

**CIHM
Microfiche
Series
(Monographs)**

**ICMH
Collection de
microfiches
(monographies)**



Canadian Institute for Historical Microreproductions / Institut canadien de microreproductions historiques

© 1997

Technical and Bibliographic Notes / Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming are checked below.

- Coloured covers / Couverture de couleur
- Covers damaged / Couverture endommagée
- Covers restored and/or laminated / Couverture restaurée et/ou pelliculée
- Cover title missing / Le titre de couverture manque
- Coloured maps / Cartes géographiques en couleur
- Coloured ink (i.e. other than blue or black) / Encre de couleur (i.e. autre que bleue ou noire)
- Coloured plates and/or illustrations / Planches et/ou illustrations en couleur
- Bound with other material / Relié avec d'autres documents
- Only edition available / Seule édition disponible
- Tight binding may cause shadows or distortion along interior margin / La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure.
- Blank leaves added during restorations may appear within the text. Whenever possible, these have been omitted from filming / Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.
- Additional comments / Commentaires supplémentaires:

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

- Coloured pages / Pages de couleur
- Pages damaged / Pages endommagées
- Pages restored and/or laminated / Pages restaurées et/ou pelliculées
- Pages discoloured, stained or foxed / Pages décolorées, tachetées ou piquées
- Pages detached / Pages détachées
- Showthrough / Transparence
- Quality of print varies / Qualité inégale de l'impression
- Includes supplementary material / Comprend du matériel supplémentaire
- Pages wholly or partially obscured by errata slips, tissues, etc., have been refilmed to ensure the best possible image / Les pages totalement ou partiellement obscurcies par un feuillet d'errata, une pelure, etc., ont été filmées à nouveau de façon à obtenir la meilleure image possible.
- Opposing pages with varying colouration or discolourations are filmed twice to ensure the best possible image / Les pages s'opposant ayant des colorations variables ou des décolorations sont filmées deux fois afin d'obtenir la meilleure image possible.

This item is filmed at the reduction ratio checked below /
Ce document est filmé au taux de réduction indiqué ci-dessous.

	10x		14x		18x		22x		26x		30x	
	12x		16x		20x		24x		28x		32x	

The copy filmed here has been reproduced thanks to the generosity of:

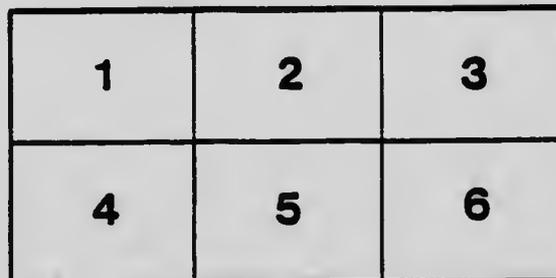
Library
Agriculture Canada

The images appearing here are the best quality possible considering the condition and legibility of the original copy and in keeping with the filming contract specifications.

Original copies in printed paper covers are filmed beginning with the front cover and ending on the last page with a printed or illustrated impression, or the back cover when appropriate. All other original copies are filmed beginning on the first page with a printed or illustrated impression, and ending on the last page with a printed or illustrated impression.

The last recorded frame on each microfiche shall contain the symbol \rightarrow (meaning "CONTINUED"), or the symbol ∇ (meaning "END"), whichever applies.

Maps, plates, charts, etc., may be filmed at different reduction ratios. Those too large to be entirely included in one exposure are filmed beginning in the upper left hand corner, left to right and top to bottom, as many frames as required. The following diagram illustrates the method:



L'exemplaire filmé fut reproduit grâce à la générosité de:

Bibliothèque
Agriculture Canada

Les images suivantes ont été reproduites avec le plus grand soin, compte tenu de la condition et de la netteté de l'exemplaire filmé, et en conformité avec les conditions du contrat de filmage.

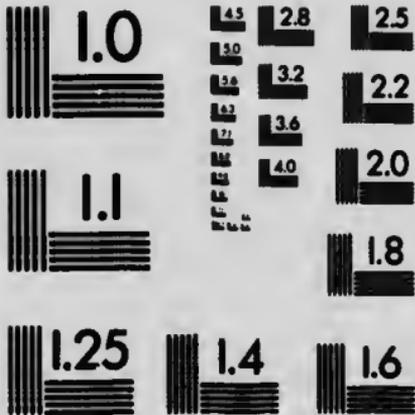
Les exemplaires originaux dont la couverture en papier est imprimée sont filmés en commençant par le premier plat et en terminant soit par la dernière page qui comporte une empreinte d'impression ou d'illustration, soit par le second plat, selon le cas. Tous les autres exemplaires originaux sont filmés en commençant par la première page qui comporte une empreinte d'impression ou d'illustration et en terminant par la dernière page qui comporte une telle empreinte.

Un des symboles suivants apparaîtra sur la dernière image de chaque microfiche, selon le cas: le symbole \rightarrow signifie "A SUIVRE", le symbole ∇ signifie "FIN".

Les cartes, planches, tableaux, etc., peuvent être filmés à des taux de réduction différents. Lorsque le document est trop grand pour être reproduit en un seul cliché, il est filmé à partir de l'angle supérieur gauche, de gauche à droite, et de haut en bas, en prenant le nombre d'images nécessaire. Les diagrammes suivants illustrent la méthode.

MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)



APPLIED IMAGE Inc

1553 East Main Street
Rochester, New York 14609 USA
(716) 482 - 0300 - Phone
(716) 288 - 5989 - Fax

**PRESERVATION
OF
FRUITS AND VEGETABLES
FOR HOME USE**

By
MARGARET MACFARLANE



**BULLETIN No. 93
DOMINION EXPERIMENTAL FARMS**

**OTTAWA
J. de LABROQUERIE TACHÉ
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1919**

630.4
C212
Exp. Farms
Service
Bul.



DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE
DOMINION EXPERIMENTAL FARM

DIVISION OF HORTICULTURE
W. T. MACOUN
Dominion Horticulturist

PRESERVATION OF FRUITS AND VEGETABLES FOR HOME USE

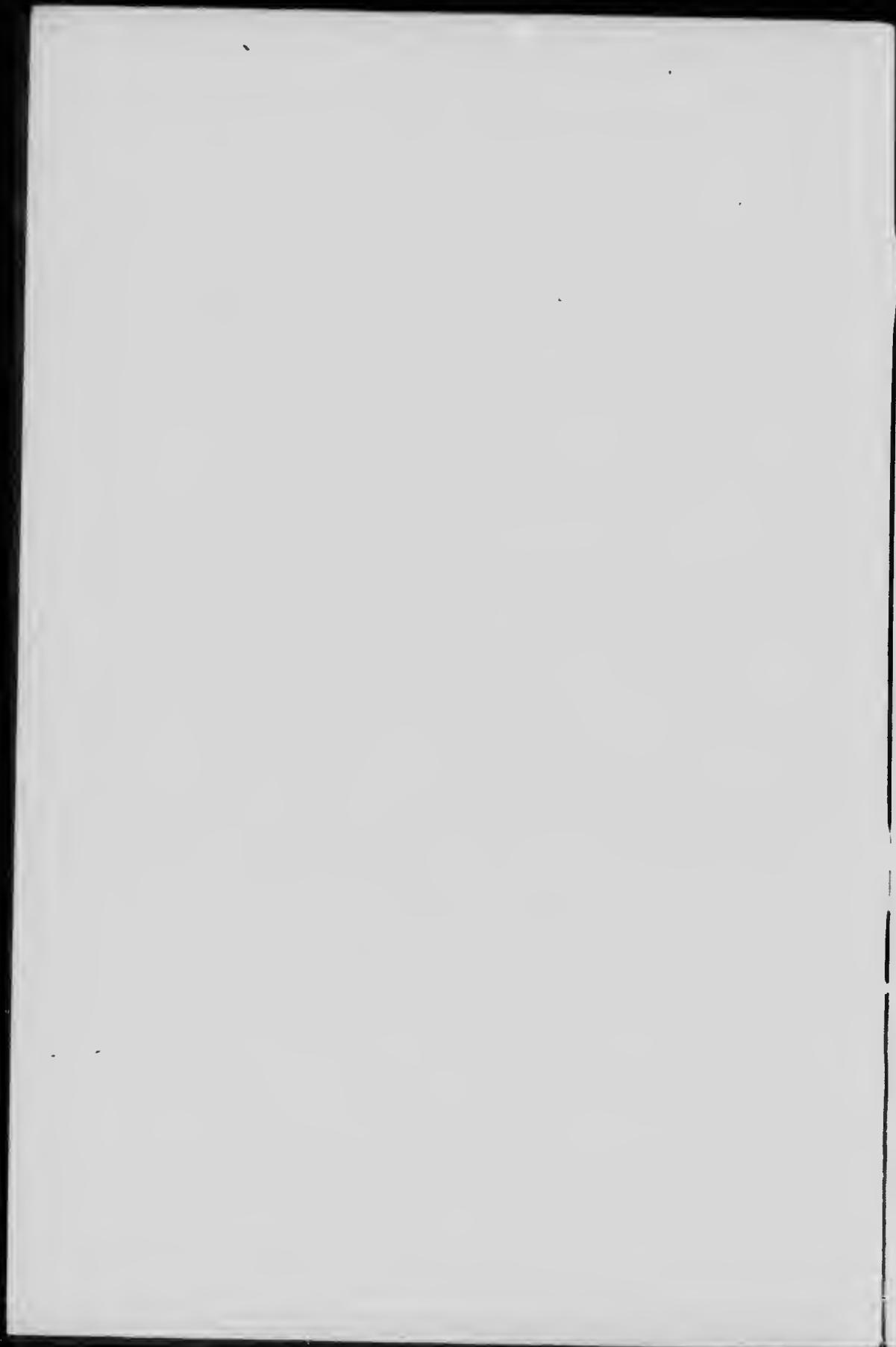
with Results of Experiments in Canning,
Drying, Pickling and Preserving at the
Central Experimental Farm, Ottawa, Ont.

