

Canning and Preservation of Fruit

By Miss Cora White,
A graduate of W. S. C. with the
Class of 1911

In order that the best results may be obtained the fruit for canning should not be over-ripe. In general, ripe fruits are less acid than green, and contain less starch, woody material, and crude fiber, and the carbohydrates commonly referred to as protein bodies and correspondingly larger amounts of the different sugars.

Fermentation and bacterial changes occur soon after the ripened state has been reached. Thus it is more difficult to preserve the fruit then than when it is not so fully matured. When a fruit has begun to ferment it is hard to destroy the ferment organisms and their spores so as to prevent further fermentation. However, there are some fruits which are improved by the proper kind of storage, as is the case with some varieties of pears and apples.

It is of great importance that the housewife know the changes which accompany the growth, ripening and storage of fruits. Thus, in cider making, the fruit should be used when the cider and vinegar content is high, as the quality of cider and vinegar is largely determined by the amount of sugar present.

Under-ripe fruit is the most satisfactory for jelly-making, for it still contains the so-called pectin bodies rather than the sugars and other carbohydrates characteristic of fully ripened fruit.

Principles of Canning and Preserving

The principles underlying the various processes of the preservation of fruits, whether by canning, preserving, etc., are: (a) thorough sterilization of the fruits and of all utensils and (b) the sealing of the sterilized fruit to exclude all germs.

A clean place in which to work is the first essential of thorough sterilization of the fruits and of all utensils and then dusted thoroughly with a damp cloth; the clothing of the workers and all towels used should be clean. Thus there will be fewer mould spores to float about.

To sterilize utensils used in the care of fruit, the steam pans, spoons, strainers, etc., may be put on the fire in cold or boiling water and boiled ten minutes. Tumblers, bottles, glass jars, and covers should first be washed and then put in cold water and heated gradually to the boiling point, and then boiled ten or fifteen minutes. The jars must be taken, one at a time, from the boiling water at the moment they are to be filled with the boiling fruit. If rubber bands are used, dip in hot water, but do not let stand. Use new rubbers each season, and care should be taken that the rims of the covers are not bent, as jars cannot then be hermetically sealed.

The fruit to be sterilized should be sound and clean. Fruit should be first washed before being prepared in any way; for example, strawberries should be washed before being hulled. Otherwise more or less dirt might be washed into the stem cavity, the berry would absorb more moisture, besides the firmness of the fruit is better retained.

The best way to wash berries is to put them in a colander and pour cold water over them. The quickest and easiest way to wash peaches is to drop them into boiling water for a few minutes, or better yet, fill a wire basket and place in boiling water and leave for about three minutes, then lift out the basket. Place basket for a few moments in a basin of cold water, lift, let drain and peel. Plums and tomatoes may be prepared in this manner for peeling.

Utensils Needed

The main thing to be remembered in regard to the utensils used, is that all the fruit is more or less acid, and that this acid attacks tin or iron, giving a bad color and a metallic taste to products; therefore utensils of these materials should not be used. The jelly pans and preserving kettles should be porcelain-lined, enameled, or of a metal that will not form any troublesome chemical combination with the fruit juices. Aluminum ware is growing rapidly in favor for this, as well as most other lines of cookery.

The most necessary articles to have at hand are two preserving kettles, one colander, one fine strainer, one ladle, one large-mouth funnel, one wire basket, one wire sieve, long-handled spoons, wooden masher, a few large pans, silver-plated paring knives, flat-bottom clothes boiler, wooden racks to put in bottom of boiler, squares of cheese cloth, jelly bag and plenty of clean towels.

It is well to have at hand small iron rings which may be slipped under the preserving kettle when the stove becomes too hot. Several small asbestos mats should be kept on hand.

As fruit keeps its shape better by not being cooked in deep layers, broad-bottomed kettles should be used. This also hastens the cooking

process, especially in jelly making, for the more surface there is exposed to the heat the quicker the material will cook.

Selection and Preparation

Fruit should not be gathered and allowed to stand long before using, as it loses its freshness. If impossible to use fruit at once put where it will keep cool and crisp. Prepare only as much fruit as can be cooked while it still retains its color and crispness.

