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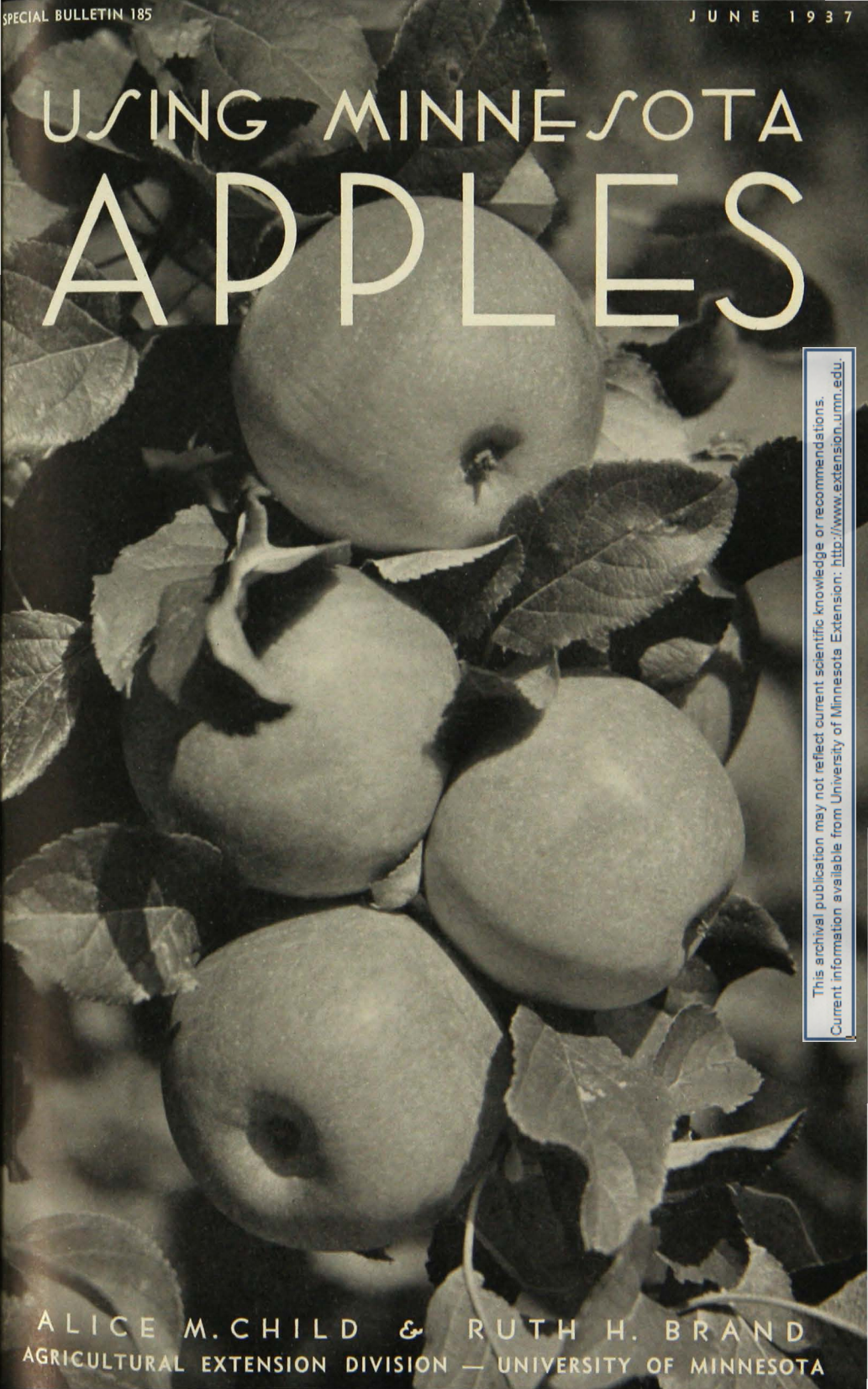
USING MINNESOTA APPLES



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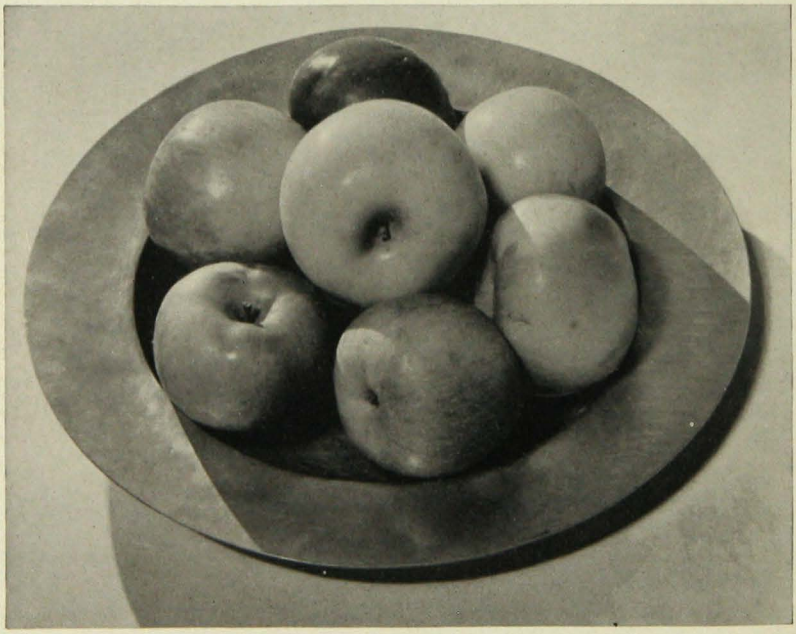
ALICE M. CHILD & RUTH H. BRAND
AGRICULTURAL EXTENSION DIVISION — UNIVERSITY OF MINNESOTA

Using Minnesota Apples

ALICE M. CHILD and RUTH H. BRAND[1]

Minnesota is now raising excellent apple varieties, some of which have been developed at the University of Minnesota Fruit Breeding Farm. The Home Economics Division of the University of Minnesota for several years has been studying these varieties, its main interest being in the varietal characteristics and qualities of apples which make them good for sauce, pie, baked apple, or jelly. This bulletin gives some of the results of this experimental work and interesting facts about apples and apple uses.



VARIETIES OF MINNESOTA APPLES

The many apple varieties show a wide range of differences and usefulness for various methods of cooking. Some apples are excellent for certain cooking purposes such as pie making, baking or glazing, and

[1] The authors are greatly indebted to Prof. W. H. Alderman for supplying fruit from the University of Minnesota Fruit Breeding Farm, to Prof. W. G. Brierley for suggestions and selection of fruit, and to J. D. Winter and Inez Nienow for judging apple products.

WPA workers and Federal students assisted in the laboratory work connected with this experimentation

jelly; some are excellent for eating; others are only fair for either purpose; while many varieties are so low in quality that they are practically worthless for any purpose.

Good apples for every purpose are now available and the purchaser will be better satisfied if she knows the varieties best suited to her needs and can select and purchase her apples according to variety. This is not difficult if she becomes familiar with about a dozen varieties. Choosing from these, she can give her family the most excellent cooking and eating apples the year around.

Remember that apple varieties have definite seasons and should be chosen accordingly. The varieties of best quality grown in Minnesota with their seasons are:

Early Fall Apples

(For a description of the crabapples and information concerning the jelly qualities of these apples, see section on Apple Jelly.)

