 to 12 minutes in boiling water or steam. Cut from the cob in whole grains. Sun drying is especially good for corn. Stir frequently so that it will dry evenly and quickly.

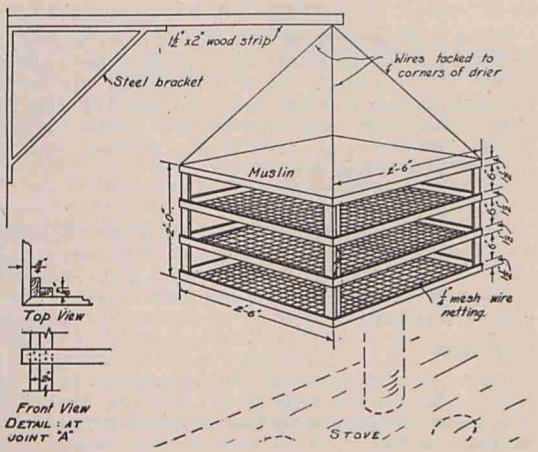
Green Beans

Select pods when beans are just beginning to form. Wash, stem and tip. Cut into pieces ½ to 1 inch long. Steam 6 to 8 minutes. Dry between 2 cloths. Place on the dryer. These are best not stored too long.

DRYING SCREEN TRAYS — FIGURE 1.



STOVE DRIER — FIGURE 2.



Greens

Trim, remove heavy stems. Wash, steam and spread thin to dry.

Peas

Shell the green, fresh peas. Steam eight minutes. Spread to ½ inch on trays. Begin drying at 115 degrees F. and continue to 140 degrees F. Stir frequently. Certain varieties are better for drying than others.

Tomato Paste

Slice the tomatoes; cook at simmering temperature until broken down. Sieve the pulp and cook slowly as long as possible without burning. Place in pans one inch deep; place pans in evaporator and heat to 150 degrees F. Stir frequently. Combine pans as the drying reduces the volume. Total time for drying to a thick paste is 6 to 8 hours. When dried to this consistency, bring to a boil and immediately place in half-pint sterilized glass jars. Seal immediately.

Apple and other fruit pastes may be made the same way.

TIME REQUIRED FOR DRYING

The time required for drying fruits and vegetables will depend on climatic conditions and the method of drying. Often part of the product dries before the rest. In this case, remove only the thoroughly dried products and allow the remainder to continue drying.

STORAGE AND CARE OF DRIED PRODUCTS

Foods taken from drying trays are conditioned by placing the product into deep containers and stirring each day for eight to ten days. If the product is too moist to store after this process, return to the dryer.

Products may be stored in glass jars, cellophane bags, tin containers, or sacks coated with wax. It is advisable to store in small quantities so that the food will be used within a short time after opening.

Store in a cool dry place. During long spells of wet weather, dried foods should be returned to the dryer for a short time.

Source of Material

1. Drying Foods at Home, Extension Service, Agr. and Mech. College of Texas, College Station, Texas.
2. How to Dry Fruits and Vegetables, G. W. Carver, Tuskegee Institute.
3. Drying Fruits and Vegetables, Extension Circular 350, South Dakota State College, Brookings, South Dakota.
4. Drying Fruits and Vegetables in the Home, Ext. Bulletin No. 188, State College, Washington.
5. Farm and Home Drying of Fruits and Vegetables, U.S.D.A., Farmers' Bulletin No. 984.

HOME STORAGE OF VEGETABLES.

By JAMES H. BEATTIE, *senior horticulturist, Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry.*

CONTENTS.

	Page.
Reasons for storing vegetables	3
Types of storage	4
A storage room in the basement of the dwelling	4
Outdoor storage cellars	7
Storage in banks or pits	14
Storage of various vegetables	16
Beans and peas	16
Late beets	16
Late cabbages	17
Carrots	18
Storage of various vegetables—Continued.	
Late celery	19
Onions	21
Parsnips	21
Potatoes, Irish	21
Potatoes, sweet	21
Pumpkins and squashes	22
Salsify	23
Late turnips	23
Storage of apples	23

REASONS FOR STORING VEGETABLES.

FOR THOSE PERSONS who are fortunate enough to control land for the growing of vegetables in sufficient quantity for the needs of the family, storage will prove an economy. Likewise, it will often prove an economy to grow late vegetables to store. Home storage is of importance at all times, but especially so if vegetables are scarce and prices are high. Crops of suitable sorts that mature at a season when they can be preserved by storing should be kept in their natural condition instead of being canned or dried. Not only is it possible to reduce the cost of the menu materially by growing and storing vegetables for home use, but the satisfaction and dietary advantage of having a supply of fresh vegetables near at hand, so that regardless of markets and winter temperatures the list may be varied, cannot be measured in dollars and cents.

A half-acre garden, if cared for properly, will produce far more vegetables than the average family can consume during the maturing period of the crops. Only a small portion of the garden should be devoted to those vegetables which must be used as soon as they reach maturity. Beets, late cabbage, carrots, celery, onions, parsnips,

potatoes, sweet potatoes, salsify, and turnips may be stored in their natural condition, and should be grown to the extent of the family needs for storage for winter use. Beans of various kinds, including the limas, may be stored dry. The successful storage of vegetables is not at all difficult; in fact, good storage facilities already exist in most homes, it being only necessary to make use of the cellar, the attic, a large closet, or other parts of the dwelling, depending upon the character of the product to be stored, and to take reasonable care to discard all individual vegetables showing any decay or mechanical injury before putting them into storage.

Different vegetables require different storage conditions; as a rule vegetables dry out or wilt or wither rather quickly unless the atmosphere of their storage place is kept damp and the temperature as low as possible without actual freezing. Certain vegetables, however, furnish exceptions to this rule, as will be noted later.

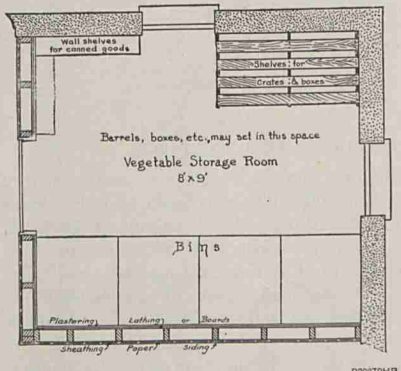


FIG. 1.—Floor plan of a storage room in a corner of a basement. The arrangement of the shelving and bins may be changed to suit conditions. While the construction of the wall may be varied, it must be tight.

Some attention will necessarily have to be given to ventilation. Ventilation is needed in a storage space not only to change the air to carry off odors but also to help obtain a desirable storage temperature and humidity. Advantage should always be taken of the cool air at night and at other times when the outside temperature is near but not below freezing and the air is not too dry.

TYPES OF STORAGE.

A STORAGE ROOM IN THE BASEMENT OF THE DWELLING.

A cool, well-ventilated cellar under the dwelling offers good conditions for the storage of vegetables. Many cellars are not well

suited for storing vegetables because of poor insulation or lack of ventilation. Cellars containing a furnace for heating the dwelling usually are too warm and too dry for the storage of root crops. It is often possible, however, to partition off a room either in one corner or at one end of the cellar where the temperature may be controlled by means of outside windows. At least one window is necessary, and two or more are desirable for admitting light and for ventilation. If the cellar is square or rectangular, a room similar to the one illustrated in figure 1 can be arranged. If, as is often

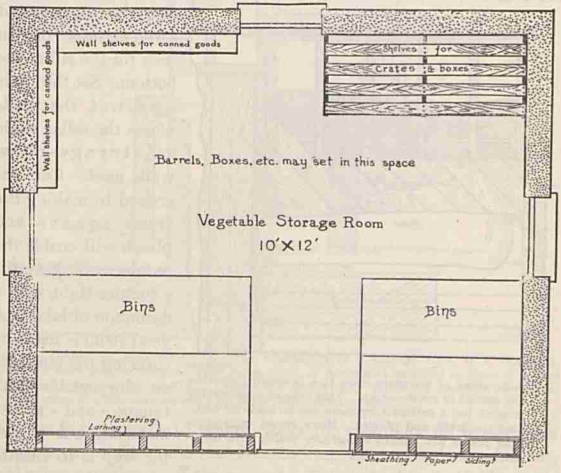


FIG. 2.—Floor plan, showing the possibility of constructing a storage room by partitioning off the portion of the cellar under the wing of the house.

the case, however, the cellar is built in the shape of an ell, the room should be made by partitioning off the offset, as shown in figure 2. In some cases it is possible to cut off one end of the cellar with one straight wall.

CONSTRUCTION OF THE STORAGE ROOM.

The size of the storage room should be determined by the space available and the amount of material to be stored. Natural earth makes a better floor than concrete or brick, as a certain amount of

moisture is desirable. The walls of the storage room should be parallel to the walls of the cellar. Lay 2 by 4 inch scantling flat on the floor and secure them with pegs driven into the floor or by nailing them to the top of short posts set in the ground. Set 2 by 4 inch studding from this sill to the ceiling, spacing them 16 inches apart from center to center. Locate the door to the storage room at the most convenient point, making it large enough to admit barrels, boxes, etc., a good size being 2½ feet wide by 6½ feet high. Set the studs on either side of the door 32 inches apart, which will allow for the door and the frame. Put a header over the door, allowing 1 inch for the frame and seven-eighths of an inch for the sill at the bottom. Set the studs against the walls where the cellar walls and storage-room walls meet. Care exercised in making the frame square and plumb will enable the builder to get the structure tight with a minimum of labor. A good room is made by covering the studding on the outside with tongue - and - groove material, but a better way is to sheathe the outside with plain lumber, tack building paper on this, and side with tongue-and-groove material. This construction in connection with lath and plaster or wall board on the inside makes an excellent room. The construction of such a wall is illustrated in figure 3.

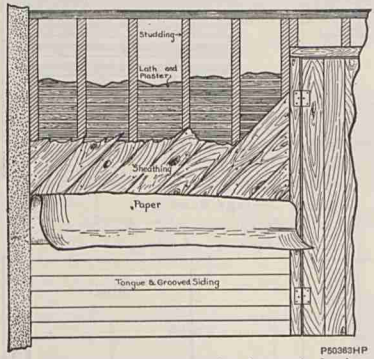


FIG. 3.—Wall of a storage room in a basement, showing the details of construction. This type of construction is good, but a satisfactory room can be made by omitting the laths and plaster. Many rooms with studding frame and tongue-and-groove siding give excellent results.

Ventilation may be secured by opening one or more windows. An air duct constructed of wood, metal, or terra cotta and fitted in one of the windows, as illustrated in figure 4, is desirable, as it permits the cool air to enter at the bottom of the room. Two or more joints of 6-inch stovepipe, one with a damper, and an elbow may be used. A piece of board with a hole the size of the pipe is fitted in the

window in place of one of the panes of glass. Another pane of glass may be removed from the sash and a small hinged door fitted in its place, which when open allows the heated air to escape. In cold weather both the hinged door and the damper in the stovepipe must be closed. The windows in the storage room should be darkened in order to protect the vegetables from the light.

Barrels, crates, boxes, or bins may be used as containers for the various vegetables, but movable containers are preferable to built-in

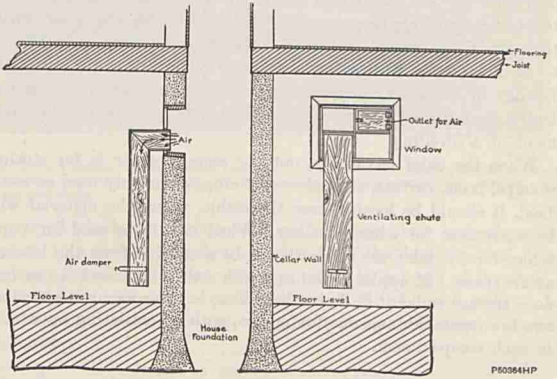


FIG. 4.—Details of construction for the ventilation of a storage room in a basement. The air duct may be made of wood, terra cotta, or metal and installed in place of a pane of glass, thus avoiding cutting through the cellar wall. A hinged door the size of another pane of glass may serve as an outlet for the warm air.

bins, as it is possible to remove them for cleaning. It is advisable to construct shelves or a slat floor to keep the crates, boxes, baskets, and other containers off the ground. This is highly desirable to insure a free circulation of air and to prevent the containers from harboring mice, rats, and other vermin. The shelves for canned goods along one side of the room need not be more than 6 inches wide. A suggested arrangement for the bins, shelves, etc., in the storage room is shown in figures 1 and 2.

OUTDOOR STORAGE CELLARS.

Outdoor storage cellars or caves are excellent for the storage of many vegetables. They are particularly desirable on the farm, as

they afford convenient and inexpensive storage facilities for surplus vegetable crops that otherwise might be lost. They possess all the advantages of the storage room in the basement and are superior in many respects. The outdoor storage cellar can be maintained at a uniform temperature over a long period. It is possible to keep the cellar cool and quickly to reduce the temperature of the stored product to the desired point for safe storage by opening the door during the night and closing it in the morning before the air becomes warm. All ventilators should likewise be kept tightly closed until the outside air is again cooler than that within the cellar, when they should be opened, unless the outside temperature is so low as to be dangerous. This safeguards the product and adds to the efficiency of the storage chamber. Vegetables can be more conveniently placed in such a cellar than in the storage room in the basement of a dwelling.

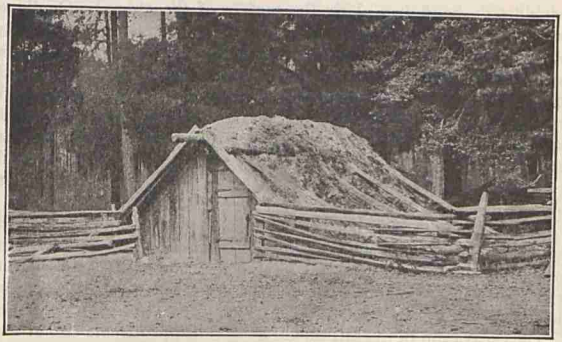
When the chief use of the outdoor storage cellar is for storing turnips, beets, carrots, and other root crops commonly used as stock food, it should be located near the stable, where the material will be convenient for winter feeding. When it is to be used for vegetables for the table the cellar should be accessible from the kitchen at all times. If apples or other fruits are to be stored in an outdoor storage cellar it is desirable to have a two-compartment cellar, one for vegetables and one for apples, with a ventilating apparatus in each compartment.

CONSTRUCTION OF THE OUTDOOR STORAGE CELLAR.

As the root cellar must be weatherproof, that is, capable of being kept free from moisture and free from frost, its type and construction vary with the geographical location. In the southern portion of the country the structure is usually entirely above ground and protected by only a few inches of sod and with straw, leaves, etc. In northern sections outdoor storage cellars are made almost entirely below ground and covered with a foot or two of earth.

STORAGE IN REGIONS OF MILD WINTERS.

An aboveground storage cellar suited to conditions in southern sections of the United States may be built on a well-drained site at slight expense. A row of posts may be set 5 or 6 feet apart, extending 7 or 8 feet above the surface of the ground, with a ridgepole placed on top of them. Against each side of the ridgepole



P10851HP

FIG. 5.—An outdoor storage cellar, typical of those used in the South for storing sweet potatoes and other root crops. It consists of a pole and plank frame covered with sod and straw.

a row of planks or puncheons is placed, with their opposite ends resting in a shallow trench 4 or 5 feet from the line of posts. The ends are boarded up, a door being provided in one end of the structure, and the roof covered with sod to a depth of 5 or 6 inches. A good type of outdoor storage cellar built along these lines is shown in figure 5.

STORAGE IN REGIONS OF SEVERE FREEZES.

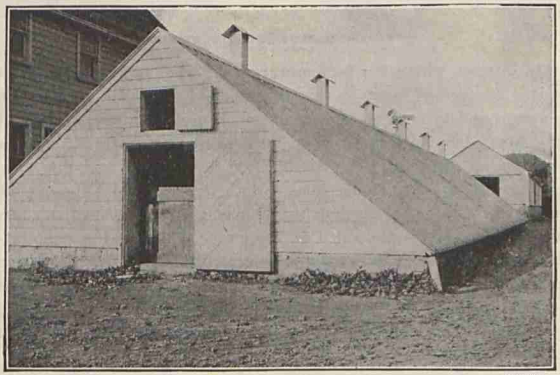
In sections where low temperatures prevail it is necessary to insulate the storage house so that the vegetables will not freeze. An aboveground type of storage house much used in many sections of the North has thick walls filled with insulating material, such as sawdust or shavings. The construction is of frame and the walls are usually 10 to 12 inches thick. Both the inside and the outside walls are sheathed with matched lumber so as to make them airtight. The rafters are ceiled on the under side with the same material and the space between the rafters filled with dry insulating material. The use of building paper in the roof and walls of the storage house is of great assistance in insulating it. Ventilation is provided in the same manner as in the outdoor storage cellar built of concrete described on page 11.

A type of storage cellar much used in northern sections of the country is built partly under ground. The walls are of masonry and

extend to a point just above the surface of the ground. On these walls plates are set and a roof of frame construction erected. The roof structure is ceiled on the under side of the rafters and some suitable insulating material, such as dry sawdust or shavings, packed in the space between the rafters, and then the sheathing, paper, and roofing material are applied as in the case of the aboveground type of storage cellar described in the previous paragraph. This type of structure (fig. 6) is preferable in many respects to the aboveground type, as it is easier to maintain the temperature at the proper point and its insulation is a comparatively easy matter.

Protection from freezing may be secured with a simpler type of structure (figs. 7 and 8) by making it entirely under ground. In order to avoid steps down to the level of the floor, with the consequent extra labor in storing and removing the vegetables, a sidehill location is desirable.

The excavation in the hill should be of the approximate size of the cellar, using the dirt for covering the roof and for banking the sides of the structure. A frame is erected by setting two rows of posts of uniform height in the bottom of the pit near the dirt walls and a third line of posts about 5 feet higher through the center of the pit. These posts serve as supports for the planks or puncheons forming the roof of the structure, as with the aboveground type of storage cellar already described. The door is placed at one end and a ventilator put in the roof. The whole structure with the exception of the



P692HP

FIG. 6.—A storage cellar typical of those much used in the northern sections of the country, consisting of masonry walls and a well-insulated wooden roof.

portion occupied by the door is covered with dirt and sod. The thickness of the covering must be determined by the location; the colder the climate the thicker the covering. The dirt covering may be supplemented in winter by a layer of manure, straw, corn fodder, etc. Outdoor storage cellars usually are left with dirt floors, as a certain degree of moisture is desirable. These cellars may also be made of concrete, brick, hollow tile, stone, or other material.

OUTDOOR STORAGE CELLARS BUILT OF CONCRETE.

The type of outdoor storage cellar described above, while low in first cost, is short lived, as the conditions in the cellar are favorable to the decay of wood. The concrete storage cellar, although rather high in first cost, as compared with wood, is a permanent structure. Concrete possesses several advantages over brick, stone, or other decay-resisting materials. In the construction of a small structure suitable for the home it is possible to make the roof self-supporting and to employ unskilled labor, thus lessening the cost. It is a simple matter to waterproof concrete, a feature highly desirable in a storage cellar.

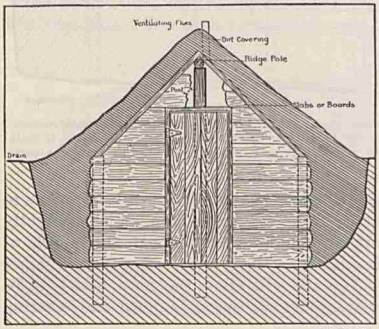


FIG. 7.—End view of an outdoor storage cellar, showing the frame of posts covered with planks or puncheons and with dirt. Additional protection may be given by placing manure, straw, or corn fodder on top of the dirt.

For detailed information in reference to the mixing and handling of concrete, the reader is referred to Farmers' Bulletin 1772, entitled "Use of Concrete on the Farm."

The site for the concrete storage cellar should be selected with the same considerations in mind as for the wood-frame cellar, namely, a well-drained, convenient location, preferably a sidehill, into which it may be built, as shown in figures 9 and 10. The excavation should be just large enough for the dirt walls to serve as the outside form for the concrete. For that portion of the wall which is above the surface of the ground a board form must be used. The inside form usually is made of boards held in place by scantling spaced about 18 inches apart. Temporary supports should be placed across the top to carry the form, so that it will be of the size and shape desired. The side

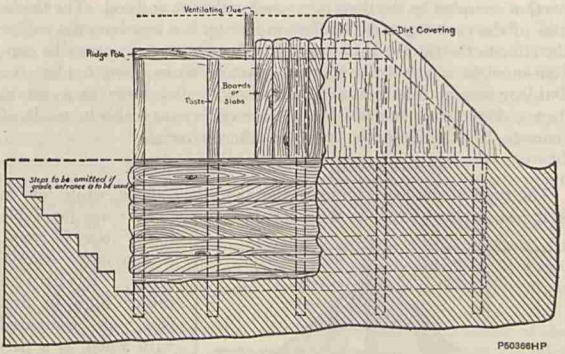


FIG. 8.—Side view of an outdoor storage cellar, showing the details of construction. If the cellar is more than 12 feet long, two ventilating flues should be used. If built on a sidehill, no steps will be needed, making it easier to store and remove the vegetables.

walls and roof should be so constructed that there will be no joints to weaken the structure. The form for the ceiling may be slightly arched by setting a temporary line of posts through the middle of the excavation. A plate placed on these posts a few inches higher than the height of the side walls will allow the form boards to be laid crosswise of the cellar, springing the ends down and securing

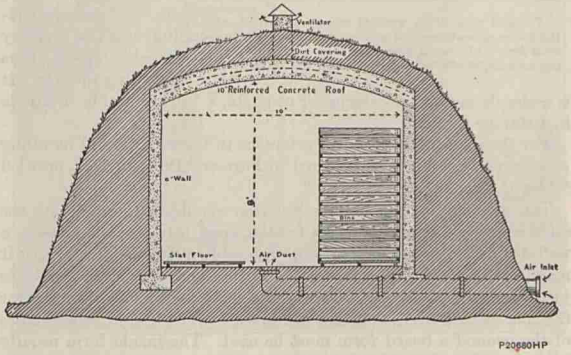


FIG. 9.—Cross section of a concrete storage cellar, showing the arrangement of ventilators, slat floors, and bins, with provision for the circulation of air under and around the slat floors and bins. This cellar is 10 feet wide and 8 feet high, inside measurement.

them to the forms for the inside of the walls. An arch a few inches high makes a strong roof and helps in ventilating the cellar.

The whole structure, with the exception of the portion occupied by the door, is covered with earth to prevent freezing, the thickness of the earth covering depending upon the geographical location. In the colder sections of the country 2 or 3 feet is not too much, and additional protection may be given by using a supplementary covering of straw, fodder, or manure. In severely cold weather both the top and bottom air ducts must be closed. It is well to cover the outside ends of the air inlets by woven wire in order to prevent small animals from entering the storage cellar.

The cellar illustrated in figures 9, 10, and 11 is 10 feet wide, 12 feet long, and 8 feet high and will contain the products of an acre garden. The walls are of 6-inch concrete reinforced by five-eighths inch iron rods. The floor is earth, as this permits good moisture conditions for the storage of vegetables. The structure is provided with a ventilating flue in the roof and an air inlet in the floor for the admission of cool air.

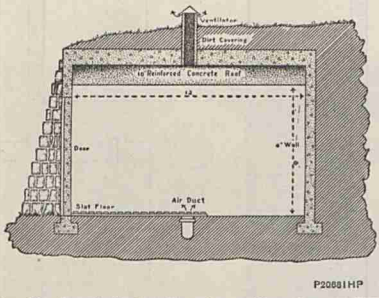


FIG. 10.—Longitudinal section of an outdoor storage cellar 12 feet long, built of concrete. The structure may be lengthened to increase the storage capacity, but if this is done additional ventilators must be provided.

The storage capacity may be increased by making the structure longer, but when this is done additional ventilators must be provided. If the width is increased, either middle piers should be used to assist in carrying the roof or the roof should be arched. A cellar 6 feet wide, 8 feet long, and 7 feet high will provide the necessary storage space for the products of a small home garden and may be built in the same manner as the one illustrated in figures 9, 10, and 11.

THE STORAGE CELLAR UNDER AN OUTBUILDING.

Sometimes it is possible to build a storage cellar as the lower story of and foundation for an outbuilding. When this is done it is desirable to have the cellar almost entirely under ground and well insulated by banking the outside walls with dirt. The ceiling of the

cellar may be made frostproof by constructing a double wall to be filled with dry sawdust, shavings, or other insulating material. Concrete is a good material of which to construct the side walls of the cellar, although brick, stone, tile, etc., may be used. The entrance may be through the floor of the room above or through an outside door placed in one end of the cellar, reached by steps or a grade entrance. Ventilation may be secured by placing a shaft from the ceiling of the cellar through the room above to the roof, or by placing the ventilators in the side walls near the ceiling. The inlet ducts should be put in the floor as in other outdoor concrete cellars and their outer ends covered with wire screen.

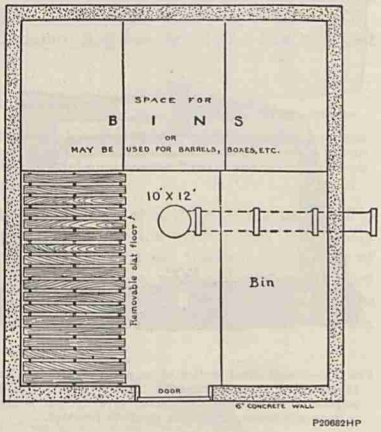


FIG. 11.—Floor plan of a simple concrete storage cellar which may be used for potatoes, beets, carrots, turnips, rutabagas, cabbage, celery, and apples. The floor is of dirt, but the barrels, crates, etc., used as containers for the vegetables, are set on a slat floor. Bins decay so quickly that barrels, boxes, etc., are usually preferable.

STORAGE IN BANKS OR PITS.

Outdoor banks or pits are used very generally for keeping vegetables. The conical pit is used commonly for such vegetables as potatoes, carrots, beets, turnips, salsify, parsnips, and heads of cabbage and is constructed as follows: A well-drained location should be chosen and the product piled on the surface of the ground; or a shallow excavation may be made of suitable size and 6 or 8 inches deep, which may be lined with straw, leaves, or similar material and the vegetables placed on the litter in a conical pile. The vegetables should then be covered with straw or similar material and finally with earth to a depth of 2 or 3 inches. As winter approaches, the dirt covering should be increased until it is several inches thick. The depth of the earth covering is determined by the severity of the winters in the particular locality. It is well to cover the pits with straw, corn fodder, or manure during severely cold weather.

The amount of ventilation necessary will depend upon the size of the pit. Small pits containing but a few bushels of vegetables will receive sufficient ventilation if the straw between the vegetables and dirt is allowed to extend through the dirt at the apex of the pile. This should be covered with a board or piece of tin held in place by a stone to protect it from rain. In larger pits ventilation may be secured by placing two or three pieces of rough boards or stakes up through the center of the pile of vegetables so that a flue is formed. This flue is capped by a trough formed of two pieces of board nailed together at right angles, as illustrated in figure 12.

Vegetables keep very well in such pits, but it is difficult to get them out in cold weather, so that when a pit is opened it is desirable

P1311HP

FIG. 12.—Banks or pits ventilated by a flue formed of two or three pieces of board or poles capped with a trough made by nailing two pieces of board together at right angles. Banks of this kind are used for the storage of potatoes, carrots, beets, turnips, salsify, parsnips, and cabbage.

to remove its entire contents at once. For this reason it is advisable to construct several small pits rather than one large one, and instead of storing each crop in a pit by itself it is better to place a small quantity of several kinds of vegetables in the same pit, so that it will be necessary to open only one bank to get a supply of all of them. In storing several crops in the same bank it is a good plan to separate them with straw, leaves, or other material. The vegetables from the small pit may be placed temporarily in the storage room in the basement, where they will be easily accessible as needed for the table.

The construction of the storage bank or pit is illustrated in figures 13 and 14, figure 13 showing the cross section of a storage pit containing Irish potatoes and figure 14 one containing sweet potatoes.

STORAGE OF VARIOUS VEGETABLES.

BEANS AND PEAS.

Beans may be kept for winter use by picking the pods as soon as they are mature and spreading them in a warm, dry place, such as an attic floor, until the beans are thoroughly dry. Then shell and store in bags hung in a dry, well-ventilated place until needed. Do not store beans in the cellar as cellars are likely to be too damp. Allow navy and other bush beans to mature on the vines until a maximum number of pods are ripe; then pull the whole plant and cure it like hay. After thorough drying, thrash the beans and store as suggested above.

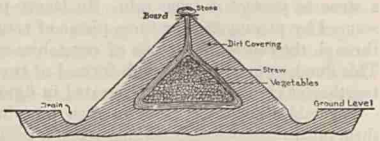


FIG. 13.—Cross section of a storage pit containing Irish potatoes. During severely cold weather the dirt covering may be supplemented by manure, straw, etc.

Peas may be treated like bush beans and stored in the same manner.

LATE BEETS.

Storage for beets may be of any of the types described. The beets should be pulled and the tops cut off when the soil is dry. If they

FIG. 14.—A bank of sweet potatoes being covered with dry cane tops. Corn fodder, straw, leaves, or similar material might have been used.

are to be held in the storage room in the basement or in an outdoor storage cellar, they should be placed in ventilated barrels, loose boxes, or, better still, in crates. If sufficient space is available in the cellar, it is a good plan simply to place them in small piles along

the wall. Storage in large piles should be avoided, as it is liable to cause heating and decay. Beets dry out and wilt very rapidly if kept too dry.

For storage in banks or pits prepare the beets as for storage in the room in the basement or in the outdoor cellar. Select a well-drained location, make a shallow excavation, about 6 inches deep, line it with straw, hay, leaves, or similar material, and place the beets in a conical pile on the lining. Make the bottom of the pile about the same size as but not larger than the bottom of the excavation. Cover the beets with the same material as that used for lining the bottom of the pit, and carry it up several inches above the apex of the pile of vegetables, having it extend through the dirt covering. This serves as a ventilating flue, and it should be covered with a piece of tin or a short board as a protection from rain. The dirt covering should be 2 or 3 inches thick when the vegetables are stored, and it should be increased as severely cold weather approaches until it is a foot or more in thickness. In finishing the pit the dirt should be firmed with the back of the shovel in order to make it as nearly waterproof as possible.

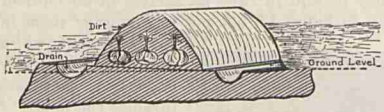


FIG. 15.—Cabbages stored in long banks. Good drainage is essential, but the dirt covering need not be as thick as for vegetables that are easily injured by frost.

The shallow trench around the base of the pit should have an outlet for carrying off the water. Supplement the dirt covering with manure, straw, corn fodder, or other protecting material. Use several small pits instead of one large one, as vegetables keep better in small pits and the entire contents may be removed when the pit is opened.

LATE CABBAGES.

Heads of late cabbage may be cut and stored in conical pits in the same manner as beets. Another common and very satisfactory method is to pull the plants, roots and all, and place them in a long pit with the heads down, as illustrated in figure 15. A few heads may be removed from time to time without disturbing the remainder of the pit. As slight freezing does not injure the cabbage, the covering of the pit need not be as thick as for other vegetables.

