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Research Article

Quality Evaluation of Hides and Skins Based on Defects Grading

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Abstract

For study purpose 75 pieces of green hides and skins (25 from each of sheep, goat skins and cattle hides) were taken and graded depending on the defects. The results showed that 48% of sheep Skins were fourth-grade (*Escarto* or rejected) and the first-grade skins were 40%. Also, the study revealed that 44% of goats' skins were fourth grade. Whereas 84% of cattle hides were fourth grade. The study also found that the most and great important reason which reducing from cattle hide's quality was skinning defects, which accounted for 80% of the reasons for low quality. It formed for about 86.96% of the total recorded defects. In sheep skins, it was found that defects resulting from poor skinning and mechanical defects were among the most common defects, as they negatively affected the graduation of 20% from raw skins. Its percentage was 33.33% of the total observed defects in sheep skins. As for goats' skins, the study found that the natural causes that caused by skin diseases and parasites were among the most common reasons that reduced the quality of the skins. As it led to a decrease in the quality of 40% of raw goat's skins and made up 52.63% of the total observed defects in goat skins. Followed by, the defects resulting from bad skinning, which constituted about 32% of total defects in raw goat skins, and it was led to decreasing the quality of 24% of the skins.

Keywords: *Hides; Skins; Defects Grading*

Introduction

The contribution of hides and skins in national economy of the Sudan is significant (18.7 million SDG) from exporting of about 49 million pieces of sheep skins, 47 million of goats skins, 23 million pieces of cattle hides, 2 million pieces of snakes skins and 500,640 pieces of desert lizard skins. In proportion to the livestock which is estimated at 103 million of cattle, sheep, goats and camels, it could be seen that, hides and skins form a huge natural resources, for various reasons the full potential of such material is not realized [1-3].

Leathers were known since the beginning of life. Man produced leathers from dead animals or those hunted for different life needs like clothes, covering and carpets. Fields and uses of leather increased and developed year by year up today. The continuous needs for using leather led to synthetic leather as the substitute for natural leather. In spite of the existence of these substitutes and a huge development concerning their manufacturing, still demands on natural leathers are increasing rapidly and continuously due to the properties or characteristics of natural leathers such as healthful, stoutness and strength in addition to their ability to satisfy requirements of fashion and social status.

Hides and skins of the principal species of domesticated animals like cattle, goats and sheep are the main sources of raw material for conversion into various types of leather. The above types of hides and skins have become a necessity to procure, preserve and utilize them properly for social and economic angels. There are also other sources for hides and skins such as camels and also that of aquatic animals like lizards (warals) and crocodiles are used. Other exotic types of skins are that of snakes and wild animals like tigers are used mainly for making domestic shoes [4].

Hides and skins obtained from slaughter houses are estimated at 21.5 % of cattle hides, 17.1% of sheep skins and8% of goat skins. These rates are estimated by Ebrahiem., *et al*. [5] according to the proportion of animal numbers slaughtered in the acceptable slaughter houses with an annual rate of meat consumption. It could be seen that large numbers of hides and skins are never recovered and may be allowed to be wasted chiefly as a result of many defects. Wastage percentage of hides and skins are estimated at5% from cow hides, 10% of sheep and goat skins and8% of camel hides. In addition to a huge number of hides and skins wasted as a result of inadequate storing, transporting and handling [6,7].

The common uses of leather in Sudan are identified according to the degree of social development. Traditional uses are scattered in rural areas of the Sudan especially among nomadic tribes used as water and cereal containers, saddles etc. Recent uses include shoes, bags, clothes carpets etc. In addition to other uses such as gelatin and manufacturing of animals feeding [6]. The overall uses of leather are the value of hides and skins as national economical commodity. Also it is accepted as a fact that hides and skins are not primary animal commodities, but are secondary products of meat industry. They are nonetheless, a major natural resource of particular importance to the Sudan.

It can really be seen that leathers, renewable huge natural resources, constitute an enormous potential. At the same time, leathers are recognized by many defects, both ante-mortem and post-mortem, to which they are subjected.

Objective of the Study

The overall objective of this study is to draw attention to the defects of hides and skins which detract from the potential value of these natural resources and to offer advice and suggestion for producing better hides and skins through controlling such defects.

