Wanke Sheep Skins: A Promising Opportunity for Value Addition to Ethiopian Leather Sector

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Abstract

Leather industry is one of the priority sectors in Ethiopia, which has been identified as potentially competitive in the global market. Ethiopian tanners face a shortage of raw material input for production of leather. About fourteen sheep breeds are recognized in Ethiopia. Among the available resources, Wanke sheep skins, indigenous to lowland of Ogaden area of Somali Region take prime position based on their availability. Leathers made out of Wanke skins usually have low selections compared to Abyssinian sheep skins and are utilized for making mainly lining leather. In this work, an effort has been made to develop a process technology for making high value leather from Wanke sheep skin.

Keywords: Wanke skins, Ethiopian leather sector, chrome tanning, improved post tanning

1. Introduction

Ethiopia is one of the countries in the world who posses largest livestock population. Ethiopia stands eighth for cattle, twelfth for sheep and eighth for goat livestock populations.[1] 53.4 million cattle, 25.5 million sheep and 22.78 million goat livestock population are found in Ethiopia, which is the share of Ethiopia is 2.5% of the world livestock population.[2] The Blackhead Somali is indigenous to the Ogaden area of the Somali Region.[3] The Blackhead Somali is distinguished by the black color of the head. The body is predominantly white but other colors may be observed. The hair is short, stiff and shiny. Both rams and ewes are hornless, though males can sometimes have rudimentary horns. The forehead is convex and the nose tends to be of the Roman type. The ears are short and pointed with an outward-forward inclination. Most animals have a well-developed dewlap which sometimes extends from the chin to the chest with considerable fat deposits. The tail is a fat rump type with a very distinct fat depot having a thin tip sticking straight backward and sometimes hanging down.[4] Ethiopian tanners could not produce high value leather from Black Head "Wanke" sheep skins owing to high natural fat deposition, very thin substance, low strength, surface has too many defects like scratches and rib marks. Due to this, leather made out of Black head usually has low selection result compared to high land sheep skins. Usually 'Wanke' skins are used for making lining leather due to their poor quality. The main objective of this study is to understand histological, chemical and physical

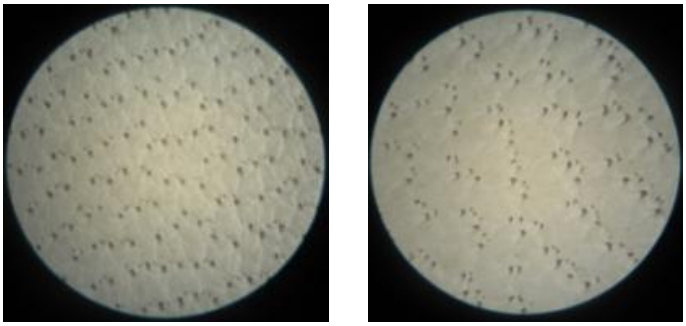
strength characteristics of Black Head "Wanke" sheep skin and to devise a strategy for making high value leather from Black Head "Wanke" sheep skin and to characterize the final product made.

2. Materials and Methods

Dry salted sheep skin of Abyssinia and Wanke sheep skins were used for the study. Leather processing chemicals used were of commercial grade. The grain surface pattern of Wanke and Abyssinia sheep skin at crust stage were studied using Stereo Microscope. Histological features of Wanke sheep skin and Abyssinian sheep skin have been analysed. After understanding the problem of Wanke sheep skins, a method was devised to address the problem, and a number of trials were conducted to standardize the process for making high quality leather from Wanke sheep skins. The crust leathers were tested for physical strength properties such as tensile strength,[5] elongation at break[5] and tear strength[6] using standard procedures. Sampling and conditioning were done according to the standard procedure.[7] The softness properties of both Wanke and Abyssinan skins were also measured using standard procedure.[8] Organoleptic properties such as softness, fullness, roundness, smoothness of grain, uniformity of color and overall appearance of the crust leather were evaluated in values ranging from 1-10 where higher value represent better property.

3. Result and Discussion

Samples from butt region of crust leather were examined using Stereo Microscope. The grain surface pattern of Wanke and Abyssinian sheep skin is shown in Figure 1. The presences of coarse and fine hairs are seen from the surface morphology figures of Wanke and Abyssinia.



Wanke **Abyssinia**

Fig. 1 Grain surface pattern of Wanke and Abyssinia sheep skin at crust stage

Cross section of raw Wanke sheep skin and Abyssinian sheep skin from butt region after main soaking, were observed under microscope. Figure 2 show images of the cross sections after main soaking stage. The insertion angle of hair follicles seems to be slightly higher in Wanke sheep skin than Abyssinian.

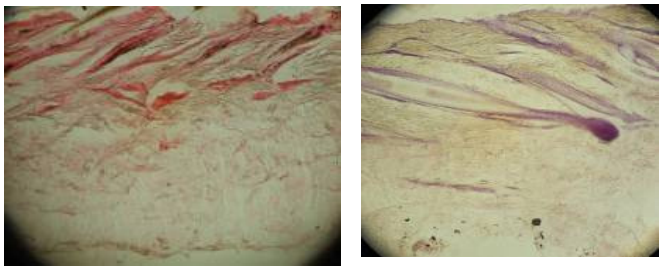


Fig. 2 Cross section of Wanke and Abyssinia after soaking left: Abyssinia, right: Wanke

Owing to the high fat content of Wanke skins extensive degreasing was carried out followed by chrome tanning and improved post tanning. The resultant leather with improved fullness and softness was suitable for garment leather. Evaluation of the organoleptic properties such as softness, fullness, roundness, smoothness of the grain and general appearance of crust leathers for full chrome leather were carried out and the results of the evaluation are presented in Table 1. It could be observed from the table that Abyssinian and Wanke sheep skin leathers exhibited similar bulk properties.

Table 1 Organoleptic properties of the leathers made from optimized trial

Parameters	Full chrome	
	Wanke	Abyssinia
Softness	9	9
Fullness	9	8
Roundness	8	8
Smoothness of grain	8	9
Uniformity of color	8	8
Overall appearance	9	9

4. Conclusions

Ethiopia has ample resource of Wanke sheep especially in the lowland area of the country; however the skin is not adequately utilized. Leather making from Wanke sheep skin was limited to low value leathers such as used for lining. Present study has tried to understand the problem and the possible solution scientifically. From the result of the research, it can be concluded that leathers made from Wanke skins through full chrome process exhibited good softness, fullness, fine grain with improved strength properties suitable for both light upper and garment leather.

5. Acknowledgements

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