Another good method of storing cabbage is illustrated in figure 16. The plants are pulled, roots and all, and set side by side with the roots down in a shallow trench, the length of which corresponds to the width of the bed. The bed may be any width up to 8 or 10 feet and as long as necessary to hold the number of cabbages to be stored. Cover the roots with earth. Around the bed erect a

frame of rails, boards, or poles, or by driving a row of stakes into the ground so that an inclosure about 2 feet in height is formed. Bank the outside of this frame with dirt and place poles across the top, covering them with straw, hay, or corn fodder. Make provision for removing portions of the stored product from one end of the pit. This type of storage is inexpensive and gives good results. When the heads are cut, leave the roots in position, and in the spring these roots will sprout and supply the family with an abundance of greens.

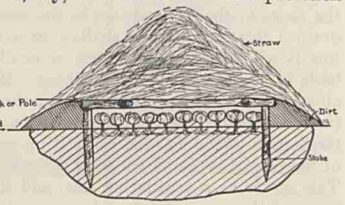


FIG. 16.—Cross section of a cabbage storage pen made of stakes and poles and covered with straw. This is a good way to store cabbage.

Heads of cabbage may be laid in rows on shelves in an outdoor storage cellar, as shown in figure 17, but not in a storage room in the basement of a dwelling, as the odor is likely to penetrate through the house.

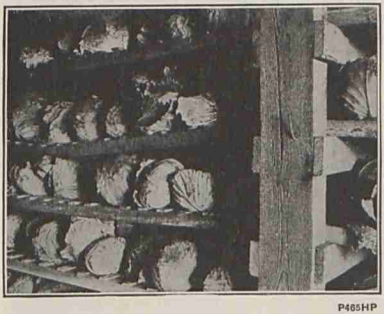


FIG. 17.—Heads of cabbage stored on shelves in an outdoor cellar. The storage room in the basement of a dwelling should not be used, as the odor of the cabbage will penetrate through the house.

For information on the storage of cabbage on a large scale, see Circular 252, Commercial Cabbage Culture.

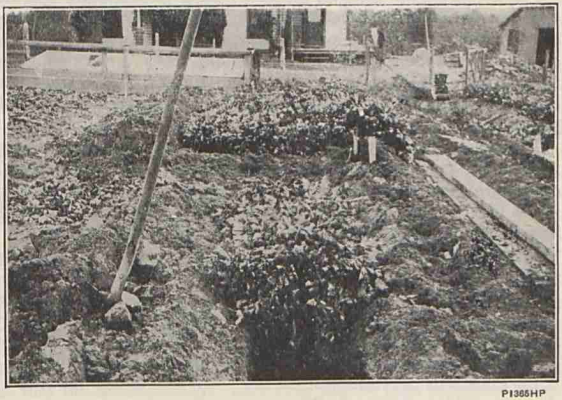
CARROTS.

Carrots may be stored in a storage room in the basement, in outdoor storage cellars, or in banks or pits, and are handled in the same way as beets. It is advisable to place a small quantity in the storage room in the basement or in the storage cellar and the remainder in banks or pits. They are not injured by slight freezing; hence they need not be covered as deeply as potatoes. Carrots, like beets, dry out and wilt very rapidly if kept too dry. The atmosphere of the storage space should be kept damp, with a relative humidity of 90 to 95 percent.

LATE CELERY.

Celery may be stored for a time in the position where grown by placing enough earth around the base of the plants to hold them in good form. Allow them to remain in this condition until just before severe freezing occurs; then bank the earth up to the very tops of the plants, almost covering them, and as the weather becomes colder cover the ridge with coarse manure, straw, or corn fodder held in place by means of stakes or boards. The celery may be removed as needed, but this method is open to the objection that it is hard to get the celery out when the ground is frozen.

Another method of storing celery, illustrated in figure 18, is to excavate a pit 10 to 12 inches wide to a depth of about 24 inches and of any desired length; thoroughly loosen the soil in the bottom or shovel in loose topsoil to form a bed in which to set the roots of the celery, and pack this trench with fully grown plants, placing the roots close together with considerable soil adhering to them. Water the celery as it is placed in the trench and allow the trench to remain open long enough for the tops to become dry. Unless the soil is very dry at the time of storing or extended warm weather should follow, it will not be necessary to apply more water. Place a 12-inch board on edge along one side of the trench and bank it with the surplus earth; cover the trench with a roof of boards, straw on poles, or cornstalks from which the tops have been removed, placing



P1365HP

FIG. 18.—Celery stored in trenches. A 12-inch board is placed on edge along one side of the trench and cornstalks across it, so that one end of the cornstalks rests on the board and the other on the ground.

FIG. 19.—Cross section of hotbed pit used for the storage of celery on a small scale.

the stalks across the pit with one end resting on the board and the other on the ground; spread over this a light covering of straw or other material which will pack closely, and as the weather becomes colder increase the covering to keep out the frost. Celery stored in this manner will keep until late in the winter. This method, because of its simplicity, is recommended for the farmer and small grower.

The unused pit of a permanent hotbed may be utilized as a storage place for celery by removing the surplus earth and substituting a covering of boards for the sash. Store the celery in the same manner as in the trench, and cover the bed with any material which will keep out frost. Figure 19 shows a hotbed used for this purpose.

Celery may be stored on the floor of a storage room in the basement of a dwelling or in an outdoor storage cellar. Take up the plants just before freezing occurs, with considerable earth adhering, and set them on the floor with the roots packed together as closely as possible. If moderately moist, the celery will keep well under the conditions found in most storage cellars. Celery should not be stored in the same cellar as turnips or cabbage, as it will absorb the odor of these vegetables, ruining its flavor.

ONIONS.

To keep well, onions must be mature and thoroughly dry. Put them in ventilated barrels, baskets, crates, or loosely woven bags, as good ventilation is essential to the keeping of onions. A dry, well-ventilated place, such as an attic, furnishes a good storage space for onions, as slight freezing does not injure them, provided they are not handled while frozen.

For further information regarding the storage of onions, see Farmers' Bulletin 354, entitled "Onion Culture."

PARSNIPS.

Parsnips may be allowed to remain in the ground and dug as needed, as freezing does not injure them. However, as it is a difficult matter to dig them when the ground is frozen, it is advisable to store a small quantity in the storage room in the basement of the dwelling or in the outdoor storage cellar for use during the periods when the ground is frozen. Parsnips may be stored in the same manner as beets and carrots.

POTATOES, IRISH.

The Irish potato is the most important vegetable in the northern portions of the United States and is stored in large quantities for winter use. It may be kept in the storage room in the basement, in outdoor storage cellars, and in banks or pits. When stored in cellars, the potatoes may be put into barrels, boxes, baskets, crates, bins, or on the floor, but must be protected from the light. When stored in banks or pits they are handled in the same way as beets, carrots, etc. Potatoes must be protected from freezing, and in cold climates before winter sets in the pit must be covered with manure, straw, or other material in addition to several inches of earth. It is a good plan to place the major portion of the crop in banks or pits and a small quantity in the storage room in the basement or in the outdoor storage cellar for immediate use. A good type of storage cellar especially designed for potatoes is shown in figure 20.

For more detailed information on the storage of potatoes, read Farmers' Bulletin 847, entitled "Potato Storage and Storage Houses."

POTATOES, SWEET.

Sweet potatoes should be mature when dug and should be left exposed for a few hours to dry off the surface moisture before being placed in storage. They should be handled carefully at all times, as they are bruised easily. This crop may be kept in pits or banks

or in outdoor storage cellars of the type shown in figure 5, but a warm, dry place is preferable. When stored in pits or banks sweet potatoes are handled in much the same way as beets or other root crops. When kept in a specially constructed storage house, either in bulk or in crates, the potatoes should be cured for about 10 days or two weeks at a temperature of 80° to 85° F. After the curing period the temperature should be reduced gradually to about 53° F. and maintained at that point or as near it as practicable for the remainder of the storage period. When well matured before digging,

P3945HP

FIG. 20.—A small storage cellar, suitable for holding the products of a home vegetable garden. It is of concrete, is built partly under ground to make it frost proof, and has a small frame entrance.

carefully handled, well cured, and held at a uniform temperature of about 53° F., sweet potatoes may be kept throughout the winter and spring. When only a few bushels of sweet potatoes are to be stored, they may be placed in the basement near the furnace, on a shelf near the kitchen stove, near the chimney on the second floor, or even in a warm attic.

For more detailed information on the storage of sweet potatoes, read Farmers' Bulletin 1442, entitled "Storage of Sweet Potatoes."

PUMPKINS AND SQUASHES.

Pumpkins and squashes may be kept for winter use in the storage room in the basement or in dry, well-ventilated cellars, but a dry, above-ground, frostproof place is best. Put them in rows on shelves so that they are not in contact with each other. If the temperature is maintained at about 50° F., late-maturing varieties of these vegetables will keep until late in the winter. The keeping qualities of squashes, especially those of the Hubbard type, are greatly improved by giving them a curing process similar to that recommended for sweet potatoes.

SALSIFY.

Salsify may be stored in the same way as beets, carrots, and parsnips.

LATE TURNIPS.

Turnips will withstand hard frost, but alternate freezing and thawing injures them. Gather, top, and store the roots in banks or pits, or in an outdoor storage cellar. Do not place them in the storage room in the basement of the dwelling, as they give off odors that penetrate throughout the house.

STORAGE OF APPLES.

Apples may be kept in the storage room in the basement of the dwelling, in outdoor storage cellars, and in banks or pits. Conditions suitable for the keeping of potatoes answer fairly well for apples. Under some conditions it will be an advantage to store part of the crop in the cellar and the late-keeping varieties suitable for spring use in outdoor banks or pits. Do not store apples with potatoes or most other root vegetables, as the apples will absorb an unpleasant flavor.

ORGANIZATION OF THE UNITED STATES DEPARTMENT OF AGRICULTURE WHEN THIS PUBLICATION WAS LAST PRINTED

Secretary of Agriculture	CLAUDE R. WICKARD.
Under Secretary	PAUL H. APPLEBY.
Assistant Secretary	GROVER B. HILL.
Director of Information	M. S. EISENHOWER.
Director of Extension Work	M. L. WILSON.
Director of Finance	W. A. JUMP.
Director of Personnel	ROY F. HENDRICKSON.
Director of Research	JAMES T. JARDINE.
Director of Marketing	MILO R. PERKINS.
Solicitor	MASTIN G. WHITE.
Land Use Coordinator	M. S. EISENHOWER.
Office of Plant and Operations	ARTHUR B. THATCHER, *Chief.*
Office of C. C. C. Activities	FRED W. MORRELL, *Chief.*
Office of Experiment Stations	JAMES T. JARDINE, *Chief.*
Office of Foreign Agricultural Relations	LESLIE A. WHEELER, *Director.*
Agricultural Adjustment Administration	R. M. EVANS, *Administrator.*
Bureau of Agricultural Chemistry and Engineering.	HENRY G. KNIGHT, *Chief.*
Bureau of Agricultural Economics	H. R. TOLLEY, *Chief.*
Agricultural Marketing Service	C. W. KITCHEN, *Chief.*
Bureau of Animal Industry	JOHN R. MOHLER, *Chief.*
Commodity Credit Corporation	CARL B. ROBBINS, *President.*
Commodity Exchange Administration	JOSEPH M. MEHL, *Chief.*
Bureau of Dairy Industry	O. E. REED, *Chief.*
Bureau of Entomology and Plant Quarantine	LEE A. STRONG, *Chief.*
Farm Credit Administration	A. G. BLACK, *Governor.*
Farm Security Administration	C. B. BALDWIN, *Administrator.*
Federal Crop Insurance Corporation	LEROY K. SMITH, *Manager.*
Surplus Marketing Administration	MILO R. PERKINS, *Administrator.*
Forest Service	EARLE H. CLAPP, *Acting Chief.*
Bureau of Home Economics	LOUISE STANLEY, *Chief.*
Library	CLARIBEL R. BARNETT, *Librarian.*
Bureau of Plant Industry	E. C. AUCHTER, *Chief.*
Rural Electrification Administration	HARRY SLATTERY, *Administrator.*
Soil Conservation Service	H. H. BENNETT, *Chief.*

For sale by the Superintendent of Documents, Washington, D. C. - - - - Price 5 cents

March, 1941 Extension Misc. Pamphlet No. 39

Simplified Methods for Home and Community Canning

NORTH CAROLINA STATE COLLEGE
OF
AGRICULTURE AND ENGINEERING
OF THE
UNIVERSITY OF NORTH CAROLINA
AND
UNITED STATES DEPARTMENT OF AGRICULTURE,
COOPERATING
NORTH CAROLINA AGRICULTURAL
EXTENSION SERVICE
I. O. SCHAUB, *Director*
STATE COLLEGE STATION
RALEIGH

DISTRIBUTED IN FURTHERANCE OF THE ACTS OF
CONGRESS OF MAY 8 AND JUNE 30, 1914

FOREWORD

In "Simplified Methods For Home and Community Canning" the hot-water canner is recommended, as directions are given only for products that can be safely canned at boiling temperature, 212 degrees, F. This list includes only tomatoes, fruits, freshly-gathered, young, tender string beans, and a pre-cooked soup mixture containing a large proportion of tomatoes.

In communities where there are pressure canners, North Carolina Extension Circular No. 223 should be used, as this bulletin includes directions for canning non-acid vegetables such as corn, peas, beans, spinach, squash, okra, etc.

Requests for Circular No. 223 should be sent to the Agricultural Extension Service, State College, Raleigh, N. C.

CORNELIA C. MORRIS
Extension Economist in Food Conservation and Marketing.

HOT-WATER CANNERS

Several convenient types of canners are on the market. The simplest hot-water outfit is one to be placed on the kitchen stove. Another, more complete, has a fire box attached and is used out-of-doors. These outfits also include blanching trays, tongs for handling hot jars, and a false bottom.

The type of canner should be chosen with reference to the kind and amount of canning to be done. The small hot-water canner is the least expensive of the commercial outfits for home canning. For inexperienced people it is also more easily handled. This type of canner is preferable for canning fruits and tomatoes. They are canned safely at boiling temperature, and the texture, flavor, and color of the finished products are good.

A wash boiler, lard tin or any vessel that has a tight cover and is large enough to hold the required number of cans or jars will make a satisfactory canner, provided that it is fitted with a wooden rack or a piece of wire mesh to prevent jars from breaking by touching the bottom of the canner.

SOME THINGS TO BE OBSERVED WHEN CANNING

1. If hot-water canner is used, be sure the canner is partly filled with water before fire is built.
2. Keep the water at a jumping boil and do not allow fire to die down for an instant while cans are in the canner.
3. Keep cover on canner every moment of the boiling time. Steam plays a large part in cooking the contents of a can.

4. If possible, use two canners, one for blanching fruit and the other for canning. A large pot set over a fire will serve for blanching.

5. The quality or grade of the pack depends on the number of whole fruits or uniform pieces of fruit in the can, the color of the fruit, the weight, and the flavor.

6. The flavor is often injured by letting peeled fruit stand too long before cooking. Prepare at any one time as many cans only as can be processed immediately.

7. Let "Straight From Vine to Can" be the motto.

8. Mark every tin can as it is filled with the name of its contents. A pencil may be used, as the writing will not boil off. This prevents confusion when labeling.

Use No Artificial Preservatives. Artificial preservatives in the form of "Acids," "Preserving Powders," and "Formulas" of various kinds should not be used. Some of these are injurious to health and are forbidden by the pure food laws.

The cheapest, surest, and only absolutely safe way to sterilize is by means of heat. The small amount of sugar and salt used in canning fruits and vegetables does not act as a preservative. It is added for flavor.

MEANING OF TERMS USED

Sterilizing—Boiling to destroy bacteria.

Blanching—Placing vegetables or fruits in a cotton bag or wire basket and plunging into boiling water before packing jars or cans to be processed. This improves flavor and softens product, so that more can be placed in a can.

Processing—Boiling fruits or vegetables in the jar or can.

Exhausting—Heating filled can before sealing to drive off air.

CANNING IN GLASS

Glass Jars.—There are a number of different types of jars on the market. Those most commonly used are the Mason screw top and the glass top with metal springs. Both of these are fitted with rubber rings.

Another type has a lacquered metal top with a sealing composition flowed on and does not require a rubber ring. The top is held in place by a metal band which is screwed on during processing.

Do not use metal tops with waxed paper inset for canning, as these are designed for honey, syrup and other products which do not require processing.

Jar Rubbers.

Use good new rubbers, as the success of canning depends largely on the quality of the rubber rings used. Do not use rubbers the second time.

Sterilizing the Jars.

To sterilize glass jars, place them upside down on a rack in the canner in warm water. Do not fill the canner with more than three inches of water. Place cover on the canner. Bring the water to a boil and boil jars 8 minutes.

Rubbers should be dipped into boiling water and placed on the jar wet.

Packing and Processing the Jars.

Remove the jars from the canner, prepare the fruits or vegetables, and pack them right into the neck of the jars, filling with water, brine, or syrup, as the packing proceeds. Wipe clean the rim of the jar and place the rubber on. Seal lightly and place jar in the canner holding warm water. Never place a cold jar in boiling water, as there is danger of breakage.

When the water begins to boil, count time. Consult the recipe noting the exact number of minutes, and never cut this time short. Have a clock handy and do not guess at time.

Leave the jars lightly sealed during the whole processing, and when the time is up, remove one at a time from the canner, and seal tightly. Do not turn jars upside down. **After screw top jars cool, do not tighten tops again as the seal will be broken and contents will spoil.**

CHECKING UP RESULTS

Examine jars and cans for signs of leakage. Hold canned products for a week or ten days, where they can be examined at least once a day to be sure that they are keeping. If the contents of any jars or cans show signs of spoilage, they should be destroyed. Do not taste spoiled food.

CANNING IN TIN

Tin Cans.

The No. 3 can is popular for tomatoes, peaches, etc., and holds a quart. No. 2 can is used generally for peas, corn, soup mixture, etc.

Wash and sterilize all cans which are to be used. Place them in a canner where water is boiling. Let them remain ten minutes. Remove and turn upside down on clean surface until used.

After fruit or vegetables are blanched, pack them in sterilized cans until the can is filled to about one-half inch of the top. Begin to pack firmly with spoon when first bit of fruit or vegetable is put into a can, pressing down gently until the can is filled. Add hot brine or syrup as packing proceeds. Tomatoes must have no water added. There will be sufficient juice to cover them.

Products in tin should be exhausted in boiling water from three to five minutes before sealing to insure a good vacuum.

If directions call for precooking of products and they are packed while boiling hot, exhausting is not necessary.

Food in glass jars is exhausted during the processing as the jars are not fully sealed.

After the can has been sealed, it is ready for the processing. Place cans for processing in trays and lower into the boiling water. The temperature of the water will then be reduced. Wait until boiling begins again before processing time is counted. Keep the water boiling every minute of the time during processing and remove cans promptly when time is up. Have a clock or watch at hand. Do not guess.

CANNING FRUITS AND BERRIES IN GLASS AND TIN

Dewberries, Blackberries and Raspberries.

To can dewberries, blackberries and raspberries, the following method will prove satisfactory: Gather berries when ripe but firm. Place in muslin sack and plunge into boiling water one minute. This will slightly soften the berries and allow the packing of almost twice as many in a can or jar. It will also prevent the condition where berries rise to the top of the jar.

Pack tin cans to within one-quarter inch of the top with berries. Fill glass jars quite full. Fill the spaces and cover the berries with a syrup made of one gallon of water and one pint of sugar.

The flavor of all canned berries is finer when syrup or sugar is added.

Process the filled No. 3 tin cans 8 minutes.

Process the filled quart glass jars 13 minutes, permitting jars to remain lightly sealed while processing. Lift jars from the canner and seal tightly immediately.

Canned strawberries do not make an attractive product. They shrink badly and lose their color. If they are canned, the recipe for blackberries may be followed.

Huckleberries.—Huckleberries should be canned just as blackberries. Care should be taken that they are well stemmed and perfectly clean before blanching.

Huckleberries should be canned in glass jars as the acid will eat through the seams of a plain tin can.

Peaches.—Peaches should be selected when they are fully ripe and of a uniform size and color. Never pack fruit of varying colors in the same jar.

Peeling Peaches.—When semi-cling peaches, such as the Elberta, or a soft peach is canned, they may be peeled by first plunging into boiling water and then into cold water. It is difficult to peel ripe soft peaches without dipping them in boiling water.

After peeling, cut peaches into halves and remove the pit. Have ready a boiling syrup of 2 pounds of sugar and 1 gallon of water. Drop peaches into boiling syrup one-fourth at a time, allowing them to cook for 1 minute, or until tender but not soft.

Place in jars in overlapping layers with the pit side down and the stem end towards the center of the jar. Add syrup bit by bit when packing.

Process a quart jar 25 minutes.

Process No. 3 can 20 minutes.

Canned Apples.—Late fall and winter apples which are slightly acid are best for canning. Peel, cut, and drop into a brine made of 2½ ounces of salt and 1 gallon of water. Cook in syrup made of 2 pounds of sugar and one gallon of water.

Process No. 3 cans 8 minutes.

When canning apples in glass, process quart jars 15 minutes.

It is advisable to make mellow summer apples into apple sauce. Pour sauce hot into quart jars and process 15 minutes.

Canned Pears.—The Bartlett pear is best for canning. Select ripe, sound, medium-sized fruit (cut in halves, or if large in quarters). Remove all the hard portions around the seed and dip in brine similar to that used for apples to prevent discoloration.

Plunge the halves or quarters into boiling syrup and allow them to cook until they can be pierced with a straw, remove and pack closely in a No. 3 can or quart jar. Cover with a boiling syrup made of 3 pounds and 9 ounces of sugar and 1 gallon of water.

Process No. 3 can 20 minutes.

Process quart jar 25 minutes.

Canned Cherries.—Cherries are usually canned without the seed, and should be put in glass jars. Large wax cherries are often canned whole. They should be blanched for 1 minute.

Pack seeded or whole cherries in jar to within one-quarter inch of top, fill jar with syrup made of 3 pounds and 9 ounces sugar and 1 gallon of water.

Process quart jars 30 minutes.

Process pint jars 20 minutes.

Fruit may be successfully canned without the use of sugar; and when there is a scarcity, it is sometimes necessary. Sugar is not used to preserve the fruit, but to bring out the flavor and improve the taste. Even a small amount of sugar will greatly improve flavor.

CANNING VEGETABLES IN GLASS AND TIN

Canned Tomatoes.—Select ripe tomatoes for canning.

Blanch for one minute. The skin may then be removed easily. Do not peel any more than may be immediately canned, as tomatoes ferment quickly.

Be careful to remove hard part of tomato with sharp knife at stem end.

Pack into cans as many whole tomatoes as possible, cutting them only when they are too large to slip in. Fill can to within one-quarter inch of top, press gently and shake down fruit to fill crevices. Exhaust from 3 to 5 minutes.

A level teaspoonful of sugar and a level teaspoonful of salt added to a No. 3 can or a quart jar of tomatoes will improve the flavor of the product.

Use no water with tomatoes. If the can is properly filled the juice will be sufficient.

Process No. 3 tin cans 35 minutes.

When canning tomatoes in glass jars, fill quite full and process quart jars 40 minutes.

String Beans.—To can string beans, select those that are young and tender and which have few strings. The Green Pod Stringless is a good variety. If the beans are gathered when young and tender, and the strings removed, a good product results. Snap the beans at both ends, string, and place in a thin cotton bag, and dip in boiling water from 3 to 5 minutes. This improves the flavor of the beans and allows more to be packed in a can. Pack closely to within one-quarter inch of the top, and fill with hot water. Add 1 level teaspoonful of salt.

String beans are a non-acid vegetable and should be processed with steam under pressure. If no pressure cooker is available, the young tender beans can be processed for 1 hour and 30 minutes in a hot water canner. If the beans are older and small beans have formed, process for 3 hours. Do not can mature beans. Do not use canning powders.

Soup Mixture.—Corn, butterbeans, and okra are difficult to can in a hot-water canner without spoiling unless they are combined with tomatoes, as the acid in tomatoes helps to destroy the bacteria. Therefore, it is recommended that these products be made into soup mixture unless a pressure cooker is available.

Five quarts tomatoes, 2 quarts corn, 2 quarts okra or lima beans, 2 tablespoonfuls sugar (level), 2 tablespoonfuls salt (level). Scald and peel tomatoes, cutting out green or hard spots. Chop and measure. Cut young and tender field or sugar corn from cob. Slice okra in rings one-half inch thick. Place all in open agate kettle and boil until thick. Pour into No. 2 cans while hot, seal, and process 1 hour and 15 minutes. Process No. 3 can 1½ hours.

Use an asbestos mat under the kettle when boiling soup mixture and stir constantly. It is very easily scorched.

When canning soup mixture in glass jars, process quart jars 1½ hours. Process pint jars 1 hour and 15 minutes.

Sauerkraut.—For making sauerkraut in the home, 4, or 6-gallon stone jars are considered the best containers unless large quantities are desired, in which case kegs or barrels may be used.

Select only mature, sound heads of cabbage. After removing all decayed or dirty leaves, quarter the heads and slice off the core portion. For shredding, one of the hand-shredding machines which can be obtained on the market is much the best, although an ordinary slaw cutter or a large knife will do.

In making sauerkraut the fermentation is carried out in a brine made from the juice of the cabbage which is drawn out by the salt. One pond of salt for every 40 pounds of cabbage makes the proper strength of brine to produce the best results. The salt may be distributed as the cabbage is packed in the jar or it may be mixed with the shredded cabbage before being packed. The distribution of 2 ounces of salt with every 5 pounds of cabbage probably is the best way to get an even distribution.

Pack the cabbage firmly, but not too tightly, in the jar or keg. When full, cover with a clean cloth and a board or plate. On the cover place a weight heavy enough to cause the brine to come up to the cover.

If the jar is kept at a temperature of about 86 degrees F., fermentation will start promptly. A scum soon forms on the surface of the brine. As this scum tends to destroy the acidity and may affect the cabbage, it should be skimmed off from time to time.

If kept at 86 degrees F., the fermentation should be completed within 10 days.

After fermentation is completed, set the sauerkraut in a cool place. If the cabbage is fermented late in the fall, or if it can be stored in a very cool place, it may not be necessary to do more than keep

the surface skimmed and protected from insects, etc., otherwise it will be necessary to resort to one of the following measures to prevent spoilage.

(1) Pour a layer of hot paraffin over the surface, or as much of it as is exposed around the cover. Properly applied to a clean surface, this effectually seals the jar and protects the contents from contamination.

(2) After the fermentation is complete, pack the sauerkraut in glass jars, adding enough of the "kraut" brine, or a weak brine made by adding an ounce of salt to a quart of water, to completely fill the jars.

The second method is much to be preferred to the first. If it is heated before sealing in a water bath until the temperature of the center of the jar is about 160 dgrees F., and then stored in a cool place, sauerkraut packed in this way will keep in good condition for a year or longer.

In the commercial canning of sauerkraut, where conditions and length of storage can not be controlled, heat must always be used.

SPECIAL DIRECTIONS TO BE FOLLOWED IN THE MOUNTAIN SECTION OF NORTH CAROLINA

When canning in a hot-water canner the temperature of water does not go beyond the boiling point (212 degrees F.) at sea level. The boiling point of water depends upon the atmospheric pressure which changes with altitude. Water boils at approximately two degrees lower for every 1000 feet above sea level, therefore, it is necessary to cook products longer in high altitudes, as the lower temperatures will not sterilize as readily as the sea level boiling point. As an example: In Madison and Avery Counties at an altitude of 3,000 feet above sea level, water will boil at 206 degrees F., which is six degrees lower than boiling point at sea level.

If the altitude is more than 1,000 feet above sea level, use the following time table for canning:

Tomatoes: No. 3 tin can—Process 40 minutes.

Tomatoes: Quart glass jar—Process 45 minutes.

String Beans: No. 3 tin can—Process 1 hour and 38 minutes. Process older beans 3 hours and 15 minutes.

String Beans: Quart glass jar—Process 1 hour and 50 minutes. Process older beans 3 hours and 20 minutes.

Soup Mixture: No. 2 tin can—Process 1 hour and 30 minutes.

Soup Mixture: No. 3 tin can—Process 1 hour and 50 minutes.

Soup Mixture: Quart glass jar—Process 1 hour and 50 minutes.

Berries: No. 3 tin can—Process 10 minutes.

Berries: Quart glass jar—Process 16 minutes.

Peaches: No. 3 tin can—Process 25 minutes.

Peaches: Quart glass jar—Process 30 minutes.

Apples: No. 3 tin can—Process 10 minutes.

Apples: Quart glass jar—Process 16 minutes.

Pears: No. 3 tin can—Process 25 minutes.

Pears: Quart glass jar—Process 30 minutes.

Cherries: Quart glass jar—Process 35 minutes.

Cherries: Pint glass jar—Process 25 minutes.

HOME Canning

of FRUITS VEGETABLES and MEATS

U. S. DEPARTMENT
OF AGRICULTURE
FARMERS' BULLETIN
No. 1762

CONTENTS

	Page
Canning, economical way to preserve food	1
Correct processing for canning success	2
Is food acid or nonacid	4
Canning equipment and methods	5
Boiling-water bath—for acid foods	5
Steam pressure canner—for nonacid foods	6
Steamers and ovens	9
The open kettle	10
Glass jars and bottles	11
Tin cans	14
Other utensils and supplies	18
Steps in canning	19
Canning fruits, tomatoes, and other acid foods	21
Fruits with or without sugar	22
Packing and processing	23
Apples	23
Apricots	24
Beets, pickled	24
Berries	24
Cherries	24
Currants	25
Gooseberries	25
Peaches	25
Pears	26
Pimientos, ripe	26
Pineapples	27
Plums	27
Rhubarb	27
Sauerkraut	27
Strawberries	27
Tomatoes	27
Tomato juice	28
Fruit juices	28
Fruit purees	29
Canning nonacid vegetables	32
Packing and processing	32
Asparagus	32
Beans, fresh lima	32
Beans, snap	32
Beans, dried kidney or pinto	33
Soybeans	33
Beets, baby	33
Carrots	33
Corn	33
Greens	35
Mushrooms	35
Okra	35
Okra and tomatoes	35
Peas, green	35
Peas, black-eyed	36
Pumpkin	36
Squash	36
Sweetpotatoes	36
Vegetable-soup mixtures	36
Canning meats and chicken	36
Utensils and equipment	37
Precooking	38
Packing and processing	39
Beef, fresh	39
Beef, ground (hamburger)	39
Beef, hash, and stew meat	39
Beef, heart and tongue	40
Beef stew with vegetables	40
Beef, corned	40
Chicken and other poultry	40
Chicken sandwich spread	41
Chicken-liver paste	41
Chicken-gumbo soup	41
Chile con carne	42
Lamb and mutton	42
Liver paste	42
Pork and beans	42
Pork, fresh	43
Pork, headcheese	43
Pork sausage	43
Rabbit, domestic	43
Soup stock and broth	43
Veal	45
Before eating, inspect all canned food	45
Signs of spoilage	46

OTHER BULLETINS ON FOOD PRESERVATION

United States Department of Agriculture:

Farmers' Bulletin No. 879, Home Storage of Vegetables.
Farmers' Bulletin No. 1186, Pork on the Farm—Killing, Curing, and Canning.
Farmers' Bulletin No. 1415, Beef on the Farm—Slaughtering, Cutting, Curing.
Farmers' Bulletin No. 1438, Making Fermented Pickles.
Farmers' Bulletin No. 1800, Home-made Jellies, Jams, and Preserves.
Farmers' Bulletin No. 1807, Lamb and Mutton on the Farm.
Farmers' Bulletin No. 1918, Drying Food for Victory Meals.

