

## MODIFIED PROCESSING FOR CONCEALING COCKLE DEFECT IN SHEEPSKINS

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### Introduction

The cause of cockle defect in domestic sheepskins has been demonstrated (1, 2, 3). It is caused by keds (*Melophagus ovinus*), which are blood-sucking parasites that live in the wool of sheep. The defect becomes apparent only after the wool is removed during processing. It appears as a scattering of dense nodules in the grain layer of sheepskin in a characteristic pattern of distribution (1). Affected sheepskin leathers can be seriously downgraded, depending on the severity of the defect. In addition, cockle reduces the physical strength of both grain and suede leathers and increases their stiffness (4).

Our earlier studies entailed special processing to expose the cockle nodules for easier counting. When subjected to certain process modifications, however, which were suggested by a cooperating tanner, sheepskins resulted that had lower apparent cockle counts and improved appearance (2). This paper describes certain process modifications which were found effective in attenuating some of the grosser defects in cockled sheepskins.

### Experimental

Six lots of salted woolskins were obtained from six different carload shipments from Midwest packers, and six woolskins were selected at random from each lot, totalling 36 pelts, for a laboratory study of defects (5). These pelts were cut in half along the backbone and were dewooled in the usual manner. The skins were divided into three batches for processing under somewhat varying conditions. The first treatment (I) was performed for the purpose of maximizing the exposure of cockle; it eliminated the reliming step and minimized the bating. The second treatment (II) included the regular reliming and normal bating. The third treatment (III) involved prolonged reliming and an intensified bating.

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#### DEWOOLING

Before being processed, the pelts were soaked overnight in cold water, drained, and painted on the flesh side with: (Formulation for six pelts)

Hydrated lime—5 lb  
Sodium sulfide—1.5 lb  
Water —2.5 qt

The skins were stacked overnight, dewooled in the morning, and thoroughly washed.

#### RELIMING

Treatment I skins were not relimed. Treatment II and III skins were relimed as follows:

Hydrated lime—1.25 percent (The percentages of chemicals and water used in the reliming, bating, and pickling steps were based on the drained skin weights)  
Water —110 percent float

The skins were rolled in a drum for 5 min, and the following was added:

Sodium sulfide—2 percent (dissolved in hot water,  
15 percent float)  
Total float —125 percent

The skins were rolled another 30 min. The skins from Treatment II remained in the relime liquor overnight, and the skins from Treatment III remained in the relime liquor a further 24 hr. After the reliming treatment, the skins were washed for 30 min at 75°F and for 30 min at 90°F. The wash waters were checked with lead acetate paper till free of sulfides. The skins were then drained.

#### BATING

Bating was carried out as follows:

Ammonium sulfate—4 percent  
Oropon N\* —0.2 percent — treatment I  
—0.3 percent — treatment II  
—0.6 percent — treatment III  
Water (100°F) —133 percent float  
Final pH —8.5

The skins were rolled for two 30-min periods, with 30 min resting between. The skins were then washed at 80°F for 15 min, and at 70°F for 30 min, and drained.

\*Reference to brand or firm name does not constitute endorsement by the U.S. Department of Agriculture over others of a similar nature not mentioned.

## PICKLING

Pickling was carried out with:

Sodium chloride	—16 percent
Sulfuric acid	—2.5 percent
Cold water	—125 percent float
Final pH	—1.5

The skins were rolled for two 30-min periods, with 30 min resting between, and remained overnight in the liquor. The skins were then drained and examined for cockle by transmitted light by holding them over a specially constructed light box with a glass cover (1).

### Results and Discussion

Treatment I skins showed large numbers of well-developed cockle widespread over entire sides, and many prominent fat wrinkles. Treatment II skins were smooth to feel, light in color, the fat wrinkles were considerably diminished, and the apparent cockle count was reduced about one-third and considerably masked. Treatment III skins were smooth to feel, lighter in color, fat wrinkles were absent, and the apparent cockle count was reduced about two-thirds and almost completely masked.

The effects of Treatments I and III are illustrated in Figure 1, which shows the left and right sides of the same sheepskin. The left side (A, C) was processed by Treatment I and the right side (B, D) by Treatment III. The upper photographs (A, B) show the appearance of the sides by reflected light and the lower photographs (C, D) the appearance of the same sides by transmitted light. Rows of well-developed cockle nodules on the left side processed by Treatment I are clearly shown by the reflected light (A). Photographs B and D illustrate how much Treatment III masked the cockle nodules and greatly reduced the apparent cockle count. The left side count was 1082 cockle nodules, and the right side 593 nodules. The apparent reduction in cockle count as a result of Treatment III was nearly 50 percent.

