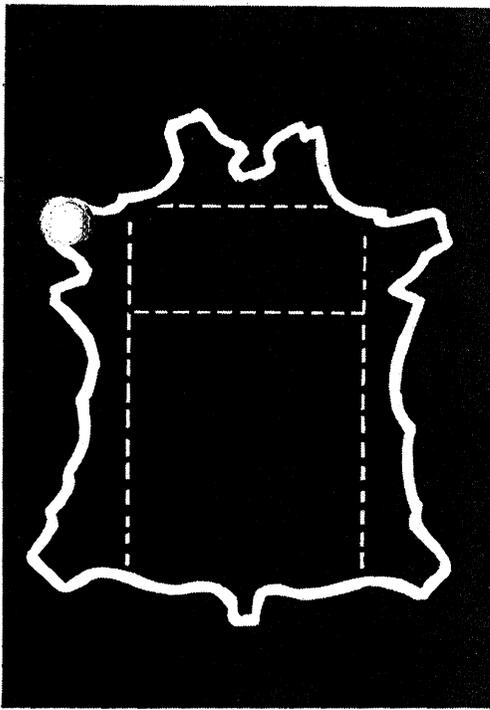


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HIDES and
SKINS from
locker plants
and farms

MISCELLANEOUS PUBLICATION NO. 857

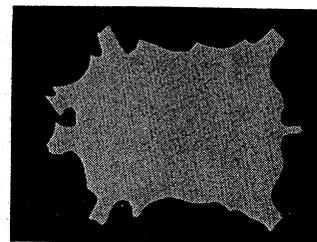
Agricultural Research Service
UNITED STATES DEPARTMENT OF AGRICULTURE

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HIDES and SKINS

from locker plants and farms



Most hides and skins¹ are the byproduct of the meat industry. These hides are removed in large, well-equipped packing plants by experienced butchers with professional skill. They are called packer hides. Of the hides on the market, however, from 25 to 33 percent come from animals slaughtered in locker plants or small establishments. Normally, only between 4 and 5 percent are from animals butchered on the farm by individual farmers.

Rarely do hides from locker-plant operators or farmers approach the quality of packer hides. Usually those from the small operator are full of defects which cause them to be downgraded far below their potential value.

Since practically all the hides we produce are tanned into leather, the value of a hide must be determined by the quality of leather it will make. Fine leather cannot be made from hides that have been cut or scored in the takeoff, or skinning, or have not been properly preserved. There is at present a good market only for the finest leathers; the lower grades have been largely replaced by synthetic materials. Therefore, a mutilated or partly rotten hide will not be profitable to tan domestically and certainly will not be worth exporting.

The farmer or the butcher in a locker plant can produce hides of packer quality. True, he does

not have as much opportunity to develop his skill as do the butchers in the large packing plants, where not only are many animals skinned daily but where the men specialize in certain operations, one skinning only heads, another only legs and sides, another the rump, and so on. He is probably also lacking in many of the specialized facilities provided in packinghouses, such as well-equipped hide cellars for salting and storing hides. Nevertheless, by study of instructions for proper skinning and curing, by close observation of procedures followed in packing plants, by careful butcherwork, and by avoiding practices which lower the value of a hide from the tanner's viewpoint, the small operator can produce hides on the farm or in his plant that should command prices close or equal to those obtained for packer hides.

Little more labor is involved in producing a good hide than a poor one. The principal difference is the butcher's knowledge and care; knowledge of the correct way to skin an animal and preserve the hide, and care in putting this knowledge into practice.

The purpose of this publication is to show, in words and pictures, how hides can be removed and cared for on the farm or in the locker plant so that full value can be received for them. Specific directions are given for correct skinning and salting, and the principal faults in these procedures that render parts of the hide useless to tanners are explained. General hide characteristics that influence their grade and price are also discussed.

¹ Hides are from large animals (cattle, horses, mules, buffalo); skins are from small animals (calves, sheep, goats, pigs, deer); there is no other difference. Throughout this publication both will be referred to under the general term "hides."

MISCELLANEOUS DIRECTIONS

Although it is permissible to market hides of animals that have died from most ordinary diseases or from an accident, hides of animals that have died from highly contagious or communicable diseases, such as anthrax or foot-and-mouth disease, should be burned or buried with the carcass.

The animal selected for slaughter should be quieted, allowed to cool, and given access to water before being killed. Thirsty, excited, heated animals will be difficult to skin.

The animal should also be cleaned of any dirt and manure, if possible, before being killed. Be careful, however, not to scratch or scar the hide during cleaning. Instruments with sharp teeth, such as an old-fashioned currycomb, may do serious damage to the hide.

Avoid damaging the hide while handling the animal. See that the animal, when knocked down, does not fall on stones or rocks that will bruise

both its hide and meat. Do not drag the carcass on the ground, as it will rub off the hair and will damage the grain surface of leather made from the hide. Keep the hide out of pools of blood and water.

As soon as the animal is killed, proceed promptly with the skinning before the body heat has escaped. A cold carcass is much harder to skin without cutting or scoring the hide than a warm one.

The operations and steps in skinning are difficult to describe so that they may be followed easily. Actual demonstrations are more informative. Take advantage of every opportunity to visit large killing establishments to observe and study the methods and operations employed there. Skinning requires a skill that comes only with practice, patience, and care, and a desire to learn must be exercised until this skill is developed.

DIRECTIONS FOR SKINNING

Special facilities and equipment for butchering and skinning will be profitable if many animals are to be slaughtered. A locker plant should have either a separate building or part of a building set aside for butchering. It should be equipped with a holding pen, knocking pen, rail, trolleys, electric hoist, hot and cold running water, a concrete floor with drains that can be flushed easily with water, and a separate, cool room for salting and storing the hides.

Obviously, however, the farmer or rancher who kills only a few animals a year would not be justified in installing special equipment. Still, if he understands well how to skin an animal, he can perform the operation adequately by intelligently adapting the tools and facilities he has to the task. Often a hard, clean spot under a tree that has a strong limb for hanging the animal on is quite a satisfactory location for successful butchering.

Tools

For killing and skinning on a small scale, only the following simple tools are required: An ax, preferably with a small cylindrical head, for stunning the animal; a 6- or 8-inch straight-blade knife for sticking; a 6- or 7-inch curved knife for skinning; a whetstone and a steel for sharpening the knives; a stout stick or rod (pritch) about 3 feet long, sharpened at one end, for supporting the animal while it is on its back; spreaders or gambrels for hoisting or swinging the carcass by the hindlegs (single trees may be used); and a block and tackle for hoisting heavy animals.

Selection and Care of Knives.—The knives are the most important tools for skinning, and a good job cannot be done without suitable ones. In figure 1 are shown slaughtering knives of the correct shape for *A*, skinning sheep; *B* and *C*, for skinning cattle; and *D*, for sticking; also a steel *E*, for keeping the knives sharp.

The skinning knives should have well-rounded ends and curved edges to help prevent scoring and nicking the hide. These knives must be kept razor sharp and should be used for no other purpose than for skinning. More damage is done by

HIDES AND SKINS FROM LOCKER PLANTS AND FARMS

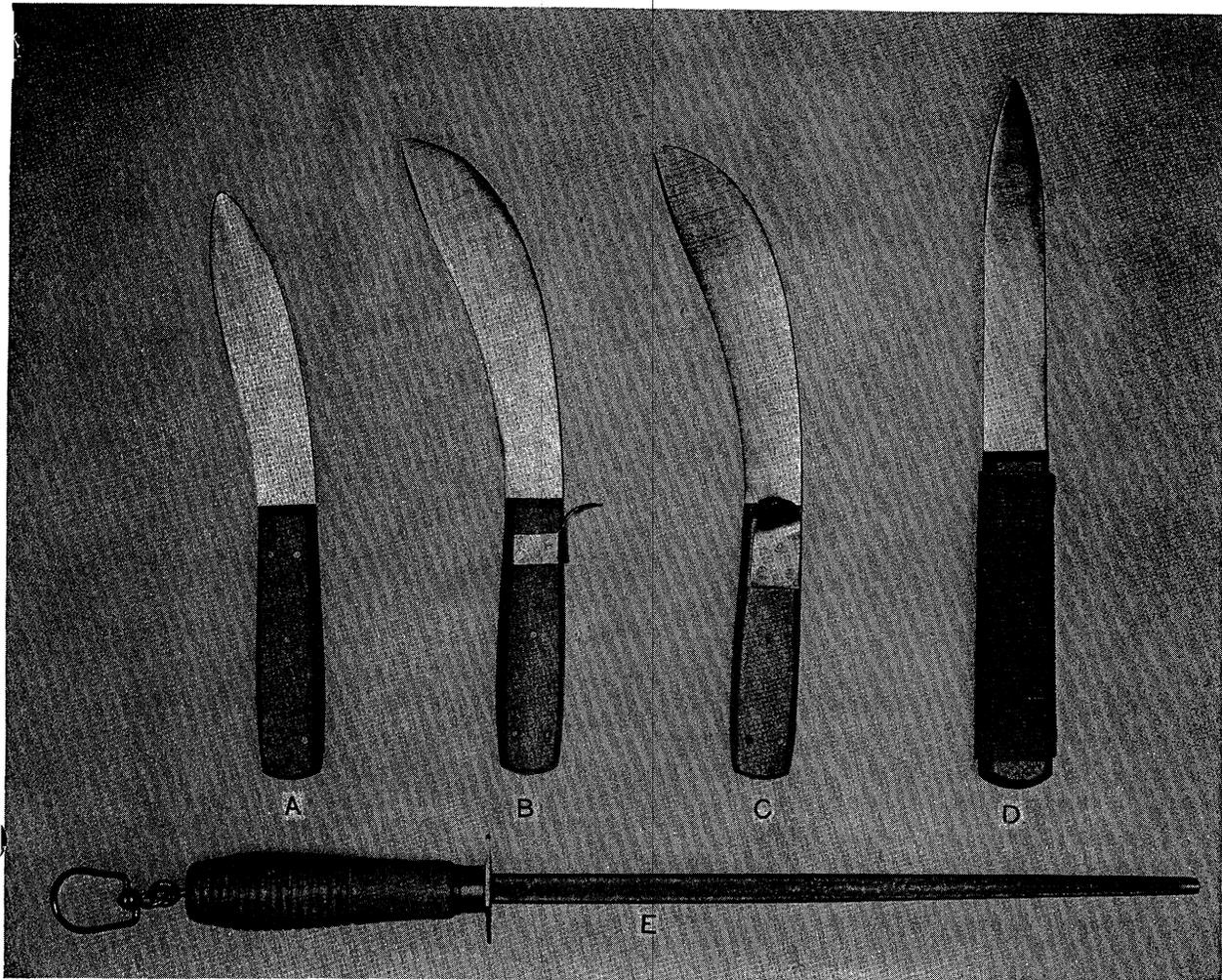


FIGURE 1.—Slaughtering knives: *A*, Sheep-skinning knife; *B*, cattle-skinning knife with bottom hand guard; *C*, cattle-skinning knife with side hand guard; *D*, sticking knife; *E*, steel for keeping knives sharp.

forcing a dull knife than by guiding a sharp one. Experts may use two knives, one for working inside the hide and the other for operations in which the knife blade must contact the outside of the hide. The latter cannot be kept so sharp as the former, because the blade is dulled by sand and dirt in the hair. Skinning knives should be heavy, with thick (almost one-eighth inch) steel blades. A thin blade may bend and cut the hide, whereas a thick one will make it easier to keep the knife edge off the hide, especially when skinning over tight areas. Furthermore, a heavy knife will require less pressure than a light one; it will not feel heavy if it is well balanced.

A new skinning knife, as it comes from the factory, is not ready for use. It must be ground, then sharpened on a stone, and finally steeled.

The skinning knife must be free from a wire edge and be perfectly smooth. A knife with a wire edge, while seeming to be sharp, will feel rough in use, will tend to hang in the middle of a stroke, and will get dull quickly. The entire blade from point to heel must be equally sharp. A dull place will catch in the flesh when skinning the sides or rump.

In sharpening a new knife, first grind the end round, then grind both sides of the edge on a grinding wheel at such an angle that the ground surfaces will show a width of about one-sixteenth inch. Continue grinding until the edge has been reached on both sides for the entire length of the blade. Next, work the blade on a good whetstone at the same angle as in grinding, with the sharpening stroke at right angles to the blade. Whet

one side for a few strokes, then the other, and continue until the blade will slice a piece of newspaper smoothly without tearing it.

