

Beef Forequarter. Cut between 5th and 6th ribs to backbone. Cut across clod and over socket joint. Cut between arm shank and brisket, through socket joint.



Remove arm shank. Separate lower-half clod.



Lower clod half.

Cut out bladebone from upper-half clod (not shown).



Upper clod half.



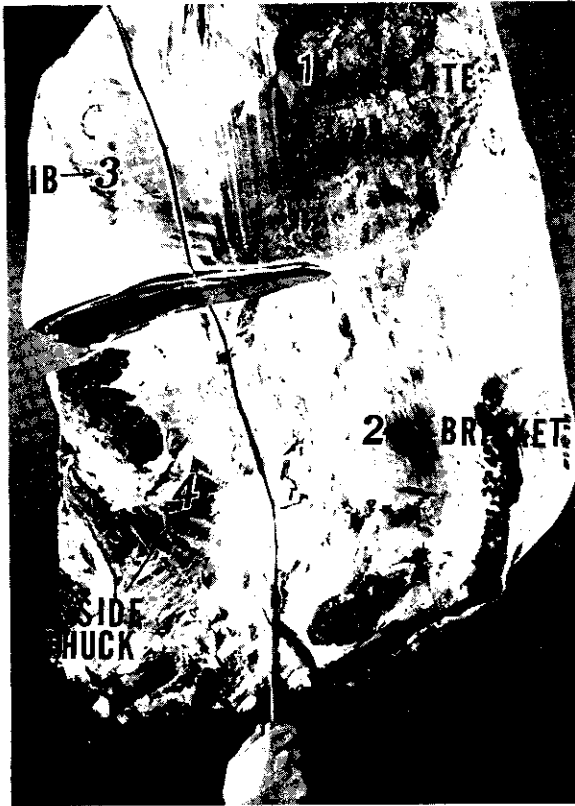
Follow seam to finish removing outside chuck.

Cut along ridge of bladebone to remove chuck tender (not shown).



Chuck tender.

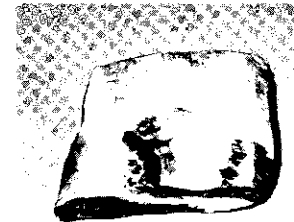
Illustration 10
Breaking Down Beef Forequarter



Beef forequarter after removal of foreshank and outside chuck. Remove boneless ribs. Partially remove inside chuck and neck. Finish removing chuck by cutting between neckbone, and backbone (not shown). Cut between 5th and 6th ribs. Cut downward close to ribs to remove plate meat (not shown).



Boneless plate.



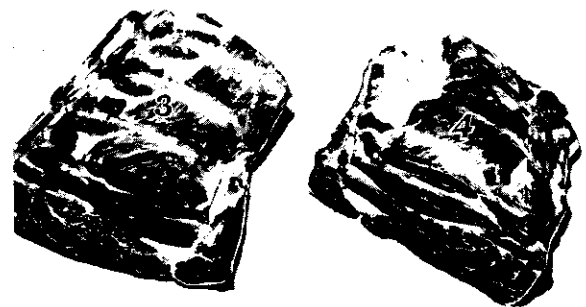
Boneless brisket.



Boneless rib.



Removing brisket.



Inside chuck (No. 3). Boneless neck (No. 4).

Illustration 10
Breaking Down Beef Forequarter

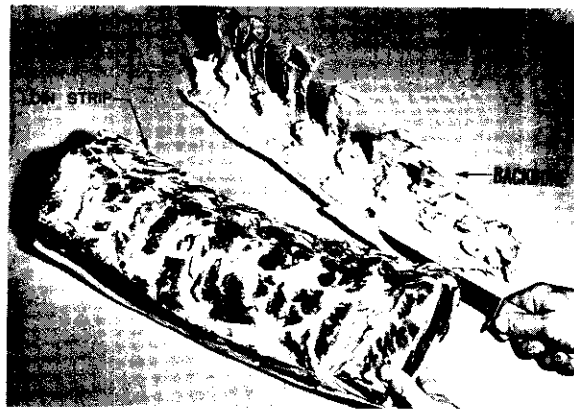


Removing flank. Remove thin layer of meat from outside of flank. Loosen clod fat (a) by cutting through seam over inside round and knuckle. Cut through seam around knuckle to partially separate flank from hindquarter. Finish removing flank; strip membrane, 13th rib, and fatty tissue. Cut into pieces for dicing or grinding.

Removing hanging tender. Remove the blood vessel from along edge of chine bone. Cut hanging tender from hindquarter. Remove membrane, surplus fat, and gristle. Dice or grind (not shown).

Removing loin fat and kidney knob. Trim hindquarter free of inside and outer layer of fat. Split open kidney knob and take out kidney (not shown).

Removing short loin. Twist free short loin from sirloin-butt section of hindquarter after cutting through vertebra with a saw (not shown).



Making loin strip. Separate loin from the backbone.



Removing tenderloin. Cut under tenderloin to separate from short loin. Trim outside membrane.



Tenderloin.



Loin.

Illustration 11
Breaking Down Beef Hindquarter



Removing sirloin-rump butt. Cut through meat to leg bone and cut around it to separate layer of meat from round. Remove loose fat from sirloin-rump butt. Split meat into two pieces.



Sirloin-rump butt.



Removing knuckle tip. Follow seam cut from a to b to remove outside meat and fat. Cut through seam to leg bone; unjoint knee cap; pull knuckle from leg; cut off knee cap.

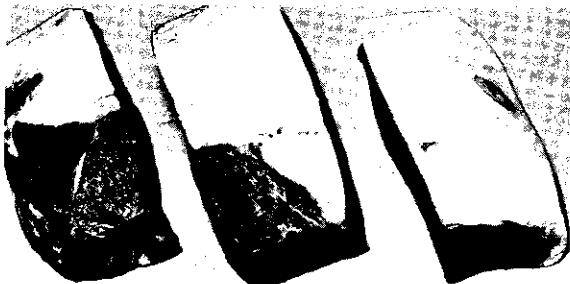
Illustration 11
Breaking Down Beef Hindquarter



Knuckle (tip).



Removing inside (top) round. Cut from lower edge of gam cord (a) to upper end of leg (round) bone (b). Cut through seam to remove inside top round. Split in two or three pieces.



Inside (top) round.



Removing outside (bottom) round. Cut through seam between heel and outside (bottom) round, cutting meat free from leg bone. Trim, divide outside (bottom) round into two pieces.



Outside (bottom) round.

Removing heel and shank meat. Cut around shank and leg bones to remove heel and shank meat. Cut through seam to separate shank meat from heel meat. Trim heel (not shown).



Heel.

Illustration 11
Breaking Down Beef Hindquarter

1006-c(2)—**Veal**—Veal is best defined as immature beef or calves of less than 1 year of age. Most of the veal or calves slaughtered for meat are dairy cattle. The younger animals of other cattle breeds are allowed to mature for beef. The bone structure is identical to beef, although bone sizes are quite different, the animal for veal being much smaller.

The color of the lean of veal is the best way to distinguish it from beef. Veal flesh is a faint red, or pink color, or sometimes shows a grayish-pink hue, while lean beef is a deep, brighter red. Veal has little or no fat streaks through the lean meat, but the meat texture is velvety and the flesh tender and watery.

Although no distinction is made between meat from veal and calf in military procurements, subsistence personnel may encounter differences in terms used to identify them. The U.S. Department of Agriculture distinguishes a calf as older veal. Federal specification documents by which this meat is procured for the military services state a difference between veal and calf, but deliveries will include both calves and veal meat.

Veal may show quality characteristics similar to beef if the meat animals slaughtered are older or heavier. In the trade, such veal may be sold as "beevettes" or "baby beef." For all practical purposes, however, subsistence personnel should cook the meat by directions given for veal because of the special handling this meat requires.

Veal is cut from veal sides in the order shown in illustration 12.

Veal sides consist of the approximate half portion of the carcass produced by splitting or sawing and cutting carcasses lengthwise centrally through the spine of the carcass, thus

separating the two sides; or at the contractor's option, the sides may be divided into a forequarter and hindquarter by cutting between the 12th and 13th ribs, the 13th rib remaining with the hindquarter or hindsaddle.

The veal sides are divided into meat cuts as directed in illustration 13-I, p. D10-24. The veal hindsaddle may be cut as directed for the beef hindquarter. (See Illustration 11, "Breaking down the Beef Hindquarter." pps. D10-20, D10-21, and D10-22.)

One of the most popular uses of veal is for cutlets. Roasts may be used for this purpose, including these veal boneless or bone-in cuts shown in illustration 13-II, p. D10-25.

In addition, semiboneless and boneless veal are used in the Navy general mess, particularly afloat. Cuts included in these forms of veal are shown in table B, p. D10-25.

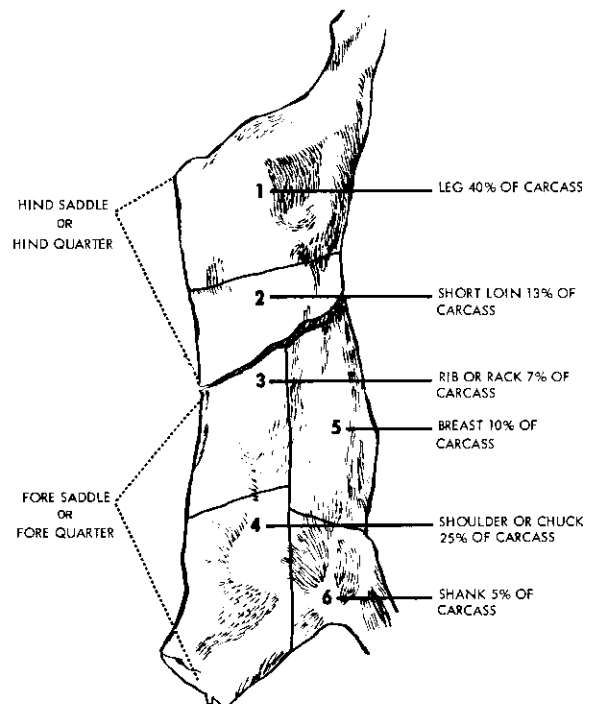


Illustration 12

The Division of Veal Sides Into Major Cuts

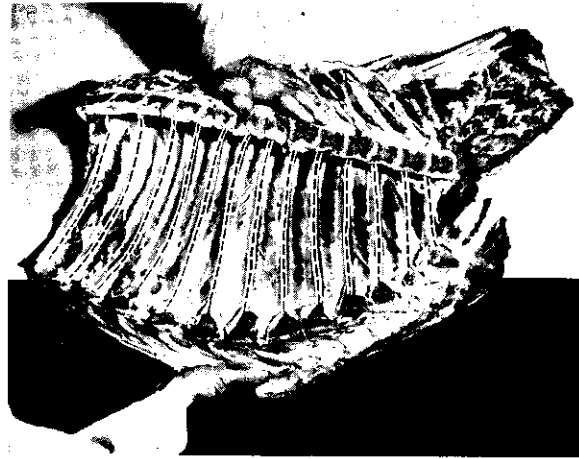


Removing outside shoulder (includes shank, arm, and bladebones). Cut through outer layer of meat from (a) to (b) and (c) to (d), with tip of knife, following natural seam.

