

Assessment of Market Characteristics, Price Determinant Factors and Causes of Skin and hide Rejection  
in Alamata, Maichew, Adigrat and Sheraro Districts of Tigray Regional State, Ethiopia  
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## Abstract

Skin and hide significantly contribute to the domestic leather industries. A cross sectional study was conducted in Alamata, Maichew, Adigrat and Sheraro districts of Tigray to assess market characteristics and causes of skin and hide rejection. Data were collected from randomly selected respondents (n=240) comprising of butchery houses, restaurants, hotels and individual users by pre-tested structured questionnaires, focused group discussion with key informants from the above mentioned target groups and personal observation. The overall mean of animals slaughtered per household per annum was  $4.66 \pm 0.99$  (sheep),  $27.58 \pm 6.07$  (goats) and  $17.97 \pm 5.24$  (cattle). It was revealed that, 74.2% of the respondents were selling skin and hide to generate income. Skin and hide were sold to wholesalers by 45.8% of the respondents, while the rest were sold to other actors involved in the skin and hide marketing chain. The mean selling price of intact skins and hides was  $18.385 \pm 0.552$  birr (sheep skin),  $18.173 \pm 0.450$  birr (goat skin) and  $45.37 \pm 2.395$  birr (cattle hide). However, the mean selling price of partially rejected skin and hide was  $8.315 \pm 0.647$  (sheep skin),  $8.358 \pm 1.588$  (goat skin) and  $14.543 \pm 1.820$  birr (cattle hide). Statistically significant difference ( $p < 0.05$ ) was found in the selling price of intact and partially rejected skin and hide. Knife cut (58.8%), putrefaction (27.5%) and diseases such as sheep and goat pox, mange mites, and lump skin disease (13.3%) were the major causes of rejection for skin and hide. Therefore, providing trainings and extension services to butchery houses, restaurants, hotels and individual users is substantial to minimize defects and rejection of skin and hide, and improve the economic gain of the producers.

**Keywords:** *Causes of Skins and Hides Rejection; Market Characteristics; Price determinant Factors*

## Introduction

In Ethiopia, livestock is the second major source of foreign currency through export of live animals, meat, skins and hides. Skin and hide significantly contribute to the domestic leather industries. However, in recent years, this rank has been relegated to fifth level mainly because of rejection and down grading inflicted on hides and skin defects mainly due to infestation by external parasites (Kassaw, 2005) but also due to pre-and post-slaughter skin management problems (Zenaw and Mekonnen, 2012). The raw material of the leather industry is mainly derived from local areas of the country where basic amenities for slaughtering and subsequent marketing are either not in existence or lacking. Additional sources of skins and hides include slaughter slabs, municipal slaughterhouses, export abattoirs, meat, and meat product processing plants. Skin quality is primarily defined by the absence of damage to the grain layer of the skin. The quality of finished leather is related to a number of surface and structural defects that skins

and hides acquire during the life of the animal, slaughtering, storage and transportation stages. Skins and hides defects are classified into two main groups. First group being those created or acquired during the life of the animal (pre-mortem defects) and second group being those that occur during and after slaughtering of animals (postmortem defects) (Yacob, 2013). In some circumstances, domesticated animals may receive almost no attention throughout their lives. These are the animals left to graze or forage (sometimes in open grassland), which may only be handled immediately before dispatch to the abattoir. Post-mortem defects comprise of inadequate bleeding, gouge marks, flay cut, putrefaction, hair slip and beetle damages (Kidanu, 2001) which are directly related to transportation, preservation and storage of the materials and hence are the product of poor management and treatment. Considering the development potential and economic importance of skins and hides, in the last few years, the government of Ethiopia has launched different development programs aimed to increase the supply and improve the quality of the raw material.

Marketing of skins and hides starts at the producer/consumer level and passes through a chain of middlemen until it reaches the tanneries. Collectors of raw skin and hide are available in almost all towns of Ethiopia. They collect the hide and skins through rural agents or through farmer's carriage to the market and urban areas through intermediary collectors or themselves. Major producers of hides and skins are individual householders residing in different kebeles across Ethiopia. About 90–95% of the hide and skin, production is derived from urban as well as rural backyard slaughters, while the remaining 5–10% is produced from major urban slaughterhouses and export abattoirs (Mahmud, 2011). The main constraints adversely affecting the leather production and market of skins and hides are shortage of raw materials, quality deterioration, lack of incentives to producer supplying good-quality raw materials to suppliers, and inadequate numbers of slaughterhouses and slabs in the country (Mohammed, 2000).

