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## Defects in Hides and Skins that Affect Quality Assessment

*The defects in raw hides and skins procured from different parts of the country vary considerably in view of the variations in climate and other environmental conditions. Proper identification of the most common defects, therefore, assumes much significance in evolving standardized procedures for assessing quality of raw hides and skins. Reference may be made to 'IS: 7656-1975 Code of practice for curing and preservation of cattle hides and goat and sheep skins by wet salting method' which gives improved methods of curing and preservation as also precautions to avoid defects in hides and skins. Ed.*

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Raw hides and skins are appreciably affected in quality due to various antemortem and postmortem defects. Antemortem defects occur prior to the slaughtering of the animal and postmortem defects after the death of the animal. Although many of the defects are responsible for the deterioration of hide skin or leather quality, all of them cannot be taken into consideration during assessment. This is because of the fact that many defects are not detectable by naked eye or simple test. Moreover, the extent of damage caused to leather by a particular defect may not be significant enough or its occurrence may be occasional. The defect, which degrades finished leather quality quite substantially and in respect of which a good percentage of hides and skins are found affected are thus to be considered for the purpose of this discussion. An attempt has been made in this paper to point out such defects but the exact criteria of evaluation and price variation between the grades are yet to be determined.

### ANTEMORTEM DEFECTS

Animals in India suffer from malnutrition and various skin infections. Breed of the animal, variations in climate and vegetation, age and sex of the animal also contribute to the quality of hide or skin. Prior to slaughtering, hide or skin quality may be affected by the following defects.

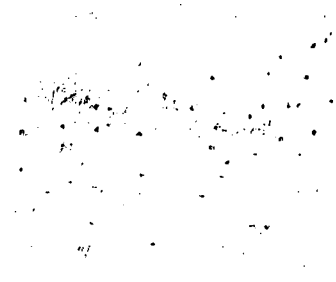


Fig. 1 Winkle holes in leather from goat skin

### Poor Substance

The term 'substance' indicates the thickness of hide or skin and boldness and compactness of the fibre structure. A thicker hide with a compact fibre structure is expected to produce a better leather than a thin, spready and loose-structured hide. The substance in a hide is generally influenced by the breed of animal, nutrition, and climatic conditions.

Uniformity in substance is also an important criterion in assessing hides. In Indian cattle hides the fore and hind shanks appear to be thin and empty, and affect of thickness and structural variation in a hide is much more aggravated during its processing. The estimation of substance should better be done by actually 'feeling' the thickness of hide by fingers.

#### Defects Due to Animal Diseases

Animal diseases affecting hide or skin quality are caused by various biological agents, but for the purpose of assessing raw quality, defects caused by the following diseases may be primarily considered.

**Warbles**—Warbles (grubs) are responsible for severe damage to hides and skins, and they cause substantial economic loss to the leather industry (see Fig. 4). Most common species of warble flies associated with warble damage in hides and skins are *Hypoderma lineatum*, *Hypoderma bovis* and *Hypoderma crossi*. Buffalo hides are rarely affected by warbles. Adult flies come out of the animal body leaving a few to many holes on the hide or skin in and around the line of backbone. The holes may, however, heal up in due course but the healed-up areas may be poorer in some properties from normal hide or skin. Open as well as healed-up warbles can be detected visually. Warble damage is evaluated depending on the number of holes and their location in hide or skin.

**Mange mites**—Damage due to mange mites is common to cattle hides, and goat and sheep skins. Damage caused by demodectic, sarcoptic and psoroptic mange mites is quite considerable. 'White spot', a defect found in goat skin is caused partly by demodectic mange mites. 'Rainy season defect' in goat skins and 'scab' in sheep skins are known to be caused by *P. cuniculi* and *P. ovis*, respectively. Damage caused by demodectic and psoroptic mange mites, though differing in appearance, are mostly restricted to the grain side. Sarcoptic mange mites, on the other hand, burrow into the skin substance-producing channels. In all these cases, the lesions formed or the area affected by mange infestation are denuded of hair or wool. 'Sheep scab' is readily visible on the hair side. The lesions formed by different mange mites on the grain side are to be detected carefully as the grain surface in goat and sheep is generally covered with long hair or wool (see Fig. 2 and 3).

