Indian Farming

MAY 2004

Pattern of utilization and potentiality of camel skin

Champak Bhakat¹ and M S Sahani²

National Research Centre on Camel, Jorbeer, PB 07, Bikaner (Rajasthan) 334 001

Today camel skin are utilized for preparation of a variety of consumer goods in few regions of Rajasthan (Jaisalmer, Barmer) and Gujarat but in olden days camel hide were popularly utilized for storing ghee and oil under village conditions. Skin of young calves are useful for making fur and those of adults for leather. The epidermis of camelid is usually composed of stratum corneum, s. lucidum, s. granulosum, s. spinosum and s. germinativum. The dermis consist of superficial layer, mid-dermis and hypodermis. Flaying of camel hides is generally done manually to get raw hide which are mostly cured by air-drying. The semi-dried camel calf skins have to pass through some chemical and mechanical treatments before they get actually converted into a fur, viz. soaking, removal of flesh, pickling, tanning, fatliquored and finally washed and dried. Additional operations in making leather are treatments of cured camel hides with liming process, bating process, dyeing and lacquer finishing. There is a great potentiality of utilization of camel skin as furs. The cost of small article varies from Rs 500 to Rs 3 000, whereas the cost of big item varies from Rs 10 000 to Rs 12 000. Attention has also been paid to explore the possibilities for modern use with the help of newer technology, in addition to the traditional uses too.

LIVESTOCK plays a significant role in the rural economy of hot arid and semi-arid regions as these are prone to frequent drought due to irregular and scanty rain. Farmers of the regions rely heavily on livestock enterprises for their sustenance. Camel rearing enterprise fits well with such requirements. The total world camel population is estimated to be 19.32 million, of which India has 1.03 million. Indian camel population is mainly confined to north-western states, viz. Rajasthan, Gujarat, Haryana and Punjab with highest intensity of camel in arid districts of Rajasthan. The report on All-India survey on raw hides and skins have no references and figures regarding camel hides. This is mainly due to the infinitesimal population of camels in India as compared to other livestock species. Mostly Indian camels are managed in traditional extensive

system and death of these camels occur in field condition. So removal of skin is not possible in time which also leads to non-availability of skin data.

PRESENT STATUS OF UTILIZATION

Camel hides are largely utilized for storing ghee and oil under village conditions about four to five decades back by Raikas/Rabarries and other camel-rearing community. Today camel skin are widely utilized for preparation of a variety of consumer goods like stool cover, purse, bag, jewellery box, toys, mojari etc. It is also used for preparation of various decorative items like ghara, kuppi and lampshade. Items of camel hide with gold carving made by Usta community are very popular as export potential item. Presently, camel hide appears to have little commercial use but if processed properly can be used for making leather goods such as shoes, sandals etc. Camel hides can be used

for making fancy items of tourist interest and it needs to be explored because very few people bother to take out the skin of a dead camel, whereas this is not the case with other livestock species. The wet hides weighed between 22.5 and 47.0 kg, equivalent to between 8.5 and 11.8% of empty live-weight. Camel hide are used for manufacturing of tourist items in Egypt and the middle East. The possible areas and prospects of utilization of camel skin are given. The attention is also required to explore the possibilities for modern use with the help of newer technology, in addition to the traditional uses.

ADVANTAGE OF CAMEL SKIN

Camel hides, if tanned and converted into leather or furs have many advantages, viz. (i) it has good 'substance' which means thickness, toughness, compactness and texture of the hide are of good quality, (ii) camel

¹Scientist (SS), ²Director

Goods made of camel leather (top), ghara and kuppi of camel hide used in olden days (below)

Decorative lamp shades and kuppi of camel hide with golden paints (top), furs of skin of camel calves (below)

skin is versatile in use, which means that skin of young calves are useful for making furs and those of adults are used for making leather, and (iii) the unique translucent structure of camel hides makes them specially useful for making the articles such as lampshades, toys, drum leather, containers of various types.

SKIN STRUCTURE AND CELLS

Anatomical studies of camelid skin are few in number. This information can be useful because the skin of camelids is unique among domestic animals.

The epidermis of camelid usually consists of following layers.

