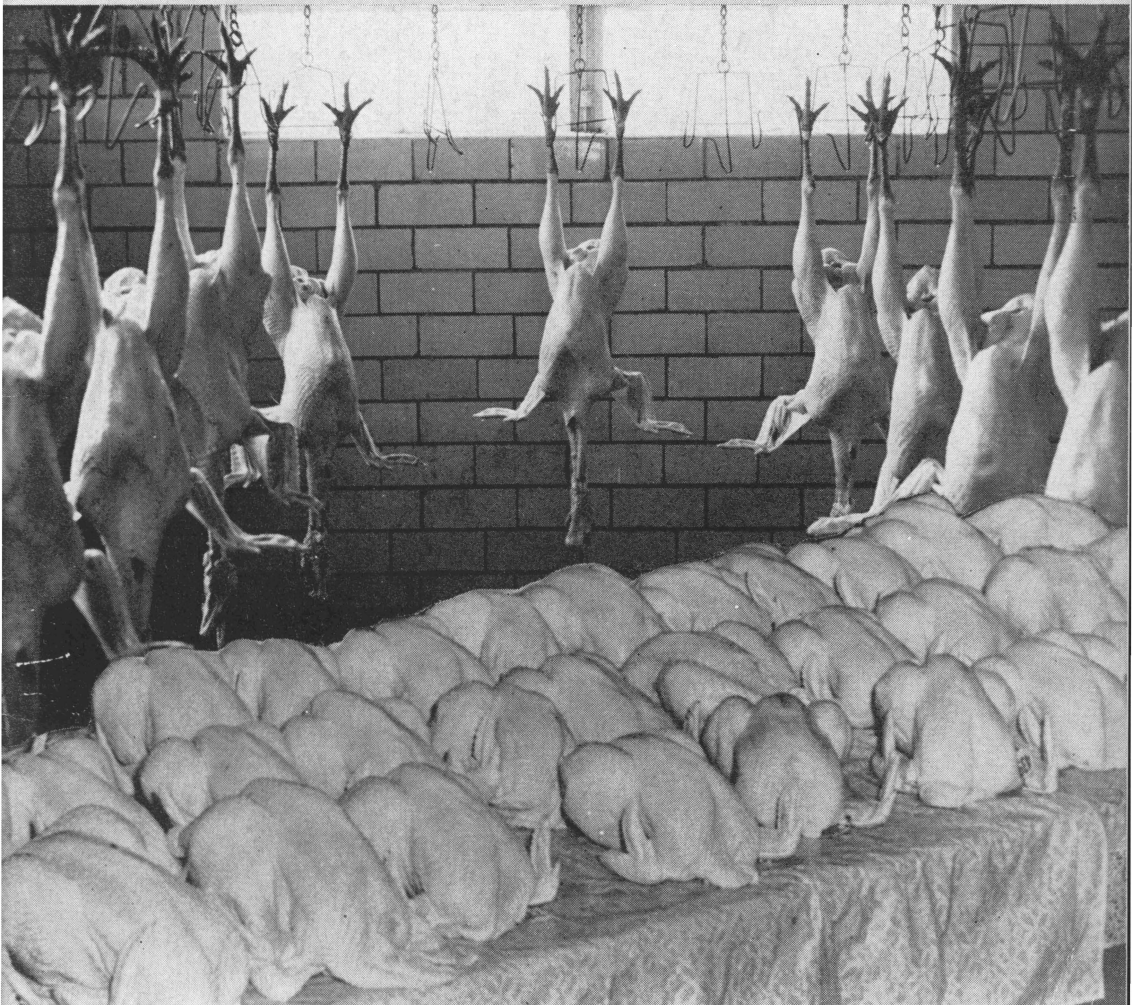


Processing Poultry



THE AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS
TEXAS AGRICULTURAL EXTENSION SERVICE
J. E. Hutchison, Director, College Station, Texas

CONTENTS

	Page
Selecting Birds for Processing	4
Age	4
Fleshing	4
Fat	4
Waste	4
Deformities	4
Health	4
Processing Equipment	4
Killing Poultry	5
Starving	6
Bleeding	6
Braining	7
Attaching Blood Cup	8
Use of Funnels	9
Plucking Poultry	10
Removing Feathers	12
Removing Pinfeathers	12
Singeing	12
Drawing Poultry	13
Whole Carcass	13
Halved, Quartered or Disjointed Carcass	18
Trussing Poultry	21
Processing Terms Defined	21
Hard-scald	21
Intermediate Scald	21
Semi-scald	21
Dry-pick	21
Dressed Poultry	21
Braining	21
Sticking	21
Disjointing	21
Halving	21
Quartering	21
Trussed	24
Plucking	24
Singeing	24
Dressing Percentages	24
Summary	24

Processing Poultry

FLOYD Z. BEANBLOSSOM

Extension Poultry Marketing Specialist

ROY W. SNYDER

Extension Meat Specialist

The A&M College of Texas

LOCKER PLANTS, HOME STORAGE UNITS and other cold storage for chickens and turkeys are now available to a large number of people in Texas. Many who now use or expect to use them are asking how chickens and turkeys should be selected, bled, killed, dressed and drawn. This indicates a need for uniform and adequate information on these skills. Some desire information on these skills when the carcasses (ready-to-cook birds) are not to be frozen. The information in this bulletin can be used on chickens and turkeys for immediate home use, and when freezing birds to be put into lockers, home storage units or sold.

When processing chickens and turkeys, the aim should be to maintain as much of the quality possessed by the live birds as possible. Skills used in selecting, bleeding, killing, dressing and drawing chickens and turkeys will affect the percent live-bird quality that is maintained.

This bulletin is written primarily for home processing of poultry or for a very small volume of sales when compared to large commercial processing business.

Commercial operations in poultry processing aim at getting the greatest possible number of pounds of the product processed with the least amount of man-hours of labor and at the same time maintain the original quality of the poultry when alive. Equipment used in commercial operations makes it possible to process several thousand head of poultry daily.

Pictures on the front cover show poultry being processed on the line and some which have been processed ready-to-cook.

Selecting Birds for Processing

Chickens and turkeys selected for processing must be of good quality if the carcass is to be of high grade. Methods and skill used in processing can lower the quality and grade of the carcass, but they cannot improve upon that which the live bird possessed. This is equally true for poultry to be put into the frozen food locker, home storage unit, used immediately or sold.

Consider the following factors when selecting chickens and turkeys for the frozen food locker, home storage unit, immediate home use or to be sold.

Age. Select young birds such as broilers, fryers, roasters; such as young hens and capons; also turkeys, 24 to 28 weeks old.

Fleshing. Select birds with full, well-rounded breasts; also thick legs and thighs.

Fat. Select birds evenly covered with fat over the entire body. Thick skin on the back of the neck between the first wing joints usually indicates that the body is covered with fat. A layer of fat over the ribs indicates that the body is well fattened since this area is the last to lay on fat.

Waste. Select birds that do not have large rear abdomens with excess fat or watery fluid.