United States Department of the Interior:

Fish and Wildlife Service, Fishery Investigational Report No. 34, The Home Canning of Fishery Products. 10 cents per copy from Superintendent of Documents, Washington, D. C.

Washington, D. C.

Issued September 1936
Revised 1942

FOODS and NUTRITION DIVISION • BUREAU of HOME ECONOMICS

HOME CANNING OF FRUITS, VEGETABLES, AND MEATS

by

LOUISE STANLEY, Chief, MABEL STIENBARGER,[1] associate specialist and DOROTHY SHANK, specialist in home economics

CANNING, ECONOMICAL WAY TO PRESERVE FOOD

CANNING is a method of using heat and airtight containers to preserve food as nearly as possible in the condition in which it is served when freshly cooked. It is a desirable and economical method of preserving many foods so that their use can be distributed over seasons and to places where they are not available fresh. Canned foods thus make possible a better-balanced and more-varied diet throughout the year.

The method of canning foods affects the vitamin content to some extent. With the possible exception of vitamin C there may be no serious loss during the canning process, though of course when foods are removed from the cans and reheated before serving, there may be additional loss of vitamins. In order to preserve all the vitamins possible in canned products, emphasis is placed throughout this bulletin on canning foods very soon after they are gathered and on carrying every step of the process through rapidly. Precooking foods for a short time, packing them hot, and processing them in the containers help to preserve the vitamin value.

None of the minerals in foods need be lost in canning, providing the liquid in which they are precooked is used to fill up the containers and provided the entire contents of the can is served.

A canning budget prepared at the beginning of the season will indicate what quantities of different canned foods are needed by the family. In making such a budget, consider the number of persons in the family, the length of time that fresh foods are out of season, and what foods are available for canning, as well as the cost of equipment and containers, and the value of the time of the persons doing the work. Assistance in planning a canning budget suitable to the locality

[1] Deceased.

and adapted to the nutritional requirements of the family may be obtained from the State college of agriculture.

Correct Processing for Canning Success

Successful canning is based on an understanding of the important causes for the rapid spoilage of fresh foods and on a knowledge of the methods by which this spoilage may be prevented. The two agents that cause food spoilage are enzymes and micro-organisms, including bacteria, yeasts, and molds.

"Two hours from garden to can"

All fresh fruits, vegetables, and meats contain substances called enzymes. Up to a certain point these enzymes bring about desirable changes in foods. They cause fruits and vegetables to ripen normally and the tissues of meats to become more tender as they are held in storage; but if allowed to go on unchecked, enzymes hasten the decay of foods. The low temperatures of cold storage retard the action of enzymes, and the heat of cooking or canning destroys them entirely.

To prevent undesirable changes due to enzymes, fruits and vegetables should be canned as soon as possible after they are gathered. "Two hours from garden to can" is a good rule. If they must be held they should be kept in small lots in a cool, well-ventilated place. Meats should be refrigerated at 30° to 32° F. if they are to be held for several days.

Trouble-making organisms

The second and more important cause of food spoilage is the action of three groups of minute organisms that are present in the air, soil, water, and, in fact, on everything. They are yeasts, molds, and bacteria.

If all micro-organisms in food are killed and it is sealed steaming hot in sterile airtight containers, it is said to be sterilized. The application of heat to foods during canning in order to kill micro-organisms is called processing. Food spoils when it comes in contact with unheated air because of the bacteria, yeasts, and molds the air contains. For successful canning, it is not enough just to destroy the micro-organisms. After being processed, the food must be protected from the air by a hermetic seal.

Yeasts and molds are easily destroyed by heat in canning. Temperatures below the boiling point of water (from about 150° to 180° F. for varying periods of time) are effective in destroying them. Yeasts rarely cause spoilage in canned foods, and molds never do unless the container holding the food is faulty and permits the organisms to gain entrance from the air.

In killing bacteria by heat, both the degree of temperature and the

length of time it is to be applied must be considered. A very high temperature may produce a sterile canned product that will keep well, but this may be at too great a sacrifice of flavor and texture. Therefore the temperature applied should ordinarily be the lowest and the period of time the shortest necessary to accomplish the desired result. This may not in every case actually sterilize the food, but it does give "effective sterilization," by destroying the organisms that are likely to grow and cause spoilage when the food is stored under average conditions.

While bacteria are growing actively they are easily destroyed at the temperature of boiling water (212° F.). But some kinds of bacteria go through a dormant or spore form in the course of their life cycle and in that stage are very resistant to heat. It may take 6 hours or more at boiling temperature (212°) to kill these spores, but at 240°, the temperature obtained in the steam pressure canner, they may be destroyed in 30 minutes.

Whether foods are acid or nonacid also makes a difference in the rate at which bacteria may be killed. When the foods are definitely acid, as, for example, fruits and tomatoes, all forms of bacteria are killed within a reasonable time at the temperature of boiling water. With the nonacid foods, such as meats and corn, peas, beans, and practically all vegetables except tomatoes, these heat-resistant bacteria can be killed with speed and surety only at the high temperatures obtainable in the steam pressure canner.

The types of bacteria vary with different foods, also with the year, the locality, and the conditions of production. For example, some of the most heat-resistant forms of bacteria are in the soil. Consequently a low-growing vegetable like spinach may be heavily contaminated and the fuzzy coating on snap beans may shelter such bacteria and make them difficult to remove.

Dangerous bacteria

Bacteria may cause the following types of spoilage in canned foods.

Fermentation is one type of spoilage caused by bacteria. During fermentation, acid and gas are produced, causing the food to become sour or "cheesy." Tin cans may bulge or seals on jars may be broken by accumulated gas.

Flat-sour spoilage is caused by bacteria that produce acid without gas. They grow best at temperatures about 130° to 140° F. and sometimes cause spoilage in canned foods not properly cooled after processing or held at too-high storage temperatures. Corn, peas, and snap beans are subject to flat-sour spoilage.

Another type of bacteria causes putrefaction in canned food. The growth of putrefactive bacteria is marked by gas production, a bad odor, and the softening and darkening of canned food. Putrefaction

usually occurs in foods low in acidity, such as meats, peas, and corn.

Botulinus spoilage

When the spores of botulinus bacteria are not destroyed in the canning process they may grow later and produce a toxin in the food. Since a number of cases of botulinus poisoning have been traced to inadequately processed foods, the botulinus bacteria have been studied in order to find the temperature and conditions necessary for destroying them. They will not grow in salt solutions when more than 9 percent of salt is present. They are destroyed by processing at 212° F. if the solution is sufficiently acid. With beans, corn, peas, and other nonacid vegetables and meats they may not be killed at the temperature of boiling water (212° F.) unless the food is heated for 6 to 10 hours or even longer, but the time may be decreased very much if the higher temperature of the steam pressure canner is used.

Since various agents, such as birds and winds blowing dust, may carry bacteria from one area to another, it cannot be assumed that any particular locality is free from botulinus bacteria. The directions in this bulletin for handling the various fruits, vegetables, and meats have been prepared as a safeguard against spoilage due to this dangerous type of bacteria.

Is Food Acid or Nonacid?

For purposes of canning, foods are considered in two groups according to the quantity of free acid they contain. The acid foods are fruits, tomatoes, pickled beets, ripe pimientos, and rhubarb. The nonacid foods include all other vegetables, such as asparagus, peas, beans, and corn, and also meats and poultry.

The acid foods are processed at or near the temperature of boiling water (212° F.) in a boiling-water bath, or in a steamer without pressure, or in an oven. The acid products may also be canned from the open kettle.

Nonacid foods must be processed in a steam pressure canner at temperatures of 240° to 250° F. obtained by applying 10 to 15 pounds of steam pressure.

The addition of small quantities of an acid, such as vinegar or lemon juice to a nonacid vegetable or meat does not change the acidity of the food enough to permit processing in the boiling-water bath. This can be done only if enough acid is added to pickle the food. For example, beets are a nonacid vegetable and need to be processed under steam pressure, but when they are pickled in vinegar they may be handled as an acid product in the boiling-water bath.

The use of chemical preservatives, such as salicylic acid, sodium benzoate, and "canning powders," should be avoided in home canning any kind of food. These chemicals vary in their effects on the human body, some being more harmful than others. Therefore

the safe way for the home canner is to process foods adequately with heat and not to use chemical preservatives.

CANNING EQUIPMENT AND METHODS

Prepare for the canning season by checking over in advance the equipment and materials that will be needed. This may prevent delays when the food is ready to can.

Boiling-Water Bath—for Acid Foods

For processing acid foods, the water bath is the most generally satisfactory method in the home. If water is boiled in an open vessel or in one on which the top is not clamped down tightly, the temperature reached is never higher than the boiling point of water. All additional heat applied goes to changing the water to steam, and the water boils away. Therefore the temperature of the food in the cans surrounded by the boiling water does not go higher than that of the water.

Time varies with altitude

Moreover, the boiling point of water is not always the same. It depends upon atmospheric pressure, which changes with the altitude. At sea level, the boiling point of water is 212° F., and it decreases as the altitude increases. Allowance should be made for this in home canning. In this bulletin the directions for processing in boiling water are based on the boiling point at altitudes of 1,000 feet or less. For altitudes above 1,000 feet the length of processing should be increased 20 percent for each additional 1,000 feet.

Altitude (feet)	*Temperature of boiling water*		*Altitude (feet)*	*Temperature of boiling water*	
	° F.	*° C.*		*° F.*	*° C.*
Sea level	212	100	5,225	202	94
1,025	210	99	6,304	200	93
2,063	208	98	7,381	198	92
3,115	206	97	8,481	196	91
4,169	204	95	9,031	195	90

Using the water-bath canner

A water-bath canner may be made from a wash boiler, a bucket, or any vessel that has a tight cover and is large enough to hold a convenient number of cans of food and to permit covering them with 1 to 2 inches of water. It should be fitted with a rack to hold the jars. A wire basket for this purpose can be made by a tinner at small cost or at home from wire-mesh fencing, or it may be purchased.

In processing fruits and other acid foods in the water bath, be sure that the jars or cans are far enough apart and that the rack on which

they are supported is so arranged that the water can circulate freely under and around them.

Have the water in the canner boiling before putting in the cans of food. In order to keep the glass jars from breaking they must be preheated in water or filled with hot food.

When all the containers are in the canner, see that the water comes over the tops at least 1 or 2 inches. Add more boiling water as needed to keep this level.

Count time as soon as the water begins to boil vigorously. Keep the bath boiling constantly during all of the processing period.

As soon as the processing time is up, remove the glass jars from the water one at a time. Jars should be tightly sealed at this time if necessary. Methods used for sealing the different kinds of jars are described on pages 11 and 12. Tin cans are sealed before they are placed in the water bath and need no further adjustment.

Steam Pressure Canner—for Nonacid Foods

A steam pressure canner is required for processing meats, practically all vegetables except tomatoes, and other nonacid foods. It is not safe to can such foods at home unless a pressure canner is available.

Share the canners

Since pressure canners are made of materials much needed in the war effort, not enough of these canners are now being manufactured to supply the demand. It will help in meeting this situation, for owners of pressure canners to share their equipment in a neighborhood. It is worth while to find out whether community canning centers are set up within the community. At these centers resources are pooled, and homemakers with less experience in canning may have helpful guidance.

If no pressure cooker is available, nonacid foods should be preserved in other safe ways. Ways of preserving vegetables and fruits are drying, pickling, quick freezing, storing. Meats may be cured or frozen.

The pressure canner is especially designed to heat foods to higher temperatures than can be reached in a boiling-water bath or an ordinary steamer. Foods cannot be heated beyond the boiling point of water at a particular altitude unless the vessel has a tight-fitting cover clamped down so the steam is held in under pressure. It is desirable to have a thermometer set into the top so that pressure can be checked against temperature. Pressure canners of usual household sizes are not manufactured with thermometers, but on canners of larger size, as 40-quart or more capacity, a reliable thermometer can be inserted for a few dollars' additional cost.

If nonacid foods are being canned for sale the pressure canners should be equipped with thermometers to make certain that the

processing will be adequate. Pressure gages may become inaccurate after a period of use. Those that have the indicator soldered or otherwise attached permanently to the stem will remain in good condition longer than gages in which the indicator is held in place by friction only.

The size of the pressure canner should be suitable to the kind of containers and the probable number to be handled at one time. For home use, pressure canners of from 18- to 21-quart capacity have been found most satisfactory. While larger canners are available on the market, they are too heavy and too awkward for the homemaker to handle. The smaller steam pressure outfits, of 10- to 12-quart capacity, are intended for cooking rather than canning. They hold only a few cans at a time, and it is almost impossible to operate them so that the pressure does not fluctuate during the processing period. If home canning is to be done regularly, therefore, it pays to have a good-sized pressure canner in perfect working order (table 1).

TABLE 1.—**Approximate capacity of steam pressure canners of various sizes**

Size of canner (quarts)	Net weight of canner	Capacity			
		No. 2 tin cans	No. 3 tin cans	Pint glass jars	Quart glass jars
	Pounds	*Number*	*Number*	*Number*	*Number*
18	18	14	8	8	5
25	27	16	10	18	7
30	35	19	12	20	8
40	50	25	16	24	16

Pressure varies with altitude

Since the temperature obtained in the steam pressure canner, as well as in the boiling water bath, is affected by altitude, allowance for this must be made in home canning. In this bulletin processing periods are based on the pressure-temperature figures at sea level. At altitudes over 2,000 feet, add 1 pound pressure for each additional 2,000 feet (table 2).

TABLE 2.—**Corresponding pressure and temperature figures, under standard conditions at sea level**

Steam pressure (pounds)	Temperature		Steam pressure (pounds)	Temperature	
	° *F.*	° *C.*		° *F.*	° *C.*
5	228	109	20	259	126
10	240	115	25	267	131
15	250	121			

467454°—42——2

Using the pressure canner

In operating and caring for a pressure canner follow the directions of the manufacturer. Certain points need special attention.

Pour boiling water into the canner to a depth of about 1 inch or until the level is just below the rack that holds the containers. Add more water up to this level after processing each load, so that the canner will not boil dry and be damaged.

Allow space between the containers for the circulation of steam. Tin cans may be arranged in several tiers by using a wire rack or metal strips to keep the cans apart and permit the circulation of steam.

After the canner is loaded, adjust the cover and fasten it securely. If there are several clamps fasten moderately tight those opposite each other, a pair at a time; then go back over the whole set and tighten each pair.

See that no steam escapes anywhere except at the pet cock.

Allow the pet cock to remain open until the steam escapes from it in a steady stream for 4 to 7 minutes, indicating that no air remains inside. Otherwise the pressure will be partly due to air, and the temperature will fall short of the required degree. Then close the pet cock and allow the pressure to rise until the gage registers the desired point.

Count time from the moment the desired pressure is reached. Keep close watch on the canner while in use. Regulate the heat carefully so as to maintain a uniform pressure during the processing period, and do not allow drafts to blow on the canner. Fluctuations in pressure, as from 10 pounds to 15 pounds and down again, should always be avoided. This may cause loss of liquid from glass jars. It is especially important to keep the pressure from going so high that the safety valve releases the steam suddenly, nor should the steam be allowed to escape suddenly by opening the pet cock.

At the end of the processing period remove the canner from the fire. When using glass jars or No. 3 or larger tin cans, allow the canner to cool until the gage registers zero before opening the pet cock, and then open gradually. Remove glass jars one at a time and seal rubber ring jars tightly at once. Self-sealing types of jars should have no further adjustment. Tightening at this time may break the seal. Adjustments vary with the types of jar (p. 12). If liquid has been lost, do not open the jars to add more.

Do not hasten the cooling of a pressure canner by applying cold water or wet cloths, or by placing it on a cold surface. To do so may crack the canner.

If tin cans smaller than No. 3 are used, open the pet cock gradually at the end of processing and allow the steam to escape slowly.

When opening the pressure canner, tilt the cover so that the steam emerges away from the operator.

Care of the canner

Wash the pressure canner after it has been used. Keep the surfaces that form the closure between pot and cover clean. This will reduce the tendency of the cover to stick. Take care not to dent or roughen these surfaces. Do not use an abrasive on them. New pressure canners sometimes leak steam slightly at this junction, but after being heated several times the surfaces should adjust to each other to make the closure tight.

Keep the safety valve in good working condition. If it is a valve of the ball and socket type, wash it each day after using. A safety valve that fails to operate properly may cause an accident.

Use a toothpick to keep the opening of the pressure gage clean. Do not immerse the pressure gage in water.

Since the pressure gage is the only guide to the temperature reached inside most home canners, it is essential that pressure gages register accurately. They sometimes get out of order, hence should be checked at the beginning of the canning season or more often if the canner is in constant use. Simple ways to do this are with a master pressure gage, or with a maximum thermometer of suitable range 100° to 300° F.

To make the test with a master pressure gage, first unscrew the pet cock or safety valve from the lid of the pressure canner and replace it with the master gage. Next pour water into the canner and heat (p. 8) running the pressure up gradually. Compare the two gages. If the difference is 2 pounds or less, tag the canner with the number of pounds its gage must register when processing food in order to correspond to 5, 10, or 15 pounds on the master gage. If the difference is more than 2 pounds get a new gage. After the test is over, reset the pet cock or safety valve with a steamtight closure by applying a paste of litharge and glycerin, such as plumbers use, to the threads of the stem before screwing it into the lid.

Details of testing pressure gages with a maximum thermometer can be obtained on request.

Manufacturers will check the gages if they are removed and returned to the factory where they were made. It is also possible in some States to get the State agricultural college to check gages.

Steamers and Ovens

In canning acid foods, heat may also be applied in a steamer or an oven.

For acid foods only

In the steamer, where the steam circulates but is not held under pressure, the temperature surrounding the cans of food may be the same as in the boiling-water bath. It is necessary, however, to maintain a good circulation of steam if this method is to be efficient

in processing. In actual practice the steamer is often used without good circulation of steam and for that reason is unsatisfactory. When the steamer is properly operated, the processing periods for acid foods are the same as in the water bath.

Oven canning refers to the processing of food in glass jars in an oven. The temperatures generally used for the oven are from 250° to 275° F. Even with the oven at these or higher temperatures the food being processed inside the jars is little if any hotter than boiling water. For as steam forms in the jars it forces its way out, and the temperature remains near 212° F. Glass jars using rubber rings can be only partially sealed for oven processing. Otherwise, the accumulated steam would break the seals or the jars themselves. When caps of the vacuum or self-sealing types are used, screw the bands on tightly before processing. Tin cans cannot be used in oven canning, because of the danger of spreading or bursting the seams.

Since the temperature of the food in oven canning is only about 212° F., this method is not safe for nonacid foods. Oven canning is used successfully for some acid products such as the small fruits. Peaches, pears, and apricots, especially when packed without precooking, are likely to develop a brownish discoloration after oven canning. Another disadvantage of oven canning is that some of the liquid bubbles out of the jars and is lost.

Processing periods in the oven are about half as long again as in the boiling-water bath because the air in the oven is not so good a conductor of heat as is water. However, if the food is precooked and packed hot into the jars, the processing period in the oven may be shortened somewhat. Even so, it is still longer than that in the boiling-water bath. For example, peaches packed hot require 15 minutes processing in the water bath, but in the oven, 25 minutes.

The Open Kettle

In the so-called open-kettle method fruits or tomatoes are cooked directly in an open vessel to kill the bacteria. This cooking takes the place of both precooking and processing in the other methods.

Water or sirup is added if required, and the food is boiled for several minutes or until tender. It is then quickly filled into sterilized jars and each one is sealed immediately. The jars should be filled to the top to drive out the air.

In this open-kettle method though the food heats through evenly and quickly the temperature does not go above the boiling point of water, except as it may be slightly raised by added sugar or soluble materials in the juices. Therefore this method can be used only for fruits and tomatoes canned in glass. Disadvantages of the open-kettle method are the necessity for sterilizing jars and caps before using (p. 12) and the chance of contaminating them again during

filling. Furthermore, there is always danger that air containing micro-organisms will be incorporated when jars are filled in this way. If they are sealed while boiling hot, however, this danger is in part avoided. Tin cans should not be used for open-kettle canning of fruits and tomatoes because the lids cannot be sterilized before being sealed on the can (p. 16). This method cannot be used safely for canning nonacid foods.

Glass Jars and Bottles

Wartime types

Glass jars for home canning are being made in quart and larger sizes only, as a wartime economy measure. By discontinuing small jars it is possible to reduce the amount of rubber and metal used in home canning.

Mason jars have several kinds of tops: (1) A one-piece cap lined with porcelain; equipped with a rubber gasket between cap and shoulder of the jar. This is called a shoulder rubber. (2) A glass cap with rubber ring that fits between the glass cap and the jar top, both of which are held in place with a metal screw band. This ring is called a top rubber. (3) A metal disk with a flowed-on gasket, the disk is held on the jar by a metal screw band. Types 2 and 3 are sometimes called vacuum or self-sealing types.

Another type of jar known as lightning-type has an all-glass top. This uses a shoulder rubber ring, and the top is held in place with a wire clamp. Some lightning-type jars may still be bought, but manufacture of this type is being discontinued for the duration.

To use jars on hand

Home canning jars may be used repeatedly by providing new rubbers, and in some cases new caps. If pint or quart jars that held mayonnaise, peanut butter, or other commerical products are to be used in home canning, be sure that the jar mouth is so threaded that it will take one of the standard tops which will seal air tight.

Jars in which fruits and vegetables are packed now by commercial methods cannot be reused for home canning because the closures require special machinery not available in the home.

A word of warning: Check the types of jars on hand and see that any new lids or rubber rings purchased will fit. See that the rubber ring is right for the particular type of top, and that the screw band is exactly the right depth to fit jar and lid.

Rubber rings

Rubber rings are highly important to keep food from spoiling. Rings should be of good quality to withstand the heat of processing. The simplest test is: Double the ring together and press the fold with the fingers. The rubber should not crack when this is done. A good rubber ring should also stretch to twice its length and return without changing shape.

Rubbers of especially good quality may occasionally be reused with safety. They should meet the tests described in the preceding paragraph. Also, each rubber considered for reuse should be examined closely and used only if it shows no impressions from contact with jar and top.

Screw bands

Since it is important to use metals economically, buy only as many screw bands as are needed. If canning is done on more than one day, screw bands on a set of finished jars may be removed and used in canning another set. *Do not, however, remove screw bands from any jar of canned food until the jar has completely cooled. Do not put away any canned food with screw band in place.*

Getting jars ready to use

Examine glass jars and caps carefully before using, to make certain that they are in good condition. Discard any jars or caps that have cracks, chips, or dents. Anything that prevents an air-tight seal may cause food to spoil. Jar rims should be smooth with no cracks or chipping. If lightning-type jars are used, they may need some tightening of wire clamps. A wire clamp that has loosened in use may be tightened by removing the top wire, bending it down in the middle, and then bending the sides inward, if necessary, to fit the jar.

Wash the jars and tops in hot soapy water and rinse. Place them in a pan of warm water with a rack or cloth in the bottom to prevent bumping. Bring to the boiling point and keep hot until required. Jars and tops for open-kettle canning should be sterilized by 15 to 20 minutes' boiling. When jars are packed with food and then processed they do not need to be sterilized first, but they should be clean and hot when filled. Prepare jar caps that have a sealing composition by pouring boiling water over them. Allow them to stand until used. Dip rubber rings into boiling water and place on the jars before filling them.

Head space

When food is processed in glass jars a head space is left at the top to permit expansion of the food. Head space is measured from a straight edge laid across the top of the jar. Allow one-half inch of head space in all jars except those containing starchy foods (corn, peas, and lima beans); they require 1 inch because of greater expansion. The solid material in jars should be covered by liquid—water, sirup, or broth, as the case may be.

Exhausting and cooling

All types of glass jars can be adjusted to allow the exhausting, or passing out, of air from the food during processing.

With the mason jar, the cap is screwed on until it is tight and then turned back one-fourth inch. After processing, the

cap is screwed down as tightly as possible on the jar. With the lightning type of jar, the top clamp is snapped into place and the side clamp is left up. After processing, the side clamp is pushed down. In both of these jars the actual seal is formed by the pull of the partial vacuum in the jar during cooling. Hence, it is better if these jars are cooled in an upright position.

With the vacuum- or self-sealing jars no special adjustment is used for exhausting the air. The screw bands are put on tight or the clamps adjusted. During the processing period the top is held in place by the band or clamp, which allows the air to escape but holds the top to the jar. When the jar starts to cool after processing, the steam condenses, and a partial vacuum is formed within. Greater pressure outside the jar than inside presses the top down firmly and the seal is formed between top, gasket, and jar. The sealing material hardens as the jar cools, making the seal complete. If the screw band is loose after processing, hold the lid in place so it will not turn, and screw the band tight. Jars of this type must be left to cool in an upright position. When the jars have cooled, remove the screw bands and clamps and save them to use again.

Cool all glass jars in air, out of drafts. Special care should be taken to protect jars that have just been taken from a pressure canner, as the temperature of the food is still above the boiling point. This places the glass under considerable strain, and breakage may occur if a draft strikes the jars. Leaving the jars in the canner for 3 or 4 minutes after the canner has been opened will reduce the danger of breakage. Use a jar lifter or tongs to remove the jars from the pressure canner.

Do not cover the jars with cloths or blankets while cooling as this prolongs the cooking of the food. The processing period is adequate to make the food keep, and cooling should follow at once.

After processing and cooling, all types of glass jars using rubber rings should be inverted and observed for leakage. Tap with a spoon the top of jars sealed with lacquered metal tops. A clear ringing sound denotes a seal. If the sound is dull, a seal has not been formed. First examine to see if the gasket is defective. Process the food a second time, and replace the gasket if necessary.

Loss of liquid

When glass jars are processed in the steam pressure canner there is frequently a loss of liquid. While this may occur to some extent with all types of jars, it is generally less with those of the vacuum-sealing type, which have a separate rubber ring or sealing composition in addition to the glass or metal cap and screw band. Mason and lightning-type jars are partially sealed before they are put in the canner, and the seals are completed as soon as they are taken out. Tight sealing of these jars will not prevent the loss of liquid during pressure processing

and may cause the rubbers to push out, thus making a tight seal difficult to obtain. For adjustments of the different types of jars see page 12. Steps can be taken to reduce the loss of liquid by properly regulating the pressure canner (p. 8).

Never open the jars after processing to add more liquid.

Opening jars

To remove caps from the self- or vacuum-sealing jars, puncture the caps to release the vacuum and lift up. For other types of jars pull out the rubber ring with the fingers or with pliers. If this is difficult, invert the jar in warm water covering the cap and allow the jar to remain for several minutes. This will soften the rubber ring and make it easier to remove.

Bottles

Bottles are convenient to use for canning liquids. Use the crown caps and a capping device, which may be obtained at small cost. Bottles should be boiled to sterilize them, but the caps are only dipped in boiling water just before being fixed on the bottles. Boiling the caps may prevent the formation of tight seals.

When liquids are processed in bottles it is necessary to leave about 2 inches of head space to permit expansion.

Tin Cans—If and When Available

Tin-can supplies for home canning are likely to be uncertain during the war, because of the need of conserving metals. Sealing machines, required for open-top cans, are scarce.

The following paragraphs give general information on canning in tin for the benefit of homemakers who may have access to the materials needed.

Canning in tin has some advantages; canning in glass has others. Tin cans are easy to handle because there is no danger of breakage. Also there is no loss of liquid from tin cans because they are always tightly sealed before they are processed.

Plain and enameled

Plain tin cans are made of thin sheet steel plated with tin. These cans are satisfactory for most vegetables, fruits, and meats. Some foods, however, change color when canned in plain tin because of chemical reactions due to the metals. These changes do not affect the wholesomeness of the food, but they do affect appearance. Red-colored fruits and vegetables, including most berries, cherries, currants, plums, and beets, which owe their color to anthocyanin pigments, fade when they are heated in contact with plain tin. Corn becomes darkened in color when canned in plain tin. The high temperatures necessary in processing corn cause hydrogen sulfide gas to be liberated, and this reacts with the metals of the can and forms dark-colored metallic sulfides that are deposited on the corn and on

the can. Succotash and lima beans behave in a similar manner, but to a lesser extent. With peas, some meats, and other foods the metallic sulfides may merely cause the can to mottle or darken.

Enamel-lined cans have come into use to preserve the appearance of foods that discolor in plain tin or to prevent excessive darkening or corrosion of the cans. Sanitary, fruit, or R enamel, of a deep-gold color with a bright finish, is used to keep red-colored fruits and beets from fading, and pumpkin and squash from corroding the can. C or corn enamel, of light-gold color with dull finish, is used to prevent corn, succotash, and some other products from discoloring. C enamel should not be used with acid foods or with chicken or meats that contain much fat. The acid or fat may cause this enamel to peel off and make the food unsightly, although harmless.

The following list gives the kind of enameled can recommended for different foods; other foods may be satisfactorily canned in plain tin:

C enamel	Sanitary enamel
Beans, lima (C enamel preferred; plain tin also used).	Beets (sanitary enamel preferred; C enamel also used. For pickled beets, use glass only).
Beans, red kidney (C enamel preferred; plain tin also used).	Berries, all kinds.
Corn.	Cherries.
Succotash.	Cranberry sauce.
	Pimientos.
	Plums.
	Pumpkin.
	Squash.

Gaskets

Under the rim of the can lid is a gasket of paper or rubber composition, which helps to make the seal airtight. The sealing machine folds this into a double seam between the can and lid. Whether a paper or rubber composition gasket is preferable depends on the machine and the care with which it is operated (p. 17). The paper gasket is generally recommended in home canning because it is a little more bulky and more completely fills the seam made by hand-sealing machines. When the better grade of hand-sealing machines and power machines are used by experienced operators, the rubber gasket is preferred. Paper gaskets also make a better seal when reflanged cans are used. Some disadvantages of the paper gaskets are that they must be kept dry; they sometimes drop out of the cover; and they may wrinkle if wet or imperfectly adjusted, and thus cause a faulty seal.

Can sizes

The usual sizes of cans for home use are No. 2, No. 2½, and No. 3. The larger sizes, No. 5 (half-gallon) and No. 10 (gallon), are generally for hotel and institution use. When No. 5 and No. 10 cans are processed under pressure special precautions must be taken to prevent the cans from

buckling. Various practical points about the use of different-sized cans are given in table 3.

TABLE 3.—Capacity and use of standard sizes of tin cans

Can size	Dimensions	Contents, average net weight	Volume of contents	Products adapted to different-sized cans
	Inches	*Ounces*	*Cups*	
No. 1, tall	3 1/16 by 4 11/16	16	2	Concentrated soups, meat products.
No. 2	3 7/16 by 4 9/16	20	2½	Corn, peas, snap beans, fruits, meats.
No. 2½	4 1/16 by 4 11/16	28	3½	Fruits, vegetables, meats.
No. 3	4 1/16 by 4 15/16	33	4	Fruits, pumpkin, tomatoes.

Packing tin cans

Wash tin cans with soap and water, rinse in clear water, and drain. Lids may be wiped with a damp cloth, but gaskets, especially paper gaskets, should be kept dry to avoid difficulties in sealing.

Fill cans to obtain a reasonably tight pack of solid food without cramming and add liquid to cover—water, sirup, or broth. The desirable proportion of liquid to solids varies with different products. Uniformity of pack may be obtained by weighing the solids and adding enough liquid to cover, or by weighing both solids and liquid. Packing by weight may be desirable for large-quantity canning, as in a community center or for products intended for sale.