Remove and bone the shank (not shown).

Cut through elbow joint to separate shank from arm section. Cut shank meat from bone (not shown).

Bone the outside shoulder (not shown). Cut along the sides of arm and blade bones, through ball and socket joint. Take out arm bone, blade bone. Cut off thin meat on end of shoulder. Roll and tie for roast or use for veal cutlets.



Score inside of ribs with tip of knife (along dotted lines). Break breastbone and rib cartilages over edge of block.

Pull breast meat from rib bones to backbone. Cut meat from base of ribs. Remove backbone and rib cartilages (not shown).

Remove backstrap. Separate breast from back meat. Dice. Cut boneless rib, inside shoulder and neck into two pieces of uniform length. Roll and tie meat into roasts (not shown).

Illustration 13-I
Breaking the Veal Forequarter



Shank half of leg.



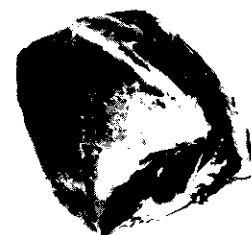
Inside (top) leg.



Outside (bottom) leg.



Sirloin-rump butt.



Veal knuckle.

Illustration 13-II
Cuts From Veal Hindsaddle Used for Cutlets

TABLE B
FABRICATED VEAL CATEGORIES AND CUTS

Cuts in Boneless Veal		
Roasts	Cutlets	Ground and Diced
Clod Bottom round (with and without heel) Chuck roll (including chuck tender)	Top (inside) round Knuckle Sirloin-rump butt Flank steak Back (rib and loin) Tenderloin Heel	Remaining cuts
Cuts in Semiboneless Veal		
Chops	Roasts	Stews
Veal back Tenderloin butt Knuckle	Top round Bottom round Clod Sirloin-rump butt	Shoulder and neck Brisket

1006-c(3)—Pork—The flesh of hogs, pork, is the lightest color of all meats. Young pork is a grayish pink; the meat of older animals is a darker pink. Most pork procured, however, is of uniform color because hogs are slaughtered young, usually from 6 to 12 months of age. The flesh is firm and fine grained and there is a good intermingling of fat and lean.

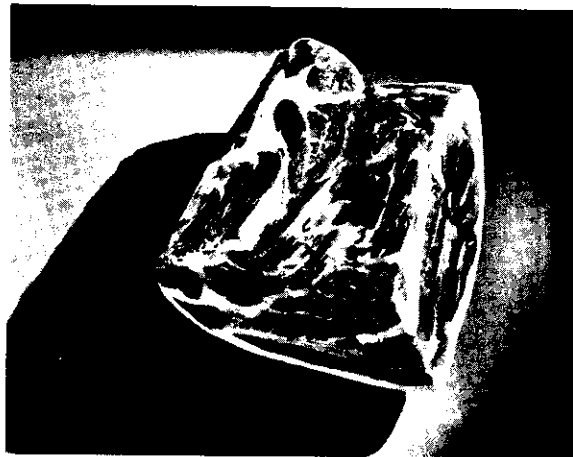
Most pork bought by the Navy comes aboard in the form of wholesale (or primal) cuts such as loins or smoked hams. (See illustration 14.) Practically all pork sold to the military services is partially or totally boned and trimmed at meatpacking plants.

Pork cuts are procured both in the fresh and the cured state. Shoulder cuts, hams, and variety meats made from pork are most frequently preserved in this way.

Procurement of pork cuts for the Navy are as follows:

Boston Butt—This cut is that portion of the skinned pork shoulder remaining after the "picnic ham" has been removed. Picnics, erroneously called hams, are not procured for or used in the Navy general mess. (See illustration 5, p. D10-7.) The Boston butt has the major portion of the bladebone still remaining, but the underlying excess fat has been removed. This pork cut is not cured or smoked, but is used for preparing a number of meat dishes where moist heat is employed. Examples of meat dishes using this pork cut are smothered shoulder chops and pork chop suey.

Loin—This is considered to be one of the choicest cuts of pork. Loins are used for roast pork and for chops prepared in a variety of ways, including both moist- and dry-heat methods. Loins are obtained from Grade 1, or top-quality hogs, and are trimmed and boned according to specific use.



1—Boston butt (shoulder).



2—Spareribs.



3—Jowl squares, smoked.

Illustration 14
Market Cuts of Pork

Loins are procured in a number of forms. These are:

Bladeless—This is that portion of the loin remaining after the removal of the bladebone and related cartilage.

Partially boned—This form of loin has had all bones except the rib removed. Tenderloins also are removed.

Boneless, string-tied—This is a completely boned item with tenderloin, cartilages, and rib figures removed.

Tenderloin—This is a muscle removed from the loin section of pork sides. The tenderloin is relatively small in size. The use of this item is limited to a very few general messes.

Cutting the Loin—The steps necessary to complete deboning of a pork loin from which the bladebone has been removed are shown in illustration 15, p. D10-28.

Boning a Whole Pork Loin for Roasting—Whole pork loins may be used for roasting if divided into two pieces of equal lengths; the pieces boned and string tied, or kept separate for roasting. (See illustration 16, p. D10-29.)

The loin is used for roasting or is cut into pork chops with bones or without bones. (See illustration 17, p. D10-30; see also illustration 18, p. D10-31.)

Spareribs—This is a bony but flavorful rib section of a pork side, made by separating the rib bones closely from the backbone and loin strip. (See illustration 5, p. D10-7, "Wholesale Cuts of Pork.")

Fatback and Bellies—The fatback is used primarily as a seasoning ingredient in vegetable cookery such as dried beans. Cooking practices of regions in the United States differ, so that some cooks prefer pork fatback or salt pork while others consider pork bellies more acceptable.

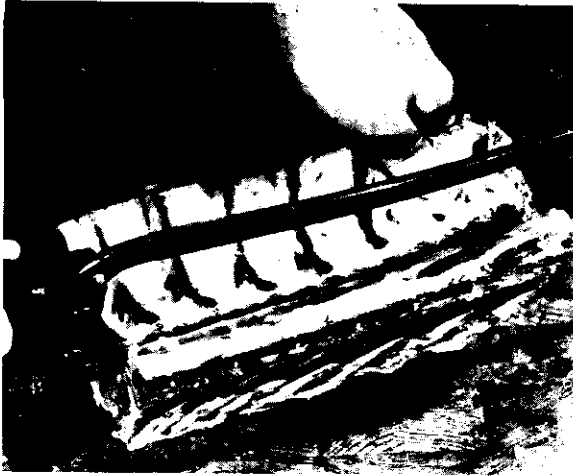
Bellies are rectangular cuts with lean streaks, obtained from the breast and flank sections of the pork side. Most bellies from lightweight hogs are used for bacon. Heavier hog bellies are salt cured.

Fatback is that part of the carcass on the opposite side of the loin from bellies, but unlike bellies, fatback never has lean streaks. This is because it has been stripped from the loin and the meatier parts are left on the loin cut. The majority of fatback is used for making lard and sausage, but some is preserved by dry salt cure and used for seasoning.

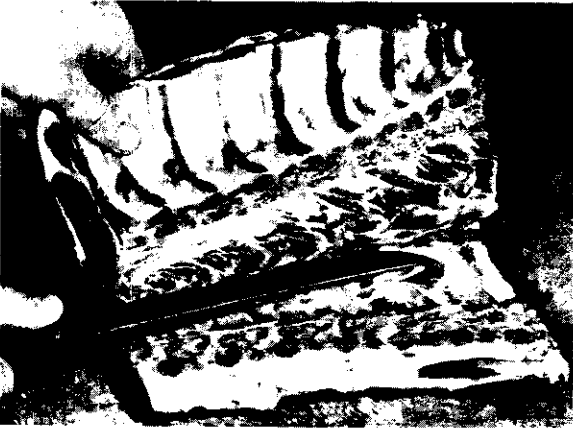
Jowls—This pork cut is obtained from the shoulder by trimming the cheek side of the hog's head and cutting it square. It may be cured and smoked and sold on the retail market as bacon squares. Because most jowls have some streaks of lean, consumers prefer this cut for seasoning in lieu of bacon, fatback, or bellies. (See illustration 5, p. D10-7, "Wholesale Cuts of Pork.")

Hams—Cured hams come to the Navy general mess in a variety of forms: (1) Regular, not cooked, bone-in (with aitch bone removed); (2) boneless, precooked; and (3) canned, whole or chunks.

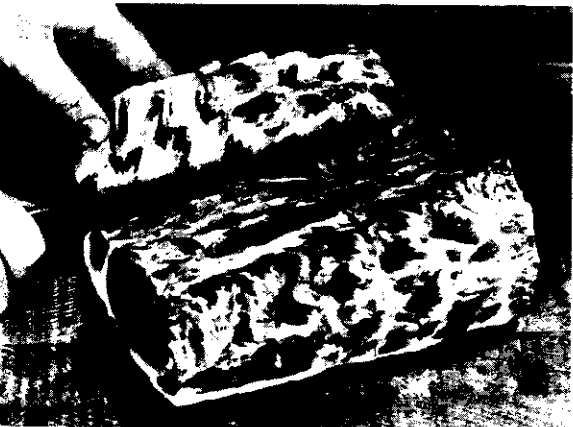
Hams also may be procured fresh, not cured. These hams are skinned, and weigh in the 10-



1—Loosen the backbone by sawing across base of ribs at a slight angle so that the saw blade will not cut into the "eye" of the loin.



2—Remove backbone, leaving no more meat than necessary on this bone.



3—Lift backribs from meat. The boneless blade loin is used for (1) roast as individual loins or two tied together as a boneless roll; and (2) chops as single slices, or butterfly cuts.

Illustration 15
Steps in Boning a Bladeless Pork Loin



1—Pork loin cut into two equal lengths. Shoulder or loin end at left. Rib half of the loin at right.



2—Parts removed from rib half of partially boned pork loins. Blade piece, upper left, backbone, lower.



3—Parts removed from loin half of partially boned pork loins. Hip bone, upper left, back-bone, lower.



4—Parts removed from loin half of partially boned pork loins. Tenderloin.

Illustration 16
Partially Boned Pork Loin

18-lb. range. Fresh legs or fresh ham, as described in military procurement documents, may be boned before cooking for the Navy general mess.

The use of boned fresh or smoke-cured hams are advantageous because they shrink less during cooking, and possibly are more easily carved if boned and tied correctly. Legs weighing less than 14 lb. may be made into one boneless "football" roll. Legs weighing from 14 to 18 lbs. may be made into two boneless rolls by splitting into two roasts. (See illustration 19, pps. D10-32 and D10-33; see also illustration 20, pps. D10-34 and D10-35.)