BEACON.[2]—An apple which is striped or blushed with bright red over yellow and is often highly colored. Very good for eating, pie, and sauce. (Season—Middle of August to September 30)

RED DUCHESS.—A rosy red apple, which is a little tart for eating, but good for pie and sauce. (Season—Middle of August to September 15)

Fall Apples

PATTEN.—A clear, pale, greenish-yellow apple, sometimes blushed with orange or bright red. The ends of the apple are slightly flattened. It has good flavor when cooked for sauce, or pie. (Season—September to January)

WEALTHY.—An apple which is blushed or striped with red over pale yellow, often entirely red. Considered by some to be a little too tart for eating, but good for sauce, pie, or glazed apples. (Season—September to January)

Early Winter Apples

JONATHAN.—The bright red Jonathan is of high quality for eating because of its crisp flesh and pleasing flavor. Also it is unexcelled for pie, sauce, or glazed apples. (Season—October to January)

MCINTOSH.—An apple blushed or completely covered with dark red over a yellow ground, it is usually covered with a heavy bluish-white bloom over the entire surface, which may make it appear purplish. Its white flesh is fine, crisp, sweet, and aromatic, very good for eating raw, but not especially good for cooking. (Season—October to January)

CORTLAND.—This apple has a yellow ground color and is blushed or completely covered with dark red which is often dulled by a heavy waxy bloom. It has a very white flesh, which is delightfully crisp, and has a

[2] This apple was not tested by the Home Economics Division because it was not available when the work was started in the late fall.

flavor of the highest quality. It rates high as fruit for sauce or for glazing. (Season—October to March)

Winter Apples

HARALSON.—A greenish-yellow apple almost entirely overlaid with red. A new variety in Minnesota but one of excellent quality for pie, sauce, or glazing. It is slightly tart but is crisp and of good flavor for those who prefer a slightly tart fruit for eating. (Season—October to April)

MINNEHAHA.—A dark red apple with a crisp, juicy flesh. A good apple for sauce and for glazing. It makes a very good pie. Not extensively grown. (Season—October to February)

NORTHWESTERN.—A clear pale yellow or green apple which is sometimes faintly blushed. A very good apple for pie or sauce, but rather poor for glazing because it loses its shape. (Season—October to April)

WINDSOR CHIEF.—A yellow-green apple with a thin dull red. It has a firm, juicy flesh which is sweet. It makes a very good apple for glazing, and sauce, and also makes a very acceptable pie. Not extensively grown. (Season—October to April)

APPLE PIE

There are different standards for apple pie, but the one which has been adopted for this work is similar to that usually accepted by the commercial maker, who has found that it is the kind of pie which sells readily over the counter.

Standard Apple Pie

Upper crust.—Uniform golden brown, flaky and not soggy.

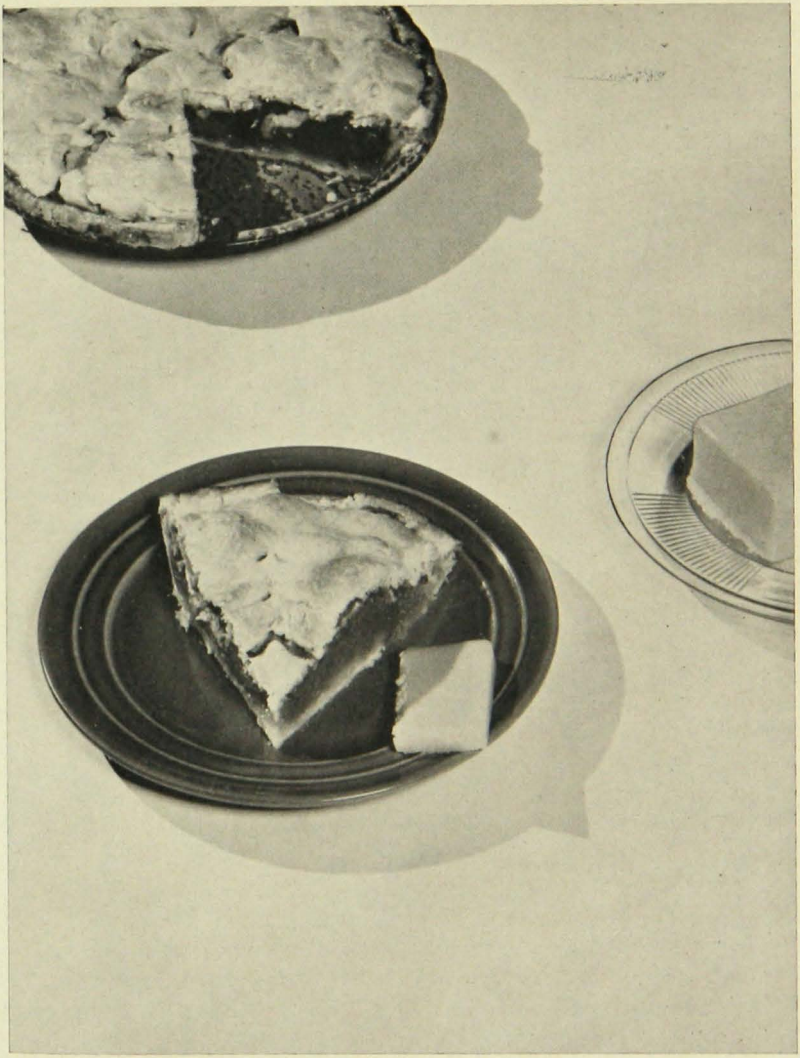
Lower crust.—Flaky, well done, browned on bottom, affected only slightly by apple juice.

Apples.—Color: Clear, translucent yellow (any brown present should be due only to spice). Shape: Pieces distinct but soft, so that they lie together without spaces between slices. Juiciness: Juice well retained in the apple pulp. Texture: Pieces tender and easily cut with a fork. Flavor: Characteristic apple flavor prominent and distinct; pleasingly acid.

Apple Pie

(Deep 9-inch plate)

Crust	Filling
1½ cups all-purpose flour or 2 cups pastry flour	5 to 8 tart apples (6 cups apple slices)
6 tablespoons shortening	½ to ¾ cup sugar
½ teaspoon salt	Spice to suit taste
4 to 6 tablespoons cold water	⅛ teaspoon salt



Cut shortening into flour until the pieces are about the size of rice kernels.

Sprinkle cold water over the surface of the flour mixture while tossing lightly with a knife or pastry fork. Add only sufficient water to hold the mixture together, and avoid overmixing.

Divide dough into two parts.

Roll dough on a lightly floured board or pastry canvas until it is slightly larger than the pie plate. Fold lightly in middle and lift carefully into the pie plate, easing it down into the pan by lifting the edges. Be careful not to stretch the crust, but take care that no air bubbles remain under it.

After crust is ready, peel and slice apples.

Mix apples thoroly with the sugar and spices and place in the lined pie plate.

Roll upper crust a little larger than the lower crust and prick or slit in several places to allow for the escape of steam. Fold and place over the apples.

Moisten upper surface of lower crust along edge of tin with milk or water and press upper and lower crusts firmly together with fingers so that there is a thick ridge around the rim of the plate.

Brush upper crust with milk, using either the finger tips or a pastry brush.