Deformities. Select birds that do not have crooked backs and breasts, especially, for cold-storage locker use. Deformed carcasses are never of the best quality.

Health. Select healthy, vigorous birds. Thin, poorly fleshed and otherwise unthrifty birds are usually not of good quality for food.

Processing Equipment

Good equipment and the proper kind are necessary for efficient killing, dressing and drawing of chickens and turkeys. The amount and kind of equipment depends upon the number of birds to be processed. Figure 1 shows some of the equipment needed when processing only a small number for home use or small volume of home sales.

It includes shackles (A and B) for hanging the birds; small rope and block of wood (C), also used for hanging birds; cutting shears (D), used especially for cutting off

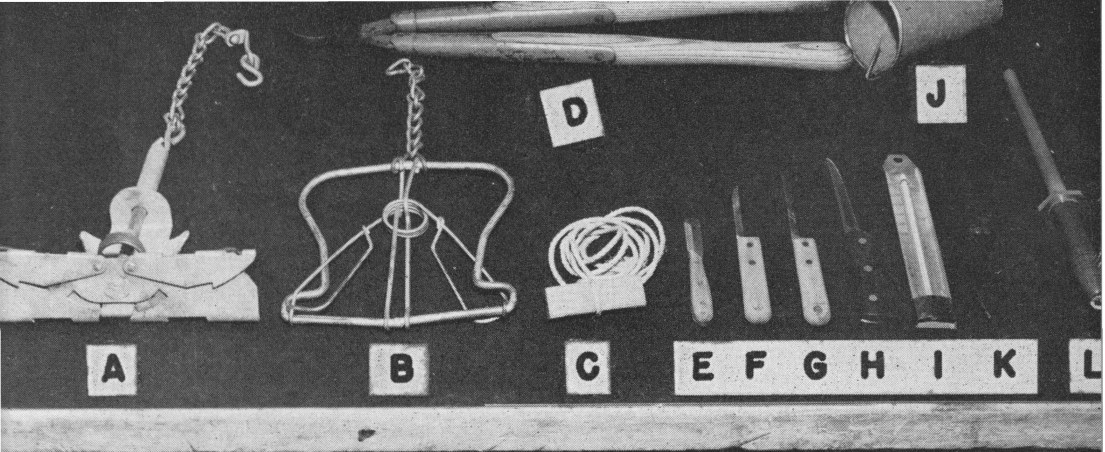


Fig. 1. Equipment for killing and dressing.

head, neck and feet; pinning knife (E), for removing pinfeathers; sticking knives (F and G), for bleeding and braining chickens and turkeys; cutting and boning knife (H), used to disjoint and bone birds; thermometer (I), for testing temperature of water; blood cup (J), for catching blood and holding bird's head down for good bleeding; pliers (K), used to pull wing coverts when processing turkeys; and carborundum stone (L), used to keep knives sharp. In addition to the equipment shown in Figure 1, a 10-gallon container for scalding should be available. A smaller scalding container can be used, but the water is harder to keep at proper temperature. Water temperatures used range from 123 to 180 degrees F. The best temperature to use depends upon the method used in plucking. One hundred and twenty-three to 128 degree F. is recommended to produce the best-grade carcass. Higher temperatures are required to remove feathers easily unless an efficient job of braining is done on turkeys and older fowl. *If processing is to be done on a commercial basis, other equipment will be needed.*

Killing Poultry

After good-quality birds have been selected, every effort should be made to maintain their quality. The use of proper equipment helps. Important as selection and equipment are, they will not insure a carcass of high grade with all the live-bird quality. The percent live-bird quality maintained in the carcass depends largely upon the efficiency in doing the processing jobs in the correct order. These jobs are discussed under the following headings in the order recommended for greatest efficiency.

Starving. Do not feed chickens and turkeys 10 to 12 hours before processing. During this time they should have all the water they will drink. This makes drawing easier.

Bleeding. Chickens and turkeys which have been thoroughly bled will be carcasses that possess greater keeping qualities than if poorly bled. Blood showing around the joints, in veins of the body and in the feather follicles (the depression from which the feather grows) indicates poor bleeding. Bruises on the carcass cause poor bleeding and discoloration at that point.

Use one of these recommended practices for good bleeding. 1) Hang bird by its feet, head down, as shown in Figure 2. The shackle used to hold bird should be located so the thighs of the hanging bird are even with the operator's face. 2) Grasp the head as shown in Figure 3 and cut through the skin to sever blood vessels shown in Figure 6. Another method sometimes used is as follows—grasp the bird's head with the left hand, the comb resting in the palm, as shown in Figure 4. Avoid holding the bird's throat in such a manner that the flow of blood will stop. 3) Press on each side of the bird's head where upper and lower mandibles (beaks) join.

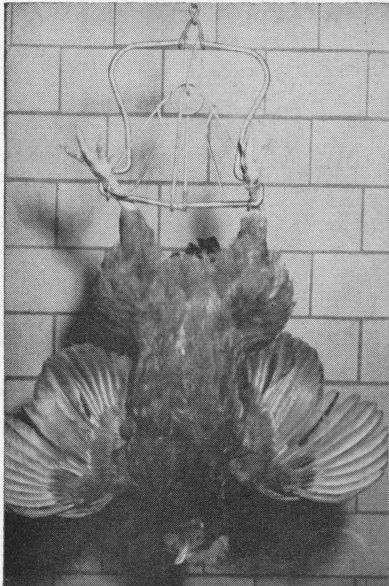


Fig. 2. Feet of bird correctly placed in shackle will help prevent broken bones and holds bird securely.

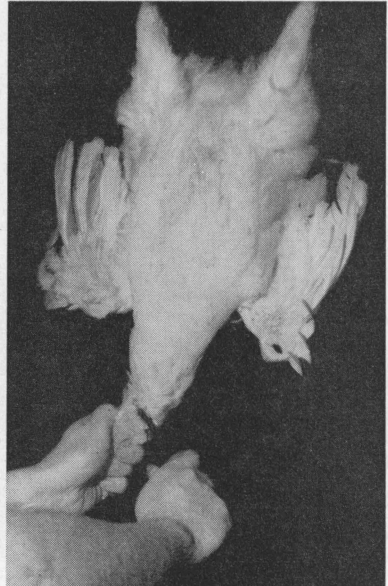


Fig. 3. Bleeding by severing the two blood vessels on either side of the neck where they join as shown in Figure 6.



Fig. 4. Beginning of bleeding process. Cutting edge of knife away from blood vessels.



Fig. 5. Finish of bleeding process. Cutting edge of knife towards blood vessels.

Open bird's mouth with the two last fingers of left hand, as shown in Figure 5. Do not use sufficient pressure on head to close throat, thus cutting off flow of blood. 4) Insert sticking knife through mouth and into throat with sharp edge away from operator, as shown in Figure 4. To make correct cut, first turn knife edge toward neck bones, then place knife so blade crosses blood vessels as indicated in Figure 5. Pressure placed on knife point as it is withdrawn from the mouth will insure cutting blood vessels. Figure 6 shows the blood vessels to be cut and the proper angle for cutting to get most complete bleeding.

