Prominent Physical Characteristics of ETHIOPIAN HIGHLAND SHEEP LEATHER

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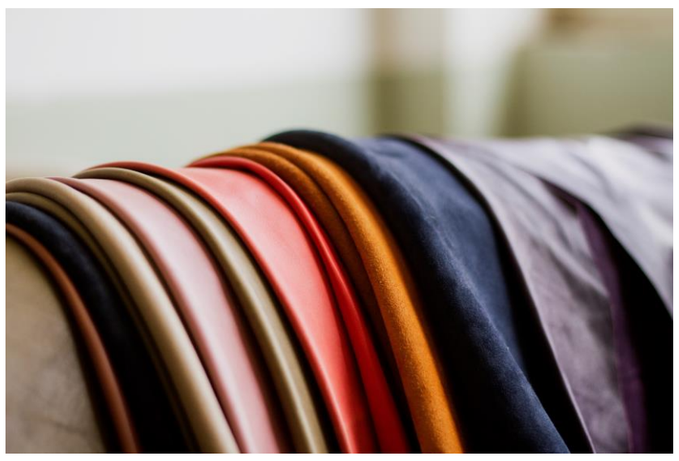
Background



Why is Ethiopian highland sheep leather durable even thin?

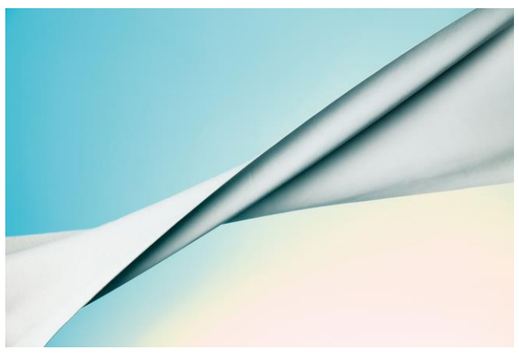
Ethiopian sheep leather can be as thin as 0.35 mm and still be smooth and strong, and it is highly reputed in the international market as a material for sports gloves and fashion gloves. However, the reason why it remains strong even when thin has never been scientifically proven.

"Find out scientifically the reason, and use it to promote the export of Ethiopian highland sheep leather!"

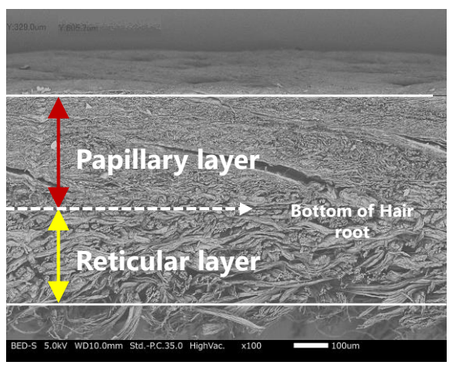
Methodology

Comparison of three regions

The physicochemical property of Ethiopian highland sheep leather was compared with other sheep leathers. Raw hides from different origins (**Ethiopia, Indonesia, and South Africa**) were tanned in the same methods.



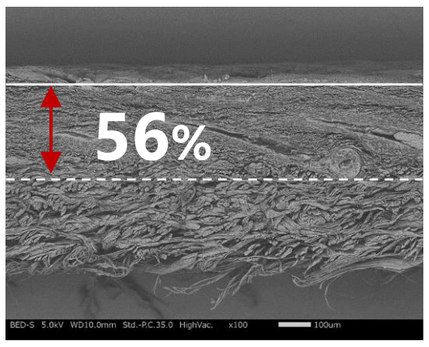
Physical Test:
Density,
Specific gravity,
Tensile strength,
Elongation,
Tear strength
Softness test

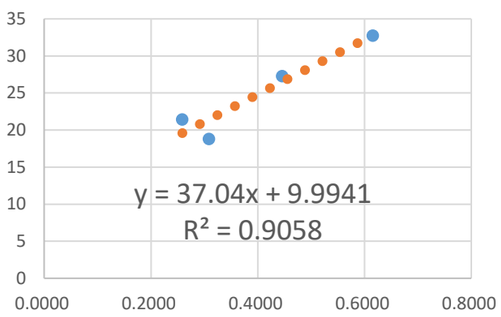


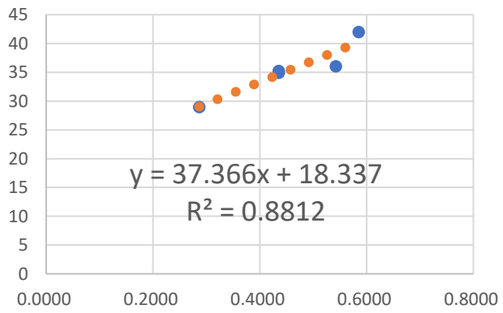
Electron Microscope Observation:
Shave to 0.7 and 0.4 mm and examine the percentage of each papillary layer