The liquid in the can serves two important purposes. It helps to drive out air from the can, and also to conduct heat into the solid material during processing. Foods packed without liquid require longer processing because of the slower penetration of the heat into the food.

Head space

Head space is needed to prevent the cans from bulging, because of the expansion of the food during processing and storage. If a can is filled too full, it does not have sufficient head space and cannot be properly sealed; whereas too slack a fill, or excessive head space, leaves too much air in the can. Head space is measured from a straight edge across the top of the can. Since the cover goes one-eighth inch into the can, the actual head space is less after the cover is sealed on. For most foods canned at home or in community centers the following allowances are recommended, although head space varies somewhat for different products.

	Head space (inch)
No. 1 cans	¼
No. 2 cans	¼
No. 3 cans	½

Exhausting

When tins are used, unless most of the air in food is removed by some means before the cans are sealed, both food and can discolor, and the food loses flavor.

It has been usual practice to pack fruits, tomatoes, asparagus, and meats raw. To save jar space, preheating fruits and tomatoes is recommended. When food is packed raw, the air is exhausted in the following ways: Place the packed cans in a bath of boiling water deep enough to come within about 2 inches of the top of the cans. Keep the water boiling without bubbling into the food and cover the bath to hold in the steam. Start counting time when the space above the cans is filled with steam, and continue to heat for the time given for the various foods. Seal the cans as rapidly as possible after the exhaust, while the food is still steaming and process at once. This method is not suitable for glass jars because of the slower penetration of heat.

The nonacid vegetables, such as beans, peas, corn, and pumpkin, are precooked to drive the air out of the tissues. They are then packed boiling hot, and the tin cans are sealed at once and processed. Fruits and tomatoes may also be precooked.

Sealing

The food must be hot when the cans are sealed in order to insure a satisfactory vacuum. It is good practice to measure this sealing temperature at the center of the can with a thermometer. For tomatoes, fruits, and other foods that heat penetrates easily, the sealing temperature should be about 125° to 150° F. But for other products, such as cream-style corn, pumpkin, and squash, through which heat penetrates slowly, sealing temperatures should be 180° to 190° F. For meats, about 170° F. is recommended.

A machine is necessary for sealing open-top cans. Sealing machines must be strongly built to be durable and efficient. It is poor economy to purchase a machine too light in construction to do its work well; such a machine is likely to break and to be difficult to keep in proper adjustment for sealing the cans tightly. For home canning a hand-operated machine is satisfactory, but for continual use, as in a community canning center, power operation may be desired.

Different makes of sealing machines vary in design, and the manufacturer's instructions regarding the care and operation of the machine should be followed. With all types, however, the actual seaming process of the cans is the same. The filled can with cover is set on the base plate and is raised by a lever until the chuck of the machine fits closely into a countersink about one-eighth inch deep in the top of the can lid. The can is rotated while the first seaming roll of the machine folds the flange of the cover over the flange of the can. The second seaming roll of the machine then presses the folded layers

together into a tight seam which is made airtight by the gasket of the lid. The seaming rolls should be observed frequently to see that they are in proper adjustment. Some machines are furnished with a wire or other means of testing the adjustment of the seaming rolls.

The finished seam between lid and can should be smooth and even. A way to try out the adjustment of the sealer is to test the tightness of the seam on a can. Place a few tablespoons of water in a can, seal it, then submerge it in boiling water for a few minutes. If air bubbles come up from the can, the seam is not tight.

Cooling

After processing tin cans of up to and including the No. 2½ size, open the pet cock on the pressure canner to let the steam escape gradually, as the pressure drops to zero. With No. 3 cans and larger sizes, allow the pressure gage to come to zero; then open the pet cock gradually.

Cool tin cans at once in cold water, preferably running water, until they are lukewarm, or about 100° to 105° F. If the cans have paper gaskets, use only water suitable for drinking. When the cans are cool, wipe off any remaining moisture and examine for leaky seals.

Reflanging

Tin cans are sometimes reflanged for use a second time by means of special attachments on the sealing machine both for opening the cans and for reflanging. Cans that are corroded or very much discolored should never be used a second time. Also, unless the reflanging is properly done and the sealing machine is adjusted to handle reflanged cans, it is impossible to obtain a tight closure. The use of reflanged cans, therefore, is not generally recommended.

Other Utensils and Supplies

Most of the utensils needed for home canning are in common use in the kitchen. In addition to the containers and processing equipment and a worktable and sink, the following utensils are generally needed:

- Shallow pans.
- Preserving kettles.
- Colander.
- Wire basket or cheesecloth.
- Jar funnel.
- Quart measure.
- Standard measuring cup.
- Ladle or dipper.
- Jar tongs.
- Long-handled spoons.
- Stainless-steel paring knives.
- Cutting knife.
- Scissors.
- Household scales.
- Vegetable brush.
- Thermometer.

Special devices may be provided if desired for paring apples and peaches; coring apples, pears, and tomatoes; pitting peaches and cherries; shelling peas; and slicing, cubing, grinding, and sieving food materials.

The thermometer should be of the type that can be immersed in

liquids, and should register at least to 220° F. A candy or dairy thermometer may be used, and can usually be obtained through local dealers for about a dollar.

When fruits are being canned for sale a sugar tester or saccharometer is very useful to measure the concentration of sugar in the sirups. The Brix and Balling saccharometers or hydrometers indicate directly the percentage of sugar in the solution. The Baumé saccharometer differs in the scale and does not indicate the percentage of sugar directly. The approximate percentage is obtained by multiplying the reading by 2. A saccharometer costs about 75 cents.

Utensils for cooking foods for canning may be of aluminum or a good grade of enamelware or stainless steel. Do not use galvanized-iron utensils for cooking any food or for holding acid foods with cut surfaces, as the foods will take up zinc and become poisonous. Copper or copper-lined utensils may be used for cooking fruits and vegetables, provided the utensils are kept bright and shiny so that no copper salts accumulate and provided the food is removed from the utensils at once after cooking.

Water

The water used for various purposes in canning, such as washing food and utensils, cooking, making sirups, and cooling cans, should be suitable for drinking. Very hard water may toughen vegetable tissues or make fruit sirups cloudy. Such water can be partially softened by boiling and straining through several thicknesses of muslin. Or the boiled water may be allowed to stand until the fine precipitate settles and the clear water then poured off for use.

STEPS IN CANNING

Safe canning requires careful attention to every step in the process—from the selection of the raw food to the final check-up of the canned products during storage. The following list gives the steps in order.

● Select good materials.—The quality of canned products can be no higher than the quality of the raw food that goes into the can. Use only clean, fresh, sound foods in prime condition, and be sure that the containers in which they are handled are clean. Any unnecessary infection of the raw food increases the difficulty of processing and the liability of the canned products to spoilage.

With fruits and vegetables, grade for size and the same degree of ripeness if a uniform product is desired. Wash thoroughly until every trace of soil is removed. The most dangerous bacteria and those most difficult to kill are in the soil. A wire basket is a help in washing but should not be loaded too heavily. Always lift the fruit and vegetables out of the water rather than pour the water off.

For special precautions about meats, see page 37.

● Prepare jars or cans.—Follow the directions for glass jars on page 12 and those for tin cans on page 16.

● Sirup.—Make the sirup for fruits in advance so there will be no delay when it is required (p. 22).

● Precooking.—Some foods are precooked for a short time before they are packed into the containers. This precooking helps to remove air from the tissues, shrinks them, facilitates packing, and speeds up the processing because the foods are already hot when they are placed in the canner.

● Packing.—When using glass jars, remove one jar at a time from the hot-water bath where it has been held. Keeping the jars hot helps to prevent breakage during packing and processing. If needed, place a new wet rubber ring in position, resting flat on the sealing shoulder of the jar.

Pack the containers quickly so that the precooked food remains hot. Use a sufficient proportion of liquid to solids to prevent too dense a pack, and work out the air bubbles with a knife blade or spatula.

Leave the proper head space in the containers (pp. 12 and 16).

● Exhausting and adjusting covers.—Food in glass jars is exhausted, or the air partially removed during processing, because the jars are not fully sealed. As each glass jar is packed, carefully wipe the rubber ring and sealing edge of the jar to remove any particles of food, and adjust the cap to seal the jar partially and permit exhausting (p. 12). Place the jars as finished in the canner or where they will keep hot until processing begins.

Tin cans packed with precooked food should be sealed at once, while the food is steaming hot, and placed in the canner. If the food has not been precooked before packing, it should be exhausted (p. 17). Seal the cans at once after exhausting.

● Processing.—Process at the temperature and for the time indicated in the tables on pages 30–31, 34–35, 45.

● Cooling.—Cool glass jars in air but protect them from drafts. After they are cool, invert rubber-ring jars and observe for leakage. Test lacquered metal-top jars by tapping (p. 13). Do not attempt to tighten screw caps or screw bands after jars have cooled. Cool tin cans in cold water, using running water if possible.

● Reprocessing.—If a container leaks, determine the cause. Process the food again, using another container, top, or ring, as needed.

● Labeling.—Wipe the containers clean and label with the name, the date, and the lot number, if more than one lot was canned on that day. Glass jars may be labeled with a pencil that writes on glass or with gummed labels. Use rubber cement to fix paper labels on tin,

or if the labels are long enough, put glue along one end, wrap smoothly around the can, and lap the glued end over the other. Or tin cans may be marked with a glass pencil, rubber stamp, or canners' ink.

● Checking up results.—Hold canned products at room temperature for a week or 10 days where they can be examined from time to time to be sure that they are keeping. If any show signs of spoilage, examine all of that lot carefully.

● Storage.—Store canned foods in a cool, dry place, and protect glass jars from the light so that the food will not fade in color. The quality is generally better if they are used within the first year after canning.

CANNING FRUITS, TOMATOES, AND OTHER ACID FOODS

Fruits, tomatoes, and other acid foods are best processed at 212° F., the temperature of boiling water at sea level. Read carefully the sections under Canning Equipment and Methods that relate to the handling of acid foods. The boiling-water bath is the most successful way of applying heat for processing foods of this type in the home.

The higher temperatures reached in a pressure canner are not only unnecessary for these foods, but acid foods become overcooked when processed under steam pressure.

Figures in table 4 are a rough guide to quantities of raw fruit required in canning.

TABLE 4.—**Amount of raw fruit needed for 1 quart or 1 No. 3 can of canned fruit**

Fruit	Quantity raw	
	Pounds	Units
Apples	2½	7 to 8 apples.
Berries	1¼ to 1½	5 cups
Cherries	1¼ to 1½	6 cups.
Peaches	2 to 2½	8 to 10 peaches.
Pears	2 to 2½	5 to 6 pears.
Plums	1½ to 2	24 to 32 plums.
Tomatoes	2½ to 3½	8 to 10 tomatoes.

The following figures based on extensive canning work in Texas give the approximate number of pounds of raw fruit to a bushel: Apples, 50; blackberries, 60 (a 24-quart crate of blackberries is 36 pounds); peaches (standard), 50; pears, 58; plums, 56; tomatoes, 56.

Fruits With or Without Sugar

Cane and beet sugar are equally good in sweetening fruit for home canning. Brown sugar is not recommended for this purpose, as it may contain spoilage bacteria or other impurities.

Fruits naturally contain a great deal of water, and the most economical way to use sugar when it is limited is to add a small amount directly to the fruit. This is preferable to covering the fruit with a thin sugar-and-water sirup, which means canning extra water. This canning in juice makes the most of natural fruit flavor. Canned fruits thus prepared may not look so attractive as products which homemakers are accustomed to pack but have more fruit flavor and food value.

Why pack hot?—Packing fruits hot into containers offers several advantages. The precooking draws out juice for covering fruit when packed in jars. Precooking shrinks the fruits, so that more generous amounts may be packed in containers. Precooking cuts down the time that packed fruits need to be processed in the water bath.

Fruits in their own juice

To draw juice out of the more juicy fruits, such as berries, cherries, plums, ripe peaches and pears, sweeten the fruits to taste and bring to the boiling point slowly. To avoid scorching, stir from time to time, or set the pan in hot water, or cover the pan and place in a moderate oven. If juicy fruits are cut or sliced, they will probably form enough juice in this process for canning liquid.

If juicy fruits are to be canned whole or in halves, some added liquid may be needed. Fruit juice may be used for this instead of the usual sirup. To provide juice, set aside the riper fruits at the start. Crush and heat these to boiling point and extract juice. Sweeten juice as necessary. Heat the firmer fruits in this juice, and pack the fruit quickly into jars or cans, cover with the boiling hot juice, and process.

For shortcakes, frozen desserts, and pies, crush or make a sauce of some fruit. Sweeten as desired and heat before packing into jars.

Apples and some kinds of peaches and pears may not yield enough juice for canning liquid. To get the most possible juice, slice or cut these fruits and add sugar before heating, as for juicy fruits. Add a little water, if necessary, to prevent sticking. Fill into jars and cover with the hot juice and process.

In sirup

If fruits are to be canned in a sirup made with water, prepare the sirup in advance, to be ready when needed. Standard proportions are shown in table 5. The present sugar canning ration of 1 pound of sugar for every 4 quarts of finished fruit can be used to make thin or moderately thin sirup, allowing from ¾ to 1 cup of sirup to each jar.

TABLE 5.—**Proportions of sugar and water for thin, medium, and moderately heavy sirups**

Sirup	Sugar to 1 gallon of water				Degrees Balling or percent of sugar
	Cups	*Quarts*	*Pounds*	*Ounces*	
Thin	5	1¼	2	2	20
Moderately thin	8	2	3	10	30
Medium	12½	3⅛	5	9	40
Moderately heavy	19	4¾	8	6	50

Boil the sugar and water for approximately 5 minutes to make a sirup. Remove any scum that has formed. A heavy sirup may be prepared and diluted with water to yield thinner sirups as required.

Honey may be used to replace up to one-half the sugar called for in canning, and corn sirup up to one-third.

Without sugar

Fruits for pie making or for use in diabetic diets are commonly canned without sugar. Juicy fruits, such as berries, cherries, currants, and plums, should be canned in their own juices when sugar is omitted. Water is not required. Extract the juice from the riper fruits by crushing, heating, and straining. Pack the remaining fruits closely into containers without preheating, and add boiling hot juice to cover. Adjust caps on glass jars; or exhaust tin cans and seal; then process. Or give the fruits a short precooking, as 2 to 4 minutes simmering, pour into containers at once, seal, and process.

The less juicy fruits, such as apples, peaches, and pears, when canned without sugar require the addition of water. To preserve the natural fruit flavor use only the smallest quantity of water necessary. Follow the directions for canning given on pages 23 to 29, substituting water in place of the sirup.

Packing and Processing

Apples

Pare the apples and cut into pieces of desired size. To prevent darkening of pieces exposed to air, place them in a mild salt and vinegar solution (2 tablespoons salt and 2 tablespoons vinegar to a gallon of water). Precook by boiling 5 minutes, adding a little sugar to draw out juice. Fill hot into jars or cans, covering with boiling hot juice, or with sirup if there is not enough juice. If apples are being canned for use in pies, pack the containers solidly, using as little

juice as possible. Allow head space (for jars see page 12, for cans see page 16).

Windfall or green apples may be made into sauce. Pack boiling hot.

Process apples as directed in table 6.

Apricots

Same as peaches.

Beets, pickled

Select beets of uniform size, cut off the tops, but allow at least 1 inch of the stems to remain so that the beets will not bleed and lose color and sweetness. Wash and cook until tender in enough water to cover. For young beets this will require about ½ hour. When tender, plunge into cold water and remove the skins, and when cool, dice or cut into thin slices. Pack into jars and to each pint add ½ teaspoon of salt. Fill with a boiling hot vinegar and sugar sirup of desired sweetness. Make sirup by proportions in table 5, substituting vinegar for water. Very strong vinegar may be diluted by using one-fourth water. Process immediately as directed in table 6.

Berries

Blackberries, blueberries, dewberries, huckleberries, Logan blackberries, raspberries—gather them in shallow vessels so as to prevent crushing, and plan to can them as soon as possible. Wash carefully and remove caps and stems. Sort out smaller and less perfect berries to make a juice and sugar sirup of desired sweetness, use juice instead of water (for proportions see table 5), and heat together to dissolve the sugar. For the most economical pack, precook berries in this juice. Fill carefully into the container and cover with the hot juice.

For use in pies where the appearance of the whole fruit is not important, precook the berries with sugar added to sweeten lightly. Stir gently and let the fruit boil 3 to 4 minutes. Pack boiling hot. Raspberries and other berries of soft texture keep their shape better for dessert purposes if packed raw, although they tend to rise to the top of the container after processing. Cover them with the hot juice and sugar sirup made from the softer berries; or cover with a hot sugar and water sirup made by proportions in table 5.

If tin cans are used, exhaust them for 3 to 5 minutes before sealing.

Process berries as directed in table 6.

Cherries

Cherries may be canned pitted or unpitted, depending upon the way in which they are to be served.

If the fruit is pitted, save all juice. Cook the cherries 5 minutes over low heat in this juice to shrink them. Add sugar to taste. Pack hot, covering the cherries with boiling hot juice.

If cherries are unpitted, pack the raw fruit in hot containers and cover with hot juice obtained by heating other cherries with sugar; or cover with hot sirup made by proportions in table 5.

If tin cans are used, exhaust for 3 to 5 minutes before sealing.

Process cherries as directed in table 6.

Currants

Same as berries.

Gooseberries

Precook in sirup to shrink. Fill into containers and cover with hot sirup. If tin cans are used, exhaust for 3 to 5 minutes before sealing. Or, add a small quantity of water to the gooseberries after they have been sorted and washed and boil until they are cooked to a pulp. To each quart of this pulp add sugar to sweeten lightly or up to ½ cup per quart if needed. Heat until the sugar is dissolved and pack boiling hot into containers. If packed raw, use the method suggested for berries.

Process as directed in table 6.

Peaches

To prepare peaches for canning, immerse them in boiling water for about one-half minute or until the skins will slip easily, plunge at once into cold water for a few seconds, remove the skins, cut the peaches into halves, and discard the pits.

If a bushel or more of peaches or apricots is to be canned at one time, the skins may be removed in a lye bath. This method is not justified with a small quantity, unless the peaches are so firm that hot water will not loosen the skins. Be careful in using lye, especially if children are around, for it is a powerful caustic, and serious accidents have happened.

To peel peaches or apricots with lye, prepare in an agateware or iron kettle (never aluminum) a solution of one-fourth pound (4 ounces, or about 4 level tablespoons) of granulated lye of a standard brand in 2 gallons of water. Heat to boiling, and while the solution is actively boiling, immerse the peaches or apricots in it in a wire basket until the skin is loosened and partially dissolved. This will usually require 30 to 60 seconds. Remove the fruit, wash it at once in running water, if possible, until skin and lye are removed, and then thoroughly rinse the fruit. If the lye is not thoroughly rinsed off, the peaches may turn brown as a result. A 2-minute dip in a bath with 2 tablespoons each of salt and vinegar to each gallon of water also helps to prevent the fruit from browning. Lye-peeled fruit should be canned immediately.

If a thermometer is available it is better to use a stronger lye solution at a lower temperature. An 8- to 10-percent solution con-

taining 1 pound of lye to 1½ gallons of water heated to 135° to 140° F. (not higher) is recommended.

Peaches may be packed raw but a better pack is obtained if they are precooked for a few minutes. Precooking brings out juice which is usually sufficient to cover the fruit. Juice is extracted more readily from sliced peaches than from halves. If peaches are juicy, heat slowly to boiling point and add sugar to help draw out juice. Be careful not to cook peaches until they are soft. If peaches are of less juicy varieties, a sirup may be prepared according to proportions in table 5, and the peaches precooked like juicy peaches, but in the sirup.

Pack precooked peaches quickly. Sliced fruit takes up less jar space. If the fruit is cut in halves, place them pit side down in overlapping layers. Cover the peaches with boiling hot juice or sirup in which they were precooked. If necessary, add a little boiling hot water, since fruit must be covered by liquid.

If peaches are packed raw in tin cans, cover with hot sirup and exhaust the cans for 5 minutes before sealing.

Process peaches as directed in table 6.

Pears

Peel pears, cut them in halves, and core. Slice if desired. To prevent discoloration place the pared fruit in a solution made in the proportion of 2 tablespoons each of salt and vinegar to a gallon of water. Cook in boiling water or sirup (for sirup proportions see table 5) for 4 to 8 minutes, according to the size and firmness of the fruit. When pears are very juicy heat slowly, without adding sirup, to draw out juice for covering. Pack pears hot into containers and fill with boiling hot liquid. If packed raw in tin cans, cover pears with hot sirup and exhaust for 5 minutes before sealing.

Process pears immediately as directed in table 6.

If Kieffer pears are to be canned, quality is improved by holding the fruit for 2 weeks after harvest at a temperature of 60° to 65° F. before canning.

Pimientos, ripe

Select ripe, thick-fleshed pimientos, free from bruises. To remove the skin, immerse the whole peppers in hot cooking oil (290° F.) for 2 or 3 minutes, or place them in a hot oven (450°) for 6 to 8 minutes; then dip quickly into cold water. Slip the skins off, remove stems and seed cores. The peppers are then soft and pliable. Fold and pack them into the containers, and add one-half teaspoonful of salt to each pint. Add no liquid because the processing brings out almost enough thick liquor to cover them. If tin cans are used, exhaust them for 5 minutes before sealing. Process immediately as directed in table 6.

Pineapples

Peel, core, and remove "eyes." Slice or cut in pieces; add sugar to taste. Heat slowly for 10 to 15 minutes to draw out juice. Pack into containers and cover with the hot juice. Process immediately as directed in table 6.

Plums

Plums are ordinarily canned whole and should be gathered just as they are beginning to ripen. Wash; prick each plum to prevent the skin from bursting. Precook in small amount of sirup (see proportions in table 5). Pack plums into containers and cover with boiling hot sirup. Exhaust tin cans for 5 minutes before sealing.

If preferred, prepare sauce by straining out pits and skins and cooking pulp with enough sugar to sweeten lightly. Fill into containers boiling hot.

Process plums as directed in table 6.

Rhubarb

Select young, tender stalks; trim, wash, and cut into half-inch lengths. Boil until soft with enough sugar to sweeten. Since rhubarb corrodes tin cans, it is better for home use to pack it in glass. Pack boiling hot into jars and process immediately as directed in table 6.

Sauerkraut

Sauerkraut should be well fermented before it is canned. Heat the sauerkraut to simmering (about 180° F.), but avoid boiling. Fill hot into the containers and pack closely. Cover with the hot sauerkraut juice, leaving ⅛- to ¼-inch head space. Process immediately as directed in table 6.

Strawberries

Strawberries are usually more palatable preserved than canned. In canning, this method gives best results: To washed and stemmed berries add sugar to taste. Bring slowly to the boiling point and let stand overnight in the kettle. In the morning bring quickly to boiling and fill into the containers.

Or, place capped berries in shallow pans in a single layer. Sweeten the berries to taste. Place in an oven that can be held at 250° F. and leave for an hour. Pack hot in sterilized jars, covering with the hot juice.

Process strawberries as directed in table 6.

Tomatoes

Select firm, ripe tomatoes of medium size and uniform shape, free from spots and decay. Put into trays or shallow layers in wire baskets and dip in boiling water for about a minute, according to ripeness. Then plunge quickly into cold water, drain, peel, and core promptly.

Pack into the containers as closely as possible. Fill with tomato juice and add 1 teaspoon of salt per quart. If using tin cans, exhaust them 5 to 6 minutes before sealing.

Or cut the tomatoes in quarters, heat until boiling hot, and pack hot. Process immediately as directed in table 6.

Tomato juice

To preserve the natural flavor and color in canned tomato juice, use knives of stainless steel and avoid utensils of copper, brass, and iron. Use only fully ripe, firm tomatoes, preferably of bright-red color, as freshly picked from the vines as possible. Discard any with green, moldy, or decayed portions. Wash well, remove cores, and cut into small pieces. The skins may or may not be removed. Handle the tomatoes in quantities of 1 to 2 gallons and avoid delay at any stage of the procedure. Precook the tomatoes at about 170° F. to 180° F., or if a thermometer is not available, simmer until softened. Avoid boiling. Put the softened, hot tomatoes at once through a fine sieve, preferably a bowl- or cone-shaped sieve because it allows the least air to be incorporated in the pulp. If the tomato juice is for infant or invalid use, omit salt; otherwise add one-half to 1 teaspoon salt to each quart. Spices tend to darken the color of tomato juice and change the flavor undesirably; hence it is better to add them at the time of serving.

Reheat the juice at once after putting through the sieve. If using glass containers, heat the juice to 190° F. (or just to boiling), pour into the sterilized containers, and seal. No processing is necessary. Invert the bottles while cooling. If tin cans are used, heat the juice to 180° to 190° (or to simmering if no thermometer is available), pour into cans, seal, and process the cans as directed in table 6. Do not leave head space in either glass or tin containers.

Fruit juices

Fruit juices for beverages may be extracted from berries, cherries, currants, grapes, and plums. Use only sound, well-ripened fruit in such quantities that the process can be carried through promptly. To avoid overcooking and to preserve as much as possible of the original flavor and color, check the temperature with a thermometer as the fruit is pre-cooked and the juice is pasteurized. Sugar also helps to preserve color and flavor, but it may be omitted.

Wash the fruit, drain, and crush. Remove the seeds from cherries before crushing as seeds change the flavor of juice. Add water, if desired, to thin the juice, about one-half cup to each pound of fruit, except to berries which require no water. Heat to 170° to 180° F., and hold for several minutes, or until the juice can be separated from the pulp. Extract the juice with a fruit press or strain through several layers of cheesecloth. If a press is used avoid crushing the

seeds of berries. Crushed seeds spoil the flavor. A second straining without pressure makes the juice clearer. Add sugar if desired, about ½ to 1 cup of sugar to a gallon of juice. Heat the juice to 160° to 170° F. and fill into hot, sterilized glass jars or bottles to within one-eighth inch of the top. Seal at once, and lay bottles on their sides in the water bath. Process immediately as directed in table 6.

Fruit purees

For purees of almost any soft fruit put the cooked fruit through a fine sieve; otherwise proceed as for fruit juice. Process as directed in table 6.

TABLE 6.—Timetable for processing fruits, tomatoes, and other acid foods

The times given here for processing in the boiling-water bath apply only to places with altitudes of 1,000 feet or less. For all altitudes above 1,000 feet, the time should be increased 20 percent for each additional 1,000 feet.
When half-gallon glass jars are used, add 5 minutes to times given for pint and quart glass jars.
Process the containers immediately after packing.
Cool the food in tin cans in cold water immediately after processing.

Product	Style of pack	Processing period in boiling water 212° F.		Type of tin can
		Pint and quart glass jars	No. 2 and No. 3 tin cans	
		Minutes	*Minutes*	
Apples	Boil, pack in hot juice or sirup	15	10	Plain tin.
	Same as above but dry-pack	20	15	Do.
	Applesauce, pack hot	5	5	Do.
Apricots	Precook and pack hot	15	15	Do.
	Pack raw; cover with hot sirup	25	No. 2, 15 No. 3, 25	Do.
Beets, pickled	Pack hot	30		
Berries:				
Blackberries	Precook and pack hot	5	5	Sanitary enamel.
Blueberries	Pack raw; cover with hot juice or sirup	20	15	Do.
Dewberries				
Huckleberries				
Logan blackberries				
Raspberries				
Cherries	Precook and pack hot	5	5	Do.
	Pack raw; cover with hot juice or sirup	25	20	Do.
Currants	Precook and pack hot	5	5	Do.
Gooseberries	Precook and pack hot	5	5	Do.
	Pack raw; cover with hot juice or sirup	20	15	
Peaches	Precook and pack hot	15	15	Plain tin.
	Pack raw; cover with hot sirup	Soft, 25 Firm, 35	Soft, 20 Firm, 30	Do.
Pears	Precook and pack hot	20	20	Do.
	Pack raw; cover with hot juice, water, or sirup		No. 2, 20 No. 3, 25	Do.
Pimientos, ripe	Pack hot	Pint, 40	No. 0, 30 No. 1, 30	Sanitary enamel.
Pineapples	Pack hot	25	No. 3, 30	Plain tin.
Plums	Precook and pack hot	5	5	Sanitary enamel.
	Pack raw; cover with hot sirup	20	15	Do.
Rhubarb	Precook and pack hot	5	5	Do.
Sauerkraut	Precook and pack hot	Pint, 25 Quart, 30	No. 2, 15 No. 3, 30	Plain tin.
Strawberries	Precook and pack hot	5	5	Sanitary enamel.
Tomatoes	Precook and pack hot	5	5	Plain tin (preferred); or sanitary enamel.
	Pack raw	45	35	
Tomato juice	Pack hot	No processing	5	Do.
Fruit juices:				
Berries	Pack at 160° to 170° F. and process in water bath at 180°.	20		
Cherries				
Currants				
Plums				
Fruit purees	Pack at 160° to 170° F. and process at 212°	20		

CANNING NONACID VEGETABLES

Nonacid vegetables require processing in the steam pressure canner at temperatures of 240° and 250° F. If a pressure canner is not available, then drying, brining, or some method of preservation other than canning should be used for these vegetables.

In estimating the approximate yield of canned products from raw vegetables the figures in table 7 are a guide.

TABLE 7.—**Approximate yield of canned products from raw vegetables**

Vegetable	Quantity raw	Yield as canned product
Asparagus, whole	2 pounds	1¼ pints or No. 2 can.
Beans, shelled, lima	do	1 quart or No. 3 can.
Beans, snap	1½ pounds	Do.
Beets, baby, without tops	2½ to 3 pounds	Do.
Corn	4 to 6 ears	1¼ pints or No. 2 can.
Greens	1 pound	Do.
Peas, green:		
In pods	2½ to 3 pounds	Do.
Shelled	1 pound	Do.
Pumpkin	4 pounds	1 quart or No. 3 can.
Sweetpotatoes	2½ to 3 pounds	Do.

Packing and Processing

Asparagus

Select fresh and tender stalks, sort according to size, and wash thoroughly. Tie in uniform bundles, stand upright with tough portion in boiling water, cover tightly, and boil for 2 to 3 minutes. Or cut in half-inch lengths, add enough water to cover, and boil for 2 minutes in an uncovered vessel. Pack boiling hot into containers, cover with the water in which boiled, and add 1 teaspoon of salt to each quart. Or pack raw in No. 2 tin cans, cover with boiling water, and exhaust for 4 to 5 minutes before sealing. Process immediately as directed in table 8.

Beans, fresh lima

Only young and tender lima beans should be canned; older ones may be dried. Shell, wash, and bring to a boil in water to cover. Pack hot into the containers, cover with hot water, and add 1 teaspoon of salt to each quart. Process immediately as directed in table 8.

Beans, snap

Wash throughly and cut into pieces of desired size. Add boiling water to cover and simmer uncovered for about 5 minutes, or until the beans are wilted and will bend without breaking. Pack hot into the containers, cover with hot water, and add 1 teaspoon of salt to each quart. Process immediately as directed in table 8.

Beans, dried kidney or pinto

Pick over the beans, wash, and soak overnight in a cool place. Drain. Blanch in boiling water for 3 to 4 minutes and drain. Fill at once into containers to about seven-eighths capacity. Cover with boiling water containing 2 ounces each of salt and sugar to the gallon. The sugar may be omitted or replaced by molasses if desired. Small pieces of salt pork may be added. Process immediately as directed in table 8.

