

Short communication

Impact of ectoparasite control campaign on quality of processed skins in tanneries of the Amhara Regional Government: a rapid assessment

Solomon Wolde Mariam

Agricultural Bureau of Amhara National Regional State P. O. Box 447, Bahir Dar

Introduction

Small ruminants are important contributors to food production in Ethiopia, providing 35% of the total meat and 14% of milk consumptions (Wondwesen Asfaw, 1997). Their population in Amhara Region is about 9.5 million sheep and 5.5 million goats (CSA, 2008). Small ruminants are kept for various purposes. Their role for income generation, food supply (meat and milk), and financial security for the rural poor is documented (Workneh Ayalew, 1999). They provide 46% of the value of national meat production and 58% of the value of hides and skins production and play an integral part in the production system of the country (Tembley, 1998). Hides and skins account for 12-16% of the total value of exports (Wondwesen Asfaw, 1997). However, the contribution of sheep and goats to the national income is way below the expected potential. This is because external parasites such as mange mites, lice, sheep keds and ticks are the major causes of skin diseases that have resulted in downgrading or rejection of skins (Getachew Tilahun, 1995; Tembley, 1999). In Ethiopian tanneries, 35% of sheep and 56% of goat skins have been downgraded and rejected due to defects by external parasites (Kassa Bayou et al., 1998).

Control campaigns against mange, lice and keds in sheep and goats were undertaken for three consecutive years (2008-2010) in the Amhara National Regional State. The impact of the campaign has been assessed at a certain level and it focused more on the incidence of the disease in selected areas of the region. Currently a rapid assessment of the programme focusing on industrial tanneries and storages was conducted in eastern Amahra Region. It was carried out between Aug 25 and Sep 7, 2010 in four tanneries and twenty hides and skins stores. Studies conducted at various localities of the country and tannery reports on magnitude of skin pelts damage due to skin disease especially ectoparasites indicate that skin diseases are becoming growing threat for small ruminant production and export of skins in Ethiopia. The

present study, therefore, aims at assessing the impact of ectoparasite (mange, lice and keds) control campaign on the quality of processed skins.

Target groups

The rapid assessment encompasses four tanneries and stores of hides and skins located in different parts of the eastern part of Amhara Region and the one in Bahir Dar city. The tanneries are at the final end of the value chain of raw hides and skins. As they are the end users of the raw material, their role in the trade is decisive all the way along the market chain.

Bahir Dar Tannery

The Bahir Dar Tannery is located in Bahir Dar, northwestern Amahara Region. It was established in 1997 and has a tanning capacity of about 4000 skins per day. The tannery collects considerable number of raw materials from western part of the region. It also obtains from other parts of the country. The tannery processes hides and skins to semi-finished and finished leather for local and export markets.

Debre Birhan Tannery

Debre Bihan Tannery was established in 1992 EC in North Shoa Administrative Zone of Amhara Region. It is a private tannery specialized in the collection of sheep and goat skins and processing of export leather and leather products. Its capacity is estimated at about 576,000 skins per annum. The tannery collects its raw materials from hides and skins traders and individual collectors. The sources of raw materials are mainly from western part of Amhara Region (Gojjam and Gondar; 38%), Addis Ababa (24%), North Shoa Zone of Oromia Region (Selale, 15%), Jimma (15%) and rarely from Dire Dawa (8%).

Kombolcha Tannery

Kombolcha Tannery was established in 1967 in Kombolcha town, South Wollo Administrative Zone. It is a private share company and processes hides and skins to semi-finished and finished leather and leather products for local and export purposes. Hides and skins reach the tannery through trade agents and individual collectors. The Kombolcha Tannery receives raw materials from South Wollo (60%, especially goat skins) and from other localities (40%) such as Gojjam, Gondar, Tigray and Addis Ababa. It has a tanning capacity of about 1.5 million skins per year.

Dessei Tannery

Dessei Tannery was established in 1989 EC in South Wollo Zone of Amhara region. It is located in Haik about 30 kms from Dessei, capital of South Wollo Zone. It produces semi-processed skins for local and export markets. It obtains raw materials mainly from Borena, Kelela, Woreilu and rarely from Geregera, Woldia and Dessei town. The tannery has a tanning capacity of about 1 million skins per year.

Mersa Tannery

Mersa Tannery, which is currently named as Ayenew Degu Mersa Tannery, was established in 1989 EC in Mersa town in North Wollo Administrative Zone. It is a privately owned firm specialized in collection of raw hides and skins for the production of semi-processed and finished products for local and export purposes. It collects raw materials mainly from Dessei and Kombolcha towns and also obtains from Gondar and Gojjam areas. Raw hides and skins reach the tannery through trade agents and individual collectors. It processes about 90,000 hides and 1.5 million skins annually.