Bacon—This highly used product is procured in several forms, noted as follows:

- Slab bacon, dry sugar-box-cured
- Slab bacon, dry box-cured
- Slab bacon, injection cured
- Slab bacon, injection combination cured
- Slab bacon, penetrated cured
- Sliced bacon (cured as described for slab bacon)
- Sliced, prefried, canned

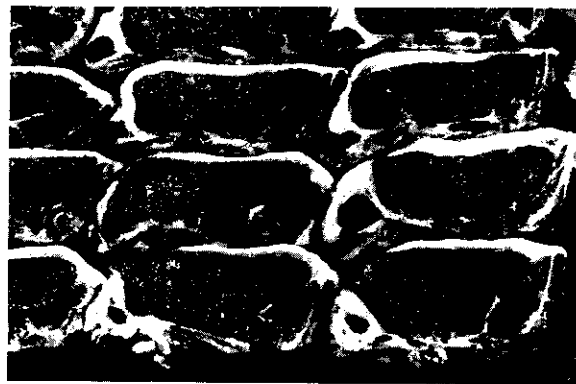
The types of cure used on slab-sliced and canned bacon vary according to the packer contract. The curing processes referred to above are identified as follows:



1—Remove the chine bone from the center section of the pork loin. If hand saw is used, cut loin in two pieces to facilitate removal of chine bone.



2—Cut center section into chops with power saw. Cutting chops with a cleaver is not recommended.



3—Chops cut of uniform thickness.

Illustration 17
Steps in Cutting Bone-in Pork Chops From the Rib Half of the Loin (Machine Operation)



1—Cut boneless loin (ribs removed) into chops by leaving one side of each double chop hinged together with a thin layer of meat.



2—Butterfly chops.

Illustration 18

How to Cut Butterfly Pork Chops From Loin (Hand Operation)

(1) Dry Sugar-Box Cure (or Dry Box Cured)—This is one type of cure used for better grades of breakfast bacon, usually thinly cut. Dry sugar-box cure (or dry box cured) produces a uniformly cured product. The process includes rubbing dry salt, sugar (an optional ingredient), nitrates, nitrites, and spices into the bacon. If sugar is used, the cure is referred to as dry sugar-box cure. The slices are packaged in a box covered with a slatted lid so it can cure, hence the expression, "box cure." The curing period covers 3 to 4 weeks, during which time moisture is withdrawn from the bacon as the salt is applied.

(2) Injection Curing—This is a modern-day bacon-curing method in which the "pickle" cur-

ing ingredients (salt, sugar, nitrites, and nitrates—mixed with water) is injected into pork bellies by needles.

(3) Combination Curing—This term refers to a combined form of different cures used together for speeding up the curing of bacon. Combination curing consists of stitch pumping plus dry salt curing, or a pickle-dry salt-curing combination.

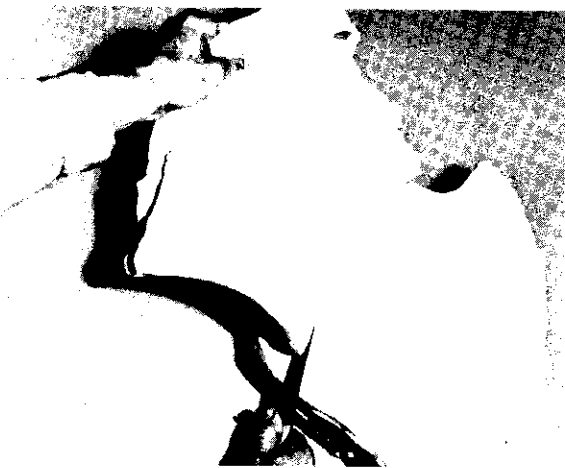
(4) Penetration Cure—This type of cure is a mechanical curing method in which a needle is inserted at several points in the bellies and the pickle is injected in the meat. Following penetration, the bellies are covered with a pickle or a dry-cure mixture.



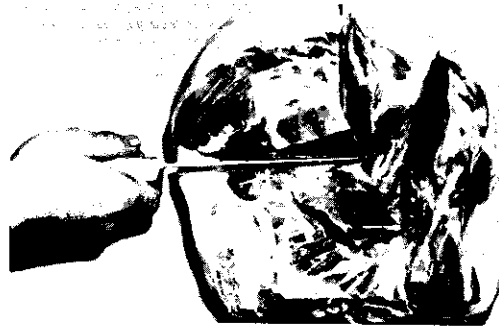
1—Remove hock at stifle joint leaving part of hock attached to inside round (or cushion). Remove aitch bone.



3—Place fat side down. Hams weighing under 14 lb—remove leg bone and split as shown. Hams weighing over 14 lb—split lengthwise and use as two boneless rolls.



2—Trim skin and extra fat (leave $\frac{1}{4}$ in) from outside of leg.



4—Cut tip from end of inside round (cushion). Triangle formed from cut should fall down and replace hole formed by removal of leg bone.

Illustration 19
Making a Football Roll From Fresh Ham (Leg of Pork)



5—Cut through meat above kneecap and parallel with large end of leg.

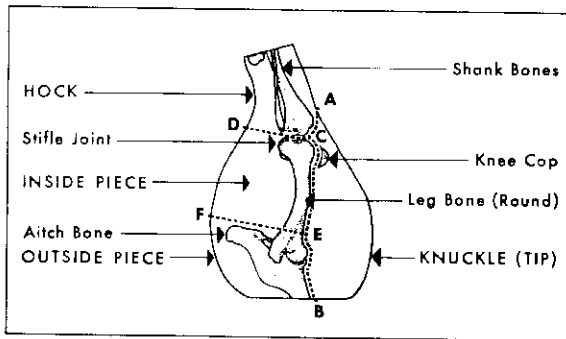


6—Twist knuckle section over portion of leg where hock bone was removed.



7—Tie knuckle in place. Turn leg and tie lengthwise and crosswise as many times as necessary.

Illustration 19
Making a Football Roll From Fresh Ham (Leg of Pork)



1—Bone structure of the ham; location of three boneless cuts; inside, outside, and knuckle.



2—Stand ham on end with knuckle side to right. Using a boning knife, cut into shank, following downward closely to shank bone, to hip bone.



3—Trim off excess outside knuckle fat. Cut thin slices ($\frac{1}{8}$ in thick), starting at kneecap end. Use remainder for diced ham.



4—Cut through stifle joint to separate short shank.

Illustration 20
Splitting Smoked Ham Into Three Pieces



5—Place ham knuckle side down. Cut off boneless outside piece by splitting ham lengthwise.



6—Outside piece, trimmed and split in two pieces for slicing, leave whole for baking.



7—Remove inside piece. Turn ham with aitch bone forward. Cut (as shown) to the right of bone and continue cutting around leg bone.



8—Cutting slices from inside piece. Inside can be used whole for baking.



9—Cut lean meat from leg, aitch bones. Dice.

Illustration 20

Splitting Smoked Ham Into Three Pieces

1006-c(4)—Lamb—High-quality lamb has a smooth covering of clear, white, brittle fat over most of the exterior. The lean is pinkish red in color; in yearling lamb it is a deeper red. The texture of the lean is fine grained and velvety in appearance.

The bones are porous and reddish in color. In older lamb they become hard and white. In young lamb, the forefeet when broken off expose eight well-defined ridges, known as the break joint. In yearlings, the break joint is hard and white instead of porous, moist, and reddish. This joint cannot be broken by the time the mutton stage is reached. The break joint is a sure and simple way of identifying lamb.

The thin, paperlike covering over the outside of the lamb carcass is known as the fell. It does not affect the flavor. Under normal conditions, the fell should not be removed from the leg, since this cut keeps its shape better, cooks in less time, and is juicier when the fell is left on. Chops, however, will be more desirable if the fell is removed before cooking.

The military services procure lamb as follows: (1) Lamb not over 1 year old; and (2) yearling lamb or mutton 1 year and older.

The hindsaddle, or the posterior portion of the unsplit carcass, is divided into leg, comprising

33 percent, and loin (plus flank), comprising 17 percent of the lamb carcass.

The foresaddle, or the anterior portion of the carcass, is produced by "ribbing" the carcass; that is, separating the foresaddle from the hindsaddle by sawing and cutting between the 12th and 13th rib. The foresaddle is composed of hotel rack, 11 percent; chuck, 25 percent; and breast (including shank), 15 percent.

Telescope Lamb—This is a form of carcass lamb used for overseas shipment, cut and packaged to save 40 percent shipping space over that required for whole lamb carcasses. Requirements for quality are similar to carcass lamb, but the handling and packing techniques are vastly different. The neck is tied down prior to chilling. After chilling, foreshanks are cut off at the knee; hindlegs are cut from the carcass; and the legs are placed inside the carcass cavity and stitched and tied.

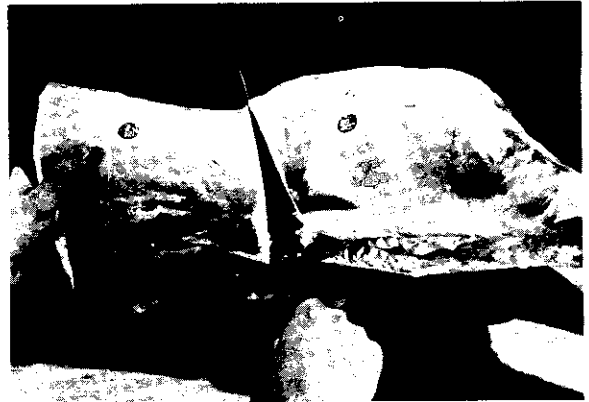
Carcasses are divided into primal cuts for the retail trade as shown in illustration 7, p. D10-8, "Wholesale Cuts of Lamb."

Lamb to be used for roasts may be cut as shown in illustration 21, p. D10-37.

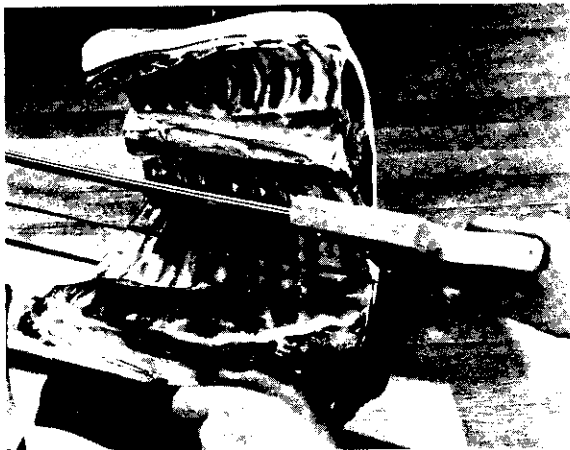
The major use of lamb in the Navy general mess is for chops. (See illustration 22, pps. D10-38 and D10-39.)



1—Cutting a five-rib shoulder (unsplit).



3—Separate loins from double leg portion of hindsaddle. Cut in front of hip bones.