The blade is then ready for steeling. The steel should be smooth, not ribbed; ribs tend to form a wire edge. Steeling is done by stroking or wiping the knife edge along the steel toward the handle, starting the stroke with the heel of the knife blade at the far end of the steel and finishing the stroke so that the point of the blade comes off the steel almost at the handle of the steel. Move the knife while holding the steel still. Do not strike the knife against the steel.

During skinning, use the steel frequently to keep the edge straight and in excellent shape. The principal purpose of steeling is to straighten the edge rather than to sharpen it. During use, many extremely fine "saw teeth" form on the edge of the blade and are smoothed out on the steel. Before resharpening, clean the knife. Wash it thoroughly with water no hotter than the hand can bear—boiling water will ruin the temper.

Use of the Skinning Knife.—Except when skinning the rump or making the opening cuts, the knife should be grasped in the hand, with the thumb resting squarely on the back of the blade, as shown in figure 2. The knife stroke should be a combined wrist, forearm, and shoulder movement. The wrist should be firm but not stiff. The forearm is used to control the length of the stroke and to furnish the pressure that is put on the knife

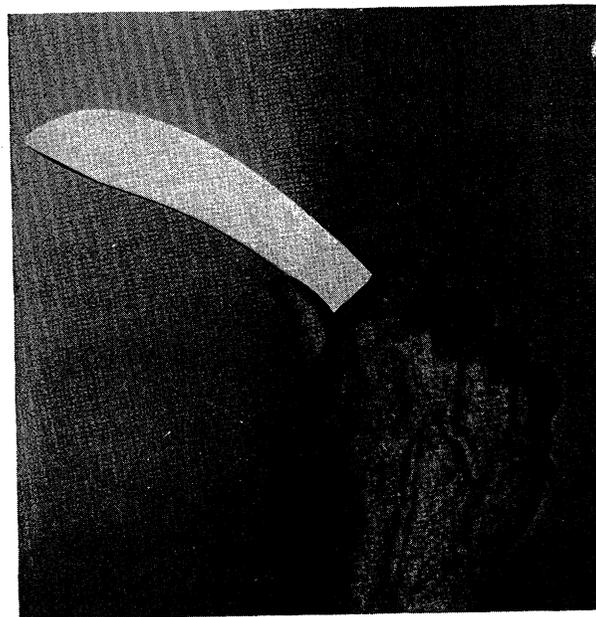


FIGURE 2.—Method of holding the skinning knife.

blade. The end of the blade alone should never be used for skinning. If the section being worked on is small, use the rounded part of the blade in back of the end. Expert skinners always start the skinning stroke as near the heel of the blade as a natural motion will allow. Use the knife sparingly. Most butchers use the knife too much. In many places a few blows with the fist will separate the hide from the carcass.

Skinning Cattle

Instructions for performing all cattle-butcher operations, such as bleeding, cutting up the carcass, and curing the meat, are given in Farmers' Bulletin No. 1415, "Beef on the Farm."² Also included are brief skinning instructions as an integral part of cattle butchering. In Farmers' Bulletin No. 1415, removal of the hide is incidental to dressing the animal for meat; here, our primary concern is to preserve the value of the hide.

Sticking.—The sticking cut should be a straight slash in line with the center of the underlip and the center of the brisket. Do not cut the throat crosswise through the hide. Inexperienced butchers or farmers may prefer to make a cut in the throat 12 or 14 inches long, deep enough to expose the windpipe and extending from just back

of the jaw hinge to the brisket, in line with the center of the belly (fig. 3). It is then possible to cut the throat crosswise *under the hide* and so prevent both bloody carcasses and damaged hides.

During bleeding, the carcass should be placed so that the blood will drain away from and not saturate the hide.

Skinning the Head.—The face is skinned as shown in figure 4, first by making the opening cuts as outlined in tape, then pulling the skin to the side. The skin from the face should all be on the animal's right side of the hide. Horns should be left on the skull and the ears on the hide, although the ears should be cut off the hide before salting it. After skinning the face, start at the cut in the throat and skin out the remaining part of the head (fig. 5).

² Out of print; available in libraries in most large cities.

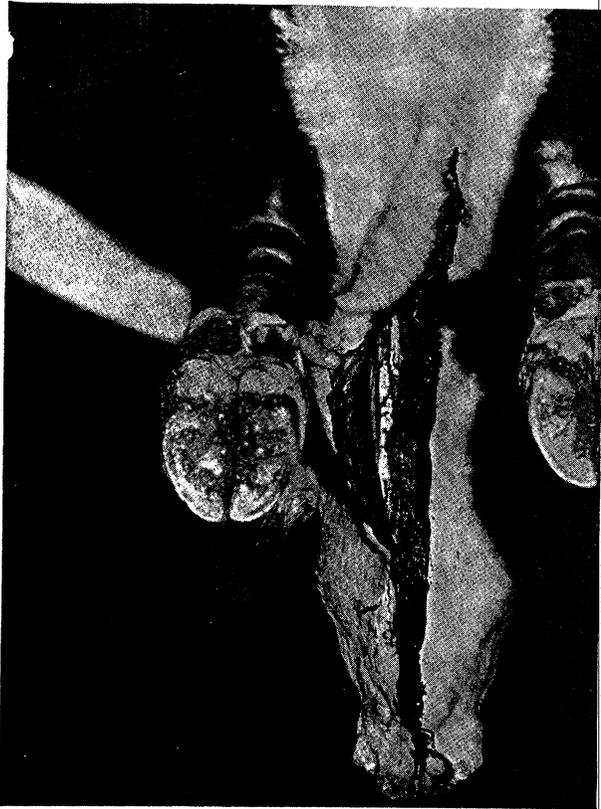


FIGURE 3.—Lengthwise slit in the hide before cutting the throat.

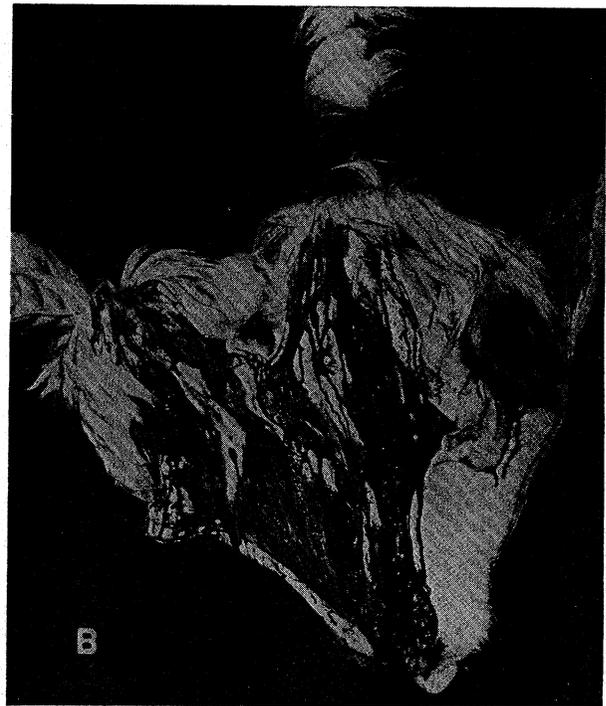
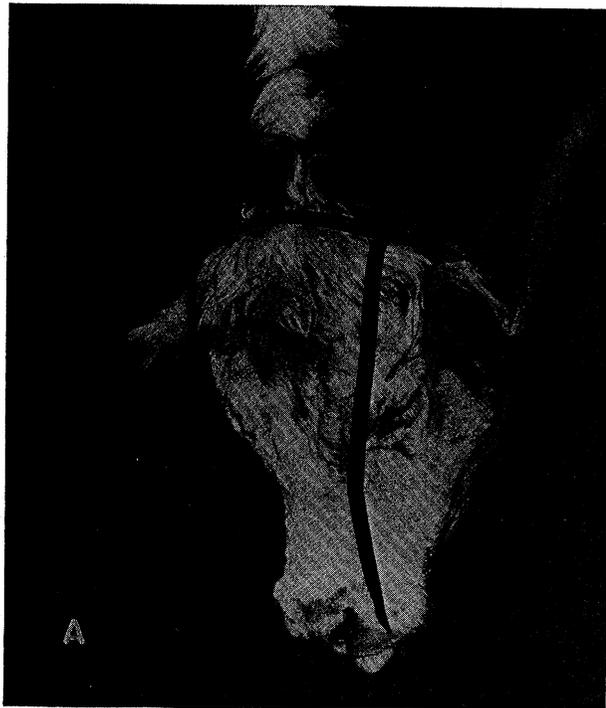


FIGURE 4.—Skinning the face: A, Opening cuts are outlined in tape; B, skin pulled to the side.

Skinning the Legs.—With the carcass on its back supported by the pritch (sharp end on the floor), start the leg skinning by making a deep cut crosswise in the cleft just above the hoof (fig. 6) to sever the sinews and permit the leg to relax. Cut off the dewclaws. Split the hide up the back of the leg *between* the dewclaws, through the center of knee and hock joint and 6 inches beyond (fig. 7). Splitting between the dewclaws instead of at one side is now standard practice for packer hides. Skin out the shanks until the joint is exposed and disjoint (fig. 8).

Ripping the Belly Open.—The all-important pattern of the hide or the proportion of hide in the shoulder, belly, and butt sections is governed by the cut down the center of the belly and the cuts to the legs. The paths of these opening cuts are shown in figure 9. For these photographs tape was laid out on the hide before skinning was started in order to show where the cuts should be made.

First, split the hide down the belly from the sticking point in the throat to the tail (fig. 10). This cut must be straight, even, without jagged edges, and along the exact center of the belly. The cuts to the legs, however, must not be made

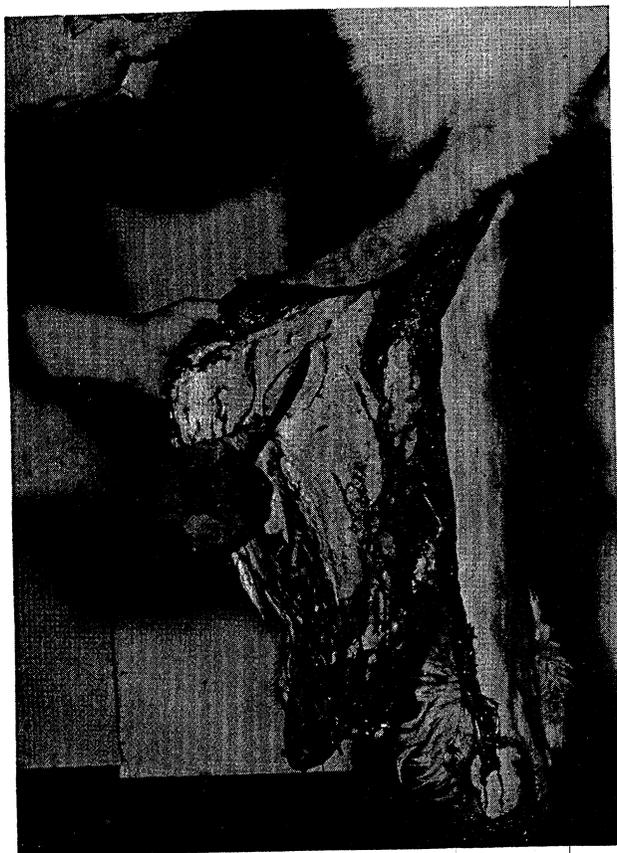


FIGURE 5.—Skinning the head.

until the sides have been skinned out; otherwise, these leg cuts will be rough and jagged.

Siding.—When siding, stand opposite the pritch and skin the near side of the animal. Start about midway of the belly and work forward to the brisket and back to the inside of the hindlegs close to the tail, but leave the hide attached to the thighs and shoulders. Skin off the hide to within 6 or 8 inches of the backbone on each side. Use the free hand to pull the hide outward and upward against the knife, as shown in figure 11. Keep the hide taut and without wrinkles, but do not pull it too tight, or a series of fine scores, called corduroy, may be formed by the knife. Use long, steady sweeping strokes, not short choppy ones. Keep the red covering muscles on the carcass. Siding is difficult and requires time and care.

An excellent job of siding can be done by hammering off the hide with the back edge of a cleaver or a *dull* ax or hatchet. Although the ax or hatchet edge must be too dull to cut, it must be smooth and the ends must be rounded. Beating

off the hide results in improved appearance of the carcass; this may be important to a small butcher.

Cuts to Legs.—Start the foreleg cuts at the center-belly cut, well forward at the brisket and somewhat in advance of the point where the legs join the body. (See fig. 9.) Cut across to the point where the foreleg and body join, then continue down the leg to meet the cut already made in skinning out the forelegs. Start the hindleg cuts 7 or 8 inches from the root of the tail and cut upward to the back of the legs so as to connect with the cuts previously made.