Stores of hides and skins

A total of twenty stores were visited in different woredas and all store owners were interviewed using questionnaire format. Many were established in residential areas. In some cases the stores were constructed close to living quarters. The rooms were not properly ventilated and because of this many hides and skins were found putrefied. Infestation of skins by pests was also common. Most of the stores did not meet the international standards of hides and skins preservation method.

Study approaches

Retrospective data were collected from tanneries and individual traders who collected and stockpiled hides and skins for the market. Open-ended and closed types of questionnaire were used to interview traders and tannery owners. Traders were categorized into three groups in accordance with their sources of raw materials (Table 2).

Table 1. Grouping of traders based on source of raw materials

Group	Sources of raw materials	Total number of traders
I	Meat consumers/primary producers only	4
II	Meat consumers and collectors	8
III	Meat consumers, collectors, trade agents, etc.	8

Efforts were also made to observe large number of pickled and wet blue skins at the tanneries. Defective skins were recorded and pictures were also taken during visiting of the tanneries. Consideration to conduct a short-term assessment programme had been reached followed by recording of results on semi-processed skins at the tanneries in a selected month from each year and evaluating the situation of the past five years. Laboratory results from Bahir Dar Animal Health, Investigation and Diagnostic Laboratory were incorporated during assessment of the control programme.

Findings

Questionnaire survey result

Out of 21 stores used for hides and skins, most of them were established during the 1960s and 1990s (Fig. 1). The increase in the number of stores could be linked to the surge in the hides and skins market in those periods. Some reports indicate that the relative importance of coffee in total export revenues has significantly declined since the mid-1990s, i.e. from 70 percent of export earnings to roughly 45 percent in 2003. This is largely attributed to the deteriorating coffee trade on world market since 1998. At the same time, the relative export earnings of hides and skins have increased considerably from below 10 percent in 1995 to roughly 20 percent each in 2003.



Figure 1. Hides and skins stores and year of establishment

The capacity of the traders, in group III in supplying raw materials to the tanneries was high (105,500 skins per year) in the year 1998 EC. Though the supply of hides and skins depends on the slaughtering capacity of the meat consuming population of the country in general and the region in particular, their performance was gradually dropping between the years of 1999 and 2001. In 2002, their capacity was gradually recovering reaching 71,000 skins per year. Similar pattern has also been observed in the performance of traders in group II. On the other hand, traders categorized in group I have shown no significant changes in the supply of raw materials to the tanneries (Fig. 2).

The market can be a factor for the reduction of skin supplies. In mid-1990s many surveys that were conducted in different parts of Amhara Region indicated that ectoparasites were the problems for the production of poor quality of sheep and goat skins. Control campaigns against mange, lice and keds in sheep and goats were undertaken for three consecutive years (2000-2002 EC) in the Amhara National Regional State. The increase in supply of skins in 2002 may be associated with the impact of ectoparasite control campaign, which resulted in improving skin damage caused by external parasites.

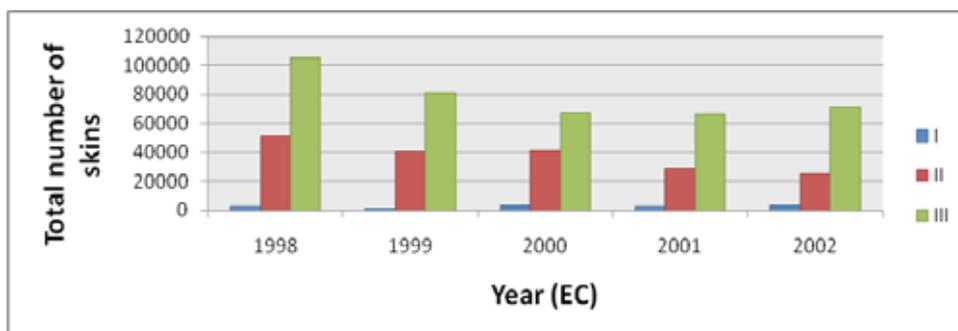
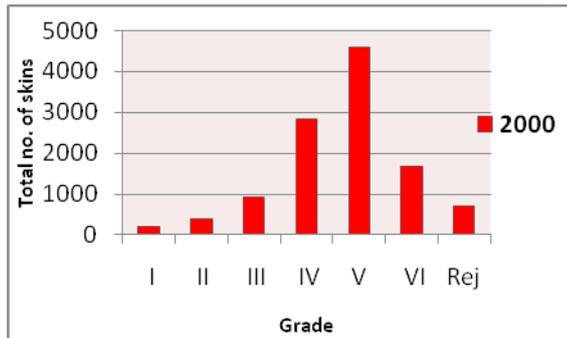
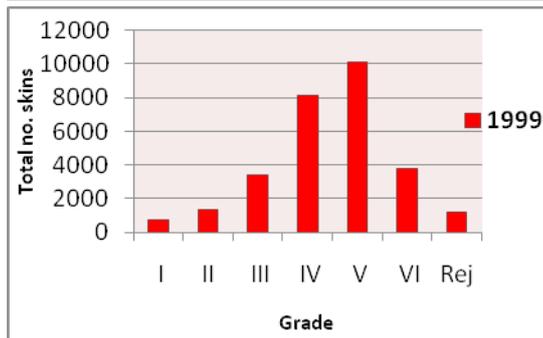
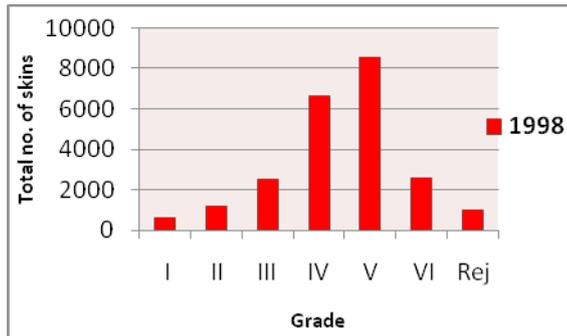


