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William J. Loeffel

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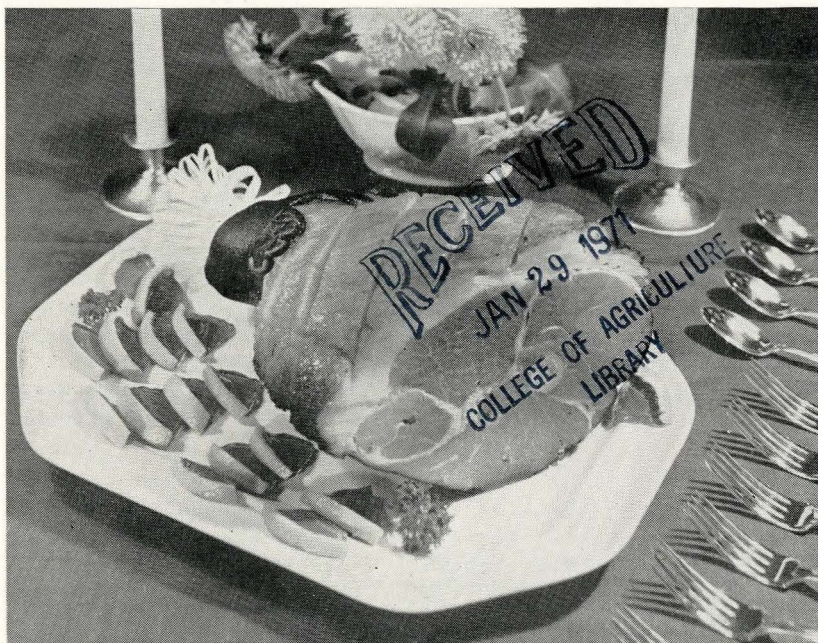
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Hog Slaughtering and Pork Cutting



University of Nebraska Agricultural College
Extension Service. Extension Circular 247

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This circular has been prepared for use of farm families who slaughter, cut and cure their own pork. The methods advocated are followed in slaughtering and meat cutting demonstrations arranged by county extension agents and livestock specialists of the agricultural extension service. These recommendations are based upon experiences of the author in conducting many such demonstrations throughout Nebraska.

Illustrations were made available through the courtesy of the Morton Salt Company.

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20M.

**Extension Service of the University of Nebraska College of Agriculture
U. S. Department of Agriculture Cooperating
W. H. Brokaw, Director, Lincoln, Nebr.**

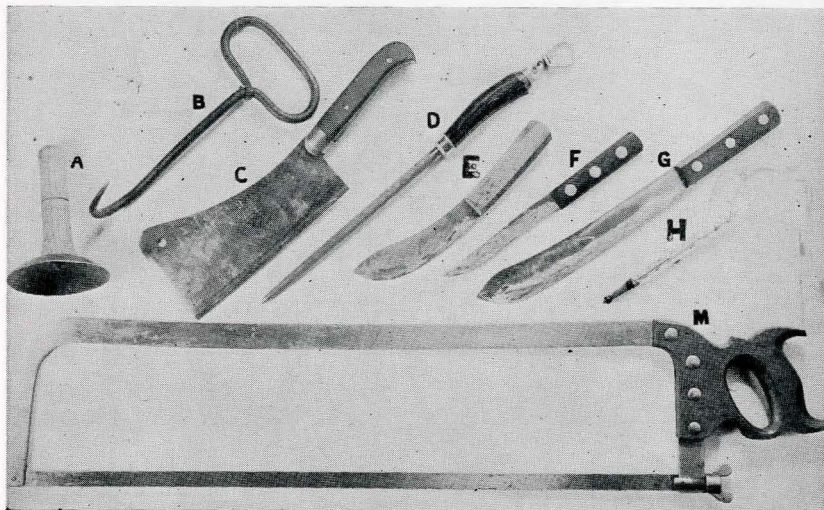
Hog Slaughtering and Pork Cutting

Wm. J. Loeffel

MEAT is a perishable product. It may be broken down as the result of bacterial action, the action of molds, and enzymes. It is imperative, therefore, that meat be handled in a cleanly manner. Animals should not be slaughtered in dusty or muddy surroundings, or handled with dirty equipment, for this definitely lowers the keeping quality of meat. Unless artificial refrigeration is at hand, slaughtering should not be attempted excepting when temperatures get down reasonably close to freezing at night. As the usual thing, it is a good plan to do the slaughtering in the afternoon so the carcass may chill overnight, and be cut up the following day.

Selecting the Animal

Only healthy animals should be slaughtered for food. This is particularly true where expert veterinary opinion is not available to pass on the wholesomeness of the carcass. The animal should be well-finished, for meat from properly fattened animals is more juicy, more tender, and possesses a better flavor. Well-fattened pork cures better and keeps better. For home slaughtering, light hogs, weighing from 225-250 pounds, are easier to handle and the carcasses chill more quickly. Light cuts may be cured in less time and with less hazard of spoilage and the cuts are leaner, thus better adapted to the requirements of the average family. As a general rule, hogs should be kept off feed for 24 hours prior to slaughter, although they should be given free



Good tools make the job easier. A—candlestick or bell scraper, B—hook, C—cleaver, D—Steel, E—skinning knife, F—boning knife, G—steak knife, H—dairy thermometer, M—saw.

access to water. If the hogs are empty at slaughter time, they will bleed better and are much easier to dress.

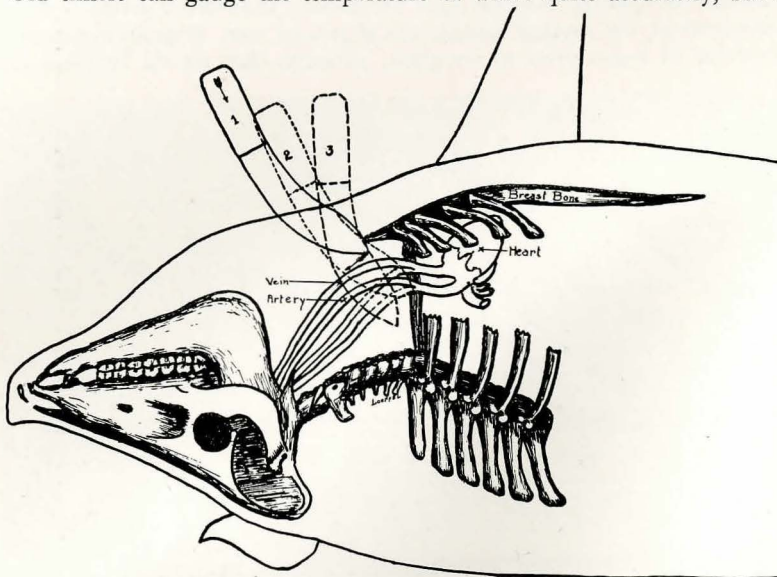
Little Equipment Needed

Equipment needed for hog slaughtering is relatively simple. All equipment should be assembled and carefully checked to see that it is ready for use.

A good knife, or better still, several well-sharpened knives are perhaps the most important items. A smooth steel is very helpful in keeping the edge on a knife, but for fear that the cutting edge may be dulled, a whet stone or water stone should be at hand. A meat saw is useful, especially for cutting up the hog, but if a meat saw is not available, a wood saw may be used. A cleaver will be needed if chops are to be cut, although a hand ax or hatchet may be used if necessary. The use of the cleaver should be reduced to the minimum because bone splinters in meat are very annoying.

Granting that the hogs are to be scalded, some means must be available for heating water. A large kettle or several wash boilers may be satisfactory. If live steam is at hand, water may be heated by running a steam hose into a tank or barrel of water. For scalding, a barrel may be used if the hogs are not too large. The barrel is usually set on a slant at one end of a bench, the lower edge of the barrel being set into the ground and the barrel blocked with sacks of sand or dirt. About one-third of a barrel of water is necessary. If the hogs are to be scalded by means of a hoist, the barrel should be set upright under a scaffold. A stock tank is excellent where a number of hogs are to be scalded.

Old timers can gauge the temperature of water quite accurately, but for



The back of the knife crowds the underside of the breastbone. A downward cut splits the forking veins and arteries.

the beginner, a dairy thermometer saves much time and annoyance. Candlestick or bell hog scrapers are perhaps the best equipment to remove bristles from scalded hogs. Some means of suspending the hogs should be provided. A timber about seven feet from the ground is very good, although a substantial tree limb may be used to good advantage. A hoist of some sort is very helpful. This may be a wire stretcher or a chain hoist. A short cultivator singletree makes a very satisfactory gambrel.

It is helpful to have a bench 18 or 20 inches high on which to lay the hog while scraping. This is usually made by placing a door on two sawhorses or on hog crates. An ample supply of hot and cold water is desirable to cleanse equipment and hands. Tubs, pails, and clean cloths also are needed.