Rumping.—The hide over the buttocks and rump is the most valuable part of the hide for making leather, but it is also the tightest section. Its removal requires slow, careful work with a keen knife. It is important not only to avoid cutting the hide but also to avoid breaking the thin fell membrane. The fell should remain on the carcass to protect it from molds and to keep it from drying out, unless, of course, the carcass is to be cut up at once for sale or freezing. Skinning this part should be started while the animal is on the floor, but should not be completed until it has been raised to half hoist; that is, until the rump is about as high as the butcher's shoulders (fig. 12).

Skinning the Tail.—After rumping, remove the tailbone while the carcass is at half hoist.



FIGURE 6.—Cutting the tendon to relax the leg.

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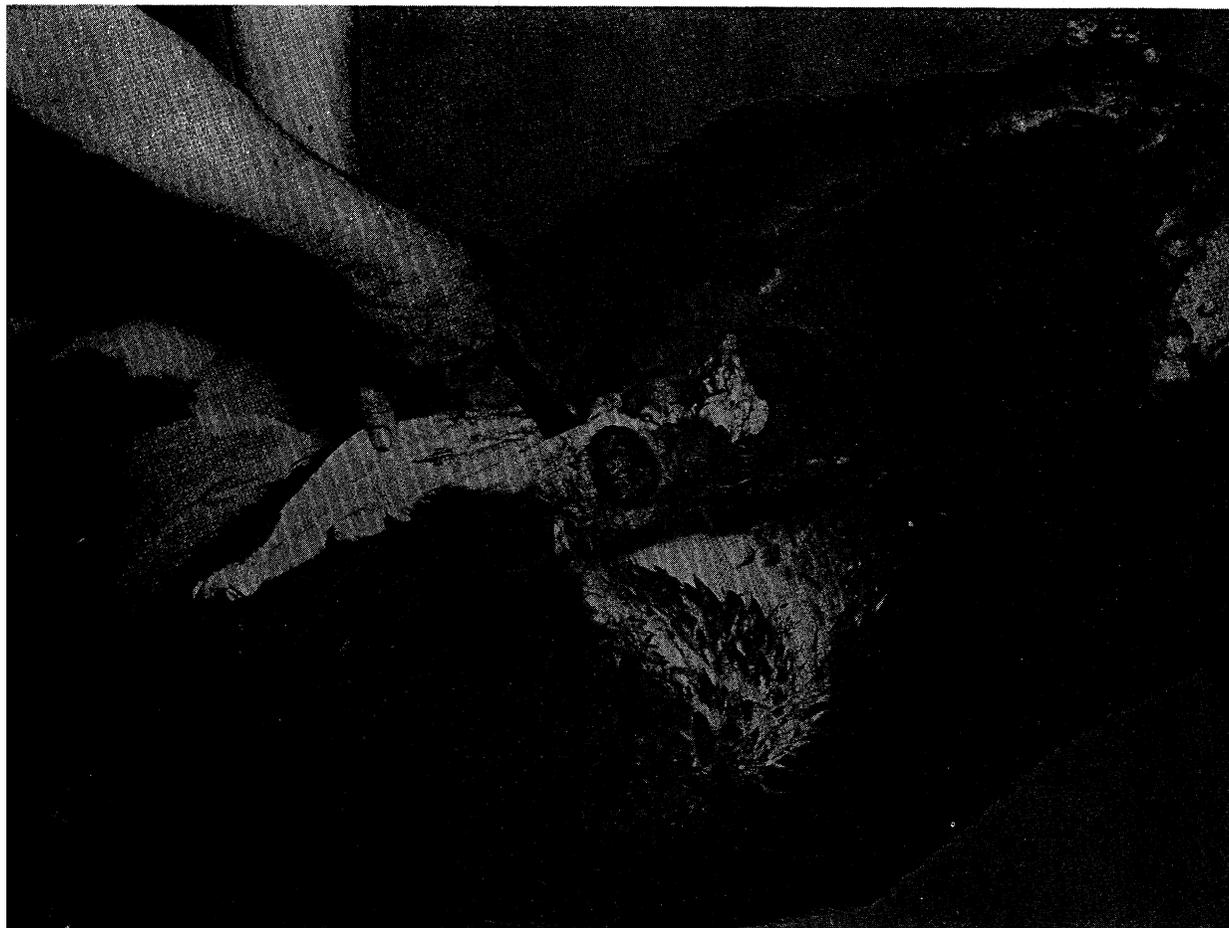


FIGURE 7.—Skinning the hind leg.

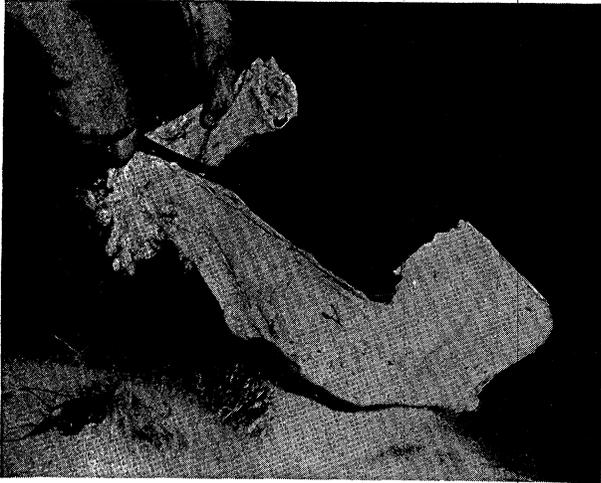


FIGURE 8.—Skinning and removing the shank.

First slit the skin on the underside of the tail to the tip (fig. 13), then work the skin from the bone, starting at the tip. If the tailbone tip is fastened

in a tailgrip (fig. 14), the skin is easily removed by pulling on the switch.

The carcass now should be raised to full hoist, completely free from the floor. The part of the hide skinned out up to this point is shown in figure 15.

Skinning the Fell and Flanks.—The hide should be pulled from the round and flank (fig. 16), starting it by a few hard jerks, then continuing by pulling and at the same time beating the hide with the fist or the back of a cleaver. Lay the knife against the meat, if necessary, to keep the meat from being pulled off with the hide. The round should be left with a bright, smooth, clean finish, which is typical of good butchering.

Skinning the Back, Shoulders, and Neck.—At this point the hide should be attached only by a narrow strip along each side of the backbone; it will almost drop of its own weight. Use the knife

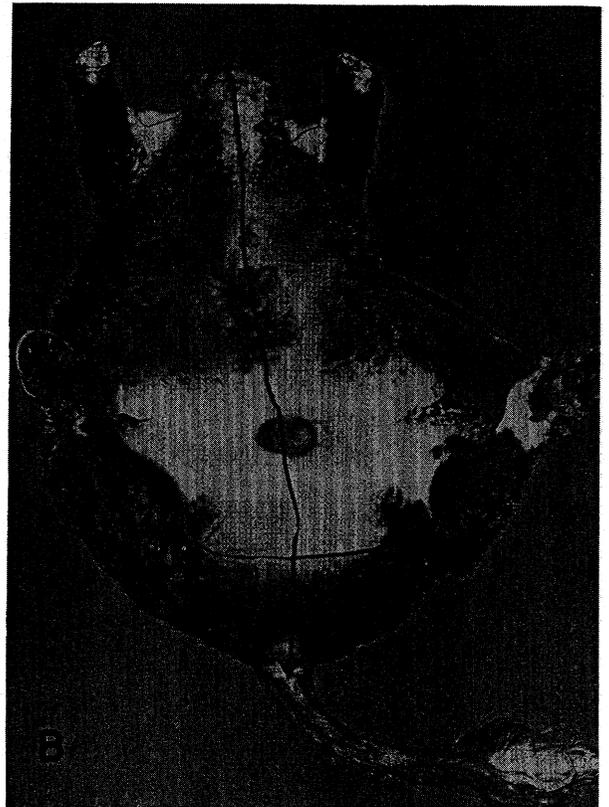
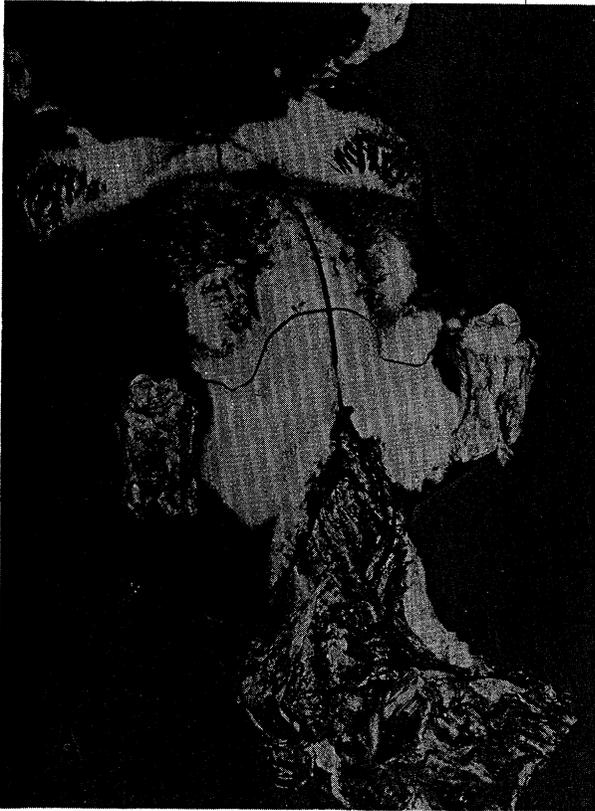


FIGURE 9.—Location of cuts: *A*, Down the center of the belly; *B*, to the legs. (Cuts to the legs are not made until the sides have been skinned out.)

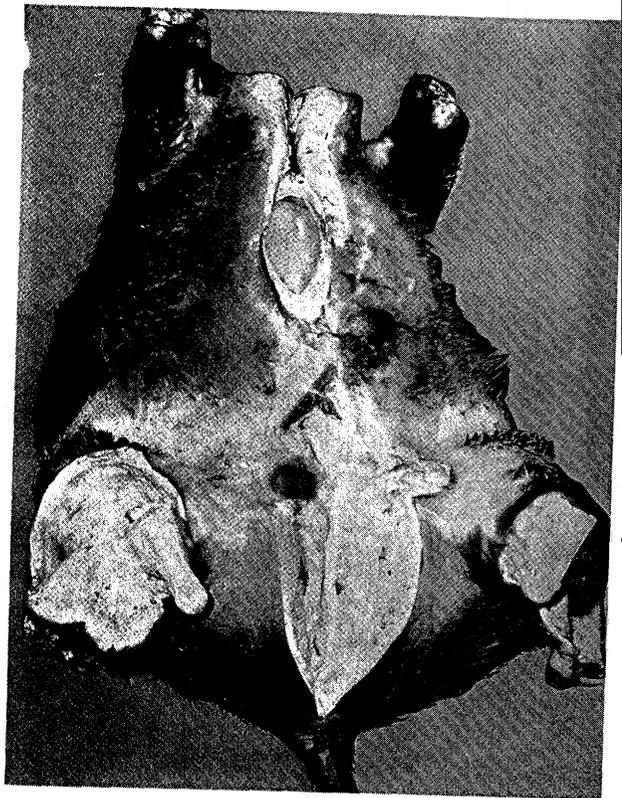


FIGURE 10.—Opening cut down the belly.

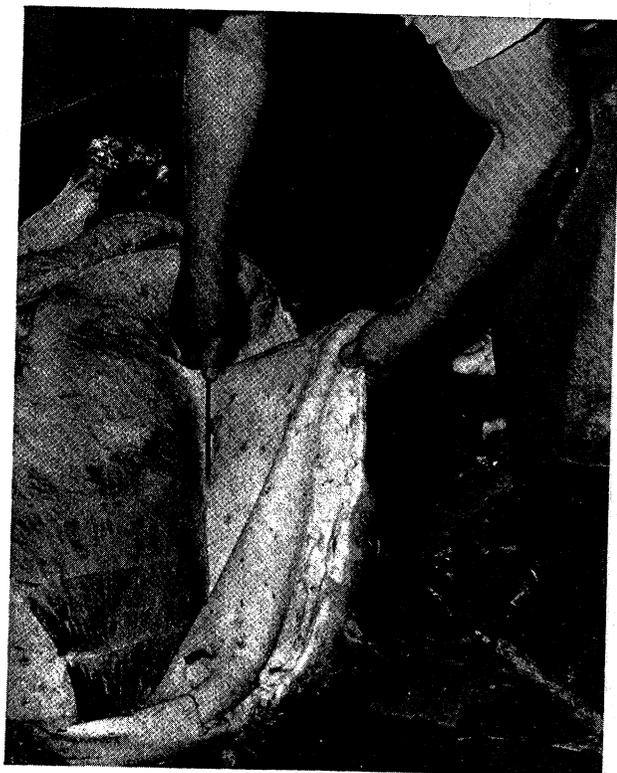


FIGURE 11.—Siding.