By
MARGARET MACFARLANE

—
Bulletin No. 93
—

*Published by authority of Hon. T. A. CRERAR, Minister of Agriculture
Ottawa, Ont.*

62008—1



The Honourable
The Minister of Agriculture,
Ottawa.

SIR,—I have the honour to submit herewith for your approval the manuscript of a bulletin prepared at my request by Miss Margaret Macfarlane, on the Preservation of Fruit and Vegetables for Home Use, with results of experiments in canning, drying, pickling and preserving, with recipes of methods recommended.

The information in this bulletin is based on that available from many sources in regard to the general principles underlying the successful preservation of food, on recipes found by long experience to be good, and on experimental work at the Central Experimental Farm in 1917 and 1918. The work in 1917 was in charge of Miss Laura Kirby, while Miss Macfarlane conducted the experiments in 1918. Both these ladies are graduates in Household Science of Macdonald College. It has been thought important to publish the tables giving the different methods tried so as to impress on those who are about to preserve fruit and vegetables the necessity of adopting the best methods. Owing to the continued high cost of food and the great interest in canning and the preservation of fruit and vegetables during the past few years, this bulletin should be in great demand throughout Canada.

I have the honour to be, sir,

Your obedient servant,

E. S. ARCHIBALD,

Director, Dominion Experimental Farms.

OTTAWA, May 1919.



Public Demonstration in Canning, Experimental Farm, Ottawa, Ont.

TABLE OF CONTENTS.

	PAGE
Sterilisation	7
Two kinds of spoilage to guard against.....	7
Causes of "flat sour".....	7
To prevent "flat sour".....	8
Steps in Canning Process	8
The preparation of canning utensils.....	8
The preparation of vegetables and fruit.....	8
Blanching.....	8
Cold Dip.....	8
Cold Pack.....	10
The sterilisation of the jars.....	10
Completion of process.....	10
Test of finished jars.....	10
Cause of shrinkage.....	10
Fractional or Intermittent Sterilisation	12
Open Kettle Method of Canning	12
The Steam Pressure Method of Canning	12
Non-Cooking Method	12
Recipes for Preserving Plums	14
Jelly Making	14
Preservation of Vegetables by Fermentation and Salting	14
Salting without fermentation.....	15
Fermentation with dry salting.....	15
Fermentation in brine.....	15
Sauerkraut.....	16
Favorite Recipes	16
Pumpkin Chips.....	16
Marmalade.....	16
Green Tomato Mince Meat.....	16
Chili Sauce.....	17
Green Tomato Sauces.....	17
Green Tomato Pickle.....	17
Ripe Cucumber Pickle.....	17
Unripe Cucumber Pickle (Gherkins).....	17
Mustard Pickles (Winter Salad).....	18
Pickled Onions.....	18
Home Drying	18
The advantages of drying.....	18
Preparation of material.....	18
Sun drying.....	18
Drying by artificial heat.....	19
Drying by air-blast.....	19
The condition of products when sufficiently dried.....	19
Proper storage for dried products.....	19
Preparation of dried products for the table.....	19
Directions for drying.....	19
Time-table for Drying	20
Time-table for Canning	21
Canning Experiments	21



Preservation of Fruits and Vegetables.

PRESERVATION OF FOOD.

Canning has become the most popular means of preserving large quantities of fruit and vegetables and since these are so plentiful during the summer months as actually to be wasted, and at other times very difficult to obtain, it is important to preserve quantities of perishable fruits and vegetables during the growing season for use during the winter. Moreover, the use of an abundant supply of fruit and green vegetables is essential to health at all seasons of the year.

The motto in every household should be "The best is not too good for canning". Select young, fresh, clean fruits and vegetables or none at all.

STERILIZATION.

Foods decompose or spoil because they are attacked by living germs, minute forms of plant life. Three type of these tiny organisms cause the spoilage in foods, namely, moulds, yeasts and bacteria.

Every household is familiar with moulds in their growing state. Moulds thrive in dampness and darkness, require moisture and warmth, and feed upon sugar and starches. Moulds are easily killed by moist heat.

The use of yeast in breadmaking is familiar. Yeasts require food in the form of sugar, warmth, moisture and air. When they grow the sugar is broken up and alcohol and carbon dioxide are formed. This gas shows on the sides of a fermented bottle in the form of bubbles.

Yeasts are very abundant in the air and on the food and for this reason it is necessary to destroy them and seal the jar air-tight, so that none can enter, after the food is canned. One yeast in a jar of fruit will cause fermentation in a very short time if conditions are favourable for its growth.

Bacteria are much more difficult to destroy. They require warmth, moisture and food. Bacteria in their growing state may be killed by subjecting them to a moist heat at boiling temperature for different lengths of time.

TWO KINDS OF SPOILAGE TO GUARD AGAINST.

In canned goods there are two kinds of spoilage. The first is called "flat sour", a term used to include all forms of bacterial growth that develop within the food. The second type of spoilage to guard against is mould, a plant growth that is distinctly different from the bacterial growth. Moulded foods are seldom more than surface affected because air is necessary for its growth; the "flat sour" spoilage means that the entire can must be discarded.

"Flat Sour" may be caused:—I. By the vegetables being allowed to stand in the cold water of the blanching period for a longer time than is necessary. Never blanch or cold dip more than you can pack at once.

II. By the jars being allowed to stand after being filled with boiling water, before being placed in the canner or sterilizer. If one or two of the jars are in the canner a few minutes longer than is necessary the fruit or vegetable will not be affected, while if the jar were left on the table for a corresponding length of time "flat sour" might be started.

III. By the jars being placed close together after being taken from the canner which prevents their cooling rapidly.

IV. By the product being allowed to stand over night before canning. Peas, beans, corn and asparagus which are overripe or too mature when canned will readily "flat sour".

To Prevent "flat sour":—

- I. Can within five hours after picking.
- II. Can only young, tender, fresh products.
- III. Blanch, cold dip and pack one jar of the product at a time, and place each jar in the canner as it is packed. The first jar will not be affected by extra cooking.
- IV. Cool the jars as quickly as possible, but do not let a draught strike them.

PRINCIPAL METHODS OF CANNING.

1. One period cold-pack method.
2. Fractional or Intermittent Sterilization.
3. Open Kettle.
4. Steam Pressure.

The one recommended for home use is the single boiling, or one period cold-pack method. It is the simplest and most successful way of canning. The product is superior in taste, texture and colour. To can successfully by the one period cold-pack method it is important that careful attention be given to each detail.

STEPS IN CANNING PROCESS.

1. *The preparation of canning utensils.*—If jar has been used the previous year, special attention must be paid to washing. Wash carefully in clean, hot, soapy water. Rinse in hot water and test. Test every jar, top, and rubber. See that the edges of the jar or top are not rough, by running your finger around the edge. All sharp edges should be filed or scraped off. Fill each jar half full of warm water, adjust the rubber, put on the cover and snap the wire clamp. Turn jar upside down to see if it leaks. In using a Perfect Seal jar, if the jar leaks, the clamp may be tightened by turning the spring of the clamp underneath the word "tight" on the neck of the bottle.

Never use a rubber ring which has been used before. Old rubbers lose their elasticity, are brittle and break when stretched. Test rubber by folding the ring and pressing tightly. Turn it over and reverse the fold in the same place. A good rubber ring will show no crease or break where the rubber has been folded.

After the jars have been tested they should be put on in warm water and boiled for 10 minutes. The tops and rubbers should also be sterilized for the same length of time.

2. *The preparation of vegetables and fruit.*—Wash carefully, using a brush when necessary. Too much attention cannot be paid to the careful washing or even scrubbing of the fruit or vegetables.