Soybeans

Either green or dried soybeans of varieties suitable for table use may be canned. The green soybeans make a better product, however, in both flavor and color. Follow the directions given above for kidney beans, except with green beans omit the overnight soaking and do not add sugar. Salt pork may be added if desired.

Beets, baby

Select young, tender beets preferably of the turnip-shaped varieties. Trim off the tops, but leave on at least 1 inch of the stems and all of the roots to prevent bleeding. Wash thoroughly and scald in boiling water or steam for about 15 minutes until the skins slip easily. After the beets are skinned and trimmed, pack into the containers, add 1 teaspoon of salt to each quart, and fill with hot water. Process immediately as directed in table 8. Pickled beets may be processed in the boiling-water bath (p. 24).

Carrots

Young tender carrots may be canned in the same way as baby beets.

Corn

Use only tender, freshly gathered sweet corn, shuck, silk, and clean carefully.

Sweet corn is canned in two styles—whole grain and cream style. Whole-grain corn is cut from the cob without scraping, while for cream style the corn is given a more shallow cut and the cobs are scraped. Corn for the whole-grain pack should be gathered 3 or 4 days earlier than for cream-style corn. The whole-grain product retains the appearance and flavor of fresh corn more nearly than the cream style because it can be given a lighter processing and therefore is not so likely to be overcooked. When cream-style corn, which is thick and viscous, is canned in glass jars, it sometimes becomes brownish in color because of the caramelization of the sugar by the heavy processing required. Whole-grain corn has less tendency to discolor when packed in plain tin cans than does cream-style corn, though the C enamel cans give better results for both.

For the whole-grain style, cut the corn from the cob deeply enough

TABLE 8.—Timetable for processing nonacid vegetables in the steam pressure canner

The processes given here apply to places with altitudes of 2,000 feet or less. At altitudes over 2,000 feet, add 1 pound pressure for each additional 2,000 feet. Follow the directions on pages 8, 13, and 18 for operation of canner and removal of jars and cans after processing. Cool tin cans in cold water immediately after processing.

Product	Pint glass jars		Quart glass jars		No. 2 tin cans		No. 3 tin cans		Type of tin can
	240° F., or 10 pounds pressure	250° F., or 15 pounds pressure	240° F., or 10 pounds pressure	250° F., or 15 pounds pressure	240° F., or 10 pounds pressure	250° F., or 15 pounds pressure	240° F., or 10 pounds pressure	250° F., or 15 pounds pressure	
	Minutes	*Minutes*	*Minutes*	*Minutes*	*Minutes*	*Minutes*	*Minutes*	*Minutes*	
Asparagus	30		35		30				Plain tin.
Beans:									
Fresh lima	50		55		40		50		C enamel or plain tin.
Snap	30		35		25		30		Plain tin.
Dried kidney or pinto	80		90		70		85		C enamel or plain tin.
Soybeans	80		90		70		85		Do.
Beets, baby	30		35		30		30		Sanitary enamel.
Carrots	30		35		30		30		Plain tin.
Corn:									
Whole-grain	60		70		50		65		C enamel.
Cream-style		75				70			Do.
Greens		60		65		55		No. 2½, 60	Plain tin.
Mushrooms	25		35		25		25		Do.
Okra	35		40		25		30		Do.
Okra and tomatoes	25		35		25		30		Do.
Peas:									
Green	45				40				Do.
Black-eyed	50		55		40		50		Plain tin or C enamel.
Pumpkin		60		75		60		70	Sanitary enamel.
Squash		60		75		60		70	Do.
Sweetpotatoes	95		120		95		115		Do.
Vegetable-soup mixtures	60		70		50		65		Plain tin.

to remove most of the kernels without objectionable hulls. Do not scrape the cobs. Add 1 teaspoon of salt to each quart of corn and half as much boiling water as corn by weight. Heat to boiling and pack into containers at once. Process immediately as directed in table 8.

For the cream style, with a sharp knife lightly cut off the tops of the kernels, and with the back of the knife scrape out the pulp. This gives a thick, pasty mass with the minimum of hulls. Add 1 teaspoon of salt to each quart, and half as much boiling water as corn by weight. Heat to boiling, and fill into containers at once. Process immediately as directed in table 8.

Greens

Pick over the greens, discarding any imperfect leaves and tough fibrous stems. Wash carefully in running water or through a number of waters, lifting the greens out each time. To precook, cover the greens with water heated to simmering, not boiling, and cook in an uncovered vessel for 5 minutes, or until the greens are wilted. Pack hot into the containers, taking care not to make too solid a pack and to have sufficient hot liquid to cover the greens. Add 1 teaspoon of salt to each quart. Process immediately as directed in table 8. Greens should not be canned in No. 3 tin cans, because of the difficulty of heat penetration.

Mushrooms

Wash thoroughly, peel mature mushrooms, and drop into water containing 1 tablespoon of vinegar per quart. Precook, place in a wire sieve or colander, cover with a lid to hold the mushrooms under water, and immerse for 3 to 4 minutes in boiling water that contains 1 tablespoon of vinegar and 1 teaspoon of salt per quart. Fill into containers at once and cover with freshly boiling water. Add 1 teaspoon of salt to each quart. Process immediately as directed in table 8.

Okra

Only young, tender pods should be canned; older pods should be dried. After the okra is washed, cover with water, bring to a boil, and pack hot into the containers. Add 1 teaspoon of salt to each quart. Process immediately as directed in table 8.

Okra and tomatoes

Use only young, tender okra and sound, ripe tomatoes. Wash the okra and slice crosswise. Wash the tomatoes, remove the skins and cores, and cut into sections. Combine the okra and tomatoes and heat to the boiling point. Pack while hot, and add 1 teaspoon salt to each quart. Process immediately as directed in table 8.

Peas, green

Use only young, tender peas. Shell, wash, add hot water to cover, and simmer for about 5 minutes. Pack hot in pint jars or No. 2 tin

cans, cover with hot water, and add one-half teaspoon of salt to each pint. If tender peas are packed in quart jars or No. 3 cans they become overcooked and mushy. Process immediately as directed in table 8.

Peas, black-eyed

Same as lima beans.

Pumpkin

Wash, peel, and cut the pumpkin into 1- to 1½-inch cubes. Add a small quantity of water and simmer until heated through, stirring occasionally. Pack hot into containers, add 1 teaspoon of salt to each quart, and cover with the water in which cooked. Process immediately as directed in table 8.

Squash

Same as pumpkin.

Sweetpotatoes

Where sweetpotatoes can be stored successfully, only enough should be canned to take care of the season during which the stored potatoes are not available. Or if in harvesting more are cut with the plow than can be used immediately, they may be canned in order to save them. In that case, precook them slowly in order to develop the sugar.

Wash the sweetpotatoes thoroughly and boil or steam them until the skins slip off readily. Peel quickly, cut into medium-sized sections, and pack hot into containers. Add 1 teaspoon of salt to each quart and enough boiling water to cover. Process at once as directed in table 8.

Vegetable-soup mixtures

The combinations of vegetables for soups may include two or more of the following: Tomato pulp, corn, lima beans, peas, okra, carrots, turnips, celery, onion, pimientos, and sweet and red peppers. Wash and trim the vegetables and cut into small pieces or cubes. Keep the diced carrots and turnips covered with water or weak brine to prevent darkening. Seasonings should be light, and may include sugar, salt, white pepper, dashes of cayenne and garlic, parsley, thyme, and bay leaf.

Bring the soup mixture to the boiling point, and pack hot, with sufficient liquid to cover the vegetables and prevent too dense a pack. Process as directed in table 8.

CANNING MEATS AND CHICKEN

Beef, veal, mutton, lamb, pork, and chicken may be canned successfully in the home, provided they are processed under steam pressure. The temperatures required for effective sterilization (240° to 250° F., corresponding to 10 and 15 pounds steam pressure) can-

not be obtained inside the can or jar except by the use of the steam pressure canner. The water bath, the oven, and the steamer without pressure are inadequate for canning meats and cannot be used safely. Insufficiently processed meat may keep if stored at a low temperature, but even when no visible signs of spoilage are observed there is no certainty that the bacteria which cause food poisoning have not been active. If a pressure canner is not available, other methods of preservation should be used for meats.

While a variety of meat and poultry products may be canned, it is more economical of can or jar space to put up the meat alone and combine it with the other foods at the time of serving. This also permits greater variety in the use of the meat, and combinations with fresh, crisp vegetables as well as a wider choice of seasonings. Onion, garlic, and spices should be used sparingly, and white pepper retains a better flavor than black pepper in meat products.

All meats and poultry for canning should be slaughtered and handled in a strictly sanitary manner. Unless the meat is to be canned at once, chilling the carcass after slaughtering is necessary; otherwise decomposition will start within a few hours. There is little difference in the flavor or tenderness of the canned product whether the meat is chilled or unchilled. However, raw meat is easier to handle after chilling and may be held for a few days until convenient to can.

Frozen meat may be canned, but it does not make a high-quality product. If meat has become frozen, do not thaw it out before canning. Cut or saw the frozen meat into uniform strips 1 to 2 inches thick and plunge at once into boiling water. Simmer until the color of raw meat has almost disappeared; then pack and process.

Utensils and Equipment

Utensils for meat canning are preferably of enamelware, aluminum, retinned metal, or stainless metal. Copper and iron utensils may discolor canned meat and should not be used. Also meat must not be allowed to remain in contact with galvanized iron more than 30 minutes, or it may take up harmful quantities of zinc. Wooden utensils or surfaces require special care in cleaning to free them from bacteria. They should be scrubbed with soapy water to remove all grease and then rinsed with boiling water. If used for several days at a stretch they should be disinfected with a hypochlorite solution (calcium, potassium, or sodium hypochlorite) applied after the scrubbing and scalding.

Plain tin cans and glass jars are used for the home canning of meats and poultry. When canned in tin, chicken is more likely than other meats to discolor the cans, and sometimes there is a deposit on the chicken itself. If the directions given here are followed for packing

the chicken hot and leaving proper head space in the containers, this discoloration will be reduced to a minimum. The C-enamel cans used for corn and the R- or sanitary-enamel cans for certain fruits are not suitable for chicken because the fat may cause the enamel to peel off and make the product unattractive although harmless.

In canning meat and poultry the head space is particularly important. If the liquid does not cover the meat it will discolor and lose flavor during storage. In packing containers allow the following head space: Glass jars, one-half inch; No. 1 tin cans, one-fourth inch; No. 2 tin cans, one-fourth inch; No. 3 tin cans, one-half inch.

Pint containers are most suitable for canning meat, and it is suggested that any of these small containers on hand may well be set aside for meat. Do not can meat in jars or tin cans larger than quart size. See table 9 for processing times.

Precooking

When glass jars are used, meats should be precooked in the oven or in water before being packed in the container. A better looking pack results. And since heat penetrates glass slowly the precooking is necessary to shorten the processing time. When tin cans are used the meat may be precooked in either of these ways and packed hot, or it may be packed raw and the cans exhausted before being sealed. The latter method gives a little better flavored product, and the liquid is all meat juice, but it takes more time and stove space. Frying is not recommended as a method of precooking meat for canning, because it makes the meat hard and dry and gives it a disagreeable flavor.

In the oven Cut the meat into uniform pieces weighing about 1 pound each, and cook in a moderate oven (350° F.) until the red or pink color of the raw meat almost disappears at the center. This requires about 30 to 40 minutes. Cut the meat so that there are two or more pieces to each container, pack at once closely, cover with the pan drippings or with boiling water, leaving proper head space, and process immediately.

Chicken is handled in this same way except it needs only about 20 to 30 minutes because of the smaller size of the pieces. This is the best way to precook chicken for canning in glass.

In water Cut the meat into uniform pieces weighing about 1 pound and place in boiling water. Partly cover the kettle and simmer for 12 to 20 minutes, until the color of the raw meat has almost disappeared from the center of the pieces. At this stage the meat has lost about one-third of its original weight because of the juice that has cooked out. At once cut the meat into smaller pieces, pack into the containers, and press the meat down closely with a wooden mallet or pestle. Cover with the broth, leaving proper head space, and process immediately.

This method, commonly referred to as parboiling, is the quickest way to precook a large quantity of meat. It is also used with chicken except that the time is only about 8 to 10 minutes.

In tin cans

Pack two or more pieces of meat into each can, and place the filled but open cans in a bath of boiling water that comes to within 1½ to 2 inches of the top of the can. Cover the bath to hold in steam and heat, being careful that water from the bath does not bubble into the cans. Continue heating until the meat in all the cans is steaming hot, or 170° F., at the center of the cans, and has practically lost the color of raw meat. If no thermometer is available, turn out the meat from a few of the cans to be sure it is heated through. The time required is about 40 to 50 minutes for No. 2 cans of beef or pork and somewhat less for chicken. Press the meat down and be sure that it is covered with broth and that there is proper head space in the cans. Seal at once and process immediately.

Packing and Processing

Salt is added to cans of meat as follows: One-half teaspoon to a pint jar, three-fourths teaspoon to a No. 2 can, and 1 teaspoon to a quart jar or No. 3 can. When tin cans are used, place the salt in the cans before packing them with meat. If the salt is placed on top of the meat, the lids sometimes rust.

Beef, fresh

Select cuts of beef commonly used for roasts or steaks—round, rump, loin, rib, and chuck. Cuts that contain more connective tissue and bone may be canned as stew meat, hamburger, or other products utilizing small pieces or used in soups. Wipe the meat with a damp cloth, remove the bone and gristle, and leave only enough fat to give flavor. If using glass jars, precook in the oven or in water (pp. 39 and 40), pack into containers, add salt, cover with broth, and process as directed in table 9. If using tin cans, follow the same method, or pack the meat raw and exhaust the cans (pp. 39 and 40).

Beef, ground (hamburger)

Prepare hamburger by grinding the meat through a plate with ⅛-inch holes. Add 1 cup of salt for each 25 pounds of meat and mix well. Pack the cold meat tightly into tin cans and exhaust the cans until the meat is steaming hot (pp. 39 and 40). If canning in glass jars, form the meat into cakes, precook in the oven, pack hot, and cover with broth. Process immediately as directed in table 9.

Beef, hash, and stew meat

One way of utilizing small pieces of meat is to can it for combining later with potato in hash. Cut or chop the meat into uniformly small pieces. Add sufficient water to cover, bring to simmering, and

cook for several minutes. Pack hot and process as directed in table 9.

For use in making stew, cut the meat into 1-inch cubes, cover with boiling water or broth, and simmer until the meat is shrunken and heated through. This requires about 8 to 10 minutes. The color of raw meat will have almost disappeared from the center of the pieces. Pack the drained meat closely into containers, add salt, and cover with boiling concentrated broth. Process immediately as directed in table 9.

Beef, heart and tongue

The tongue and heart are generally used as fresh meat, but they may be canned as follows: Wash the tongue, drop into boiling water and simmer for about 45 minutes, or until the skin can be removed. Skin and cut into pieces that will fit into the containers. Reheat to simmering in broth, pack into containers; add salt and broth to cover. Process as directed in table 9.

Wash the hearts, remove the thick connective tissue, and cut into pieces suitable for packing. Drop into boiling water and simmer for 15 to 20 minutes. Pack at once; add salt and broth to cover. Process as directed in table 9.

Beef stew with vegetables

Sprinkle the stew meat with salt and white pepper and dredge with flour. Brown the meat in hot beef fat; then add a small quantity of chopped onion and brown. Remove from the heat. Prepare a mixture of tomato pulp and equal parts of diced carrots, diced turnips, and diced potatoes. Add hot water and bring to boiling. Add the meat mixture and more salt and white pepper if needed. Pack hot and process as directed in table 9.

Beef, corned

Wash the corned beef, cover with cold water, bring to the boiling point, and drain. Cover the meat again with cold water, bring to the boiling point, then lower the heat and simmer until the meat is thoroughly heated through. Remove the meat from the broth a piece at a time, and while it is still hot cut into smaller pieces, and pack into the containers. Season the broth as desired, with bay leaves, cloves, or nutmeg. Sometimes gelatin softened in a little cold water is added. Pour boiling broth over the meat to cover. Process as directed in table 9.

Chicken and other poultry

For canning select plump, 2-year-old hens, preferably when they are culled from the flock during July and August. Young birds may be canned, but the texture and flavor of the meat is not so good as that from mature birds.

Dress the chickens as for cooking, and take particular care not to break the gall bladder because the meat is then unfit for canning.

Also remove the lungs, kidneys, and eggs. Cut the chicken into the usual sized pieces for serving and separate into three piles—the meaty pieces (breasts, thighs, legs, and upper-wing joints), the bony pieces (backs, wings, necks, and perhaps the feet after they have been skinned), and the giblets.

The giblets should not be canned with the other meat as they will flavor and discolor it. Also it is better to can the livers alone, and the gizzards and hearts together. Remove the chicken skin or not as desired, and trim off lumps of fat. Too much fat makes chicken difficult to process.

Make broth with the bony pieces. Cover with lightly salted cold water, simmer until the meat is tender, and drain off the broth to use as the liquid in canning the meaty pieces. Strip the meat from the bones and can as small pieces or use in making sandwich spread.

If desired add 5 tablespoons of granulated gelatin to each quart of broth. Moisten the gelatin first with a little of the cold liquid and dissolve in the hot broth.

The meaty pieces of chicken may be canned either with or without the bone. With the bone the product is better flavored. Precook in the oven or in water and pack hot as described on pages 39 and 40. Or exhaust in tin cans until steaming hot (p. 40). Add salt according to the size of the container (p. 40), and process as directed in table 9.

Precook giblets in water and pack hot, or exhaust in tin cans, and process as directed in table 9.

Chicken sandwich spread

This is a good way to utilize the small bits of meat stripped from the bony pieces.

4 pounds cooked chicken, chopped or ground.
1½ pounds olives, chopped.
1 pound pimientos, cut in small pieces.
1 quart chicken broth.
½ teaspoon curry powder.
1 teaspoon ground mace.
1 teaspoon ground mustard.
Salt and white pepper, to taste.

Combine all of the ingredients, stir, and heat gradually to simmering. Pack hot and process immediately as directed in table 9.

Chicken-liver paste

Chicken livers may be made into a paste for sandwiches. Simmer the livers for 10 minutes and drain. Mash with a fork and remove any stringy tissue. Then add a small quantity of finely chopped olives, mayonnaise, and dashes of tabasco sauce and paprika. Stir while heating carefully to prevent scorching. Pack hot and process as directed in table 9.

Chicken-gumbo soup

Prepare chicken-gumbo soup by any tested recipe. Pack hot into the containers and process according to the directions given in table 9.

Chile con carne

Use 2 pounds of chili beans or some other pink or red variety. Pick over the beans, wash, and soak overnight in a cool place. Remove thick connective tissue from 5 pounds of lean beef, or beef and pork mixed, and grind coarsely or chop. Add a little chopped garlic, 3 to 5 tablespoons of chili powder, 3 tablespoons of salt, and one-half cup of wheat flour, and mix well with the meat. Cook the mixture in 1 cup hot beef fat until the red color of the meat disappears. Add 2 quarts hot water, cover, and simmer for about 10 minutes. Drain the beans and blanch for 5 minutes in boiling water. Drain. Fill cans or jars about one-third full of the hot beans. Add the hot meat mixture to about seven-eighths of capacity, then hot water to fill. Process immediately as directed in table 9.

Lamb and Mutton

Select the fleshy parts and follow the same method as for beef, page 40. Can the smaller pieces as stew meat (p. 41).

Liver paste

Beef, calf, lamb, or hog liver may be used in this way.

3 pounds liver.	1 medium sized onion, chopped.
1½ pounds fat fresh pork.	3 eggs.
2 tablespoons salt.	6 tablespoons fine dry bread crumbs.
1 teaspoon white pepper.	½ cup water.
½ teaspoon ground cloves.	

Wash the liver thoroughly and remove veins and membranes. Grind the raw liver and pork twice through a plate with ⅛-inch holes, to make it very smooth. Add the seasonings. Beat the eggs well and combine with the bread crumbs and water. Stir all ingredients together until well mixed. Pack into No. 2 cans leaving 1 inch of head space and exhaust until the paste is heated through to the center of the cans. This requires about 40 to 50 minutes (p. 40). Remove some of the paste or add a little hot water, if necessary, so that the cans have the proper head space before sealing. Process as directed in table 9.

Pork and beans

Pick over white navy beans, wash, and soak in a cool place for about 16 hours, or overnight. Drain. Prepare liquid to cover the beans, using the proportion of 1 quart of water, 1 tablespoon of salt, and 1 tablespoon of sugar (or molasses) to each pound of dry beans. Or prepare an equal quantity of tomato sauce, using 3 cups of tomato pulp to 1 cup of water. Add ground spices, cayenne pepper, and chopped garlic or onion, as desired. Cook until thick.

Blanch the beans for 2 minutes in boiling water, and drain. Place small pieces of salt pork in a bean pot or other container for baking. Add the beans and additional pieces of salt pork, and cover with the prepared liquid or tomato sauce. Cover the pot and cook the beans

in a slow oven (about 250° F.) for 1½ hours. Remove the lid and combine all of the ingredients, stir, and heat gradually to simmering. Pack hot and process immediately as directed in table 9.

Pork, fresh

The cuts of pork usually canned are the following: Loin; meat from spareribs; head, tongue, and heart in headcheese; loin and lean trimmings in sausage; and liver in liver paste. While the ham and shoulder may be canned, they are generally preserved by curing.

Remove excess fat from the meat to be canned and precook by any of the methods described on page 39. Pack hot and process as directed in table 9.

Pork, headcheese

Headcheese may be made from a hog's head, tongue, and heart, according to any good recipe but omitting the sage. Pack the headcheese hot into containers and process as directed in table 9. It is better to use tin cans so that the product can be removed in a single piece.

Pork sausage

Follow any tested formula for preparing the sausage, but omit the sage for that gives the sausage a bitter flavor after processing. See that the seasonings and meat are well mixed together.

If using tin cans, pack the raw sausage closely into the No. 2 size and exhaust the cans until the sausage is steaming hot, as directed on page 40. This requires 40 to 50 minutes. Process as directed in table 9. Before opening a can heat for a few minutes in boiling water, then slip the contents of the can out in one piece, slice into rounds, and reheat in gravy or in an oven.

If glass jars are used, mold the sausage into cakes and precook in a moderate oven (350° F.) for 10 to 15 minutes, or until the cakes are slightly browned and the color of raw meat has almost disappeared. Pack into the jars and cover with the drippings or with hot water. Process as directed in table 9.

Rabbit, domestic

Precook and process in the same way as chicken (table 9).

Soup stock and broth

Chicken or meat.—Broth containing small pieces of meat and sediment from coagulated proteins is commonly called soup stock. Clear meat broths for canning should be fairly concentrated but avoid prolonged boiling as it will cause loss of flavor. Also, if meat bones are cooked for a long time under pressure to make broth or soup stock, the broth will have a disagreeable gluey flavor. Remove excess fat from broth or soup stock before canning.

Rice or barley may be added to the broth in the proportion of 1 cup

TABLE 9.—Timetable for processing meats and chicken in the steam pressure canner

At altitudes over 2,000 feet, add 1 pound of pressure for each additional 2,000 feet. Follow the directions given on pages 8, 13, and 18 for operation of canner and removal of jars and cans after processing. Cool tin cans in cold water.

250° F., OR 15 POUNDS PRESSURE

Product	No. 2 can	No. 2½ can	No. 3 can	Pint glass jar	Quart glass jar
	Minutes	*Minutes*	*Minutes*	*Minutes*	*Minutes*
Beef:					
Fresh	85	110	120	85	120
Ground (hamburger)	90	115	------	90	120
Hash	90	115	------	90	120
Heart and tongue	85	110	120	85	120
Stew meat	85	110	120	85	120
Stew with vegetables	85	110	120	85	120
Corned	85	110	120	85	120
Chicken and other poultry:					
With bone	55	65	70	65	75
Boned	85	110	120	85	120
Giblets	85	------	------	85	------
Sandwich spread	No. 1, 55	------	------	½-pint, 65	------
	No. 2, 90	------	------	Pint, 90	------
Liver paste	No. 1, 55	------	------	½-pint, 65	------
	No. 2, 90	------	------	Pint, 90	------
Lamb and mutton	85	110	120	85	120
Liver paste	90	------	------	90	------
Pork:					
Fresh	85	110	120	85	120
Headcheese	90	------	------	90	------
Sausage	90	115	------	90	120
Rabbit domestic	85	110	120	85	120
Soups:					
Broth, clear	25	30	30	25	30
Broth with rice or barley	35	40	40	35	40
Chicken gumbo	65	75	80	65	80
Soup stock	40	45	45	40	45
Veal	85	110	120	85	120

240° F., OR 10 POUNDS PRESSURE

Chile con carne	120	135	150	120	150
Pork and beans	70	80	85	80	90

of the uncooked cereal to each gallon of clear meat broth. Wash the cereal, boil for 15 minutes in salted water, drain, and rinse with cold water. Bring the meat broth to the boiling point and add the cereal. Season as desired. Process as directed in table 9.

Veal

Same as beef, fresh.

BEFORE EATING, INSPECT ALL CANNED FOOD

All foods should be inspected before being prepared for the table. Canned food is no exception to this rule. If there is any evidence of spoilage, the food should be discarded and nonacid vegetables and meats should be burned.

Inspect the can or jar before opening. In tin cans both ends should be flat and curved slightly inward. Neither end should bulge or snap back when pressed. All seams should be tight and clean, with no traces of leaks. In glass jars there should be no bulging of the rubber and no signs of leakage.

When the container is opened there should not be any sudden outburst of air or spurting of liquid. The odor should be characteristic of the product. Any different odor probably indicates spoilage. The inside of tin cans should be smooth and clean or well-lacquered and not markedly corroded. Food may be left in a tin can after it is opened, provided it is covered and kept cold just as any other cooked food. Acid foods and tomatoes may dissolve minute quantities of iron from the can and acquire a slightly metallic flavor, but this is harmless. The purple that develops in red fruits and sometimes in peaches and pears canned in tin, is merely a change in the color pigments and is also harmless.

The broth over canned meats and chicken may or may not be jellied, depending on the quantity of connective tissue and cartilage in the meat. If it is liquid, this is no indication of spoilage.

Never taste to discover spoilage. When spoilage has occurred in nonacid foods there is always a possibility that even a taste may cause serious illness. For this reason it is good practice to boil all canned nonacid vegetables before using them. The processes recommended for meats are much longer than those for vegetables and should destroy all dangerous bacteria.

Freezing does not cause canned foods to spoil unless it breaks the seal and permits micro-organisms to enter. All frozen canned foods should therefore be examined for leakage. Sometimes freezing may bulge tin cans and spread the seams enough to permit bacteria to enter and yet not cause leakage. Bulged cans of frozen food, therefore, should be used as promptly as possible if they cannot be kept frozen.

Signs of Spoilage

Foods canned in tin sometimes show the following evidences of spoilage.

Buckled cans Cans that have caved in, or collapsed, on the sides are called buckled cans. This may occur when No. 3 or larger sized cans are cooled too quickly after processing. These large cans should be allowed to remain in the canner until the pressure gage has reached zero to avoid too sudden change of pressure. Cans of smaller sizes when slack-filled sometimes buckle on cooling and break the seams. In this case the food should be put into other cans and reprocessed, or used at once.

Springers Springers are cans with bulged ends. The ends of cans generally become convex, or outwardly curved, during processing because of expansion of the food and the formation of steam. When the cans cool the ends should snap back to a concave, or inwardly curved position. If a can is too full, the ends may not snap back into proper position, and the can is called a springer. Such cans should be marked so they will not be confused with those that become bulged during storage.

Swelled cans When gas is formed within a can it may cause the ends of the can to bulge. For example, some fruits, such as prunes, apples, and some berries, react with the metals of the can, and hydrogen gas is liberated. When this collects, the can may become a "hydrogen swell." In this case the food itself is not affected. However, in several types of food spoilage, gases are produced that cause swelled cans. For this reason bulged ends on a can are regarded as an indication of spoilage. When canned fruits show such a condition, they should be examined for other indications of spoilage. When a can of meat or nonacid vegetables has bulged ends the food in it should be disposed of by burning.

Perforations Some of the fruits that react with the metals of the can to produce hydrogen swells may also cause perforations and leaks. These result from the centering of the chemical reaction on a few points. If the can is discovered soon after leaking starts the food may be used, but if the leakage is not detected until later, fermentation or other types of spoilage may have set in.

Canned foods are likely to develop perforations and hydrogen swells rather quickly if stored in too warm a place; hence cool storage is especially important for canned fruits that react in this way on the metal.

U. S. GOVERNMENT PRINTING OFFICE: 1942

For sale by the Superintendent of Documents, Washington, D. C. - - - - Price 10 cents

DRYING FOODS for Victory Meals

FARMERS' BULLETIN No. 1918
U. S. DEPARTMENT OF AGRICULTURE

CONTENTS

	Page
Important in wartime	1
Speed is the word	1
What to dry	1
Preparation for drying	2
Special treatment for fruits	2
Special treatment for vegetables	3
Equipment for steaming	3
In wartime use what you have	3
Methods of drying	4
Sun-drying	4
Drying with controlled heat	4
Home-made heated driers:	
Swinging or bird-cage drier	5
Cabinet drier is widely used	5
Tunnel drier	9
Temperature and thermometers	9
Test for dryness	9
Keep dried foods dry	10
Preparation for table use	10
How to dry fruits:	
Apples	10
Apricots	11
How to dry fruits—Continued.	
Berries	11
Cherries	11
Figs	11
Nectarines	11
Peaches	11
Pears	12
Plums	12
Prunes	12
How to dry vegetables:	
Beans, lima, and other fresh shell	12
Beans, snap	12
Beets	12
Corn	13
Herbs, including celery leaves and parsley	13
Leafy green vegetables	13
Okra	13
Peas	13
Peppers, paprika	13
Pimientos	13
Pumpkin	13
Squash	13
Sweetpotatoes	13
Additional information	14

INTENSIVE RESEARCH on home drying is under way. This bulletin does not attempt to give all the answers. It brings together the most satisfactory information to date on methods of drying several fruits and vegetables widely grown throughout the United States. For advice on how to dry products limited to certain regions, consult your State agricultural college, county home demonstration agent, or local people experienced in home drying.

Washington, D. C. Issued August 1942

DRYING FOODS FOR VICTORY MEALS

VICTORY GARDENS lead directly to victory meals—all the year round—for those who take thought for the morrow and put by a store of fruits and vegetables.

Part of the food from orchard and garden will be canned or pickled, or made into preserves, jam, or jelly. Some foods will go into freezer lockers. Some—such as potatoes, turnips, carrots, parsnips, and late-maturing cabbage—can readily be stored in cellars or outdoor pits and should be taken care of in this way rather than by drying. Other foods, too perishable for storing, will need to be dried at home with simple equipment.

IMPORTANT IN WARTIME

Home drying is especially important in wartime because it does not require sugar—nor the metals, rubber, and other materials used in more common types of food preservation. Drying is not a difficult job. However, it does take time—and constant attention—especially at the beginning and the end of the process.

Directions for drying several kinds of fruits and vegetables are given in the section beginning on page 10. Timetables are not given as drying time varies greatly—depending on the kind of food, the size of the pieces, the type of drier, and the weather.

For fruits, drying time in a home-made drier varies from about 6 to 24 hours. For vegetables, from about 3 to 15 hours. Sun-drying takes much longer. Dried products weigh from one-third to one-twelfth as much as the fresh material.