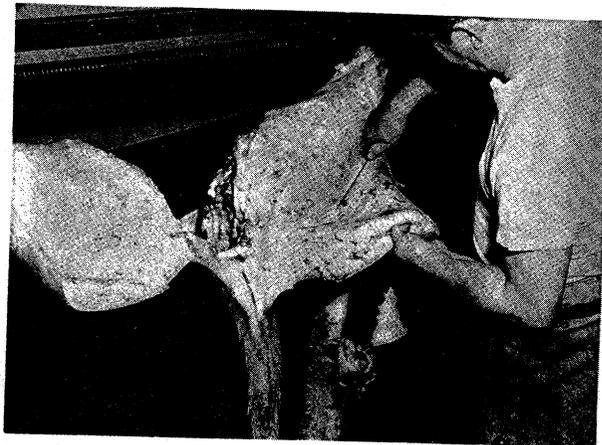


FIGURE 12.—Skinning the rump.



FIGURE 13.—Slitting the skin on the tail.

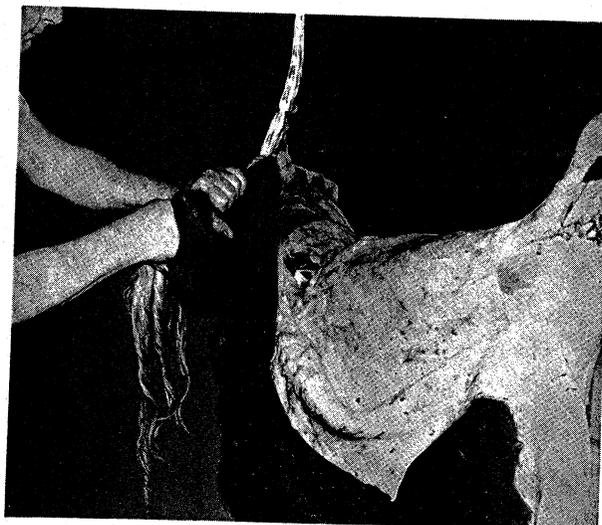


FIGURE 14.—Pulling the skin from the tailbone.

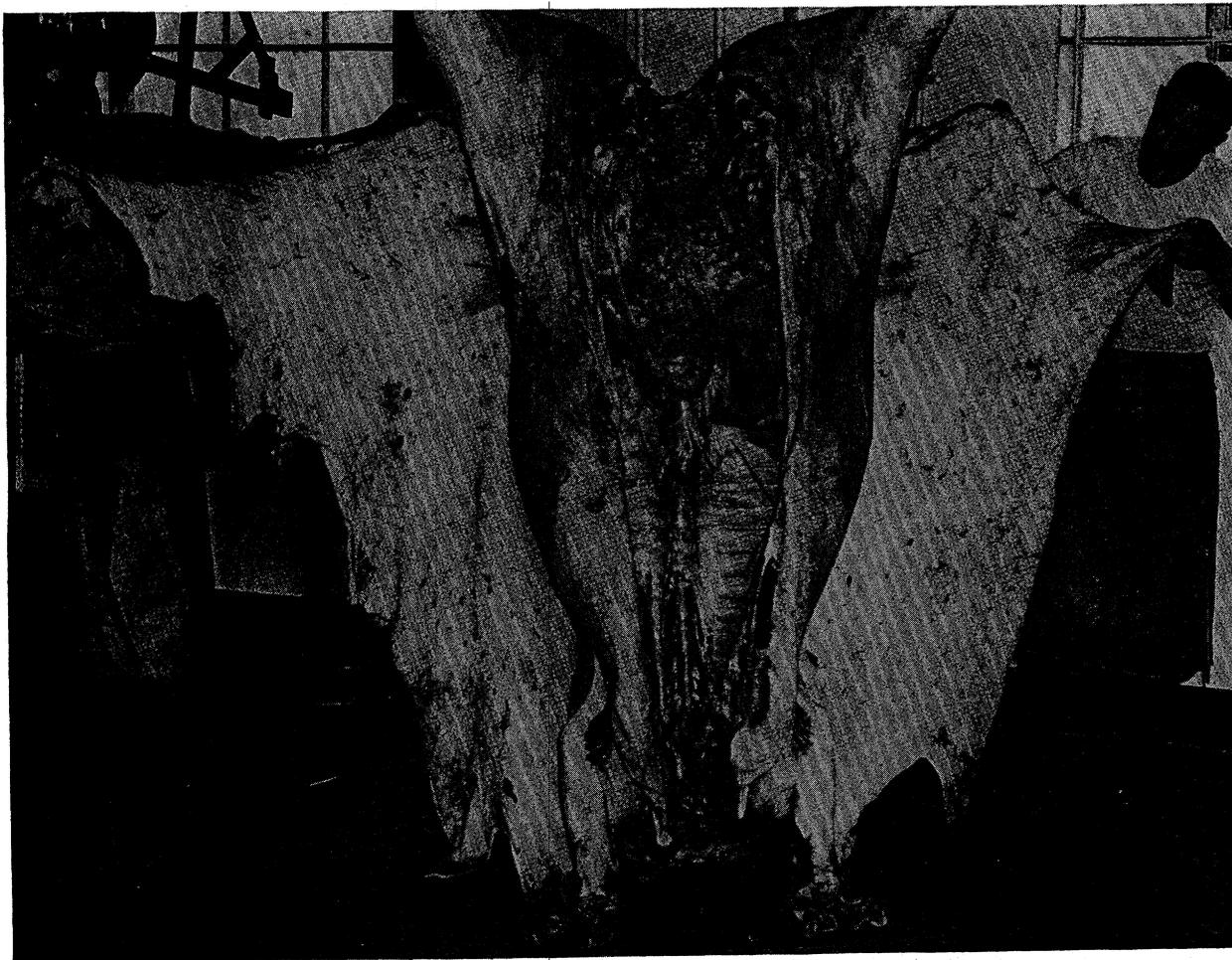


FIGURE 15.—Part of the hide skinned out while the animal is on the floor and at half hoist.

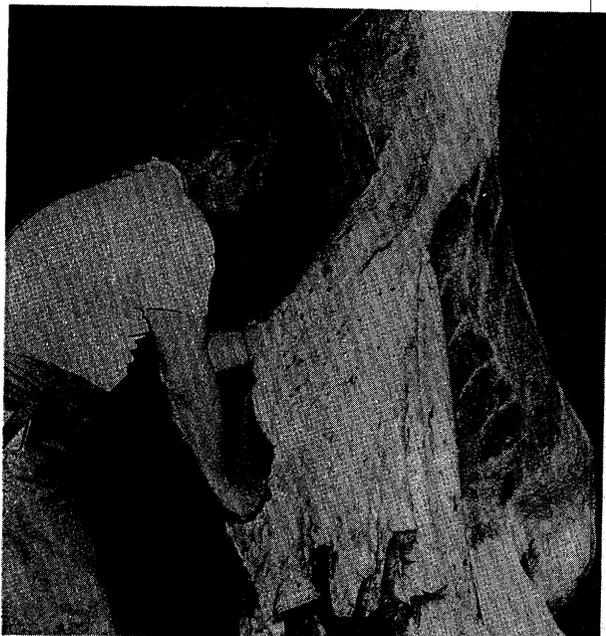


FIGURE 16.—Pulling the hide from the fell.

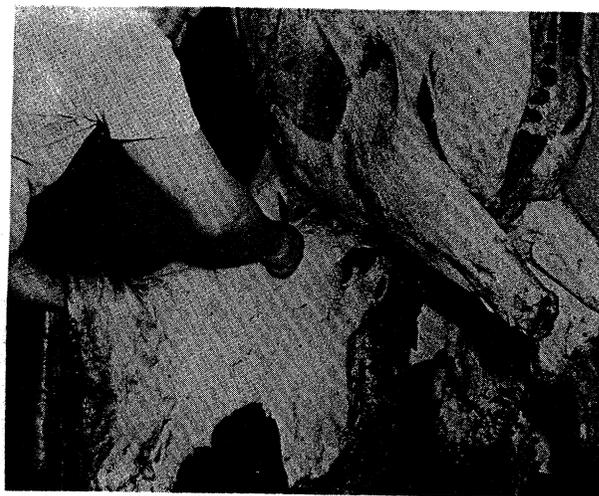


FIGURE 18.—Skinning the shoulder.



FIGURE 17.—Skinning the back.



FIGURE 19.—Skinning the neck and dropping the hide.

only to start the skinning and to keep the layer of fat from being pulled off with the hide (fig. 17). Then skin out the shoulders (fig. 18) and finally the neck (fig. 19). When skinning the neck pull the hide only moderately. Keep the knife razor sharp and hold it flat against the hide.

Trimming.—Trim any irregular or ragged edges from the hide and any parts of the hide near the edge containing large holes. Also remove horns, hoofs, dewclaws, snouts, ears, and lips. Figure 20 shows the hide after being removed and trimmed.

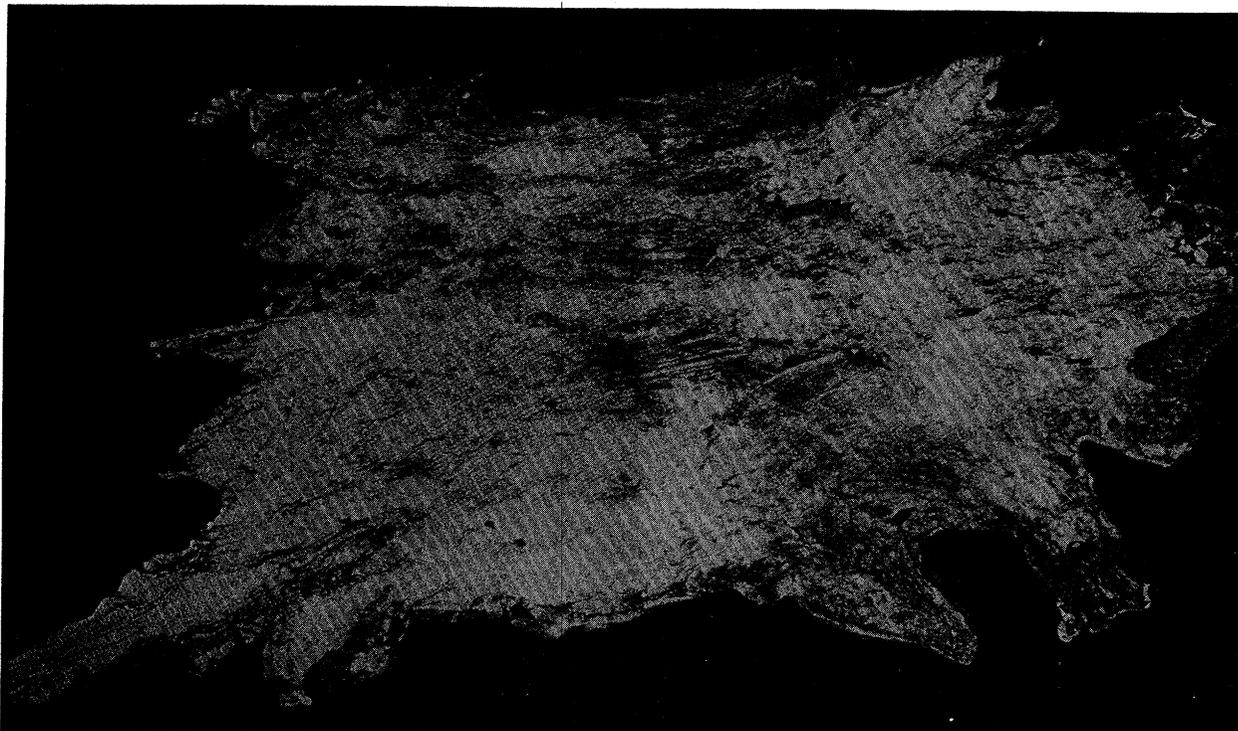


FIGURE 20.—Trimmed cattle hide.