3. *Blanching.*—All vegetables and some fruits are blanched or scalded. It may be done with either boiling water, or steam. The length of time varies with the product. The easiest way to blanch is to use a large cheesecloth bag or a square of cheesecloth. Tie the prepared product in the bag and place in boiling water to cover for the time stated. With greens, the blanching is done in steam; a colander placed over boiling water may be used.

4. *Cold Dip.*—After removing the fruit or vegetable from the boiling water or steam, dip in cold water, the colder the better, and allow to stand only long enough to cool the vegetable sufficiently to arrest all flow of juices and to be easily handled.

The blanching and cold dip are very important. They ensure a close pack, partially remove strong acids, begin the sterilization of the vegetable and loosen the skin of such vegetables as the tomato.



Fig. 1.

Testing jar.

Fill each jar half full of warm water, adjust the rubber, put on the cover and snap the wire clamp; turn jar upside down to see if it leaks.

Fig. 2.
Testing rubber by folding the ring and pressing tightly, turn it over and reverse the fold in the same place. A good rubber ring will show no break where the rubber has been folded



Fig. 3.

Blanching, using a square of cheesecloth.



5. *Cold Pack.*—(1) Pack the blanched product in the hot sterilized jar, taking each sterilized jar out of the canner as needed.

(2) To the vegetables add 1 teaspoon of salt to each quart jar and fill jar with boiling water to within one-quarter of an inch of the top.

(3) To the fruit add boiling syrup to within a quarter of an inch of the top of the jar.

(4) After filling the jar put on the sterilized rubber and top. If the Perfect Seal or Lightning type of jar is used, clamp the upper clamp into position, but do not touch the lower clamp. This leaves the jar half sealed. If using a screw top jar, screw the top on half way.

6. *The sterilization.*—The jar is now ready to be put into the boiler or canner. The boiler should have a rack—a wooden rack is good—to allow the water to circulate beneath the jars. The jars should not touch. The water in the boiler should be of the same temperature as the contents of the jar, there being no difficulty about this if the jars are taken out of boiling water, filled with the vegetable or fruit, boiling water or syrup added, and the jar then put back into the boiler. The water in the boiler should be at least two inches over the tops of the jars. Some directions state that it is only necessary to have the water in the boiler half way up on the jars. This method has not proved as uniformly successful as when the tops are completely covered. If the water level sinks below the rubber rings, there is a distinct difference of temperature within the jar.

Count the time from when the water begins to boil vigorously. Water is not boiling when bubbles merely form on the bottom, or when small bubbles rise to the surface. The water must be kept rapidly boiling during the sterilization period. No jar can be thoroughly sterilized unless the water is kept rapidly boiling for the length of time stated. When it says "Sterilize 20 minutes" it does not mean "leave in the boiler" for that length of time. Count the time from when the water begins to boil rapidly.

7. *Completion of process.*—(1) Remove the jars and seal at once. Many jars crack or even break after being removed from the boiler or canner on account of being placed on a cold metal table, or in a draught.

(2) Invert the jars in a place where they will cool rapidly, and do not stand them in a draught, or too close together.

(3) Wash.—Care must be taken that the cloth with which the jar is washed is perfectly clean.

(4) Label and store in a cool dry place.

TEST OF FINISHED JARS.

After fruits and vegetables are canned and stored for several days, the seal may be tested and many jars saved by reesterilization. To test, raise the clamp of the Perfect Seal type of jar and attempt to lift the jar by the cover. If the cover falls off the jar has not been air-tight, or the food has started to ferment. The only method of testing a screw top jar is to invert and test for leaks.

CAUSE OF SHRINKAGE.

Shrinkage in a jar may be caused by improper or insufficient sterilization and cold-dipping, careless packing, or sterilizing for too long a period. Liquid may be lost from the jars during the sterilization period if the water in the canner does not cover the tops of the jars, if the covers of the jars are adjusted too loosely, if the false bottom in the boiler does not permit the water to circulate underneath. Such things as towels, excelsior, hay, newspapers, are unsatisfactory for use because the water cannot circulate underneath the jars.

Fig. 4.

Cold dip.



Fig. 5.

Packing the blanched product in the hot sterilized jar taking each sterilized jar out of the canner as needed



Fig. 6.

Add half teaspoon of salt to each pint jar and fill jar to within quarter of an inch of the top



FRACTIONAL OR INTERMITTENT STERILIZATION.

The term "intermittent" is used when the packed jars are subjected to boiling temperature for a definite period on each of three successive days. In beginning the process the jar is only half sealed, but the jar is completely sealed after each period of sterilization, and the clamp loosened again when put into the canner to allow for the expansion caused by heat. The temperature of the water in the canner should be the same as the temperature of the contents of the jar on the second and third days.

It is always necessary to can vegetables which have been picked for several hours by this method. Between the periods of sterilization, when the jars are kept at ordinary temperature, the spores not killed develop into bacteria of the easily killed growing state. These are then killed by the next period of sterilization. Rarely do any spores fail to develop and be destroyed by the third boiling.

The disadvantage of this method is that the jars are handled several times and more fuel is used.

OPEN KETTLE METHOD OF CANNING.

The old fashioned method of canning, especially of fruits and tomatoes, was by the open kettle method. This method consisted of cooking the fruit in an open kettle, transferring it, boiling hot, to a hot sterilized jar, and sealing immediately. Mould frequently appeared on the top of the jar, often causing complete loss.

This method is not advisable on account of so frequently resulting in insufficient sterilization and a product of inferior quality. The housekeeper is forced to watch her product very carefully, necessitating standing over a hot stove.

When this method is used, as in the case of apple sauce, the jar should be sterilized for at least ten minutes after being filled.

THE STEAM PRESSURE METHOD OF CANNING.

The steam pressure canner is constructed of very strong material, has a tightly fitted lid, which when stamped into place, allows the steam to be held under pressure and obtain a high temperature. It is fitted with a steam gauge and a thermometer. These register the number of pounds pressure and the temperature. A great heat is necessary to bring the temperature up quickly on account of the canner being made of very heavy material.

The advantage of this method is that it requires less time for complete sterilization and is very often more successful.

The disadvantage is that it requires special apparatus, which costs more than the average housekeeper can afford to pay, and it is not as successful for fruits as for vegetables.

NON-COOKING METHODS.

The non-cooking method of canning rhubarb, gooseberries and sour cherries did not prove a success. A peculiar flat taste was noticed when the product was tested.

Several methods were used including the following:—The jars were packed with fresh sound fruit, placed in a receptacle deep enough so that the water came four inches over the tops of the jars. The receptacle was placed under a source of fresh running water and the water was allowed to run for from ten to twenty minutes until all the air bubbles had disappeared. The jars were then sealed under water.

Another method used:—The jars after being packed with fresh sound fruit were filled with cold sterilized water and sealed.

The success of these methods depends upon the acidity of the fruit.



Fig. 7.
The half sealed jar
ready for the boiler.



Fig. 8.
Sealing jars after
removing from the
boiler.



Fig. 9.
Simple home canner.
Wooden false bottom for
wash boiler.



Fig. 10.
One type of steam
pressure canner.

RECIPE FOR PRESERVING PLUMS.

The following recipe for preserving plums has been found to be the best for American plums.

The recipe was supplied by Mrs. Dora M. Robson, Ottawa, Ont.

"The plums were not quite ripe, being partly red and partly yellow. No ripe or all red plums were used, and to this is attributed part of the success of this formula. The fruit was weighed and put into a preserving kettle at the back of the range, a few of the plums being crushed. The fruit was left here until the slow heat drew the juices out, then the preserving kettle was drawn forward and the plums cooked slowly until they were thoroughly done. One pound of heated sugar was then added to one pound of fruit, including stones and skin. The fruit was then left on the range just long enough to be sure all the sugar had melted and boiled up once, probably about three minutes. No water was put with the plums."

When a gas range is used the plums might be left in a very slow oven, covered, until all the juices are drawn out instead of leaving them on the back of the stove.

JELLY MAKING.

Fruit juice, in order to make good jelly, must contain both pectin and acid. Pectin is a substance soluble in hot water, which when cooked in the presence of sugar and acid and cooled, gives the right consistency to jelly.

Fruit for jelly making should be just ripe or slightly under-ripe.

Wash and cut the larger fruit into pieces. Put in a saucepan, adding a small quantity of water according to the amount of juice in the fruit. To the very juicy fruits, such as grapes and currants, add only enough water to prevent burning. Boil slowly until well cooked.

Drain through a jelly bag made of double thickness of cheesecloth, unbleached cotton, or flannel.

Measure and find out how much sugar it is necessary to use for the particular fruit juice.

To determine amount of sugar needed, mix 1 tablespoon of juice with 1 tablespoon of grain alcohol. If a firm jelly forms, use equal measures of sugar and juice; if a loose jelly, $\frac{1}{2}$ sugar, 1 of juice; and if a very loose jelly, $\frac{1}{3}$ sugar and 1 of juice.