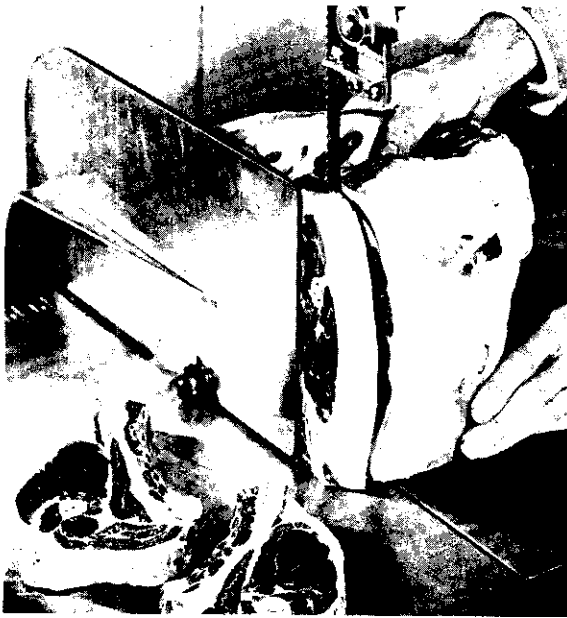
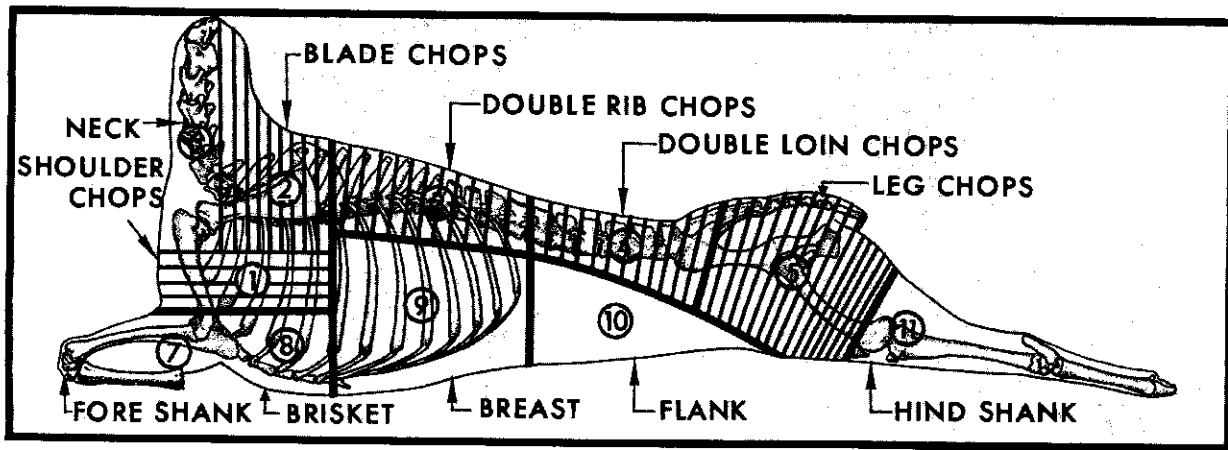


2—Cut behind last rib to separate bracelet. Separate breasts from hotel rack by sawing as shown.

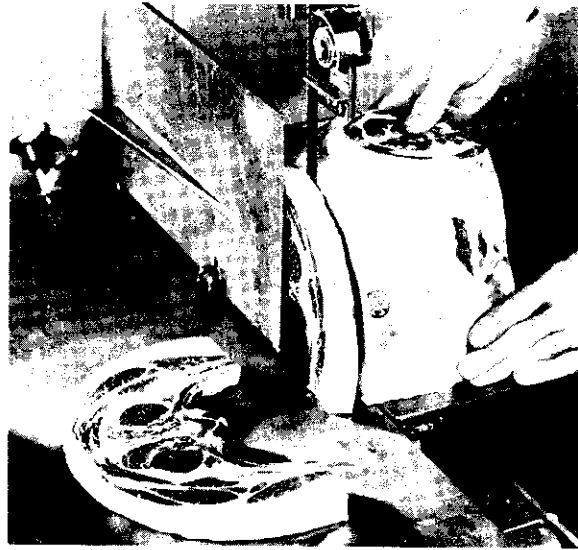


4—Divide legs into two single cuts and remove shanks.

Illustration 21
Cutting Carcass Lamb Into Major Cuts (Double)



1—Arm chops. Cut unsplit shoulders as shown.



2—Blade chops. Cut from unsplit shoulders and then divide each chop into two pieces. Remove chine and feather bones.

Illustration 22
How to Divide Lamb Carcass Into Chops



3—Rib chops from lamb racks (split). Remove backbone as shown at left. Lower right—rib chops with fell; Upper right—Frenched rib chops.



5—Sirloin chops. Cut leg (sirloin section) as shown.



4—Loin chops. Split loin as shown upper left, after removing flank, fell, and excess fat. Leave loin unsplit for double chops.



6—Types of chops from leg. Left—leg; center—sirloin; right—pinbone.

Illustration 22
How to Divide Lamb Carcass Into Chops

1006-d—VARIETY MEATS OR MEAT PRODUCTS AND BYPRODUCTS—In addition to the meats described in paragraph 1006-b, the following miscellaneous meats should become familiar to subsistence personnel.

1006-d(1)—Liver—This is an edible organ obtained from beef, calf, lamb, and pork. Military procurements are limited to beef liver because this is the largest and most flavorful of the edible organs of meat animals. The cost of veal and calves' livers is usually higher than beef liver, and military procurements of these meats are limited to those intended for commissary resale.

Most afloat users of beef liver obtain it in two portion-sliced forms: (1) Round (or oval); and (2) normal shaped.

1006-d(2)—Other Meat Byproducts—Heart, tongue, sweetbreads, and brains are the other variety meats most often found on the commercial market in the United States. Beef kidneys, pigs' feet, calf and beef sweetbreads, beef and pork tripe, ox tails, and chitterlings are used also, but appear less frequently in the retail market.

1006-d(3)—Processed Beef—Beef is used in several processed forms in the Navy general mess.

Corned Beef—Usually boneless beef brisket is the cut meat is pickle cured, but other parts of the carcass, such as boneless rump butt, spencer roll, shoulder clod, or knuckles, may be used also for corned beef. These cuts are of good quality, particularly if used for fresh (or frozen) corned beef.

The curing materials used in canning beef are nitrate, nitrite, and salt (sugar is an optional ingredient), plus varying amounts of water, depending upon whether brisket or other cuts are used. The cure can be accomplished by several methods. One major process is pumping

the curing brine into the arteries of the animal before cutting into primal cuts of beef. In addition, some briskets are treated with a cover pickle for periods up to 2 weeks, being kept under refrigeration at all times. Corned beef, unlike ham, is not smoked.

Canned corned beef is corned similarly to fresh beef; it is tenderized by the heat processing method and thus it is more tender and dense than frozen corned beef.

Dried Beef—This product originates from what the meat trade calls beef hams, or beef rounds. This beef cut is usually obtained from lower quality beef since the manner of cutting or shaving eliminates the possibility of unpalatable meat texture. The cuts to be used for dried beef are divided and given a mild pickle cure followed by smoking-drying treatment and then sliced very thin.

1006-d(4)—Pork Sausage and Other Sausage Products—Sausage is a name applicable to a wide variety of products including many table-ready meats usually not referred to specifically as such. The term sausage originated from a Latin word, *salsus*, meaning salted or preserved, but now is generally applied to finely chopped meat cooked and seasoned with spices and preserved by curing and/or smoking.

Sausages are named usually according to their place of origin. For example, bologna was first made in Bologna, Italy, and Lebanon bologna originated in Lebanon, Pennsylvania.

Sausages primarily are classified, however, as (1) domestic, and (2) dry. There are many other classification breakdowns that may be used to further identify sausage products. (See table C, p. D10-41.)

(1) Domestic-Type Sausages—These are manufactured by a process that requires water to control temperature.

TABLE C
SAUSAGE CLASSIFICATION
(Pork or Pork, Veal, and Beef)

Domestic Types	Unsmoked, Cooked
(May or may not be cured and smoked)	Liver sausage with smoke flavor added ^{2 4} Pork and beef sausage, precooked ⁴
<u>Fresh, Uncooked</u>	Dry Types
Pork sausage—molded ³ linked ^{1 3 7} unlinked ^{1 3}	(All classes cooked cured, smoked)
Pork and beef sausage ⁴	<u>Semidry</u>
<u>Smoked, Cooked</u>	Soft Cervelat or Thuringer ^{5 6}
Frankfurters ^{2 4 7}	<u>Cooked</u>
Bologna ^{2 4}	Salami, ^{5 6} cooked
Lebanon bologna ²	<u>Dry</u>
Vienna sausage ⁷	Salami, ^{5 6} dry
New England-style sausage ⁴	<u>Uncooked</u>
<u>Smoked, Uncooked</u>	Dry Cervelat ^{5 6} Pepperoni ⁶
Polish (not procured for Navy)	
<u>Refrigeration States:</u>	
¹ Fresh, chilled	⁵ Dry, frozen
² Cooked, chilled	⁶ Dry, chilled
³ Frozen	⁷ Canned
⁴ Cooked, frozen	

(a) Fresh Sausage—This is a product made of uncooked fresh ingredients.

(b) Smoked or Unsmoked Sausage—This is generally made from cured meats that may or may not be cooked after smoking. Examples of cooked, smoked sausages are frankfurters and bologna. Smoked country and polish sausages are examples of the uncooked type. Some cooked sausages are unsmoked, the best example being scrapple, a perishable, cooked, ready-to-serve product.

(2) Dry-Type Sausages—These are processed without the addition of water. There are sub-classifications of these sausages, including semidry types, like thuringer and cooked salami, and dry types, such as Cervelat and pepperoni.

The ingredients used in the broad class of products known as sausage vary. These include many combinations of pork and beef meat and fat trimmings finely or coarsely ground. Veal is used less extensively than pork and beef, and very little lamb is included in sausage products.

The ingredients are mixed according to formulas prescribed in the specification, then stuffed into casings or other types of containers by hand or air-pressure stuffing machines. These casings may be made of artificial cellular materials or natural animal intestines from sheep, hogs, or cattle. These stuffed sausages are then cured and processed to develop products with distinctive flavors.

Pork and beef and pork sausages are available in the chilled and canned forms. Fresh sausage is frozen.

1007—FROZEN MEATS

Most of the meat used in the Navy general mess is procured in the frozen state. Handling procedures prior to cooking are extremely important from a sanitary standpoint as well as for economic and palatability reasons.

Frozen meat improperly thawed risks contamination. Uncovered meat surfaces make a perfect area for promoting bacterial growth; therefore long exposure of the moist surface to open air must be avoided.

Improper thawing causes an unnecessary seepage of meat juice, resulting in lowered quality and a loss of valuable food nutrients contained in this highly important and costly protein food.

Section E, "Storage and Care of Subsistence Items"¹ gives specific information on the conditions for storing and holding frozen meat. Steady, constant, low (0° F or below) storage temperature is essential to maintaining meat quality. Subsistence personnel should keep constant watch over the freeze box to prevent fluctuation of storage temperatures. After issue, close surveillance of frozen meat is also required to retain maximum quality and obtain maximum returns from meat-dollar investment.

Once thawed, meat should never be refrozen because with each thawing period, moisture loss occurs. A dry, less flavorful cooked product results when using meat that has once been thawed and refrozen. With thawing and refreezing, and subsequent rethawing and refreezing, meat becomes progressively more dry.