Whatever the method of drying, by sunshine or controlled heat, "speed is the word"—both when preparing the fresh food and when getting it into the drier. The faster you work, from garden to drier, the higher will be the vitamin value of the dried food and the better the flavor and cooking quality. Once started drying should be kept going until enough water is removed to keep the food from spoiling.

WHAT TO DRY

Fruits are easier to dry than most vegetables. Those commonly dried at home are apples, apricots, figs, peaches, and pears. Among other fruits that may be satisfactorily dried are blackberries, dew-

berries, loganberries, black raspberries, red raspberries, cherries, nectarines, plums, and prunes.

Vegetables ordinarily dried are sweet corn, shelled mature beans and peas, and okra. Other vegetables added to the list during recent years include beets, leafy green vegetables, green peas, snap beans, peppers, pimientos, pumpkins, and squash. Sweetpotatoes should be dried only in those parts of the country where they cannot be stored. They dry best in a heated drier with a forced draft. (See fig. 3, p. 8.)

Such leafy green vegetables as beet tops, dandelion greens, kale, mustard greens, and turnip greens are at their best when fresh. They should be dried only in regions where winter gardens are not feasible. Herbs, including celery leaves and parsley, are easily dried in the air.

PREPARATION FOR DRYING

Dry only fresh, ripe, sound, clean foods—those at the right stage for table use. Handle carefully to prevent bruising. One decayed slice of apple or one moldy bean may give a bad flavor to an entire lot.

To prevent discoloration, pare all foods with stainless-steel knives. Cut food into thin, even slices or uniform pieces, on a wooden board.

As soon as fruits and vegetables are cut open and exposed to the air, certain changes begin to take place in food value, color, flavor, and odor. To control these changes, foods prepared for drying are usually given special treatment. They may be dipped in an acid or salt solution, sulfured, or precooked in steam or boiling water. Work fast through this step.

Special Treatment for Fruits

To help hold the color and prevent darkening, most fruits should be sulfured, steamed, or dipped in salt water. Apples may be treated in any one of these three ways.

Sulfuring is a good treatment for many fruits. Properly used, it is not harmful. It protects certain vitamins during drying and preserves natural fruit color and flavor. It also prevents souring and insect attacks during drying. Products to be sulfured should be placed on wooden trays—sulfur fumes will corrode galvanized screen trays.

To sulfur fruit.—Work out of doors. For small amounts of fruit the sulfuring chamber may be simply a tight packing box or a wooden frame covered closely with roofing paper or wallboard. It should be high enough to cover a stack of trays and wide enough to allow about a foot of extra room for the sulfur pan. At the bottom of the sulfuring box allow a small space for air to enter—otherwise the sulfur may not burn.

Two blocks of wood laid on the ground will form a support for the loaded trays. Stack the trays one upon the other, with pieces of light lath between. The lowest tray should be 6 to 8 inches from the ground.

Measure out 1 level teaspoon of sulfur for each pound of prepared fruit. (Don't use too much sulfur.) Wrap the sulfur in a small piece of paper and place in a shallow tin can. Set the can of sulfur on the ground in front of the loaded trays. Light the paper, and quickly place the sulfuring chamber over trays and can. It should cover the trays completely to prevent loss of sulfur fumes. For length of time to sulfur each kind of fruit, see detailed directions (pp. 10–12).

If fruit is not sulfured.—Although such fruits as apples, apricots, and peaches are usually sulfured, they can be dried without sulfur treatment. If they are not sulfured they should be steamed before drying. (Apples may be dipped in salt water.) To retain the juices, pitted fruits should be dried stone side up, on wooden trays.

Special Treatment for Vegetables

Before drying, vegetables should be precooked in steam or boiling water. Recent experiments indicate that as a rule vegetables precooked in steam are higher in food value than those precooked in boiling water. They also keep better, require less soaking before they are cooked for the table, and have better flavor and appearance.

However, precooking in boiling water is quite satisfactory if directions are carefully followed. Work with small amounts of food at a time so that the water will not be cooled more than necessary. To conserve vitamins and minerals, hold the vegetables in the boiling water the shortest time necessary to cook them almost tender—and use the same water for several lots of food.

EQUIPMENT FOR STEAMING

A steam-pressure canner is ideal equipment for steaming. Put a small amount of water in the container and heat to a rapid boil. Place a thin layer of prepared food in a wire basket or colander, and set the basket on a rack above the level of the boiling water. Cover the cooker, leaving the pet cock open, and keep the water boiling briskly for the time recommended in directions for each product.

Steamers are also excellent equipment for precooking. Put a thin layer of food in the top compartment and place over rapidly boiling water.

In Wartime Use What You Have

If you lack special equipment for steaming, use a large kettle or any other deep container with a tight-fitting cover. An ordinary wash boiler or large lard can may be fitted with a wire basket for the food and a rack to hold the basket above the level of the boiling water.

Start the water heating in plenty of time so that it will be boiling briskly as soon as the food is ready for steaming.

Place the prepared material in the wire basket. Steam until all the pieces are heated through to the center. They should be almost done. (There is more danger of undercooking than of overcooking.) Stir occasionally, and, when the food is sufficiently steamed, spread the pieces on trays and place in the drier immediately.

METHODS OF DRYING

Successful drying depends on three things: Dryness of the air, temperature of the air, and circulation of the air.

Sun-Drying

In regions with clear, dry, practically rainless periods several kinds of fruit and a few kinds of vegetables may be sun-dried on an outdoor shelf, a roof sloping toward the south, or on racks in sunny windows.

Good fruits for sun-drying are apples, apricots, blackberries, raspberries, cherries, peaches, and plums. Fortunately most of these ripen at a time of year when the weather is favorable for outdoor drying.

The most satisfactory vegetable for sun-drying is early-maturing sweet corn. However, vegetables dried with controlled heat have a more pleasing flavor than those that are sun-dried—and this applies even to sweet corn.

Small lots of food may be spread out on clean boards, canvas, heavy wrapping paper, cheesecloth, or clean flour sacks or feed sacks held in place by laths. Wire trays, window screens, or slat trays covered with thin cloth are even better, as they allow the air to circulate under as well as over the food. Stir two or three times daily. Take the food in at night and at the approach of showers.

Trays are desirable for drying large amounts of material. These should be of uniform size so they can be easily and quickly stacked.

To keep out insects, cover drying products with cheesecloth, mosquito netting, or wire window screening.

Drying With Controlled Heat

Drying in heated driers with controlled or artificial heat has several advantages over sun-drying. It goes on continuously—even after sundown—and in rainy as well as sunny weather. It reduces drying time and extends the drying season into the fall, when late varieties of certain fruits and vegetables are maturing.

Vegetables should be dried by controlled heat rather than sunshine in order to protect food value, color, and flavor. A possible exception to this rule is sweet corn maturing early in the hottest weather of the season.

Home-made Heated Driers

Swinging or bird-cage drier.—The simplest of the three heated driers illustrated is the swinging, or bird-cage, drier shown in figure 1. It is convenient for drying small amounts of food and may be used above an ordinary cook stove. The frame should be covered with thin cloth, to protect the food from dust.

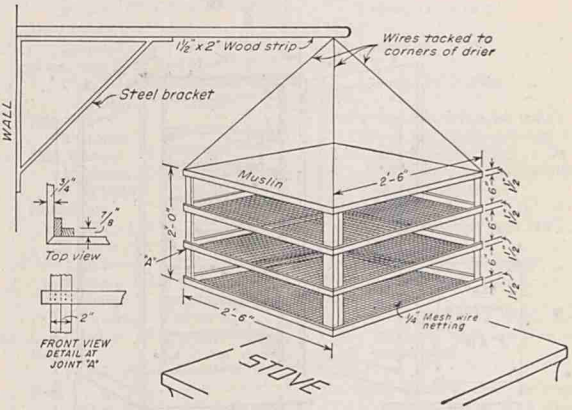


FIGURE 1. Swinging or bird-cage drier.

Cabinet drier is widely used.—One of the most widely used home-made driers is the cabinet type, shown in figure 2. To provide an air channel, the trays are adjusted so that the top tray touches the door of the cabinet, the second tray the rear wall, the third the door. The remaining trays alternate in similar fashion. Any number of trays from one to seven may be used, provided that the top tray and every alternate tray touch the door.

Heat the drier for 20 to 30 minutes before putting in the trays. Place thermometer on bottom tray. Check the temperature at the end of the first half hour, and if necessary adjust the heat according to the directions recommended for the particular food being dried. Shift the trays every hour—moving the bottom tray to the top and dropping each of the others to the place just below.

Building the cabinet drier.—Construct the drier from inside measurements, as thickness of posts and boards causes variation in outside measurements.

SIDES.—Build two frames, preferably of 2- by 2-inch material, 30 inches wide and 62 inches high over all, with one brace of same ma-

terial flush with top of the 62-inch uprights; one brace of same material 36 inches from top and one brace of 1- by 2-inch material, 10 inches from bottom. On these frames nail boards to a depth of 36 inches, preferably using ½-inch material, any width, or various widths.

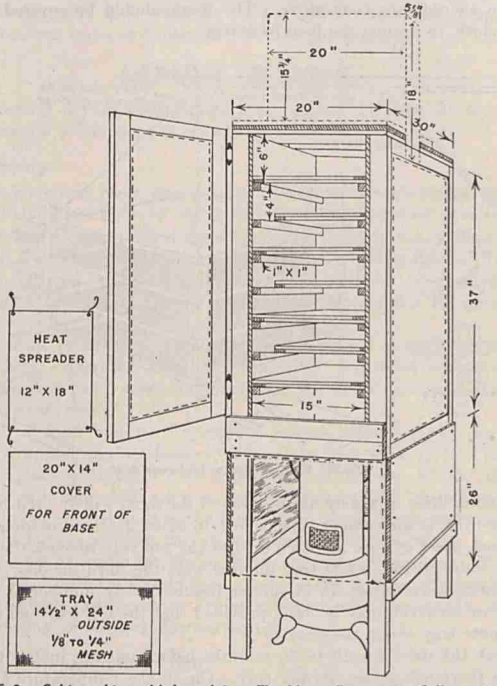


FIGURE 2.—Cabinet drier. (Adapted from The Home Evaporator, College of Agriculture, University of California, Berkeley.)

TRAY RUNWAYS.—To the wall thus formed, nail one tray runway 1 by 1 by 30 inches, 6 inches from the top. Place the remaining six runways 4 inches apart, measuring from the top of one runway to the top of the next. Place the two sides of the evaporator in a vertical position and insert two measuring sticks 15 inches long, one on the upper runway; one on the lower runway between the sides. Measure the width of the evaporator over all. Cut lumber accordingly for

rear wall and top. Nail one 3-inch piece on top at door end. Allow a 3-inch opening (ventilator) as shown in figure, for escape of moist air. Cover the remainder of the top.

MATERIALS NEEDED TO BUILD CABINET DRIER

Lumber for—
- Posts and braces:
  - 3 pieces, 2″ x 2″ x 10′
- Door frames and braces:
  - 2 pieces, 1″ x 2″ x 9′
- Sides, tops, back, and door:
  - 6 pieces, ½″ x 6″ x 10′
  - 1 piece, ½″ x 3″ x 2′
- Runways:
  - 3½ pieces, 1″ x 1″ x 10′
- Tray frames:
  - 12 pieces, ½″ x 1″ x 8′ (or 25 laths)
- Chimney:
  - 2 pieces, 15¾″ x 20″ x ¼″
  - 2 pieces, 18″ x 4½″ x ¼″ plywood
  - 2 pieces, 19½″ x 2½″ x 1″ lumber
  - ½″ quarter-round 63″

Insulating material for—
- Door:
  - 1 piece, 28½″ x 15½″
- Back:
  - 1 piece, 36⅜″ x 19½″
- Sides:
  - 2 pieces, 32½″ x 26″
- Top:
  - 1 piece, 3″ x 19½″
  - 1 piece, 24¼″ x 19½″

Fireproof material for apron—
- Back:
  - 1 piece, 14″ x 19½″
- Front:
  - 1 piece, 14″ x 20″
- Sides:
  - 2 pieces, 14″ x 29½″

Hardware—
- Galvanized wire screen for trays:
  - ⅛″ or ¼″ mesh, sufficient to cut 7 pieces 14½″ x 24″ (24″, 30″, and 48″ widths cut without waste)
- Heat spreader:
  - 1 piece of sheet iron, 12″ x 18″
- 1 small hook-style door clasp
- 2 hinges, 2¼″ or 2½″ size
- Wire:
  - 4 pieces, 8″ long (small size copper or black iron wire, or broom wire)
- Nails:
  - ½-lb. 2-penny nails, for trays
  - 1 lb. additional nails, 3 sizes, suitable for lumber to be used
- 1 medium-size coal-oil heater

REAR WALL.—Cover rear wall to a depth of 36 inches and nail a brace of 1- by 2-inch material, 10 inches from bottom (fig. 2).

DOOR.—Nail 1- by 2-inch brace to frame, even with lower edge of side wall. Build door to fit evaporator (fig. 2).

INSULATION.—Fit into the sides, top, back, and door around the actual drying chamber pieces of ½-inch celotex or other insulation of similar thickness. Fasten them in place with brads or nails. Be sure the entire inside surface of the door is flush with the front of the drier.

CHIMNEY.—Attach each of the 1-inch wood pieces at right angles to one of the large plywood pieces, across the 20-inch side at the bottom end. Turn so the L's face outward with the inside walls parallel and fit the 4½-inch pieces between the L-shaped pieces, tops even. Nail in place to form an oblong box 20 by 5⅛ by 15¾ inches,

open at the top and bottom, and with the narrow ends extending 2¼ inches below the sides. Nail one strip of ½-inch quarter-round into each inside corner to make the chimney stable. This chimney slips on over the vent in the top of the drier. It may be removed when the drier is stored.

APRON.—Enclose the space between the lower braces and the upper insulated walls with one layer of material of the dimensions

FIGURE 3. Tunnel drier.

given, to protect the heater from drafts and direct the heat upward. This material should be fireproof. Do not nail the front piece in place; it must be removable in order to allow for placing the heater.

TRAYS.—Cut seven pieces of galvanized-wire screen mesh 14½ inches wide and 24 inches long. Cut 28 pieces of lumber ½ by 1 by 23 inches, and 28 pieces of lumber ½ by 1 by 13½ inches for tray frames. Place two pieces of each length together to measure 14½ by 24 inches

over all. Place wire screen on these strips and place four similar strips over the netting in position to make corners of tray firm. Nail firmly together.

HEAT SPREADER.—On each side on the inside of evaporator, 6 inches from corners and 3 inches above the lower edge, insert a screw eye or small nail from which to suspend, by pieces of wire, the heat spreader (fig. 2). Adjust the heat spreader over the oil stove, allowing a 2-inch space between the two for circulation of air.

Tunnel drier.—In a tunnel drier (fig. 3) the drying compartment is a long rectangular box, raised at the back. The trays—on slides parallel to the top of the box—are placed to form a channel in the front, through which the heated air enters. An opening in the top surface of the tunnel at the rear allows the air to escape. The heat flows up at the front, and back over the inclined trays—escaping from the vented opening in the rear.

Temperature and Thermometers

In general, the best temperatures for drying are between 125° and 160° F., although for some vegetables the temperature should never exceed 150°. Increase the temperature in the middle stages of drying and decrease toward the end. If the temperature is too low to begin with, the food may sour; if it is too high, the water-filled cells of fruits and vegetables may expand and burst. Or the products may harden on the surface, thus making it more difficult for moisture to be removed from the inside of the food.

When the drying products have lost considerable moisture, increase the temperature. Reduce it again toward the end of the process. Otherwise the food may scorch—or caramelize, if it contains a great deal of sugar.

A thermometer is a help in regulating the temperature of a heated drier, but when thermometers are not available old-fashioned rules of thumb still hold good. Learn to tell by the feel of the material on the trays whether it is drying satisfactorily. It should be moist to the touch and cooler than the air flowing over it. If the food is practically at air temperature and not moist to the touch, it is drying too fast.

Test for Dryness

Fruits are ready to remove from the drier when they are tough and leathery. Vegetables should be rigid and brittle. If in doubt as to whether material is dry enough, leave it in the drier a little longer, but reduce the temperature. As long as the temperature is held low enough, there is not much danger of food becoming too dry.

Proper condition for storing.—Even though they pass the test for dryness, fruits and vegetables taken from the drying trays are not

uniformly dry, and pieces that are too moist may cause mold to develop. Sort food carefully, and return to the drier any pieces that show signs of moisture.

As a final precaution against insects, just before storing return all foods to the drier and reheat for 10 to 15 minutes at a temperature from 165° to 180° F.

KEEP DRIED FOODS DRY

Dried fruits and vegetables will keep for a year or longer if sealed in moistureproof containers and stored in a cool, dark, dry place. Examine the food occasionally. If there is any sign of moisture reheat to 165° F. and reseal.

Practical containers include glass jars, tin cans, and tin boxes, with tight-fitting lids, and stone crocks with covers that can be sealed. If you have glass jars but no rubber rings, or jars that are not perfect around the top, they can be sealed with a strip of muslin dipped in hot paraffin and placed over the opening. Screw-top jars may be sealed with used rubber rings that have not become hard and brittle. Use two rings instead of one and screw the top down very tightly.

Other containers that prove satisfactory in a *dry* storeroom are heavy paper and cloth bags that have been dipped in melted paraffin.

Store in small amounts.—Fill containers as full as possible. As dried foods are best if used a short time after opening, it is well to store them in small amounts. A number of small bags may be filled, labeled, and placed in a lard can or stone crock. The large container should of course be sealed.

PREPARATION FOR TABLE USE

Cover dried foods with cold water and soak for ½ to 6 hours, adding more water if necessary. Cook until just tender in the same water in which soaked. Most of the liquid will be absorbed during cooking.

Dried vegetables have already been precooked and therefore can be cooked for the table in a very short time. Before cooking, soak just long enough to plumpen. Dried greens do not require soaking. Cook until tender in boiling salted water to cover.

HOW TO DRY FRUITS

Apples.—Select late varieties of good dessert or cooking quality. Fruit should be mature but not soft. Wash, pare, and core. Remove blemishes. Cut into ¼-inch slices or rings, or into quarters or eighths. Before drying, fruit should be sulfured, or steamed 5 to 7 minutes, or held in salt solution 10 minutes (4 teaspoons salt per gallon of water).

To sulfur, spread cut fruit on wooden or slat-bottom trays, 1 to

1½ inches deep. (See p. 2.) Apples cut in slices or eighths should be sulfured 20 to 30 minutes; if cut in quarters, 45 to 60 minutes. Place in drier at 130° F. and gradually increase temperature to 165°. Finish drying at 145° to 150°. For sun-drying, spread fruit in thin layers not more than two slices deep.

Apricots.—Select tree-ripened fruit. Do not peel. Cut in halves and remove stones. Sulfur 1½ to 2 hours, or steam 5 to 7 minutes (p. 3). Spread on wooden trays in single layers, stone side up. Start drying at 130° to 145° F. and gradually increase temperature to 155°.

Berries—blackberries, dewberries, loganberries, black raspberries, red raspberries.—Pick in early morning. Select only ripe but firm fruit. Spread in thin layers—softer fruit not more than two berries deep. Use wooden trays or screen trays covered with cloth. The cloth keeps the berries from sticking.

Get trays into drier as quickly as possible. Start drying at 135° to 145° F. (Start dewberries, loganberries, and red raspberries at 130°.) Gradually increase temperature to 150° and 155° when fruit is two-thirds to three-fourths dry, decreasing temperature toward end of drying process. Berries are sufficiently dry when they rattle on the trays and no longer show moisture when crushed between the fingers. For sun-drying, spread in single layers.

Cherries—Tartarian, Bing, Lambert, Dikeman, and sour or pie.—Pick in early morning. Select fruit that is just ripe. Wash, remove stems and imperfect cherries. Pit the fruit, and drain for about 1 hour. The juice may be bottled. Spread fruit on trays in single layers, place in drier, and start drying at 120°. The temperature should never be over 150°.

Figs—Adriatic, Mission, Smyrna, Celeste, Turkey, Magnolia, Brunswick, Black Ischia.—Hand-pick when well-ripened but firm. Remove stems. To soften skins, dip figs for 1 minute in steam or boiling water. Cut in halves lengthwise. Spread on trays in single layers. Place in drier at 115° to 120° F. When fruit is noticeably shriveled the temperature may be increased to 140° to 145°. Stir at intervals to keep fruit from sticking to trays.

Nectarines.—Directions same as for apricots.

Peaches.—Select any good table variety. The fruit should be ripe enough for eating but not dead ripe. Wash, and peel by steaming or by holding in boiling water 1 to 2 minutes.

Peaches for drying may also be lye-peeled, in a solution containing ¼ pound (4 ounces, or about 4 level tablespoons) of granulated lye of a standard brand to 2 gallons of water. Use an agateware or iron kettle, never aluminum. Heat solution to boiling, and while it is actively boiling immerse the peaches, in a wire basket, until skins are loosened and partially dissolved. This usually takes 30 to 60

seconds. Remove the fruit and wash it immediately—in running water if possible—until skins and lye are removed. Then rinse thoroughly—otherwise the peaches may turn brown. A 2-minute dip in cold water containing 2 tablespoons each of salt and vinegar per gallon of water helps to prevent browning. If a thermometer is used, peaches may be peeled in a stronger lye solution at a lower temperature—1 pound of lye to 1½ gallons of water, heated to 135° to 140° F. (never higher). Freestone peaches are usually lye-peeled *after* they are halved and the pits are removed.

For drying, remove pits, and place fruit in single layers on trays, pit side up. If peaches are very large, cut in quarters or slices. Sulfur 1 to 2 hours, or steam 5 to 7 minutes. Start drying at 125° to 130° F., gradually increase to 175° and lower again to 150° toward end of drying.

Pears—Bartlett, Kieffer.—Wash, pare, and core. Remove blemishes. Cut into ¼-inch slices or rings, or into quarters or eighths. Sulfur 3 to 4 hours, or steam 5 to 7 minutes. (If there is any delay between the preparation of the fruit and the steaming process, hold prepared fruit in salt solution—4 teaspoons salt per gallon of water.) Place in drier at 130° F., and gradually increase the temperature to 150°. Dry in single layers.

Plums—Abundance, Burbank, Clifford, Hunt.—Wash, cut in halves, and stone. Place on trays in single layers, stone side up. Sulfur 20 to 25 minutes. Place in drier at 130° F. and gradually increase to 165°.

Prunes.—These are varieties of plums often dried with the pit in. To soften skins, hold in steam or boiling water 2 minutes. Or cut the prunes in halves, remove pits, and spread fruit on trays in single layers, pit side up. Start drying at 130° F. and gradually increase to 165°.

HOW TO DRY VEGETABLES

Beans—lima and other fresh shell beans.—Gather when just ready for table use. Shell. Steam 8 minutes, or hold in boiling water 5 minutes. Drain. Spread on trays, ½ to ¾ inch deep. Start drying at 115° to 120° F., allowing temperature to rise to 140°. Stir frequently at beginning of drying process.

Beans, snap.—Wash, cut off ends or remove strings. Leave the beans whole, or cut in halves or thirds. Steam for 15 minutes (p. 3), or until almost tender. Spread on thin cloth on drier trays. Dry at a temperature not exceeding 155° F.

Beets.—Select young tender beets. Trim off tops and wash beets thoroughly. Steam 20 to 30 minutes (p. 3). Cool, peel, dice or cut into ¼-inch slices, and pile loosely on trays. Dry at a temperature not exceeding 150° F. Stir frequently; otherwise the slices will stick together.

Corn.—Any good table corn may be dried. Gather in milk stage, in amounts that can be prepared immediately for drying. Husk, remove any blemishes. Silking is not necessary. Steam for 10 minutes or hold in boiling water 8 to 12 minutes, or until the milk is set. Drain, cool, cut corn from cob. Spread on trays, ½ to ¾ inch deep. Dry at 130° to 140° F. Stir during drying to separate grains.

Herbs, including celery leaves and parsley.—Gather when leaves are fully mature but usually before flowers develop. Leaves should be free from sand and other foreign matter. To preserve flavor and color hang stems over a wire and dry quickly in the shade, or tie in small bundles and hang in a dust-free room with good air circulation. When thoroughly dry, remove all coarse stems and store the leaves in glass jars with screw tops. Label, and keep in a cool, dry place.

Leafy green vegetables—beet tops, dandelion greens, kale, mustard greens, turnip greens.—Wash in several waters to remove grit. Trim off tough stems and discard. Steam the leaves 5 minutes, or until the stem is heated through. Pile loosely (not more than 1 inch deep) on thin cloth on trays. Dry at a temperature not exceeding 150° F.

Okra.—Select young tender pods. Cut in ½-inch slices. Steam 4 to 8 minutes. Place in thin layers on tray. Start drying at 125° F. and increase temperature to 140°.

Peas.—Steam 8 to 10 minutes, or hold in boiling water 3 to 4 minutes. Otherwise directions are same as for lima beans.

Peppers, paprika.—Paprika peppers dry readily in the air and are not subject to mold or spoilage. Wash, string with needles and cord and hang in a dry place, or spread on trays in single layers. Dry at room temperature for several weeks. Or the plants may be suspended in bunches, root side up, where the air can get to them.

Pimientos.—Wash, sort, and trim. Spread on trays in single layers. Start drying at 165° F. and finish at not above 150°.

Pumpkin.—Cut in strips 1 to 2 inches wide. Peel, remove seeds and pithy material, and cut in slices ½ inch thick. Steam or hold in boiling water 5 to 8 minutes. Spread on trays in single layers. Place in drier at 175° F. and finish drying at 160°.

Squash.—Directions same as for pumpkin.

Sweetpotatoes.—Wash thoroughly. Loosen skins by dipping in boiling lye solution composed of 5 ounces of commercial concentrated lye to 2 gallons of water. (Or steam until tender—15 to 45 minutes, depending on the size of the potatoes.) Cool under cold water, and peel off skins. Slice lengthwise about ¼ inch thick. Dip slices in citric acid solution just long enough to coat surfaces. The solution is made by dissolving 5 ounces of citric acid crystals in 2 gallons of water. Place slices on thin cloth on drier trays. Start drying at 135° to 150° F. The temperature should never exceed 160° to 165°. Sweetpotatoes should not be dried in a cabinet or swinging drier, but in a drier of the tunnel type with a forced draft.

ADDITIONAL INFORMATION

Those who wish to learn more about drying fruits and vegetables at home may get further information from their own State agricultural experiment stations and extension services. The United States Department of Agriculture also publishes a comprehensive bulletin on the subject, Farmers' Bulletin 984, Farm and Home Drying of Fruits and Vegetables. Other bulletins on preservation of fruits and vegetables published by the United States Department of Agriculture are listed below:

Home canning of fruits, vegetables, and meats. Farmers' Bul. 1762.
Home storage of vegetables. Farmers' Bul. 879.
Making fermented pickles. Farmers' Bul. 1438.
Home-made jellies, jams, and preserves. Farmers' Bul. 1800.
Making vinegar in the home and on the farm. Farmers' Bul. 1424.
Community food preservation centers. Misc. Pub. 472.

U. S. GOVERNMENT PRINTING OFFICE: 1942

For sale by the Superintendent of Documents, Washington, D. C. - - - - Price 10 cents

MARCH, 1943 4-H CLUB SERIES NO. 35

VICTORY CANNING

JUNIOR 4-H CLUBS

Victory Canning for Junior 4-H Clubs

By Ruby Scholz

Extension Economist in Food Conservation and Marketing

Food preservation is important at all times in order that families can be assured of good healthful food throughout the year. Safe food preservation methods are especially necessary. The method recommended here is simple, the equipment is inexpensive, so no food need be wasted.

Foods successfully canned in the hot-water canner include only products that can be safely canned at boiling temperature, 212°F. This list includes only fruits, freshly gathered; tomatoes; young, tender string beans; and a pre-cooked soup mixture containing a large proportion of tomatoes.

EQUIPMENT AND METHOD

The Hot-Water Canner: The simplest hot-water canner outfit is one to be placed on the kitchen stove. This outfit may be made from any vessel that has a tight cover and is large enough to hold a convenient number of jars of food and to permit covering them with one inch of water. It should be fitted with a rack to hold the jars. This rack may be made of coarse mesh screen. Have the water in the canner somewhat hotter than the contents of the filled jars.

Care of Jars: Jars should be washed thoroughly, then inverted in a pan holding 1 or 2 inches of water. Boil 8 to 10 minutes. Let the jars remain in this water until they are filled.

STEPS NECESSARY FOR GOOD RESULTS

The canned food will be no better than the food that goes into the can. For this reason, use only clean, fresh, sound products.

1. Prepare the jars.
2. Precook or blanch the food to be canned.
3. Pack quickly into hot, sterilized containers.
4. Use enough liquid when packing to prevent too dense a pack and to prevent air bubbles.
5. Allow one-half inch of head space for all products that are canned in the hot-water canner.
6. Wipe the rim, adjust the rubber ring and top, and partially seal. Seal other types of tops according to directions.
7. Place the jar in the canner. In order to keep glass jars from breaking, pack hot sterilized jars quickly with hot products, then lower gently into the hot-water bath.
8. Count time in the water bath as soon as the water begins to boil vigorously.
9. Keep the water boiling constantly during the processing period.
10. When the processing time is up, remove the jars from the water, one at a time and seal tightly at once, except the automatic seal top jars, which should not be tightened again.
11. Cool all jars in air, out of drafts.
12. Never invert jars to cool.
13. Should the jar have a faulty seal, replace the rubber ring or top if necessary, and process the food a second time for 5 minutes.
14. Never use canning powders as they may be harmful.

KINDS OF TOPS AND HOW TO SEAL THEM

1. A one-piece cap lined with porcelain, equipped with a rubber ring between cap and shoulder of jar, this is called a shoulder rubber.
2. A glass cap with a rubber ring that fits between the glass cap and the jar top, both of which are held in place with a metal screw band. This ring is called a top rubber.
3. A metal disk with a flowed-on composition, the disk is held on the jar by a metal screw band.

4. Another type has an all-glass top. This uses a rubber ring and the top is held in place with a wire clamp.

Types 1, 2, and 4 are partially sealed before placing in the hot-water bath. After the processing period, they are completely sealed. Type 3 is completely sealed before placing in the hot water bath. After the processing period, it is not sealed again.

Remove the screw bands from Type 3 tops one to three days after canning. Dry these thoroughly to prevent them from rusting during storage.

THE MEANING OF TERMS USED

Sterilizing: Boiling to destroy bacteria.

Precooking: Boiling or steaming to shrink the product and improve the flavor and texture.

Blanching: Plunging fruit or vegetables into boiling water or steaming for a minute to shrink them before packing the jars.

Processing: Cooking fruits or vegetables in the jar.

SIRUPS

To make the sirups recommended, boil sugar and water together in proportions given below:

Sirup	Sugar	Water
Thin	½ cup	1 quart
Medium	1 cup	1 quart
Moderately Heavy	1¾ cups	1 quart

Quantity of Sirup:

Each quart of fruit will require 1½ to 2 cups sirup.

CANNING YIELDS

Fruit	Amount required for 1 quart		1 bushel will yield
	Pounds	Units	
Apples	2½	7 to 8 apples	20 quarts
Peaches	2 -2½	8 to 10 peaches	20 quarts
Pears	2 -2½	5 to 6 pears	25 quarts
Tomatoes	2½-3½	8 to 10 tomatoes	18 quarts
Berries	1¼-1½	5 cups	30 quarts
Beans, snap	1¾		14 quarts

APPLES

Late fall and winter varieties are best for canning. Peel, cut and drop into a brine made of 1 tablespoon salt and 1 quart water. Drain. Drop apples into boiling thin sirup. Cook 5 minutes. Fill jars, cover with boiling sirup. Partly seal. Process quart jars 15 minutes. Remove from hot-water canner and seal completely.