The juice is allowed to come to a boil before the heated sugar is added.

The jelling point is reached when the juice drops as one mass from the side of a spoon, or when two drops run together and fall from the spoon as one. Pour immediately into jelly glasses. When the jelly is cold, pour over it a thin layer of hot paraffin wax.

Ideal fruits for jelly making include the following: currants, sour apples, crab-apples, and grapes. Raspberries, blackberries, and blueberries may be used in combination with apples.

PRESERVATION OF VEGETABLES BY FERMENTATION AND SALTING.

One advantage of this method of preserving vegetables is that containers, such as old kegs, butter tubs or stone crocks may be used.

THREE PRINCIPAL METHODS:

1. Salting without fermentation.
2. Fermentation with dry salting.
3. Fermentation in brine.

SALTING WITHOUT FERMENTATION.

The vegetables are washed, the water drained off, and the vegetables weighed. The best results are obtained when 25 lbs. of salt are used to every 100 lbs. of vegetables.

Spread a layer of the vegetable one inch deep in the bottom of the crock and sprinkle with salt, being careful to distribute the salt evenly throughout the crock. Continue making alternate layers of vegetable and salt until the crock is nearly full. Cover with a piece of cotton or a double thickness of cheesecloth. Over this put a plate or a piece of board and a weight. A clean brick or stone is a very good thing to use as a weight.

The container should now be set aside in a cool place. If at the end of 24 hours the salt and the pressure on the vegetables have not extracted brine enough to cover, add a brine made by dissolving 1 pound of salt in 2 quarts of water. Enough brine should be added to come above the plate or board. Set aside in a place where it will not be disturbed and cover with hot paraffin wax.

The following vegetables may be preserved by this method: beet tops, spinach, string beans, green peas, corn and cabbage.

The beans should be cut in two-inch pieces; the peas shelled; the corn cooked for ten minutes to set the milk, and cut off the cob with a sharp knife.

It has been found that in preparing salted beans for the table, it is much better to soak the beans for two hours in the morning, changing the water several times and also changing the water while cooking, than it is to soak the beans over night. Long soaking softens the beans.

FERMENTATION WITH DRY SALTING.

In this method the vegetables are washed, the water drained off and the vegetables weighed, using 3 lbs. of salt to every 100 lbs. of vegetables. No water is used. The salt extracts the water from the vegetables.

Spread a layer of vegetables one inch thick in the bottom of the crock, covering with a very thin layer of salt, being careful to distribute the salt evenly. If more salt has to be added the finished product will be too salty.

Fill the crock only three-quarters full, placing a cloth over the top, then a plate turned upside down or a piece of clean board, and a weight. A ten pound weight is sufficient for a five gallon crock.

The container should be allowed to stand in a warm room for from eight to ten days. When the bubbles of gas cease to appear the fermentation is complete.

A layer of hot paraffin wax, about one-half inch thick, is poured over the top to prevent a scum forming. It is very important that the wax should not be added before the fermentation ceases.

The following vegetables may be preserved by this method: cabbage (sauerkraut), string beans, beet tops.

FERMENTATION IN BRINE.

Wash the vegetables, drain off the water, and pack in a crock until nearly full. Prepare a weak brine, using one-half a pint of vinegar and three-fourths of a cup of salt to each gallon of water. If a five-gallon crock is used, two and one-half gallons of brine will be necessary. This must be covered with a cloth, a piece of clean board or a plate, and a weight. The container must be left in a warm place until the fermentation has ceased and then taken to a cool place, where it will not be disturbed after covering with hot paraffin wax.

The following vegetables may be preserved by this method: Cucumbers, string beans, green tomatoes, beets, peas and corn.

When salting cucumbers, a layer of dill and a handful of mixed spice may be placed on the bottom and top of the crock. Green tomatoes may also be prepared with dill and spices. Beets should not be peeled or sliced before being fermented or they will lose their colour and flavour. Fermented corn may be used in the preparation of such dishes as chowders or omelets, where the acid taste may not be objectionable, as it might be to some people if the corn were eaten alone.

SAUERKRAUT.

In making sauerkraut the outer green leaves and any decayed or bruised leaves should be discarded, as well as the core.

The cabbage should be shredded with a saw cutter or a sharp knife. After weighing, pack immediately in a water-tight receptacle. It has been found that 1 pound of salt to 4 pounds of cabbage gives the best flavour to the finished product.

The cabbage should be pressed down as firmly as possible and covered with a cloth, board and weight. The weight should be sufficient to cause the brine to rise above the board.

The container should be set in a warm place until fermentation is complete. Before adding a layer of paraffin the scum should be taken off.

It is not necessary to add a layer of paraffin if the sauerkraut is made late in the fall, and can be frozen as soon as the fermentation is complete.

FAVOURITE RECIPES.

PUMPKIN CHIPS:

12 pounds pumpkin,
1 pound green ginger,
2 lemons,
Sugar.

Cut the fruit into strips one inch square and one-eighth inch thick. Prepare ginger by paring and slicing thinly and boiling one hour in a syrup of equal parts sugar and water. Slice lemons as for marmalade. Put all in a preserving kettle and let stand twenty-four hours, after adding an equal weight of sugar. Boil about one and one-half hours, or until fruit is transparent, and can.

MARMALADE:

1 orange,
1 grapefruit,
1 lemon.

To one pint of finely sliced fruit add three pints of cold water and let stand over night. Cover seeds and white fibre with water in a separate bowl, and strain liquid off seeds into orange the next morning. Boil fifteen minutes, and again let stand over night. The following day weigh, and to each pound of fruit add one pound of granulated sugar. Stir well and boil until a little, well cooked, will jelly.

Pour into jars and when cold cover with melted paraffin.

TEN TOMATO MINCE MEAT:

1 peck green tomatoes	2 pounds raisins
1 peck apples	2 teaspoons cinnamon
6 pounds brown sugar	2 teaspoons cloves
2 pounds currants	2 teaspoons allspice.

Cook three hours.

CHILI SAUCE:

18 rip tomatoes	1 tablespoon mustard
2 or 3 red peppers	1 tablespoon cinnamon
2 tablespoons salt	1 tablespoon celery seed
1 tablespoon ginger	1 quart vinegar
1 tablespoon allspice	$\frac{1}{2}$ cup sugar
1 tablespoon cloves	2 onions.

Remove skins from tomatoes and cut in pieces. Cut up peppers very finely and onions. Add spices and vinegar and boil for about two hours, until mixture is right consistency, being careful it does not scorch.

GREEN TOMATO SAUCE:

2 dozen large tomatoes	2 pon brown sugar
$1\frac{1}{2}$ dozen apples	2 ounces mustard
$\frac{1}{2}$ pound salt	2 tablespoons ground ginger
4 large green sweet peppers	2 pints vinegar
1 red pepper	6 large onions

Boil $1\frac{1}{2}$ hours.

GREEN TOMATO PICKLE:

- 4 quarts green tomatoes
- 4 small onions
- 4 green peppers.

Slice the tomatoes and onions, sprinkle with $\frac{1}{2}$ cup of salt and leave over night in a crock. The next morning drain off the brine. Put in a preserving kettle 1 quart of vinegar, 1 level teaspoon each of black pepper, mustard seed, celery seed, cloves, allspice and cinnamon and $\frac{1}{2}$ cup of sugar. Bring to a boil and add the prepared tomatoes, onions and peppers, cook slowly for 30 minutes. Fill jars and seal.

RIPE CUCUMBER PICKLE:

Cut cucumbers in halves lengthwise. Cover with alum water, allowing 2 teaspoons powdered alum to each quart of water. Heat gradually to boiling point, then let stand on back of range two hours. Remove from alum water and chill in ice-water. Make a syrup by boiling five minutes two pounds of sugar, one pint of vinegar with two tablespoons each of whole cloves and a stick of cinnamon tied in a piece of muslin. Add cucumbers and cook ten minutes. Remove cucumbers to a stone jar, and pour over the syrup. Scald syrup three successive mornings and return to cucumbers.

UNRIPE CUCUMBER PICKLE (GHERKINS):

Wipe four quarts small unripe cucumbers. Put in a stone jar and add 1 cup of salt dissolved in 2 quarts of boiling water, let stand three days. Drain cucumbers from brine, bring brine to boiling point, pour over cucumbers, and again let stand three days; repeat. Drain, wipe cucumbers and pour over one gallon boiling water in which one tablespoon of alum has been dissolved. Let stand six hours, then drain from alum water. Cook cucumbers ten minutes, a few at a time, in one-quarter of the following mixture heated to the boiling point and boil ten minutes:—

1 gallon vinegar	2 tablespoons allspice
4 red peppers	2 tablespoons cloves.
2 sticks cinnamon	

Strain remaining liquor over pickles which have been put in a stone jar.