Slaughtering

Unless the hog is very wild, there is usually no occasion to shoot him. Usually the hog is placed squarely on his back and the stickler bears down on the hog's chin with his left hand. He makes a short incision in front of the



With the pig squarely on his back, the incision is made just in front of the breastbone.

breastbone squarely in the center. The back of the knife is permitted to slide under the breastbone, after which a downward cut is made. This splits the veins and arteries which lie immediately beneath the breastbone. Properly stuck, a hog will die quickly. After sticking, the head should be down hill to obtain a more complete "bleed." If the hog can be suspended with a chain looped around one hind leg, bleeding will be greatly hastened. Any clots of blood should be washed from the carcass with cold water for they will prevent a good scald.

Scalding

Hogs may be scalded at temperatures as low as 140° F. However, on the farm, somewhat higher temperatures are needed, especially if the slaughtering is done on a cold day and if a metal barrel is used. Where temperatures can be accurately controlled, 146° is very good. However, under field conditions, it may be necessary to begin the scalding at temperatures as high as 150 or 155° F. When a barrel is to be used for scalding, it is generally preferable to scald the head end first, while the hind legs are still dry to furnish a good handhold. The hog is plunged up and down in the barrel, turning him from side to side. He should be permitted to "air" from time to time. When the front end of

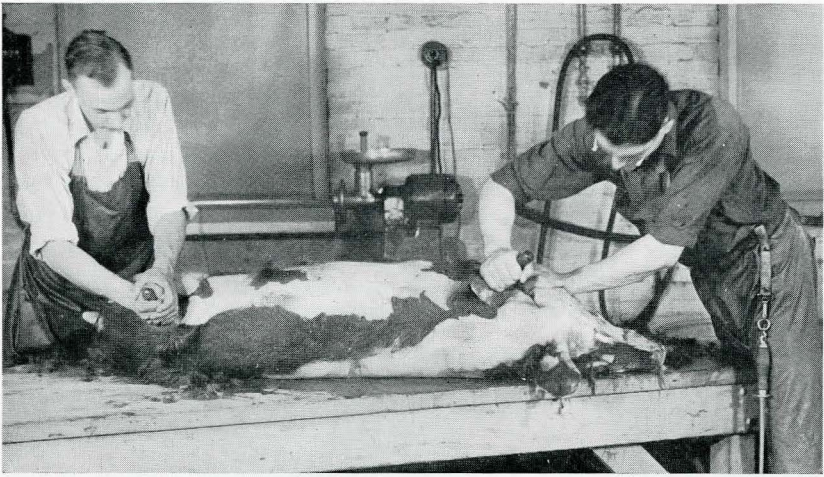


The head end of the pig is scalded first while the hind legs are dry.

the hog is thoroughly scalded, the hog is reversed and a hay hook placed in his lower jaw to pull him out of the barrel. The scalding operation is repeated until the back end is thoroughly scalded. With the addition of a little hot water, it is usually possible to scald two hogs with one batch of water, provided there is ample help so that scalding and scraping may be done at the same time.

Scalding may be facilitated by adding a little soap, lye, or wood ashes to the scalding water. Only enough should be added to "break" or soften the water. Too much lye will turn the skin of the scalded hog a yellowish-brown.

At certain seasons of the year, hogs are difficult to scald. This is particularly true in the early fall. Hogs scald best in cold weather. Considerable difference will be noted between breeds in ease of scalding. Hogs are usually adequately scalded when the bristles on the legs can be twisted off easily. Mangy hogs are difficult to scald.



Bell scrapers are convenient for scraping.

After scalding, the hog should be placed on the scraping bench and the bristles removed with hog scrapers as quickly as possible. These work more effectively if the scraping is done with the hair. Since the legs and head cool rapidly, they should be scraped first. A dash or two of hot water from time to time is helpful during the scraping process. After the hogs have been "roughed out" they are wet down and the scraper placed against the skin in a flat position and moved in a rotary manner. This creates a suction which removes most of the dirt from the skin. A bucket of water and a scrub brush or a vegetable



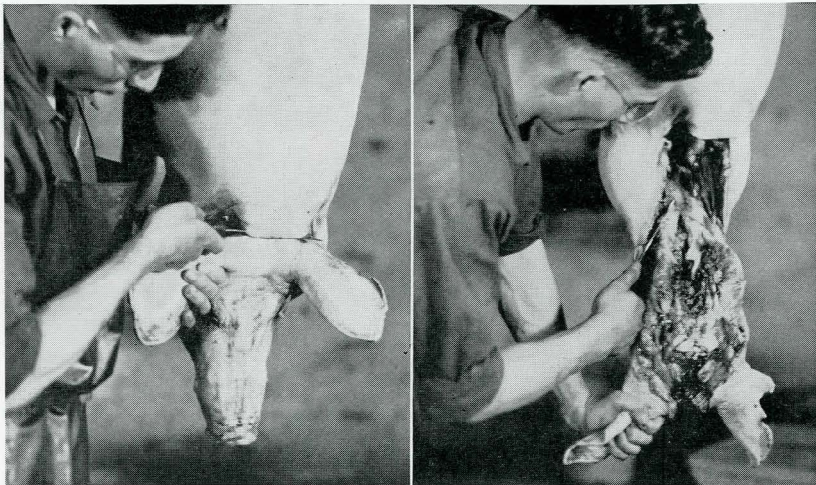
The gambreling incision is made squarely in the center of the back leg beginning between the dewclaws.

brush may be used to cleanse the obstinate spots. The hog is shaved with a sharp knife.

The gambrels are cut on the hind legs by splitting upwards from the dewclaws. With the incision made squarely in the center, the tendons will be exposed and can be fastened in the hooks of the singletree for hanging. If the hog has been properly scalded, the hoofs and the dewclaws may be removed with a hay hook. The carcass should be hung up and washed with warm and then with cold water.

Skinning

Some prefer to skin hogs, thereby eliminating the scalding equipment. Skinning a hog is a tedious job for a beginner, although some become very



The head is unjointed at the first joint back of the ears, then rolled out leaving the jowls on the carcass.

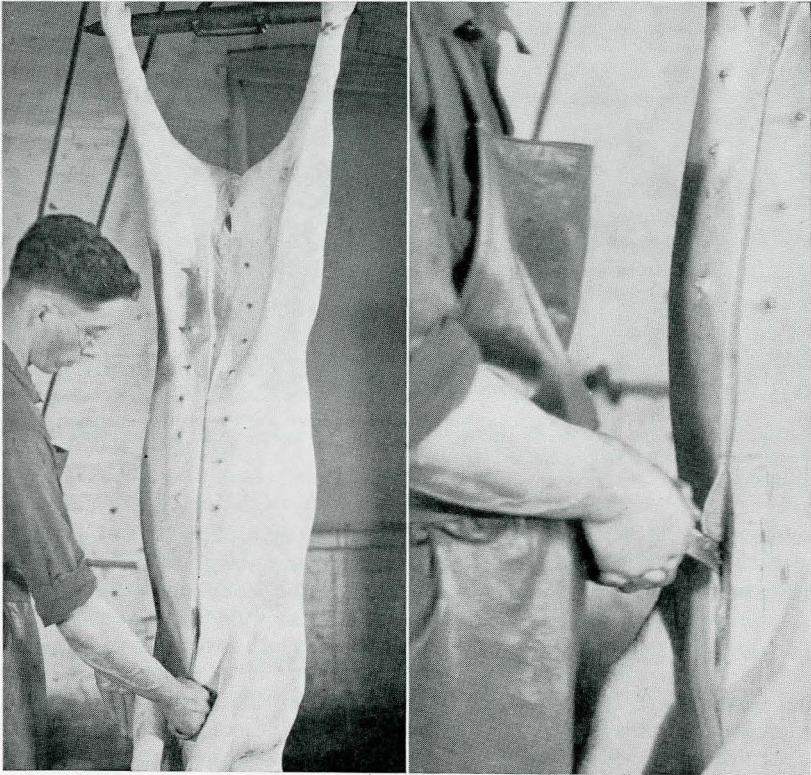
skilled at it. Skinned hogs are not as attractive as scalded ones, they become soiled more readily, and it is questionable whether skinned cuts keep as well. The rind probably performs a valuable function in protecting the cuts from oxidative changes in the fat which result in rancidity.

Dressing

The removal of the head permits drainage of the accumulated blood from the carcass. Many cut the head off just behind the ears, twisting it until the neck vertebrae are dislocated. This leaves the jowls on the head. A better method is to remove the head, leaving the jowls on the carcass. To do this the head is unjointed just back of the ears. A cut is then made around the jawbone, cutting nearly to the eyes and then down to the chin. This leaves the jowls on the carcass to chill. By this method one cut trims both shoulder and jowl.

