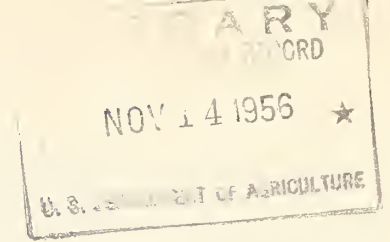


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Sauerkraut for

School Lunch and Institutional Use

These instructions for storing cabbage and for making, canning, or storing sauerkraut were written specifically for use in schools and institutions eligible to receive cabbage purchased through the U. S. Department of Agriculture's program to remove surplus agricultural commodities from the markets. The canning instructions were written primarily for school, community, and institutional canneries using tin containers. Information on canning in glass, however, is included for the guidance of those canneries that also use glass jars.

STORAGE REQUIREMENTS FOR FRESH CABBAGE

As soon as cabbage is received, store in a cool, well-ventilated place. Some moisture in the air is desirable to prevent excessive wilting. Summer cabbage does not store well. It should therefore be used as soon as possible to prevent heavy trimming losses. Fall cabbage will keep for longer periods of time under proper storage conditions. Bins with slatted floors are good to use for storing cabbage. They should be elevated to permit air to circulate under them.

KEY POINTS FOR SUCCESSFUL KRAUT MAKING

Both late and early varieties of cabbage may be used for sauerkraut. Early cabbage is harder to handle, however, because it matures during the summer when the weather is warm. Spoilage organisms grow rapidly at warm temperatures. Therefore, when making kraut from early cabbage, take extra care to see that it is kept cool (65° to 70° F.) during fermentation. Successful kraut making depends on:

1. Using cabbage that is sound, well matured, and fresh. (Do not use badly bruised or frozen cabbage.)
2. Trimming and shredding cabbage carefully.
3. Using the right amount of salt for the amount of shredded cabbage. Too much salt will prevent fermentation and cause kraut to turn pink. Too little salt will cause the kraut to soften. It is important to weigh cabbage after trimming or shredding so you will know how much salt to use.

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4. Getting the salt evenly mixed with the shredded cabbage. Failure to spread salt evenly may cause kraut to be soft or pink in spots.
5. Packing the salted cabbage firmly into clean crocks or barrels, then weighting it down so that brine covers the kraut.
6. Storing the kraut at the right temperature to get good fermentation (65° to 70° F.).
7. Keeping the scum cleaned off top of brine. Scum will cause kraut to spoil.
8. Letting the kraut stand until fermentation is completed. Kraut lacks flavor unless it is completely fermented.
9. Canning the kraut as soon as fermentation is completed or storing it properly to prevent spoilage.

Follow carefully the directions given for making and caring for kraut.

EQUIPMENT AND SUPPLIES NEEDED

Containers: Stone crocks ranging in size from 1 to 50 gallons are best to use for making kraut. They are easily cleaned and do not dry out when stored or rot when put in a damp place. Neither do they take up flavors or odors. They have no hoops to rust or drop off.

Wooden kegs or barrels may also be used if they are tight and don't leak. If brine leaks out, kraut will spoil. Do not use wooden vessels made from yellow or pitch pine, as the pine odor and flavor will be taken up by the kraut. If barrels are used, those made of fir, cypress, spruce, or redwood are best. Get new barrels or kegs, if possible. Old barrels or kegs will need to be cleaned carefully, scalded with boiling water or steam, and coated with paraffin or some other waterproof material.

For each 300 pounds of trimmed cabbage, at least one 50-gallon container will be needed.

Weights: Use a clean, hard stone for a weight. Be sure it is large enough to bring the brine up over the kraut. The kraut must be covered with brine at all times, otherwise it will spoil. A 5-gallon container should have about a 10-pound weight.

Clean Cloth: Several thicknesses of cheesecloth or a muslin cloth is needed to cover the kraut.