Bake in a hot oven (425° F.) 40 minutes.

Hints for Making Apple Pie

Preparation of fruit.—Fruit should be peeled just before using. Allowing it to stand exposed to the air after being peeled causes it to turn brown. Putting apples in water to prevent discoloration is not satisfactory because they absorb water and will make crusts soggy.

The following method of preparing the fruit has been found very satisfactory and rapid:

Peel, but do not core, apples which have been thoroly washed and dried.

Slice parallel to the core in ⅜-inch slices. Only two, or at the most three, slices from each apple contain core. Two strokes of the knife will remove these. The other slices can be cut in half.

Addition of sugar.—Too much sugar tends to mask the apple flavor. One-half cup is satisfactory for most varieties, and seldom should more than ¾ cup be used even if a sweet pie is desired. Mixing the sugar with the apples before they are put in the crust tends to preserve the color and improve the flavor.

Crust.—Brushing the upper crust with milk tends to produce a glaze and an appetizing brown color. Sugar may be dissolved in milk before brushing, or the sugar may be sprinkled over the top crust after coating with milk, if a sugary crust is desired.

Thin spots in the crust along the rim of the plate are apt to burn. It is best to pinch the crusts together so that a ridge is formed around the pie plate. This makes a thicker crust where the heat is most intense. Pressing down with a fork or fingers is to be avoided.

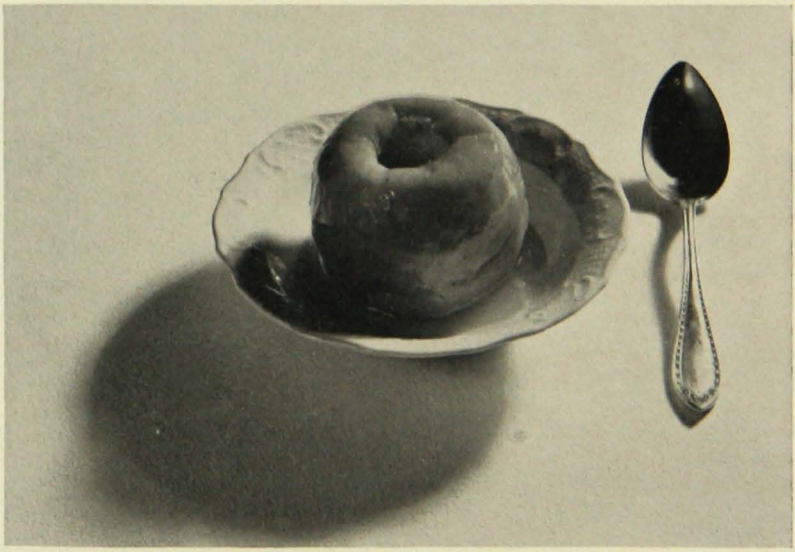
Oven temperature.—Baking in a hot oven (425° F.) for 40 minutes gave the most desirable pie, when judging crusts, flavor, and color of the apple. An oven temperature as low as 350° F. (moderate) may be used if the time is increased beyond 40 minutes. The use of a hot oven at the beginning and reducing to a moderate oven gave no better results than when a constant temperature was used.

Dripping of pies.—Many methods were tried to overcome the dripping of the juice into the oven, such as folding the upper crust over the lower crust before sealing, placing a piece of cloth or paper around the rim of the pie plate, or putting funnels through holes in the top. They all worked sometimes, but none of them were entirely satisfactory if enough apples of a juicy variety were used. The best method was to shrink the fruit before placing it in the crust. The apples and sugar were

mixed and placed in a covered baking dish for about five minutes, the juice was drained, and the apples were placed in the crusts. After the pie was baked, the juice was put through a hole in the top crust with a funnel or teaspoon.

BAKED OR GLAZED APPLES

Preliminary investigation revealed that few commercial concerns really bake apples, altho they still call them "baked" apples. Tests of varieties cooked by commercial methods, however, produced products that were superior in appearance and color and equal in flavor to those prepared by the ordinary oven method. A method which gave similar



results was worked out for use in the home. This we call "glazing," and it is in many respects similar to the commercial method of baking in the oven except that the apples are cooked on top of the stove. Glazing apples is a time-saver, as it takes less than half the time required for baking in the oven the ordinary way.

Selection of variety.—Select your apple variety for baking or glazing carefully because it must be one which will hold its shape when cooked and not become mushy. The varieties which hold their shape best when baked are: Duchess, Patten, Haralson, Jonathan, Minnehaha, and Windsor Chief.

Color of apples.—Apples cooked on the top of the stove have a better outside and inside color than those cooked in the oven in a covered baking dish and they have other qualities equal or superior to those of the oven-baked fruit. The reasons for this are that the time of cooking is

shortened and the temperature is lower on the top of the stove than it would be in a covered dish in the oven. The fruit turns brown and acquires an undesirable color if cooked uncovered.

Standard Baked or Glazed Apple

SHAPE.—Slight cracking of the skin or no cracking, apple having the appearance of being soft without flattening of the pulp.

COLOR.—Outside, a golden yellow with pink or red. Inside, a clear translucent yellow.

JUICINESS.—Juice well retained in the apple pulp.

TEXTURE.—Fine grained, smooth and granular, so tender that it may easily be cut with a fork.

FLAVOR.—Characteristic apple flavor, and pleasingly acid.

Glazed Apples

Scrub the apples.

Core and slit skin at right angles to the core around middle of apple and place in a sauce pan.

Put sugar mixed with spice in the core openings.

Add ¼ cup water for each apple.

Cover and place over low fire.

Cook until tender (usually 7 to 15 minutes), taking care not to overcook as the apples cook to a mush quickly.

Remove cover during last minute of cooking and turn apples once during this period to produce a glaze.

Spice may be added with the sugar, about 1 teaspoon to ½ cup sugar.

Baked Apples

Prepare as for glazing and bake in a hot oven (400° F.) for 30 to 45 minutes, depending upon the variety of apple. If baking apples with an oven dinner, lower temperatures may be used.

APPLE SAUCE

Some prefer a strained sauce, while others like a sauce in which the apple pieces hold their shape. There is little or no difference in the color or flavor characteristics which are desired in both kinds of sauce.

Standard Apple Sauce

CONSISTENCY.—A slightly rounded mass, not thin and watery.

COLOR.—A typical, uniform bright color.

TEXTURE.—Granular and not pasty when eaten.