Meat may be cooked in the frozen state except for a very few cuts where complete thawing is

necessary (hamburger, diced meat, and pork chops). Extra time must be allowed for completely thawing meats before cooking. On the other hand, extra fuel, as well as cooking time, is required to cook meat in the frozen state. Partial thawing is not recommended for any meat except frozen portion-sliced liver, which is to be coated with flour and thawed only until the cut surface is moist.

1007-a—THAWING METHODS FOR FROZEN MEATS—There are several ways frozen meat may be thawed. The preferred method is slow thawing because there is less drip loss in the meat. Meat thawed slowly yields a juicier and more palatable cooked product. An alternate method is recommended under circumstances where slow thawing is not practicable, such as on small ships with limited chill space, or whenever time is limited between meat issue and meal time.

1007-a(1)—Preferred Thawing Procedure—Break out the quantity of meat required. Remove from shipping container, but leave inside wrappings (usually polyethylene bags) on meat. Thaw slowly at reefer temperatures (36°–38° F) until almost completely thawed. The thawing period will vary according to:

- (a) Size of the meat cut. The larger the size, the longer time required.
- (b) Bone-in or boneless state. Bone-in meats take less time to thaw.
- (c) Air temperature and circulation in chill space. Moving air accelerates thawing.
- (d) Quantity of meat being thawed in a given area. A large amount will lower the temperature of the room and deter thawing action. Spread the cuts out. Do not stack them.

It is difficult, if not impossible, to predict exact time required to thaw meat unless there is a perfectly controlled set of circumstances. Frozen wholesale beef cuts and frozen boneless

¹ To be published at a later date.

beef may require up to 48 hours to thaw at 36°-38° F temperatures; however veal sides and telescope lamb may thaw in about 36 hours at this temperature range. Cuts from pork, veal, and lamb would probably thaw in about 24 hours under refrigerator temperatures.

1007-a(2)—Alternate Thawing Procedure—Thaw in the original sealed container at room temperature (72° F or above) for a period of several hours. Then, open the box. If meat is not completely thawed, it will become so rapidly. The important point to remember is that unsealed boxes of the various six-way beef components, for example, will be the equivalent of a refrigerator, allowing meat to thaw slowly. The outside meat will thaw rapidly while the thawing continues inwardly toward the center of the package. Meanwhile, the outside thawed pieces will remain sufficiently cold to prevent spoilage while the center is thawing.

1007-b—COOKING FROZEN AND THAWED MEATS—Thawed frozen meats and meats cooked in the frozen state are prepared exactly like chilled meats. Methods do not vary according to the states of refrigeration in which meats are stored. The principle of using low temperatures for cooking is equally applicable to all meats. Length of cooking time does vary, of course, for frozen meats.

1007-b(1)—Roasts—In the frozen state, roasts will require approximately $\frac{1}{3}$ to $\frac{1}{2}$ additional cooking time. Seasoning, as well as flouring, must be delayed until the outside is somewhat thawed and the surface is sufficiently moist to retain salt, pepper, and flour. The insertion of meat thermometers can be delayed also until roasts are partially thawed. Another alternative is to make a hole in the center of the roast by hammering in a sharp skewer; the meat thermometer then can be inserted.

1007-b(2)—Ground and Diced Meats—Thaw these meats completely before cooking. Ground meats used for hamburger, as well as other

meat dishes, require shaping prior to cooking. Diced meats used in stews or other recipes often require browning and this is accomplished best when meats are thawed.

1007-b(3)—Steaks and Chops—Beef, veal, and lamb chops may be grilled in the frozen state. Pork chops **MUST BE THAWED** to insure complete doneness. In institutional food service, however, the lengthy periods required for cooking any of these meats completely done from the frozen state make it less practical because it ties up the cook's time as well as the griddle space. If griddles are located on the serving line, cooking beef in the frozen state will slow up the line considerably.

1007-b(4)—Liver—Grilling or deep-fat frying of sliced frozen liver of $\frac{3}{8}$ to $\frac{1}{2}$ in thickness is recommended. Liver cooked without thawing is more moist and, therefore, more palatable than prethawed cooked liver, and slices are more uniform and attractive in appearance. Liver cooked with a flour coating is the exception. (See par. 1007.)

Liver should be deep-fat fried in the frozen state if it is sliced into "finger size" pieces. Should liver appear "greenish" after grilling, do not regard as spoiled. This discoloration on cooked liver surface may be due to several factors resulting from oxidation of pigment.

1008—MEAT COOKERY

There are three basic methods for cooking meat: (1) Dry heat; (2) moist heat; and (3) frying. Meats to be cooked can be classified in two simple categories: (1) Tender cuts; and (2) less tender cuts.

1008-a—MEAT COOKERY PRINCIPLES—The method chosen to cook any kind of meat depends principally upon one factor: The Connec-

tive Tissue Content (connective tissue is explained in par. 1003-a). The amount of connective tissue present in meat is related to the location of a particular animal muscle from which a cut is taken, for instance, there is more connective tissue in muscles located on the beef leg. This tissue must be broken down, or softened, during cooking. Heating in liquid below the boiling point converts the protein of connective tissue, chemically known as collagen, into gelatin.

On the other hand, meat containing little, or less developed, connective tissue does not require this chemical breakdown and may be cooked without moisture. The meat muscles of an animal along the backbone, such as the loin, receive less exercise and have less connective tissue. Other factors, too, may alter the character of the connective tissue in meat. These are:

(1) **High Heat**—Meats cooked at high temperatures toughen, shrink, cook less uniformly, and have less juice and eye appeal than meat cooked at low or moderate temperatures.

(2) **Acid**—Acids added to the meat—in form of tomatoes or tomato juice, lemon, vinegar, or sour cream—are frequently used on less tender cuts. Acid aids the breakdown of connective tissue.

Every cut of meat can be made tender or kept tender and palatable by applying basic principles of meat cookery. Cook by methods recommended for tender or less tender meats. Observe Low to Moderate temperatures at all times.

1008-a(1)—Dry Heat—Meats having a minimum of connective tissue, that is the Tender Cuts, can be cooked by dry heat. Dry-heat cookery, or cooking meat uncovered without added moisture for a specified period of time, includes: (1) roasting, (2) broiling or griddle broiling, and (3) pan broiling.

Frying is suitable for thin, tender cuts. Frying

is not, in the strictest sense, a dry-heat cookery method. Frying, including pan frying and deep-fat frying, is cooking with a large or small amount of fat with meat submerged in the fat.

1008-a(2)—Moist Heat—Simply defined, moist heat is cooking with a specified amount of added liquid. Moist-heat cooking methods include: (1) braising, and (2) cooking in liquid (sometimes described as water cookery). Moist-heat methods are used to cook less tender cuts of meat.

There are several limiting terms used to describe cooking of meat in liquid, for example, simmering, poaching, and stewing; however, these terms need to be qualified (see par. 1008-g). The term "cooking in liquid" embraces a wide number of meat dishes given more variable titles than those used for preparing meats by braising. To mention a few:

Stews of various kinds,
Soups of various kinds,
"Simmered" meats (corned beef, for example).

1008-b—ROASTING OR BAKING—The term "roasting" appropriately describes the procedure used for cooking meat by dry heat in an oven. Baking is more generally applied to cooking breads, cakes, cookies, and cheese and egg dishes. Ham is usually referred to as baked on a menu while pork loin is called roast pork.

The term "pot roast" is incorrect when used to describe a "method" of meat cookery. Pot roast is a meat entree cooked by braising, a moist-heat method.

Any tender cut of beef, veal, pork, or lamb may be roasted. (See table D, p. D10-45.)

1008-b(1)—Preparing Meats for Roasting—Roast pans should be of heavy material with low sides which allow meat to be cooked by hot air freely circulating over and around cuts in the pan. Open pan roasting will brown roasts

TABLE D

Beef ¹	Veal	Pork	Lamb
<u>Carcass</u>	<u>Carcass</u>	<u>Hams</u>	<u>Carcass</u>
Spencer roll (or rib eye)	Leg	Fresh	Leg
Sirloin tip	Loin	Smoked	Loin
Tenderloin	Rib		Rack
	Shoulder (boned)		Shoulder
<u>Boneless</u>	<u>Semi- and Boneless Roasts</u>	<u>Loin</u>	
Sirloin	Top round		
	Bottom round		
	Clod		
	Sirloin rump butt		
	Chuck		

¹ The following beef cuts are roasted or used for pot roast:

Carcass—inside round	Boneless—top round
knuckle	knuckle tip
	rump
	eye of round

evenly. The meat is placed on a rack to insure even cooking and to prevent the meat cooking in the drippings. If racks are not available, the meat should be turned during cooking.

DO NOT CROWD ROASTS IN PAN. The number of roasts to cook per pan per oven will depend on the type or cut of roast. Large standing-rib, bone-in beef roasts, for example, are usually cooked one at a time. Up to six loins of pork (boned), may be cooked at one time.

When to add salt is important because too much salt retards browning. Salt will penetrate only to depth of about $\frac{1}{2}$ in on roasts. Season meat with salt and monosodium glutamate as directed on meat recipes. Other seasonings, such as onion and bay leaf, also are used as directed on recipes. Salt flavors only the outside of the meat and the melted fat and meat juices collecting in the pan. Seasoning can be added to carved slices if an additional amount is desired. Care should be taken not to oversalt.

1008-b(2)—Basting—Roasts with outer layers of fat will be self-basting if placed fat-side-up in roasting pan. Pouring or spooning drippings back over the meat is unnecessary if well-marbled meat is cooked slowly at 300° F. No

water, stock, or moisture of any form is added to the pan for roast meats.

1008-b(3)—Cooking Temperatures—Oven temperatures for roasting vary from 300° F to 350° F. Generally, all meats should be roasted at low temperatures to conserve moisture and tenderness and to prevent excess shrinkage and flavor loss. Searing meat, or browning it, prior to oven roasting is not a good practice. Searing actually toughens the outer layer of the meat and increases cooking losses.

1008-b(4)—Cooking Time—This is an important facet of meat roasting, but at best can be stated only as a guide to meat doneness or tenderness. Roasts will continue to cook to a slight degree after removing from the oven. Cooking time depends principally upon the size and style of the meat cut, the degree of doneness desired or required, and temperature control. (See table E, p. D10-46.) A discussion of each of these points follows:

Size—In general, the larger the cut, the fewer minutes per pound required to roast it. Most recipes for boneless beef roasts cooked by dry or moist heat are geared to uniform 8-lb pieces to insure even cooking. Roast veal is cut into

TABLE E
TIME TABLE FOR ROASTING MEATS

Roast	Weight each approximate (Pounds)	Oven temperature (° F)	Internal temperature (° F)	Approximate total cooking time (Hours)
Beef:				
Ribs, standing (bone-in).....	6-8	300	Rare—140.....	Varies.
		300	Medium—160.....	Varies.
		300	Well done—170.....	Varies.
Boneless cuts.....	6-8	300	Rare—140.....	Varies.
		300	Medium—160.....	Varies.
		300	Well done—170.....	Varies.
Pork:				
Ham, fresh.....	12-14	350	185.....	6.
Ham, smoked, boned.....	10-18	300	170.....	2½-4.
Ham, canned.....	8-14	300	145.....	2.
Ham, precooked, casing type.....	8-12	300	145.....	2.
Loin (partially boned).....	6-8	350	185.....	4.
Loin (boned).....	6-8	350	185.....	4.
Lamb:				
Boneless leg, loin, or shoulder.....	4-6	300	170-180.....	2-3.
Veal:				
Boneless leg, loin, or shoulder.....	5	300	170.....	2½.