A study on assessment of market characteristics, price determinant factors and causes of skins and hides rejection is paramount important to design appropriate intervention strategies. Moreover, having such data are substantial inputs for policy makers. Therefore, this study was conducted with the following objectives: to assess skins and hides market characteristics, to determine price determinant factors of skins and hides and to assess major causes of skins and hides rejection in the study districts.

## **Methodology**

### **Description of the study areas**

The study was conducted at Maichew, Adigrat, Alamata and Sheraro cities of Tigray regional state (Figure 1).

**Maichew city:** is a district town located in the Southern Zone of Tigray Regional State at 12°46'N latitude and an elevation of 1200-2478 m.a.s.l. It is located at 665 km north of Addis Ababa, the capital of the country (Shishay and Messay, 2014). The monthly precipitation distribution in Maichew is not uniform throughout the year; however, rainy periods frequently occur in both summer and winter,

comparatively with no dry periods throughout the year, the rainfall being heavy in the summer months. The average temperature of the area ranges from 7-26 °C. Maichew has a total population of 23,419, of whom 11,024 are men and 12,395 women (CSA 2007).

**Adigrat city:** is located in northern Ethiopia around 893 km far from Addis Ababa. It lies between latitude 14° 16' North and longitude 39° 27' East with an elevation of 2,457 meter above sea level. The projected population of the town in 2014 was 81,738 (CSA, 2013).

**Alamata city:** is located in northern Ethiopia around 600 km far from Addis Ababa. It lies between latitude 12° 25' North and longitude 39° 33' East with an elevation of 1520 meter above sea level. The projected population of this town in 2015 was 49,795 (CSA, 2013).

**Sheraro city:** is located in the North Western Zone of the Tigray Region, at distance of 1,175.3km far from Addis Ababa. The altitude of the area is 1246 meters above sea level, longitude 14° 24' 0" North and latitude of 37° 56' 0" East (CSA, 2013).

### **Sampling Techniques and Data Collection**

A cross sectional study was conducted from December 2017 to May 2018 to assess market characteristics, price determinant factors and causes of skins and hides rejection in four districts of Tigray regional state. Primary data were collected from randomly selected (n=240) respondents by questionnaire survey, group focused group discussion with key informants from butchery houses, restaurants, hotels and individual users and personal observation.

### **Data Management and Analysis**

Data were analyzed using Statistical Package for Social Sciences (SPSS) version 20. Descriptive statistical analysis such as frequency and percentages were computed for the qualitative data and one way ANOVA was used to calculate mean, standard error and p-value of the quantitative data. For all quantitative data a p-value <0.05 was considered statistically significant.

## **Results**

### **Respondents Demographic and Socioeconomic characteristics**

This study revealed that, 37.1% of the respondents were between 48-58 years old. Regarding the sex of the respondents, majority (73.8%) of them were males. This study also showed that, 40.4% of the respondents were farmers, while the rest were merchants, butchery owners, head of restaurants and civil servants. Besides, 35.4% of the respondents were illiterate, while education level of the rest was elementary, high school, certificate and diploma and above (Table 1).

### **Animal slaughtering and market characteristics of skins and hides**

The overall mean of animals slaughtered per household per annum at the study districts was  $4.66 \pm 0.99$  (sheep),  $27.58 \pm 6.07$  (goats) and  $17.97 \pm 5.24$  (cattle). A statistically significant difference ( $p < 0.05$ ) were found in the mean of animals slaughtered per household per annum among the study districts (Table 3).

According to this study, 81.7% of the respondents slaughtered animals at backyard area. Skins and hides in the study areas used for different purposes. It was revealed that, majority of the respondents (74.2%) were selling skins and hides for income generation. Moreover, 41.3% of the respondents were selling skins and hides at nearby town markets; whereas the rest at home and village. Furthermore, some respondents were selling skins and hides at more than one market place. This investigated 45.8% of the respondents were selling skins and hides to wholesalers, whereas, the rest to licensed and non-licensed middle-men and traditional tanneries (Table 2).

This study has shown that ante-mortem and postmortem defects of skins and hides cause partial and/or total rejection. Partially rejected skins and hides are sold at a cheaper price than intact skins and hides. Highly statistically significant difference ( $p = 0.0001$ ) was found in the mean selling price of partially rejected and intact skins and hides (Table 4). It was revealed that, skins and hides were sold to various agents involved in the marketing chain. Factors such as lack of market information and availability determine where skins and hides are sold. Skins and hides at the study districts were sold to retailers and/or wholesalers. According to this study, skins and hides sold to wholesalers at a higher price ( $p = 0.0001$ ) than to retailers (Table 5).