1. Stratum corneum (horny layer) represents $\frac{1}{2}$ – $\frac{3}{4}$ of the total epidermal thickness. This layer consists of fully keratinized cells pushed up from basal layers.
2. Stratum lucidum is occasionally seen in sparsely haired skin as a dense eosinophilic layer beneath the stratum corneum.
3. Stratum granulosum (granular layer) is a single layer of cells in some areas and discontinuous in others. The nuclei are pycnotic, and most of the cytoplasm has been replaced with keratin.
4. Stratum spinosum (prickle layer) is reduced but is composed of daughter cells of the basal layer and

is 1–3 cells thick. These cells are viable and nucleated and actively synthesize keratin.

5. Stratum germinativum is the deepest layer of the epidermis and consists of a single layer of cuboidal or columnar cells, most of which are keratinocytes with a few melano-cytes. Melanocytes contain melanin pigment in pseudopods distributed between epidermal cells of the skin and hair. Skin colour is determined by the number, size, arrangement, and dispersion of melanin granules.

The dermis (corium) is thick (up to 1 cm in the cervical region of a mature male camel) and consists of a

superficial layer composed of loose connective tissue interdigitating with undulations in the epidermis and the deep dermis, which is composed of dense fibrous tissue. The dermis contains hair follicles, blood and lymph vessels, nerves, and sebaceous and sweat glands. The mid-dermis is characterized by a proliferation of blood vessels, in contrast to that in other domestic animals. Vessel walls are hyalinized. There is variation in the thickness of the epidermal layers in various areas of the body. Also, the degree of vascularity and mononuclear infiltration may vary. The hypodermis (subcutis) is composed of loose connective tissue, which attaches the skin to the underlying bones or muscles. Some sweat glands extend into the hypodermis.

CAMEL SKIN AS A RAW MATERIAL

The raw camel skins are obtained from few areas only in small number from 'fallen' stock, which have been allowed to linger on till they die of old age or disease or by accident, since in India camels are not slaughtered for meat or any other purpose. Flaying of camel hides is generally done manually by the people engaged in the business of collection of raw hides. The flaying of camel hide is not an easy job due to its large body size. Flay cuts and scores are, therefore, a common sight on flayed hides. The raw hides are mostly 'cured' (preserved) by air-drying or drying in direct sunlight. As the semi-dried hide possess many problems during later stages of processing. It is necessary that the people engaged in this business are made conversant with the method of curing by applying dry common salt.

SKIN PROCESSING

Camel calf skin

The skins of young camel calves can provide the best raw material for making good quality furs as it hold lustrous, fine and soft hair covering of excellent quality and silky feeling in nature. The hair is naturally coloured

in varying shades and tones ranging from light fawn to dark brown colour. The semi-dried camel calf skins have to pass through following chemical and mechanical treatments before they get actually converted into a fur. Adequate precautionary measures are to be taken to preserve the original characters of hair, viz. colour, luster, silkiness, and also to impart other properties of a fur such as flexibility, elasticity, softness, suppleness etc.

- I. Soaking raw camel calf skins in water is the first treatment. This rehydration process uses the common salt, some wetting agent and a bactericide invariably as additives to the soak-bath to dissolve the proteins such as albumins, globulins, mucins and mucoids etc. and to avoid bacterial attack.
- II. Soaking followed by removal of flesh, the adipose tissue which is not the part of the hide or the skin but a loose connective layer lying between the true skin (corium) and the actual body muscles of the camel. This is done by scrapping with blunt knives.
- III. Pickling: The skins are then treated with a mixture of acid and common salt to open up the texture of collagen fibres and to condition them for tanning which facilitates better penetration of tanning chemical towards the production of soft and flexible skins.
- IV. Tanning: The process which converts the raw skin into leather is called tanning. The formaldehyde tanning, followed by combination tannage of 'alum + chrome' gives best results in terms of strength, flexibility, pliability and softness of the end-product in comparison to either chrome tannage or alum tannage along.
- V. The tanned skins are the 'oiled' or 'fatliquored' by applying emulsion of oil or fat on the flesh side of the skin. The dried fat liquored skins are then conditioned in moist raw dust, followed by mechanical

operations such as dusting, staking and buffing etc.

VI. It is then finally washed and dried.

Adult camel skin

The hides of adult camels have excellent properties of leather making. The leather making process is comparatively more complex and lengthy than fur making. It involves a large number of operations, many labours and huge machinery. The additional operations in making leather are treatments of cured camel hides with lime and sodiumsulphide (liming process) for dehairing, removal of final traces of lime treatment with certain enzymes (bating process), dyeing, resin finishing and/or lacquer finishing. The resin finishing consists of treatments of applying staining coat, seasoning coat by using some resin bindery hot plating (ironing) and glaze finish. It is subjected to lacquer finishing also to add water-repellent properties to the finished leather.