Braining. Feathers on chickens and turkeys may be loosened by piercing the back lobe of the brain which controls the feather muscles. This part of the brain is located at the junction of the skull and neck. Loosening the feathers makes it possible to pluck

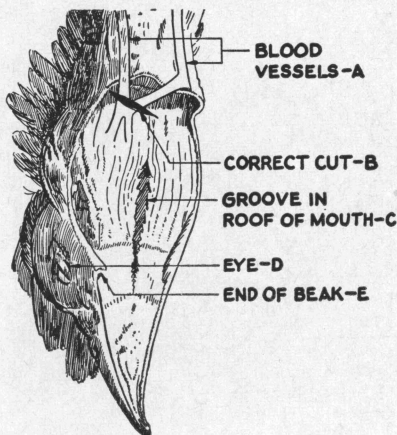


Fig. 6. Illustration showing blood vessels and correct angle to cut for bleeding.

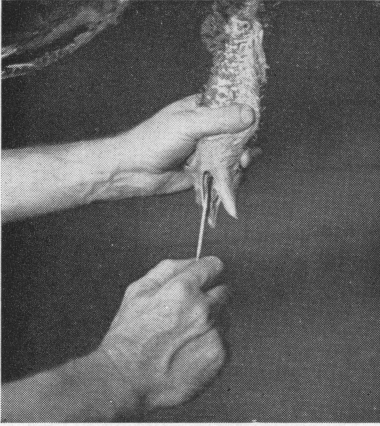


Fig. 7. Braining through opening in top of mouth.

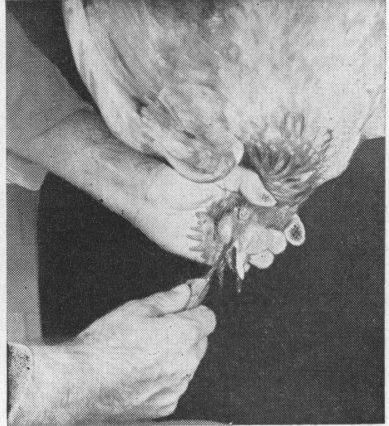


Fig. 8. Braining through eye socket.

them without hard-scalding. This is *essential* since the quality of the carcass is lessened by hard-scalding. Torn skin is also likely to be an indirect result of poor braining.

Equipment used in modern processing plants makes it possible to process broilers or fryers without braining and yet use water 123 to 128 degree F. Turkeys and older chickens are still brained unless they are scalded with higher water temperatures.

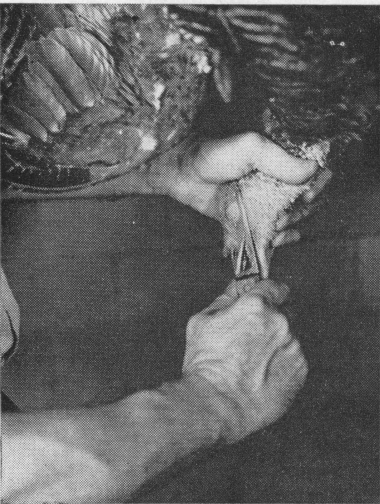


Fig. 9. Knife point showing location of the lobe of brain to be struck when braining.

Use these recommendations for efficient braining. Hang bird and hold the head as recommended under Figures 4 and 5 for bleeding to puncture the back lobe of the bird's brain. Insert knife through groove in roof of mouth (Figure 7) or eye (Figure 8) to back lobe of brain as indicated by knife point (Figure 9). One twist of the knife blade will assist in destroying brain tissue.

Attaching Blood Cup. Immediately after braining and before releasing bird's head,

attach blood cup (Figure 1-J). Do this by forcing the hook through the bird's lower mandible (beak) from outside to inside as shown (Figure 10). If this is done properly the bird's mouth will be held open and blood will drain freely. Cups of proper weight and size for chickens and turkeys will hold the head down, which aids in thorough bleeding. The blood cup should remain attached until the bird is through flopping. This also helps to keep the bird from throwing blood on the operator.

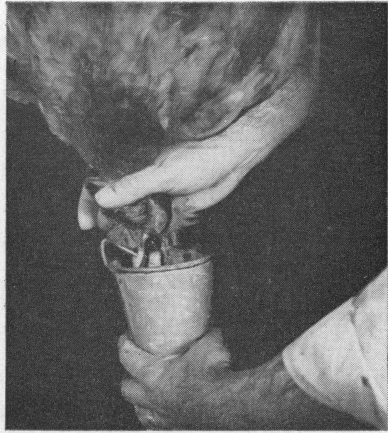


Fig. 10. Attaching blood cup.

*26 pins
pop line*

Use of Funnels. Funnel-shaped containers are sometimes used to hold birds. Care should be taken to provide proper-size funnels for different sizes of birds. This procedure in processing increases labor necessary in killing and plucking. It is also necessary to remove birds before plucking primary and secondary wing feathers. The funnels may help to keep birds from being bruised while killing.

Under certain conditions small processing plants may find the use of funnels meets their needs adequately.



Fig. 11. Position of hand to twist main tail-feathers from bird.



Fig. 12. Main tail-feathers removed by twist of hand.

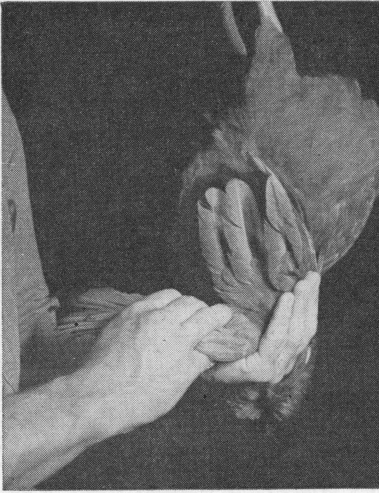


Fig. 13. Pulling primary wing feathers after braining.

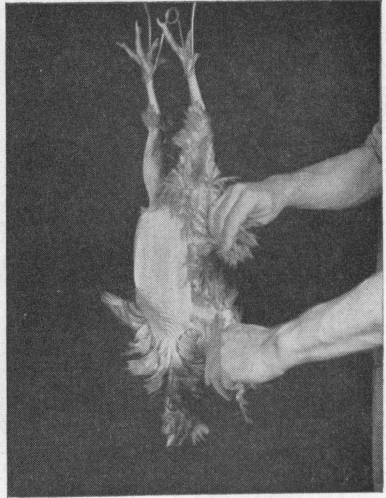


Fig. 14. Correct plucking helps to maintain live-bird quality.

Plucking Poultry

The four conditions used to pluck birds are *dry-pick*, *semi-intermediate* and *hard-scald*. The semi- and intermediate scald methods are most commonly used by commercial firms and give the most desirable carcass. This means that the highest percent of live-bird quality is maintained. To use the semi-scald method the following procedure is recommended. Pull the primary and secondary wing feathers and main tail feathers about 10 seconds after bleeding and braining have been done. The bird then should be put into water which has been heated to 123 to 128 degrees F. Hold the bird by its feet and force it up and down in the water so the water will reach the skin on all parts. Do not leave the bird in water over 60 seconds. This method of scalding leaves the skin and flesh in a more normal condition than if the bird is scalded by intermediate or hard-scald method. Figure 15-B shows a carcass where semi-scalding method has been used.