Boards: Boards placed on the cloth are needed to provide a firm surface for the weight and to distribute the weight evenly over the top of the kraut. Use 2 separate pieces of board other than pine, and shape them to fit the crock or barrel. Make them slightly smaller than the container so that they can be removed easily.

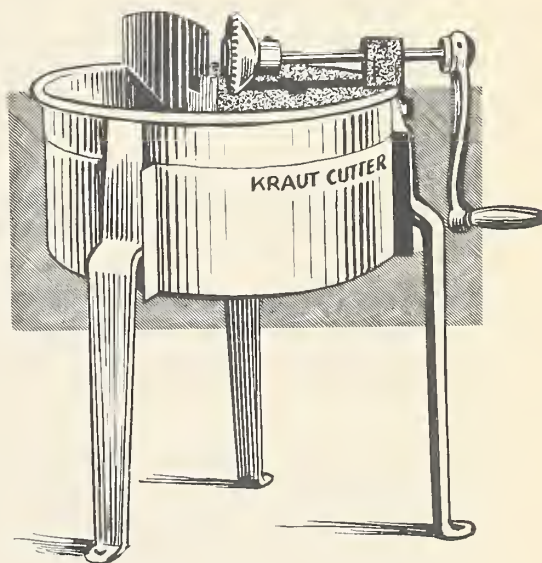
Scales: It is essential to have good scales on hand to weigh the cabbage and salt.

Salt: For each 100 pounds of trimmed or shredded cabbage you will need $2\frac{1}{2}$ pounds of salt. For a 50-gallon container of kraut using 300 pounds of cabbage, you will need $7\frac{1}{2}$ pounds of salt. Use a good grade of canning salt that is fine-grained and free from lumps. Do not use iodized salt.

Wooden Stomper: A stomper is needed to press cabbage into the vessel. Make one from a piece of hard wood, 4 to 6 inches in diameter.

Kraut Cutter: For making large amounts of kraut, get a hand-operated kraut cutter, such as the one shown here, or get one with a motor attached. For small amounts, use a slaw cutter with fitted box to hold the cabbage. Have knives of kraut or slaw cutter sharp and space them to cut a fine shred about the thickness of a dime.

Core Shredder: A core shredder is very useful when making large amounts of kraut. It shreds the core without removing it from the head of cabbage. The core passes on into the kraut when the cabbage is shredded, thus increasing the yield.



Kraut Cutter

Some suppliers of kraut cutters and core shredders are as follows:

Chisholm-Ryder Co., Inc., 5480 Highland Avenue, Niagara Falls, N.Y.
and San Jose, California.

Food Machinery & Chemical Corp., Canning Machinery Division,
101 East Maple Street, Hoopeston, Illinois.

F. H. Langsenkamp Co., South and Harmon Streets, Indianapolis 4, Ind.

A. K. Robins & Co., Inc., 111 Concord Street, Baltimore, Maryland.

(In furnishing this partial list of suppliers no guarantee of reliability is implied, and no discrimination is intended.)

MAKING SAUERKRAUT

1. Trim heads of cabbage to remove loose, outer green leaves and leaves that may have spray residue on them. Shred the cores with a core shredder or cut the heads lengthwise in half and quarter them to remove the core.
2. Weigh after trimming or when shredded.
3. Shred cabbage. Cut lengthwise of head, if possible, so that shreds will be long and slender. Make shreds about the thickness of a dime.
4. To each 10 pounds of cabbage, add $\frac{1}{4}$ pound of salt. (100 pounds of shredded cabbage requires $2\frac{1}{2}$ pounds of salt.) Pack the shredded cabbage into clean crocks or barrels. Pack in thin layers. Sprinkle salt on each layer. Divide salt so that each layer will receive a small amount. It is better to have more salt on the top layer than to put too much on the bottom layers. As each layer is added, press the cabbage down firmly with a wooden stomper. This will force the air out and help to get a better pack. It will also help to bring out the juice.
5. When crock or barrel is filled to within 2 or 3 inches of top, cover the cabbage with clean cheesecloth or muslin. Tuck the edges down to completely cover the kraut. Place boards on cloth.
6. Put clean, heavy stone on the boards to weight the kraut down. The weight should be heavy enough to keep the kraut below the surface of the brine. It is important to have the kraut covered with brine at all times to prevent spoilage.
7. To ferment kraut, store it at a temperature of 65° to 70° F., if possible. This is the best temperature for fermentation. Do not keep kraut too cold (below 60° F.) or too hot (above 85° F.). Fermentation is more rapid at warmer temperatures, but spoilage is more likely to occur. If kept too cold, the kraut will not ferment. Fermentation should begin within a day or two after packing. The level of the brine should come up and gas bubbles should form on the surface. A scum usually forms on the surface of the brine within a few days.
8. Remove scum from brine every other day. Scum left on kraut too long will cause spoilage.