Result and Discussion

Ethiopia





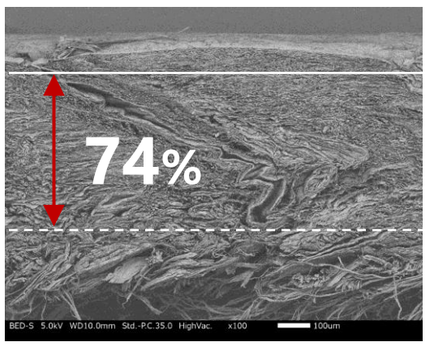


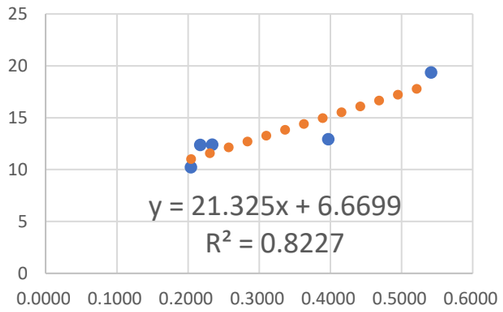
Ratio of papillary layer

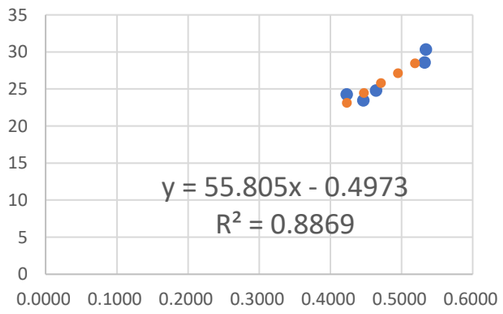
Ave. 60% at 0.4mm

Vertical axis=Tensile strength(MPa)
Horizontal axis=Raito of papillary layer

South Africa





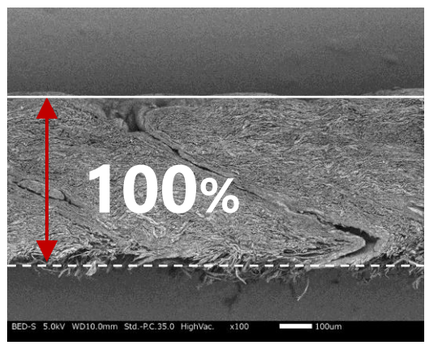


Ratio of papillary layer

Ave. 68% at 0.4mm

Vertical axis=Tensile strength(MPa)
Horizontal axis=Raito of papillary layer

Indonesia



Ratio of papillary layer

Ave. 100% at 0.4mm

No data was available because it was impossible to measure at 0.4mm.

Conclusion

The thinness of the papillary layer is the reason why Ethiopian highland sheep leather can be made thinner and still maintain its durability.

	Ethiopia		Indonesia		South Africa	
	0.4mm	0.7mm	0.4mm	0.7mm	0.4mm	0.7mm
Tensile strength(MPa)	28	35	11	9	13	26
Tear strength(N/mm)	32	38	7	10	30	41
Elongation (%)	72	76	48	58	65	74
Specific gravity(mg/cm^2)	29	44	26	38	26	46
Density (g/cm^3)	0.62	0.59	0.50	0.49	0.50	0.54

For the 0.4 mm leather from Ethiopia, the correlation between the ratio of the reticular layer and the tensile strength was calculated. There is correlation between the reticular layer and the tensile strength, extremely strong correlation with R^2 = 0.91. That is, the tensile strength tended to become stronger as the ratio of the reticular layer became larger. Other cases were similar.

Looking forward

Promote the quality and uniqueness of Ethiopian sheep leather with the results.

Ethiopian highland sheep leather is currently promoted for export in EU and the US markets under the brand of **"Ethiopian Highland Leather."** The results of this research will be utilized as scientific proof of its quality.

ETHIOPIAN HIGHLAND LEATHER™

"Ethiopian Highland Leather" is a brand of Ethiopian sheep leather owned by Ethiopian Leather Industries Association (ELIA). Only leather produced by tanners that meet the quality standards set by Ethiopian Leather Industry Development Institute and leather products made from the leather can use this logo.

Acknowledgement

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MINISTRY OF TRADE AND INDUSTRY
JICA

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