The use of water hot enough to loosen the bird's feathers is known as intermediate and hard-scalding. These methods of scalding cause the outer skin to peel and as a result the carcass becomes discolored unless it is kept moist until thoroughly cooled and frozen by quick freezing methods at minus 20 to 40 degrees F. There also is greater dehydration of the carcass. When these methods of plucking are used, braining is not necessary, but thorough bleeding is just as essen-

tial as in dry picking or semi-scalding. Figure 15-A shows a carcass which has been hard-scalded.

When the dry-picking method is used, the skin maintains its natural color. No water is used when this method is

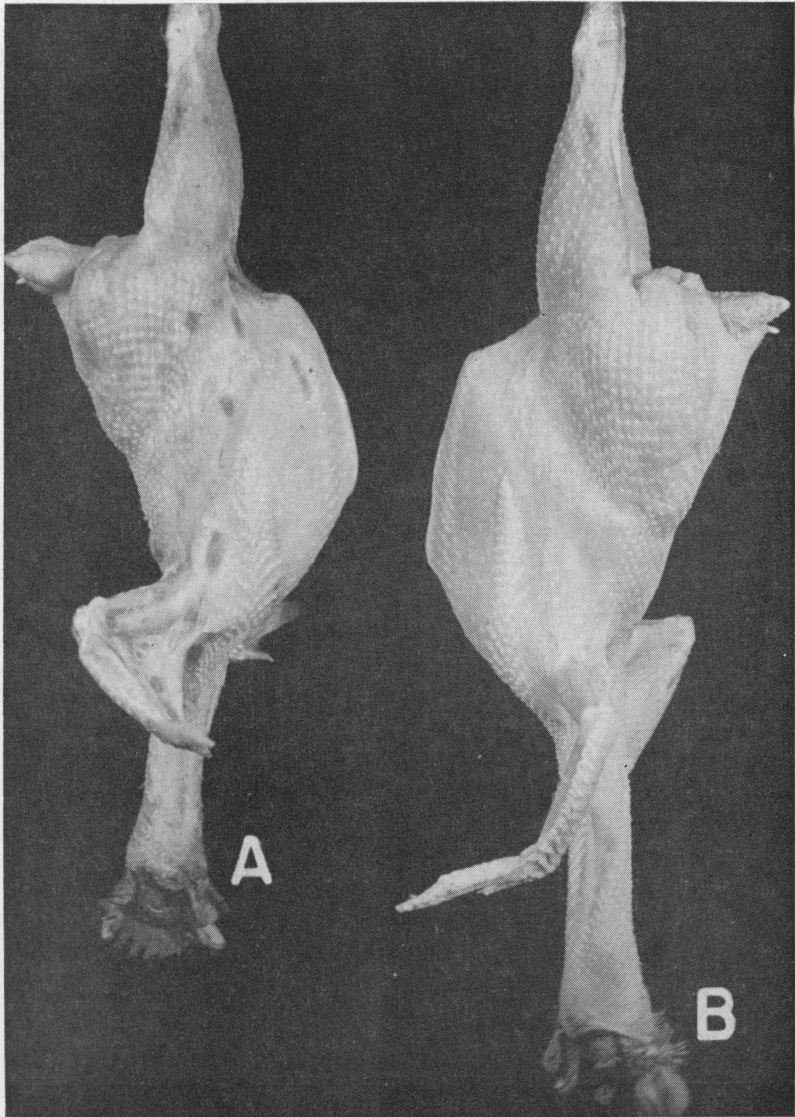


Fig. 15. Carcasses showing skin condition when different methods of scalding were used. A. Hard-scald. B. Semi-scald or dry-pick.

practiced. The bird should be bled and brained as if semi-scald picking method is used.

Water temperatures of 138 to 140 degrees F. recently have become known as the intermediate scald. These temperatures cause feathers to loosen but also cause a part or all of the outer skin to peel off. When this method is used, the carcasses should be kept in ice until sold for consumption, or wrapped in moisture-vapor-proof containers as soon as animal heat is out of the carcasses and then frozen. The intermediate and hard-scalding methods are not recommended for long storage.

Removing Feathers. Unless feathers are removed properly the skin is likely to be torn. Always pull the feathers from the bird with the grain. Torn skin permits greater dehydration and lowers the grade of the carcass. Remember to pull primary and secondary wing feathers and main tail feathers before scalding, if dry-picking or semi-scald method is to be used.

Removing Pinfeathers. Place the pinning knife (Figure 1-E) under the pinfeather. Then place the thumb against the feather and, by pressing against knife, pull it out of carcass. Do not rub or scrape the carcass to remove pinfeathers. This is likely to break the skin and lower the keeping qualities and grade of the carcass.

Singeing. Hair-like feathers (filoplumes) usually remain on the carcass after feathers and pinfeathers are removed.

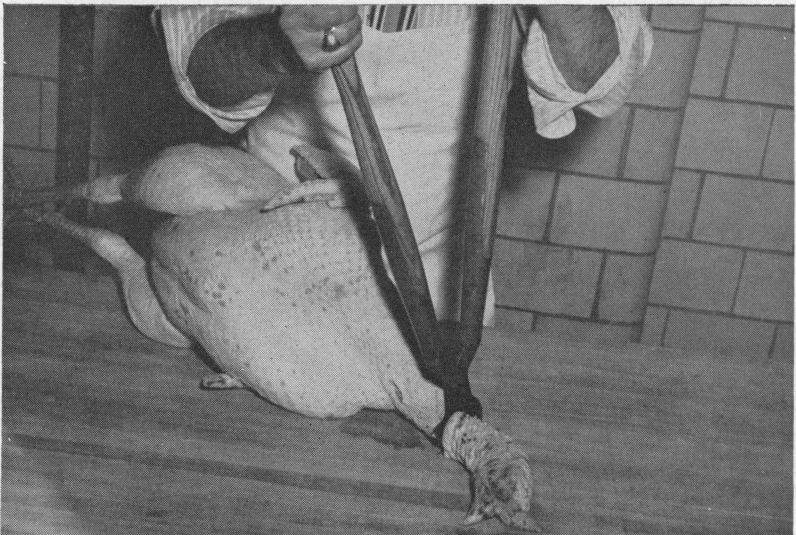


Fig. 16. Remove head by disjuncting neck close to the head.