Materials and Methods

Study area

North Kordofan State- Sheikan locality lays between latitudes 27˚13¯- 32˚24¯ E and longitudes 11˚20¯ -16˚36¯ N in area of 25 million hectares. Out of this area, 14.5 million hectares are rangelands. The state is considered among the leading regions of Sudan in terms of

animal and range resources, where more than 60 millions heads of sheep, goat, camel and cattle are raised. Animal production in the state is mainly practiced under traditional extensive systems, depending on natural rangelands [8]. The average monthly temperature according to Nimer (2000) was 34.60°C, and the coldest months were December and January with mean temperatures of 14.10°C and 13.50°C, respectively. The hottest months were April, May and June with an average mean temperature exceeding 40°C. The soil of the State lies within the sand dune area, these soils are inherently poor, but their high permeability and easy penetration of roots, compensate for their inherent poverty [8].

Experiment sampling method

75 pieces of dry-salted hides and skins were taken randomly (25 pieces from each of cattle hides, sheep and goat skins) from leather agencies in Sheikan Locality, North Kordofan State, Sudan. The taken hides and skins were graded according to the presence of defects in them depending on ESALIA [9] grading guidelines.

Grading method

First grade skin or hide must be, regular in shape, free from defects, free of blood and dung, and has no traces of bacterial infection. As for the skin of a second degree, there may be a knife cut that does not exceed two centimeters and be in the circumference area and the center of the skin is free from defects. And if a knife cut is found that is impermeable and does not exceed a centimeter in length in the mid-skin region or Butt area only, without the presence of other defects in the circumference of the skin, it is also classified as a second degree. More on the skin is regular in shape and free from traces of blood and dung and has no signs of putrefaction, which are known by smell and easy hair loss. As for the skin of a third degree, there are at most two knife's cuts, not exceeding two centimeters in the middle of the skin (Butt area), or the presence of one mark of the knife in the middle of the skin with slight traces of bacterial infection or the presence of signs of cauterization and decorations in the center of the skin with the presence of urine or dung on it. As for the skin of the fourth degree, or the *Escarto* or the rejected, it has all or some of these defects, with larger areas and greater degrees, and has clear bacterial rot with smell and hair loss, and it may also be irregular in shape [6,7].

Statistical analysis

Data were analyzed by descriptive statistics using the Statistical Package for Social Sciences (SPSS) program to obtain frequencies and percentages.

Results

Sorting and grading of raw hides and skins

Table 1 shows the results of sorting and grading of 25 randomly selected sheep skins. It turned out that 48% of them were reject (*Escarto*) or fourth grade skin. However, first grade skins account for 40% and are completely free from defects.

Grade	No	%
First	10	40
Second	3	12
Third	00	00
Fourth	12	48

Table 1: *Grading of raw sheep skins (25 pieces).*

From the fact of sorting and grading 25 pieces of goat skins, it was clarified that 44% of them were from the fourth grade (*Escarto* or rejected), and the proportion of the skins was equal in the first and second degrees (28%) for each. No skins were recorded in the third grade (Table 2).

Grade	No.	%
First	7	28
Second	7	28
Third	00	00
Fourth	11	44

Table 2: *Grading of raw goat skins (25 pieces).*

As for cattle hides that were randomly selected for grading, 84% of them were found to be fourth-grade (*Escarto* or rejected hides). Hides of the first and second grades recorded only 16%, while the third grade hides were not observed (Table 3).

Grade	No.	%
First	2	8
Second	2	8
Third	00	00
Fourth	21	84

Table 3: *Grading of raw cattle hides (25 pieces).*

Table 4 shows the screening and grading results for 75 cattle, sheep and goat skins combined. Accordingly, the highest percentages were for fourth-degree hides and skins (rejected or *Escarto*), which reaching 58.67% of total hides and skins number. As for the first class hides, they represented 25.33% of total hides and skins listed. The third degree hides and skins were not recorded.

Grade	No.	%
First	19	25.33
Second	12	16
Third	00	00
Fourth	44	58.67

Table 4: *Grading of 75 pieces of raw sheep, goat skins and cattle hides.*

Defects affecting the grading of hides and skins

When studying and recording defects that lead to poor quality of sheep skins, it was found that defects resulting from bad skinning and mechanical defects were among the most common defects, affecting negatively the grading of 20% of raw sheep skins. Its percentage was 33.33% from all recorded defects for sheep skins. Poor storage before transportation came in the second place as a reason for skins quality deterioration, which led to reducing the quality of 12% of raw hides and skins. Poor storage before transportation forms about 20% of total hides and skins recorded defects (Table 5).

