

## GOAT AND SHEEP SKIN PRESERVATIVES - I

Nishat Rizvi and Abdul Wadood Qureshi

*Leather Research Centre, PCSIR, Karachi*

(Received October 10, 1988; revised March 16, 1989)

Five different chemicals, were used as each, as well as in mixtures of varying combinations for testing the relative efficacies as preservative on twenty different sheep and goat skin pieces. Each sample of skin was taken from 24 hours' soaked, well washed, free of salt piece of salted stock. This was incubated at 37° for a week, to activate the microbial flora, checking the effectivity of the applied preservatives. Results were calculated on the basis of % weight loss of the skin.

*Key words:* Skin preservatives, Raw skin preservative, Curing agent.

### INTRODUCTION

The raw hide and skin being an ideal environmental for Microbial growth, the danger of putrefaction during drying can be greatly reduced by salting. Although plentiful and cheap, may contain traces of metals or other impurities, which can impart stains on the hides and skins. Sometimes halophilic microbes causing defects. Keeping in view the defects associated with preservation by salting, work on other preservatives is undertaken in many parts of the world. This includes both long term and short term preservation techniques.

Any deterioration of skin before or during curing is of irreversible nature, poorly cured skin will not produce the highest quality leather, regardless of the tanners' care or skill [1].

A system for short term preservation of hides that might be used in slaughter houses to produce acceptable side upper leather has been proposed [2]. The method preserves hides for about 7 days, and involves treatment with sodium sulfite and acetic acid.

A 20% soda ash solution used for preserving raw cattle hide has been reported [3]. There was neither slippage nor bad odor during the storage period.

Pig skin samples treated with a 20% float of 1% sodium bisulfite and 1% acetic acid could be preserved for 28 days at 30° based on control of microbial numbers and protease activity [4].

No such work has been reported in earlier in Pakistan.

### MATERIALS AND METHODS

For testing the effectivity of various preservatives, two different skin samples of sheep and goat were taken. The chemicals used as preservatives were:-

(1) Boric acid 0.5% wt. basis, (2) Na-benzoate 0.5% wt. basis, (3) Neomycin 0.1% wt. basis, (4) Common salt 25% wt. basis.

All these chemicals were used separately or as mixtures. Total twenty skin pieces were tested for preservation, ten pieces each of sheep and goat. The effectivity was calculated on the basis of present weight loss of skin i.e. of hide substance, after incubation at 37° for one week, then at room temp. Afterwards this was same for varying lengths of time. The purpose of the incubation of the experimental skin pieces in an incubator at 37° was to activate the microbial flora, then checking the effectivity of the applied preservatives.

Table 1. Chemicals and its percentages of preservatives applied on sheep and goat skins.

S. No.	Preservative offered on the wt. of skin	Offered (%)	Code No (sheep)	Code No (goat)
1.	Common salt	25.0	S <sub>1</sub>	G <sub>1</sub>
2.	Boric acid	0.5	S <sub>2</sub>	G <sub>2</sub>
3.	Sodium benzoate	0.5	S <sub>3</sub>	G <sub>3</sub>
4.	Neomycin	0.1	S <sub>4</sub>	G <sub>4</sub>
5.	Boric acid and common salt	25.5	S <sub>5</sub>	G <sub>5</sub>
6.	Sodium benzoate and common salt	25.5	S <sub>6</sub>	G <sub>6</sub>
7.	Neomycin and common salt	25.1	S <sub>7</sub>	G <sub>7</sub>
8.	Boric acid and sodium benzoate	1.0	S <sub>3</sub>	G <sub>8</sub>
9.	Sodium benzoate and neomycin	0.6	S <sub>9</sub>	G <sub>9</sub>
10.	Boric acid and neomycin	0.6	S <sub>10</sub>	G <sub>10</sub>

Table 2. Comparative analysis on the basis of hide substance wt. loss percentage

Sheep skin sample No.	Original wt. of skin (g)	6/12 (%)	7/12 (%)	10/12 (%)	15/12 (%)	18/12 (%)	22/12 (%)	26/12 (%)	31/12 (%)
-----------------------	--------------------------	----------	----------	-----------	-----------	-----------	-----------	-----------	-----------

## (a) Results obtained during December

S-1	17	14.41	30.88	49.41	54.6	54.6	57.0	57.0	57.0
S-2	20	20.5	25.5	40.0	45.5	50.5	50.5	50.5	53.0
S-3	18	50.5	50.5	55.5	61.6	61.6	61.6	61.6	61.6
S-4	20	55.1	60.1	70.0	70.0	70.0	70.0	70.0	70.0
S-5	14	7.35	11.47	14.3	29.0	32.6	36.2	36.2	36.2
S-6	18	2.20	2.27	16.66	58.3	58.3	58.3	61.1	63.8
S-7	15	17.8	58.43	64.0	64.6	64.6	64.6	64.6	68.0
S-8	18	17.8	21.2	22.2	22.7	22.7	22.7	22.7	22.5
S-9	19	26.9	48.0	52.6	58.4	58.4	58.4	58.4	58.4
S-10	16	31.87	44.35	50.0	50.0	53.1	56.25	56.2	56.2