The tongue is removed from the head. The eyeballs may be removed from their sockets with a narrow-bladed knife. The ears are split and the cores removed. The lower lip may be peeled from the lower jawbone. A knife may be inserted on each side of the jawbone. If properly loosened, the jawbone may be pulled down, unjointed, and discarded. The snout may be loosened and pounded back with a cleaver. Setting the head on its base, a saw cut is made to remove the nasal sinuses and the teeth. The skull may be split with a saw to remove the brain. The head, after washing and shaving, may be boned out for sausage and lard or it may be cooked up for head cheese and liver sausage.

Standing squarely in front of the hog, the belly is scored from between the hams to the point of the chin. Then the knife is inserted in the sticking cut with the cutting edge up. If the knife is grasped firmly in both hands, the breastbone may usually be split by pulling upward. In a mature hog, the breastbone may need to be sawed. The breastbone becomes thinner toward the rear edge and if too much force is used, the knife may slip through and perforate the stomach and intestines.

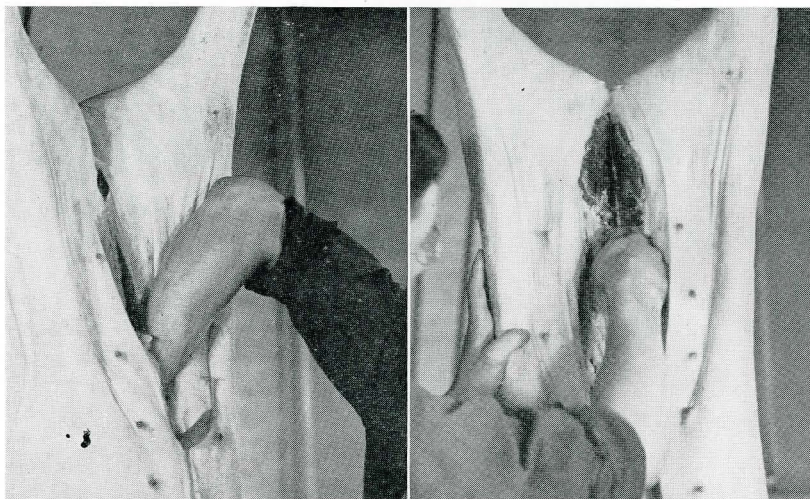


The belly wall is scored down the center.

The knife is inserted in the sticking cut, cutting edge up. Using it as a pry, the breastbone is split.

If the hog is a barrow, the pizzle and sheath should be dissected free, but left attached at the base. A short incision should be made in the belly wall as high as possible. The knife should be firmly grasped in the right hand and "choked down"; that is, grasped as near the blade as possible. The fist should be placed inside the body cavity with the blade out. Bearing down on the knife will cut the belly wall. By this method there is no danger of cutting the intestines for the knuckles crowd them away from the cutting edge. With the belly wall cut through, the abdominal viscera fall forward.

The hams should be divided in the center down to the pelvic or aitchbone. If the separation has been made squarely in the center, a cartilaginous seam will be found. Unless the hog is mature, the aitchbone may be split here with a knife. With an older hog, a saw may need to be used.

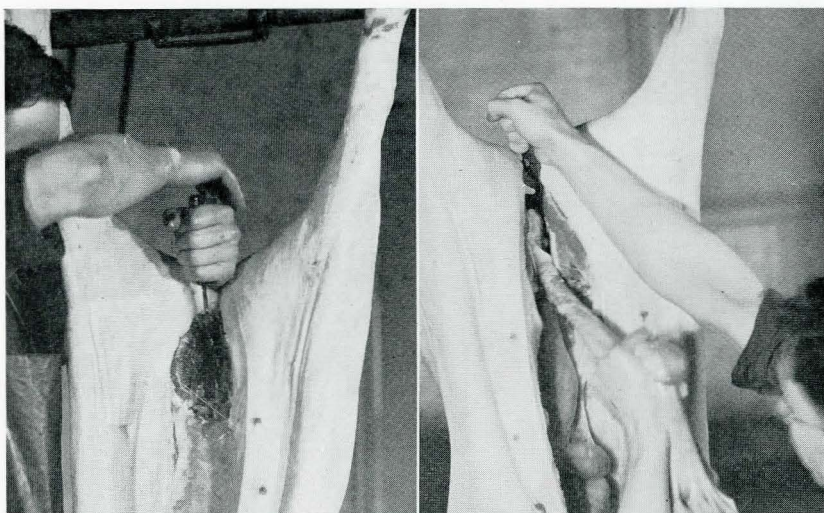


The clenched fist crowds the intestines away from the cutting edge in ripping the belly wall.

The hams are split to the pelvic or aitchbone.

The next step is to loosen the rectum, which may be stretched by pulling forward on the pizzle in the case of a barrow or the uterus and ovaries in the case of a gilt. The knife with the point downward is forced around the rectum. When it is cut free, it should be tied to prevent soiling the carcass. The rectum is drawn forward and downward, cutting the attachments. Care should be taken not to cut the small intestine which crosses the large intestine near the level of the kidneys. The kidneys and the leaf fat which covers them should be left intact in the carcass.

At this point a firm hold should be taken of the viscera with the left hand and the intestines supported with the left forearm. The liver will be found on the right side. It is attached by a blood vessel near the top. This must be cut to free the liver. The stomach is located on the left side. The hand may be



If the hog is too mature, the aitch-bone may be split in the center seam by tapping the knife handle.

With tension kept on the pizzle or the uterus, the rectum is cut free.

run behind the stomach and this organ loosened and pulled forward. Dragging forward and downward on the viscera will bring into view the gullet which passes through the red muscular portion of the diaphragm. For the beginner, the gullet should be cut off and the viscera placed on a clean table. An experienced butcher may remove the viscera from both the chest and body cavities at the same time.

The diaphragm is a sheet of white tissue which separates the body from the chest cavity. Through the center of the diaphragm and also around the outer border will be found a red muscular portion. The diaphragm is cut through "where the white joins the red," leaving the muscular portion in the carcass. The central fleshy part of the diaphragm is known as the "hanging tender." This is raised up, disclosing a large blood vessel beneath it. This vessel is cut across and pulled downward, together with the heart and lungs. The knife should be used to free these organs, leaving all possible pluck fat in the chest cavity. As the heart and lungs are pulled downward, the wind-pipe and gullet will also be removed.

Work Up Viscera Promptly

The viscera should be worked up before they have a chance to chill. The heart should be cut off, washed in cold water and chilled. The lungs are usually discarded. The liver is cut free from the intestines. The gall bladder is trimmed from it and the liver washed and chilled.

The long, flat, red organ is the spleen or melt. It is freed from the fat, and usually is discarded.



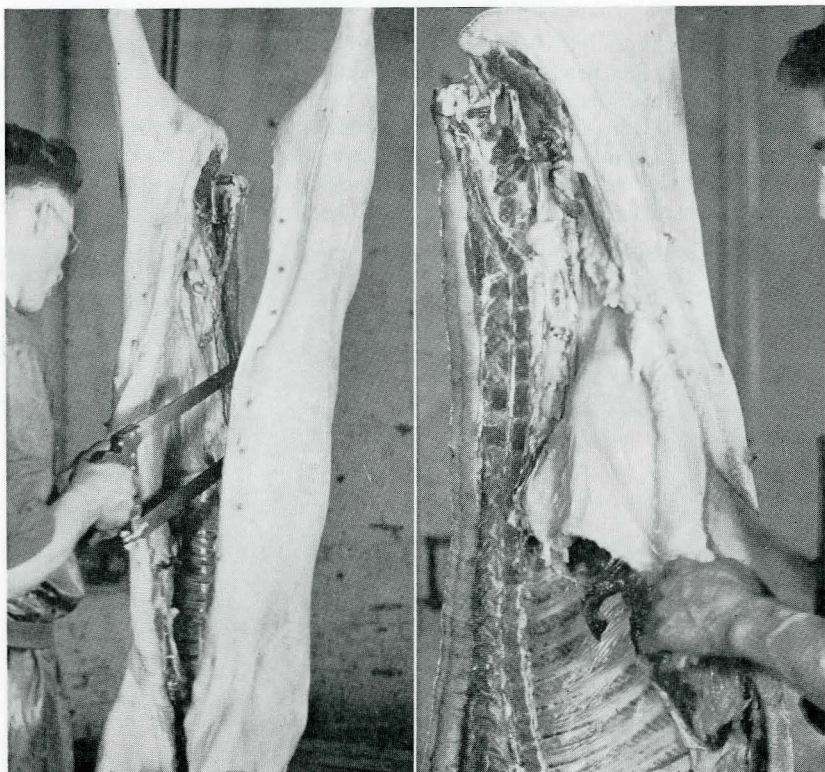
After freeing the rectum, the viscera are cleared by pulling forward and cutting across the gullet.

Over the viscera and attached to the outer border of the stomach is a thin layer of fat known as the caul, web, or apron. It may be cut free, plunged in cold water and chilled. If not soiled in dressing, it may be used for lard.