Skinning Other Farm Animals

Horses and Mules.—These animals are skinned in essentially the same way as cattle, except that the head is split straight down the middle of the face instead of down the left side.

Calves.—There is a double reason for the farmer or locker-plant operator to exercise special caution in skinning calves. First, calves are easier to skin than beef animals; hence there is a better chance for a good takeoff, or skinning, to be accomplished, even by the inexperienced. Secondly, there is a steady demand for first-quality calfskins. Such skins are worth much more per pound than cattle hides, because they make such excellent leather. However, they will bring a top price only if they are perfect in pattern and take-off, as shown in figure 21.

The knife must be used to make the opening cuts and to skin out the shins, belly, flanks, neck, base of tail, butt, and also the head, unless the head is cut off with the skin on it, as is frequently

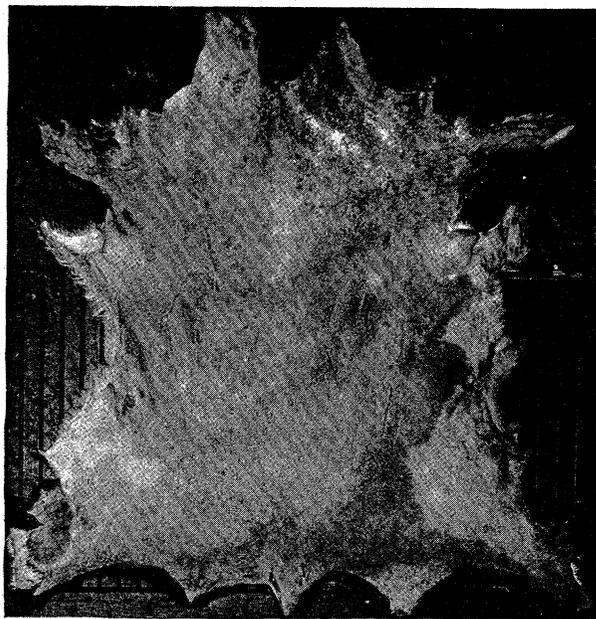


FIGURE 21.—Trimmed calfskin of excellent pattern.

done. For this work the calf should be suspended by the hindlegs. Few butchers can skin calves on the floor without damaging the skin, because this position is too low for comfort. Raising the animal onto a cradle is not satisfactory.

After skinning the parts mentioned above, the remainder of the skin should be pulled or worked from the carcass, with the knife being used only as a last resort. Often at this point, the skin is left on the carcass when it is put in the cooler and pulled off just before the meat is sold.

Sheep.—Skinning a sheep is essentially the same as skinning a calf in that after skinning the legs and neck, the skin is pulled or fisted from the carcass. Fisting is done by pulling with one hand, alternately tightening and slackening the skin, while the other hand is being used as a fist, back against the carcass, to work the skin loose.

Directions for slaughtering sheep, including some aspects of skinning, are given in Farmers' Bulletin No. 2152, "Slaughtering, Cutting, and Processing Lamb and Mutton on the Farm."

CURING

Unless a hide is promptly cured, or treated with a preservative, after it is removed from the animal, it will spoil or rot, just as meat will. The curing is done by covering the hide with ordinary salt. Drying is used as a preservative treatment in countries where salt is difficult to obtain, but for leathermaking purposes dried hides are not so valuable as salt-cured hides.³

In warm weather, a hide must be cured the day

it is removed from the animal. In cold weather an unsalted hide will keep for several days, but even then salt penetration is best if the curing is done without delay. The butcher should never neglect or postpone the curing operation, unless he can sell his hide immediately to a hide dealer. Since only sound, well-preserved hides will make strong, long-wearing leather, correct curing is even more important than good skinning.

Preparation for Curing

Before salting, wash the hide, if necessary, to remove blood and dirt. Then scrape off or carefully cut off all large pieces of meat and fat. Cleaning the hide and trimming off all fat and meat are important operations, because they permit the salt to penetrate the hide easily and rapidly. Moreover, fat and meat will not make leather; since they must be removed by the tanner,

their presence in excessive quantities will result in downgrading of the hide.

While bacteria grow slowly on a clean hide, they readily attack blood and meat. If such contaminants are allowed to remain on the hide, they will provide an excellent starting place for bacterial growth which, once started, will continue rapidly and soon destroy the entire hide.

Salt Used for Curing

The salt that is applied to hides for curing is dissolved by moisture from the hides, forming a brine. Most of this brine remains on the hides until they are thoroughly penetrated and saturated with salt. Since the rate at which the salt dissolves determines in a large measure its curing efficiency, some consideration must be given to its

grain size. Thick hides, which require a longer time for the salt to penetrate, are thus cured best with coarser, mined rock salt with grains about the size of peas or a little larger. Examples are the No. 1 and No. 2 hide salts shown as *C* and *A*, respectively, in figure 22. Many hide men consider the No. 2 salt too coarse, however. For calf and other skins, on the other hand, salt with grains somewhat smaller than rice (fig. 22, *E*) is recommended, such as mined CC salt or evaporated GA

³ This statement regarding drying does not apply to fur skins; they are always dried.

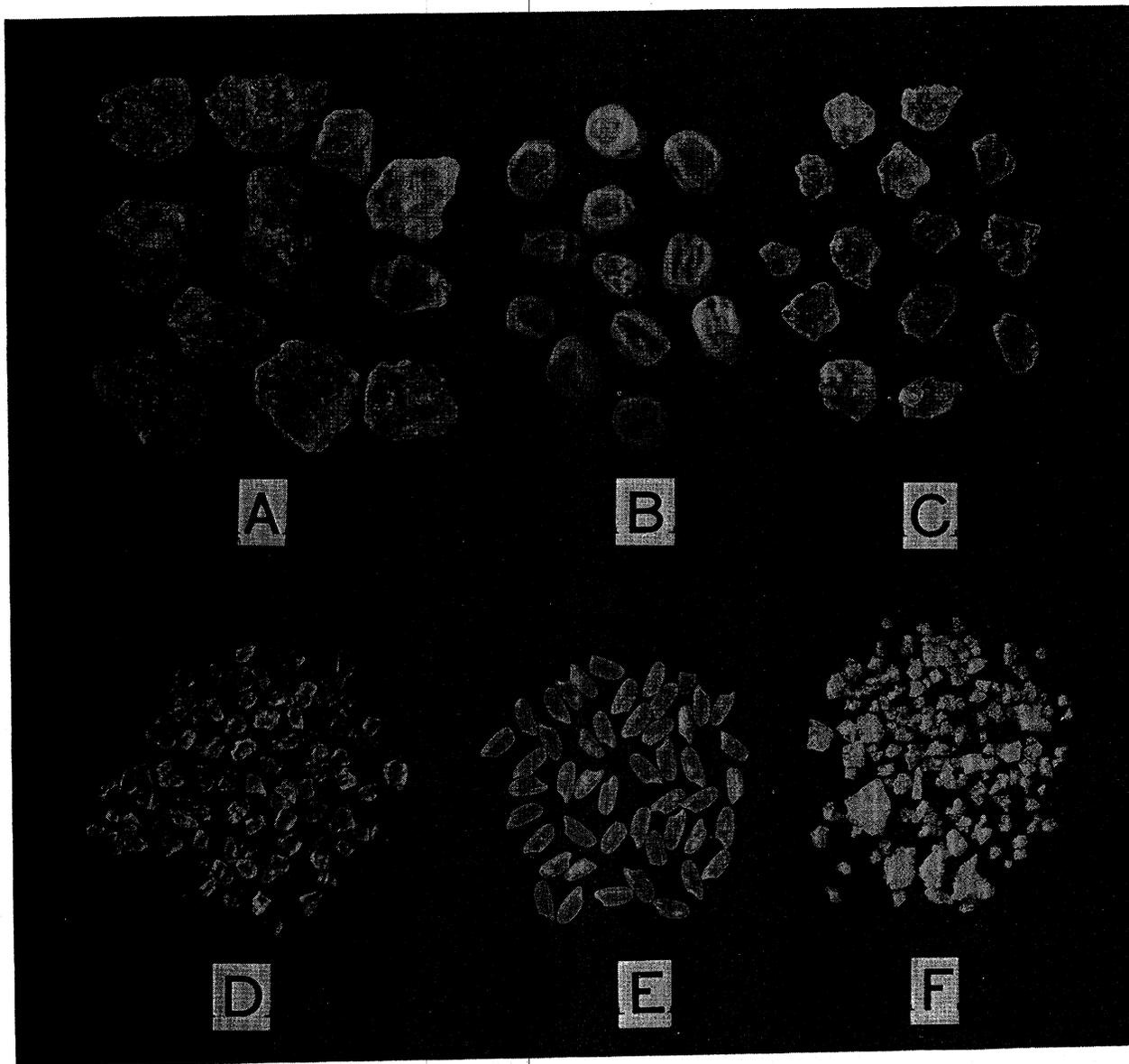


FIGURE 22.—Hide salt: *A*, No. 2 mined hide salt; *B*, dried peas (for comparison of size); *C*, No. 1 mined hide salt; *D*, mined CC salt; *E*, rice (for comparison of size); and *F*, evaporated GA Packer salt.

Packer salt,⁴ which are shown as *D* and *F*, respectively.

As far as salt purity is concerned, any of the commercial grades are satisfactory for curing hides. Salt evaporated from brine wells is excellent. Solar-evaporated sea salt should not be used, however, because it is highly contaminated with slow-growing, salt-tolerant bacteria that become

⁴ Mention of specific products does not imply recommendation by the U.S. Department of Agriculture over others of a similar nature not mentioned.

reddish when mature. Hides cured with sea salt and stored in a warm place for some months will thus take on a red discoloration. Because of the slow growth of these bacteria, however, the discoloration will not become evident for at least 25 to 30 days. Also, sea salt contains quantities of magnesium which is one of the factors causing salt crystal specks in the grain of hides (salt stippen).

The salt used for hide curing should be clean and new. Used salt, especially if not clean, is contaminated with bacteria and will thus promote

rather than prevent, spoilage. If nothing but used salt is available, it should be put in a pile and washed with water from a hose or spray until the water draining from the pile is clear. Sometimes

salt previously used for pork curing is used on hides, but this procedure is not recommended because the salt may contain so much fat or grease that its curing action will be very slow.

Location of Hide-Curing Operation

In large slaughtering establishments hides are usually dropped to the cellar, and salted and cured there because such a location best meets the requirements for good curing.

The ideal curing room should have a uniform temperature of between 50° and 55° F. and a relative humidity of between 85 and 90 percent. It should have good ventilation but no drafts; drafts usually lower the humidity which would cause the hides to become too dry. There should be sufficient light for salting and inspecting the hides, but no direct sunlight which would raise the temperature too much. The floor should be of cement and should slope gently to gutters between the hide packs, or pipes, so that brine from the hides will

drain freely to a sewer. There should be no overhead pipes from which water can drip, and no pipes, nails, or other metal overhead from which iron rust might fall onto the hides.

If a cellar is not available, the location should meet the above requirements. A room or shed should have a tight roof so that no water can leak through onto the hides. If the room cannot be closed to prevent drafts, the hides must be covered with burlap or heavy paper to prevent them from drying too much. If the floor is not suitable, a wooden platform can easily be made from rough lumber, with one side of the platform raised slightly to aid drainage.

Salting Cattle, Horse, and Mule Hides

The floor or platform selected for the curing operation should be covered with a layer of salt at least one-quarter inch and preferably one-half inch thick and slightly larger in area than the hide. Spread the hide on this layer of salt, hair side down and with the head at the low side of the area. Pull the hide as smooth as possible, and straighten and spread the legs so that they lie flat. Make sure there are no folds or laps on the edges. Spread salt all over the flesh side, using a half pound or more of salt for every pound of hide. Be sure that every part of the hide is covered.

If only one hide is to be cured at a time, cover it with clean burlap bags 24 hours after salting. Every few days sprinkle the burlap with a strong brine solution made by dissolving about 3 pounds of salt in a gallon of water.

If several hides are to be cured, pile them one on top of the other, always hair side down with the heads at the low end of the pile. Salt each hide on the flesh side as directed above as it is put down. Be careful not to disturb the salt on the lower hide when putting a fresh hide on the pile. Cover the

top of the pile with damp burlap after the last hide has been on the pile for a day. Hides may be added to the pile over a period of a week or so, instead of all at once, but always keep the pile covered with damp burlap. Hides should remain in the pile for 30 days from the time the pack is closed. They will then be "salt firm" or "salt hard" and can be taken up safely, shaken, bundled, and shipped.

