Investigation of Major Factors That Cause Skin and Hide Rejection in Ethiopia: The Case of Tanneries in Addis Ababa and Modjo Towns

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Abstract

A study was conducted from May 2013 to September 2013 with the objective of identifying the major causes of skin and hide rejection on wet blue skins and hides in AA and Modjo tanneries. A total of 769 rejected skins and hides out of which 272 wet blue sheep skins, 275 goat wet blue skins and 222 cattle hides were examined for the major defects that cause rejection.

For sheep skins ekek 110(40.3%), scratch 54(19.9%), wound 54(19.4%), scar 23(8.3%), flay cut, machine defect, and pox each 11(4.2% and putrefaction4(1.4%)) were major causes of sheep skin rejection..

In goats skin, scratch 95(34.7%) was the dominant cause of rejection followed by scar 62(22.7%), ekek 49(18.1%), flying defect 22(8%) and pox14(5.3%).

In cattle hide, putrefaction 98(44.2%), flying cuts 58(26.2%), ekek 33(14.8%), Scratch 20(9%), branding 6(2.5%)were major causes of hide rejection.

In sheep skin diseases such as Ekek and scratch caused high rejection of skin and entailed serious economic loss in terms of foreign exchange earning to Ethiopia. Therefore, this main cause of sheep skin rejection and factors that cause rejections should be controlled. whereas in goat skins serious issue is scratch responsible for rejection.

This study revealed that ekek, scratch, wound and scar, putrefaction and flay cuts were major causes of skin and hide rejection and this suggests out of six major defects four (67%) are pre-slaughter defects and there need to be integrated efforts towards improved livestock extension and husbandry and better health care which are vital issues for production of better quality hide and skin.

Keywords: Ekek, wet blue, Hides, Skins, skin and hide rejection
1. Introduction

Ethiopia has the largest livestock population in Africa. According to FAO, 2013, it is estimated that there are about 55.3 million heads of cattle, 27.5 million sheep, and 21.8 million goats. From these resources, Ethiopia has a capable of supplying around 20 million pieces of hides and skins per year. Thus, its resource base for the development of the leather and leather goods industry is substantial. However, the extent to which the available resource is exploited depends on the off-take rate, which is in turn a result of the level of economic development of a Country. The annual off-take rate from the Country’s cattle is estimated at 7% while from sheep and goats it is estimated to be 33% and 35% respectively. The annual potential supply of hides and skins is estimated at 3.8 Million pieces of hides and 16 million pieces of skins.

Not only the volume but also the unique quality of Ethiopian leather, some of which are considered to be of prime quality in international markets, gives the country a competitive edge over other countries. As a result, Ethiopia has great potential for the rapid development of its leather sector (Ministry of Foreign Affairs, 2007).

Though Ethiopia has very good potential to produce substantial quantities of skins, the quality of skins supplied is deteriorating from time to time. This has resulted in an ever increasing number of complaints about the quality of skins available to local tanners and the export market. The problem has adversely affected all aspects of the industry including the income derived from exports. Improvement of the quality of raw material is vital in expanding trade in the sector. Better-quality skins fetch better prices.

Reducing defects that cause the skin rejection of the raw material will improve price received. In Ethiopia, a study on the prevalence of defects that cause skin and hide rejection so far was very little. In line with the above fact, there is scarcity of information on the magnitude of skin and hide defects that resulted in rejection at tannery, Ethiopia.

Therefore, this study was conducted with the following objectives:

1. to identify magnitude and type of major defects that cause skin and hide rejection at tanneries located in Addis ababa and Modjo, Ethiopia.
2. To use the study result as an input in the preparation of implementation strategy document.

2. Methodology

2.1 The study area

The study was conducted from march to April 2013 at eight tanneries in Addis ababa and modjo towns. Modjo town is located in East Shoa Zone of Oromia National Regional State. It is located 70 km southeast of Addis Ababa, 8°35′N and 39°10′E at an altitude of 1,777 m
above sea level. (CSA), 2010).

2.2 Sampling
Among the 13 tanneries that share majority of foreign export currency; for the purpose of this study 8 tanneries are selected randomly to study focusing only on the percentage of skin and hide rejection and with responsible dominant defects. Random sampling method was used for identification of rejected sheep, Goat skins and cattle hide at wet blue stage at tanneries. Among the total 1500 pieces of rejected hides and skins remained in the sampled tanneries during export and study period of these tanneries, a total of 769 (272 from sheep, 275 from goat and 222 from cattle) stages at wet blue of skins and hides were randomly sampled. After sampling, it was examined by inspection for the defects by us and trained skin selectors and graded accordingly as grade 7 (reject) based on parameters of skin grading on defects set by Ethiopian Standard Authority in 2008.

2.3 Data collection and analysis
Data’s from each skin and hide were collected, decoded, entered and managed in to Microsoft Excel and Computation of descriptive statistics and data analysis was employed using Statistical Package for Social Sciences (SPSS, version 17) software.