Even where the casings are not to be used, enough fat can be secured from them to justify "running" them. Where the intestines are to be used for casings, great care should be taken to prevent soiling them. The start should be made where the small intestine leaves the stomach. A double tie should be made and the intestine cut off between them. A little care is necessary to strip off the fat and to follow through the loop of the large intestine. Then the sheet of fat and connective tissue, or ruffle (mesentery) as it is known, is taken between the left thumb and fingers. The intestine is grasped in the right hand and torn from the ruffle. The intestines may be run into a pail or tub. When the large intestine is reached, the fat is torn off, washed, and chilled. As a rule, the large intestines do not carry sufficient fat to justify running them. The ruffle fat, if not soiled, is sometimes used for lard. However, it is probably best rendered separately for inedible purposes.

Cleaning Casings

Where the casings are to be cleaned, they should be spread out on a large table. Starting at one end, the contents are stripped, using the thumb and forefinger. Several strippings are desirable. For the beginner, it is a good plan to cut the small intestine into 10- or 12-foot lengths. Three people are necessary



Center splitting hastens chilling.

The leaf lard is easily loosened with the clenched fist while the hog is warm.

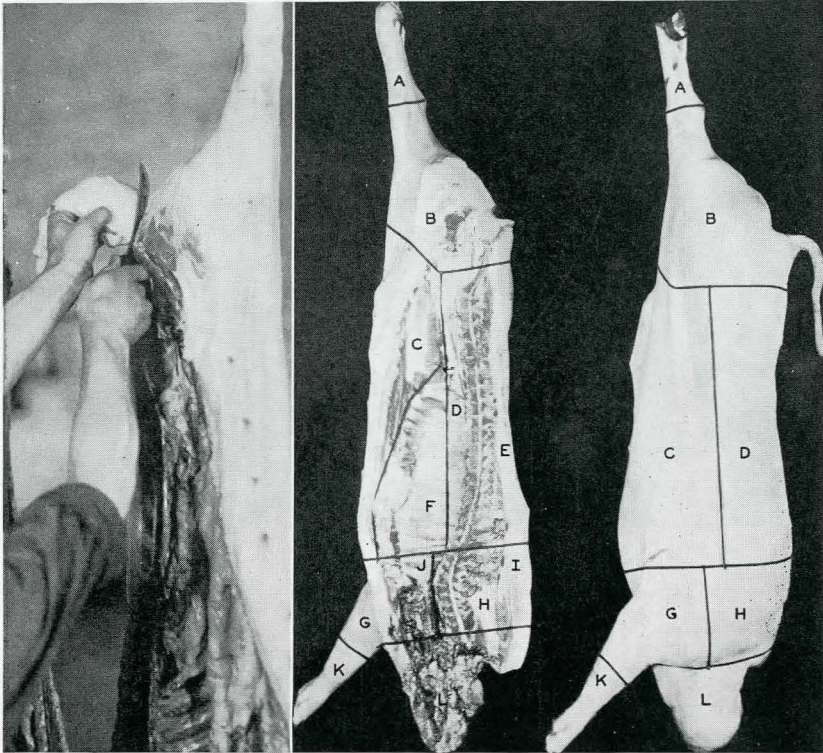
to turn the casings inside out. The first one reverses one end turning it back like the cuff on a pair of trousers or like the finger of a glove. The second pours tepid water into the cuff. The weight of this water turns the casing inside out as the third member of the group feeds in the casing from above. The reversed casing can be collected in a clean tub.

The next step is to "slime" the casing or remove the mucous coat. This is best done by using a notched stick, the casing being forced against the sharpened notch by the right thumb. As the casings are cleaned, they are wound on the left hand. Casings need to be "slimed" several times, after which they may be rubbed with dry salt and kept in a cool place until needed.

Hog stomachs are sometimes used as a casing for head cheese. A small incision is made at the lower end and the stomach turned inside out and washed thoroughly. The stomach is then scalded for ten minutes at 150° F. after which the mucous coat may be scraped off with a hog scraper or old tablespoon.

Prompt Chilling Essential

Prompt and thorough chilling of the carcass and the edible offal is imperative if a high quality product is desired. To hasten chilling, center splitting of the carcass is recommended. A meat saw is best for this job, but a wood saw may be used if necessary. Experienced butchers may split a carcass with a cleaver, but the beginner will find the saw more dependable. It is a good plan to leave 12 to 15 inches of skin over the shoulders to hold the two sides together.



Facing the ham while the carcass is warm is easier and hastens both chilling and curing.

The pork cuts. A—hind foot, B—ham, C—belly, D—loin, E—fat back, F—sparerib, G—picnic shoulder, H—shoulder butt, I—clear plate, J—neck bone, K—front foot, L—jowl.

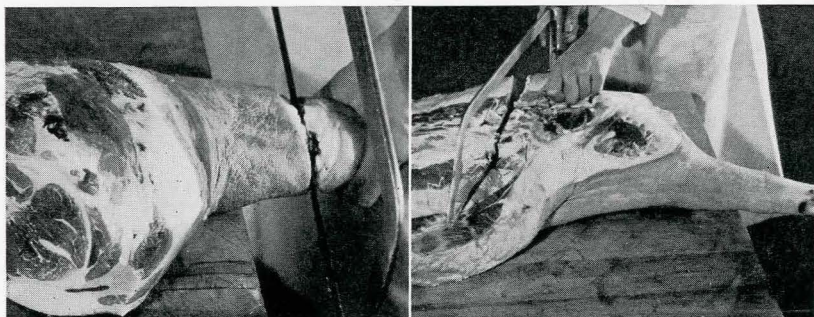
The leaf lard which lines the abdominal cavity may be loosened with less effort while the carcass is still warm. This is done with the clenched fist. With the leaf lard, the kidneys also are removed. Removing the leaf fat will hasten the chilling of the carcass. If a place to chill the lard is available, the leaf fat may be removed completely. If not, the leaf fat and kidney may be left hanging by the upper end.

Another operation which can well be done now is to face the ham. Starting in the flank, a strip of fat and skin from inside the ham is peeled off. A better job of facing can be done while the carcass is warm. Further, it facilitates chilling and curing. The facing may be left hanging on the ham.

The carcass should be allowed to chill for at least 24 hours at a temperature near the freezing point. However, the carcass should not be allowed to freeze, for this destroys the texture of meat and makes curing more difficult. The freezing of a layer of meat on the surface of the carcass retards the elimination of the animal heat from the center of the carcass, thus permitting spoilage to occur. The carcass should be hung in such a way as to protect it from rats, cats and dogs.

Pork Cutting

The cutting method adopted should efficiently meet the family requirements. The one here given is the commercial method which is designed to produce the maximum percentage of wholesale cuts and the minimum of sausage and lard trimmings. For the family that wants more sausage or lard, it is a simple matter to trim the cuts more closely. The half carcass is placed

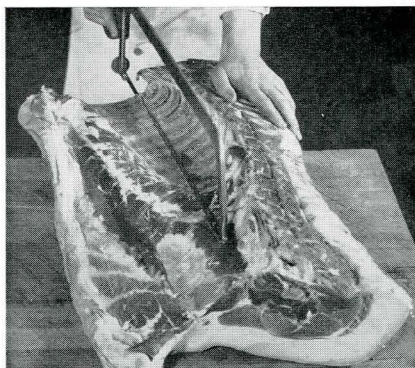


After the picnic shoulder is smoothed and rounded up, the shank is cut off.

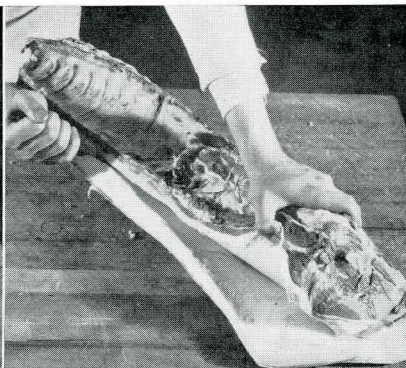
The ham is cut off and one and one-half inches in front of the aitchbone and at right angles to the shank.

on the table, skin-side down. The ham is cut off $1\frac{1}{2}$ inches in front of the pelvic or aitchbone at right angles to the shank. The shoulder is cut off at right angles to the back, three ribs wide. The middle piece is turned across the table and the ribs sawed, starting where the rib joins the backbone at the front and aiming at the bottom of the tenderloin muscle at the rear. The cut is completed with the knife. The four primal pork cuts are ham, shoulder, belly, and loin.

In trimming the cuts, the objective should be to produce the maximum amount of meat. If the family consumes fat, it may well be left upon the cuts. If the family dislikes it, fat should be trimmed off and rendered into lard. Cuts should be smoothly trimmed with all ragged tags of meat taken off and used in sausage.