PEACHES

Peaches should be selected when they are fully ripe and of a uniform size and color. Peaches may be peeled by first plunging into boiling water and then into cold. After peeling, cut into halves and remove the pit. Drop peaches into medium sirup which is boiling, allow them to cook for 1 minute, or until tender but not soft. Pack in jars in overlapping layers with the pit side down and the stem end towards the center of the jar. Cover with hot sirup, partly seal. Process the quart jars 25 minutes. Remove jars from the canner and seal.

PEARS

Select ripe, sound, medium-sized fruit, peel and cut in halves or quarters. Remove all hard portions around the seed and dip in brine similar to that

used for apples. Plunge halves into boiling medium sirup and allow them to cook until they can be pierced with a straw. Pack into quart jars. Cover with hot sirup, partly seal. Process 25 minutes. Remove jars from the canner and seal.

Dewberries, Blackberries, Raspberries

Choose ripe, but firm berries. Place in a thin muslin sack and plunge into boiling water one minute. Fill jars quite full. Fill the spaces and cover the berries with a thin sirup. Partly seal. Process quart jars 13 minutes. Lift jars from the canner and seal tightly.

TOMATOES

Choose ripe tomatoes for canning. Blanch for one minute. Peel quickly. Be careful to remove with a sharp knife the hard part of the tomato at the stem. Pack as many as possible into the jars. Fill jars to within ¼ inch of the top, press gently and shake down fruit to fill crevices. Add one level teaspoon of sugar and a level teaspoon of salt to each quart jar. Use no water with tomatoes. Seal partly. Process 40 minutes. Remove from the canner. Seal at once.

SOUP MIXTURE

Corn, butterbeans, and okra when combined with a large proportion of tomatoes, can be canned safely in a hot-water canner. The acid in the tomatoes helps to destroy the bacteria.

5 cups tomatoes
2 cups corn
2 tablespoons sugar

2 cups okra or lima beans
or
1 cup okra and 1 cup lima beans
2 tablespoons salt

Scald and peel tomatoes, cutting out green and hard spots. Chop and measure. Cut young tender corn from cob. Slice okra in rings one-half inch thick. Place all in open kettle (agate) and boil until thick. Pour into jars, partially seal and process 1½ hours. Remove from the canner and seal. Use an asbestos mat under the kettle to prevent scorching.

String Beans

Select young, tender beans which have few strings. Wash, string, and cut into uniform pieces. Cover with boiling water and simmer for 5 minutes. Pack hot into containers. Cover with the hot water in which they were cooked and add 1 teaspoon salt for each quart. Partially seal. Process for one hour and 30 minutes in a hot-water canner.

If the beans are older and small beans have formed, process 3 hours. Remove from canner. Seal at once. Do not can mature beans. Do not use canning powders.

REQUIREMENTS

Junior 4-H Club members are required to can 8 quarts of fruits and vegetables selected from the following: apples, peaches, pears, tomatoes, berries, soup mixture, and young tender green beans.

Required Products	Fruits and Berries	Tomatoes	Soup Mixture	String Beans
Total No. of Quarts Canned				

North Carolina State College of Agriculture and Engineering of the University of North Carolina and U. S. Department of Agriculture, Co-operating. N. C. Agricultural Extension Service, I. O. Schaub, Director, State College Station, Raleigh. Distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914.

MARCH, 1943

4-H CLUB SERIES NO. 35

VICTORY CANNING

JUNIOR 4-H CLUBS

Victory Canning for Junior 4-H Clubs

By Ruby Scholz

Extension Economist in Food Conservation and Marketing

Food preservation is important at all times in order that families can be assured of good healthful food throughout the year. Safe food preservation methods are especially necessary. The method recommended here is simple, the equipment is inexpensive, so no food need be wasted.

Foods successfully canned in the hot-water canner include only products that can be safely canned at boiling temperature, 212°F. This list includes only fruits, freshly gathered; tomatoes; young, tender string beans; and a pre-cooked soup mixture containing a large proportion of tomatoes.

EQUIPMENT AND METHOD

The Hot-Water Canner: The simplest hot-water canner outfit is one to be placed on the kitchen stove. This outfit may be made from any vessel that has a tight cover and is large enough to hold a convenient number of jars of food and to permit covering them with one inch of water. It should be fitted with a rack to hold the jars. This rack may be made of coarse mesh screen. Have the water in the canner somewhat hotter than the contents of the filled jars.

Care of Jars: Jars should be washed thoroughly, then inverted in a pan holding 1 or 2 inches of water. Boil 8 to 10 minutes. Let the jars remain in this water until they are filled.

STEPS NECESSARY FOR GOOD RESULTS

The canned food will be no better than the food that goes into the can. For this reason, use only clean, fresh, sound products.

1. Prepare the jars.
2. Precook or blanch the food to be canned.
3. Pack quickly into hot, sterilized containers.
4. Use enough liquid when packing to prevent too dense a pack and to prevent air bubbles.
5. Allow one-half inch of head space for all products that are canned in the hot-water canner.
6. Wipe the rim, adjust the rubber ring and top, and partially seal. Seal other types of tops according to directions.
7. Place the jar in the canner. In order to keep glass jars from breaking, pack hot sterilized jars quickly with hot products, then lower gently into the hot-water bath.
8. Count time in the water bath as soon as the water begins to boil vigorously.
9. Keep the water boiling constantly during the processing period.
10. When the processing time is up, remove the jars from the water, one at a time and seal tightly at once, except the automatic seal top jars, which should not be tightened again.
11. Cool all jars in air, out of drafts.
12. Never invert jars to cool.
13. Should the jar have a faulty seal, replace the rubber ring or top if necessary, and process the food a second time for 5 minutes.
14. Never use canning powders as they may be harmful.

KINDS OF TOPS AND HOW TO SEAL THEM

1. A one-piece cap lined with porcelain, equipped with a rubber ring between cap and shoulder of jar, this is called a shoulder rubber.
2. A glass cap with a rubber ring that fits between the glass cap and the jar top, both of which are held in place with a metal screw band. This ring is called a top rubber.
3. A metal disk with a flowed-on composition, the disk is held on the jar by a metal screw band.

4. Another type has an all-glass top. This uses a rubber ring and the top is held in place with a wire clamp.

Types 1, 2, and 4 are partially sealed before placing in the hot-water bath. After the processing period, they are completely sealed. Type 3 is completely sealed before placing in the hot water bath. After the processing period, it is not sealed again.

Remove the screw bands from Type 3 tops one to three days after canning. Dry these thoroughly to prevent them from rusting during storage.

THE MEANING OF TERMS USED

Sterilizing: Boiling to destroy bacteria.

Precooking: Boiling or steaming to shrink the product and improve the flavor and texture.

Blanching: Plunging fruit or vegetables into boiling water or steaming for a minute to shrink them before packing the jars.

Processing: Cooking fruits or vegetables in the jar.

SIRUPS

To make the sirups recommended, boil sugar and water together in proportions given below:

Sirup	Sugar	Water
Thin	½ cup	1 quart
Medium	1 cup	1 quart
Moderately Heavy	1¾ cups	1 quart

Quantity of Sirup:

Each quart of fruit will require 1½ to 2 cups sirup.

CANNING YIELDS

Fruit	Amount required for 1 quart		1 bushel will yield
	Pounds	Units	
Apples	2½	7 to 8 apples	20 quarts
Peaches	2 -2½	8 to 10 peaches	20 quarts
Pears	2 -2½	5 to 6 pears	25 quarts
Tomatoes	2½-3½	8 to 10 tomatoes	18 quarts
Berries	1¼-1½	5 cups	30 quarts
Beans, snap	1¾		14 quarts

APPLES

Late fall and winter varieties are best for canning. Peel, cut and drop into a brine made of 1 tablespoon salt and 1 quart water. Drain. Drop apples into boiling thin sirup. Cook 5 minutes. Fill jars, cover with boiling sirup. Partly seal. Process quart jars 15 minutes. Remove from hot-water canner and seal completely.

PEACHES

Peaches should be selected when they are fully ripe and of a uniform size and color. Peaches may be peeled by first plunging into boiling water and then into cold. After peeling, cut into halves and remove the pit. Drop peaches into medium sirup which is boiling, allow them to cook for 1 minute, or until tender but not soft. Pack in jars in overlapping layers with the pit side down and the stem end towards the center of the jar. Cover with hot sirup, partly seal. Process the quart jars 25 minutes. Remove jars from the canner and seal.

PEARS

Select ripe, sound, medium-sized fruit, peel and cut in halves or quarters. Remove all hard portions around the seed and dip in brine similar to that

used for apples. Plunge halves into boiling medium sirup and allow them to cook until they can be pierced with a straw. Pack into quart jars. Cover with hot sirup, partly seal. Process 25 minutes. Remove jars from the canner and seal.

Dewberries, Blackberries, Raspberries

Choose ripe, but firm berries. Place in a thin muslin sack and plunge into boiling water one minute. Fill jars quite full. Fill the spaces and cover the berries with a thin sirup. Partly seal. Process quart jars 13 minutes. Lift jars from the canner and seal tightly.

TOMATOES

Choose ripe tomatoes for canning. Blanch for one minute. Peel quickly. Be careful to remove with a sharp knife the hard part of the tomato at the stem. Pack as many as possible into the jars. Fill jars to within ¼ inch of the top, press gently and shake down fruit to fill crevices. Add one level teaspoon of sugar and a level teaspoon of salt to each quart jar. Use no water with tomatoes. Seal partly. Process 40 minutes. Remove from the canner. Seal at once.

SOUP MIXTURE

Corn, butterbeans, and okra when combined with a large proportion of tomatoes, can be canned safely in a hot-water canner. The acid in the tomatoes helps to destroy the bacteria.

5 cups tomatoes
2 cups corn
2 tablespoons sugar

2 cups okra or lima beans
or
1 cup okra and 1 cup lima beans
2 tablespoons salt

Scald and peel tomatoes, cutting out green and hard spots. Chop and measure. Cut young tender corn from cob. Slice okra in rings one-half inch thick. Place all in open kettle (agate) and boil until thick. Pour into jars, partially seal and process 1½ hours. Remove from the canner and seal. Use an asbestos mat under the kettle to prevent scorching.

String Beans

Select young, tender beans which have few strings. Wash, string, and cut into uniform pieces. Cover with boiling water and simmer for 5 minutes. Pack hot into containers. Cover with the hot water in which they were cooked and add 1 teaspoon salt for each quart. Partially seal. Process for one hour and 30 minutes in a hot-water canner.

If the beans are older and small beans have formed, process 3 hours. Remove from canner. Seal at once. Do not can mature beans. Do not use canning powders.

REQUIREMENTS

Junior 4-H Club members are required to can 8 quarts of fruits and vegetables selected from the following: apples, peaches, pears, tomatoes, berries, soup mixture, and young tender green beans.

Required Products	Fruits and Berries	Tomatoes	Soup Mixture	String Beans
Total No. of Quarts Canned				

North Carolina State College of Agriculture and Engineering of the University of North Carolina and U. S. Department of Agriculture, Co-operating. N. C. Agricultural Extension Service, I. O. Schaub, Director, State College Station, Raleigh. Distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914.

FEBRUARY, 1942 (REPRINT) EXTENSION CIRCULAR No. 223

CANNING FRUITS AND VEGETABLES

NORTH CAROLINA STATE COLLEGE OF AGRICULTURE AND ENGINEERING
OF THE
UNIVERSITY OF NORTH CAROLINA
AND
U. S. DEPARTMENT OF AGRICULTURE, CO-OPERATING
N. C. AGRICULTURAL EXTENSION SERVICE
I. O. SCHAUB, DIRECTOR
STATE COLLEGE STATION
RALEIGH

DISTRIBUTED IN FURTHERANCE OF THE ACTS OF CONGRESS OF MAY 8 AND JUNE 30, 1914

CANNING BUDGET

(6 Non-Productive Months)

The amount of canned foods needed for one person is given below. Multiply t amount by the number in your family. Write this figure in the third column and yo will have the Canning Budget for your family. If all varieties listed below are not available, can more of those that are. Be sure to have at least 32 quarts of vegetables and 24 quarts of fruits for each member of the family.

For **Western North Carolina** where the growing season is limited to three or four months, **increase** the amount conserved by **one-half** or more.

Name of Product	No. Qts. for One Person	No. Qts. for Family of	Remarks
Vegetables			
Asparagus	1		
Beans—String	4		
Beans—Lima	1		
Beets	2		
Carrots	1		
Corn	1		
Greens	1		
Okra	1		
Peas—Garden	2		
Soup Mixture	6		
Tomatoes	12		
Total Vegetables	32		
Fruits			
Apples	3		
Blackberries	3		
Dewberries	2		
Huckleberries	2		
Cherries	1		
Grapes	2		
Peaches	4		
Pears	4		
Plums	2		
Fruit Juices	1		
Total Fruits	24		
Additional Products			
Meats—Canned	10		
Kraut	1		
Pickle	1		
Relish	1		
Preserves	2		
Jam	2		
Jelly	1		
Dried Vegetables	10 lbs.		
Dried Fruits	8 lbs.		

CANNING FRUITS AND VEGETABLES

CORNELIA C. MORRIS

Extension Economist in Food Conservation and Marketing

Canning is a method of using heat and air-tight containers to preserve food as nearly as possible in the condition in which it would be served when freshly cooked. It is a desirable and economical method of preserving many foods, by means of which their use is distributed over seasons and in places where they are not available fresh. Canned foods thus add variety and make possible a better-balanced diet at all seasons of the year.

ACID AND NONACID FOODS

Acid foods such as fruits, tomatoes, ripe pimientos and rhubarb are processed at the boiling temperature of water (212 degrees F.) in a hot-water canner.

Nonacid foods include all other vegetables such as peas, corn, beans, asparagus and squash. Nonacid foods must be processed in a steam-pressure canner at temperatures of 240 degrees to 250 degrees F. obtained by applying 10 to 15 pounds pressure.

TYPES OF CANNERS

The Hot-Water Canner.—There are many excellent types of hot-water canners. They should have closely fitting tops, as steam plays an important part in the sterilization of cans and jars.

The simplest hot-water outfit is one to be placed on the kitchen stove. Another has a fire-box attached and is used out-of-doors. These outfits also include trays, tongs for handling hot jars, and a false bottom.

The type of canner should be chosen with reference to the kind and amount of canning to be done. The small hot-water canner is the least expensive of the commercial outfits for home canning. This type of canner is preferable for processing fruits and tomatoes as they are canned safely at boiling temperature, and the texture, flavor, and color of the products processed at this temperature are superior to those which have been canned at higher temperatures.

Steam-Pressure Canner.—The steam-pressure canner is constructed of strong material and is provided with a tightly-fitting lid which, when clamped in place, makes it possible to hold steam under pressure and obtain a correspondingly high temperature. It has a steam gauge attached to the lid. This attachment registers the temperature and the corresponding number of pounds pressure.

The steam-pressure canner only is recommended for nonacid vegetables. Other methods are considered unsafe.

Oven.—Oven canning is not recommended.

DIRECTIONS FOR USING PRESSURE CANNER

Pour boiling water into the canner until the level is just below the rack that holds the jars. Be sure that there is enough to prevent boiling dry during processing.

Keep the safety valve in good working condition. If it is a valve of the ball and socket type, wash it each day after using. A safety valve that fails to operate properly may cause an accident.

Use a toothpick to keep the opening of the pressure gauge clean. Do not immerse the pressure gauge in water.

When the canner has been filled with jars or cans, adjust the cover and fasten securely. In case the cover is fastened by several clamps, fasten moderately tight those opposite each other, one pair at a time; then go back over the whole set and tighten each pair.

See that no steam escapes anywhere except at the pet-cock.

Allow the pet-cock to remain open until steam escapes from it in a steady stream for at least 5 to 7 minutes, indicating that no air remains inside, then close the pet-cock.

Allow the pressure to rise until the gauge registers the pressure that indicates the desired temperature.

Count time from the moment the desired temperature and pressure are reached.

Maintain a uniform pressure during the processing period by regulating carefully the source of heat. Fluctuations in pressure, as from 10 pounds to 15 pounds and down again, are to be avoided in any case, and when canning in glass may result in loss of liquid. A sudden drop in pressure through cooling or release of steam may also cause this. It is especially important to avoid having the pressure go so high that the safety valve releases the steam suddenly, nor should the steam be allowed to escape suddenly by opening the pet-cock.

At the end of the processing period remove the canner from the fire and proceed according to the following directions adapted to jars or cans.

When canning in *glass jars*, allow the canner to cool until the steam gauge registers zero before opening the pet-cock, and even then open cautiously. This is to prevent too sudden a drop in pressure, which would cause the liquid to blow out of the jars. Remove jars from canner, seal tightly, and allow them to cool as quickly as possible to room temperature. Do not stack them while they are still hot.

When canning in *tin*, open the pet-cock wide at once and allow the steam to escape rapidly. Remove the cans from the canner and plunge them into cold running water if possible, or, if this is not available, change the water as soon as it becomes warm. The more rapidly the cans are cooled the less danger there is of overcooking the product. Watch carefully for air bubbles that indicate imperfect sealing.

CHECKING UP RESULTS

Mark all canned products so that those in each batch can be distinguished. Examine the glass jars for signs of leakage. Hold canned products at room temperature for a week or ten days, where they can be examined at least

once a day to be sure that they are keeping. If the contents of any jars or cans show signs of spoilage, examine all of that lot carefully. After this observation period, store the canned goods in a cool place. A short storage at rather high temperatures serves to bring out quickly defects that might not be noticed if the products were stored at a lower temperature. Results can thus be checked and methods improved.

EXAMINATION OF CANNED FOODS BEFORE USE

All canned foods should be inspected before being prepared for the table. If there is any evidence of spoilage, the food should be discarded and nonacid vegetables and meats should be burned.

Inspect the can or jar before opening. In tin cans both ends should be flat and curved slightly inward. Neither end should bulge or snap back when pressed. All seams should be tight and clean, with no traces of leaks. In glass jars there should be no bulging of the rubber and no signs of leakage.

When the container is opened there should not be any sudden outburst of air or spurting of liquid. The odor should be characteristic of the product. Any different odor probably indicates spoilage. The inside of tin cans should be smooth and clean or well lacquered and not markedly corroded. Food may be left in a tin can after it is opened, provided it is covered and kept cold just as any other cooked food. Acid foods and tomatoes may dissolve minute quantities of iron from the can and acquire a slightly metallic flavor, but this is harmless. The purple that develops in red fruits and sometimes in peaches and pears canned in tin, is merely a change in the color pigments and is also harmless.

Never taste to discover spoilage. When spoilage has occurred in nonacid foods there is always a possibility that even a taste may cause serious illness. For this reason it is good practice to boil all canned nonacid vegetables before using them.

SOME THINGS TO BE OBSERVED IN CANNING

1. If a hot-water canner is used, be sure the canner is partly filled with water before fire is built.
2. Keep the water boiling and do not allow fire to die down while cans are in the canner.
3. Keep cover on canner during the processing time.
4. If possible, use two canners, one for blanching fruit and the other for canning. A large pot set over a fire will serve for blanching.
5. The quality or grade of the pack depends on the number of whole fruits or uniform pieces of fruit in the can, the color of the fruit, the weight, and the flavor.
6. The flavor is often injured by letting peeled fruit stand too long before cooking.
7. Let "Straight from Vine to Can" be the motto.
8. Mark every tin can as it is filled with the name of its contents. A pencil may be used, as the writing will not boil off. This prevents confusion when labeling.
9. Artificial preservatives in the form of "Acids," "Preserving Powders," and "Formulas" of various kinds are not recommended.

LIST OF ARTICLES REQUIRED FOR A CANNING DEMONSTRATION

Canner
Hand sealer
Tin cans
Cheese cloth
Three tables
Salt and sugar
Three teaspoons
Three tablespoons
Glass jar with tops
Rubber rings
Dish towels
Pencil
Watch or clock
Household scales
Three paring knives
Four granite-ware pans
Bag for blanching
Soap
Hand towels

CANNING EQUIPMENT

Tin Cans.—Plain tin cans are used for most vegetables, fruits and meats.

Enameled tin cans should be used for highly colored products such as beets, berries and cherries to prevent bleaching of the product and pinholing of the can. These cans are the R enamel.

Another type of enameled can is used for sea foods and corn to prevent discoloration. This type is called C enamel.

The No. 3 can is popular for tomatoes and peaches, and holds a quart. No. 2 is used generally for peas, corn, soup mixture, etc. No. 1 is the size used for pimientos.

Glass Jars.—There are a number of different types of jars on the market. Those most commonly used are the Mason screw top and the glass top with metal springs. Both of these are fitted with rubber rings.

Another type has a lacquered metal top with a sealing composition flowed on and does not require a rubber ring. The top is held in place by a metal band which is screwed on during processing.

Do not use metal tops with waxed paper inset for canning, as these are designed for honey, syrup and other products which do not require processing.

Rubber Rings.—Do not use rubber rings the second time as the first season's heating destroys the elasticity of the rubber. Test the rubber rings for elasticity by stretching and folding.

STEPS TO BE TAKEN WHEN CANNING

1. **Washing Cans.**—Wash all cans thoroughly, and invert on clean surface until used.
2. **Sterilized Jars.**—To sterilize glass jars invert them in the canner in tepid water. Do not fill the canner with more than three inches of water. Place cover on the canner. Bring the water to a boil and steam jars 8 minutes. Pour boiling water over rubber rings before placing them on the jars.
3. **Sorting and Grading Fruit.**—Select only fresh, sound, thoroughly ripe fruit and vegetables, and grade as to size and color. Wash thoroughly to remove all traces of soil.
4. **Blanching.**—Blanching is used to loosen the skins of such fruits and vegetables as apricots, peaches and tomatoes. Berries are blanched for a moment to shrink them and prevent them from rising to the top

of the container. To blanch, place vegetables or fruit in a wire basket or in a thin muslin sack and plunge into boiling water for one minute.

5. **Precooking.**—Precooking by boiling or steaming is recommended for most vegetables and some fruits to shrink them and to improve flavor and texture. Precooking helps to remove air from the tissues and hastens the processing as the foods are already hot when placed in the canner.

6. **Packing.**—After foods are precooked or blanched pack them quickly into the containers so that they will remain hot. Use enough liquid to prevent too dense a pack and work out air bubbles with a knife blade. Fill with water, brine, or syrup, as the packing proceeds. Wipe the rim of the jar, adjust rubber ring and top and place jar in the canner holding tepid water. Allow the water to cover the jars in the hot-water canner.

7. **Head Space.**—Head space is left in containers to allow for expansion of the food during processing and to prevent tin cans from bulging. Although head space varies for different products, approximately one-third of an inch is allowed for No. 2 cans and one-half of an inch for No. 3 cans. In glass jars allow one-half inch of head space for all products except those containing starch such as corn, peas and lima beans. These should be packed loosely to within one inch of the top of the jar.

8. **Exhausting.**—Products in tin should be exhausted in boiling water from three to five minutes before sealing to insure a good vacuum.

   If directions call for precooking of products and they are packed while boiling hot, exhausting is not necessary.

   Food in glass jars is exhausted during the processing as the jars are not fully sealed.

9. **Processing.**—After the can has been exhausted and sealed, it should be processed immediately. Processing is sterilizing by cooking continuously for a given length of time.

   When the water begins to boil in hot-water canner or the desired pressure is reached in the pressure canner, count time. Consult the time tables. Do not guess at time.

   Leave jars lightly sealed during the whole processing, and when the time is up remove one at a time from the canner, seal tightly, and set aside. See directions for removing jars from pressure canner.

   Process foods packed in tin and glass at the temperature and for the time indicated in the time tables.

   Seal glass jars tightly as they are removed from the canner.

10. **Cooling.**—Cool glass jars in air, but not in a draft. Do not invert jars, while cooling. Do not tighten screw caps again after the jars have cooled. Cool tin cans in cold water.

11. **Labeling.**—Clean jars and label with name of product and date. Place label underneath the jar. Mark tin cans with pencil or canner's ink before processing. Do not paste labels on until cans are ready to be sold.

12. **Storage.**—Store canned foods in a cool, dry place, and protect glass jars from the light so that the food will not fade in color. Canned foods if properly processed will keep almost indefinitely under the right conditions. However, the quality is generally better if they are used within the first year after canning.

The following standards are sent out by the United States Department of Agriculture:

STANDARDS FOR 4-H BRAND CANNED VEGETABLES

Tomatoes.—Cans to contain not less than 2 pounds 1 ounce tomatoes in No. 3 and not less than 1 pound 4 ounces tomatoes in No. 2. To be filled with sound, ripe fruit, carefully peeled and cored; tomatoes to be whole or in large pieces, firm, uniformly red, and of good flavor.

String Beans.—Net weight in No. 3 can before liquor is added at least 1 pound 8 ounces, brine 8 to 10 ounces. Net weight No. 2, 13 ounces beans and about 8 ounces liquor. Beans to be tender, green, uniform in size, well strung, and of good flavor. The net weight which appears on label should be, for No. 3, 2 pounds, for No. 2, 1 pound 5 ounces.

Peas.—No. 2 cans to have at least 13½ ounces net weight of peas and about 8½ ounces liquor; peas to be fairly uniform in size, tender, whole, and of good flavor; liquor clear. Net weight appearing on label should be for No. 2 cans 1 pound and 8 ounces.

Baby Beets.—To be packed in No. 2 lacquered tins, about 30 baby beets to each can, maximum size 1½ inches in diameter and average size 1 inch in diameter. No. 2 can to have at least 16 ounces whole beets and 4 ounces liquid. Net weight which appears on label should be for No. 2 can 1 pound 4 ounces.

Okra.—Net weight of contents in No. 3 can should appear on label, 2 pounds. Only young, tender okra should be packed, and it is best to remove the cap without cutting into the seed pod, and pack whole. Brine is added as explained in the table.

Peppers.—No. 2 cans to contain between 8 and 10 whole peppers. Flat No. 1 cans to contain 4 or 5 whole peppers, and net weight of contents appearing on the label should be for No. 2 cans not less than 1 pound, or flat No. 1 can not less than 8 ounces.

Soup Mixture.—No. 3 cans contain 34 ounces. Net contents.

STANDARD FOR 4-H BRAND CANNED FRUITS

Figs.—Net weight contents No. 2 enamel-lined can of figs should appear on label not less than 1 pound 6 ounces. Figs should remain whole, and a No. 2 can contain about 30 whole figs.

Peaches.—No. 3 can to have at least 1 pound 5 ounces solids and 11 ounces liquid; to contain between 10 and 12 halves of peaches, and have net weight of contents appearing on label not less than 2 pounds.

Pears.—Net weight in No. 3 can should be not less than 2 pounds, having 11 ounces liquid, 1 pound 5 ounces solids, and between 12 and 14 halves.

Berries.—No. 3 can, blackberries or raspberries, net weight 2 pounds; No. 2 cans, net weight 1 pound 6 ounces, whole berries weighing about one-half of total in each case. Berries to be large, whole, of good color and flavor. Enameled cans should be used for berries.

Almost all No. 3 cans, no matter what they contain, weigh 38 ounces gross.

To make the syrups recommended, boil sugar and water together in proportions given below:

Syrup No. 1, use 14 ounces sugar to 1 gallon water.
Syrup No. 2, use 1 pound 14 ounces sugar to 1 gallon water.
Syrup No. 3, use 3 pounds 9 ounces sugar to 1 gallon water.
Syrup No. 4, use 5 pounds 8 ounces sugar to 1 gallon water.
Syrup No. 5, use 6 pounds 13 ounces sugar to 1 gallon water.
One pint sugar is one pound.

Number of cans per bushel yielded by the following vegetables:

1 bushel of tomatoes yields 24 No. 2 cans.
1 bushel of tomatoes yields 18 No. 3 cans.
1 bushel of beans yields 20 No. 2 cans.
1 bushel of beans yields 14 No. 3 cans.
1 bushel of peas in hull yields 25 No. 2 cans.
100 ears of corn yields 30 No. 2 cans.

SCORE FOR JUDGING THE QUALITY OF CANNED FRUITS AND VEGETABLES

		Score of 100
I.	Appearance	25
	(a) Color.	
	(b) Clearness.	
II.	Texture	10
III.	Flavor	20
IV.	Uniformity	15
	(a) Ripeness.	
	(b) Appropriate size.	
V.	Pack (arrangement and weight)	15
VI.	Container	15
	(a) Appropriate package.	
	(b) Label.	
	(c) Neatness.	

CANNING FRUITS AND BERRIES IN GLASS AND TIN

Read directions for sealing glass jars and exhausting tin cans before proceeding. *Process all filled containers* immediately, as directed in time tables.

Apples.—Late fall and winter apples which are slightly acid are best for canning. Peel, cut, and drop into a brine made of 2 ounces of salt and

1 gallon of water. Drain. Cook in No. 2 syrup 5 minutes. Process immediately.

Dewberries, Blackberries, Raspberries, and Huckleberries.—Gather berries when ripe but firm. Place in a muslin sack and plunge into boiling water one minute. This will slightly soften the berries and allow the packing of almost twice as many in a can or jar. It will also prevent the condition where berries rise to the top of the jar.

Pack tin cans to within one-quarter inch of the top with berries. Fill glass jars quite full. Fill the spaces and cover the berries with a syrup made of 1 gallon of water and 1 pint of sugar. (Use Syrup No. 2, or No. 3 if sweeter berries are desired.) Process immediately.

Strawberries.—Wash berries thoroughly, but quickly. Do not allow them to stand in the water. Remove caps and measure. For every quart of berries used, add one cup of sugar. Do not add any water. Put berries and sugar into a shallow enamelware preserving kettle and bring slowly to the boiling point. Reduce the heat and let the berries simmer gently for ten minutes. Remove from stove. Cover and let stand overnight to absorb the syrup. The following morning reheat to boiling point and pour immediately into hot sterilized jars. Add enough hot syrup to cover the berries. Seal and process for five minutes at boiling point. This recipe preserves the color of the berries and they will not rise to the top of the jar.

Canned Cherries.—Cherries are usually canned without the seed. Large wax cherries are often canned whole.

Prick whole cherries to prevent shrinkage and save juice to use in making syrup. Pack cherries in hot containers and cover with hot syrup No. 3. Use heavier syrup for acid cherries. Process immediately.

Figs.—Peel 6 quarts of figs. Bring 2 quarts of No. 3 syrup to boiling and add the figs. Cook until saturated with sugar, but not until fiber breaks down.

Place figs carefully in jars and fill with the syrup. Process immediately.

Peaches.—To prepare peaches for canning, immerse them in boiling water for one minute or until the skins will slip easily, plunge at once into cold water for a few seconds, remove the skins, cut the peaches into halves, and discard the pits.

Have ready a boiling syrup made of 1 pound and 14 ounces of sugar and 1 gallon of water (Syrup No. 2). For extra fine peaches use Syrup No. 4. Drop peaches into boiling syrup one-fourth at a time, allowing them to cook for 1 minute, or until tender but not soft.

Place in jars in overlapping layers with the pit side down and the stem end toward the center of the jar. Add syrup bit by bit when packing and paddle to remove all bubbles. Process immediately.