9. Let kraut stand until fermentation is completed. This will take from 4 to 6 weeks, depending on the temperature of the room in which the kraut is stored. When fermentation is complete, bubbles cease to rise to the top of the liquid, and the kraut settles. At this stage the kraut should have a good flavor.
10. As soon as fermentation is complete, can the kraut or prepare it for storage in bulk.

CANNING SAUERKRAUT IN TIN CONTAINERS

Type and Number of Cans: Use plain (unenameled) type L cans, since they are most resistant to corrosion. Sauerkraut is an especially corrosive product and, if canned in lighter weight cans, may develop swells when stored for even a short period of time. If plain type L cans are not available, R-enamel cans may be used. However, they will make the kraut darker. Do not use C-enamel cans. Table 1 will serve as a guide in determining the number of cans you will need:

Table 1. -- Approximate number of containers needed for each 50 pounds of trimmed cabbage made into kraut

Tin Cans						
Size	:	No. Needed	:	Size	:	No. Needed
No. 2	:	30 to 32	:	No. 3	:	18 to 20
No. 2½	:	22 to 24	:	No. 10	:	6 to 8

If canning is to be done in glass jars, see page 7 for number of jars needed.

Preheating: Heat kraut in its own juice until hot (165° F.). Do not boil. If the kraut lacks juice, add more brine made by using ¼ cup (2 ounces) of salt to 1 gallon of water. Heat the kraut slowly and turn it often with long forks or paddles so it will heat evenly. Stainless steel kettles are ideal for heating kraut. Aluminum kettles may be used but the acid of the kraut may cause them to pit. Do not use copper or iron kettles as they will darken the kraut.

Filling: Fill hot kraut into cans to within ¼ inch of top. Add hot kraut juice to barely cover the kraut. Push a pointed stick through the center of the kraut to the bottom of the can and loosen the kraut so that the juice will be evenly distributed throughout.

Exhausting: Exhaust kraut for 3 to 5 minutes, depending on can size, to bring the center-can temperature to 165° F. This temperature at the time of sealing is essential to minimize development of flippers or springers.

Sealing: Seal cans immediately and process at once.

Processing: Process kraut in boiling water (212° F.) or in steam at 216° F. as follows:

<u>Size of can</u>	<u>Minutes 1/</u>
No. 2	20
No. 2½	30
No. 3	30
No. 10	40

1/ The processing times given above are for use at sea level where the temperature of boiling water is 212° F. At altitudes above sea level, the processing time will need to be increased because water boils at a lower temperature. A longer processing time is therefore required to heat the product through sufficiently to prevent spoilage. Use the following formula to make up a corrected timetable for the altitude at which processing is done: For each 1,000 feet above sea level add 1 minute to processing time for No. 2, No. 2½, and No. 3 cans. Add 2 minutes for No. 10 cans. Do not count processing time until water returns to boiling after cans are placed in water bath. Be sure water covers cans by at least 2 inches.