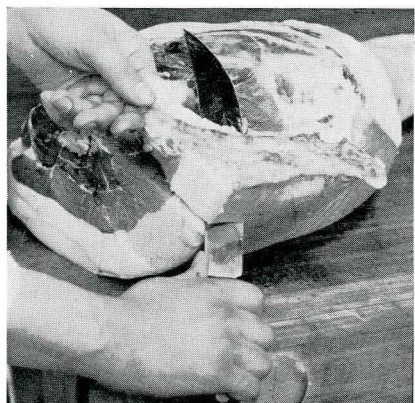
The loin is separated from the belly, starting where the ribs join the backbone in front and cutting to the bottom of the tenderloin muscle in the rear.



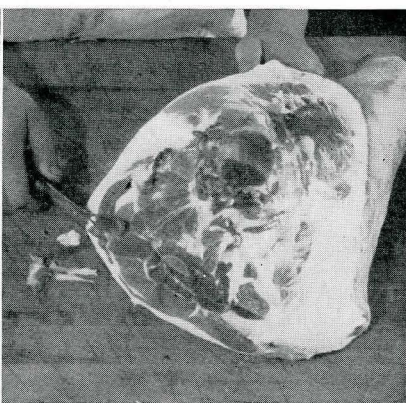
The loin is separated from the "fat back," the covering layer of fat and skin.

The Ham

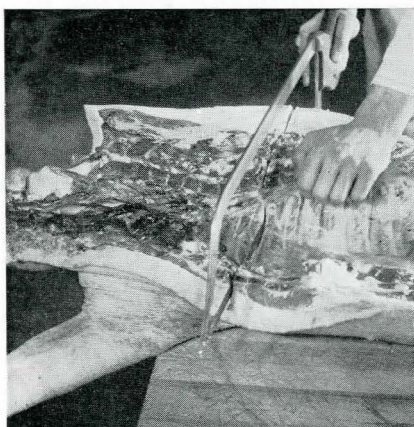
The ham is placed on the table skin-side down. The knife is placed under the tail bone and kept as flat as possible while the bone is removed. Using the facing as a handhold, the top of the ham is trimmed off. The flank portion of the ham is trimmed on an outward flare, leaving the ham as broad as possible. The ham is turned over and the skin and fat tapered back about three-quarters of an inch. This provides for the natural stretching of the skin and fat in the curing and smoking process. The shank of the ham is cut off at the hock. Such a ham with the skin and fat left on is known as a "regular" ham.



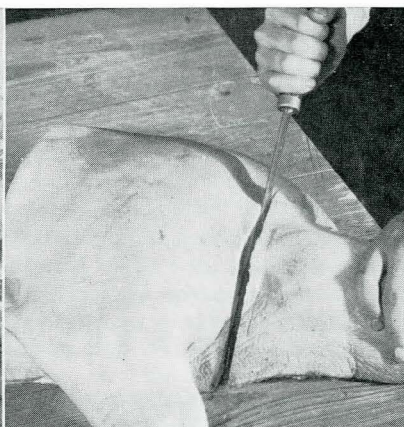
The knife is held flat in removing the tail bone from the ham.



The ham is smoothed up and rounded and the shank cut off at the hock.



The shoulder is taken off three ribs wide and at right angles to the back.



The jowl is cut off in the neck wrinkle, parallel to the cut at the rear of the shoulder.

If the family will not eat fat, the ham might well be skinned. The skin and most of the fat is removed from the fleshy two-thirds of the ham. A collar of skin and fat is left around the shank end. In skinning a ham, about one-fourth inch of fat should remain and the lean should not be exposed.

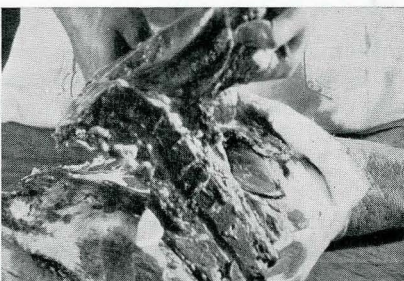
The Shoulder

The jowl should be separated from the shoulder, making a straight cut in the wrinkle of the neck, parallel to the cut at the rear of the shoulder. Some of the glandular cheek meat of the jowl may be removed and the cut smoothed up. A more attractive cut may be made by flattening the jowl with a cleaver after the cheek meat has been removed. The jowl may be squared up as a bacon square which may be cured for a seasoning piece. The jowl may also be used for sausage and lard.

The neckbones are next removed by laying the shoulder skin-side down. The neck vertebrae, the breastbone, and the first three ribs are removed by



The jowl may be flattened and trimmed as a bacon square.

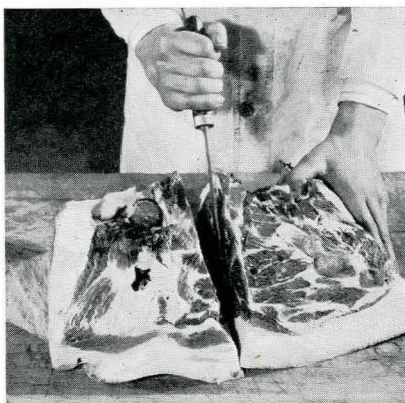


The neck bone is removed from the shoulder.

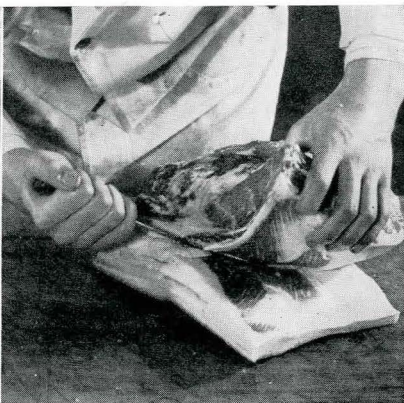
keeping the knife as close to the bones as possible. The flesh side should be smoothed up by removing the loose tags. The brisket should be trimmed around the crease and smoothed up. Some of the fat may be taken off the top third of the shoulder. This produces a "long cut" shoulder after the shank is sawed. The length of shank left on the shoulder will vary with individual preference. The shank may be unjointed at the "knee joint" or it may be sawed at some point higher up. Long cut shoulders may be used fresh or cured.

A more common practice is to cut the shoulder in two through the smallest part of the blade bone. This point lies just below the place where the neck vertebrae were located. The cut should be made parallel to the brisket. The lower half of the shoulder is rounded up slightly and is designated as a picnic shoulder. It may be used fresh or cured, or where the demand for sausage is great, it may be boned out.

The top of the shoulder is "fatted," leaving one-fourth inch of fat on the lean. This lean piece is known as a shoulder butt or Boston butt. It may be used fresh either for roast or as steaks. It contains a portion of the blade bone



The long-cut shoulder is frequently divided to make a picnic shoulder (left) and shoulder butt (right).



The shoulder butt is separated from the covering fat and skin which is known as the clear plate.

which may be removed. The boneless butt is well adapted for canning. With the blade bone removed, the boneless butt is often cured and smoked. The layer of fat which covered the butt, if sufficiently thick, may be squared up and cured for a seasoning piece. More frequently it is used for lard.

The Loin

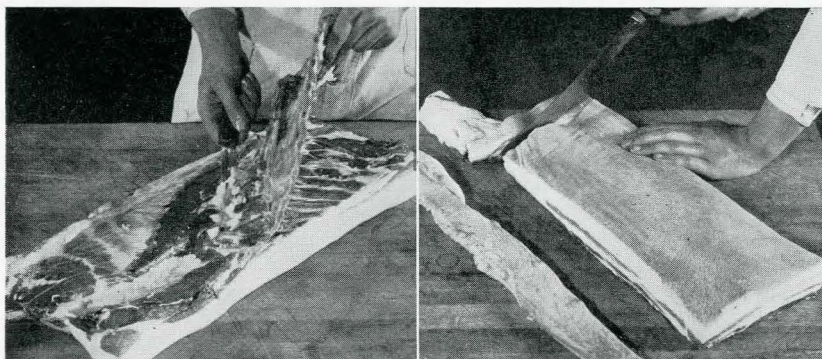
The loin is covered with a layer of fat and skin. This skin-side is placed down and the knife inserted in such a way as to leave one-fourth inch of fat over the lean. The knife is drawn lengthwise of the loin. The loin is reversed and the operation repeated. The loin may then be scraped with the knife to smooth it up. The layer of fat and skin is known as the fat back. It may be

squared up and cured for seasoning purposes, although more frequently it is used for lard.

The Bacon

The bacon is placed skin-side up and smoothed out with the heel of the hand. It may be flattened with the broad side of a cleaver or ax to loosen the spareribs.

The bacon is turned over and the knife inserted under the breastbone to loosen it. Then the knife is inserted at the top of the ribs beginning at the front. The curve of the ribs is closely followed, keeping the knife flat to avoid mutilating the bacon. The knife is permitted to cut upward and out as quickly as possible at the lower margin of the ribs, leaving the cartilaginous buttons in the bacon.



After flattening the belly, the spareribs are removed.

The bacon is trimmed to an attractive shape.

After removing the spareribs, the bacon may again require flattening. To secure the maximum yield of "side meat," the bacon needs only to be squared up. However, where quality rather than quantity is wanted, the bacon should be more closely trimmed.

