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HIDES & SKINS, LEATHER AND LEATHER PRODUCTS IMPROVEMENT SCHEME

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SALTING OF HIDES AND SKINS

Based on the work of

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1. INTRODUCTION

Curing of hides and skins by salting is the most widely practiced system in the world and perhaps the tanners prefer to obtain the raw material in salted condition while there are many advantages attributed to salt cured stock, there are many disadvantages also. Salt curing combined with brining is one of the best available techniques. This note deals with in detail only salting without brining as this is addressed to countries where salt is not always readily available. The most important factors to be taken into account while deciding the type of preservation to be adopted are:

a) Point of application of the treatment and how long preservation is required;
b) Method of application and extra equipment and handling involved;
c) The cost effectiveness of the treatment for the period or preservation likely to be needed. The effect of salt and other chemicals in causing pollution also has to be taken into account.

If the raw material is to be exported, the preservation must have long term effects whereas, if the raw material is for local processing involving only short distance transport from the point of production, short term protection is adequate. If a tannery receives its raw stock in small quantities from several small abattoirs delivering over a period of time, longer term protection is necessary.

In salting, the applied salt dehydrates the hides and skins and makes the conditions unfavorable for the growth of bacterial and other micro-organisms making them ineffective until the hides and skins are taken for processing in the tanneries. A green hide or skin will have about 65070% moisture and by wet salting, it will be brought to about 40-45% and in dry salting to about 12-15%.

2. WET SALTING TECHNIQUE

The hide or skin is spread on a wooden pallet and salt is uniformly applied on the flesh side with common salt to the extent of 35 to 40% on the green wight. In case of skins, 50% will be required. The second hide is then spread on the first one with flesh side up and salt is applied in the same manner. A pile of about 100 hides may be made or approximately to a height of one meter. The salt draws out water from the hides and skins and the brine so formed is allowed to drain out along with dissolved blood, lymph and other soluble proteins. The pack is allowed to cure for about five days and then it is opened up and put in another pile with top hide going to the bottom and with application of additional salt, if necessary. The hides remain in the second pile for five days. The hides are then removed from the pile and extra salt removed from the flesh side so that the loose salt will be less than 5% of the weight of the hide. The grain side also is cleaned of the salt. Two hides may be kept grain to grain and folded along the four edges and bundled to be despatched to tanneries.

Salt draws out about 20% of the water from hides or skins. Salt is absorbed by the hide to the extent of 12-17% by weight. In all, the weight loss compared to green hide will be about 10-20%. Either rock salt or sea salt or lake salt can be used and generally should have sodium chloride content of about 95%. Lake salt in Tanzania having about 70% sodium chloride with 10-20% sodium bicarbonate and sulphate

with insignificant quantities of calcium and magnesium salts have gave five excellent results in curing. The salt should not be too fine or too coarse. If too much powdered, the salt flows out as brine and is not absorbed by the hide to the required extent. The suggested grain size for salt 2-3 millimeters. Rock salt is the most ideal salt for curing. Because of the availability, sea salt is most commonly used. In this case, the main disadvantage is the formation of red heat with patches on the flesh side of hide or skin through the action of halophilic bacteria and other salt tolerant organisms. In order to improve the salt curing and make it more long lasting, a variety of preservatives are mixed with salt before application. For 100 parts of salt by weight, the proportions of various preservatives are:

Sodium fluoride	2 parts
Sodium silicofluoride	2 parts
Sodium penta chloro phenate	0.2 parts
Zinc chloride	0.5 parts
Para chloro meta cresol	0.2 to 0.5 parts
Topane WS I.C.I.	0.5 parts
Preventhol liquid I (Bayer)	0.5 parts

Mixture of two parts of soda ash and one part of naphthalene powder. Addition of 1% b o r i c acid and 0.5% naphtalene powder to salt before curing has proved extremely useful in preventing red heat. In countries where edible salt is in short supply, it may be necessary to denature salt used for curing to prevent their entry into the consumer market.

3. DRY SALTING TECHNIQUE

This technique is very much similar to wet salting but the hides and skins are dried after the initial salting which fives the advantages of both drying and salting. This technique is especially suited for preparing stock for export purpose, at the same tine overcoming the problems of wet salting. The initial operations are the same as in wet salting. As soon as the brine has drained off after salting, the hides are dried in the air with flesh side up on the ground. Drying can be done with advantage by hanging them on wire or rope or pole in the shade. In dry salting quantity of salt used will be 10% less than in wet salting. With rains, the air drying of salted hides may present considerable difficulties. When the humidity is very high, a mixture of one part of common salt to four parts of anhydrous sodium sulphate is often used to speed up drying. Dry salted goods do not require protection from beetles but are very susceptible to damage by wetting. Care is necessary during transport.

Quick dry salting can be easily practiced by butchers or farmers who handle only small number of hides.. After application of salt, the hide is folded with flesh side in with all the four sides brought in. Hides remain in folded condition for two days and then opened out, drained and dried. After the drying of flesh side, the grain side is exposed for drying.

4. PRACTICAL ASPECTS OF SALTING

It is always necessary, the hides are piled on wooden pallets which are six inches above ground level and this will allow free flow of brine. This also helps

free flow of air which is essential to prevent heating at the bottom of the pile. There should be drainage channels for the waste liquids to flow out. The pallets should have a small gradient between the front and back. Under humid conditions, wet salted hides can be kept for about two to three months whereas, if the salt is mixed with preservatives and applied, storage can be up to six months. If the atmosphere temperature is in the range of 35° and above, the salted stock needs more occasional handling, depending on storage time.