Cooling: As soon as processing is completed, cool the cans to 100° F. as rapidly as possible in cold running water to stop the cooking. Check temperature by shaking can and holding it against the bare arm. The can should feel just slightly warm. It is necessary to leave enough heat in the cans to dry them and prevent rusting. When removing cans from the cooling water, tilt the processing crate to drain off excess water and air cool cans until they are cold and dry. Stack cans on their sides in double rows spaced to allow for air circulation between rows. Let stand overnight or longer to completely cool them. Do not case sauerkraut until it is thoroughly cool. Otherwise it may darken.

Marking Cans: Mark the individual cans to show name of product and date processed. This may be done with a crayon or with phenol-free canners' ink. If cans are to be cased, mark the cases to give the same information.

Storage of Canned Kraut: As soon as cans of kraut are thoroughly cooled, they should be removed from the cannery and placed in a cool, dry room. This is particularly important where canning operations are under way as moisture will condense on the cans, causing them to rust. The storeroom should be well ventilated and as cool as possible without danger of freezing. The loss in quality during storage is four times more rapid at 90° F. than at 54° F. Do not stack cans or cases against storeroom walls, or too near the ceiling. Provide racks to keep product off the floor.

CANNING SAUERKRAUT IN GLASS JARS

Type and Number of Glass Jars: Use standard jars that are made for canning. Where possible use wide-mouthed jars, as they are easier to fill. To simplify operations, use self-sealing metal lids.

For each 50 pounds of trimmed cabbage made into sauerkraut you will need from 18 to 20 quart jars or from 9 to 10 2-quart jars.

Preparation and Processing: When canning kraut in glass jars the same general techniques are used as for canning in tin. Certain exceptions, however, must be made, as follows:

1. When filling sauerkraut into jars, leave $\frac{1}{2}$ -inch head space. Heat jars before filling to avoid breakage. If all air bubbles are not removed after loosening kraut with stick, work stick down side of jars. If necessary, add more kraut juice to cover kraut. Do not completely fill jars. Leave $\frac{1}{2}$ -inch head space.
2. Be sure top of jar is free from food particles, as this will prevent a good seal.
3. Seal or partially seal jars according to the type of lid used, and process at once.
4. Process sauerkraut in boiling water (212° F.) as follows:

<u>Size of jar</u>	<u>Minutes ^{1/}</u>
Quart	30
2-Quart	35

^{1/} These processing times are intended for glass jars that are to be air-cooled. They are intended also for use at sea level; therefore for each 1,000 feet above sea level add 2 minutes to the processing time for each size jar. (See footnote 1 p. 6.)

5. Remove jars from water bath as soon as processing is completed. Complete seals, if lids are not the self-sealing type.
6. Air-cool glass jars top side up. Give each jar room so that air can get to all sides. Never set a hot jar on a cold surface or in a draft. Sudden cooling may break the jar. Do not cover jars while they are cooling.
7. When jars are thoroughly cooled, store in a cool, dark room.

PREPARING BULK KRAUT FOR STORAGE

When fermentation is completed, store kraut where it will be kept cool. The cooler the better, as long as it does not freeze. If kraut is kept in a hot place for any length of time, it will spoil. Scum on the kraut will also cause spoilage. The kraut becomes soft and tasteless. It may also turn brown.

Air helps scum to grow. Even when kraut is completely fermented, scum will grow on the surface of the brine if air is present. Therefore, when fermentation is completed, the kraut must be sealed to keep the air out. An easy method for doing this is as follows:

1. Remove all scum from kraut.
2. Remove head from a clean barrel or keg. Bore a $\frac{1}{2}$ -inch hole in head.
3. Pack kraut to within 2 inches of top of barrel.
4. Fit the head into the top of the barrel or keg. Be sure it fits tightly.
5. Pour brine through the hole to completely fill the container. Use a brine made by adding $\frac{1}{4}$ cup (2 ounces) of salt to 1 gallon of water.
6. Check the container often for leaks. Add more brine, if necessary, to keep the container full. Make fresh brine each time that additions are necessary.