The front end of the bacon is uneven in thickness, being thick at the top and thin in the axillary region. The quality of the remaining bacon is usually improved if a strip $1\frac{1}{2}$ inches wide is cut off the front of the belly. This piece is known as a bacon brisket. It may be cured as a seasoning piece or it may be trimmed out for sausage and lard. The underline is next trimmed up. Usually the cut is made just above the nipples. A choice belly should be "clear," that is it should contain no mammary tissue or "seeds." A good rule to follow is to take off only a slight trimming cut at any one time. Several trials may be made, if necessary, until a clear belly is obtained.

The top edge of the belly is now trimmed parallel to the bottom. The rear end of the bacon is squared off, making the bacon as large as possible. As a usual rule, a well-trimmed bacon will be $2\frac{1}{2}$ times as long as it is wide.

Sausage

The trimmings should be worked over as quickly as possible, removing the lean for sausage. Good sausage trimmings should carry about 25 per cent fat. If the trimmings are too lean the sausage will be too dry. The sausage trimmings should be freed of bones, gristle, and blood clots.

Tastes differ as to the amounts and kinds of spices to use in sausage. It is better to under-season than to make it too spicy, for additional salt and pepper can always be added at the table if necessary. Sausage meat and spice should be carefully weighed or measured, making it possible to duplicate a given batch or to improve on it by modifying the formula.

A mild sausage may be made up using two per cent salt. For 25 pounds of trimmings, one-half pound of salt is used. One-tenth as much pepper as salt is recommended. In other words, for the 25 pounds of trimmings, a scant ounce of pepper is suggested. If sage is used, about the same amount as pepper is added. Reduced to domestic measure, this formula would be:

10 pounds sausage trimmings
6 level tablespoonfuls salt
4 level teaspoonfuls pepper
4 level teaspoonfuls sage

The trimmings are reduced to a uniform size. One-half are spread out on a table and the spices scattered evenly over them. The other half of the trimmings are now placed on top and the entire mass thoroughly mixed before grinding.

Sausage made as above will not keep very long even under refrigeration. For prolonged storage, it should be canned or fried down. Where sausage is to be frozen, it is generally recommended that it should not be spiced until it is defrosted for cooking. The addition of salt to sausage depresses the freezing point and the pepper and sage are believed to "freeze out" during storage.

If sausage is to be kept for any considerable period of time, the percentage of salt and spice will need to be increased which, of course, lowers the palatability to many users.

Sausage may be cased in natural casings, in cellophane, or in muslin bags. It may be used fresh or smoked. Smoking imparts a flavor liked by many. It tends to dry out the sausage, which tends to increase the effectiveness of the spices and salt. Particular care must be exercised to prevent oversmoking sausage.

Lard

Too frequently lard stock is set aside for the more pressing tasks of sausage-making, meat-curing, and canning. Even under good refrigeration, lard stock breaks down quickly. At first this may not be apparent to the eye or the nose. However, the keeping quality of the resultant lard and the satisfaction which it gives in the kitchen is dependent upon the promptness and the thoroughness with which it is rendered.

If a good scald was obtained, the lard need not be skinned. If it is desired to skin the lard, the stock should be cut into strips three-quarters of an inch

wide. The strips are placed on a table skin-side down. A knife is inserted just above the skin with the blade held flat. The strip is then pulled against the cutting edge, removing the rind. One advantage of skinning lard stock is that it may then be ground. Ground lard stock renders out faster, takes less fuel, and yields more lard than unskinned stock.

The conventional method is to cut up the stock into inch cubes. However, thin slices render out better than cubes. Uniformity of size is important.

Frequently a little water is used to start a batch of lard. However, if only a little stock is rendered to start with and it is kept stirred, no water need be used. Since any added water will need to be driven off again, a material saving in rendering time may be made by not using water.

During rendering, the lard should be stirred constantly to prevent it from sticking. The fire should be conservative. Too hot a fire may cause scorching, or make the lard to boil over, causing a serious fire. The rendering should be continued until the lard reaches a temperature of 250° F. as measured by a deep-fat-frying or candy-making thermometer. At this point the cracklings will turn a golden brown. When ladled out in the air, they fry themselves dry in a few moments. Practically all the water will have been driven off.

At 250° F. the lard should be removed from the fire or the fire should be drawn. Lard at this temperature can cause severe burns, so it should be handled with caution. It should be ladled through a strainer lined with muslin to remove the fine cracklings. A sausage stuffer or jelly press may be used as a lard press. If nothing else is at hand, a colander and potato masher may be used.

Lard is best stored in air-tight containers, and should be kept in as cool a place as available. If the lard is placed in glass containers it should be protected from the light. Warm temperatures, exposure to air, and light hasten the development of rancidity.

Meat Curing

Meat curing is based upon the action of salt in inhibiting the effects of destructive bacteria and also in its dehydrating or drying effect. Salt has one objectionable feature in meat curing—that of coagulating or hardening certain proteins. Many years ago, it was discovered that sugar could be used to neutralize this hardening effect. Consequently, the best cures today are known as sweet pickles or sugar cures. They are combinations of salt and sugar, usually one part of sugar to four of salt.

Cane or beet sugar may be used, either brown or granulated. Corn syrup, sorghum syrup, honey, or maple syrup also may be used in place of sugar.

Meat cured with salt and sugar will be palatable, although it may be unattractive in color. To overcome this appearance, saltpeter is used. Saltpeter combines with the red coloring matter in the flesh in such a way as to "fix" or retain it. Like salt, it has some curing action. It is believed to foster the growth of desirable bacteria which improve flavor and also to hasten the penetration of cure into the meat. The amount of nitrate or saltpeter needed is very small, usually 1/16 as much as sugar. A cure may be spoken of as an 8-2-2, which means that for one hundred pounds of meat, 8 pounds of salt, two pounds of sugar, and two *ounces* of saltpeter are used.

The curing agents may be applied to the meats dry or they may be dissolved in water and the meat immersed in the brine or pickle. In commercial practice both methods are used—the pickle cure for hams and picnics, and the dry cures for bacons. On the farm the volume of meat is usually not sufficient to use both curing methods so the farm curer must decide upon one method or the other.

The dry cure is a little more rapid and has the further advantage of not requiring a water-tight container. With the dry cure, the mixture of the curing ingredients is simply rubbed on the meat. For the pickle cure, the 8-2-2 formula is dissolved in $4\frac{1}{2}$ gallons of water. It is usually a good plan to boil the pickle, skim it, and allow it to cool. This sterilizes the brine. The 8-2-2 formula is presumably enough to cure 100 pounds of meat. Four and one-half gallons of pickle will cover 100 pounds of average cuts in an average container.

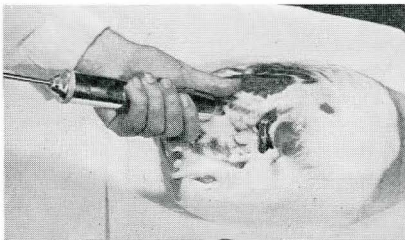
For the pickle cure, a sterile container should be used. Clean wooden barrels are satisfactory if tight and if they have been steamed or scalded. Large stone jars have the advantage of being more easily cleaned.

The Brine Cure

Meat to be brined should be rubbed with dry salt and packed in the container in such a way as to retain the shape of the cut. In the curing process the meat "sets up" so that if the pieces are jammed together, they remain unattractive and are difficult to slice. After standing overnight, the bloody liquid which accumulated should be drained off. A slatted rack should be placed on the meat and weighted down with a clean stone. Then the cooled brine should be poured over the meat. For meat curing, the brine should be strong enough to float a fresh egg. As the curing proceeds, the brine becomes weaker due to the water withdrawn from the meat.

Curing Temperature

The ideal temperature for curing is 36 to 40° F. The higher the temperature, the more rapidly curing takes place. However, at the higher temperatures, there is considerably more hazard of spoilage. It may take weeks to get enough curing ingredients into the center of a large ham to preserve it. Until those agents get there in sufficient amount, spoilage may result. Consequently,



Pumping hastens the cure and reduces the hazard of spoilage.



After curing the cuts should be soaked in several changes of water to remove excess surface salt.

meat in cure must be regarded as a highly perishable commodity. Many people erroneously have the idea that as soon as meat is immersed in brine all danger of spoilage is over.

Overhauling

To promote uniformity of cure, it is desirable to shift the pieces in the cure once a week for three weeks.

Curing Time

The time required to cure a cut of meat is dependent upon the size and shape of a cut and its fatness. Hams should be given about $3\frac{1}{2}$ days per pound in the pickle cure. Picnic shoulders can be cured in about three days per pound and bacons in $2\frac{1}{2}$ days per pound. As a general rule, a minimum of 21 days is suggested.

Whenever the temperature reaches freezing or below, little penetration of cure takes place and such days should not be counted. Under farm conditions, meat should not be frozen before curing. While this is done commercially where special equipment is available, it is hazardous under farm conditions.