MUSTARD PICKLES (WINTER SALAD):

- | | |
|-----------------------|---------------------------|
| 6 or 8 green tomatoes | 2 heads celery |
| 1 head cabbage | 2 red peppers (cut fine). |
| 6 large onions | |

Put in a preserving kettle and nearly cover with white wine vinegar. Boil 15 minutes and add 2 pounds of sugar, 2 tablespoons salt, 1 cup flour, 1 teaspoon tumeric, 2 tablespoons mustard mixed with a small quantity of water. Boil for ten minutes and bottle.

PICKLED ONIONS.

Peel, wash and put in brine using 2 cups of salt to 2 quarts of water. Let stand 2 days, pour off brine. Cover with fresh brine and let stand 2 days longer. Remove from brine, wash and pack in jars, cover with hot vinegar, to which cloves, cinnamon and allspice have been added.

HOME DRYING.

The object in evaporation or dehydration is to remove all moisture from the material, so that organisms are not able to grow and multiply. Drying should not be regarded as taking the place of canning, but rather as an important adjunct. It should be done when canning is not practicable, as in the case of small quantities of fruit or vegetables.

THE ADVANTAGES OF DRYING.

1. The finished product has a weight only one-fourth that of the fresh material.
2. The dried material may be stored almost indefinitely without danger of deterioration.
3. Dried products may be shipped very easily.
4. They have the special advantage of requiring very little storage room.

PREPARATION OF MATERIAL.

In preparing material for drying, vegetables should first be blanched as for canning, and cut in slices one-quarter of an inch thick. When cut too thin they are difficult to handle; when too thick they do not dry quickly.

It is just as important to use young and tender vegetables for drying as it is for canning. First-class material must be used in order to get first-class results.

THREE METHODS OF DRYING.

1. Sun drying.
2. Drying by artificial heat.
3. Drying by air-blast. (Using an electric fan.)

SUN DRYING.—Sun drying is the least expensive method, and, when climatic conditions permit, is the most successful. Sun drying requires bright, hot days and a breeze. Once or twice a day the product should be turned and the dry pieces removed.

The product may be spread on sheets of plain paper, pieces of muslin, or a wire screen may be used. Cheesecloth should be tacked to a frame and used as a covering, so that dust and insects may be excluded without interfering with the circulation. The cheesecloth should not rest directly on the food. Care must be taken to remove the trays indoors before sunset and during rain storms.

DRYING BY ARTIFICIAL HEAT.—Products may be dried in the oven, on the top of the stove, in trays suspended over the top of the range, or in a commercial or home-made drier. In this way the heat of the stove or the oven is utilized.

In using artificial heat the drying should be started at a comparatively low temperature and gradually increased; for this reason it is necessary to use a thermometer. The temperature at which most vegetables should begin drying is from 110° to 120° Fahrenheit. The temperature may be gradually increased to 145° or 150° Fahrenheit. When the temperature is too high at first, the surface of the vegetable becomes hard, while the inside is still juicy.

DRYING BY AIR-BLAST.—This method is perhaps the quickest and cheapest. It consists of allowing a current of air to pass over the product, using an electric fan, either with or without artificial heat.

The disadvantage of this method is that it is very difficult to regulate the drying process and the material is apt to dry out too quickly, a hard crust forming on the outside and thus preventing the moisture in the centre from escaping.

The Condition of Products when Sufficiently Dried.—The product should be leathery and pliable; not so dry that it will snap when broken. When the pieces are cut or broken open the cut ends should not show any moisture when pressed between the fingers. If the products become hard when dried they will not resume their original shape when soaked.

After the products are sufficiently dried it is important that they be "conditioned." This means that they must be placed in containers, preferably boxes, and poured from one box to another at least once a day for three or four days to mix thoroughly. If any part of the product is found not to be sufficiently dried it can be returned to the drier for a short time.

Proper Storage for Dried Products.—Proper storage is absolutely essential. In the present high price of glass jars it is recommended that other containers be used for the storage of dried products. Cans, such as baking powder cans, coffee cans, etc., with tight fitting covers, also strong paper bags and paraffin lined paper boxes may be used successfully.

If a paper bag is used the top should be twisted, doubled over and tied with a string. If the bag is coated with melted paraffin wax the moisture will be kept out.

It is a good plan to use small containers so that it may not be necessary to leave the contents exposed after opening and before using.

The products should be stored in a cool, dry place, well ventilated and protected from rats, mice and insects.

Preparation of Dried Products for the Table.—The water which has evaporated must be restored. This is done by soaking for a long time, using three to four cups of water to one cup of dried material. Care must be taken that too much water is not used, as the object is to restore the amount which has evaporated. After soaking for several hours, and in some cases over-night, the dried products should be cooked in a covered utensil at a low temperature for a long time. They should be cooked in the water in which they were soaked. In serving dried products great care must be taken that they are well seasoned.

DIRECTIONS FOR DRYING.

BEANS.—Beans must be in perfect condition. Wash carefully and string. Blanch from 5 to 10 minutes, adding $\frac{1}{2}$ teaspoon soda to each gallon of boiling water; cold dip and remove surface moisture. Spread thinly on trays to dry. Dry slowly, increasing the temperature from 120° Fahrenheit to 145° Fahrenheit.

CELERY.—Wash carefully and cut in inch pieces, blanch 3 minutes and cold-dip. Remove surface moisture with cheesecloth or towel. Dry slowly, starting at temperature of 110° Fahrenheit and increasing to 140° Fahrenheit.

CORN.—Blanch cob for from 5 to 10 minutes to set the milk, adding 1 teaspoon of salt to each gallon of water. Cold-dip and remove surface moisture. With a sharp knife cut off kernels, taking care not to include the chaff. Starting at a temperature of 110° Fahrenheit and raising gradually to 145° Fahrenheit the corn should dry in 4 to 5 hours.

If the corn is to be dried in the sun it should first be dried in the oven at 110° Fahrenheit for from 15 to 20 minutes, and again, after the sun drying is completed, at a temperature of 145° Fahrenheit for 5 minutes.

PEAS.—Shell, blanch for from 3 to 5 minutes, cold-dip and remove surface moisture. Starting at a temperatures of 110° Fahrenheit and increasing slowly to 145° Fahrenheit it takes from 3 to 4 hours for peas to dry.

ONIONS.—Peel and slice onions into ¼-inch slices. Blanching is not necessary. Dry for from 2½ to 3 hours at a temperature of from 120° to 140° Fahrenheit.

PUMPKIN.—Cut into ½-inch strips and peel, blanch for from 3 to 6 minutes, remove surface moisture and dry slowly 3 to 4 hours at 120° to 150° Fahrenheit.

SOUP MIXTURE.—Each vegetable should be dried separately and then combined. From 3 to 4 quarts of vegetable soup may be made from 4 ounces of dried soup mixture.

APPLES.—Peel, core and cut in slices ¼-inch thick. Dip in a weak salt solution; 1 to 2 tablespoons of salt to 1 gallon of water, to prevent discoloration. Remove surface moisture and dry slowly for from 5 to 8 hours, increasing the temperature from 120° Fahrenheit to 150° Fahrenheit. Apples should be tough and leathery when dried.

RHUBARB.—Cut into 1-inch pieces. Blanch 3 minutes and cold-dip, remove surface moisture and dry at a temperature of from 120° to 145° Fahrenheit.

Note: The exact length of time for drying cannot be given, as so much depends upon the method used.

TIME TABLE FOR DRYING.

VEGETABLE—	Blanching.		Approximate Drying time.	Temperature.
	Minutes.	Hours.		
Beets.....	10	3 to 4		115° to 150°
Brussels Sprouts.....	6	3 to 3½		115° to 145°
Cabbage.....	5	3 to 4		115° to 145°
Carrots.....	4 to 8	3		115 to 145
Cauliflower.....	3 to 6	3 to 4		115 to 140
Celery.....	3	3 to 4		110 to 140
Corn.....	5 to 10	3 to 4		110 to 145
Green Beans.....	5 to 8	3 to 5		120° to 145°
Onions.....		3 to 3½		120° to 140°
Peas.....	5	3 to 4		115° to 145°
Pumpkin.....	3	3 to 4		120° to 150°
Rhubarb.....	3	5 to 7		120° to 145°
FRUIT—				
Apples.....		4 to 6		120° to 150°
Berries.....		4 to 5		110° to 145°
Cherries.....		3 to 4		115° to 150°
Peaches.....		4 to 6		125° to 150°
Plums.....		4 to 6		110° to 150°

TIME TABLE FOR CANNING.