### **Causes of skins and hides rejection**

It was found that majority of the respondents (58.80%) reported knife cut as the major cause for rejection of skins and hides. Moreover, putrefaction, diseases such as sheep and goat pox, mange mites and lumpy skin disease improper trimming and bleeding, mechanical damage and branding were found to be among the causes for skins and hides rejection in the study districts (Figure 2).

### **Discussion**

According to this study, 81.7% of the respondents slaughtered animals at backyard area. This might be due to the fact that the number of modern abattoirs in the study areas in particular and the region in general are very limited. Moreover, the respondents have limited awareness on the disadvantages of slaughtering animals at backyard areas. Similarly, previous studies conducted at various districts of Ethiopia reported, rural and urban slaughter operators in rural slaughter slabs produce a sizable volume of skins and hides, second to the individual household. Lack of awareness and shortage of standard abattoirs might be among the reasons for slaughtering animals at backyard area. Previous study conducted by (Behailu, 2017), indicated backyard slaughtering of animals uses poorly equipped slaughter points, where the infrastructure is sometimes a slab of concrete, under a shade, or using poles for hoisting carcasses. This study has indicated the respondents use skins and hides for various purposes. Some households process skins and hides using homemade tanning agents for household uses, whereas others sell it for income generation at various market places. The current study finding disagrees with report of a previous study conducted by Aseged (2015) in north Tigray. According to the report of the author, none of the

interviewed respondents sold skins and hides due to household uses after processing it using homemade tanning agents. This might be due limited market availability for skins and hides and low selling price. According to this study, majority of the interviewed respondents (74.2%) sell skins and hides for income generation. This figure is higher than the report of Asegede (2015) and Buljan (1995) who reported 44% and 31% of the respondents ascertaining the selling of sheep and goats skins, respectively in north Tigray. This variation might be due to differences in the awareness of the respondents, market availability and selling price of the study areas. The market for skins and hides in the study areas is seasonal in which the demand and price is higher during holidays. Majority of the skins and hides were sold to wholesalers, and this might be due better selling price at wholesalers than retailers. Moreover, skins and hides wholesalers in the study area have license and they are the main skins and hides suppliers to the leather industries that are found in the different regions of the country.

This study also indicated that, considerable number of skins and hides in the study areas are rejected due to defects caused by various reasons. Knife cut was reported as the major cause for rejection of plenty of skins and hides. This might be due to limited knowledge and skill of the personnel's on flaying skins and hides and use of improper flaying knives Good quality skins and hides is paramount important to generate income. Hence, provision of trainings to butchery houses, restaurants, hotels and individual users on pre-slaughter, slaughter and post slaughter defects of skins and hides and their management is very important to mitigate the existing constraints.

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### **Conflict of Interest**

The authors declare that there is no conflict of interest.

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Figure 1. Map of Tigray Regional state and the study areas