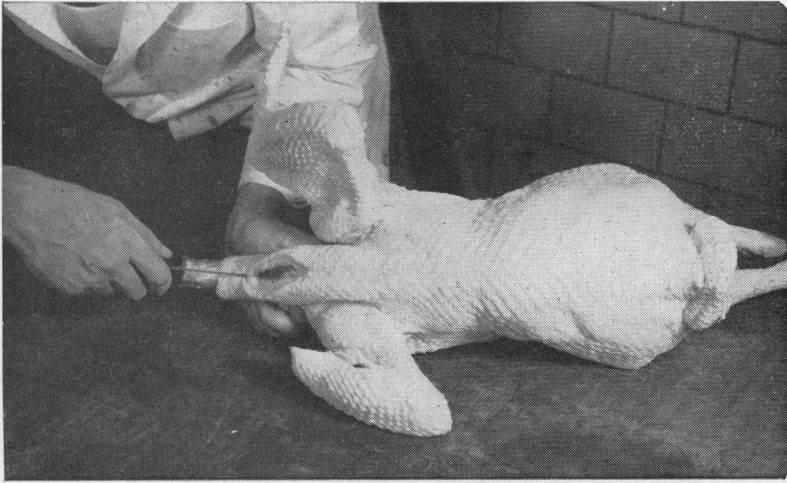


Fig. 17. Cut skin to remove neck.

Remove these by passing the carcass over an open flame. The flame should not leave carbon or soot. A flame that is clear or blue is most desirable. Care should be taken not to heat the skin. *Do not rub or scrape carcass vigorously*, as this breaks the skin.

Drawing Poultry

The carcass may be drawn after cooling or immediately after killing and plucking. The grease in the fat will not smear over the skin and the flesh will be firmer after carcass is cooled thereby making the job of drawing easier. Twelve to 24 hours of cooling at a temperature of 40 degrees F. is recommended. The method to be used in cooking, age, size, tenderness and personal choice will determine whether the carcass will be left whole, halved, quartered or disjointed.

Whole Carcass. The following steps for drawing are recommended when the carcass is to be left whole:

1) Cut off the head, leaving about three-fourths of the neck on the body (Figure 16).

2) Split the skin down the back of the neck to a point between the first wing joints. (The skin is left on the carcass to be used in trussing.) (Figure 17.)

3) Peel the skin from the neck and remove the crop. (Crop hangs under the neck.) Care should be taken not to tear skin on the breast. (Figure 18.)



Fig.18. Remove crop. Skin on neck has been peeled to wing joints.

4) Cut the neck from the body at a point between the first wing joints next to the body. (Figure 19.)

5) If tendons are to be pulled from the legs this should be done before removing shanks. Figure 20 shows this procedure. This can be done easily with proper equipment.

6) Remove legs at the hock joints. Cut so some of the leg scale is left at joint. This keeps the meat from pulling away from the joint when cooking and leaving the bone bare. (Figure 21.)

7) Remove the oil sack which is located on top at base of tail. (Figure 22.)

8) Place the carcass on its back and with a sharp knife make a vertical opening into the abdominal cavity. Begin cutting about $\frac{3}{4}$ to 1 inch below the end of the keel or breast-bone. (Figure 23.) Continue cutting down to and around the vent.

Most people prefer this method of drawing for chickens or turkeys when buying for roasting or baking.

Another method of entering the abdominal cavity is to make a lateral cut about half way between the end of the breast bone and vent, then cut around the vent. (Figure 24.)

9) Remove the intestines, gizzard, liver, heart and lungs through the opening made in Step 8. With care, the intestines can be removed without being ruptured.



Fig. 19. Cut neck off between wing joints after skin has been pulled off neck.

10) Remove the gizzard and liver from the entrails.

11) Split the gizzard lengthwise through one of the large muscles. With care, the pouch containing the feed can be removed without being ruptured. (Figure 25, A and B.) Remove liver from entrails. Avoid rupturing the gall.

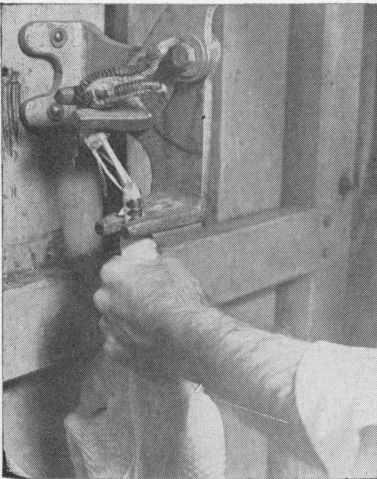


Fig. 20. Pull tendons.

12) Split open the heart and wash free of blood. (Figure 26.)

13) Wash the giblets (liver, gizzard and heart) and lay aside. Wrap separately. (Figure 27-B.)

14) The lungs are located toward the front of the body cavity and are embedded between the ribs. To remove them, place the fingers next to the backbone and force under the lungs, peeling them out.

15) Wash carcass in cold water if necessary.

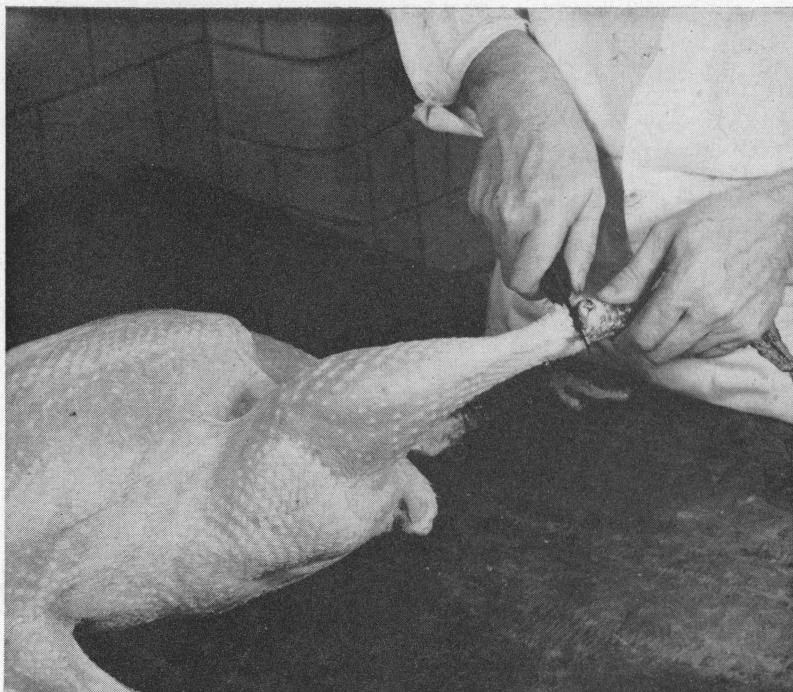


Fig. 21. Remove leg at hock joint.

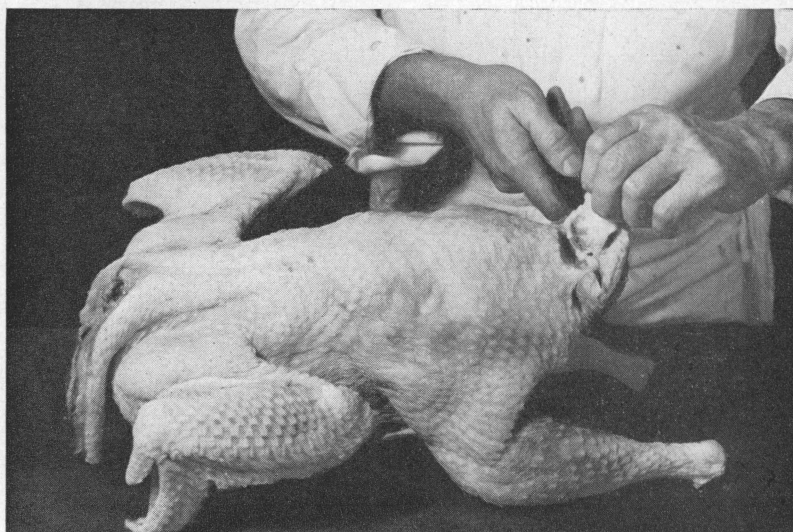


Fig. 22. Remove oil sack.