Salting is not economically feasible in places where the price of salt is very high and the availability very much limited. the extra cost in salting is made up by better quality of raw material which can be sold at higher prices. Another advantage is that the tanneries spend much less in soaking expenses compared with air dried hides. Transportation of wet salted stock is more expensive compared to dry ones and wet salted stock can be stored for much lesser time only compared to dry ones. Salted stock will need special care and handling during preparation, storage and transportation. In spite of all disadvantages, tanners prefer salted hides and skins as these will give better quality leathers with more area compared with air dry ones.

Apart from the space required for the preparation of hides and skins for curing, we need covered sheds with wooden pallets and drainage. After the first piling for five days, hides are removed to a ventilated room with pallets for the second d piling. In this room itself, the extra salt from flesh and grain side are removed before the stock is bundled. Store room for salted stock should be well protected from rain and sun, ventilated and provided within pallets. If the time lag between salting and soaking in tanneries is less than three days, only 25% of salt on green wight is required for salting.

In many countries, the rainy season is rather long and during this period the conventional method of air drying becomes ineffective. The drying time becomes longer which will result in putrefaction of hides and skins and also the capacities of drying sheds will not be sufficient, Salting is the only available system to counter putrefaction and loss during rainy season.

5. RE-USED OF ONCE USED SALT

It has been the practice in some countries to recover and re-use salt swept from hides and skins before they are bundled. One part of used salt is mixed with two parts of fresh salt. While it may be possible to adopt this practice with satisfactory results under very clean conditions, it must be recognized that the risk of contamination is very great.

Due to the very nature of salting operation, the area in which it is carried out may not be very clean because of blood, dung, dirt and remnants of skin tissues. Salt, which has been contaminated in that way is likely to permit the development of chromogenic halophilic bacteria which are capable of producing reducing enzymes or other deleterious metabolites.. Furthermore, it is not always possible to introduce satisfactory antiseptic agents to offset this risk. Because of this, it is recommended not to use once used salt.

If salt is either considered too costly for economic use or is not readily available, ways should be examined of dealing with the situation in some other manner but not by re-use of once used salt.

6. WHERE SALTING CAN BE INTRODUCED

Can salting be introduced in all parts of a country? To get good results, it is necessary to select the places where salting can be properly adopted. It is much safer to continue with air drying, when conditions are not favorable for salting. The main aspects to be considered are: regular supply of salt; the speed with which the hides and skins get dried under atmospheric conditions; available facilities for salting and transportation. If there is going to be delay in collection of salted hides and skins or if the number of hides and skins salted is small, it is better if dry salting is introduced in such places. One serious problem to be considered is the time lag between flaying and salting. It is quite possible, because of time lag, putrefaction has already set in with weakening of the structure but without any external signs like hair-slip.

Unlike salted goat and sheep skins, salted hides are marketed on weight basis and this requires a detailed study on weight of salted stock under different conditions. It may be necessary to have two types of prices for wet salted hides during the year; one during the wet season and the other during the dry season. The prices will have to be fixed after a comparative study of weight losses/gains compared to standard air dried hides. In a similar manner, the price of dry salted hides also should be worked out. At present, the traders are not willing to change over to salting of hides due to fear of loosing their profit margin.

It is generally felt that salting cannot be introduced in a place where the atmospheric temperature is high. This is not true and is proved by the fact salting is curing technique successfully employed in most of the Asian countries where temperature goes above 40°C in summer months. However, it is necessary to take suitable precautions as already mentioned in the paper.

7. BRINING

This technique, popular in South America uses saturated (33%) brine solution for initial treatment and hides cured in this way are called frigorificos. Green fleshed and washed hides are soaked in brine for 24 hours with stirring. Water comes out of the hides and dilutes brine. The reduced concentration of brine is restored by addition of fresh salt. After brining, the hides are taken out and piled to drain off. Then the hides are wet salted using 20% salt on weight of hide. Used brine can be reused several times after boiling, filtering and allowing to settle. These hides are well cured and can be kept for long periods.

8. ENVIRONMENTAL IMPACT

Disposal of liquid waste containing large quantities of salt poses a serious problem to the tanneries. In the salt curing centers, the quantity of salt coming out as waste is rather minimal and being in solid form can be easily disposed.

However, in tanneries, the salt comes out during soaking as a liquid waste and this liquid waste degenerates the surrounding land making it unsuitable for

agricultural purposes. So also, salt may enter the water streams making it unsuitable for drinking and agricultural purposes.

Being chemically inert, it is difficult to treat salt waste and the system employed is to segregate the waste liquid and allow it to evaporate by natural heat in wide-area shallow pans and then the salt in solid form is disposed off. Also, the tanneries have started using salt liquid waste to irrigate salt tolerant trees and this has proved to be a good disposal system.

If the tanneries are using air dried hides and skins, the effluent will contain more chemicals like disinfectants and detergents, which are equally bad for the environment. For the present moment and for some time to come, salting of hides and skins in developing countries will not pose any difficulties because (1) the Government are less rigorous in enforcing pollution control measures (2) the tanneries in most of the countries are situated away from the agricultural lands and (3) the hides and skins re not expected to be exported to developed countries in raw from but only in semi-processed or processed form.

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