FUTURE SCOPE AND POTENTIALITY

There is a great potentiality of utilization of camel skin as furs, keeping in view the excellent fur making properties of camel calf skin. The camel furs with their inherent natural colour, luster and softness are most suitable for wall hangings, fur garments and furniture coverings etc. The superior leather making quality of adult camel hides are useful for a wide range of articles, viz mojari, handbags, saddlery harness and several other items. Camel hides also serve as an important base material for many valuable beauty objects. The objects such as lamp shades, containers of various types, shapes and sizes, show pieces and similar other decorative articles are made of dried untanned camel hides and their surfaces are painted in gold. The golden paintings on these articles have fascinated the people world over. This craft has touched the heights of its perfection in Bikaner itself. The foreigners who

(continued on page 23)

production increases.

After successful implementation, the scheme will help in reducing the poverty in eastern region through increased agricultural production, productivity and diversification, which will increase employment and intensive utilization of land and water resources. After all irrigation will help in increasing the cropping intensity for the entire region with changes in cropping pattern. The farmers will be able to grow more remunerative crops including horticultural crops, cash crops, pulses and oilseeds. This will also meet the

objective of crop diversification. The scheme will also have direct positive benefits in improving the management and use of land and water resources and reduce pollution of the environment.

SUMMARY

After green revolution, the food-grain production increased tremendously through the development of irrigation facilities, introduction of high-yielding varieties and widespread use of fertilizers and pesticides. But over-exploitation of natural resources

including water, the production of foodgrains stagnated in northern and southern India. Now, about 8-10 million ha of saturated soils remain least exploited in the rainfed lowland areas of eastern India. Hence, there is a need to export this abundant untapped surface/underground water resources in eastern India. A centrally-sponsored scheme for the development of minor irrigation facilities in eastern India is being implemented by the Ministry of Agriculture since March 2002 through NABRAD with 30% subsidy from Government of India to the farmers.

Pattern of utilization...

(continued from page 5)

travelled from every corner of the world and visit the desert region are attracted and tempted to buy these articles even at exorbitant prices. In the olden days the camel hide containers had their use for transporting ghee, oils, scents, perfumes and other such commodities. With the rise of civilization and advancement of much better substitutes later on, it became antiquity and decorative and some useful items.

The raw camel hides to be used for making such articles are soaked in water without any bactericide being added to it and allow partial and controlled bacterial attack. As it starts smelling bad the bacterial action is partly controlled by adding ammonium chloride. In order to facilitate the easy removal of epidermis layer, a little quantity of sodium sulphide is also

added. The process takes 2-3 days, when the hides become plumpy and dehaired. Then flesh (adipose layer) is also scrapped.

This wet (semi-dry) and pliable hide is wrapped over the 'die' which is nothing but a model of clay having the shape and size of the final product. The hide is 'pasted' on joints with a paste in water of finely ground *methi* grains. After complete drying, the object is gently beaten so that clay is removed. This object is now ready for golden painting work over it. The craft of painting may take 2-3 months for completion depending upon the shape, design and size of the object. It is claimed that the painting, being of pure gold is unaffected by all weather conditions and does not get damaged, discoloured in many decades. The cost of small article varies from Rs 500 to Rs 3 000, whereas the cost of big item varies from Rs 10 000 to Rs 12 000.

SUMMARY

Camel furs with their inherent natural colour, luster and softness are most suitable for wall hangings, fur garments and furniture coverings etc. The superior leather making quality of adult camel hides are useful for a wide range of articles like mojari, handbags, saddlery harness etc. Camel hides also serve as an important base material for many valuable beauty objects, viz. lamp shades, containers of various types, show pieces and similar other decorative articles are made of dried untanned camel hides and their surfaces painted by gold with traditional usta arts. Looking to the wide utility and export potentiality of camel hide, it can be used for various purposes. The available trained persons engaged in rural cottage industry should be given proper incentives, trainings and facilities for promoting the utilization of camel skin.

- Produce more, market more, gain more
- Share your experience and views with *Indian Farming*
- It pays to advertise in *Indian Farming*
- Visit us at: <http://www.icar.org.in> for the SUMMARY of the articles appearing in *Indian Farming*