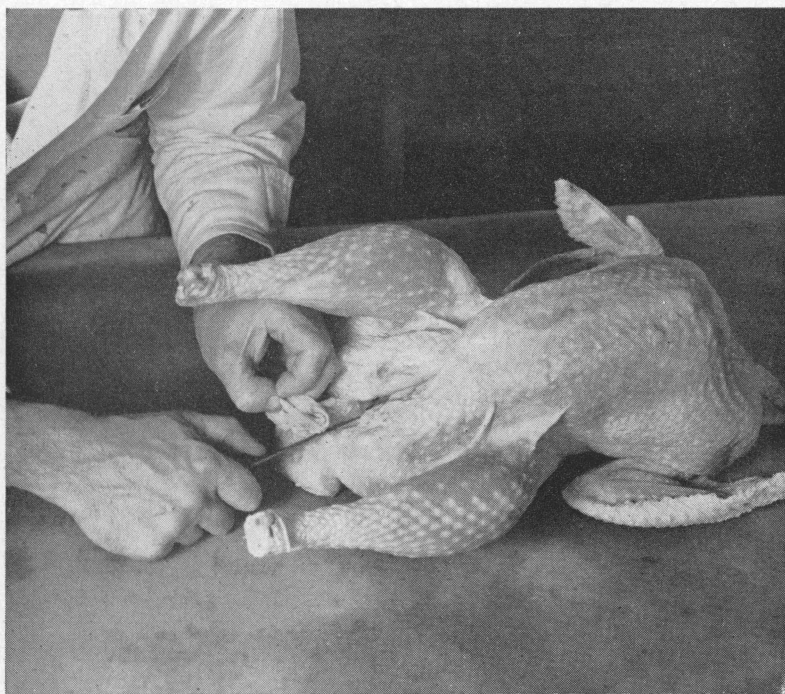


Fig. 23. Vertical cut to remove entrails.

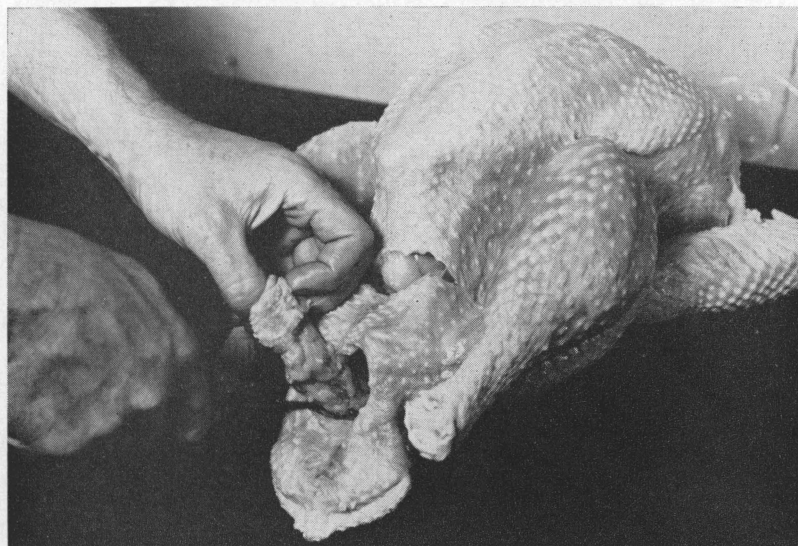


Fig. 24. Lateral cuts to remove entrails.

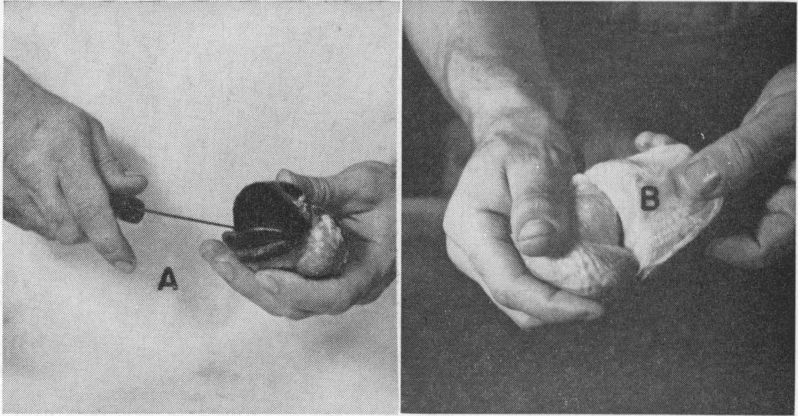


Fig. 25. A. Cut gizzard showing interior lining. B. Peeling contents out of gizzard.

Carcass is now ready for trussing. See page 20 for details on trussing.

Halved, Quartered or Disjointed Carcass. The following method of drawing is recommended for broilers and fryers, when the carcass is to be halved, quartered or disjointed as the occasion requires.

1) Remove the head by cutting the neck one-fourth the distance from the head to the body. (Figure 16.)

2) Remove the oil sack, located on top at the base of the tail. (Figure 22.)

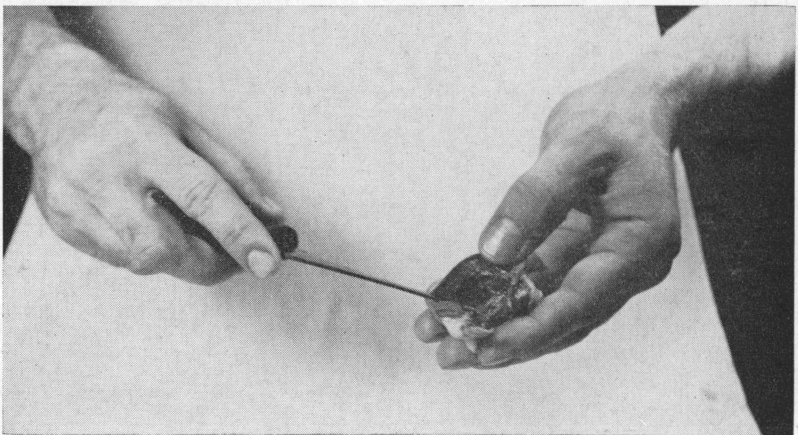


Fig. 26. Split heart to remove blood.