3. Result and discussion

Prevalence of skin and hide defects: Presently the quality of hides and skins is generally low, a greater proportion being in lower grades where by more than half of the collection is in grade 4 and rejects. Of the 769 rejected wet blue skins and hide examined during the study period include defects due to external parasites (mange mites and keds and other diseases, natural/environmental causes(type, nutrition and climate), pre slaughter/ante-mortem causes involving human activities, post mortem/post slaughter defects (veininess, incorrect shape, cuts/holes, gauge marks (knife cut), putrefaction (protein exposed to bacterial attack that leads to decomposition).

Sheep skin
From the total of 272 sheep skins rejected, The most common defects visible on pickled sheep skins that cause skin rejection were ekek (40.3%), scratch (19.9%), wound (19.4%), followed by scar (8.3%), flay cut, machine defect, and pox each 11 (4.2% and putrefaction 4 (1.4%)) were major causes of sheep skin rejection.
Cockle “Ekek” was significantly higher in sheep (40.3%) than goat (18.1%). Scratch was higher in goat (34.7%) than sheep (19.9%) and cattle (9%). This might be associated to the browsing habit of goats where they browse in thorny bush area which may expose them to much damage as compared to sheep and cattle.

Ninety five rejected goat skins (34.7%) were proved to be affected by scratch with higher prevalence as compared to sheep (19.9%). This result lies in line with that described by Zenaw Zemene and Mekonnen Addis IDOSI Publications, 2012.

**Goat skin**

From the total of 275 goat skins rejected, The most common defects visible on wet blue goat skins that cause skin rejection were scratch 95 (34.7%) was the dominant cause of rejection followed by scar 62 (22.7%), ekek 49 (18.1%), flying defect 22 (8%) and pox14 (5.3%).
This could be associated to the browsing habit of goats where they browse in bush, thorny areas which might expose them to rubbing than sheep. Current prevalence of scratch was higher than (11.3%) the report from impact assessment of parasite control in Amhara and Tigray region in 2011. Ekek (24%) which is higher than (49.2%) from the report by Zenaw Zemene and Mekonnen Addis IDOSI Publications, 2012. The present study for rejected hide (30.5%) is also higher than the report from modjo tannery and Ethio-leather industry pvt.ltd.Co semi annual report.

**Cattle hide**

From the total of 222 hide rejected, The most common defects visible on wet blue hide that cause skin rejection were putrefaction 98(44.2%), flying cuts 58(26.2%), ekek 33(14.8%), Scratch 20(9%), branding 6(2.5%) were major causes of hide rejection.
Chart 3: Dominant defects of cattle hide rejection

Table 1: Prevalence and causes of skin and hide rejection

<table>
<thead>
<tr>
<th>Major causes of rejection</th>
<th>hide</th>
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<th>Sheep skin</th>
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<th>Goat skin</th>
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<tr>
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<td>Frequency</td>
<td>Percent</td>
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<td>Frequency</td>
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<tr>
<td>Scratch</td>
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<td>54</td>
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<td>95</td>
<td>34.7</td>
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<td>14.8</td>
<td>110</td>
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<td>18.1</td>
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<tr>
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<td>23</td>
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<tr>
<td>Flay cut</td>
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<td>26.2</td>
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<td>4.2</td>
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<td>54</td>
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<tr>
<td>Puetrifaction</td>
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<td>44.2</td>
<td>4</td>
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<td>2.7</td>
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<tr>
<td>Brandning</td>
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<td>2.5</td>
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<td>3</td>
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<td>2</td>
<td>21</td>
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<td>222</td>
<td>100</td>
<td>272</td>
<td>100</td>
<td>275</td>
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4. Conclusion and Recommendation
Tanneries complained that poor quality of hides and skins, which is beyond their control, is the main factor for the substantial reduction of external demand and lower prices for their leather output. Nearly (90%) hides and skins are collected from individual households. This way of handling, in addition to natural damages, causes all kind of damage associated with traditional slaughtering, storage and lack of appropriate preservation are all responsible for down grading and rejection.

The result proved that different skin and hide defects are responsible for rejection and decline in quality which finally influences the benefit fetched from the sector. In 2005 proceeding report described by Tadese HM, due to rejection alone the country has lost 7.2 million USD but currently According to rejection rate taken from Bisrat GM, 2013 IDOSI study report and amount of skin and hide soaked in 2013 taken from LIDI annual report, due to different skin and hide defects, the tanning industry is losing more than 30.2 million USD. Moreover, they are operating at much below full capacity inevitably face a relatively high unit cost of production and there by adversely affecting its competitiveness in the international market.

Attention should be given to the most damaging effects for hide and skin such as ekek, scratch, wound, scar, flay cut, pox, putrefaction and branding were major causes of rejection. All these defects resulted in economic loss to tanneries and the country at large since the damage is recognized after a lot of cost is incurred on processing after which the damaged skins and hides have to be discarded or downgraded.