	Blanching.	STERILIZATION.		
		Hot water Bath.	Steam pressure 5 to 10 lbs.	Steam pressure 10 to 15 lbs.
VEGETABLE—	Minutes.	Minutes.	Minutes.	Minutes.
Asparagus.....	10 to 15	180	60	40
Beets.....	5	60	60	40
Brussels Sprouts.....	5 to 10	120	60	40
Cabbage.....	5 to 10	120	60	40
Cauliflower.....	3	60	30	20
Carrots.....	5	120	60	40
Corn.....	5 to 10	180	90	60
Greens.....	15	120	60	40
Lima Beans.....	5 to 10	180	60	40
Peas.....	5 to 10	180	60	40
Pumpkin.....		120	60	40
String Beans.....	5 to 10	180	60	40
Squash.....		120	60	40
Tomatoes.....	To loosen skins	22	60	40
Mushrooms.....	5	90	50	30
FRUIT—				
Apples.....		60	8	
Apricots.....	1 to 2	16	10	
Blackberries.....		16	10	
Blueberries.....		16	10	
Cherries.....		20	10	
Currants.....		16	10	
Gooseberries.....		16	10	
Pears.....	1½	30	8	
Peaches.....	To loosen skins	16	10	
Plums.....		20	10	
Pineapples.....	3	30	10	
Quinces.....	1½	20	8	
Raspberries.....		16	10	
Rhubarb.....	1½	20	15	
Strawberries.....		16	10	

EXPERIMENTS IN THE PRESERVING OF FRUITS AND VEGETABLES AT THE CENTRAL EXPERIMENTAL FARM, OTTAWA, ONT.

During the years 1917 and 1918 experiments in canning, preserving and drying fruits and vegetables were conducted at the Central Experimental Farm. The work in 1917 was in charge of Miss Laura Kirby, graduate in Household Science, Macdonald College, Que., while the author of this bulletin did the work in 1918, and the recommendations made are based on the results of Miss Kirby's work and her own. It has been thought important to publish the tables giving the different methods tried so as to impress on those who are about to preserve fruits and vegetables the necessity of adopting the best methods.

ASPARAGUS CANNED IN PINT JARS.

No.	Jars Canned.	Jars Kept.	Jars Spoiled.	Length of Blanching Period.	Length of Sterilization Period.	Method.	Why Spoiled.
1	15	15	.....	Minutes. 5	3 hours.....	Intermittent....	
2	6	4	2	5	60 minutes.....	Cold Pack.....	Sterilization period not sufficient for complete sterilization.
3	2	2	.....	5	60 minutes, 15 lbs.	Steam Pressure.	
4	1	1	.....	5	20 minutes, 10 lbs.	Steam Pressure.	

No. 1 Method Recommended.—It is of the greatest importance that asparagus for canning be fresh and tender. Select tips of uniform size and maturity. Wash carefully, cut in right length for jars, scrape off tough outer skin, tie in

bunches. Blanch by immersing the lower ends in boiling water 3 min., then immerse the entire tips for two min. longer. Plunge into cold water, then pack carefully in sterilized jars, tips up. Add 1 teaspoon of salt to quart jars, and cover with boiling water to within $\frac{1}{4}$ of an inch of the top of the jar. Sterilize by intermittent sterilization, one hour on three successive days.

BEANS, GREEN AND WAX, CANNED IN PINT JARS.

No	Jars Canned.	Ja. Kept.	Jars Spoiled.	Length of Blanching Period.	Length of Sterilization Period.	Method.	Why Spoiled.
1	22	22	.....	Minutes 5	3 hours.....	Intermittent....	
2	18	14	4	5	3 hours.....	Cold Pack.....	Beans too old to can successfully.
3	18	8	10	5	2 hours.....	Cold Pack.....	Sterilization period not sufficient for complete sterilization.
4	12	2	10	10	3 hours.....	Intermittent....	Beans too old to can successfully.
5	2	2	.....	5	20 min., 10 lbs....	Steam Pressure.	

No. 1 Method Recommended.—Wash, string and remove ends, cut if desired. Blanch 5 min., cold-dip, pack in sterilized jars, add 1 teaspoon salt to each quart jar, cover with boiling water to within $\frac{1}{4}$ of the top, half seal, sterilize by intermittent sterilization, 1 hour on three successive days.

BEETS CANNED IN PINT JARS.

No.	Jars Canned.	Jars Kept.	Jars Spoiled	Length of Blanching Period.	Length of Sterilisation Period.	Method.	Why Spoiled.
1	26	18	8	Minutes 15	1 hour.....	Cold Pack.....	Beets were not canned quickly, left in cold dip longer than necessary.
2	2	2	.....	10	1½ hour.....	Cold Pack.....	
3	7	2	5	15	1½ hour.....	Cold Pack.....	Beets were not packed in jars as soon as blanched and peeled.
4	4	4	.....	15	2 hours.....	Cold Pack.....	
5	2	2	.....	10	15 lbs., 30 minutes..	Steam Pressure.	
6	3	3	.....	10	10 lbs., 20 minutes	Steam Pressure.	

No. 1 Method Recommended.—Wash beets thoroughly, cut off the tops leaving two inches of stem and the roots to prevent loss of colour. Blanch 15 min., cold-dip, and scrape off skin and stems. Pack closely in sterilized jars, add 1 teaspoon salt to each quart jar, fill jar to within $\frac{1}{4}$ of an inch of the top with boiling water. Sterilize 1 hour.

BEEET GREENS CANNED IN PINT JARS.

No.	Jars Canned.	Jars Kept.	Jars Spoiled.	Length of Blanching Period.	Length of Sterilization Period.	Method.	Why Spoiled.
1	3	3	.....	Minutes *15	2 hours.....	Cold Pack.....	
2	3	2	1	*15	1½ hours.....	Cold Pack.....	Sterilization period not sufficient.
3	5	5	.....	*15	20 minutes, 10 lbs...	Steam Pressure.	

* Steam.

No. 1 Method Recommended.—Choose young leaves and wash carefully. Blanch in steam fifteen min., cold-dip, pack tightly in sterilized jars, add 1 tea-spoon salt to quart jar and cover with boiling water to within ¼ of an inch of the top. Sterilize 2 hours.

CARROTS CANNED IN PINT JARS.

No	Jars Canned.	Jars Kept.	Jars Spoiled.	Length of Blanching Period.	Length of Sterilization Period.	Method.	Why Spoiled.
1	25	23	2	Minutes 5	2 hours.....	Cold Pack.....	Jars were not air tight.
2	10	6	4	5	1½ hour.....	Cold Pack.....	Carrots were left standing in cold dip.
3	2	2	.....	5	20 minutes, 10 lbs...	Steam Pressure Canner.	

No. 1 Method recommended.—Wash and scrub carrots. Blanch 5 min. in boiling water, cold-dip, pack whole or in slices in sterilized jars, add 1 tea-spoon salt to quart jar, and cover with boiling water to within ¼ of an inch of the top. Sterilize 2 hours.

CAULIFLOWER CANNED IN PINT JARS.

No.	Jars Canned.	Jars Kept.	Jars Spoiled.	Length of Blanching Period.	Length of Sterilization Period.	Method.	Why Spoiled.
1	5	5	.....	Minutes 3	60 minutes.....	Cold Pack.....	
2	40	25	15	3	80 minutes.....	Cold Pack.....	Sterilization period not sufficient for complete sterilisation.
3	6	6	.....	3	1½ hours.....	Cold Pack.....	
4	7	7	.....	3	20 minutes, 10 lbs...	Steam pressure Canner.	

No. 1 Method Recommended.—Wash and divide head into small pieces. Soak in salted water 1 hour, which will remove any insects which may be present. Blanch 3 min., cold-dip, and pack in sterilized jars, cover to within ¼ of an inch of the top of the jar with boiling water. Sterilize one hour.



Corn Canned by
Intermittent Sterilization.



Beans Canned by
Intermittent Sterilization.



Cauliflower Canned by
Cold Pack Method.



Asparagus Canned by
Intermittent Sterilization.



Raspberries Canned by
Cold Pack Method.



Peas Canned by
Intermittent Sterilization.



Carrots Canned by
Cold Pack Method.



Rhubarb Canned by
Cold Pack Method.



Tomatoes Canned Whole by
Cold Pack Method.

CORN CANNED IN PINT JARS.

No.	Jars Canned.	Jars Kept.	Jars Spoiled.	Length of Blanching Period.	Length of Sterilization Period.	Method.	Why Spoiled.
				Minutes			
1	15	15	.....	5	3 hours	Intermittent....	
2	5	2	3	5	3 hours.....	Cold Pack....	Corn was too old to can successfully.
3	7	7	.....	5	5 hours.....	Intermittent....	On the cob.
4	1	1	.....	5	40 minutes, 10 lbs ..	Steam pressure Canner.	

No. 1 Method Recommended.—Blanch the corn on the cob for five minutes, cold-dip. Cut off the kernels, pack in sterilized jars and press firmly, so that corn juices may fill all spaces to within $\frac{1}{2}$ inch of the top as corn swells during sterilization. Add 1 teaspoon salt to each quart jar. Sterilize 1 hour on 3 successive days.