When a group of these skins was processed into suede leather, the contrast between the different treatments was striking. The heavily infested skins showed dark cockle nodules in the typical patterns of distribution, which downgraded these leathers severely. The skins processed according to Treatment III were clean and eminently suitable for use as garment leather. The economic advantages of concealing cockle in infested sheepskins are readily apparent.

### Summary and Conclusion

Process modifications made during sheepskin cockle studies showed that prolonged reliming and intensified bating can conceal or diminish the expression of cockle in infested sheepskins, with considerable improvement in their

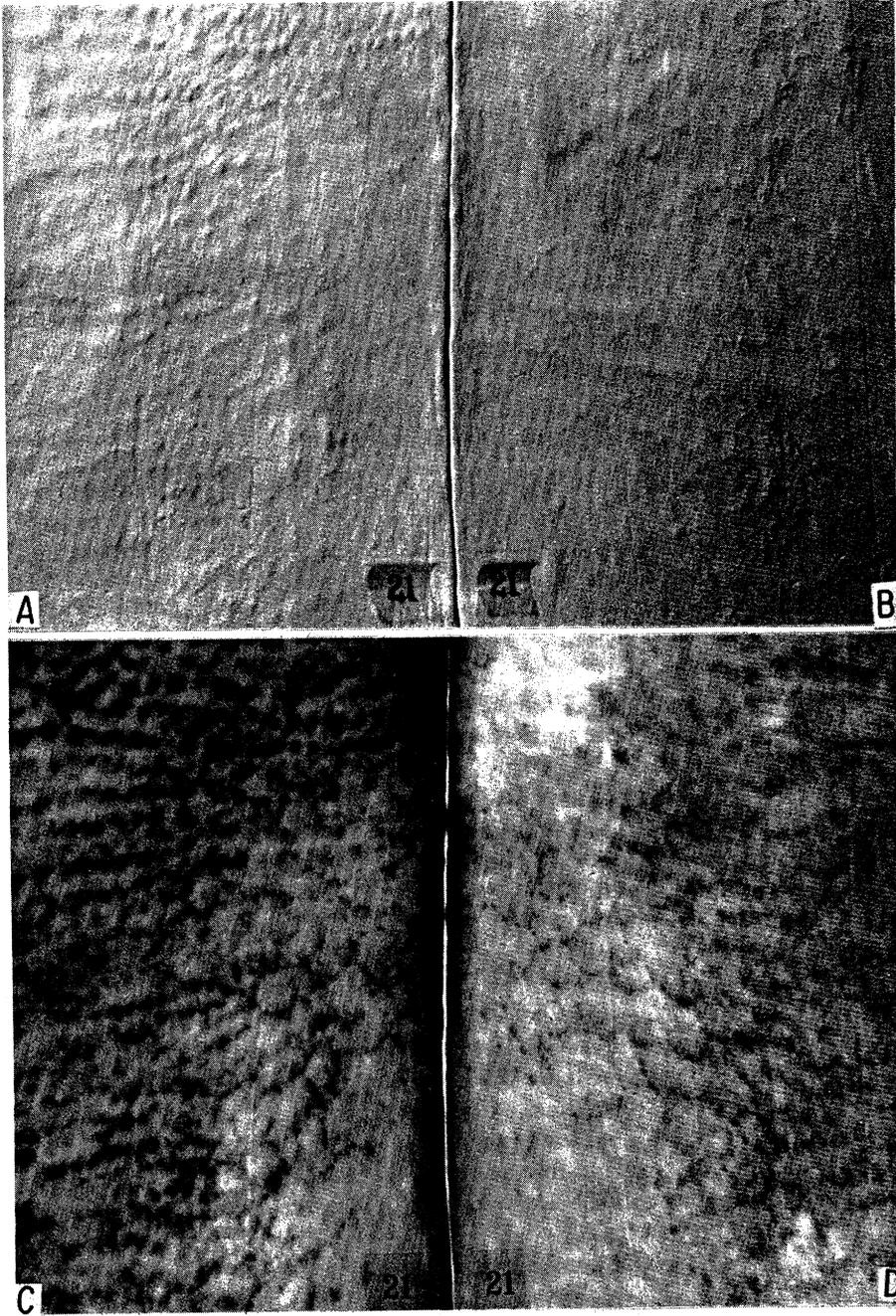


FIGURE 1.—Sheepskin infested with cockle. A, B photographed by reflected light; C, D by transmitted light. A, C Treatment I; B, D Treatment III (see text).

appearance. The processing modifications suggested in this article can lead to better use of sheepskins in higher grade leather products and should increase their economic value to sheepskin processors and retailers.

### Acknowledgments

The authors thank the officials of Morris Fishman & Sons, Inc., Philadelphia, PA, for arrangements for procuring the sheepskins used in these studies, and Mr. Richard N. Jones, National Tanning and Trading Corp., Peabody, MA, for advice in processing methods.

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