During the curing period inspect the hides occasionally to see that they do not heat. If only a few hides are in the pile, if the room is cool, and if plenty of salt has been used, the hides should need no attention. If, however, the room temperature is high and there are a number of hides in the pile, inspect them for heat every few days. Turn back the hides, reach into the interior of the pile, and compare the temperature there with that of the outside layers. If heating has started, it can be felt easily. Heated hides must be transferred one by one into a new pile; add a liberal amount of new salt as they are put down. In

extreme cases, dip the hides in iced brine before resalting to assist in preventing heat damage.

Hides from animals that have been killed accidentally or have died from disease (renderer hides) seldom can be removed and cured promptly. They are therefore more subject to spoilage than hides from slaughtered animals. It is good practice to immerse such hides for 8 to 24 hours in a

saturated salt brine containing one part per thousand of sodium pentachlorophenate.

In some locations other methods of curing are sometimes used, such as rolling the hide into a tight bundle immediately after salting, or pickle curing in a vat or barrel. However, such methods should never be used, as they always yield low-quality hides.

Salting Calfskins

Calfskins, because they are of greater value than cattle hides, justify greater attention during salting. They may be salted in a pile in the same way as cattle hides, except for the use of finer salt. When a number of skins have been salted, cover the completed pack, which may be 3 feet high, with salt so that no top skins show. This pack should never be sprinkled with brine. To retain moisture, cover it with a tarpaulin or several layers of burlap wet with brine. Leave the pack undisturbed for 30 days to complete the cure.

Hide dealers who buy high-quality calfskins usually require that the skins be salted in a "blood pack" for 2 or 3 days before they are salted in the regular pack. The blood pack removes the blood remaining in the skin, thus starting the cure and insuring a clean, bright flesh side. These dealers also require that the skin be trimmed in a specified manner. If a number of calfskins are to be produced, it should be profitable to locate such a dealer and obtain from him specific directions for producing superior skins for which he is willing to pay a premium price.

Salting Sheepskins

Sheepskins require a much longer time to cool than do other hides or skins because of the large quantity of grease they contain. In the spring, summer, or fall, a full-wooled skin takes several hours to cool, and salting must not be started until all the animal heat is gone. The skins may be spread on the floor singly (fig. 23), or hung up to cool.

Thorough salting is absolutely essential for sheepskins. With the skin spread out, wool side

down, cover the flesh side with a double handful of clean, fine salt, and rub it in by hand all over the surface until brine begins to form and all parts of the flesh side have lost their slick feel and appearance (fig. 24). Then put on more salt, enough to cover the skin well. Keep each skin separate if there is room; otherwise, pile them one on top of the other, but do not pile on more than 10 skins. Every day or two, transfer these skins, one by one, into a new pile.

PREPARING HIDES FOR MARKET

Removal of Surplus Salt

When the cured hides are to be shipped, place them over a barrel or beam and leave them there overnight to drain away excess brine. Then shake or sweep off surplus salt. In packinghouses the surplus salt is removed on a buck, which is a grating of 2- by 4- or 2- by 6-inch boards mounted on

legs approximately waist high. Four men grasp a heavy hide at the legs and snap it down vigorously on the buck, once hair side down and twice flesh side down. The hide is then ready for inspection, grading, and bundling.

HIDES AND SKINS FROM LOCKER PLANTS AND FARMS



FIGURE 23.—Sheepskins spread to cool.

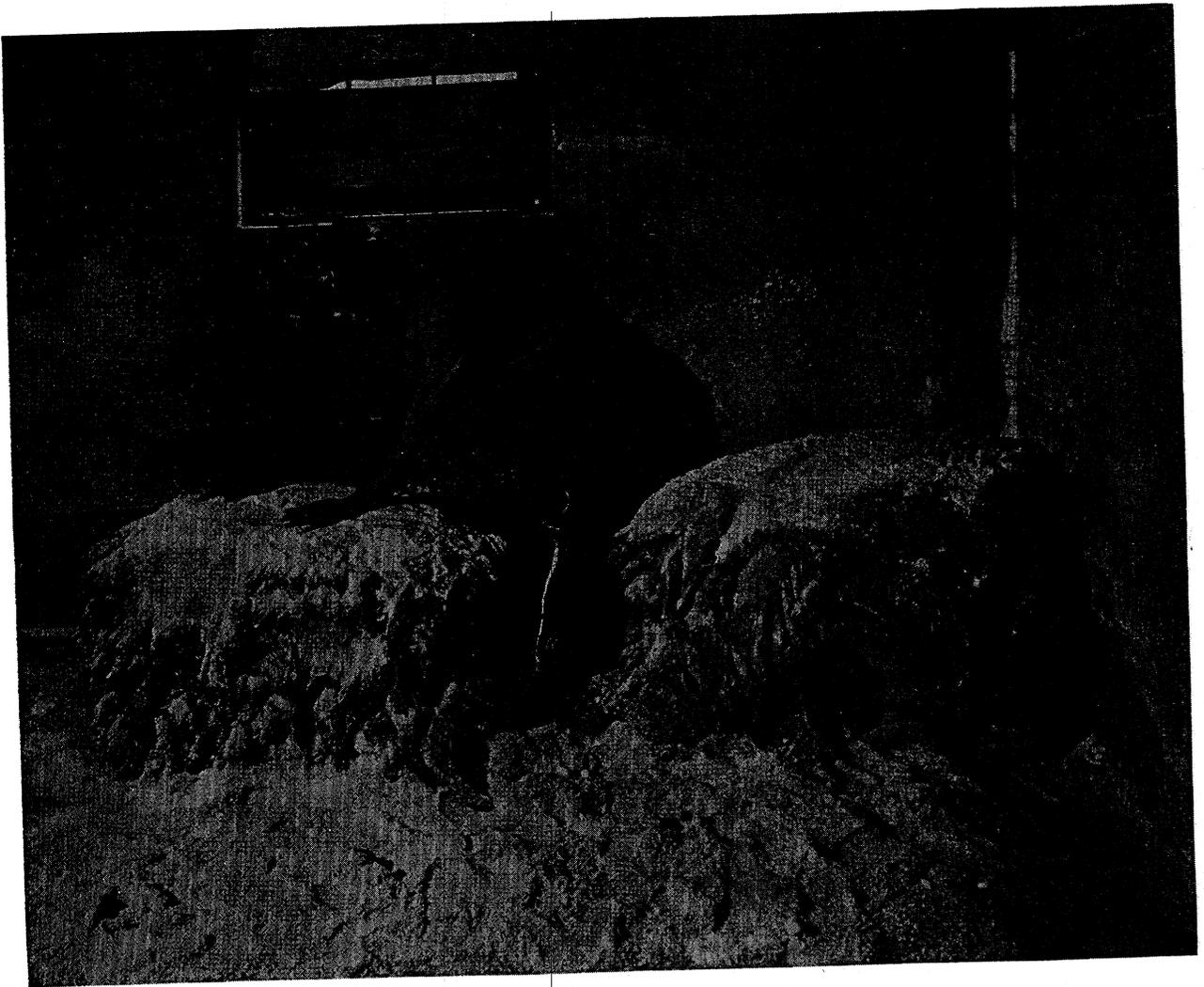


FIGURE 24.—Rubbing salt into sheepskins.

Folding and Bundling

Folding Cattle Hides.—The steps generally followed in folding and bundling cattle hides for shipment will be easily understood by studying figure 25, in which the hair side is designated by shading. As a rule, hides are folded so that the hair side is out.

Hides are bundled and tied separately. About 7 feet of rope will be needed for a bundled hide. The rope should be uncoiled and light in weight,

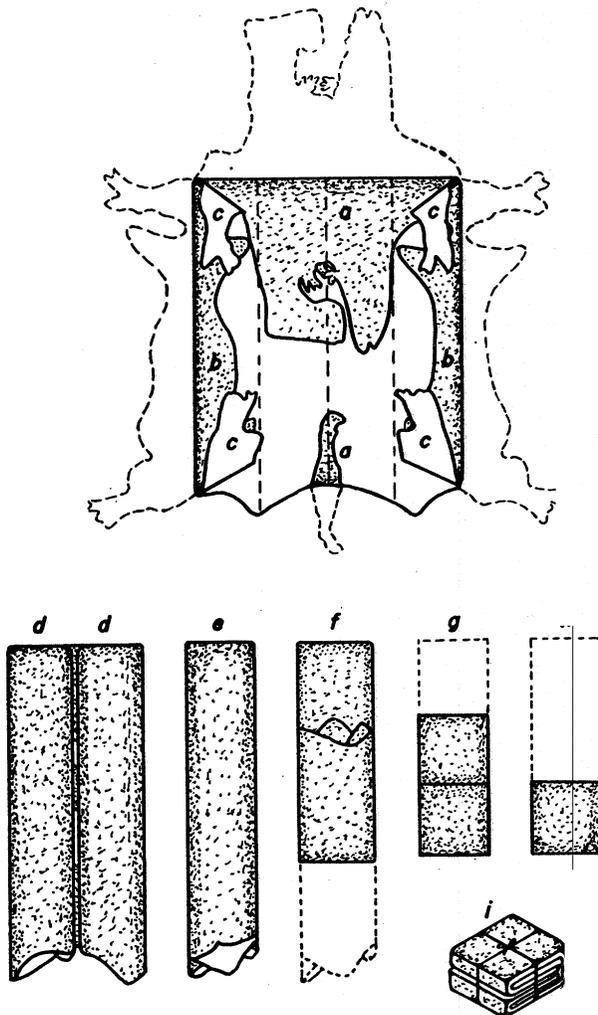


FIGURE 25.—Folding and bundling hides: *a*, First step; *b*, second step; and *c*, third step; *d* through *h*, steps in folding, and *i*, hide folded and tied, ready for shipment.

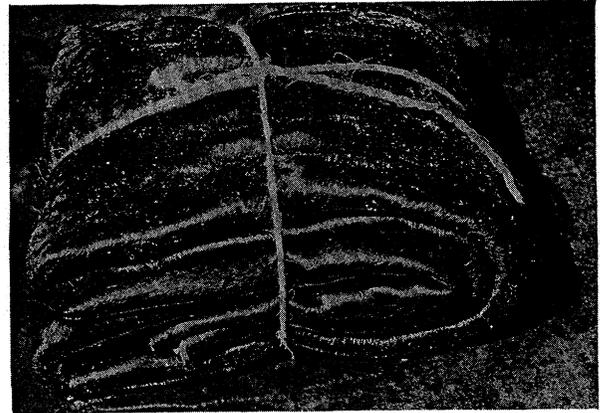


FIGURE 26.—Hide folded and tied ready for shipment.

but strong. Two-ply, uncoiled sisal is used by many shippers. Pass the rope around the bundle in two directions and tie securely as shown in figure 26. Never use wire, as rust may stain and damage the hide.

Bundling Calfskins.—The cured, trimmed calfskins should be shaken or swept to remove surplus salt, as for cattle hides, then folded to a square bundle. If a number of skins are to be shipped, they may be weighed individually, separated into the two more common weight groups (under 9½ pounds and 9½ to 15 pounds), and tied four or five to a bundle. Lap two skins to form a wrapper (hair side down), spread two or three skins on them, fold in each belly edge to make a long rectangle, then fold in the ends of this rectangle to make a square bundle. Tie as shown for cattle hides.

Bundling Sheepskins.—Sheepskins, after removing surplus salt, are tied five to a bundle. Fold each skin along the backbone line, wool side in, then pile the doubled skins on each other but reverse the folded edge as each skin is put down. Pass the rope around the bundle in two directions and tie.

Sheepskins should be marketed promptly. Do not hold them longer than a week or 10 days.

Tagging and Shipping

Put a tag on each bundle, giving the name and address of the dealer or tanner to whom the bundle is being shipped, and also your name and address as the shipper. Be sure the tag cannot come off. Use heavy paper or linen tags that are waterproof and use waterproof ink or indelible pencil.

After the hides and skins have been properly

and securely bundled and tagged, ship them without delay. Do not let the bundle remain in the sun, in drafts, or against rusty or corroding metal. Protect it from rain or other water. Promptness in shipping, always advisable, is particularly important with sheepskins. They heat rapidly after being bundled, and in hot weather, especially, must reach their destination quickly.

Hide Beetles

If for some reason hides must be held for a time, examine them occasionally for insect damage. Hide beetles (*Dermestes* spp.), if once established, can do great damage to hides, but can be controlled by dusting or spraying with an insecticide. Spraying is about three times as effective as dusting but less convenient. Dusting powders contain-

ing from 1 to 10 percent of DDT should be satisfactory. Good results have been reported with dusts containing 2 ounces of 5 percent DDT per 100 square feet, or with sufficient gammexane (benzene hexachloride) to provide 1 ounce of the gamma isomer per 2,000 square feet of hide.