Firm clingstone peaches may be peeled by placing them in a muslin bag and plunging into a boiling solution made from 4 tablespoonfuls of concentrated lye to 2 gallons of water. Allow the fruit to remain from 20 to 30 seconds and plunge immediately into plain boiling water for the same

length of time. Then plunge into a large vessel of cold water, where the peaches are emptied from the bag and the skin is removed. If peaches remain too long in the lye, discloration results.

Lye-peeled peaches should be canned immediately. Use an agateware or an iron kettle in preparing the lye solution. Do not use aluminum.

Pears.—The Bartlett pear is best for canning. Select ripe, sound, medium-sized fruit cut in halves, or if large, in quarters. Remove all the hard portions around the seed and submerge in brine similar to that used for apples to prevent discoloration. Remove from brine.

Plunge the halves or quarters into boiling syrup and allow them to cook until they can be pierced with a straw, remove and pack closely in a No. 3 can or quart jar. Cover with a boiling syrup made of 3 pounds and 9 ounces of sugar and 1 gallon of water. (Syrup No. 3). Process immediately.

Keiffer pears are not recommended for canning, but a palatable product may be had if the fruit is allowed to ripen thoroughly and care is taken to precook until it is tender.

CANNING VEGETABLES IN GLASS AND TIN

Read directions for sealing glass jars and exhausting tin cans before proceeding. *Process all filled containers immediately,* as directed in time tables.

Asparagus.—Select fresh and tender stalks, sort according to size, and wash thoroughly. Tie in uniform bundles, stand upright with tough portion in boiling water, cover tightly, and boil for 4 to 5 minutes. Or cut in half-inch lengths, add enough water to cover, and boil for 2 minutes in an uncovered vessel. Pack boiling hot into containers, cover with the water in which boiled, and add 1 teaspoon of salt to each quart. Or pack raw in No. 2 tin cans, cover with boiling water, and exhaust for 4 to 5 minutes before sealing. Process immediately.

Beets.—When canning beets, use only young and tender ones, not over 1½ inches in diameter, preferably 1 inch.

Gather beets and allow at least 2 inches of stem and all of the root to remain. Wash, but do not peel; plunge into boiling water, and cook until three-fourths done.

Remove peeling, stem and root, grade as to size, and pack symmetrically, filling with hot water. Do not use cold water with beets.

If large beets are to be used, boil three-fourths done. Slice in quarter-inch slices, and proceed as with small beets. Process immediately.

String Beans.—To can string beans select those that are young and tender and which have few strings. The Green Pod Stringless is a good variety. If the beans are gathered when young and tender, and the strings removed, a good product results.

Wash thoroughly and cut into uniform pieces. Cover with boiling water and simmer for 5 minutes. Pack hot into containers. Cover with hot water and add 1 teaspoonful salt to each quart. Process immediately. Beans should be canned the day they are gathered.

Lima Beans.—Select young and tender lima or butter beans, grade them as to size, precook from 2 to 4 minutes, and pack can or jar to within

one inch of the top. Cover with brine (1 gallon of water and one-third cup of salt). Process immediately.

Canning Corn.—Sweet corn is canned in two different styles—whole grain and cream style. Whole grain corn is cut from the cob without scraping, while for cream style the corn is given a more shallow cut and the cobs are scraped. The whole grain product retains the appearance and flavor of fresh corn more nearly than the cream style because it can be given a lighter processing and therefore is not so much overcooked. When cream style corn, which is thick and viscous, is canned in glass jars, it sometimes becomes brownish in color due to caramelization of the sugar by the heavy processing required. Whole grain corn has less tendency to discolor when packed in plain tin cans, and for this reason either plain tin or C enamel cans may be used for it.

Whole Grain Corn.—Use only tender, freshly gathered sweet corn; shuck, silk, and clean carefully. Place in boiling water and leave 4 to 5 minutes at simmering temperatures to set the starch. Cut from the cob deeply enough to remove most of the kernels without objectionable hulls. Do not scrape the cobs. Add 1 teaspoon of salt, and 2 teaspoons of sugar to each quart of corn, and half as much boiling water as corn by weight. Heat to boiling and pack into containers at once. Fully seal tin cans or partially seal glass jars. Process immediately.

Cream Style Corn.—Gather the sweet corn when tender; shuck, silk, and clean carefully. Without precooking remove the corn from the cob by shallow cutting through the grain and scraping. Add 1 teaspoon of salt and 2 teaspoons of sugar to each quart, and half as much boiling water as corn by weight. Heat to boiling. Fill into containers at once. Fully seal tin cans or partially seal glass jars. Process immediately.

Field Peas.—Gather peas when young and tender, shell, plunge in boiling water and allow to precook for 10 minutes. Remove and pack while hot into cans. Add 1 teaspoonful of salt, and fill to within one inch of the top with hot water. Process immediately.

Garden Peas.—Peas should be freshly gathered, and it is essential that they be graded. Shaking peas through wire netting of different sizes will grade them nicely.

After grading, cover small peas with boiling water and precook for 4 minutes. Large or older peas must be precooked longer.

Pack peas in No. 2 can or pint jar, fill with brine, and add 1 teaspoonful of sugar. Process immediately.

Tomatoes.—Select ripe tomatoes for canning. Blanch for one minute. The skin then may be removed easily. Be careful to remove with sharp knife the hard part of tomato at stem. Pack into cans as many whole tomatoes as possible, cutting them only when they are too large to slip in. Fill can to within one-half inch of top, press gently and shake down fruit to fill crevices.

A level teaspoonful of sugar and a level teaspoonful of salt added to a No. 3 can or a quart jar of tomatoes will improve the flavor of the product.

Use no water with tomatoes. If the can is properly filled the juice will be sufficient.

When canning tomatoes in glass jars, fill jars quite full. Process immediately.

Tomato Juice.—To preserve the natural flavor and color in canned tomato juice, use knives of stainless steel and avoid utensils of copper, brass, and iron. Use fully ripe, firm tomatoes, of bright-red color. Wash well, remove cores, and cut into small pieces. The skins may or may not be removed. Handle the tomatoes in quantities of 1 to 2 gallons and avoid delay at any stage of the procedure. Precook the tomatoes at about 170 degrees to 180 degrees F., or if a thermometer is not available simmer until softened. Avoid boiling. Put the softened, hot tomatoes at once through a fine sieve, preferably a bowl- or cone-shaped sieve because it allows the least air to be incorporated in the pulp. If the tomato juice is for infant or invalid use, omit salt; otherwise add one-half to 1 teaspoon salt to each quart.

Reheat the juice at once after putting through the sieve. If using glass containers, heat the juice to boiling, pour into the sterilized containers, add salt. Process 5 minutes. If tin cans are used, heat the juice 180 degrees to 190 degrees F. (or to simmering if no thermometer is available), pour into cans, seal, and process 5 minutes. Do not leave head space in either glass or tin containers.

Turnip Salad and Mustard.—Use directions for spinach.

Okra.—Gather young pods, wash in cold water, cut off stem, but do not cut into seed pod. Can okra whole. Place in muslin sack and blanch for 3 minutes.

Pack into jars or cans and fill with brine (1 gallon water to one-third cup of salt). Process immediately.

Pimientos.—Select sound, uniform pimientos of medium size. To remove seeds, cut around the stem of each with a slender paring knife and remove the inside partitions. To peel, place the peppers in a hot oven from 6 to 10 minutes (until the skin blisters and cracks), being careful not to allow them to burn. Then remove the skin with a slender paring knife. Flatten and pack in horizontal layers, allowing four for the flat No. 1 can and eight for the No. 2 can.

No liquid is used. The processing extracts a thick liquor which almost covers the peppers.

When canning peppers in glas, use a 12-ounce or a pint jar. Process immediately.

Soup Mixture.—Five quarts tomatoes, 2 quarts corn, 2 quarts okra or lima beans, 2 tablespoonfuls sugar (level), 2 tablespoonfuls salt (level). Scald and peel tomatoes, cutting out green or hard spots. Chop and measure. Cut young and tender field or sugar corn from cob. Slice okra in rings one-half inch thick. Place all in open agate kettle and boil until thick.

Fill containers with hot soup mixture and process immediately.

Spinach.—Prepare the spinach by cutting off all dead leaves and roots. Wash thoroughly through several cold waters; drain well. Steam for 4 minutes. Pack in cans or jars, cover with liquor left from steaming. Add 1 teaspoonful salt. Process immediately.

Squash.—Can only young and tender squash. Cut in pieces and cook 10 minutes after boiling point is reached.

Pack into tin cans or jars to within one-half inch of the top. Add 1 teaspoonful of salt to each quart can and fill with hot water. Process immediately.

Pumpkin.—Pumpkin is canned in the same manner as squash.

Sweet Potatoes.—The Nancy Hall, Norton Yam, or other varieties of yellow potatoes are best for canning. Select potatoes of medium size as nearly uniform in shape as possible; place in the wire trays or sacks and boil with skins on until three-fourths done. Remove peeling while very hot, cut in slices three-quarters of an inch thick, pack in a No. 3 can to within one inch of top, using only 2 tablespoonfuls water in a can. This is known as a dry pack, and is the proper commercial pack. Potatoes should be packed rapidly after parboiling, as they turn dark upon standing. Process immediately.

Credit is given to the following publications for information used in this circular:

U. S. Department of Agriculture, Farmers' Bulletin No. 1762, *Home Canning of Fruits and Vegetables.*

North Carolina Agricultural Extension Service, Extension Circular No. 114, *Canning Fruits and Vegetables.*

TIME-TABLE FOR CANNING FRUITS AND CERTAIN VEGETABLES IN TIN AND GLASS IN THE HOT-WATER CANNER

...d Recipes Before Proceeding

Special Directions To Be Followed In The Mountain Section of North Carolina

When canning in a hot-water canner the temperature of water does not go beyond the boiling point (212 degrees F.) at sea level. The boiling point of water depends upon the atmospheric pressure which changes with altitude. Water boils at approximately two degrees lower for every 1,000 feet above sea level, therefore, it is necessary to cook products longer in high altitudes, as the lower temperature will not sterilize as readily as the sea level boiling point. As an example: In Madison and Avery Counties at an altitude of 3,000 feet above sea level, water will boil at 206 degrees F., which is six degrees lower than boiling point at sea level.

	Treatment Before Processing	Liquid	Number of Cans	Process	Glass Jar	Process	Type of Tin Can
APPLES	Precook 5 minutes in syrup	No. 2 syrup	3	8 minutes	Quart	15 minutes	Plain tin
BLACKBERRIES	Blanch 1 minute	No. 2 syrup	3	8 minutes	Quart	13 minutes	R. enamel
CHERRIES	Pack in jars or tin cans. Cover with syrup	No. 3 syrup	3	20 minutes	Quart	30 minutes	R. enamel
DEWBERRIES	Same as blackberries						
FIGS	Peel and cook in syrup until saturated	No. 3 syrup	2	25 minutes	Quart	30 minutes	Plain tin
HUCKLEBERRIES	Same as blackberries						
LOGANBERRIES	Same as blackberries						
PEACHES	Cook in syrup 1 minute	No. 4 syrup	3	20 minutes	Quart	25 minutes	Plain tin
PEARS	Cook in syrup until tender	No. 3 syrup	3	20 minutes	Quart	25 minutes	Plain tin
PLUMS	Prick, pack in jars or cans and cover with syrup	No. 3 syrup	3	15 minutes	Quart	20 minutes	R. enamel
PIMIENTOS	Heat in oven until blistered. Peel.	No water	1	15 minutes	Pint	30 minutes	R. enamel
RASPBERRIES	Same as blackberries						
SAUERKRAUT	Precook and pack hot	Brine	3	30 minutes	Quart	35 minutes	Plain tin
SOUP MIXTURE	Cook until thick. Pack hot		2	1 hour	Quart	1 hr. 30 min.	Plain tin
TOMATOES	Blanch 1 minute	Salt, sugar. No water	3	35 minutes	Quart	40 minutes	Plain tin

If tin cans are used, the sealing temperature for the products listed in this time table should be 125 degrees to 150 degrees F.

TIME-TABLE FOR PROCESSING NON-ACID VEGETABLES IN THE PRESSURE COOKER

At altitudes over 2,000 feet, add 1 pound pressure for every additional 2,000 feet.

Product	Treatment Before Processing	Liquor	Pint Glass Jars		Qt. Glass Jars		No. 2 Tin Cans		No. 3 Tin Cans		Type of Tin Can
			240 Deg. F. or 10 Pounds Pressure	250 Deg. F. or 15 Pounds Pressure	240 Deg. F. or 10 Pounds Pressure	250 Deg. F. or 15 Pounds Pressure	240 Deg. F. or 10 Pounds Pressure	250 Deg. F. or 15 Pounds Pressure	240 Deg. F. or 10 Pounds Pressure	250 Deg. F. or 15 Pounds Pressure	
			Mins.	Mins.	Mins.	Mins.	Mins.	Mins.	Mins.	Mins.	
ASPARAGUS	Precook 4 to 5 minutes	Brine	30		35		30				Plain tin
BABY BEETS	Cook until skins will slip off	Hot water	30		35		30		30		R. Enamel
BEANS, LIMA	Precook 2 to 4 minutes	Brine	50		55		40		50		Plain tin
BEANS, STRING	Precook 5 minutes	Brine	30		35		25		30		Plain tin
CORN, CREAM STYLE	Cut from cob, cover with hot water and boil 10 minutes	Water,salt, and sugar		75				70			C. Enamel
CORN, WHOLE GRAIN	Heat to boiling with half as much water as corn by weight	Water and salt	60		70		50		65		Plain tin C. Enamel
FIELD PEAS	Precook 10 minutes. Pack hot. Add 1 teaspoon salt. Cover with hot water		50		55		40		50		Plain tin
GARDEN PEAS	Precook 4 minutes	Water,salt, and sugar	45				40				Plain tin
OKRA	Blanch 3 minutes	Brine	35		40		25		30		Plain tin
PUMPKIN	See recipe for squash										R. Enamel
SQUASH	Cook until tender. Pack hot. Add 1 teaspoonful salt to each jar	Hot water		60		75		60		70	Plain tin
SOUP MIXTURE	Cook until thick. Pack hot		30		30		30		30		Plain tin
SPINACH TURNIP GREENS MUSTARD	Wash and steam in covered vessel until wilted. Pack hot. Cover with liquor from steaming. Add teaspoon salt			60		65		55		65	Plain tin
SWEET POTATOES	Boil until three-fourths done. Peel and pack hot	Two tbs. water		70		75		65		70	Plain tin C. Enamel

If tin cans are used, the sealing temperature for the products listed in this time table should be 180 degrees to 190 degrees F.

COOPERATIVE EXTENSION WORK
IN
AGRICULTURE AND HOME ECONOMICS
STATE OF NORTH CAROLINA

NORTH CAROLINA STATE COLLEGE OF AGRICULTURE AND ENGINEERING
NORTH CAROLINA COUNTIES AND UNITED STATES DEPARTMENT OF AGRICULTURE COOPERATING

EXTENSION SERVICE
HOME DEMONSTRATION WORK

Salisbury, N. C.
February 25, 1943

Miss Ruth Current
State Home Agent
State College Station
Raleigh, N. C.

Dear Miss Current:

I am enclosing a map of Salisbury, showing organization for civilian defense and zone and sector leaders. Spencer and East Spencer are organized likewise, but I was unable to get a map of that. Mr. Walter Carter, commander of the Civilian Defense Corps here got the map for me and made some notations on the Salisbury map regarding the organization of Spencer. None of the other outlying towns in Rowan County have been organized with zone and sector leaders, but this is to be done soon at Cleveland, Landis, China Grove, and perhaps Mt. Ulla. Mr. Irving Lampert at Norman's Furniture Store has charge of that as it is being done by the Citizen's Service Corp of which he is the head. Mrs. Reid Goodson is Chairman of the Citizen's Service Corps for Salisbury and Mrs. Ed Ketchie for Spencer and they have given me lists of their zone and block leaders, which I am enclosing. I hope this information will help you.

The meetings on food conservation sound interesting, and I am glad that Rowan County is on your schedule. I will get the auditorium of the community building as our meeting place for both days, and I'll be glad to have the equipment ready.

Sincerely yours,

Lorraine B. Redden

Mrs. Lorraine B. Redden
Home Demonstration Agent

MOBILIZATION OF HOME ECONOMICS WORKERS FOR FOOD CONSERVATION

WAKE COUNTY MEETINGS FOR TRAINING

First Day

College Home Economics Teachers
Farm Security Home Supervisors
Home Economics Teachers
Home Demonstration Agents
Commercial Home Economists

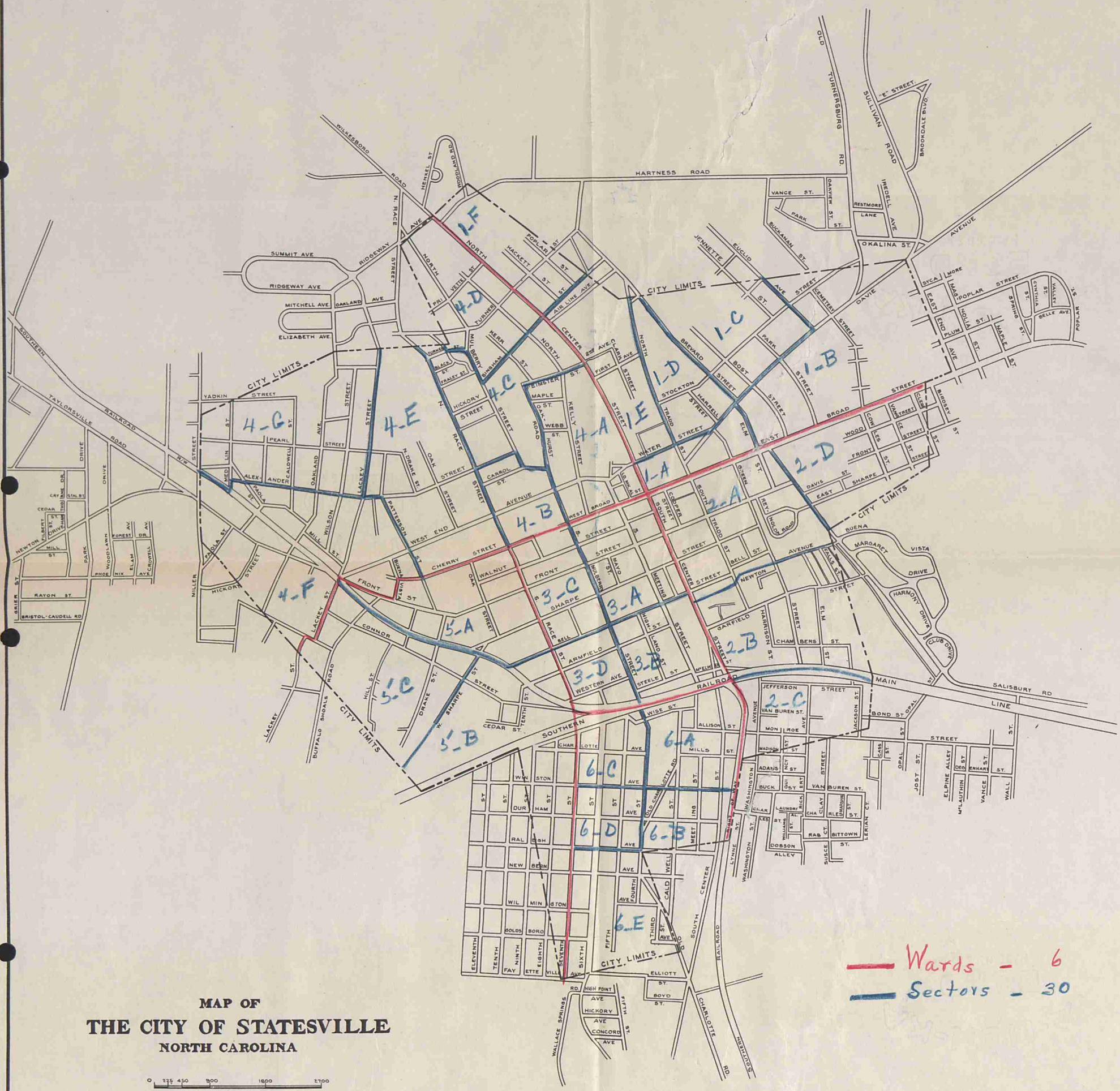
- Farm Security — One Supervisor → 200 Families
- Home Economics Teachers — 25 White, 5 Negro, 75 Girls → 2250
- Extension Service — 2 White Home Agents, 1 Negro Women & 4-H Girls → 1600
- Colleges — 3 White, 1 Negro Home Ec. Dept. 30 Students → 120
- Commercial — 2 Home Economist. → 2000

Second Day

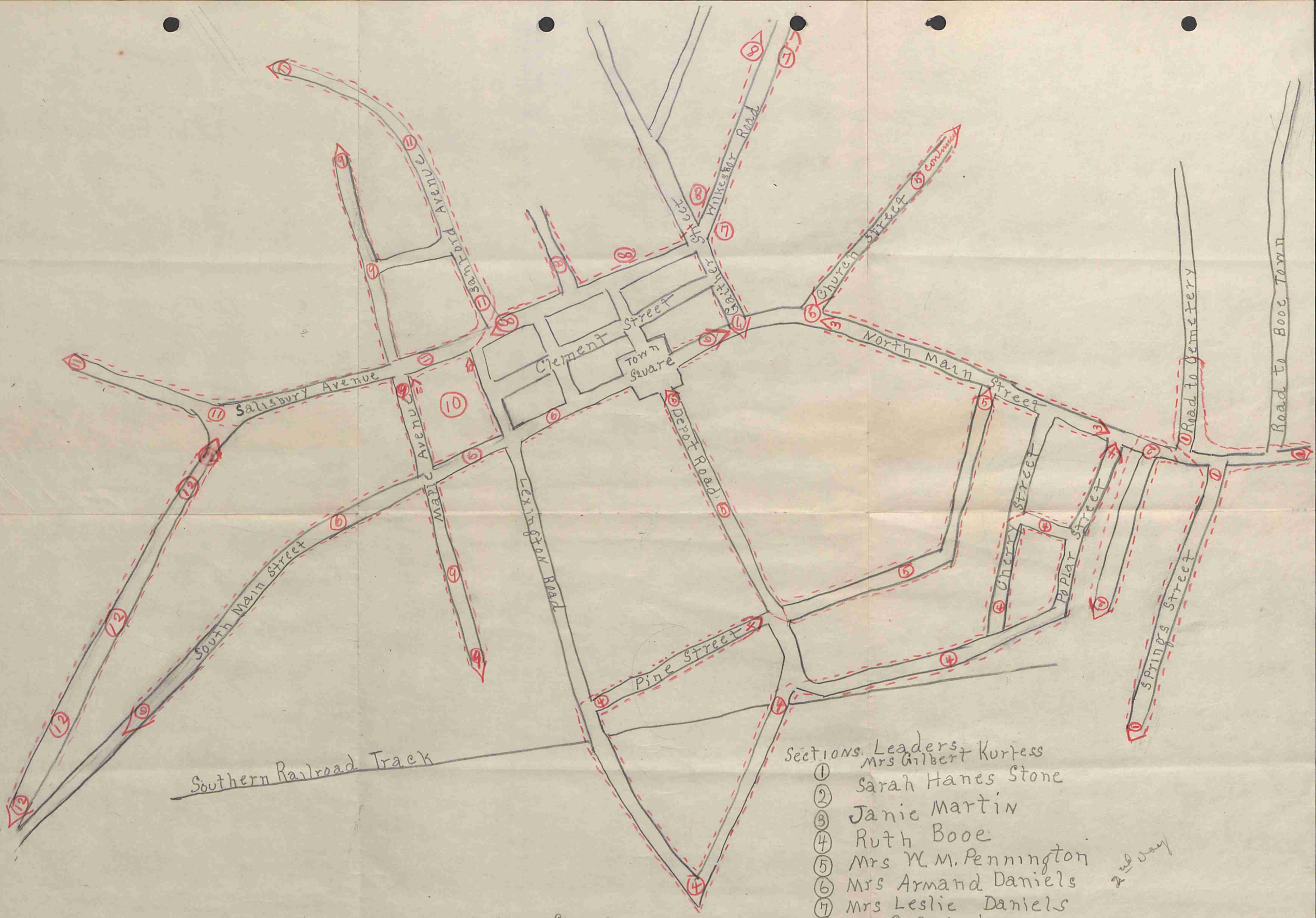
Sector Leaders - Towns (Home Economics trained workers will assist Sector Leaders in training Block Leaders)

Raleigh -	40
Zebulon -	2
Wendell -	2
Wake Forest -	2
Cary	2
Garner -	1
Fuquay-Varina -	3
Apex -	2
Holly Springs -	1
Rolesville -	1
Knightdale -	1

- Block Leader → 15-30 Families
- Block Leader → 15-30 Families
- Block Leader → 15-30 Families
- Neighborhood Leader → 10-20 Families
- Neighborhood Leader → 10-20 Families



PREPARED BY
SOUTHERN MAPPING AND ENGINEERING COMPANY
GREENSBORO, NORTH CAROLINA



Town is one mile North, South, East and West from Square

Population 1525 Homes 330

Sections Leaders

1. Mrs Gilbert Kurfess
2. Sarah Hanes Stone
3. Janie Martin
4. Ruth Booe
5. Mrs W. M. Pennington
6. Mrs Armand Daniels
7. Mrs Leslie Daniels
8. Mrs C. S. Anderson
9. Mrs Clinard LeGrande
10. Mrs Milton Call
11. Mrs Virginia Powell
12. Mrs George Hendricks

E. Spencer 41-42-43-44

Spencer 36-37-38-39-40

Schools

Boyden High School (56) I-4
Catawba College (53) D-4-5
Frank B. John's School (51) G-6
Henderson School (41) G-8-9
Innis St. Graded School (12) I-7
Lincoln School (col) (54) J-6
Livingstone College (col) H-4-5
Monroe St. School (col.) (57) H-4
Price High School (col.) (93) G-4
Sacred Heart School (91) H-6
Wiley Graded School (46) I-4

Public Buildings

Armory (94) G-8
Camp Everest C. C. C. E-4; F-4
Community Building (2) H-7
Country Club House (64) E-8
Duke Power Co. Office (19) I-7
Fire Department (13) I-7
Lowery Hospital (81) H-6
Municipal Water Works (14) H-7
Rowan County Court House (3) H-7
Rowan County Jail (4) H-7
Rowan Memorial Hospital (15) F-6-7
Salisbury City Offices (7) I-6
Southeastern Express Co. (11) H-7
Southern Railway Passenger Depot (10) I-7
Southern Railway Freight Depot (63) H-8
U. S. Post Office (1) H-6

Industrial Plants and Buildings

Arey Brick & Lumber Co. (71) K-3
Bradshaw & Son (90) H-8
Cannon Mills No. 7 (36) I-8
Carolina Rubber Co. K-3
Carolina Tractor & Equipment (95) K-3
Cartex Mills (78) G-9
City Booster Pump House (92) D-6
Duke Power Co. Car Barn (40) G-9
Duke Power Co. Sub. Station (38) J-8
Duke Power Transformer Station (60) J-8
F. B. Price, Jr. Poultry Packing Plant (59) F-3
Goodman Lumber Co. (69) J-5
Graf Davis Collet Co. (74) H-8
Grimes Milling Co. (58) H-7
Gulf Refining Co. L-2
Harris Granite Quarries Co. (44) K-3
J. & H. Motor Lines (73) F-10
Klumac Cotton Mills (70) K-4
Marsh Cotton Mills (76) G-5
Rowan Cotton Mills No. 2 (75) H-8
Rowan Creamery Inc. (84) H-7
Rowan Foundry and Machine Co. (93) J-5
Salisbury Bonded Warehouse (72) H-8
Salisbury Cotton Mills Co. (45) J-6
Salisbury Ice & Fuel Co. (77) I-6
Salisbury Iron Works & Machine Co. (80) J-5
Salisbury Veneer Co. F-4; G-4
Southern R. R. Transfer Sheds G-9-10
Stanback Medicine Co. (96) J-4; K-4
Summers Roller Covering Co. (85) H-8
Taylor Mattress Co. (82) J-5
White Packing Co. (83) G-6
Zenith Guano Fertilizer Co. (43) K-4

Churches

A. R. P. Church (52) J-4
Caldwell Street M. E. Church (Col) (30) I-5
Church of Christ (88) G-9
Church of the Sacred Heart (R.C.) (2) H-6
Church St. Presbyterian Church (Col) (5) H-7
Coburn Memorial Methodist Church (32) J-5
Dixonville Baptist Church (Col) (26) I-6
Episcopal Church (29) I-5
First Baptist Church (22) H-7
First Congressional Church (18) H-7
First Methodist Church (8) I-6
First Presbyterian Church (23) H-6
First Presbyterian Church S. S. Annex (25) H-6
First Presbyterian Rectory (24) H-6
First Reformed Church (9) I-6
Haven Evangelical Lutheran Church (34) J-5
Liberty Street Holiness Church (37) I-8
Moores A. M. E. Zion Chapel (48) G-4
Mt. Zion Baptist Church (Col) (17) H-7
North Main Street Baptist Church (87) G-9
North Main Street Methodist Church (89) G-8
Park Avenue Methodist Church South (20) I-8
Primitive Baptist Church (47) I-4
Second Presbyterian Church (35) I-4
Soldiers Memorial A. M. E. Zion Church (16) H-7
Speth Mission Church (Col) (50) H-4
Stallings Memorial Baptist Church (31) J-5
St. John's Episcopal Chapel (86) G-9
St. John's Evangelical Church (39) G-5
St. John's Lutheran Church (55) H-6
St. Luke's Episcopal Church (6) H-7
St. Pauls Episcopal Church (27) J-7
St. Pauls Protestant Episcopal Church (33) J-5
Union Star Primitive Baptist (Col) (49) G-4

Cemeteries and Parks

Catawba College Athletic Field B-4
Colonial Baseball Park ..E-9; F-9
Dixonville Cemetery (Col) J-6
Livingstone College (Col) Athletic Field H-4
Lutheran Cemetery H-7-8
National Cemetery J-6
Old English Cemetery (65) ... H-7
Salisbury Cemetery J-4
Salisbury Country Club Swimming Pool (79) E-8
Union Hill Cemetery (Col) ... G-3

MAP OF
COOLEEMEE, N.C.

Drawn by T. Hutchins — September, 1934

SCALE 180' to the Inch

LEGEND
- = Old Type
- = New Type
- = New

Cemetery
STATE HIGHWAY 801
Base Ball Park
Cooleemee Journal Office
OLD
MOCKSVILLE ROAD
School
JOYNER STREET
Presbyterian Church
Burned
WATT STREET
Baptist Church
DUKE STREET
Episcopal Church
CHURCH STREET
MARGINAL STREET
CROSS ST
YADKIN STREET
ERWIN STREET
DAVIE STREET
Methodist Church
MAIN STREET
Service Station
Riverside Park
Hotel
STATE HIGHWAY 801
RIVERSIDE DRIVE
POND
RAILROAD
depot
Cotton Warehouse
BRIDGE ST.
Drug Store
Market
SQUARE
Co. Store
Meat Market
office
Supply Room
CLOTH ROOM
COTTON MILL
Warehouse
Dye House
Dye House
Machine Shop
MILL RACE
SOUTH YADKIN RIVER
Sewage Disposal
NC. 801
GROVE STREET
CENTER STREET
TO N.C. 80
FORD ST.
New Bridge
Bridge

Annie C