If the schedule given above is adhered to, a well-cured product capable of



Cuts rubbed with dry cure.

being kept without refrigeration should result. Such a product is saltier than commercially-cured meats. Many consumers dislike country-cured meats because of their saltiness. If a mild-cured product is wanted, the curing time should be shortened. However, such mild-cured products must be stored under refrigeration.

Pieces should be removed from cure on schedule. Too many follow the practice of leaving all the cuts in the cure until the heaviest are cured. Naturally, under such a plan, the lighter cuts are badly overcured.

The Dry Cure

With the dry cure, the mixture is thoroughly rubbed on the cuts which are then placed in a clean barrel, box, or even on a table or bench. As with the brine cure, the temperature should be 36-40° F. Since meat absorbs flavors and odors readily, the place should be free from "off" taints or odors.

Within a few hours after the first rubbing, the cure will have drawn from the meat a considerable quantity of fluid. With a tight container, this may be permitted to accumulate. After four or five days the meat should be overhauled; that is, rubbed again and rearranged. In a week the overhauling should be repeated.

Curing Time

As suggested, the curing time with the dry cure is shorter than with the brine cure. As a general rule, the 20-21 day minimum should be kept. Hams should be cured $2\frac{1}{2}$ to three days to the pound, picnics $2\frac{1}{2}$ days, and bacons two days.

Emergency Curing Measures

Commercial quick cures are effected by artery-pumping; that is, injecting the cure into the main artery and thus getting rapid and complete penetration. Because of the equipment needed, this procedure is not feasible on the home basis.

Brine syringes are available which may be used to inject brine along the bones of shoulders and hams. These cause curing from the inside as well as from the outside of a cut. Such a procedure takes much of the hazard out of home curing. For pumping, two pounds of salt, one-half pound of sugar, and one-half ounce of saltpeter are dissolved in a gallon of water. Syringes should be cleaned carefully before using, otherwise destructive bacteria may be introduced into the cut of meat. After using, careful cleansing again is needed,



Cured cuts may be wrapped in muslin and then in paper.

otherwise the salt will corrode the metal parts and make the instrument worthless. Bacons ordinarily are not pumped. However, for other cuts, the curing time may be reduced a third by pumping.

In the event the weather turns warm, the curing may be expedited by cutting the large pieces into several smaller ones. Another method of hastening the curing process is to bone out the cuts. Since small cuts and boned-out cuts are more subject to molding, these practices should be followed only in emergencies.

Soaking

Whatever the method of curing used, it is necessary to overcure the outside of the cuts to get enough salt into the center. Hence, after the curing is completed, the cuts should be soaked in running water or several changes of water for an hour. The cuts are then strung and hung up to dry.

Smoking

Smoking imparts a desirable flavor to meat and tends to dry out and seal up the surface. It also coats the meat with compounds closely related to the cresols which have pronounced preservative action.

For smoking, the pieces should be hung so no two pieces touch. A piece of wire netting stretched under the meat may prevent a piece falling into the fire if a string should break or tear out.

Only non-resinous woods such as hickory, maple, apple, and ash, should be used for smoking. Resinous woods burn with a sooty flame and will coat the meat with soot. For the same reason, the minimum amount of kindling should be used.

If necessary, a smoke house may be improvised by building a firebox in a bank and carrying the smoke through a tile or piece of down-spouting to a barrel. The meat may be suspended on sticks placed across the top of the barrel and a washtub inverted over the top.

The meat should be smoked to the degree desired, usually a good chestnut color. Small, thin cuts absorb smoke more readily so care should be used to avoid over-smoking them.

Smoking Preparations

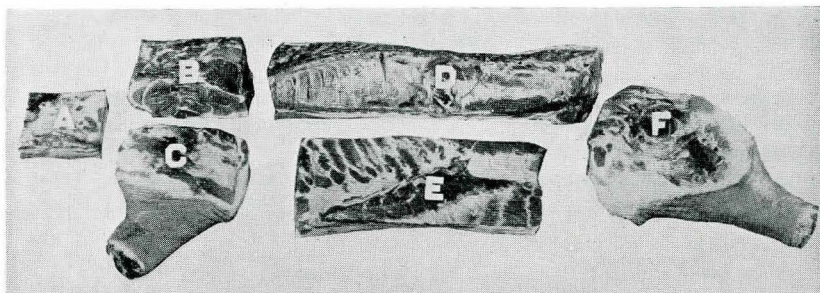
There are on the market various smoke preparations which may be used by those who have only small quantities of meat to treat or who do not have suitable fuel or facilities for smoking. In some cases the smoke is condensed to a liquid form to be painted on the product. In other cases, this smoke condensate is mixed with salt or the smoke may be condensed directly upon salt. This smoke-treated salt may also be combined with other curing ingredients so that the combination may be applied to the meat like any dry cure. Federal regulations prohibit the use of these preparations for commercial curing or for products shipped interstate. However, for farm curing they offer a simple and satisfactory solution to the smoking problem.

Equalization

The freshly-cured ham or shoulder frequently is disappointing, for the outside portions will be overcured and the center portions flat or undercured. Where cuts are hung for a period, there is a tendency for the salt to equalize; that is, for the excess to travel to the center. Hams and shoulders, after curing, are much improved in flavor by aging. The aging or ripening of cured meat is much like the ripening process in cheese.

Storing Cured Meat

Perhaps the ideal storage for cured meat is to cure it mildly, slice it, wrap it in heavy waxed paper, and freeze it. This eliminates all danger of molding and deterioration. Where freezer storage is unavailable or where it is used for other purposes, thoroughly-cured meat is best wrapped in muslin, then in



The trimmed pork cuts: A—bacon square, B—shoulder butt, C—picnic shoulder, D—loin, E—belly, F—ham.

several thicknesses of paper and hung in the coolest place available. Cured meat will mold, but most of this can be removed with the cloth wrapping. The cured cut may then be soaked in tepid water and scrubbed with a vegetable brush.

Canning

Another well-established method of preserving meat is by canning, which involves thorough sterilization by heat. This usually results in overcooking the tender cuts. Therefore, canning is best adapted to the less tender cuts. Canning should be undertaken as soon as possible after the carcass has been chilled.

Meat for canning should be precooked by any of the conventional cooking methods. The object of precooking is to shrink the product. Usually the meat is boned-out and cut into uniform-sized pieces. It should be cooked only until the red or pink color at the center of the pieces disappears. The meat is packed in containers and one teaspoonful of salt added per quart. The container then should be filled with boiling broth, made by cooking the bones, or filled with boiling water, leaving one-half inch head space. Jars should be partially sealed except the self-sealing type which should be tightened. Processing should begin at once.

The pressure cooker is generally recommended for meat canning. At 15 pounds pressure, pints should be processed 90 minutes and quarts 120 minutes. At altitudes in excess of 2000 feet, one pound additional pressure is recommended for each additional 2000 feet. When the processing is completed, the cooker should be allowed to cool until the pressure returns to zero. The jars are then removed and the lids tightened on all except the self-sealing type.

The boiling water bath may be used, processing either pints or quarts for a full three hours with the water at the boiling point.*

Before using, canned meat should be carefully inspected. Cans with leaking or bulged lids should be discarded. Likewise, cans in which the contents appear cloudy or otherwise abnormal in appearance should not be used. If there is an "off" odor, the contents should be destroyed. All canned meat products should be boiled vigorously for at least five minutes before being eaten.

Frying Down Meat

Another method used extensively for the preservation of pork chops, pork steaks, and sausage is to fry them down. The cuts are fried in a skillet and when done are placed in an earthen jar and covered with hot lard. The jar is kept in a cool place. The product will keep for several months. However, in warm weather the lard tends to become rancid and unpalatable. Hence, this method cannot be looked upon as a year-round method of preservation.

Freezer Storage

Freezer storage lockers are available in many communities. They offer good storage facilities for surplus meat. Less labor is required by this method and cuts so preserved may be prepared by a wider variety of cooking methods than canned meats. If locker space is used to capacity to store meats during the winter, and fruits and vegetables during the summer, the cost of this method of preservation is not excessive.

The meat should be cut ready for the pan for little cutting is possible after the meat is frozen. Boning cuts saves much valuable locker space. Further, the removal of part or all of the bones reduces the hazard of perforating the wrappings.

Meat must be wrapped with a suitable protective covering to prevent "freezer burn" or dehydration during freezer storage. There are many heavy waxed freezer papers as well as moisture and vapor proof cellophanes on the market. The size of the package should be governed by the size of the family, the distance from the freezer locker, the frequency with which packages are withdrawn, and the storage facilities in the farm home. Where several cuts of meat are placed in the same package, they should be interleaved; that is, pieces of suitable paper should be placed between the cuts so that the cuts may be separated when frozen. The packages should be compact so no space will be wasted. The packages should be tight so no air can enter them. The most efficient packages can generally be made by wrapping diagonally, turning in the ends tightly. The packages should be tied and properly labelled. If there is

* More detailed directions for meat canning may be secured in CC 65, "Canning Meat and Poultry," published by the Nebraska Agricultural Extension Service.

more meat than the locker can accommodate, the more desirable cuts should be frozen and the less desirable cuts boned and ground or canned. Sausage is best stored in cartons without seasoning.