In order to hasten the canning or preserving of fruit have the syrup in preparation, or if the sugar is to be added to the fruit have it measured before preparing the fruit. Anything that will make the work more convenient is a saving of time and labor. Decide upon the amount of fruit to be cooked at a time and have two measuring bowls, one for the sugar and one for the fruit. As the fruit is being prepared drop in the fruit measuring bowl and when bowl is full both fruit and sugar are ready for preserving kettle and the way is clear for another measure of fruit to be prepared and put in the second preserving kettle.

To Prevent Fruit Discoloration

If pared or cut fruit is exposed to the air it rapidly turns black in color owing to the action of oxydases, or ferments usually present in fruit, upon the tannin or other readily oxidizable bodies which are also normal fruit constituents.

To prevent such discoloration drop such fruit as apples, etc., into a bowl of cold water which has been made slightly acid—(one tablespoon full of lemon juice to a quart of water) also salt or lime water is sometimes used.

Another source of discoloration of fruit is the kind of knife used in preparing. The action of the acid of the fruit on a steel knife is the same as that which takes place when fruit is cooked in an iron kettle, thus leaving stains and dark places on the fruit besides giving it a metallic taste. To prevent this a silver-plated knife should be used.

Various Methods of Canning

The old-fashioned method of canning has always been to add the fruit to a syrup in a preserving kettle and when cooked dip into jars and seal. But the housewife is now on the alert to find even newer and better ways; ways that mean the saving of time and strength, and yet produce the same desired results.

Probably the best of the more recent methods is that of cooking the fruit in the can, itself. The fruit is prepared the same as for the old way, and the making of the syrup is the same. Place the fruit in a sterilized jar. When well filled pour the syrup over it slightly cooled so as not to break the jars and screw cap on loosely. If Economy jars are used, rinse caps in cold water and adjust on jars with one clamp only. Have ready a flat-bottomed clothes boiler in the bottom of which has been placed a wooden rack on which to set the jars, in order that they may not come in contact with the bottom of the boiler, otherwise they would break.

The water in the boiler should come up to within an inch of the top of the jars or necks. The water should be of the same temperature as the fruit in the jars. To avoid breaking the jars should be placed in the boiler so as not to touch. Cloth or folded newspaper should be placed between the jars and the sides of the boiler. Cover boiler and bring water to a boil. The time of boiling will necessarily depend upon the nature of the fruit—small fruits will need to be cooked about one-half hour, the harder fruits will require from three-quarters of an hour to one and one-half hours. When the fruit is cooked lift out of the jars, place on towel rung out of hot water, screw lid on tightly, label and set aside to cool.

Another method which has not yet come into general use is that of cooking the fruit in the oven, which does away with standing over the hot stove and the constant watching involved in the old method. Prepare the fruit as for canning, place in porcelain basins on an asbestos mat in the oven. If the fruit is not juicy a little water may be added to start the process. When done, can. If the amount of juice is deficient, add boiling water. Pears and peaches are more easily cooked in this way than the other varieties of fruits.

There is another method of cooking fruit in the oven which is better suited to all classes of fruits and has the advantage over the preserving kettle in that the shape, color and flavor of the fruit is retained better than when cooked in preserving kettles.

This is the method of cooking the fruit in the jars in the oven.

Cover floor of oven with asbestos mat or put into the oven shallow pans containing about two inches of boiling water. The pans are really better, for if the syrup runs over the pan catches it. Prepare the fruit and make the syrup the same as for any other method of canning. Fill the hot jars with the fruit, and pour in enough syrup to fill the jar.

As in canning, run blade of a silver knife around inside of edge of jar to permit air bubbles to arise to top and break. Place jars on mat or pans in moderately hot oven. Cook small fruits ten minutes, the larger, harder fruits will require more time. If the jars are not full when removed from the oven, fill with boiling syrup, wipe and seal. If Economy jars are used follow general directions for the application of "Economy lids." If screw covers are used tighten them after the glass has cooled.

The amount of sugar required for the small fruit is a little over half a pint to a quart jar of fruit. Large fruits, such as peaches, pears, quinces, crab-apples, etc., will require about a pint of syrup to a quart jar of fruit. No one set rule can be given for the sweetening of fruit, owing to the variety of fruits and the difference in personal tastes and preference. In fact, the less sugar used, the fresher and more natural the fruit will taste when opened for winter use.

