

OPTIMIZATION OF WATER USE IN THE DEHAIRING STAGE IN A TANNING PROCESS THAT ALLOWS THE BEST QUALITY OF THE FINISHED LEATHER AND THE LEAST ENVIRONMENTAL IMPACT

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INTRODUCTION

In order to be able to evaluate the environmental impact and the quality in the dehairing process, it is necessary to establish quality control measures that allow to minimize the variations that may affect the final quality of the products and to reach efficient water use.

There is a Cleaner Production (CP) option that consists of the re-use of the dehairing liquors that has been worked at the pilot level in some tanneries of Villapinzón. In this option the water has been recycled without any prior treatment for up to a period of six months, but the tanneries that produce export type leather refute this technique as they assure the quality of the leather is ruined at the end of the process.

OBJECTIVE

To optimize water use at the dehairing stage in a tanning process allowing the best quality of the finished leather of bovine origin and the least environmental impact.

BACKGROUND

The tanners of Villapinzón in the area of Bogotá perform leather quality tests only after tanning. In the intermediary processes no type of numeric measurement of the quality of the process is undertaken.

In the dehairing stage the only thing taken into consideration is that the animal hide be completely free of hair and of its roots. This gives rise to not being certain of the stage where damage to the animal hide was generated when a batch of leather of poor quality is obtained.

MATERIAL & METHODS

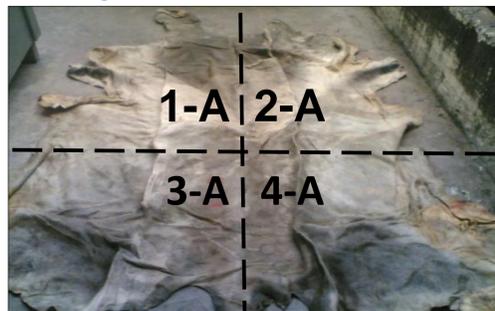
With the aim of establishing the relationship between the quality variables of the dehairing process and the effect of recycling, the experience of expert tanners in the Villapinzón zone is verified and quantified in order to determine the most relevant quality control parameters in the dehairing process to obtain export type leather.

Salted animal skins are worked with, keeping in mind the following considerations:

1. The dehairing processes to be compared are: Mixed dehairing (A mix between chemical dehairing with sulfide and the enzymatic agent) and Chemical dehairing without sulfide.

2. Two different animal skins divided in four parts are dehaired (Figure 1), with the aim of reducing interferences and to be able to compare the effect of the dehairing processes to be evaluated. The skins have different properties depending on the race, color, age and breeding conditions, which allow distinct manners of absorption of the chemicals used in the dehairing process. ITALCUR. 2010.

Figure 1. Division of a raw hide



3. Before carrying out the dehairing, the salted skins should be washed very well in order to remove the salt and blood, earth and dung residues, and should be passed through a soaking process the objective of which is to return lost moisture to the skin, through the addition of chemical products like tensoactive agents.

RESULTS

While dehairing without sulphur allows maximum one recycling without damaging the hide, mixed dehairing does not show deterioration of the quality of the animal hide dehaired throughout the recyclings. In this study only three recyclings were performed, but according to the results obtained in the mixed dehairing a greater number of possible recyclings could be performed with this dehairing process in further research Table1.

It is important to underline that the results obtained in the dehairing process depend 100% on the previous stages, washing and soaking.

Proposed treatment system to recycle water

Dehairing No-sulfide without a treatment to remove the hair one hour before the end of the application of the dosage of reagents at the liming stage.*

Mixed dehairing should have hair removal by a sieving operation, oxidation of sulfides and coagulation and sedimentation for removing pollutants in the water due to the addition of chemicals and the disposal of hair, meat and fat.

* PROCUR S.A

Table 1. Effect of water recycling in the quality control parameters

Type of Dehairing	Number of hair	Division of the epidermis	Size of the skin	Number wrinkles closed	Uniformity in the internal color
No Sulfide	Excellent 0%	Excellent 100%	Excellent 150%	Excellent 0	Excellent 100%
No Sulfide R1	Good 3%	Good 97%	Good 146%	Excellent 0	Good 97%
No Sulfide R2	Very Irregular >10%	Very Irregular <69%	Good 147%	Very Irregular >4	Very Irregular <69%
No Sulfide R3	Very Irregular >10%	Very Irregular <69%	Good 149%	Very Irregular >4	Very Irregular <69%
Mixed	Good 2%	Good 98%	Good 149%	Excellent 0	Good 98%
Mixed R1	Good 2%	Good 99%	Good 149%	Excellent 0	Good 98%
Mixed R2	Good 1%	Excellent 100%	Good 149%	Excellent 0	Good 99%
Mixed R3	Excellent 0%	Excellent 100%	Good 150%	Excellent 0	Excellent 100%

R, indicates the number of recycling that leads, for example R1 is one

CONCLUSIONS

Dehairing No-sulfide allows maximum one recycling without damaging animal hide. Mixed dehairing does not show deterioration of the quality of the animal hide dehaired throughout the three recyclings. There is even a tendency towards improvement. The remanence of the chemicals in the water does not affect the quality. According to the results in the mixed dehairing, a greater number of recyclings can be performed. It is advisable to study re-using the baths with just a sieving treatment, and to establish the maximum number of recycling baths in an industrial drum that produces a greater friction effect, helping to remove the hair of the skins.

REFERENCES

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