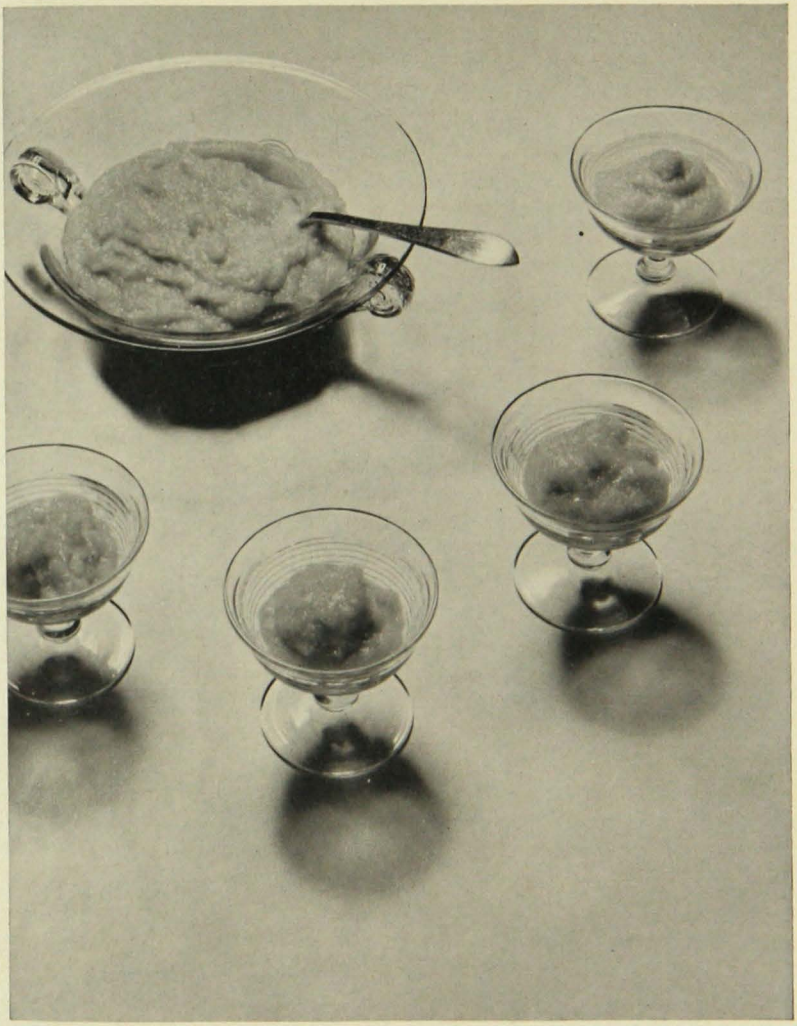
FLAVOR.—Characteristic apple flavor prominent and distinct.

Apple Sauce, Type I

(Six servings)

5-6 apples 6-10 tablespoons water 4-8 tablespoons sugar

Wash and scrub the apples. (Peel and remove cores if sauce is not to be strained.)



Slice in ⅛-inch slices.

Place apples in a sauce pan and add a small amount of boiling water. More water may be needed later for certain varieties, but most varieties can be cooked with very little if a tightly covered kettle is used.

Cover and place over a low fire.

Cook until tender, stirring occasionally to prevent scorching.

If the sauce is not to be strained, the sugar may be added at this point and the cooking continued only long enough to dissolve the sugar. Otherwise the sauce is strained before adding the sugar.

Spices may be added.

Apple Sauce, Type II

(Six servings)

5-6 apples 8 tablespoons water 4-8 tablespoons sugar

Wash and scrub the apples.

Peel and remove the cores and cut into eighths or halves as desired.

Place apples in a sauce pan and add water.

Cover and place over a low fire.

Cook until tender, stirring as little as possible.

Add sugar and continue cooking until sugar is dissolved and fruit becomes clear and translucent.

Spice may be added.

Choose your variety carefully for this type of sauce. The varieties recommended for baking or glazing are best for this type of sauce.

Hints for Making Apple Sauce

Size and shape to cut apples.—For a smooth or strained sauce, slicing in thin slices is the quickest and best method of cutting the fruit. For a sauce in which the fruit holds its shape, cutting into eighths, quarters, or halves is recommended.

Amount of water to add.—For a clear, translucent sauce, one tablespoon of water per apple is a good amount to use, altho the amount varies somewhat with the juiciness of the fruit, the consistency desired, and the quantity prepared. Avoid the use of too much water in sauce which is to be strained as it seems thicker before straining than after.

Sugar—How much and when to add.—The amount of sugar to use depends upon taste. Use just enough to bring out the apple flavor, but not enough to mask it. Two to 6 teaspoons per apple gives good results with most varieties. The fruit is more clear and is more easily cooked without scorching if the sugar is added after the fruit has been cooked tender.

Spice—Kind, amount, and when to add.—Whole spices (cinnamon, cloves) seem best. The best flavor is obtained if whole spice is added to the water and allowed to remain throughout the cooking. If ground spice is used, add it near the end of the cooking period for a sauce of the most desirable color. Use a small amount of spice, to blend with the apple flavor, not cover it.

Addition of lemon juice.—Lemon juice may be used to improve the flavor of some of the less tart varieties. It lessens the time required for cooking the fruit tender and is therefore recommended for varieties that are hard to cook. If lemon juice is added, more sugar may be needed.

Covered or uncovered while cooking.—Covering during the entire process of cooking improves flavor, color, clearness, and tenderness of the apple.

SOME GENERAL FACTS ABOUT APPLES

Flavor.—Flavor depends upon the variety and condition of the fruit. An apple has its best flavor when ripe. Fruit ripened on the tree usually has a flavor superior to that of fruit ripened after picking. Winter apples

are picked at the so-called "hard ripe" stage and further ripened after picking. Fruit that is well colored for the variety has the best flavor. Underripe or poorly colored fruit is apt to have an inferior flavor when cooked. Good flavor in a raw fruit is not necessarily indicative of good flavor in the cooked product.

Color.—Color is best preserved in cooked apples by limiting the time of cooking, regardless of method, to as short a period as possible.

The color of apple products is best conserved if oxygen is excluded during the cooking process. This may be accomplished by cooking in a tightly covered kettle.

The red pigments of apples lie just beneath the skin. Therefore, if a pink sauce is desired, do not peel the apple.

Shape.—The ability of apples to hold their shape when cooked is a characteristic possessed by some varieties and more or less lacking in others.

There is a slight tendency for acid to hasten the softening of fruit, and so it may be more difficult to cook tart apples without having them fall apart.

Altho cooking in a sugar syrup may seem to make the fruit hold its shape better, there is little actual difference in the shape of the fruit cooked in a sugar syrup and that cooked in water.

APPLE JELLY

Minnesota Apples for Jelly

Altho crabapples are perhaps the most commonly used apples for jelly, other varieties of apples may also produce jelly of equally good quality.

The crabapples most commonly used are:

DOLGO.—Medium to small in size, oblong in shape, and dark red when fully ripened. A valuable new variety. Season—late August.

FLORENCE.—Small to medium in size, usually round-oblate, prominently striped with carmine. Commonly found in old orchards. Season—late August.

VIRGINIA.—Medium in size, round, blushed or often completely covered with light red and slightly russeted. Season—September.

LYMAN PROLIFIC.—Medium to large, roundish, yellow with red stripes. Found commonly in older orchards, but no longer available at nurseries. Season—September and October.

ELSA.—Medium to small in size, nearly round. Color—bright yellow. A new variety of Canadian origin. Not available at nurseries. Season—late August.

HYSLOP.—Medium to large in size, nearly round, heavily blushed or entirely covered with deep red and a heavy blue bloom. Season—October.

TRANSCENDENT.—Medium to large in size, nearly round, usually obscurely ribbed. Color—clear yellow with a bright red blush. An old

variety of excellent quality, but the tree is so subject to the fire-blight disease that it is no longer recommended for planting. Season—September.

WHITNEY.—Large for a crab, yellow striped or nearly covered with red. One of the old varieties. A sweet crab useful for pickling but not for jelly.

For a description of other apple varieties mentioned in this section see pages 2 to 4.