In goat skins, the study found that the natural causes resulting from skin diseases and parasites were among the most common causes that reduce the quality of the skin. It reduced the quality of 40% of the raw goat skins, and it constituted 52.63% of total observed defects

Defects	No.	Grading on Defects %	Total Defects No.	Defect% from Total Defects No.
Skinning	5	20	15	33.33
Natural (Diseases+ Parasites)	2	8	15	13.33
Mechanical (Branding+Marks)	5	20	15	33.33
Storing	3	12	15	20

Table 5: *Defects affecting the grading of 25 pieces of sheep skins.*

in goat skins. However, defects resulting from poor flaying constituted about 32% of the total defects that recorded in raw goat skins, which led to a decrease in the quality of 24% of the skins. Finally, mechanical defects come from brands, wounds, etc., as they caused a decrease in the quality of 12% of raw skins and accounted for about 16% of the total defects that were detected in goat skins (Table 6).

Defects	No.	Grading on Defects %	Total Defects No.	Defect% from Total Defects No.
Skinning	6	24	19	31.58
Natural (Diseases+ Parasites)	10	40	19	52.63
Mechanical (Branding+Marks)	3	12	19	15.79
Storing	00	00	00	00

Table 6: *Defects affecting the grading of 25 pieces of goat skins.*

The study found that one of the most important and biggest reasons for reducing the quality of raw cattle hides was slaughtering defects, which accounted for 80% of the causes of poor quality. They accounted for about 86.96% of the total defects that recorded in raw bovine hides. Then the mechanical defects that led to a decrease in the quality of 12% of cattle hides and constituted about 13.04% of the total observed defects in bovine hides (Table 7).

Defects	No.	Grading on Defects %	Total Defects No.	Defect% from Total Defects No.
Skinning	20	80	23	86.96
Natural (Diseases+ Parasites)	00	00	00	00
Mechanical (Branding+Marks)	3	12	23	13.04
Storing	00	00	00	00

Table 7: *Defects affecting the grading of 25 pieces of cattle hides.*

Discussion

As for the cattle hides that were randomly selected for grading, 84% of them were found to be fourth-grade (*Escarto*) or rejected. This estimation was exceeded Hamed [10] estimation for fourth grade (*Escarto* or rejected) by about 30% in cattle hides.

When sorting and grading of 75 pieces of cattle, sheep and goat skins combined. The highest percentage was for fourth-grade hides and skins (rejected or *Escarto*), reaching 58.67% of the total leather. As for the first-grade hides, they represented 25.33% of the total studied hides and skins. No third-degree hides and skins were recorded. These estimates exceed what Hamed [10] found, that first, second and

third grade out of the total hides and skins taken from four approved slaughterhouses were in the range of 11.67%, 35% and 23.33% respectively. Whereas fourth grade (*Escarto* or rejected) was about 30% of the total hides and skins.

The study found that one of the most important and biggest reasons for reducing the quality of raw bovine hides was flaying defects, which accounted for 80% and it representing for about 86.96% of total recorded defects. This is consistent with what was stated by Ebrahiem., *et al*. [6] that flaying defects were at the forefront of the damages that reduce the value of raw hides. However, these estimates exceed what Ebrahiem., *et al*. [6] who estimated poor flaying at 28%, which causes damage to 12% of hides. Also the study estimated mechanical defects that led to a decrease in the quality of 12% and constituted about 13.04% of total observed defects in bovine hides. This corresponds to what was stated by Ebrahiem., *et al*. [6] the flaying defects come at the forefront of the damages that reduce the value of raw hides.

When studying and recording defects that leads to downward sheep skins quality, it was found that defects resulting from poor flaying and mechanical defects were among the most common defects and affecting negatively the grading of 20% of raw skins. Its percentage from all recorded defects was 33.33% for each. These estimates are above that of Ebrahiem., *et al*. [6] estimation for poor flaying which causes poor quality and deterioration of 10% of sheepskins.

As for goat skins, the study found that the natural causes resulting from skin diseases and parasites were among the most common causes that reduce the quality of the skin. It reduced the quality of 40% of the raw goat skins, and it constituted 52.63% of the total observed defects in goat skins. Defects resulting from poor flaying constituted about 32% of total defects in raw goat skins, and led to a decrease in the quality of 24% of goat skins. Finally, mechanical defects come from brands, wounds, etc., as they caused a decrease in the quality of 12% of raw goat skins and accounted for about 16% of the total detected defects. This is not in agreement with what was stated by Ebrahiem., *et al*. [6] who found that defects in goat skins cause poor quality and damaged 3.5% of the skins, followed by skin diseases that cause poor quality and damaged 4% of goat skins. Finally, mechanical defects come from dirt, wounds, etc.

Conclusion

Poor flaying and mechanical defects were among the most defects that reducing from bovine hides and sheep skins quality. In goat skins, the natural defects which resulting from skin diseases and parasites were the main quality detracting causes.

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