HIDE DEFECTS

The price a specific hide will bring is determined by the quality of leather that can be made from it. The tanner values the hide on the basis of its freedom from certain defects. Some of these defects are outside of the rancher's or the butcher's

control. A great many hides, however, are downgraded because of butcher defects, most of which can be prevented by careful skinning and curing, as described earlier in this publication.

Hide Defects on the Live Animal

Some of the defects that lower hide quality originate on the living animal. The principal defects of this type are brands, grubs, cuts and scratches from nails and barbed wire, warts, sores, and damage by ticks and certain diseases.

Brands are used to identify animals on the range and are placed on one or both sides of the animal, usually toward the rear so that they can be seen easily by a horseman. They are normally burned so deep that scar tissue forms through the skin and the brands are as visible on the under, or flesh side, of the hide as they are on the hair side (fig. 27).

Because brands are placed on the most valuable part of the hide, the loss of leather is appalling. Branded hides are separated from unbranded

hides during salting or bundling and are sold as a separate classification at a lower price. This price penalty varies from 1 to 4 cents per pound, depending on the type of hide and location of the brand. On the livestock market, branded cattle bring less per head than unbranded cattle; otherwise, the same.

Grubs cause a hide loss comparable to that from branding but, in addition, they cause an enormous loss of beef. Grubs—larvae of the warble fly (*Hypoderma* spp.)—develop in the backs of cattle, just under the hide. They puncture the hide to obtain air during growth, and when fully developed, leave the animal through the holes they have made. If the animal is slaughtered before these grub holes have had an opportunity to heal,

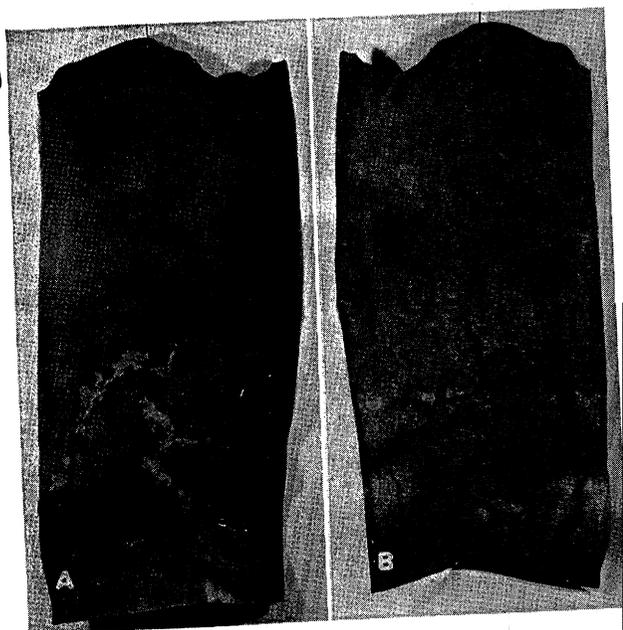


FIGURE 27.—Bend of sole leather with an unusually large brand which renders about a third of it useless: A, Grain or hair side; B, flesh side.

leather made from its hide will be practically worthless, like that shown in figure 28. In this particular sample, the grub holes are even larger on the flesh side than on the grain side. Even if slaughtering is delayed until the grub holes have healed, the scar tissue, which extends entirely through the skin, makes the affected portion of the leather unfit for most purposes. This is especially true for leather that is split into two or more layers for use as upholstery, in bags or suitcases, or in any application where thin leather is required.

The problem of grub eradication is being actively studied by the U.S. Department of Agri-

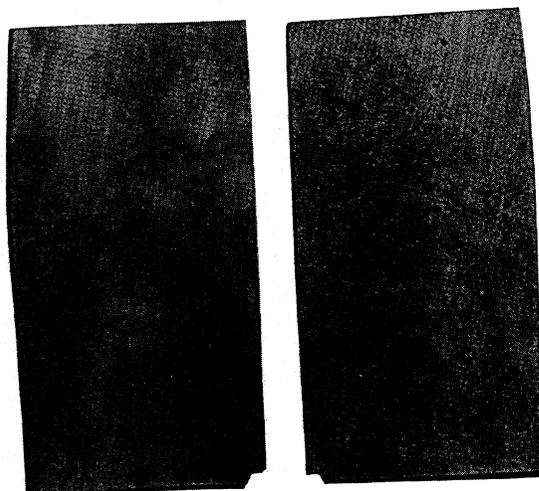


FIGURE 28.—Grub holes in leather: A, Grain or hair side; B, flesh side (sample is 7 inches wide).

culture. The development of systemic insecticides that can be fed to or sprayed on the animal to kill the grubs before they can damage the hide offer great promise for controlling this pest. Two such chemicals have been field tested and approved for use.⁵ Although treatment by an individual or a small group of farmers is helpful, it cannot be very effective in eradicating the pest if neighboring cattle are infested. A thorough simultaneous series of treatments of all cattle would be difficult to accomplish and possibly can never be done without legislation.

Other hide defects originating on the live animal, such as scratches, sores, and damage by insects and disease, mar the surface of leather and prevent its use in articles for which appearance is important. These defects can be minimized by keeping the animals in a healthy condition and in suitable quarters.

Butchering Defects

In contrast to the hide defects that are produced on the live animal, which are difficult or impossible to control, hide damage that occurs during slaughter can be prevented by careful butchering. Among the principal butchering defects are poor pattern, poor trim, and cuts and scores.

Pattern.—By "pattern" is meant the shape or outline of the hide when it is spread out flat. The importance of good pattern to the tanner can be appreciated when it is understood that not all parts of a hide have the same texture and quality. As shown in figure 29, the hide consists of (1)

the body or bend part, which is dense, firm, and of high quality; (2) the shoulder part, which is

⁵ One of these, 0,0-dimethyl 0-2,4,5-trichlorophenyl phosphorothioate, is commercially available from the Dow Chemical Co. for oral administration either as a bolus under the name of "Trolene" or as a feed additive—Tromix. The other, 0-(3-chloro-4-methylumbelliferone) 0,0-diethylphosphorothioate, is commercially available from Chemagro Corp. for external application by spraying, under the name of "CO-RAL" (also known as Bayer 21/199). The mention of these products does not constitute endorsement by the U.S. Department of Agriculture over similar products not mentioned.

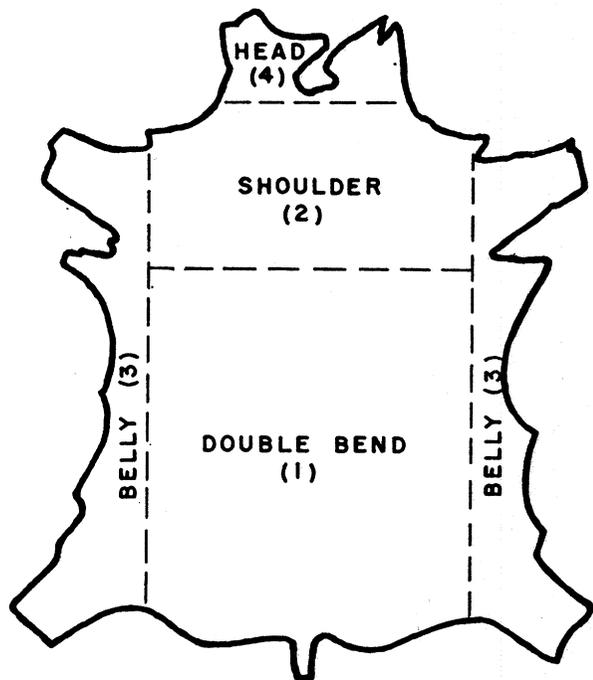


FIGURE 29.—A hide of good pattern and trim. The sections are rated from best (1) to worst (4) on the basis of the quality of leather they make.

next to the bend in leathermaking value; (3) the belly parts, which are made up largely of long fibers running parallel to the backbone of the animal with few cross fibers to bind the skin together; and finally (4) the head part, which is lowest in value. Because of these differences, only certain parts of the hide are suitable for a given type of leather. The sole-leather tanner, for example, will trim off the belly parts during tanning and finish them separately for insoles or other purposes. In a hide of poor pattern, the bend and shoulder parts might be off center, for example, so that one of the belly strips is too wide and the other too narrow for economical use.

Poor pattern is the result of careless butchering. If the animal is not split exactly down the center of the belly, or if the opening cuts that extend from the legs to the belly cut are not precisely located, a part of the hide that should be on the belly will be found on the bend part, or vice versa. Poor pattern is also obtained if the throat is slit crosswise instead of lengthwise, or if the head and legs are not skinned properly.

An example of a hide of extremely poor pattern, shown in figure 30, should be contrasted with the calfskin of excellent pattern, shown in figure 21.

(There is no head on the calfskin; many butchers cut off the head without skinning it.)

Trim.—Any irregular or ragged edges or any large holes near the edge of the hide that have not been trimmed out will decrease its value to the tanner, because these edges may catch on one of his machines and cause a larger piece of the hide to be torn out. Furthermore, the pieces of leather these edges would make would be too small for economical use. Tanners also stipulate that animal parts that will not make leather, such as horns, hoofs, dewclaws, snouts, ears, and lips, are to be removed from the hide before sale. These should have been trimmed off before the hide was salted.

Cuts and Scores.—In the aggregate, cuts and scores in hides are responsible for a tremendous loss to hide producers. Obviously, cuts that go

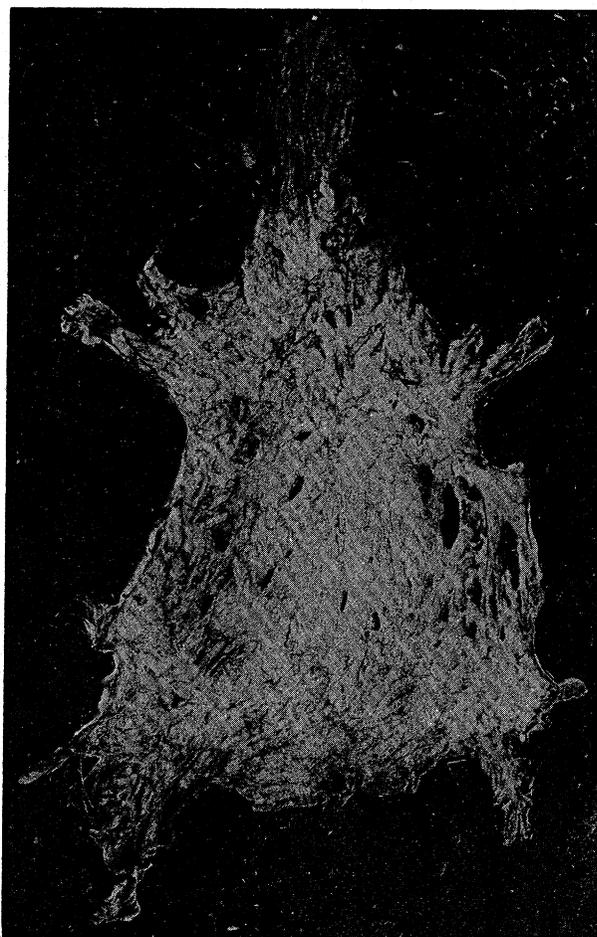


FIGURE 30.—A hide of poor pattern, showing many cuts and scores.

ntirely through the hide are ruinous to it. Scores, which do not penetrate the hide, are almost as serious.

The skin shown in figure 30 to demonstrate poor pattern is also practically worthless because of its many cuts. Not only is the cut or scored area lost, but usually an appreciable part of the hide around the area must also be discarded. For some types of leather a single cut in the bend part may render an entire hide unfit for the intended purpose. The manufacturer of belting leather, for example, must have a hide that will cut into long, perfect pieces.

Scores weaken a hide appreciably and even though they do not penetrate it, they often are visible on the grain or finished side of leather as well as on the flesh side, as shown in figure 31.

These scores would mar the appearance of any article made from this piece of leather.

Scores, like grub holes, may be very serious to the tanner of lightweight, thin leathers for upholstery, shoe uppers, luggage, and similar articles. Where the hides are split into layers, the scores will appear as holes in the under layers.

Only unscored hides are suitable for making shoe soles or uppers. In cutting the hides for shoes, intricate patterns are followed in order to obtain the maximum number of pieces in the correct proportions. Only the grain side of the leather is visible to the cutter, so that any scored pieces are not found until the cutting has been completed. For shoe uppers these defective pieces must be discarded and replaced by perfect pieces that match in color and appearance.