PEAS CANNED IN PINT JARS.

No.	Jars Canned.	Jars Kept.	Jars Spoiled.	Length of Blanching Period.	Length of Sterilization Period.	Method.	Why Spoiled.
				Minutes.			
1	16	16	.....	5	3 hours.....	Intermittent....	
2	6	2	4	5	2 hours	Intermittent....	Sterilization period not sufficient. Peas too old to can successfully.
3	8	8	.....	5	3 hours.....	Intermittent, 2 d	
4	13	13	.....	5	3 hours.....	Cold Pack.....	
5	10	4	6	5	3 hours.....	Cold Pack	Peas too old to can successfully.
6	9	.....	9	5	3 hours.....	Cold Pack....	
7	8	8	.....	5	45 minutes, 10 lbs ..	Steam Pressure Canner.	Used rubbers which had been used before.

No. 1 Method Recommended.—It is of the greatest importance that peas for canning be young and canned within five hours after picking. Blanch, cold-dip and pack one jar at a time.

Shell, blanch 5 min., cold-dip, pack in sterilized jars, add 1 teaspoon salt to a quart jar and cover with boiling water to within $\frac{1}{4}$ of an inch of the top. If the jar is packed too full some of the peas may break and give a cloudy appearance to the liquid.

Sterilize by intermittent sterilization one hour on three successive days. Wrap the jars in paper to prevent bleaching.

SPINACH CANNED IN PINT JARS.

No.	Jars Canned.	Jars Kept.	Jars Spoiled	Length of Blanching Period.	Length of Sterilisation Period.	Method.	Why Spoiled.
				Minutes			
1	2	2	.....	*15	20 minutes, 10 lbs...	Steam Pressure Canner.	
2	6	6	.....	*15	2 hours.....	Cold Pack.....	
3	4	4	.....	*15	25 minutes, 10 lbs...	Steam Pressure Canner.	

*Steam.

No. 2 Method Recommended.—Wash carefully, blanch in steam 15 min., cold-dip, pack in sterilized jars, add 1 teaspoonful salt to each quart jar and cover to within $\frac{1}{4}$ of an inch of the top of the jar with boiling water.

SWISS CHARD CANNED IN PINT JARS.

No.	Jars Canned.	Jars Kept.	Jars Spoiled.	Length of Blanching Period.	Length of Sterilisation Period.	Method.	Why Spoiled.
				Minutes			
1	6	6	.....	*10	2 hours.....	Cold Pack.....	
2	2	2	.....	*15	2½ hours.....	Cold Pack.....	
3	4	.....	4	*10	2 hours.....	Cold Pack.....	Used rubbers which had been used before.
4	4	4	.....	*15	20 minutes, 10 lbs...	Steam Pressure Canner.	

No. 1 Method Recommended.—Wash carefully, blanch in steam 15 min., cold dip, pack in sterilized jars, add 1 teaspoonful salt to each quart jar, cover to within $\frac{1}{4}$ of an inch of the top of the jar with boiling water. Sterilize for 2 hours.

APPLES CANNED IN QUART JARS.

No.	Jars Canned.	Jars Kept.	Jars Spoiled.	Sterilization Period.	Method.	Quantity of Sugar Used.	Reason why Jars did not Keep.
				Minutes.		Cups.	
1	6	6	.....	60 minutes.....	Cold Pack.....		
2	10	10	.....	60 minutes	Cold Pack.....	1 c. sugar..... 4 c. water.	
3	9	6	3	20 minutes.....	Cold Pack.....	1 c. sugar, 4 c. water.	Sterilization period not sufficient.

REMARKS—

No. 1—Could be used for pies.

No. 2—Shrank during sterilization.

No. 2 Method Recommended.—Wash, pare, and quarter or slice and drop into weak salt water. Blanch $1\frac{1}{2}$ min., cold dip, pack in sterilized jars and cover with water or thin syrup, 1 cup sugar-4 cups water, to within $\frac{1}{4}$ of an inch of the top of the jar, half seal. Sterilize 60 minutes.

Apples shrink during sterilization and for this reason economy of space is obtained by canning them in the form of apple sauce.

APPLE SAUCE CANNED IN QUART JARS.

No.	Jars Canned.	Jars Kept.	Jars Spoiled.	Sterilization Period.	Method.	Quantity of Sugar Used.	Reason why Jars did not Keep.
1	62	60	2	Minutes. 12	Open Kettle ...	Cups. c. brown. c. white.	Moulded on account of jars not being air tight.
2	87	78	.....	12	Open Kettle ...	c. corn syrup. c. white sugar.	.....
3	58	58	.....	12	Open Kettle ...	c. corn syrup. c. brown sugar.	.....
4	131	125	6	12	Open Kettle	c. white sugar	Moulded on account of jars not being air tight.
5	186	186	.....	12	Open Kettle ...	c. white sugar.	.....
6	37	37	.....	12	Open Kettle ...	c. brown sugar.	.....

No. 5 Method Recommended.—Pare, core, and cook until soft with a small quantity of water. Press through a colander or strainer and measure. Add $\frac{1}{2}$ cup sugar to 2 cups apple. Bottle in hot sterilized bottles, half seal and sterilize for 12 minutes.

Canned apple sauce should be served as cold as possible.

CURRENTS AND GOOSEBERRIES CANNED IN PINT JARS.

No.	Jars Canned.	Jars Kept.	Jars Spoiled.	Sterilization Period.	Method.	Quantity of Sugar Used.	Reason why Jars did not Keep.
1	4	4	.....	Minutes. 16	Cold Pack.....	Cups. 1 c. sugar. 2 c. water.	.....
2	7	7	.....	20	Cold Paek.....	1 c. sugar, 2 c. water.	.....
3	9	9	.....	10 (5 lbs. steam pressure).	Cold Pack.....	1 c. sugar,	.....
1	8	8	.....	16	Cold Paek.....	1 c. sugar, 2 c. water.	.....
2	3	.....	3	Running water from tap.	.....	No sugar	Not sterilized in any way.
3	5	.....	5	Water pumped on berries for 30 minutes.	.....	No sugar.....	Not sterilized in any way.

No. 1 Method Recommended.—Wash carefully and pack closely in sterilized jars, cover to within one-quarter of an inch of the top of the jar with boiling syrup, 1 cup sugar and 2 cups water. Half seal, sterilize 16 minutes.

RHUBARB CANNED IN PINT JARS.

No.	Jars Canned.	Jars Kept.	Jars Spoiled.	Sterilisation Period.	Method.	Quantity of Sugar Used.	Reason why Jars did not Keep.
				Minutes.		Cups.	
1	4	.....	4	20	Cold Pack.....	2 c. brown sugar 4 c. water.	Not sufficient sterilisation for brown sugar.
2	4	2	2	20	Cold Pack.....	1 c. brown sugar, 4 c. water.	Not sufficient sterilisation for brown sugar.
3	4	4	.....	30	Cold Pack.....	2 c. brown sugar, 4 c. water.	.....
4	4	4	.....	30	Cold Pack.....	1 c. brown sugar, 4 c. water.	.....
5	9	9	.....	16	Cold Pack.....	2 c. white sugar, 4 c. water.	.....
6	5	5	.....	20	Cold Pack.....	1 c. white sugar, 4 c. water.	.....
7	4	4	.....	.....	Open Kettle.....	1 c. sugar, 4 c. rhubarb.	.....
8	11	10	1	20	Cold Pack.....	No sugar.....	Defective jar.....
9	5	5	.....	25	Cold Pack.....	$\frac{1}{2}$ c. corn syrup, $\frac{1}{2}$ c. white sugar, $\frac{1}{2}$ c. brown sugar.	.....
10	4	4	.....	20	Cold Pack.....	$\frac{1}{2}$ c. brown sugar, $\frac{1}{2}$ c. white sugar.	.....
11	10	10	.....	25	Cold Pack.....	$\frac{1}{2}$ c. corn syrup, $\frac{1}{2}$ c. white sugar.	.....
12	5	.....	5	Cold running water for 20	.....	.....	Not sterilised in any way.
13	6	2	4	Cold sterilized water.	.....	.....	Not sterilised in any way.
14	5	5	.....	15 5 lb.	Steam Pressure.	2 c. sugar..... 4 c. water.	.....

REMARKS—

- No. 1—Fermentation took place after two weeks.
- No. 2—Not sweet enough for ordinary table use.
- No. 4—Not sweet enough for table use.
- No. 8—Could be used for pies.
- No. 12—Rhubarb fermented in a week.
- No. 13—Not satisfactory, peculiar taste.

No. 5 Method Recommended.—Wash and cut in inch pieces. Blanch $\frac{1}{2}$ min., cold-dip, pack in sterilized jars, cover with boiling water or syrup, 2 cups sugar to 4 cups water, to within $\frac{1}{4}$ of an inch of the top of the jar. Half seal, sterilize 20 min.