The value of the different apple varieties for jelly is shown in Table 1.

Standard Apple Jelly

COLOR.—Attractive, transparent.

SHAPE.—Will stand when removed from the mold, yet will quiver when touched.

TEXTURE.—Will cut easily with a spoon, yet firm enough so that angles so produced retain their shape. Not syrupy, gummy, sticky, or tough.

FLAVOR.—Sub-acid to tart, with a flavor characteristic of the fruit.

Selection of apples for jelly.—An ideal jelly fruit has a good flavor and is rich in acid and pectin. One of the important considerations in selecting fruit for jelly is to select one of good flavor. Our grandmothers found that green apples made jelly of better texture than ripe apples, thinking that only green fruit had the material which caused the mixture to jell. So they sacrified flavor in order that the juice would jell. Recent work has shown that ripe fruit is necessary if cooked apple products are to have the best flavor and that even very ripe fruit has the material which we call pectin. Failures with ripe fruit are usually due to the fact that as the fruit ripens it loses some of its acid, and the lack of acid prevents the jelly from forming in some cases and in others produces a jelly of a sticky quality. Fruits which lack sufficient acid may be corrected as suggested under the heading "Addition of Acid," while those which lack sufficient pectin may be corrected as suggested under "Addition of Pectin."

Correction of the pectin or acid content or color of a fruit juice may sometimes be accomplished by combination of two or more juices, for example, the use of Northwestern with raspberry juice, or of Dolgo crab and Patten juice.

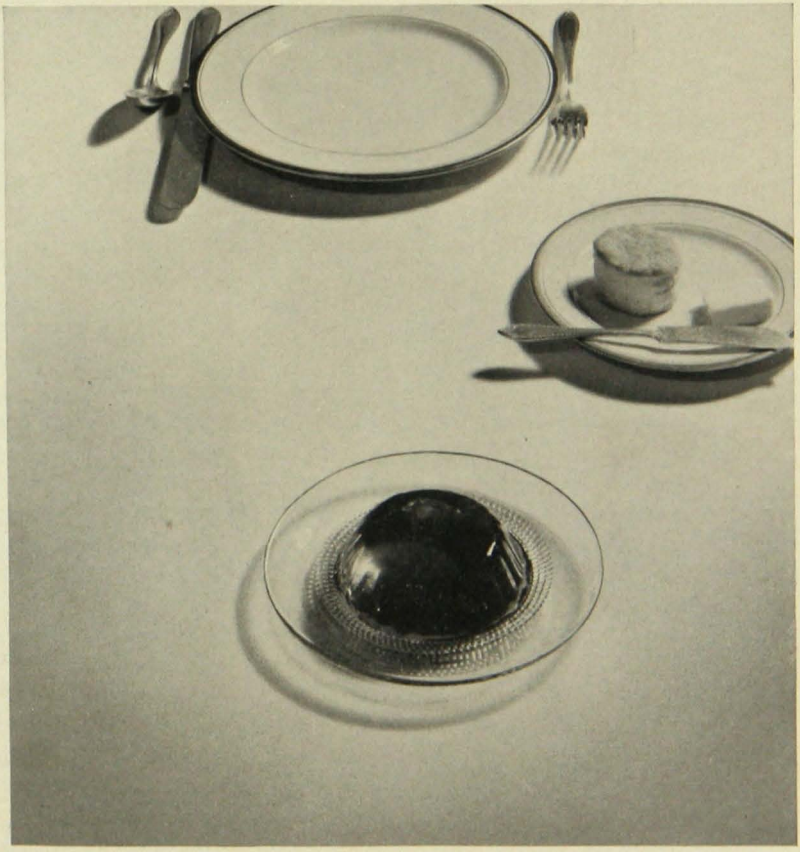
There may be considerable variation in the pectin content of apples, due to differences of variety, season, or locality. Each lot of juice should be tested before use by a reliable method to determine the pectin content. (See tests given in section on "Amount of Sugar for Jelly.")

Preparation of fruit.—Wash the apples, trim unsound portions, and cut in very thin slices with a stainless steel knife. Do not discard cores, peelings, or seeds.

Experimental tests tend to show that more pectin is extracted when the fruit is cut in small pieces. Grinding in a meat grinder gives the

greatest yield of pectin in the resulting juice, but the color of the juice is poor and the jelly made from the juice is inclined to be cloudy.

Amount of water.—One pound of water to one pound of apples is a safe amount to add for most varieties. (See note following table which classifies the varieties on the basis of their pectin content.)



Addition of acid.—Do you associate stickiness with apply jelly? Many apple jellies which hold their shape have an unpleasant stickiness. This is so common that some people consider it a necessary characteristic of apple jelly. We have found in our experimental work that adding 3 tablespoons of lemon juice to each pound of fruit at the time of extraction reduces this sticky quality and definitely improves the flavor. This lack of acidity in apple juice may also be corrected by adding lemon juice to the apple juice just before making jelly, in the proportion of one tablespoon of lemon juice for each cup of apple juice. This latter method uses less acid, but the yield of jelly from a given lot of fruit may

not be so large as when the first method is used, because the added acid helps to extract more pectin.

Extraction period.—Cooking the fruit to extract the pectin should be carefully timed. Practically all of the pectin is extracted from apples in a 15- to 20-minute boiling period. If the time is increased beyond 30 minutes, the jellying power of the juice is decreased rather than increased. Do not overcook, or the result will be less jelly rather than more, since the pectin in the solution is broken down by prolonged heating into substances which will not produce a jelly. A juice of better color is obtained if the fruit is cooked in a covered kettle, but it must be watched carefully and stirred occasionally to prevent scorching.

Draining and clarification.—Empty the cooked fruit pulp into a large colander which is placed over a bowl and allow it to stand for a few minutes until all of the juice has drained. Pour the juice while still warm through four thicknesses of cheesecloth which has been wrung out of hot water. Flannel or muslin may be used. Straining removes any pulp which has gone into the juice from the colander and helps to make a clear, sparkling jelly. The juice can be made into jelly immediately, or if you want the jelly to be especially clear, let the juice stand over night. The following morning pour the juice off carefully, taking care not to disturb the sediment in the bottom of the bowl.

Second extractions.—We have found that a second extraction of apples is rarely necessary to remove most of the pectin present in the fruit if sufficient water was used for the first extraction. Second extracts of apples rarely contain sufficient pectin to make jelly when used alone, and they have a weak flavor.

Fruit juices which have a very high pectin content may produce cloudy jellies. This difficulty may sometimes be overcome with a dilution of the juice. Second extracts are useful in these instances because they do have some flavor and yet serve to dilute the juice so that it will make a more satisfactory jelly.

Amount of sugar.—Experimental work has shown that cane and beet sugar give equally good results in making jelly. The amount of sugar necessary to produce a standard jelly is determined by the amount of pectin present in the juice and to some extent by the amount of acid present. The three factors—sugar, pectin, and acid—act as a three-cornered balance. If you increase the amount on one corner of the balance, you must also adjust the amounts of the other two to maintain the balance. With this idea in mind, it is easy to understand why juices which contain much pectin need more sugar than those containing smaller amounts, and also explains why an increase in acid may also increase the amount of sugar required.