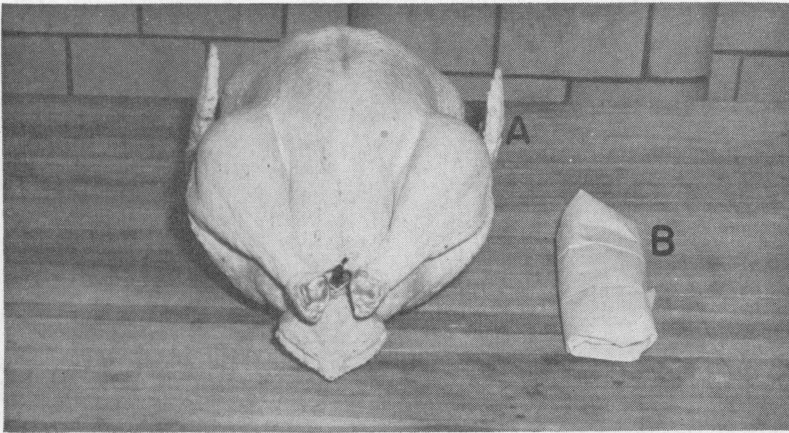


Fig. 27. Trussed bird and giblets. A. Carcass. B. Giblets.

3) Remove legs at the hock joints. (Figure 21.) Cut so some of the leg scale is left at the joint. This keeps meat from pulling away from the joint when cooking which would leave the bone bare.

4) Split bird down the back. First lay the carcass on its side, and then cut from neck to tail. Place knife edge on top side of the neck where it joins the body and cut through the back as shown in Figures 28-A and B.

5) Spread the carcass apart and remove the intestines, crop, gizzard, liver, heart and lungs. Be careful not to break the breast or wishbone. (Figure 29.)

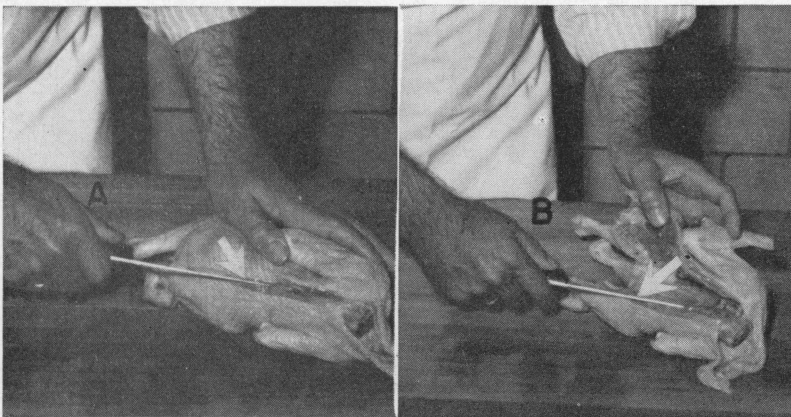


Fig. 28. Opening body cavity of young chicken for drawing and cutting in halves.



Fig. 29. Removing entrails after back has been split open.

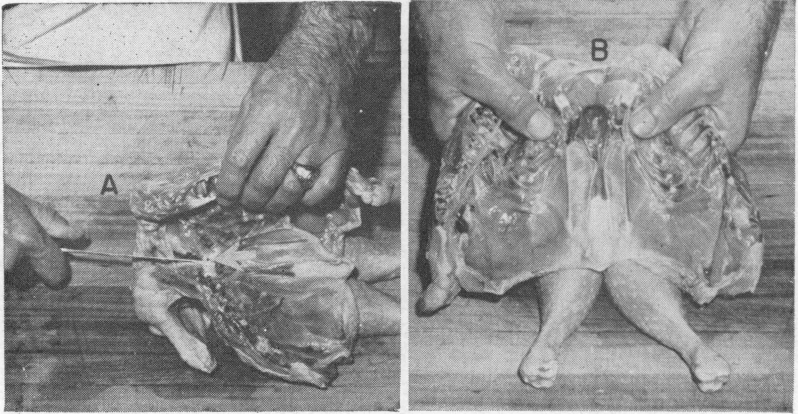


Fig. 30. A, and B. Cutting broiler in two pieces.

6) To complete the job of halving cut through the cartilage with tip end of knife at front of breastbone, then apply pressure with thumbs on each side of breastbone. This loosens the meat on the sides of the breastbone so the breast can be cut in two pieces without cutting any bones. (Figure 30-A and B.)

7) Wash the carcass with cold water.

8) Wash the giblets and lay them aside. Wrap them separately. (Figure 31.)

Trussing Poultry

Trussing the carcass will bind it tightly. This can be done by the following steps:

1) Draw the neck skin as far over the back as possible and fold wings so as to hold it in place (Figure 32) if the carcass is going to be cooked before freezing. If carcass is to be frozen, place wings beside the body. This makes wrapping easier and less sharp points to puncture the wrapping material.

2) Tie the legs down to the tailhead with a strong white cotton cord. (Figure 33.) Or if bird has been drawn by making lateral cuts as in Figure 24, then put ends of drumsticks through opening as in Figure 34. The carcass is now ready to be cooked or wrapped for sale or storage.

3) The neck may be placed in the body cavity.

4) If the carcass is to be put in the frozen food locker or home storage unit, wrap the liver, heart and gizzard separately. (They discolor the flesh of the carcass if put on inside.)

Processing Terms Defined

Hard-scald. Any poultry items other than ducks and geese which have been immersed or otherwise subjected to water for dressing at a temperature higher than 139 degrees F. (Not recommended when poultry is to be frozen for storage.)

Intermediate Scald. Any poultry items other than ducks and geese which have been immersed or otherwise subjected to water for dressing at temperatures of 135 to 139 degrees F.

Semi-scald. Any poultry items immersed or subjected to water at a temperature not to exceed 130 degrees F.

Dry-pick. Any poultry items plucked without the use of water.

Dressed Poultry. Poultry that has been killed, bled and plucked. (Commonly known as New York dressed.)

Braining. The act of piercing the back lobe of the bird's brain. This causes muscles controlling feathers to relax, thereby making them easier to remove.

Sticking. The act of cutting blood vessels to bleed bird.

Disjoining. The act of cutting bird into many pieces.

Halving. The act of cutting bird into halves.

Quartering. The act of cutting bird into halves and then cutting each half into two pieces, one piece to contain back,

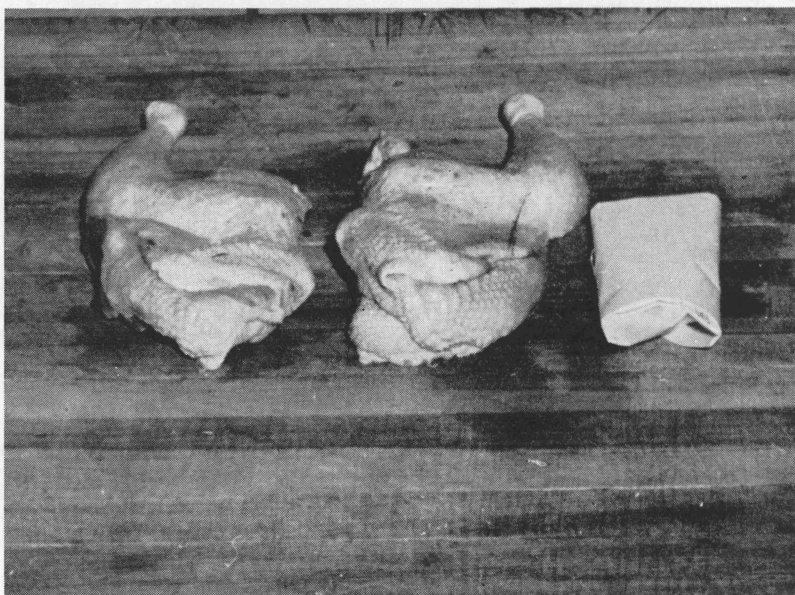


Fig. 31. Halved broiler with giblets wrapped separately.