Fruits may be canned without any sugar and then heated with sugar for table use when opened. Many prefer putting up fruit in this manner for pies. The fruit can be run through a sieve and made into fresh butters, etc., or combined with winter apples for butters or various marmalades. For canning many prefer to let the fruit stand in the sugar overnight and cook the next morning in their own juice.

All canned fruit should be plainly labeled and set away in a dry place. A box containing one hundred labels should not cost more than ten cents. The color of the fruit can be retained by slipping paper sacks over the jars or laying newspapers over and down the front of the shelf.

Diverts Funds Illegally But County Makes Profit

Although the treasurer of Pacific county is officially reported to have illegally diverted \$100,000, the county officials have persuaded the state officers not to start criminal proceedings or other actions on the ground that the act was done without criminal intent, has saved the county about \$7,000, and that procedure would make public the invalidity of county warrants and destroy the standing of warrants throughout the state with investors in such class of securities.

The deputy prosecuting attorney of that county, in conference with the state officers, said that this case differs from that wherein Geo. Bog, city treasurer of Tacoma, was sent to the penitentiary a number of years ago for diverting funds where the diversion really meant a large saving to Tacoma taxpayers.

The state officials have been trying to keep these facts quiet but in answer to direct questions Fred Leghorn said today:

"Pacific county was heavily in debt in its road and bridge fund and under the law as laid down in an official opinion by the attorney general, no county may legally contract indebtedness for road and bridge work while in debt to this fund. The Pacific county people were anxious for good roads and at a special election authorized an issue of \$100,000 in bonds to build two specific roads and construct four bridges. The bonds were sold and cash received.

The treasurer instead of keeping this money in a separate fund transferred it to the county road and bridge fund and used it to pay off outstanding debts. It is estimated he saved about \$7,000 in interest by this act. Contracts were let to the amount of \$60,000 for the road work authorized by the special bond election. Of course this is a debt the county will have to pay. How they are going to do so I do not know. I am informed nothing has as yet been paid to the contractors.

The prosecuting attorney has asked that no prosecution be started here until the officials have been given an opportunity to see if they cannot work out their salvation. He says also that under the circumstances and there being no criminal intent and a saving to the county made it would be impossible to get a jury in the county that would convict the treasurer if prosecution was started.

State Cattle are All to be Tested

Between 300 and 400 head of cattle owned by the state and used in connection with the various state institutions, are to be tested for tuberculosis by Dr. S. B. Nelson, in charge of the investigation work being carried on by the state experiment station and veterinary science department.

Dr. Wegner, who is connected with the staff at the Washington State Veterinary hospital No. 2, Spokane, left there for Medical Lake to test the cows at the insane asylum. Dr. E. T. Baker will superintend the work at the state penitentiary at Walla Walla and other institutions of the southeastern part of the state, while Dr. E. J. Drake of Seattle will have charge of the tests at Chehalis.

WASHINGTON SCHOOLS BEST IN NORTHWEST

F. F. Nalder, Deputy State Superintendent, Says Washington's Educational System Second to None in This Section.

F. F. Nalder, a graduate of W.S.C. at Pullman, Wash., now deputy state superintendent of public instruction, has returned to Olympia from the National Educational convention in California, and he announces that Washington has a school system that compares most favorably in every particular and is superior in many respects to those of the other Pacific Coast states. He declares that Washington has handled its land grant better than any other state and that as for summer schools for teachers that Oregon is just where Washington was twelve years ago.

"Our educational system is in some respects the best on the coast," said Mr. Nalder. "Our system of county and city adoption of text books, by boards of education so constituted as to render them interested only in the educational value of the books selected, is a step in advance. I talked with a number of leading school men and representatives of publishing houses, both from the coast and Eastern States, and it was the universal consensus of opinion that in this respect Washington has one of the best systems in operation anywhere. Also, our school system is proving to be second to none that I can learn of. Neither of the coast states have made such rapid progress in the development of practical branches, such as the manual arts and domestic economy, as has been made in Washington during the past five years. Indeed I met one woman who has been assigned the task of installing these branches in one of the largest cities of Southern California, and she is planning to come to Washington to study our system with a view to copying it for California.

"I spent some days in Oregon, visiting summer schools at the State University and the State Agricultural College. In the development of summer schools for teachers, Oregon is where we were twelve years ago. I found one of our leading school men, Superintendent J. G. Collicott, of Tacoma, giving a course of lectures at the University of Oregon, and his pupils and colleagues there are greatly pleased with his work.