The common method of determining the amount of sugar required for a juice is to estimate it from the pectin mass which comes down when alcohol is added to the juice. Altho it is felt that these tests are not wholly reliable and are sometimes confusing because other substances

such as gums and starches which are present in the fruit juice may also be precipitated, they do serve as a rough estimate. It may be that these tests are more reliable if sufficient acid is present in the juice.

Pectin Tests

Alcohol test.—A simple test for pectin may be made on any fruit juice by treating the juice with alcohol (grain, wood, or denatured). Place one tablespoon of cooked, cooled juice into a shallow cup or dish. Add 2 tablespoons of alcohol. Mix by gently tipping the cup.

Results of Alcohol Test	Amount of Sugar To Use for Jelly
In *excellent jellying juice,* the pectin precipitates almost at once so that practically all of the juice becomes solid with little or no liquid left.	1 cup to one cup juice
In *good jellying juice,* the pectin precipitates quickly in two or three large masses, but the volume is still good.	¾ cup to one cup juice
In *fair jellying juice,* a few lumps of jelly form, or there may be only a few flakes with considerable liquid.	½ cup to one cup juice
In *poor jellying juice,* there is little if any precipitate.	Will not make satisfactory jelly without the addition of pectin. When pectin is added to such juice, it should be retested.

"Jelmeter" test.—The amount of pectin in a fruit juice may be determined by another simple and rapid test. About a tablespoon of the cool juice is placed in a specially designed small glass tube[3] and the juice allowed to flow or drip for one minute. Various levels are marked on the tube in terms of cups or portions of cups of sugar to add for each cup of fruit juice. The level which the juice has reached at the end of one minute tells how much sugar to add for each cup of juice. This method has proved very satisfactory in our experimental work, and many homemakers are using it. If this device is used, directions which accompany it should be followed carefully if perfect results are desired.

Cooking Jelly

Experimental work has shown that sugar is best added before starting to cook the juice, as it tends to prevent the breaking down of the pectin or jellying substances by the heat. The sugar may be added without previous heating.

[3] A patented device called a "jelmeter" which is made by the Jelmeter Company, Bridgeton, N. J.

It is best to cook the jelly in rather small quantities, usually not more than 1 to 5 cups of juice at one time. It is possible with small amounts to cook more rapidly and in that way prevent the hydrolysis or breaking down of the pectin during the cooking process. Also, a short cooking process helps to preserve the fresh fruit flavor and to produce a more attractive color in the finished jelly. A kettle large enough to allow the juice to boil up rapidly is necessary (juice should not come higher than one-fourth the depth of the pan).

Spoon or sheet test.—Dip the spoon into the boiling juice, then raise it above the liquid, and let the juice run off from the side of the spoon. When the jelly is done, the juice will be so heavy that the last portions will break off in sheets instead of trickling in drops as at first. Take the jelly from the fire instantly when this point is reached, as further cooking will spoil it.

Final weight test.—If the amount of pectin is estimated with the jelmeter and a scale is available, the method suggested of weighing the sugar and juice and then cooking to a predetermined weight as given in the directions accompanying the jelmeter are simple and prove very satisfactory.

Table 1. The Pectin Value and Flavor Rating of Minnesota Varieties of Apples

Very good pectin source		Good pectin source		Fair pectin source		Poor pectin source	
Variety	Flavor	Variety	Flavor	Variety	Flavor	Variety	Flavor
McIntosh	Good	Red Duchess	Good	Haralson	Very good	Jonathan	*
Northwestern†	Fair	Patten	Good	Minnehaha†	Good		
Lyman Prolific Crab	Good	Cortland	Good	Transcendent Crab	Good		
Wealthy	Good	Dolgo Crab†	Very good				
		Elsa Crab	Good				
		Hyslop Crab	Very good				
		Virginia Crab	Good				

* No flavor rating is given since no jelly could be made.

† Second extraction contained sufficient pectin to make jelly when used alone. Second extractions were necessarily mixed with first extractions in those varieties which are rated very good as sources of pectin to produce a better quality jelly.

NOTE.—The amount of water used for extraction of those varieties which are rated as fair may safely be reduced to ¾ pound to 1 pound of fruit.

Table 1 gives the ratings on flavor and pectin quantity of the different varieties and is not intended as an index of the amount of sugar to be added. This information was secured by adding 6 teaspoons of lemon juice to one pound of water and extracting one pound of apples in this liquid for 15 minutes. The condition of the fruit may affect values to some extent, so the ratings should not be regarded as infallible without further tests of the fruit juice.

Preparation of Jelly Glasses

Wash glasses and covers with soap and water, put into a pan of cold water so that the water completely covers them, let the water come to a boil, and boil 10 minutes. Remove the pan from the fire and leave the glasses in the hot water until the jelly is nearly done. Take them out of the water with a sterilized spoon or fork, handling them as little as possible; drain, and let them dry. Neglecting to boil the glasses may cause the jelly to ferment after a few weeks. Pour the hot jelly into the hot glasses. Keep the covers in a clean place until the jelly has set.

If the water is hard and tends to form a scum on the glasses, sterilize them by placing them in the oven (250° F.) for one-half hour.

Paraffining the Jelly

A thin coating of paraffin may be poured over the jelly as soon as it is put in the glasses. When the jelly is set, add a second coat one-eighth inch thick, rotating the glass so that the hot paraffin is brought up on the sides of the glass and makes a perfect seal. If the jelly is kept in a place free from dust, no paraffin need be put on the top until it has set. After the second layer of paraffin has been added, tin covers may be put on the glasses and the jelly stored in a cool dark place.

Color of Apple Juice

The color of the juice depends on the variety used. The colors range from a red similar to that of currant jelly through the red-orange shades to yellow, and there are a few that are almost colorless. Many of the colorless juices are of good flavor, and the homemaker can exercise her ingenuity in skillfully combining them with fruit juices high in flavor and low in pectin, such as strawberries or raspberries, or adding fruit coloring and perhaps a flavor such as mint to a jelly tinted green. In Table 2 the apple varieties are classified according to the color of the jelly they will produce.

Table 2. Classification of Apple Jellies on Basis of Color*

Red	Red-Orange	Yellow-Orange	Yellow
Dolgo	Cortland	McIntosh	Northwestern
Duchess	Elsa Crab	University	
Hyslop	Haralson		
Transcendent	Lyman Prolific Crab		
	Minnehaha		
	Patten		
	Virginia Crab		
	Wealthy		
	Wolf River		

* These were the colors when additional acid was added. The color of the jellies made from normal extracts without additional acid were always less red.

METHODS OF PRESERVING APPLES[4]

Sulphuring Apples

Preparation.—Use only *fresh* apples. Wash, core, and remove any spots which may cause spoilage. Leave apples whole, cut into quarters or one-fourth–inch slices. The smaller the pieces, the less time will be required for sulphuring. Keep under cold water until ready to sulphur, then dry between towels.

Barrel method.—Equipment: Barrel, rod, heavy covering (rug), dish for burning sulphur, cotton batting, basket or cloth bag, cheesecloth, flowers of sulphur U.S.P. (only sulphur of a U.S.P. grade should be used—less refined sulphur may cause arsenic poisoning).