Except in clinically mange affected skin lesions, ekek is not observed in the raw skin and hide. Because of this the economic loses due to ‘ekek’ are not only due to down grading and rejection but also due to costs of processing affected skins. Even though the ecto-parasite control program has been started before 2006 and great success has been achieved, still the problem is critical. Ecto-parasites are among the major causes of sheep and goat production constraints and quality deteriorations of exported skin in Ethiopia.

‘Ekek’/Cockle the biggest challenge is allergic skin dermatitis which causes itching, observable only after removal of the hair or wool and is characterized by multiple small circular lesions on the grain side of the skin is one of the biggest challenge hampering the equality of hide and skin in the country.

“Ekek’’ is an allergic skin hypersensitivity reaction to keds (wingless flies which suck blood and cause skin irritation and cause lesions/cockle in processed skin and hide). Keds are considered a major cause of “ekek” and are visible on the skin surface of affected animals. The animals react to skin irritation by rubbing against trees or rocks etc.: this is manifest as scratches on the skin. It is a defect which appears in the grain side of processed skin and hide that cannot be detected when the skin and hide is examined raw or unprocessed. Ekek was higher in sheep (40.3%) than in goats (18.1%). Control campaigns against mange, lice and keds in sheep and goats should be undertaken simultaneously. So, this suggests the importance of continuation of ecto-parasite control program in coordinated actions.
simultaneously which could improve the overall efficiency of the sector. Another important
defect that need attention is scratch, it is one of the most common mechanical damages
found on both hides and skins. This is because most of the livestock is concentrated in areas
of open range land where bushes and thorny are common. Scratches give leather an
anaesthetic appearance and if deep, cause considerable loss of tear strength especially on
skins. The quality is also degraded as tanners try to obscure the faults on the grains by
embossing or printing, which also increase processing costs. Consequently, the raw materials
fetch lower prices. The other defect that could be given due attention is scores which are
caused by Knife damage to skins during flaying by cuts that do not fully penetrate through the
skin.

All the above defects considerably undermine the value of hides and skins and consequently,
Pastorals/farmers, traders and tanners in Ethiopia face huge financial losses. Mechanical
damage (often occurs when flesh left on the hide are not removed) is also another important
defect that hampers quality of skin and hide.

Flay cuts/Gouges which is another unintentional knife cutting of flat pieces of skin and hide
has resulted in a thinner quality of the finished leather. Blood stains if soiled and
blood-stained skins are not washed adequately these incrustations may produce bronish
stains on the raw hide. With respect to handling defects associated with traditional
slaughtering, storage and preservation methods, improvement in this area primarily requires
provision of ‘quality improvement services’ by government in the form of training and
infrastructure.

During in appropriate slaughtering knife cuts are common. Due to in appropriate slaughtering
hole/ Flay cuts, score, gouges, siding are commonly seen visible defects. Flay cuts/gouges
are also serious defects especially in cattle, but proper training and the use of appropriate
tools can greatly reduce the incidence of these. Damage caused by unintentional knife cutting
or careless use of a knife during flaying, sometimes cutting through the skin. This damage is
cased by the careless use of the knife or by the use of unsuitable knives. Flay cuts constitute
serious mechanical defects on hides and skins. Lack of proper tools like the rounded flaying
knives, lack of flaying skills and carelessness lead to loss of quality and resulted in rejection of
raw hides and skins.

Putrefaction or bacterial damage is caused by poor storage and handling by skin and hide
suppliers, who put their products for long period of time without proper preservation, bacterial
and enzymatic breakdown, rotting and unpleasant smelling are mostly evident indicators or
signs of putrefaction. It is essential to wash well early after flaying, clearing off all traces of
blood and dirt and then either salt appropriately or air dry as soon as possible before six hours
of interval.

Goat and sheep pox are viral disease of sheep and goats which is highly contagious. Healing
of the skin affected by pox is slow and permanent scars can be left.
Branding/Brand marks which is mainly common in big animals may not be avoidable, but could be reduced if awareness and training is given to pastorals/farmers and livestock producers.

In general, awareness creation for the producers about the effect of skin and hide defect on the revenue collected from the skin and hide also increasing the number of trained manpower is very important to improve the quality of hide and skin. Reducing the prevalence of ecto-parasite relies on treatment of affected animals by application of insecticide and acaricide by dipping/spraying and also expanding the control program campaign in all regions is very critical to eradicate the causative agent. Through combination rotational grazing, improved animal husbandry practice should be promoted. Integrated efforts towards improved livestock husbandry and animal health care are very serious to minimize the burden on the economic product of skin and hide.

An extensive training and extension service for proper management of live animals in handling, feeding and health care are relevant to minimize the defects and improve the quality of raw hides and skins which occurs while the animals are alive.

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