As soon as possible after the cuts are packaged, they should be placed in a sharp freezer where temperatures of -10° to -20° F. or colder are maintained to freeze the product quickly. Quick freezing preserves the quality of the product and reduces the amount of shrinkage when it is cooked. As soon as the product is completely frozen it may be transferred to the storage locker where a temperature of about zero is maintained. In the early days of freezer storage, it was believed that any temperatures below freezing were adequate, but recent research has shown the superiority of the lower temperatures to maintain quality in the products.

Fresh pork is definitely lower in keeping quality even in the freezer than beef, or lamb. Some suggest that fresh pork should not be stored more than six months. However, where a good product is properly wrapped, quickly frozen, and stored at zero temperature, there is no reason why it should not keep for nine to twelve months.

Mild-cured pork cuts can be sliced, packaged, and kept in freezer storage to good advantage unless the space is more urgently needed for more perishable items.

Head Cheese

Carefully cleaned heads may be cooked until the meat separates from the bones. The cleaned pork feet and other bony trimmings may also be cooked up. The meat should be spread out and all bones, bone fragments, and gristle picked out. The meat should be weighed and spiced. Two per cent salt is included. One-tenth as much pepper as salt is added, and ground cloves, cinnamon, nutmeg, and allspice to taste. After spicing, the meat is placed in bread pans or other moulds and the pans filled with the gelatinous broth in which the meat was cooked. The pans should be chilled quickly. Meat of this sort holds the heat a long time and will sour unless it is chilled quickly.

An alternative method is to place the spiced meat in cleaned hogs' stomachs which are then sewed or skewered shut. Small holes are punched in the stomach walls and the filled stomachs returned to the broth for a brief cooking. The stomachs contract during the cooking, squeezing out some of the surplus fat. They should not be filled too full or they may burst during cooking.

Liver Sausage

Some of the head cheese stock may be combined with cooked livers to make liver sausage. Livers should not be cooked more than twenty minutes or they become crumbly. Some also cook up the kidneys. The cooked livers should not make up more than one-fourth of the material by weight. It is seasoned as for head cheese except that cloves should predominate. Some also add onions. The product should be ground several times until it is very fine. Some of the soup or stock should be added during grinding. The material is then run into pans to chill if loaves are desired. It may also be cased in beef casings. This sausage after chilling may be used fresh or it may be smoked to make the Braunschweiger type of liver sausage.

Scrapple

The broth which remains may be used to make scrapple. Some prefer to add some chopped meat to it. Corn meal is added and it is cooked as for corn meal mush. Some recommend the addition of a little rye flour as a binder to hold it together. The scrapple is cooked until it is done, when it is turned out in a pan to cool. It is sliced and fried like corn meal mush.

Soap

Inedible fats may be used to make soap. The directions for making soap may be found on the labels of cans of lye.* In the homemaking of soap, the glycerine is not reclaimed, but left in the soap. In wartime emergencies, glycerine is seriously needed for the manufacture of explosives and consumers are asked to dispose of inedible fats through commercial channels so this valuable by-product may be reclaimed.

Soaps are sometimes made of cracklings. Some cracklings may better be used as human food in corn bread. The balance will no doubt be needed for feed for hogs and poultry in view of the shortage of protein feeds.

RETAIL CUTTING

The cutting should be designed to meet the family requirements. Someone has said that there are three fundamentals of good meat cutting—cut thick meat from thin meat, cut tender from less tender, and always cut across the grain.

The Ham

The ham, either fresh or cured, is divided into three parts, the top or butt, the center section, and the hock. The ham butt is usually cut along the floor of the aitchbone. The fresh ham butt may be used as a roast and the cured ham butt for baking. Cutting along the floor of the aitchbone produces the highest yield of center slices. Center slices may be made for frying or it may be used in one section as a roasting or baking piece. The hock is somewhat lacking in tenderness. It may be simmered or used as a seasoning piece with vegetables. It may also be boned and ground for sausage if fresh, and ham loaves if cured.

The Picnic Shoulder

The picnic shoulder, either fresh or cured, may be roasted or baked. The large end of the shoulder may be sliced for steak. The shank or shoulder hock may be used as a seasoning piece or boned and ground. Where shoulders are to be wrapped for freezer storage, it is a good plan to cut the shanks off closely, thereby making more compact packages. Shoulders are frequently used for canning and occasionally boned out for sausage.

* A complete discussion may be found in Nebraska Extension Circular 11-402 entitled, "Facts About Soap."

The Shoulder Butt

The shoulder butt makes an ideal piece for canning. It contains the top of the shoulder blade, which may be removed with ease. The butt may also be sliced for pork steak which may be frozen or fried down.

The Loin

The loin is generally used fresh as roasts and chops. Both the front and the back ends of the loin are usually cut off for roasts. These portions contain some bones which make slicing difficult without a saw. After the front loin roast is cut off, the chops are cut, cutting one to the rib and then one between the ribs. The slope of the ribs must be followed if uniform chops are to be made. In the rear half of the loin there are no ribs, but instead, the broad finger-like projections of the backbone which will need to be split. The chops should be made uniform in thickness.

If the loin is to be boned out for canning, the tenderloin which lies underneath the backbone at the rear end of the loin is taken out first. This is frequently made into patties by cutting it into pieces $1\frac{1}{2}$ inches long and flattening them with the broadside of a cleaver or hatchet. The rib bones then are sawed free from the backbone where they join. Then the bones are taken out to be used like spareribs. At the rear end of the loin, the hipbone may prove rather troublesome to take out.

Trichinosis

Hogs are sometimes infested with the pork tapeworm (*trichinella spiralis*) which also affects man, rats, and other animals. This parasite is commonly found in garbage-fed hogs, but is rarely found in hogs produced under pasture conditions. However, since trichinosis in man is a serious, often fatal disease, one cannot afford to take chances with it. Trichinosis may be avoided if all pork is thoroughly cooked. A safe rule to follow is "never eat pink pork." Curing does not destroy the parasite.

The flesh of pork carcasses may be examined microscopically by competent pathologists. However, not finding the parasite is not positive assurance that it may not be present in other parts of the body.

One of the most common means of contracting trichinosis is by eating summer sausage which is made from cured meat and which has not been cooked. However, summer sausage manufactured under U. S. meat inspection and bearing the U. S. inspection stamp may be eaten without cooking, for precautions are taken to safeguard it from trichinella.

Rules for Safety

Slaughtering and meat cutting involves the use of edged tools, lifting heavy weights, and working with animals which are heavier and stronger than men. There are abundant opportunities for accidents, and with the thought of reducing these hazards to the minimum, the following suggestions are set forth. Most of them are from the National Live Stock and Meat Board.

1. **Check all hoisting equipment and supports carefully** to be sure that they are adequate to support the loads contemplated.

2. **Scalding water is a real hazard** and every precaution should be taken with it. Hot lard is capable of inflicting very severe burns and every precaution should be taken to prevent this.

3. **Keep handle of knife free from grease.** A dry handle will assure a good grip and help to keep the hand from slipping forward onto the sharp cutting edge of the blade.

4. **Hold knife firmly.** Your hand is less likely to slip forward onto the blade will not hit your legs or feet.

5. **Do not grab for a falling knife.** You might miss the handle and grab the blade. The best practice is to step back out of the way so the point of the blade will not hit your legs or feet.

6. **Never lay a piece of meat on a knife.** You may forget the knife is there when you pick up the piece of meat.

7. **Avoid carrying a knife when both hands are needed** to carry meat or heavy packages. There is always danger of cutting yourself or someone else.

8. **Never throw knives together in a box or drawer.** This practice not only dulls the blades, but there is always a chance of getting cut when picking up the knives.

9. **Do not reach into soapy water for a sharp knife.** The soapy water hides the knife and you may grasp the cutting edge.

10. **Be careful when using a cleaver.** The chopping action is difficult to control, so keep the left hand as far as possible from the path of the cleaver.

11. **Do not "crowd" your working space.** A crowded working space reduces efficiency and is likely to cause accidents.

12. **Let the saw do the work.** When you force the saw it may "jump" from the bone to your hand.

13. **Use a stomper when feeding meat into a grinder.** Meat grinders are responsible for many missing fingers. Be safe. Use a metal or wooden stomper.

14. **Keep floor clean.** Fat and meat trimmings are as dangerous to step on as banana peelings.

15. **Treat bone scratches and knife cuts immediately.** Even a minor bone scratch can become infected and cause a bad case of blood poisoning. Do not neglect bone scratches and knife cuts.