Place prepared apples in a cloth bag or in a basket which has been lined with cheesecloth. Hang the basket or bag over the rod and into the open end of the barrel. Spread cotton batting on a small dish and sprinkle with one tablespoon of flowers of sulphur (U.S.P.). Surround with shavings and place in the bottom of the barrel. Ignite the cotton. Hot coals may be used instead of the shavings. The hot coals must be added after the dish has been placed in the barrel. Allow to stand for one to four hours, or over night, according to size of apple pieces. Remove apples and store in sterilized containers (jars or crocks which have been boiled for 20 minutes) unless apples are to be dried.

Crock method.—Equipment: Three- or 5-gallon crock with lid, wooden rack or cloth supports, old saucer, flowers of sulphur (U.S.P.), cotton batting (3 inches in diameter).

Place the prepared apples on wooden or cloth supports in the crock, filling the crock about one-fourth full. Place a pad of cotton about three inches in diameter on the saucer. Sprinkle one teaspoon of flowers of sulphur (U.S.P.) on the cotton. Place the saucer on top of the fruit. Ignite the cotton and quickly cover the crock. Allow to stand for one to four hours, or overnight, according to size of apple pieces. Remove the saucer and cover the apples with wax paper. Add another layer of apples the same depth as the first. Repeat the sulphuring process. Continue adding layers of apples and sulphuring until the jar is filled. The apples may be stored in this crock in a cool place.

Drying Apples

Apple slices sulphured by the above methods may be dried as follows: Make a rack for the oven or one to hang over the stove so that air can circulate around the fruit. A desirable oven rack can be made by cutting one-fourth-inch galvanized wire screening two inches longer than a shallow pan and bending the ends of the screening so that it will fit over the top of the pan. Place the prepared fresh or sulphured fruit

[4] Methods for sulphuring and drying taken from "Sulphuring of Apples" by M. Baldelli, D. Nelson, Alice M. Child, and R. B. Harvey. *Minnesota Horticulturist* 63:168-169. 1935.

in single layers on the rack. Place the racks in the oven. Leave the oven door partly open to allow the dry warm air to circulate around the fruit and the moist air to escape. The time for drying will depend upon the thickness of the fruit (3 to 5 hours). The fruit is sufficiently dried when broken ends show no sign of moisture when squeezed between the fingers. The apples will appear more dry when cooled than when warm. Dried fruit should be leathery, not brittle.

Conditioning.—After the products are sufficiently dry, store in glass or pasteboard containers. Once a day for several days remove the product from the container and pour back and forth between two bowls several times and return to the container. Moist and dry particles are thus brought in contact with each other and a more even state of dryness is the result.

How To Use Sulphured and Dried Apples

Dried apples.—Cover the fruit with boiling water and allow to stand in a covered kettle at room temperature for several hours or until soft. Cook below the boiling point for 10 to 20 minutes in the water in which the fruit was soaked.

Sulphured apples.—Sulphured apples may be used the same as fresh apples except that less water is required for cooking. They do not need to be soaked.

CANNING APPLES

The quantity of raw apples needed to yield one quart of canned apples is approximately 2½ pounds.

Canned Apples, Method I

(With sugar)[6]

Pare the apples and cut into the sizes desired. If the pieces must stand, to prevent darkening, place them in a mild salt and vinegar solution—two tablespoons salt and two tablespoons vinegar per gallon of water.

Precook by boiling 5 minutes in a light syrup (5 cups sugar to 1 gallon of water). This procedure is necessary because apples packed raw shrink in canning so that the containers are not full.

Fill hot sterilized jars and cover with boiling syrup.

Process pint or quart jars for 15 minutes in boiling water bath (212° F.).

Apples may be baked or glazed as for serving and packed hot into hot sterilized containers, filling with hot syrup. The jars should then be processed for 5 minutes in a boiling water bath (212° F.).

If the apples are made into sauce and thoroly cooked before being packed boiling hot into the sterilized jars, the processing period should be 5 minutes in the boiling water bath (212° F.).

Canned Apples, Method II

(Without sugar)[6]

Pare the apples and cut into the sizes desired.

Steam until wilted to shrink the fruit (about 5 minutes).

[6] Developed from material given in U. S. Dept. of Agri. Farmers' Bulletin No. 1762.

Pack hot into hot sterilized jars, using no water or only a very little water. Process for 20 minutes in boiling water bath (212° F.) for 20 minutes. This method is commonly used for packing pie apples.

Canned Apples for Pies

Apples—1 gallon sliced Sugar—2 cups

Peel and core sound apples.

Slice one-eighth inch thick.

Pack apples in a gallon jar, placing a layer of apples and then a layer of sugar. Repeat until all the apples are used.

Cover with a plate and press down.

Allow to stand over night in a cool place.

Pack the apples into sterilized jars, using a wooden spoon to obtain a solid pack. Add enough juice to fill the jar.

Process 20 minutes in a boiling water bath (212° F.), counting time when water is actually boiling.

These apples make excellent pies. The juice may be cooked 5 or 10 minutes to concentrate before being canned. The canned juice may be used for drinking.

APPLE RELISHES

Apple Pickles

After trying several methods of preparing apple pickles, the following methods were chosen.

Crabapple Pickles, Method I

(4 to 5 pints)

4 cups sugar, white or brown
4 cups vinegar
¼ teaspoon oil of cinnamon[6]
⅛ teaspoon oil of cloves

Make syrup of sugar and vinegar, and boil 20 minutes.

Add spice oils.

Add apples and heat slowly to boiling.

Let stand over night.

Pack cold and process in boiling water bath 5 to 10 minutes.

Crabapple Pickles, Method II

3 pounds crabapples
1½ teaspoons whole cloves
1½ teaspoons allspice
1½ teaspoons ginger root, or stick cinnamon
1½ teaspoons whole black pepper
1½ cups vinegar
½ cup water
1 cup sugar

Wipe apples, pierce with fork, steam until fairly soft.

Place sugar, vinegar, and apples in preserving kettle.

Add spices tied loosely in cheesecloth bag.

Bring gradually to boiling point and simmer 20 minutes.

Place in hot sterilized jars and fill with hot syrup. Seal at once.

Care must be taken not to overcook apples.

Honey may be substituted for half or all of the sugar.

[6] Spice oils are very strong so measure them carefully.

Apples for Pickles

Transcendent, Virginia, Dolgo, and Hyslop crabapples were used in making pickles.

Transcendents made good pickles, altho the color is not so attractive as that of some of the crabs.

Dolgos made very attractive red pickles, but the skin was a little tough. The Dolgo is tart, so a little less vinegar and a little more water may be used in the syrup.

The Hyslop is probably one of the best crabs for pickling as the texture, color, and flavor are all excellent.

The Virginias were not suitable for making pickles as they lacked flavor and did not soften sufficiently.

Number of apples in a pint: Transcendent, 15 to 18; Dolgo, 25 to 27; Virginia, 12 to 14.

Cider Apple Butter

(About 2 pints)

5 cups apple pulp
1 cup cider
¼ teaspoon salt
2 tablespoons lemon juice
1 teaspoon cinnamon
2½ cups sugar

Place all ingredients in preserving kettle and simmer until thick and clear, or about 30 minutes, stirring often.

Pour into hot sterilized glasses and seal at once.

Any tart fruit juice or water may be used in place of cider.

The apple pulp left after extraction for jelly may be used.

Some may enjoy the butter cooked longer than 30 minutes, or cooked until quite dark.