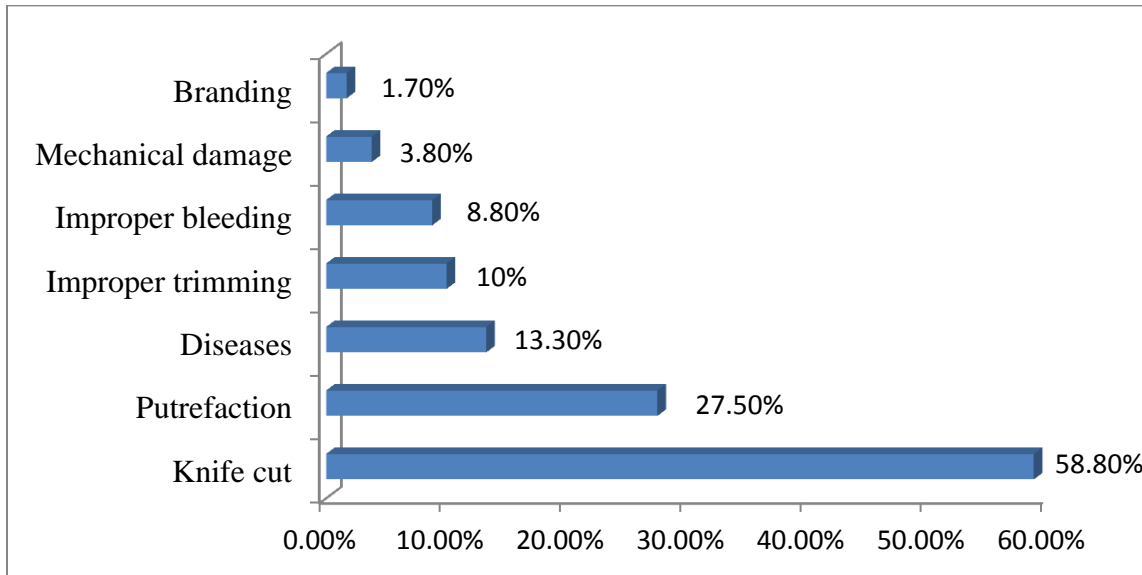


Figure 1. Causes of skins and hides rejection

Table 1. Respondents Demographic and socioeconomic characteristics

<b>Variables</b>	<b>Frequency</b>	<b>Percent (%)</b>
<b>Age (in years)</b>		
15-25	13	5.4
26-36	40	16.7
37-47	89	37.1
48-58	73	30.4
59-69	25	10.4
<b>Sex</b>		
Male	177	73.8
Female	63	26.3
<b>Level of education</b>		
Illiterate	85	35.4
Elementary	67	27.9
High school	35	14.6
Certificate	14	5.8
Diploma and above	39	16.3
<b>Occupation</b>		
Farmer	97	40.4
Merchant	16	6.7
Butchery	37	15.4
Restaurant	51	21.3
Civil servant	39	16.3



Table 2. Slaughter of animals and market characteristics of skins and hides

<b>Variables</b>	<b>Frequency</b>	<b>Percent (%)</b>
<b>Animals are slaughtered at:</b>		
Backyard area	196	81.7
Abattoir	33	13.8
Both	11	4.6
<b>Skins and hides are used for:</b>		
Household use	3	1.3
Sale	178	74.2
Both	59	24.6
<b>Skins and hides are sold at:</b>		
Home	17	7.1
Village market	96	40.0
Town market	99	41.3
Multiple market places	25	10.4
<b>Skins and hides are sold to:</b>		
licensed middle men	46	19.23
Non-licensed middle men	34	14.2
Wholesalers	110	45.8
Traditional tanneries	3	1.3
Multiple customers	44	18

Table 3. Mean number of sheep, goats and cattle slaughtered per annum

<b>Variables</b>	<b>Mean ±SE</b>	<b>P-value</b>
<b>Sheep</b>		
Alamata	7.15 <sup>a</sup> ± 1.701	0.004
Maichew	5.12 <sup>ab</sup> ±1.298	
Adigrat	5.03 <sup>ab</sup> ±0.663	
Sheraro	1.33 <sup>b</sup> ±0.291	
<b>Goats</b>		
Alamata	50.15 <sup>a</sup> ±12.229	0.004
Maichew	4.45 <sup>b</sup> ±2.484	
Adigrat	22.57 <sup>b</sup> ±5.998	
Sheraro	33.15 <sup>b</sup> ±3.563	
<b>Cattle</b>		
Alamata	21.57 <sup>ab</sup> ±6.140	0.003
Maichew	15.08 <sup>ab</sup> ±5.468	
Adigrat	33.08 <sup>a</sup> ± 8.230	
Sheraro	2.15 <sup>b</sup> ±1.112	

*Key: Different mean superscripts indicate differences in the mean of animals slaughtered per annum*

Table 4. Mean selling price of intact and partially rejected skins and hides (in Birr)

<b>Variables</b>	<b>Mean ± SE</b>	<b>P-value</b>
<b>Sheep skin</b>		
Intact	18.385±0.552	0.0001
Partially rejected	8.315±0.647	
<b>Goat skin</b>		
Intact	18.173 ±0.450	0.0001
Partially rejected	8.358±1.588	
<b>Cattle hide</b>		
Intact	45.37±2.395	0.0001
Partially rejected	14.543 ±1.820	

Table 5. Mean selling price of intact skins and hides at retailers and wholesalers (in Birr)

<b>Variables</b>	<b>Mean ±SE</b>	<b>P-value</b>
<b>Sheep skins</b>		
Wholesalers	20.11±0.324	0.0001
Retailers	16.40±0.469	
<b>Goat skin</b>		
Wholesalers	20.492±0.411	0.0001
Retailers	16.84±0.337	
<b>Cattle hide</b>		
Wholesalers	47.00 ±1.794	0.0001
Retailers	30.69 ±1.060	