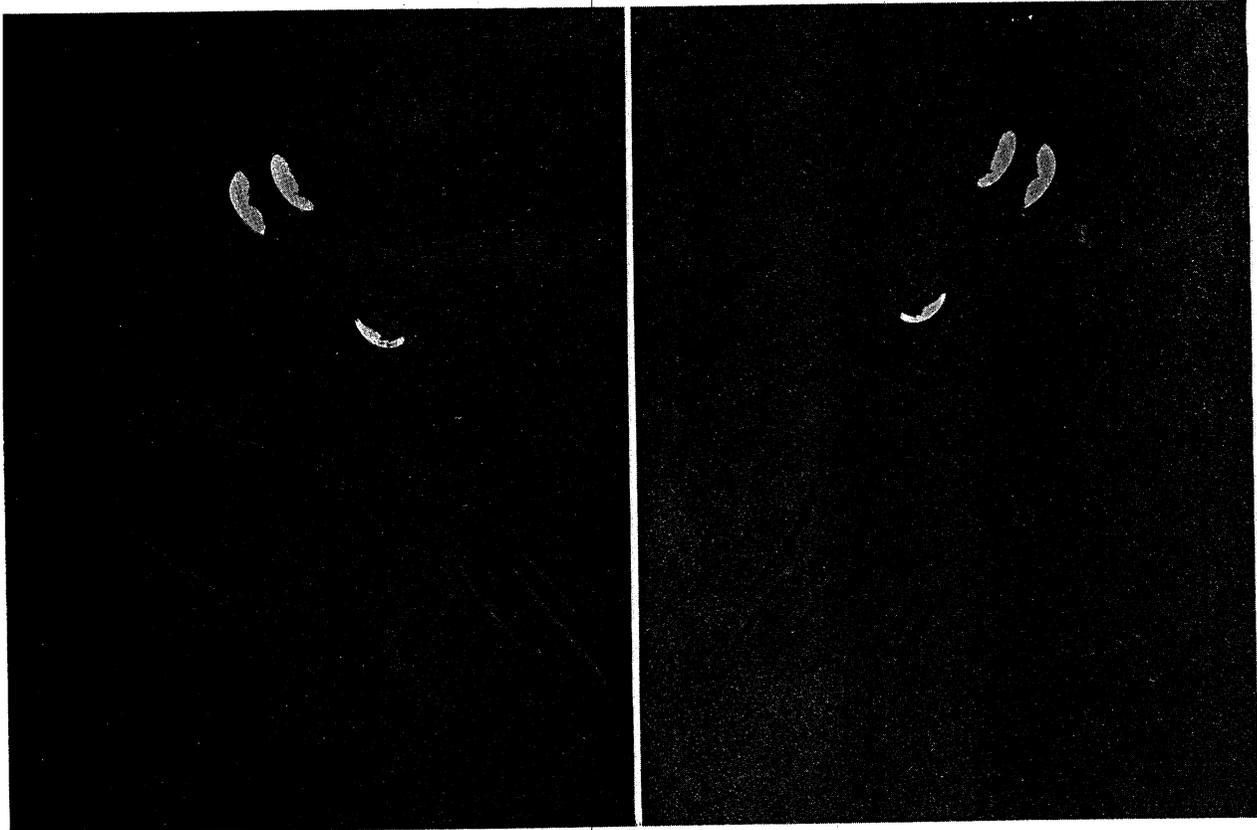


FIGURE 31.—Leather made from a scored hide: Left, grain side; right, flesh side.

Curing Defects

The principal defects arising during curing and storage are incomplete cure, salt stains, hair slip, and decomposition or rotting of the hide.

Incomplete cure will result if the hides are

not left in the pile or pack until the salt has thoroughly penetrated the hide and excess brine has drained away.

Salt stains are not caused by the salt directly

but probably by bacteria, although their origin is controversial. Dirty salt or insufficient salt will favor salt stains.

Hair slip, evidenced by spots where the hair

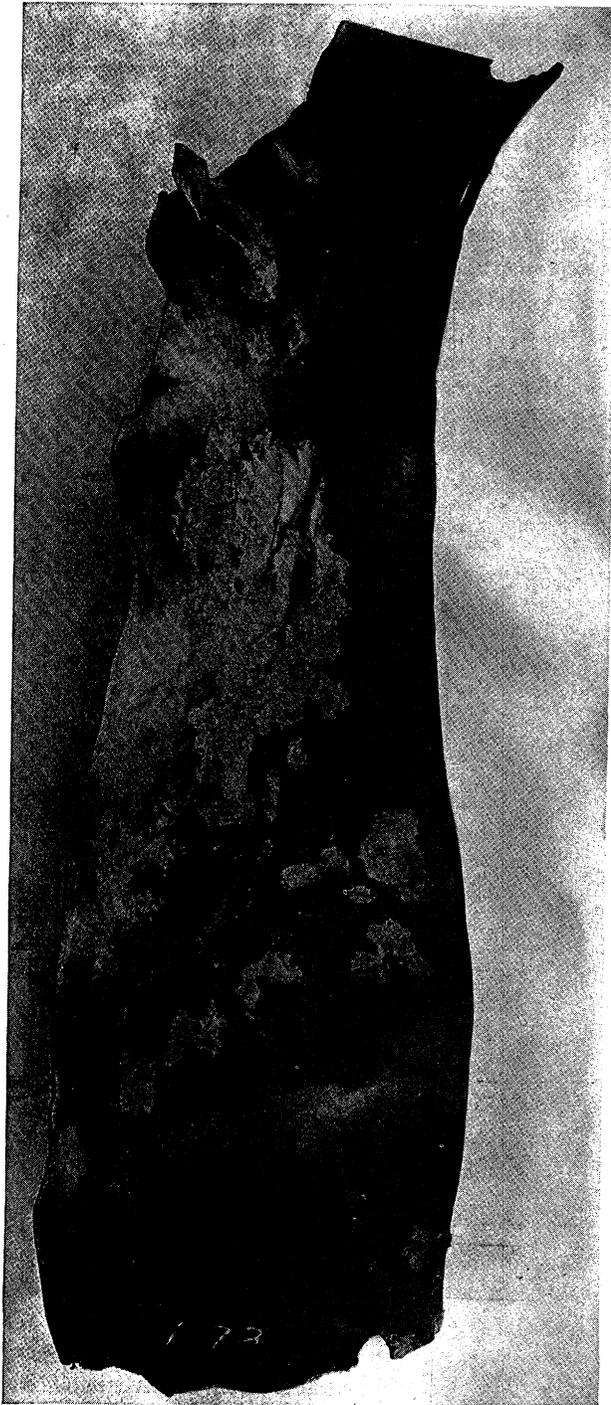


FIGURE 32.—Leather from an improperly salted hide—one way to increase the cost of shoes. The lighter areas show “hair slip” and “rot.”

is loose and can be easily rubbed off, is not necessarily a defect in itself, but it is an indication that bacterial action is well started and will rot the hide if not checked promptly. Leather made from a hide showing hair slip and rot is shown in figure 32, whereas leather made from a badly decomposed hide is shown in figure 33.



FIGURE 33.—Leather made from a decomposed hide. Properly cured, this hide would have given six to eight pairs of good outsoles.

HIDES AND SKINS FROM LOCKER PLANTS AND FARMS

Rotting is caused by the lack of sufficient salt in the cured hide, either from the use of insufficient salt or from the failure to cover all parts of the hide with salt in the curing operation. It may also result from the removal of salt from a properly cured hide by rain, or water from a leaky pipe or from any other source. Rotting can also occur in hides stored in a warm place where the relative humidity is high; under such conditions the salt

will take up moisture and leach from the hide as brine.

Although the greater danger is that hides will become too wet during storage, conditions should be such that they will not dry excessively either. If they become quite dry, stiff, and hard, they will not soak back completely to the fresh condition, will not tan uniformly, and will not make leather suitable for some purposes.

PACKER HIDE CLASSIFICATIONS

As indicated at the beginning of this publication, packer hides are generally of the highest quality, and the goal of the farmer and locker-plant operator should be to produce hides that

would meet packinghouse standards. Accordingly, a knowledge of the way hides are classified in the packing house should be of value to the small producer in determining the quality of his hides.

Classification by Weight

Before hides are graded for quality, they are selected according to their size and weight. Where many hides are being produced it is important to keep them sorted in this way, because hides are tanned in drum lots and if the hides in a given lot are not reasonably similar in size and weight, they will not all tan uniformly and completely in the allotted time. Hence the following weight classifications are observed, and the small producer should be familiar with them, even

though he is not normally faced with a sorting problem:

<i>Type</i>	<i>Weight, pounds</i>
Steer hides:	
Heavy	58 or more
Light	48 to 58
Extremely light	30 to 48
Cow hides:	
Heavy	53 or more
Light	30 to 53
Kips	15 to 30
Calfskins	15 or less

Classification into Branded and Native Hides

Brand marks have been described as hide defects. However, the practically universal prevalence of brands on cattle hides coming from the western ranges, and the complete absence of brand marks on eastern cattle, makes for a broad classification of all cattle hides into "branded" and "native" (unbranded) categories. Of course, a native

hide is of more value than an otherwise comparable branded hide, but because the two types are rarely marketed together, a strict comparison of price values is not possible. In general, the difference is from 1 to 4 cents a pound or even more. Side-branded hides bring less than butt-branded hides.

Classification by Defect

Hides with no defects, or only minor ones, are graded in the packinghouse as No. 1. Presence

of defects will lower the grade to No. 2 and cause the price offered for the hide to be reduced in ac-

cordance with the severity of the defect. The classification of hides according to defects and the usual price penalties that the various defects bring are outlined in table 1.

TABLE 1.—*Hide defects and their effect on classification and price*

Grade and defect	Price per pound
No. 1: 1st quality—only minor defects.	Full price.
No. 2: Cuts or holes more than 3 inches from edge which cannot be cut out without spoiling pattern. Deep scores or gouges halfway through the hide or more (except in belly portion). Sores-----	1 cent per pound less than No. 1. Do. Do.

TABLE 1.—*Hide defects and their effect on classification and price—Continued*

Grade and defect	Price per pound
No. 2—Continued Grain damage (break in hair side 1 inch or more in length or diameter caused by sores, rubbed spots, scuffs, or deep scratches).	1 cent per pound less than No. 1.
Warty hides: Wart-covered area 36 square inches or less. Wart-covered area 36 to 72 square inches. Wart-covered area more than 72 square inches.	Classed as No. 2. 2 cents per pound less than No. 1. Either rejected or priced on basis of wart-free area.
Grubby hides: 5 or more open grub holes that can be punctured with a wooden skewer.	1 cent per pound less than those without grubs.

Hide-Selling Practices

Hides offered for sale are usually inspected by the buyer's agent in the presence of the seller's agent. If the trim or pattern is poor, parts in the wrong location may be trimmed off before weighing. Excess fat and meat are expected to be removed by the seller, and the tail length is not to exceed 8 inches. Each hide is also inspected for manure, and adjustment for manure allowance is

mutually agreed upon by the buyer and seller, and this amount is subtracted from the overall weight. If the shipment is large and the manure-weight deduction cannot be agreed upon, the manure is removed by spade from a small number of hides selected by both the buyer and seller, weighed, and the calculated weight of the manure is subtracted from the overall weight of the shipment.

NONPACKER HIDE CLASSIFICATIONS

By far, most of the hides produced in this country are packer hides. The percentage is higher today than it ever has been. In contrast to the time when "country" hides and skins accounted for perhaps a third of our entire production, probably not more than 4 percent of today's hides are produced on the farm. The shift has been to locker plants and other small establishments. Frequently nonpacker hides are sold in mixed-weight lots, although lots of a single weight are sold. Three general classifications of nonpacker hides are recognized—locker plant, country (or farmer), and renderer (hides from plants processing animals that have fallen).

Country hides have always been low in quality as compared to packer hides; hence, they bring a

lower price. But there is no reason why this should be so inherently. The farmer or locker-plant operator who studies good slaughtering techniques and applies them carefully, even though he may not always have access to equipment like that in the packinghouses, should be able to produce good hides. The farmer or rancher who skins only one or two animals a year probably could not get a top price for them, even though they were in excellent condition. The locker-plant operator or the large rancher, on the other hand, who butchers several animals a week should be able to contact a hide buyer who will pay a price for his hides that will well justify the extra effort and care required to keep them in top-quality condition.