Apple Chutney

12 sour apples
6 green tomatoes
4 small onions
2 green peppers
1 cup raisins
2 cups sugar
2 tablespoons mustard seed
1 quart vinegar
2 teaspoons salt

Cube apples, tomatoes, onions, and green peppers in uniform cubes.

Mix with other ingredients.

Cook slowly ¾ hour. Seal.

Apple Catsup

4 cups apple sauce
1 teaspoon ginger
1 teaspoon cinnamon
1 teaspoon cloves
1 teaspoon pepper
1 teaspoon mustard
1 teaspoon onion juice
3 tablespoons salt
1 to 2 cups vinegar

Mix ingredients and simmer slowly until thick, about one hour. Bottle and seal.

RECIPES USING FRESH APPLES

Cinnamon Apple Rings

4-12 red tart apples
½ cup vinegar
1½ cups water
2 cups sugar
2-inch piece stick cinnamon
Red coloring
10 whole cloves

Cut apples, with skin left on, crosswise into ½-inch slices and remove cores after slicing.

Cook apples, cinnamon, and cloves gently in the water and vinegar, in a covered saucepan, until the apples are tender, but not soft, when tested with a fork.

Remove apple slices.

Add sugar to the liquid in which the apples were cooked, bring to a boil, and cook until sugar is thoroly dissolved.

Return apple rings to syrup and cook until translucent. Remove from syrup. Add coloring to syrup and cook until thick.

Pour syrup over apple slices and cool.

Serve with meat. Jelly may be placed in center.

Magic Apples

4-12 tart apples
2 cups sugar
2 cups water

Flavorings which may be used:
Few drops mint extract and green coloring, or ¼ cup red cinnamon candies

Wash, pare, and core the apples.

Place in a covered saucepan with the water and cook until tender, but not soft, when tested with a fork. Remove apples.

Add sugar to the liquid and bring to a boil, cooking until the sugar is thoroly dissolved.

Add flavoring to the syrup and vegetable coloring if it is being used.

Return apples to the syrup and cook until clear and translucent.

Remove apples from syrup and cool.

Variations: Rosy apples: Do not peel or add additional flavoring.
Mint apples: Use mint flavoring and green color.
Cinnamon apples: Use red cinnamon candies for flavoring and color.

Uses for Magic Apples: These variations may be served as a salad, dessert, or as a garnish for meats or desserts.

Apple Crisp

(6 servings)

5 apples
1 teaspoon cinnamon
¼ teaspoon nutmeg
½ cup butter
1 teaspoon lemon juice
½ cup water
1 cup sugar
¼ cup flour

Slice peeled apples into greased casserole.

Sprinkle with spices, add water and lemon juice.

Work together sugar, flour, and butter until crumbly. Spread over the apples.

Bake uncovered for 45 minutes in a moderate oven (375° F.) or until apples are tender.

Serve warm with plain or whipped cream.

Pennsylvania Apple Pie

(1 medium-sized pie)

Plain pastry (¾ cup flour)
1 egg—well beaten
½ cup sugar
3 cups chopped apple
1 tablespoon flour
¼ teaspoon salt
1 tablespoon melted butter

Line a deep pie tin with pastry, building up the edge.
Fill with chopped apples.
Add the remaining ingredients to the egg, beat thoroly and pour over the apples.
Bake in hot oven (425° F.) for about 30 minutes.
If canned apples are used, drain thoroly before placing in crust.
Vary sugar according to sweetness of fruit.

Apple Crystals

2 cups granulated sugar
¼ teaspoon salt
1 cup water
5 apples
Flavoring
Coloring

Make syrup of sugar, salt, and water. Color as desired—green or red is attractive.

Wash, pare, core, and cut into twelfths, one apple at a time.

Cook the pieces of apple in syrup gently until all are transparent and easily pierced with a toothpick. Add flavoring toward end of cooking process.

Remove from syrup, drain, and place on waxed paper for 24 hours.

Roll in granulated sugar. Let stand again for 24 hours and again roll in sugar. Repeat until apples are dry and crystalline outside.

Add ¼ cup hot water to syrup and cook a second apple when the first has been removed from syrup. Repeat until all have been cooked.

RECIPES USING APPLE SAUCE

Apple Upside-down Cake

(8 servings—10-inch diameter)

1 cup brown sugar
4 tablespoons butter
1½ cups thick applesauce
3 eggs, separated
1½ cups white sugar
8 tablespoons apple juice or water
¼ teaspoon vanilla
1½ cups cake flour
1 teaspoon baking powder

Melt brown sugar and butter in iron skillet, stirring often to prevent burning.
Add applesauce without stirring.
Beat yolks of eggs until light and lemon colored.
Add sugar and continue to beat.
Add apple juice and vanilla.
Sift flour and baking powder together.
Add to sugar and egg mixture and beat.
Fold in egg whites beaten stiffly.

Pour this mixture over applesauce and bake in a moderate oven (350° F.) 40 to 50 minutes. Invert and remove from pan to a platter. Serve with whipped or plain cream.

Apple Meringue Dainty

2 cups applesauce (sweetened)
½ teaspoon cinnamon
¼ teaspoon nutmeg
1 tablespoon butter
2 tablespoons powdered sugar
2 eggs, separated

Add spice, sugar, and butter to the applesauce.

Pour sauce over beaten yolk, stirring thoroly.

Pour into baked pie shell and bake 10 minutes in a moderate oven (350° F.).

Make a meringue of the whites, pile lightly on the apple mixture and return to the oven to brown the meringue. Serve hot or cold.

Apple Sauce Cake

(8 inches by 10 inches by 2 inches)

½ cup shortening
1 cup sugar
1 egg—well beaten
1 cup raisins
1 cup nuts
¼ teaspoon salt
1 teaspoon soda
1 teaspoon cinnamon
½ teaspoon cloves
2 cups cake or 1¾ cups bread flour
½ teaspoon vanilla
1 cup apple sauce (thick puree)

Cream shortening, add sugar gradually. Continue creaming until well mixed.

Beat egg into creamed mixture.

Add sifted dry ingredients, chopped nuts and raisins, vanilla, and apple sauce.

Pour into a greased or lined pan and bake in a moderate oven (350° F.) for about an hour.

Cocoa Apple Sauce Cake: Substitute 5 or 6 tablespoons cocoa for an equivalent amount of flour.

One-half cup sugar and ½ cup honey may be used in place of the 1 cup sugar.

Apple Sauce Ice Box Dessert

(8 servings)

1 cup dry cake or cooky crumbs
¼ cup powdered sugar
1 cup cream, whipped
1 to 1½ cups apple sauce
1 tablespoon lemon juice
1 teaspoon vanilla

Mix finely crumbed cake or cookies with powdered sugar.

Fold into this the whipped cream, apple sauce, and flavoring.

Chill in refrigerator for one hour before serving.

One-half cup nut meats may be added. Berries or other fruits may be used.

Apple Mallot

(8 servings)

30 marshmallows
½ cup hot water
3 tablespoons lemon juice
2 tablespoons orange juice
2 cups applesauce
1 cup whipped cream

Dissolve marshmallows in water, stirring constantly.

Add lemon and orange juice; apple sauce.

Cool and add whipped cream.

Freeze in mechanical refrigerator or pack mold in three parts of ice to one of salt in a container.

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