**Pox**—Hide or skin quality is appreciably degraded due to pox disease in most of the domestic animals (see Fig. 4). This defect caused by pox virus is known in trade as 'pock mark'. Pox lesions leave a permanent scar mark on hide or skin. Sheep skins are affected more severely by pox disease. Pox lesions can be detected on the flesh side of hide or skin by careful observation.

**Grain damages**—The grain surface of hide or skin can be damaged



Fig. 2 Red hairy sheep skin affected by 'scab' formation on the grain side

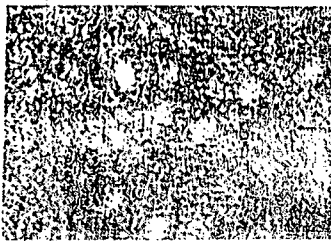


Fig. 3 Lesions caused by *P. cuniculi* on goat skin are responsible for the 'rainy season defect'

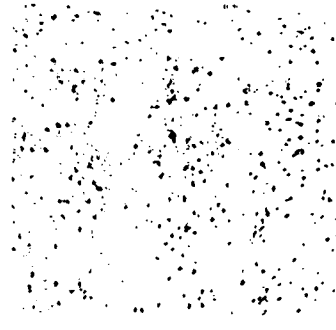


Fig. 4 Severe grain damage in pickled skin due to pox

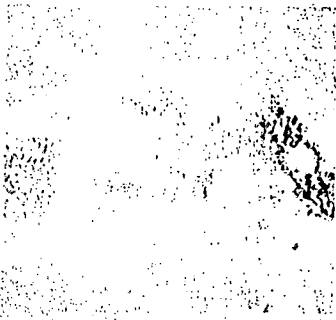


Fig. 5 Bacterial damage in upper leather due to delay in curing

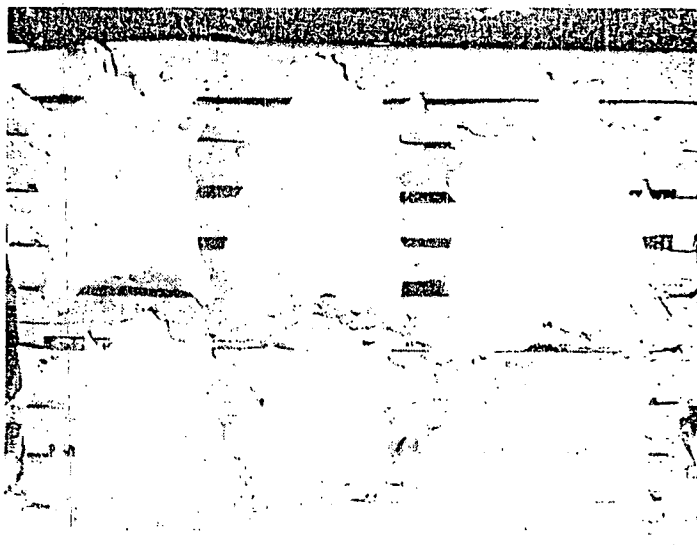


Fig. 6 Goat skin degraded in quality due to poor flaying (bad shape and flaying cuts and holes)

due to various reasons. Grain damages caused by bacterial action (see Fig. 5), abscesses, thorns or other

scratches, abrasions, brand mark, goat mark, etc. are apparently visible to the naked eye.

## POSTMORTEM DEFECTS

After slaughtering or death of the animal, damage to hides and skins may be caused by bad shape, flay cuts and curing defects. Raw stock quality may also deteriorate during storage and transport.

### Bad Shape

The shape of hide or skin depends on ripping cuts made during flaying. An experienced flayer generally produces a well-shaped hide or skin. Bad ripping cuts will result in hides or skins of bad shape (see Fig. 6).