5-lb pieces and lamb cuts are 4 to 6 lb. The shape of the meat cut also influences cooking time. Cooking times for flat and chunky roasts vary considerably. A flat roast will cook in less time than a chunky one of the same weight, since the distance from the outside to the center of the meat is less in the flat roast than the chunky one; hence, less time is required for the heat to penetrate.

Style—Boneless and bone-in meats differ in required cooking times. A standing rib roast, for example, usually cooks in less time than a boned beef cut. The amount of fat, too, may alter cooking time. Melted fat conducts heat, which results in faster cooking. The presence of fat also prevents the loss or evaporation of moisture from the meat, thus hastening the cooking and reducing the amount of drip loss.

The Degree of Doneness Desired or Required for Roasts—Beef roasts may be cooked rare, medium, or well done, as desired. Lamb is generally preferred well done. Veal should be cooked well done to insure tenderness. **PORK WITHOUT EXCEPTION MUST BE COOKED WELL DONE.**

Thus, to a large degree, cooking times are determined by the kinds of meat being cooked.

Degree of doneness is gaged by: (1) appearance, (2) internal temperature, and (3) cooking times. The most accurate means of determining doneness, however, is by the use of a meat thermometer. (See illustration 23, p. D10-47.)



1—Bone-in Roast—Meat thermometers should be placed so that bulb is in center of largest muscle. Thermometers should not touch the bone.



2—Boneless Roasts—Meat thermometers should be placed so that bulb rests in center of roll. Dial-type meat thermometers are generally used in the Navy general mess.

Illustration 23
Roasts Ready for the Oven

Temperature Control—The temperatures at which meats are cooked also determine cooking times. Even a slight variation in temperature affects cooking periods; therefore, slow to moderate temperatures, resulting in long cooking times bring about minimum quality loss and waste from cooked meat. Maintaining even temperature control permits predictable cooking periods.

1008-c—BROILING OR GRIDDLE BROILING—Broiling is a dry-heat cooking method by which heat is applied directly to the meat either by placing under a gas flame or under electric heating unit equipped with adjustable-height grid pans, or placing directly on heated, ungreased griddle. Cooking by the latter method is referred to as grilling.

Because of limited space, open-flame broilers are seldom used for broiling meats in the Navy general mess and meats are griddle broiled.

Broiling is better for cooking steaks and chops cut $\frac{3}{4}$ in or thicker. Steaks, chops, and patties less than $\frac{3}{4}$ -in thickness should be griddle broiled. This will insure the meat being the desired doneness by the time it is browned on the outside.

1008-c(1)—Cuts Used for Grilling—Tender beefsteaks, ground beef, and lamb chops are suitable for griddle broiling. Fresh pork and veal should not be grilled. Only cured and/or smoked pork cuts should be cooked by this method; that is, sliced ham and bacon or fresh or frozen pork sausage links that have been partially cooked by moist heat first. Canned sausage links, too, are suitable for grilling if excess fat is removed. This ration-dense item can be washed free of fat by rinsing the links thoroughly under running warm water and draining. (See table F, p. D10-48.)

1008-c(2)—Procedure for Grilling Meats—Most beefsteaks used by the Navy are boned, and excessive outer layers of fat have been removed. If additional trimming is required to prevent griddle from accumulating fat and burning, cut off about $\frac{1}{4}$ -in thickness of outside fat. This helps to season the meat and expedite the grilling of it. Make perpendicular slashes through the fat and membrane as insurance against edges of fat curling. Meat cooks more uniformly and browns more evenly if it stays flat to the griddle. (If meat is frozen, see procedure for handling in par. 1007.)

TABLE F
MEAT CUTS SUITABLE FOR GRIDDLE BROILING

Beef	Ham	Lamb
<u>Carcass</u>	<u>Smoked</u>	<u>Carcass</u>
Sirloin	Ham slices	Leg chops
Rib	Bacon	Shoulder chops
Club	Sausage	Loin chops
Tenderloin		<u>Semi-Boneless</u>
Ground beef		Rib chops
<u>Boneless Portion-Cut</u>		Loin chops
<u>Steaks</u>		Leg chops
Rib eye		
Loin strip		
Sirloin butt		
Tenderloin cuts		
<u>Ground Meat</u>		
<u>Beef Liver</u>		

Seasoning—Do not salt grilled meats until after cooking. Salt draws out meat juices and prevents browning.

Burned chunks of meat and/or fat should be scraped from the griddle.

1008-c(3)—Time/Temperature—Cooking periods for grilling vary for the same reason as for roasting; the larger the steak or chop, the longer time required. Cooking time depends upon the size and shape (in this instance, surface area and thickness of cut); temperature control (initial internal temperature of meat; maintaining steady 400° F. griddle temperature as cooking load increases or decreases); and degree of doneness desired (one rare ½-in-thick steak requires about 2½ minutes on each side; 4 minutes for medium; and 5 minutes on each side for well-done). (See table G, p. D10-49.)

1008-c(4)—Doneness Test—The most practical method for testing doneness in grilled meats is by time. Do not prick or puncture meats with a fork as this allows juice containing valuable nutrients and flavor extracts to escape from the meat.

1008-c(5)—Caring for Griddle—Surplus fat should be drained from griddle as it collects.

1008-d—PAN BROILING—This method is the same in cooking principle as griddle broiling, since in both methods the meat is cooked by heat transmitted from metal. Meats are seldom pan broiled in the Navy general mess because this method is not as well suited to institutional food service as griddle broiling.

1008-e—FRYING—Frying is another method of cooking meat. Frying is sometimes classified as dry-heat cookery, and qualified as such mainly because moisture is not used in the frying. Frying is cooking in fat. The amount of fat is the key to distinguishing two frying procedures. Pan Frying is cooking with a little fat. Deep-Fat Frying is cooking with a deep layer of fat. Thin cuts of round steak, or veal cutlets, and liver fingers are frequently cooked by deep-fat frying in the general mess. Meat croquettes are deep-fat fried also.

Browning in deep fat plus additional cooking using added moisture is erroneously referred to as fried meat; it is actually braising, a moist-heat method.

TABLE G
TIME-TEMPERATURE TABLE FOR GRIDDLE BROILING

Meat	Size or Weight	Temperature (° F)	Approximate Total Cooking Time
BEEF:			
Boneless steaks.....	6¼ to 7½ oz.....	400	Rare—2½ minutes per side. Medium—4 minutes per side. Well Done—5 minutes per side.
Hamburger.....	3½ oz.....	350	4 minutes per side.
PORK, SMOKED:			
Bacon.....	1 slice.....	300	Varies.
Ham, sliced.....	5½ oz.....	350	6 to 8 minutes per side.
Sausage links.....	2 links.....	300	20 minutes.
Sausage links (parboiled)...	2 links.....	350	8 minutes.
Sausage patties.....	2 oz.....	350	12 minutes.
Scrapple.....	½-in slices.....	375-400	Varies.
LAMB:			
Chops (leg, shoulder, loin, or rib).	1 in thick.....	350	6 to 8 minutes per side.
MISCELLANEOUS MEATS:			
Frankfurters.....	1 each.....	375	10 to 12 minutes.
Liver, frozen, portion-sliced.	3½- to 4½-oz slices...	375	Partially thawed, cooking time varies.
Luncheon meat.....	2¼ oz.....	350	1½ minutes per side.

Cooked chopped meats, combined and extended with other foods, such as meat croquettes are more suited to deep-fat frying. For details on deep-fat cookery see this section, Part I, "Basic Principles of Food Production," paragraph 102-d. (See also table H, p. D10-50.)

1008-f—BRAISING—This is a method of moist-heat cookery and is used generally for less tender cuts of meat, although it is applied to tender cuts as well. Braised meats are very flavorful if properly prepared. Rich brown color is characteristic of meats cooked by this method, and the aroma as well as flavor are developed. Entrees having meat sauces as accompaniments such as barbecues and curries are used with tender cuts of meat for the moisture as well as flavor.

In moist-heat cookery seasonings (herbs and spices), used wisely, add much to the variety of the meat entrees.

1008-#(1)—Selecting Cuts for Braising—A list of meat cuts appropriate for this moist-heat cookery method is in table I, p. D10-51.

The braising method is used to prepare the following meat dishes:

Pot Roasts—A pot roast is a large piece of meat cooked by browning in fat, adding moisture, and cooking covered until done. Many different menu terms are used to describe this type of entree. These include—

Yankee, French, Spanish Pot Roast,
Sauerbraten.

In addition, small meat cuts cooked by moist heat are described as—

smothered pork shoulder,
steak barbecued,
sweet and sour meats,
Mexicana and Italiana meats,
casserole meat dishes,
beef or veal birds,
Swiss steak,
veal cutlets,
curried lamb.

1008-f(2)—Procedure for Braising—Several techniques may be applied in cooking meats by this method. The meat may be browned by one of these three methods of dry heat:

- (1) Roasting or baking;
- (2) Frying (by pan or deep-fat);
- (3) Griddle broiling.

Then a small amount of moisture is added to the meat in the form of—

- (1) water;
- (2) vegetable or fruit juices;
- (3) stock;
- (4) a combination of water, vegetable, or fruit juices or stock;
- (5) thin sauces;
- (6) marinade (spices, herbs, and liquids).

A cover is placed tightly over the kettle after browning so that the moisture, which would normally escape, is retained to help soften the connective tissue.

Meats to be braised should be seasoned after browning. Browning is essential to the development of flavor in less tender cuts of meat. Dredge with flour when cooking chops or cutlets, or rub flour into meat if so directed by the recipe. Flour may be pounded into less tender beef cuts such as steaks or chops. This is one means of breaking some of the connective tissue. Meat fiber bundles are cut in this process, either by hand or by running through a tenderizing machine.

Veal steaks and pork chops may be breaded, not floured, as directed in some recipes. Browning less tender cuts first will develop flavor. Brown meat slowly on all sides in a small amount of fat in a heavy utensil over medium heat. A slow browning of meat will penetrate more deeply into the meat surface and will be better retained after subjected to the added moisture or steam formed when the cooking utensil is covered.

Browning of this type may be done in the oven. Lower the oven temperature when moisture is added and cook until done. Fast browning may cause a crust to form on the outside and flake off when liquid is added.