"One noticeable lack in Oregon arises from the fact that her land grants for educational purposes were all sold, not to say frittered away, years ago, before great value became apparent. A study of Oregon conditions convinces me of the wisdom of our guarding most jealously this great heritage of the schools of Washington.

"While leading spirits in Oregon are vainly wishing they might have their land grants back, ours are steadily increasing the worth of our educational endowment.

"The state of Washington was well represented at the convention of the National Educational association. About 350 were present from this state, and in every public discussion that took place that I heard, the sane and advanced views expressed by Washington men won universal respect, and greatly increased my pride in our state. State Superintendent Dewey, who was the leading spirit in getting our large delegation there, deserves great credit for the fine representation of our state that was present."

Vaccination for Hog Cholera.

Probably the most important work that is being conducted by the veterinary department of the A. & M. College of Texas is the war on hog cholera which is being carried on by Dr. Mark Francis, professor of veterinary science and surgery, and Dr. Ross P. Marsteller, associate professor.

To the United States Department of Agriculture is due the credit for the discovery that inoculation would reduce the mortality in a herd of hogs affected with hog cholera and that it would make immune a hog that had been treated. The bureau of animal industry of the United States department of agriculture carried on experiments for years; there was work in the laboratory and work in field experiments that were numerous, but finally these experiments resulted in the highly important discovery that hog cholera could be prevented. When it was fully demonstrated that this could be done, the United States department of agriculture invited the representatives of the various state experiment farms to attend meetings held at the experimental farm of the bureau of animal industry near Ames, Iowa, and twenty-five states were represented at three meetings. Dr. Ross P. Marsteller attended for the Texas experiment station of the A. & M. College. There the evidence of the serum was presented and demonstrated in its use were had. Dr.

Marsteller returned to Texas and since that time he and Dr. Francis have carried on experiments on their own account, have gotten the best results and have furnished the serum to the farmers of the state at the actual cost of production. Very little money was provided by the legislature for this work—only \$500 per year being allowed—and the result was that they could not undertake it on as large a scale as the exigencies of the situation demands, but by economical use of the resources, by requiring those who were supplied with the serum to pay its actual cost of production, they managed to do a great deal of good. Dr. Marsteller has been sent for on several occasions to take charge of herds of hogs which had cholera and he has had fine success in the use of the serum.

It is unnecessary to give the history of the disease. It is found in practically all sections of the United States where there are hogs, a government bulletin making the assertion that it has been prevalent in this country since 1833, when an outbreak was discovered in the state of Ohio. While outbreaks may occur at any season of the year, the great majority of instances are in the late summer and fall. The mortality has run as high as 100 per cent in some herds, but the average is between 70 and 80 per cent.

Dr. Marsteller recently in a public address called the attention of the farmers to the many ways in which cholera can be started in a herd of hogs. He called attention to the unsanitary conditions that are allowed, damp or cold sleeping places, dirty troughs and dirty drinking places. He also related that hog owners carried the hog cholera germ from one herd of hogs to another. If cholera gets into a herd of hogs in the neighborhood, Farmer Jones will go over to see its effect. He will walk about the pen, kick a hog to start him up that he may see the symptoms. Then he will go back home and arouse his own hogs. With the same foot, he will kick one of his hogs to see his symptoms. That foot very probably has brought along the hog cholera germ. According to Dr. Francis and Dr. Marsteller there are many ways the disease may be carried into a herd of hogs, but the main thing to be done is to keep the germ away from the hog herd.

It requires the sacrifice of live hogs to produce the serum. Dr. Francis and Dr. Marsteller, at the A. & M. College, use the immunizing method which was discovered by the bureau of animal industry of the United States department of agriculture, which is as follows:

A vigorous hog—that is, one which has recovered from an attack of hog cholera or which has been exposed to the disease without contracting it—is treated with a large quantity of blood from a hog sick of hog cholera. After a week or two blood is drawn from the immune by cutting off the end of the tail. After standing, the blood clot is removed and the serum or fluid portion of the blood is mixed with a weak solution of carbolic acid and filled into sterilized bottles. There is in this fluid portion of the immune's blood the serum which will protect hogs from hog cholera. This serum is used in either one or two ways, viz: (1) The serum inoculation; (2) the simultaneous inoculation. These two methods of treatment are carried out as follows:

Serum Inoculation—The hogs which are to be protected are injected on the inside of the hind leg with a suitable dose of the serum alone. This injection will serve to protect hogs from hog cholera for several weeks and in some cases for a longer time, but if the hog is not exposed to hog cholera within a few weeks after this treatment, the immunity which is conferred by the serum will gradually lessen in degree and the hog may again become susceptible. If, however, the hog is exposed to hog cholera within a short time after the injection of the serum, the immunity becomes, so far as experiments have shown, of permanent and lifelong duration. From what has been said it will be seen that the injection of the serum alone is especially to be recommended in cases where there is immediate danger of exposure, especially when valuable hogs are carried to fairs and in yards where the disease has already broken out, but has not progressed very far. In herds of this character, all the well animals may be treated, and even in the case of slightly sick animals, much good may be accomplished by the serum injection.

Simultaneous Inoculation—In this form of vaccination the same serum is used as is employed when the serum alone is used, but in addition to the serum, there is injected on the opposite side of the body, in the same manner as the serum, a very small amount of blood taken from a hog sick with hog cholera. This simultaneous injection of serum and virulent blood confers upon the injected pig a permanent and lasting immunity, and is, therefore, to be

recommended in cases of well herds which may not be exposed for some months after the treatment.

It is estimated by Dr. Marsteller that the cost of producing the serum is about 25 cents the dose. He believes the serum preparation should not be attempted by untrained men, but rather that it should be handled by those who have made a study of the methods.

High Grades—No Examination

County School Superintendent Mattoon has received instructions from the office of State Superintendent H. B. Dewey that the act of the recent legislature, providing that certificates, or rather 90 per cent grades on certificates from other states, will be accepted in Washington hereafter.

The legislature of 1911 enacted a law which permits the superintendent of public instruction to accept grades of 90 per cent or above on valid certificates from other states under certain conditions in lieu of the examination. That section of the law reads as follows:

"Credits of 90 per cent or over on a valid certificate obtained by examination in any other state in which the examination questions are prepared and answer papers graded by the state department of education may be accepted subject for subject in accordance with the rules and regulations prescribed by the state board of education."

The following points in the law are especially noted:

1. Grades must be 90 per cent or above.
2. They must be on a valid certificate.
3. The certificate must have been issued by a state department.
4. The questions upon which the applicant was examined must have been prepared by a state department.
5. The answer papers of the applicant must have been graded by a state department.
6. An entire certificate can not be accepted. Only subject for subject.

Rules of the State Board.

1. The certificate shall show on its face that it is issued by the state department and be signed by the state superintendent of public instruction or other representative of the state department.

2. The original certificate must accompany application, but will be returned provided the teacher at the time of making application for a certificate in this state forwards a copy of such original for filing.

3. Any applicant, whose certificate does not show on its face the grades upon which the certificate was issued, may file such grades when properly certified to by the superintendent of public instruction, or other representative of the state department.

4. Only grades indicated by figures and based on a scale of 100 per cent shall be accepted.

5. "Subject for subject," as stated in the law, shall be construed to mean only such subjects as represent work fairly parallel to that required by the laws of this state: Provided, however, that (1) a standing in penmanship or writing shall be accepted in lieu of the examination in penmanship and punctuation; (2) the average of the grades in English and in American literature may be accepted as a standing in literature; (4) biology will be accepted in lieu of either (a) botany, or (b) zoology.

6. No subject shall be accepted in lieu of the State manual of Washington.

7. Experience credits shall not, under any circumstances, be added to grades earned in other states.

Certificates Accepted.

Alabama—Life, first and second grade certificates.

Arkansas—State, life and professional certificates.

Connecticut—State certificate.

Idaho—Life, state, first, second and third grade certificates.

Indiana—Life state License, professional state license, high school state license, common school state license.

Iowa—State, diploma, state certificate, first, second and third grade certificates.

Kentucky—Life diploma, state certificate.

Michigan—Indorsed first grade certificate.

Minnesota—Professional second grade certificate, common school first and second grade certificates.

If an applicant is in doubt he should take the examination in all of the subjects. If he is entitled to grades which may be found on his certificate, they will be credited to him.

The fact that a certificate is listed on this sheet does not bind the superintendent of public instruction to accept the grades on it. The certificate must be issued in accordance with the law and the rules of the state board of education. In many cases this can be determined only after the certificate has been examined by us.