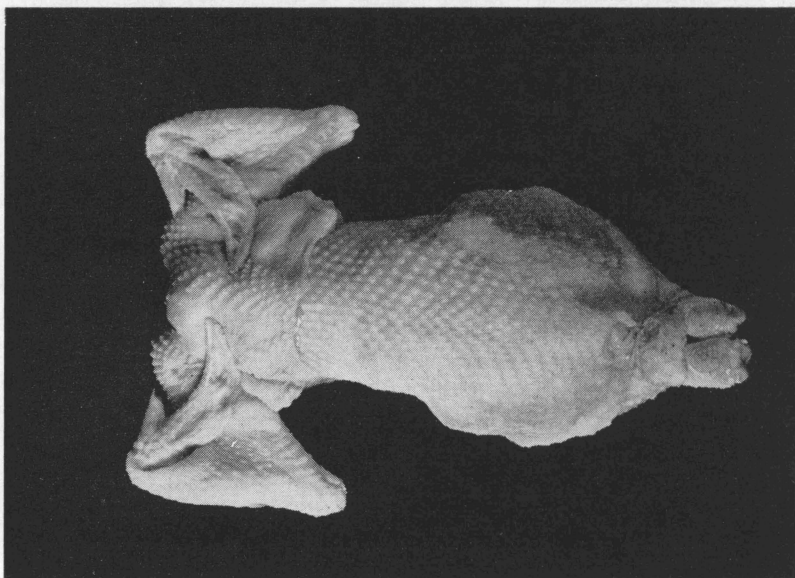


Fig. 32. Trussed bird ready to be cooked.

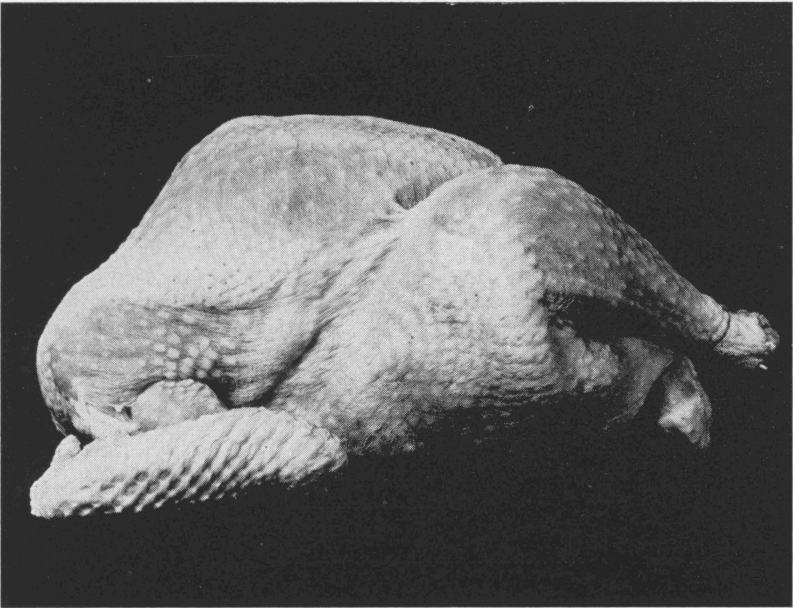


Fig. 33. Trussed bird showing legs tied to tailhead.

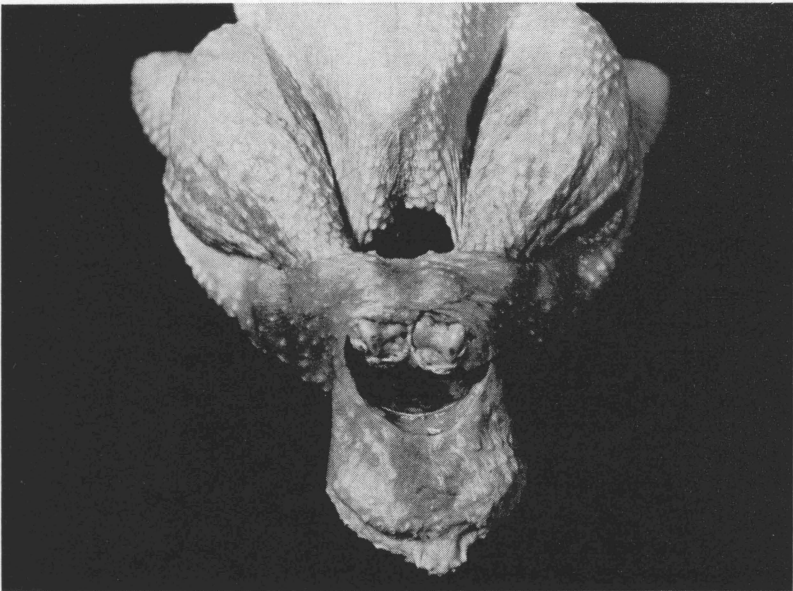


Fig. 34. Trussed bird showing legs put through openings in skin.

thigh, and drumstick; the other part includes the wing and breast.

Trussed. Drawn bird bound tightly.

Plucking. The act of removing the feathers from the bird.

Singeing. The act of burning filoplumes (hair-life feathers) on the bird.

Dressing Percentages

Poultry lose approximately 11 percent of live weight when dressed. The loss when drawn is more and varies according to things such as age, breeding, fleshing, finish and methods used in processing. The following figures are about the average percent loss of live weight for drawn poultry.

Chickens, 1½ to 2 lb.	33-36
Chickens, 2 to 3½	31-33
Fowl (Hens) 3½ lb. up	28-31
Turkeys	18-25

Summary

- Select chickens and turkeys for processing that are in good health, fully fleshed and with an even covering of fat over the body.
- Proper equipment used in killing and dressing chickens and turkeys makes the work easier and more efficient.
- Do not feed poultry 10 to 12 hours before killing, but be sure they have plenty of water.
- Bleed birds to insure thorough bleeding.
- Brain birds to loosen feathers.
- The semi- or slack-scald method of plucking is most desirable.
- Torn skin allows flesh to dry.
- Bruises on birds cause poor bleeding.
- The method used in drawing carcasses depends upon whether they are to be left whole, halved or disjointed.
- Age, size, personal choice and method of cooking determine whether the carcass is to be left whole, halved or disjointed.
- Truss birds that are to be baked or roasted so that they will be compact.