## (b) Results obtained during January

	3/1 (%)	7/1 (%)	11/1 (%)	16/1 (%)	18/1 (%)	21/1 (%)	24/1 (%)
S-1	58.5	-	-	-	-	-	-
S-2	54.2	-	-	-	-	-	-
S-3	61.6	-	-	-	-	-	-
S-4	70.0	-	-	-	-	-	-
S-5	36.2	36.2	36.25	36.2	36.2	36.2	36.2
S-6	68.3	-	-	-	-	-	-
S-7	68.0	-	-	-	-	-	-
S-8	25.5	29.44	29.4	29.4	29.4	29.4	20.4
S-9	58.4	-	-	-	-	-	-
S-10	70.0	-	-	-	-	-	-

## (c) Results obtained during February and March

	1/2 (%)	7/2 (%)	25/2 (%)	15/3 (%)
S-5	36.2	36.2	36.2	36.2
S-8	29.4	29.4	29.4	29.4

The different chemicals were applied on the basis of the weight of skin pieces (as shown in the Tables. After incubation the loss in weight was calculated. (The loss of moisture was not calculated as it was common to all the experimental pieces). Temperature and atmospheric conditions were also the same for all the skin pieces throughout the experiment.

## RESULTS AND DISCUSSIONS

In some of the experimental pieces, the weight loss was found more than 50% after 24 hours of preservatives application. Results were very promising in two of the sheep skin pieces S5 and S8 where weight loss was 36.2% and 29.4% even after 102 days of application. In one case the preservative mixture used was boric acid 0.5% + salt 25% (wt. basis). The most effective mixture was boric acid + sodium benzoate (each 0.5% weight basis). In this case the weight loss was the lowest i.e. 29.4%. In case of goat skin pieces and results of two samples were quite comparable with those of G<sub>1</sub> and G<sub>8</sub>. In case of G<sub>1</sub>, 25% of common salt was applied as preservative, while in case of G<sub>8</sub>, preservative applied was a combination of 0.5% sodium benzoate + 0.5% boric acid.

In case of G5 and G4 results obtained were promising, where a combination of 0.5% boric acid + 25% common salt and 0.1% neomycin were applied as preservatives respectively.

## CONCLUSION

It is inferred that preservative combination 0.5% sodium benzoate + 0.5% boric acid can be safely utilised to replace common salt. In case of common salt application the % used was quite high i.e. 25% which results in pollution hazard in tannery effluent treatment, while in case of preservative combination, the applied % is quite low i.e. a total of 1% (0.5% + 0.5%).

Table 3. Comparative analysis on the basis of Wt. loss percentage of hide substance (Results obtained during December and January)

Goat skin sample No.	Original wt. of skin (g)	6/12 (%)	7/12 (%)	10/12 (%)	15/12 (%)	18/12 (%)	22/12 (%)	26/12 (%)	31/12 (%)	3/1 (%)
G-1	17	1.5	1.57	5.88	48.2	54.1	54.1	54.1	54.1	54.1
G-2	20	35.5	45.5	55	55.5	55.5	55.5	55.5	58.0	61.75
G-3	25	44.5	52.5	56.0	56.4	56.4	56.4	56.4	60.4	60.4
G-4	15	46.8	46.8	53.3	56.6	56.6	56.6	56.6	56.6	56.6
G-5	28	4	7.68	35.7	57.6	57.6	57.6	57.6	57.6	57.6
G-6	20	5.5	10.5	20	60.5	63.0	65.5	65.5	65.5	65.5
G-7	15	1.5	1.5	6.6	58.0	58.0	58.0	58.0	64.4	64.4
G-8	15	44.3	47.6	53.3	53.3	54.0	54.0	54.0	54.0	54.0
G-9	15	54.0	54.0	54.0	56.5	56.6	56.6	56.6	60.0	60.0
G-10	20	35.6	50.0	50.0	53.0	55.5	55.5	55.5	59.25	63.0

## REFERENCES

1. G.D. McLaughlin and E.R. Theis, *The Chemistry of Leather Manufacture*, (1945), pp. 141.
2. W.T. Hopkins, D.G. Bailey and T.W. Harlan, Preservation of Hides with Sulfite IV A study of Methods of Applications, TALCA, 6-18, 78 (1983).
3. B.R. Rao and R.L. Henrickson, Short-Term Preservation of Cattlehide, TALCA, 48-53, 78 (1983).
4. W.T. Hopkins, E. diefendorf, D.G. Bailay and S.N. Fearheller, TALCA, 120-126, 78 (1983).