TABLE H
TIMETABLE FOR FRYING

Meat	Size (Each)	Temperature (° F)	Approximate Time (Minutes)
Beef croquettes	2 oz.	365	4-5
Liver fingers	2½ in. x ½ in. x ½ in.	375	3-5
Veal cutlets (chopped)	4 oz.	375	3-5
Veal cutlets (breaded)	5 oz.	340	4-6

TABLE I
MEAT CUTS COOKED BY BRAISING

Beef	Pork	Veal
<u>Boneless Roasts</u>	<u>Loin</u>	<u>Boneless Roasts</u>
Shoulder clod	Chops	Top round
Inside chuck	Spareribs	Bottom round
Rump	<u>Fresh Ham Steaks</u>	Clod
Bottom round	<u>Tenderloin</u>	Sirloin rump butt
Sirloin tip		<u>Chops</u>
Chuck tender		Back
<u>Boneless Beefsteaks</u>		Tenderloin
Shoulder clod		Butt
Bottom (outside) round		Knuckle
Inside chuck		
Bottom sirloin butt		
Chuck tender		
<u>Carcass Beef Roasts and Steaks</u>		
Chuck (all cuts)		
Brisket		
Plate		
Flank		
Outside (bottom) round		
Heel of round		
Rump butt		
<u>Variety Meats</u>		
Liver		

Liquid may or may not be added depending on the cut being cooked. Liquid may be derived from vegetables placed around the meat in the final stages of cooking. The amount of liquid used in braising is extremely important. Generally the smaller the amount the better.

A tight-fitting cover is essential to good braising technique because it holds in the steam or moisture and helps to maintain an even, uniform degree of temperature necessary to soften the connective tissue in less tender cuts of meat. At the end of the cooking period, the covers may be removed to allow evaporation of excess steam or to thicken the cooking liquid for sauce or gravy.

Shallow steam-jacketed kettles are most appropriate for braising in quantity cookery because they permit close vigil over the browning of large pieces of meats. Heat the kettle first by turning on steam in full with the cover down. After placing roasts in kettle, lift cover, but allow steam to remain on full heat while meat is browning and before moisture is added.

1008-f(3)—Cooking Times and Temperatures for Braising—All braised meats should be cooked at low to moderate (250° F–325° F) temperatures after the initial browning period. Long, slow cooking is required to obtain the well-done state which all less tender meats should have. Cooking times and temperatures for braised meats vary considerably from one type of entree to another. For this reason, time-temperature tables are often an estimate of the required cooking time and the time given for the preparation in a specific recipe is more practical. Consult individual recipes in the Navy-Marine Corps Recipe Service to determine the length of the browning period and the temperature if cooked in the oven.

1008-g—COOKING IN LIQUID (STEWES)—Some types of stews are actually braising; this is true if very little water is added. For true stews, however, the meat is cooked for long periods, usually with vegetables, in water to barely cover the ingredients.

Small, uniform pieces of meat are normally used in stews. These are thin, irregular portions cut into 1- to 2-in cubed pieces that are obtained from less tender cuts of beef, lamb, and veal. More often diced pork is used for chop suey or casserole-type dishes or is ground for use along with ground beef for beefloaf.

Cuts of beef, lamb, and veal relegated to the stew category are listed in table J.

1008-g(1)—Procedures Used for Cooking in Liquid (Stews)—Stews are either light or brown, depending upon whether the meat is browned before the liquid is added. In making brown stews, the cubes of meat are usually floured first to intensify the browning. Light stews, as indicated by the name, are not browned before adding liquid.

Seasoning of both brown and light stews is varied to bring out unique qualities in these popular dishes. Garlic, bay leaves, and Worcestershire are standard seasonings used for stews. Celery salt, parsley, thyme, marjoram, cloves, and curry powder are frequent stew seasonings. Many different vegetables—celery, green peppers, potatoes, onions, tomatoes, and carrots add flavor and texture interest to stews.

Dumplings, baking powder biscuits, noodles, spaghetti, or macaroni accompany many stews. One of these may be substituted for potatoes. In recent years, the addition of dehydrated potato granules to thicken cooked stews has become a common practice.

Although the Navy-Marine Corps Recipe Service does not use dehydrated potato granules as a thickener or for flavor, messes may do so if it is practicable. Use three parts potato granules for every four parts of flour or a substitution factor of 0.75 may be used. Add the granules slowly to the liquid portion of the stew after

TABLE J
MEAT CUTS USED FOR STEWS

Beef	Lamb	Veal
<u>Carcass</u>	<u>Carcass</u>	<u>Carcass</u>
Heel of round	Breast	Breast
Flank	Neck	Neck
Shank	Shank	Shoulder
Neck	Shoulder	Flank
Plate		
Brisket		
Trimmings		
Blade		
<u>Boneless</u>		<u>Semiboneless</u>
Shank		<u>and Boneless</u>
Heel of round		Neck
Blade roll		Shoulder
Neck		Brisket
Plate		

draining vegetables. Cook until the desired consistency is obtained. It is not recommended that potato granules be used in addition to potatoes already in the stew, but as a partial or whole replacement of the regular potato ingredient specified in the recipe. Although potato granules add flavor, they increase the cost considerably.

1008-g(2)—Cooking Times and Temperatures—Temperature and cooking time are of paramount importance in stew preparation. Meats, as well as vegetables, must be cooked well-done but not mushy or stringy from overcooking. Temperature must be closely watched to prevent boiling. Recipes never recommend boiling (212° F) but specify simmering temperatures of 185°–208° F for best results with stews.

Vegetables should be added to the simmered meat at a time that will insure the complete cooking of them. Uniformity of size of vegetables, as well as uniformity of size of meat, is essential to even cooking and flavor excellence.

1008-h—"SIMMERING"—Simmering is frequently used interchangeably with cooking in liquid. However, it more accurately describes a cooking temperature rather than a cooking method.

1008-h(1)—Cooking in Liquid (Large Cuts)—Large cuts for cooking in liquid should have extra fat trimmed. As in cooking stews, large cuts are cooked in liquid to cover (see par. 1008-g).

The seasoning of large cuts cooked by this method depends upon the meat. Salt, for example, would be omitted when cooking corned beef, cured ham, or other cured or smoked meats. If the cure is highly concentrated, soak or precook to prevent excess salt in the finished product.

If unsalted or fresh meats are cooked in liquid, as in the use of necks and shank bones for the preparation of stocks for use in soup and gravy, seasoning is extremely important to conserve and bring out the true meat flavor. Avoid over-seasoning, especially with monosodium glutamate and salt, because these become concentrated as moisture escapes from the cooking liquid, yielding a much too highly seasoned mixture.

1008-h(2)—Cooking Times and Temperatures—To obtain tender, juicy meats when cooking in liquid, as with other methods, low temperatures are required. Meats should be placed in large kettles on top of range or in steam-jacketed kettles, covered with water or placed in water that has reached 185° F, no higher. The water should not reach 212° F (or boiling) temperatures even at the beginning of the cooking period.

The term "boiled" applied to such dishes as Boiled New England Dinner is actually in conflict with good cookery principles. Boiling meats for long periods of time dissolves the connective tissue, and the meat fibers separate; the texture

becomes dry, stringy, and tough, making it impossible to carve uniform, thin, slices from large cuts.

Cooking periods for meats cooked in liquid vary according to cut, style, and kind of meat. Time per pound is longer than that required for roasting. This is true because less tender cuts of meat are usually cooked by this method. Boneless pot roasts (weighing about 8 lb each) require 3 to 4 hours to cook in liquid. Corned beef (brisket cuts) is done when meat thermometers register 185° F, or when cooked approximately 3½ hours. If other beef cuts are used for corning, allow up to 45 minutes or 1 hour per pound for small cuts and up to 35 to 45 minutes per pound for larger cuts. Weight ranges for corned beef vary according to the cut. Corned inside rounds, for example, weigh 20 lb or more. These cuts should be cut into 4- to 6-lb pieces before cooking.

1008-i—STEAMING—Pressure steam cookers or steamers, used mainly for cooking vegetables at Naval general messes ashore and high-compression types afloat, may be used also for meat cookery.

The steam pressure applied to meat at a controlled temperature and for a specified time will cook it effectively. Prebrowning before steam cooking is desirable to produce the rich, brown color and develop flavor of the meat.

For information on using steam cookers, see this section, Part XIII, "Vegetables," paragraph 1303-e(2) or use as directed by manufacturer.

1009—MEAT CARVING

The carving of meats is a task that not only expedites the mess operation, but can mean the difference in efficiency and economy in quantity food service. Carving has always been a more or less established art. Once a chef masters this art, he is very much in demand to perform

the task. In Navy food service operations, handcarving hams or roast meats on the line is less practical but is preferred in small messes to slicing by machine in the galley. Special meals such as Christmas, Thanksgiving, and Easter dinners can be served with a more than ordinary flair if carving can be done on the line. For these occasions, carving adds a touch of home by affording individual attention to each man in line which serves as a good morale booster.

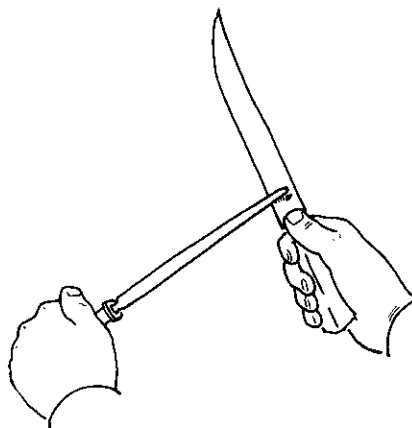
1009-a-CARVING TOOLS—Proper equipment is essential to good carving. Even the best carver is at a loss without sharp knives of proper size. Thin, roast-slicer knives with long blades and a two-tined, long-handle fork should be owned by every activity and reserved especially for carving meats. No one can carve satisfactorily without sharp knives. Sharpen knives as often as needed to keep good blades. Wooden surfaces are best for meat carving. Place the roast on a cuttingboard and hold it down with a large fork. Metal surfaces will turn the cutting edge of the knife. (See illustration 24.)

Slicing machines set at the proper cycle can do an even, fast carving job. But by no means is the operation so mechanical that meats are properly sliced by merely placing the meat on the slicer and flipping a button. Grain of meat must be considered to obtain whole even slices.

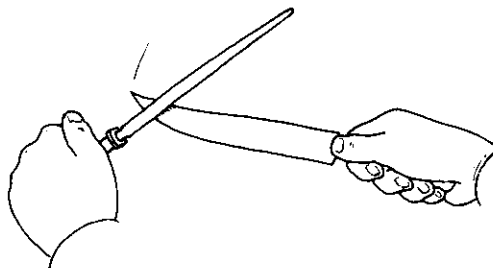
Several boneless roasts or hams can be sliced simultaneously on a meat slicer if properly placed on the carriage.

All roasts or hams should have strings or skewers removed before machine slicing.

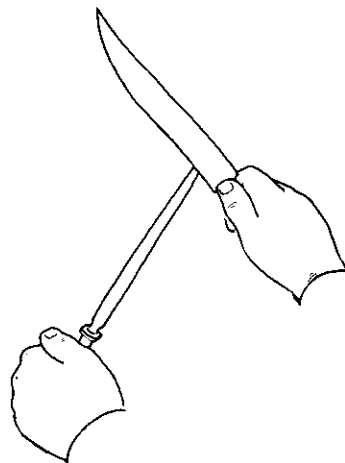
1009-b-PRINCIPLES OF MEAT CARVING—Carving requires practice and a basic knowledge of the muscle and bone structure of meat animals. Meats are much easier to carve if



1—Position for first stroke. Hold steel in left hand, thumb on top of handle. Place heel of blade against far side of steel at tip. Note slight angle.