### Flay Cuts

The detrimental effect of flay cuts and holes on hide or skin quality has been recognized long ago but even today leather industry is confronted with this menacing problem. In India, more than 80 percent of the cattle hides are obtained from fallen animals. Fallen hides are found to possess less flaying defects when they are flayed in any organized flaying centre probably because the animals are flayed without any hurry and meat is less important in dead animals. But hides obtained in remote villages are often associated with flay cuts. Slaughtered hides are comparatively more damaged due to holes, deep cuts and gouges. Cutting value of the finished leather is appreciably reduced due to the presence of holes and deep flay cuts in the croupion area of the hide. Goat and sheep skins in India are flayed in the form of bags and so flaying defects are very much restricted in these skins. During assessment, the severity of the damage depends on the number of holes or deep cuts in the croupion area. Flaying defects can be recognized easily by inspecting the flesh side of hide and skin. Hide may also be devalued if it contains too much of adhering fat and flesh.

### Curing Defects

Curing defects may be due to

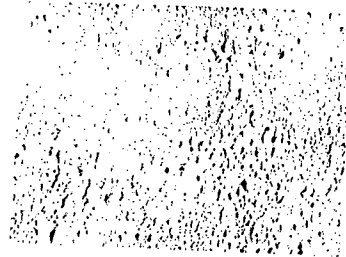


Fig. 7 Grain damage in upper leather from cattle hide due to salt prick during prolonged storage of salted hide

inadequate cure, curing with substandard salt, development of 'red heat', long storage, etc.

**Inadequate cure and prolonged storage**—Hides and skins, if not cured in time or cured with less amount of salt, are subjected to autolysis as well as bacterial hydrolysis and as a result 'hair-slip' and putrefaction may take place. Similar effect may also be experienced when the cured stock is preserved for a longer period (see Fig. 7) or it is transported to long distances by rail during summer months.

'Hair-slip' can be easily detected by pulling the hair, and strong bacterial action is indicated by ammoniacal smell and grain damage.

**Curing with substandard salt**—It is well recognized that a good quality salt has to be used for curing. Presence of calcium and magnesium impurities in curing salt in higher proportions may result in the formation of 'salt stain' and 'salt stippen'. Salt-stippen is more common in India than salt stain. Detection of salt stain by naked eye may be difficult but salt stippen appears as star like crystals on the hair side when the salted hide is partially dried. A grading box may be of great help in identifying the defects.

**Red heat**—Another curing defect that is visible on the flesh side is known as 'red heat'. This develops as red or pink spots or patches due to the growth of chromogenic halophilic

organisms generally contaminated from curing salt. Reddening appears on the edges of the salted hide because these areas are exposed to air and causative organisms grow readily in presence of oxygen. A minimum period of 3 to 4 weeks is required for considerable 'red heat' development. Though these organisms are not always harmful, the presence of 'red heat' indicates that the cured stock has been stored for at least 3 to 4 weeks and it is possible that other salt-tolerant organisms might have adapted themselves to higher salt concentrations by that time.

## ASSESSMENT OF RAW HIDE AND SKIN QUALITY DEPEND-ING ON VARIOUS DEFECTS

Though the defects mentioned earlier are well-known it is still difficult to have a uniform procedure to select the quality of hides and skins from tanners' point of view because hide or skin suitable for one type of leather may be unsuitable for the other. The types of defects prevalent in one country may differ significantly from another country. Such variations do exist in different parts of the same country depending on various climatic conditions. For example, warble damage to hides and skins is predominant in northern parts of India but it is practically absent in the south. In spite of such variations, certain standard procedures should be followed throughout India both for internal and international marketing. The defects for example, poor substance, damages due to warble and pox, flaying defects and grain damages caused by various agents have considerable impact on the quality of finished leather and most of the defects can be detected by visual inspection. Therefore, they should be considered as the criteria for the purpose of assessment of raw hide or skin quality. A grading box may, however, make the selection of raw hides and skins more easy.