RASPBERRIES CANNED IN PINT JARS.

No.	Jars Canned.	Jars Kept.	Jars Spoiled.	Sterilization Period.	Method.	Quantity of Sugar Used.	Reason why Jars did not Keep.
				Minutes.		Cups.	
1	16	16	.....	16	Cold Pack.....	1 c. sugar, 1 c. water.	.....
2	8	8	.....	16	Cold Pack.....	No sugar.....	.....
3	4	4	.....	16	Cold Pack.....	1 c. white sugar, 1 c. brown sugar, 1 c. water.	.....
4	5	2	3	16	Cold Pack.....	1 c. brown sugar, 1 c. water.	Not sufficient sterilisation when brown sugar is used.
5	5	5	.....	22	Cold Pack.....	1 c. brown sugar, 1 c. water.	.....
6	3	3	.....	16	Cold Pack.....	$\frac{1}{2}$ c. brown sugar, $\frac{1}{2}$ c. white sugar, 1 c. water.	.....
7	5	5	.....	16	Cold Pack...	$\frac{1}{2}$ c. corn syrup, $\frac{1}{2}$ c. white sugar, 1 c. water.	.....
8	3	3	.....	Boiling water poured over berries. Not sterilised in any way.	.....	No sugar.....	.....
9	3	3	.....	Fireless Cooker...	Cold Pack.....	1 c. sugar, 1 c. water.	.....
10	5	.....	5	Cold running water.	.....	No sugar.....	Not sterilized in any way.

REMARKS—

No. 8—Might be used for pies.

No. 1 and No. 9 Method Recommended.—Wash carefully pack, in sterilized jars, cover with boiling syrup to within one-quarter of an inch of the top of the jar, using syrup made with 1 cup sugar and 2 cups water. Sterilize 16 minutes.

“Raw Canning” of Raspberries.—Pack washed fruit in hot sterilized jars. Fill jars with boiling syrup and seal tightly. Place jars in a wash tub, or similar vessel, and fill it with enough boiling water to come three inches over the top of the jars. Place a blanket over the tub and leave until cold, or over night. Invert to test for leaks.

CHERRIES.—Wash carefully and pit. Pack in sterilized jars and cover with syrup to within quarter of an inch of the top of the jar, using 1 cup sugar and 2 cups water for syrup. Half seal, sterilize 20 minutes.

PEACHES.—Blanch fruit two minutes, cold-dip, remove skins, cut in halves and pack in sterilized jars. Fill jar to within quarter of an inch of the top with boiling syrup, 1 cup sugar to 4 cups water. Half seal and sterilize 16 minutes.

PEARS.—Pare, cut in halves, drop in weak salted water to prevent discoloration. Pack in jars. Add boiling syrup (1 cup sugar to 2 cups water) to within quarter of an inch of the top of the jar. Half seal, sterilize 30 minutes.

PINEAPPLE.—Pare, remove eyes, pared or cut into slices or small pieces. Pack in sterilized jars, cover to within quarter of an inch of the top of the jar with boiling syrup (1 cup sugar to 2 cups water). Half seal and sterilize 30 minutes.

MUSHROOMS.—Wash and trim the mushrooms. If small, can whole; if large, they may be cut into sections. Blanch the mushrooms in boiling water for 5 minutes. Remove and cold dip very quickly. Pack them in jars and add boiling water to cover. Add 1 teaspoonful salt to a quart jar. Half seal and sterilize 90 minutes.

TOMATOES CANNED IN PINT JARS.

No	Jars Canned.	Jars Kept.	Jars Spilled.	Length of Blanching Period.	Length of Sterilisation Period.	Method.	Why Spilled.
1	18	18	.....	Minutes	25 minutes	Open Kettle (soup)..	
2	22	10	12	.....	25 minutes	Open Kettle...	Not well sterilized when cooked in open kettle.
3	30	30	.....	.....	22 minutes	Cold Pack, using boiling strained tomato juice	
4	17	17	.....	.....	22 minutes	Cold Pack, using no liquid.	

No. 3 Method Recommended.—Choose medium sized tomatoes, wash and blanch until skins are loose, cold-dip, and remove the skins. Pack whole in sterilized jars, filling the spaces with boiling strained tomato juice, made by cooking large and broken tomatoes until well cooked, and then straining, adding 1 teaspoonful salt to each quart of juice. Sterilize 22 min. Tomatoes may be cut in pieces, packed closely in jars and sterilized 25 minutes. If this is done add no liquid. Tomatoes may also be packed in jars, 1 teaspoonful salt added to each quart jar and jar filled to within $\frac{1}{4}$ of an inch of the top with boiling water. Sterilize 22 minutes.

ACKNOWLEDGMENTS.

The authoress's grateful acknowledgments are herewith made for the assistance rendered by Dr. Frank T. Shutt in taking the photographs to illustrate this bulletin. The necessary steps in canning are much more impressed on the person who is to do the work if she can see a demonstration of them, and the next best thing to an actual demonstration is good photographs showing clearly the different operations. The only photo not taken by Dr. Shutt is the one illustrating a demonstration in canning at the Experimental Farm which was made by Mr. F. Brown. The results of the experiments carried on by Miss Laura Kirby at Ottawa in 1917 were consulted in the preparation of the bulletin and use made of them when necessary, and acknowledgment of the assistance obtained from this source is gladly made.

STRAWBERRIES CANNED IN PINT JARS.

No.	Jars Canned.	Jars Kept.	Jars Spoiled.	Sterilisation Period.	Method.	Quantity of Sugar Used.	Reason why Jars did not Keep.
				Minutes.				Cups.
1	17	17	.....	16	Cold Pack.....	1 c. sugar, 1 c. water.	.....
2	17	16	2	22	Cold Pack.....	1 c. brown sugar, 1 c. water.	Defective jars
3	6	2	4	16	Cold Pack.....	1 c. brown sugar, 1 c. water.	Sterilisation period not sufficient for brown sugar.
4	10	10	.....	16	Cold Pack.....	No sugar.....	.....
5	2	.....	2	.....	Mashed.....	1 c. sugar to 1 c. berries.	Not sterilised.....
6	5	5	.....	16	Cold Pack.....	1 c. sugar, 1 c. water.	.....
7	4	4	.....	16	Cold Pack.....	No sugar.....	.....
8	3	3	.....	Over night.....	Fireless Cooker.	No sugar.....	.....

REMARKS—

- No. 5—Fermented in two weeks.
- No. 6—Sterilized 16 minutes before syrup was added.
- No. 7—Sterilized and boiling water added.

No. 1 Method Recommended.—Wash carefully, pack in sterilized jars, cover with boiling syrup to within quarter of an inch of the top of the jar, using syrup made with 1 cup sugar and 1 cup water. Sterilize 16 minutes.

PLUMS CANNED IN PINT JARS.

No.	Jars Canned.	Jars Kept.	Jars Spoiled.	Sterilisation Period.	Method.	Quantity of Sugar Used.	Reason why Jars did not Keep.
1	15	15	.....	Minutes.	Cold Pack.....	Cups. 1 c. sugar, 1 c. water.	.....
2	6	6	.....	30	Cold Pack.....	½ c. corn syrup, ½ c. sugar, ½ c. water.	.....
3	4	4	.....	30	Cold Pack.....	No sugar used	.....
	3	1	2	30	Cold Pack.....	1 c. brown sugar, 1 c. water.	Sterilisation period not sufficient for brown sugar.
5	3	3	.....	50	Cold Pack.....	1 c. brown sugar, 1 c. water.	.....
6	3	3	.....	30	Cold Pack.....	½ c. brown sugar, ½ c. white sugar, 1 c. water.	.....
7	8	8	.....	30	Cold Pack.....	1 c. corn syrup, 1 c. white sugar, 1 c. water.	.....
8	2	2	.....	30	Cold Pack.....	1 c. brown sugar, 1 c. white sugar, 1 c. water.	.....
9	8	8	.....	40	Cold Pack.....	1 c. brown sugar, 1 c. white sugar, 1 c. corn syrup, 1 c. water.	.....
10	10	10	.....	10 (10 lbs. steam pressure).	Cold Pack.....	1 c. sugar, 1 c. water.	.....
11	12	12	.....	20 (10 lbs. steam pressure).	Cold Pack.....	1 c. sugar, 1 c. water.	.....

REMARKS—

- No. 1—Syrup not sweet enough for native plums.
- No. 2—Syrup not sweet enough for native plums.
- No. 4—Syrup not sweet enough for native plums.

No. 1 Method Recommended.—Wash pack, in jar and cover with boiling syrup 2 cups sugar to 1 cup water to within one-quarter of an inch of the top of the jar. Half seal, sterilize 20 minutes.