2—Draw knife toward left hand passing entire edge of blade over steel.



3—Position for second stroke. Note blade of knife is on the near side of steel. Alternate sides of steel, making a dozen or more strokes to true knife blade.

Illustration 24
Steeling Knives

the carver can identify the muscle and observe the direction of the meat fiber bundles. This direction of meat grain decides the carver's course of slicing action. **ALL MEATS SHOULD BE CUT ACROSS THE GRAIN.** Cross-grain slicing shortens the meat fibers and gives a neat slice. If the carver is not familiar with, or cannot identify, the cut of meat, a safe rule for this man to follow is to slice parallel to the **CUT SURFACE.** Meats used for roasts are most often cut in this manner at the meatpacking plant, or by Navy meatcutters.

Once the first slice has cut off satisfactorily, subsequent carving is made easier. The direction of the knife or slicing blade must never be altered. Follow the second slice after the first, working from left to right.

Thickness of slice is a matter of opinion. Some customers prefer thick roast beef slices and thin ham or lamb roast slices. Portions should be controlled by weight, not according to slice thickness. In institution food service, it is a good policy to have both thin and medium-thick slices on insert pans to satisfy customer demands, should a request be made.

Meats carve more easily and are certainly more comfortable to work with if allowed a "set," or cooling-off, period after cooking. Beef that has been cooked to a less than-well-done state is less firm, and should always stand for a 30-minute period before slicing. Hams, too, are more easily carved if cooled for a period of time before slicing.

1009-c—SLICING SPECIFIC CUTS—The diagrams for cutting specific bone-in cuts requiring special carving are shown in illustration 25, pps. D10-56 and D10-57.

Whole cooked hams, packed in pear-shaped cans are authorized for all general messes because of their high yield, ease of use, and economy. The full measure of these benefits is never gained, however, if canned ham is improperly sliced. Uneven portions are wasteful and costly, besides being unattractive to serve.

As shown in the diagrammatic drawing (illustration 26), the whole ham is first divided into three sections; the upper third section is cut straight across the butt end, and the remaining portion is halved into two even pieces lengthwise.

The slices are cut lengthwise across the butt section as well as the other sections as shown. Cutting with the grain of the butt section, as illustrated, is contrary to the general rule of meat carving; that is, cutting across the grain to shorten lengthy muscle fibers and tenderize. Canned hams, however, are already tender products because of the process used; hence, they become another exception to the cross-grain carving rule. Cut the canned hams as directed to get the highest yield per ham.

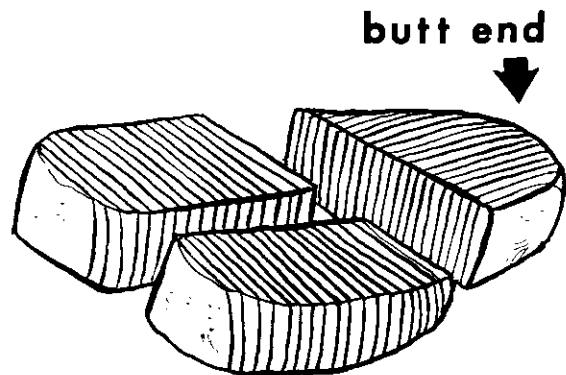
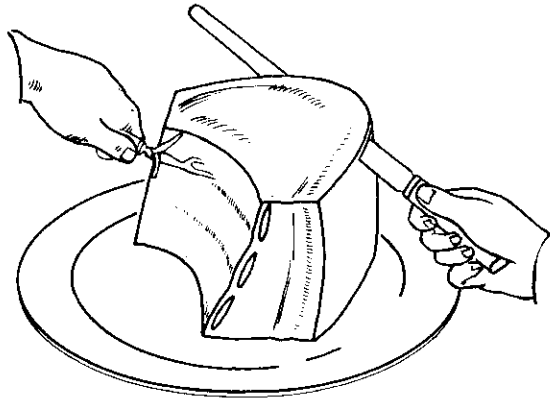
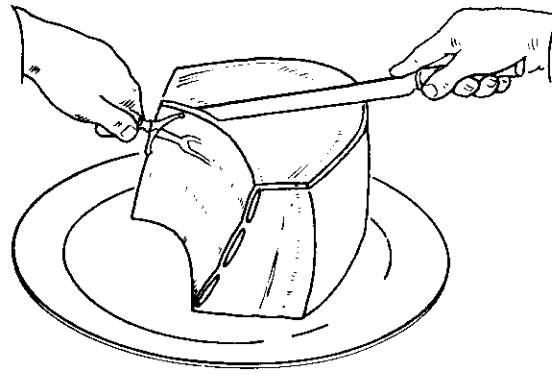


Illustration 26
Slicing Canned Ham

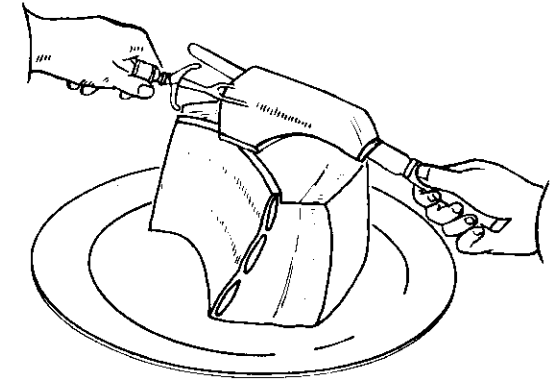
A. Standing Rib Roast



1—Place the roast largest end down to form a solid base. Insert the fork between the two top ribs. Starting on the fat side, carve across the grain to the rib bone.

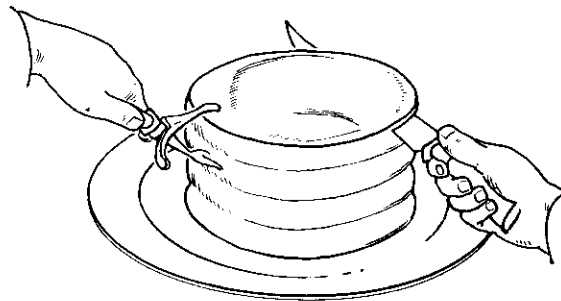


2—Use the tip of the knife to cut along the rib bone to loosen the slice. Be sure to keep close to the bone, to make the largest servings possible.

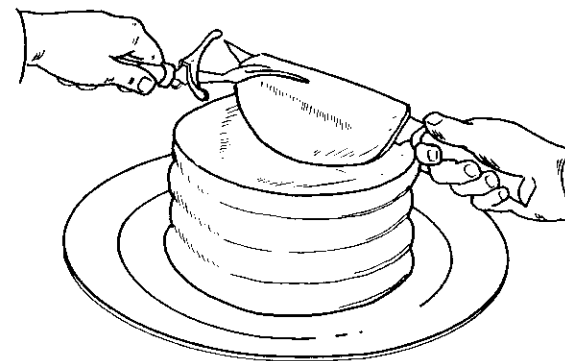


3—Slide the knife back under the slice and, steadying it with the fork, lift the slice to the side of the platter. If the platter is not large enough, place the slices on a heated platter close by.

B. Rolled or Boneless Roasts

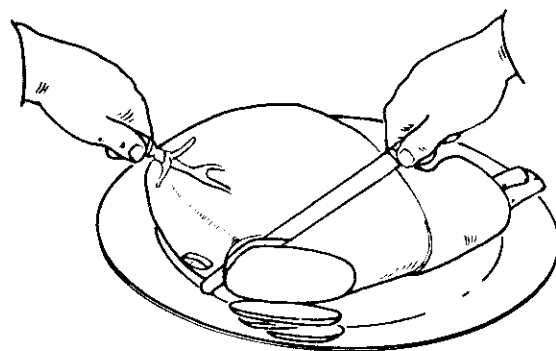


1—Place roast with larger cut side down. Hold steady with a fork on left side as shown. Move fork down as necessary. Draw knife from right to left across cut surface.

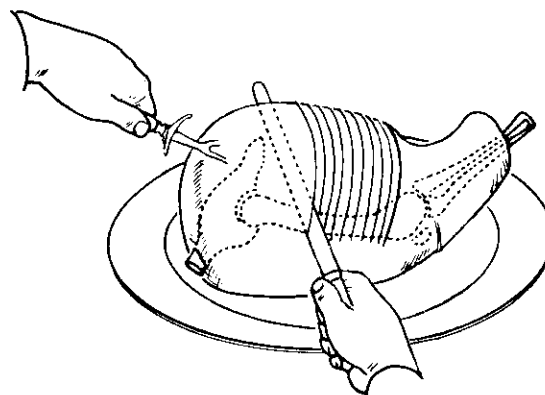


2—As each slice is cut, lift off as shown.

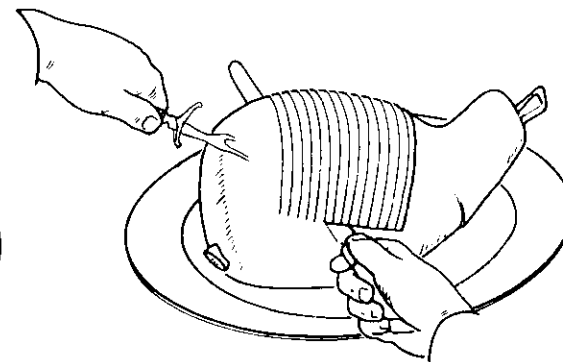
C. Roast Leg of Lamb (Bone in)



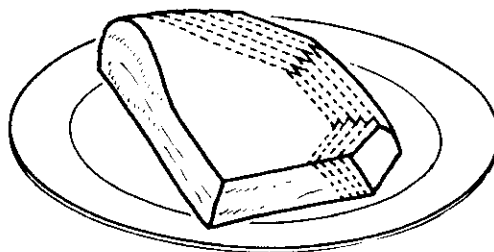
1—Place the roast with the shank to the carver's right and the tip section on the near side. From this, remove two or three slices lengthwise to form a base.



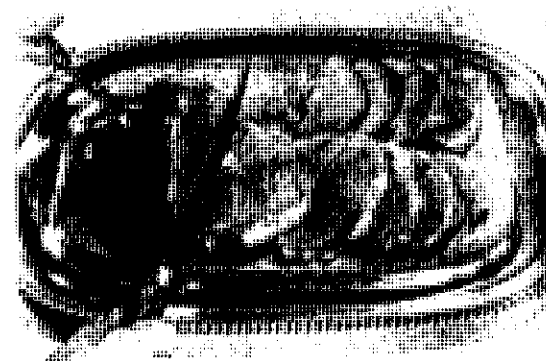
2—Turn the roast up on the base and, starting at the shank end, make slices perpendicular to the leg bone as shown.



3—After reaching the aitch bone, loosen the slices by cutting under them, following the top of the leg bone. Remove slices to platter and then serve.



D. Beef Brisket (as for corned beef). Place round side away from carver. Make slices in rotation from three sides as shown.



E. Boneless knuckle carved for special service.

Illustration 25
Hand Carving Specific Meat Cuts