Figure 2. Skin delivery capacity of traders in 3 groups by year

With regard to tanneries, variations of production performances were observed between the years of 1998 and 2002 EC. After salting, all skins were carefully classified and graded by qualified selectors, according to the quality of pelt, and their client's requirement.

Between the years of 1998 and 2000 EC (in September), Kombolcha Tannery used to produce large number of the best quality skins (grade I, II, III). However, the trend was not maintained till 2002 (Fig. 3). The highest rejection of skins was observed in years 2001 and 2002. This might be due to natural defects from which disease can share the highest proportion. During 2001 a total of

410 semi-processed skins were graded as rejects of which “Ekek” contributed 60% of the proportion. Study conducted in lowland areas of eastern Amhara indicated that the prevalence of mange in goats was 6.6% (Tefera Sertse and Abebe Wossene, 2007). On the contrary, the quantity of good quality skins (grade II & III) increased in 2002. This might be attributed to low incidence of skin disease especially mange which was realized after the last ectoparasite control campaign. It is obvious that improvements in leather quality are expected to occur gradually due to ectoparasite control.



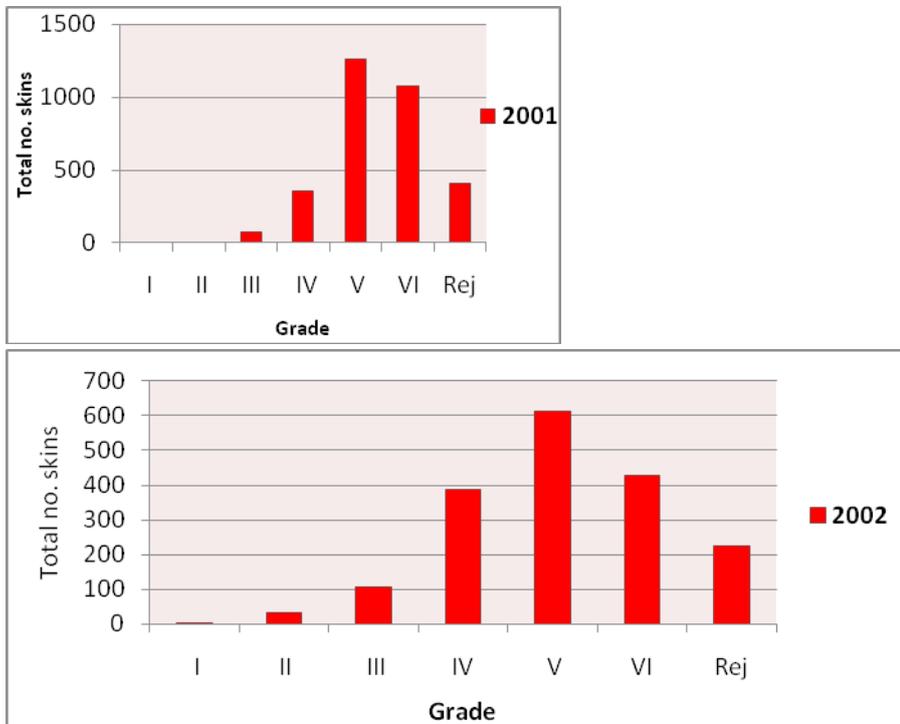


Figure 3. Trends in grading semi-processed skins at Kombolcha Tannery (1998/2002)

The quality of processed skins depends on the origin of the raw skins. A two-year selection result of semi-processed skins at Ayenew Degu Mersa Tannery showed that skins originated from western Amhara (Gondar and Bahir Dar) and Addis Ababa were found to be better in quality (Fig. 4 & 5). This suggests that these particular areas are not severely affected by ectoparasites. Relatively low prevalence of lice (7%) and mange (3%) of small ruminants was recorded by Bahir Dar Animal Health, Investigation and Diagnostic Laboratory (2009). Where there was high incidence of skin diseases caused by mange and ked, the quality of the skins was poor (Fig 6 & 7).

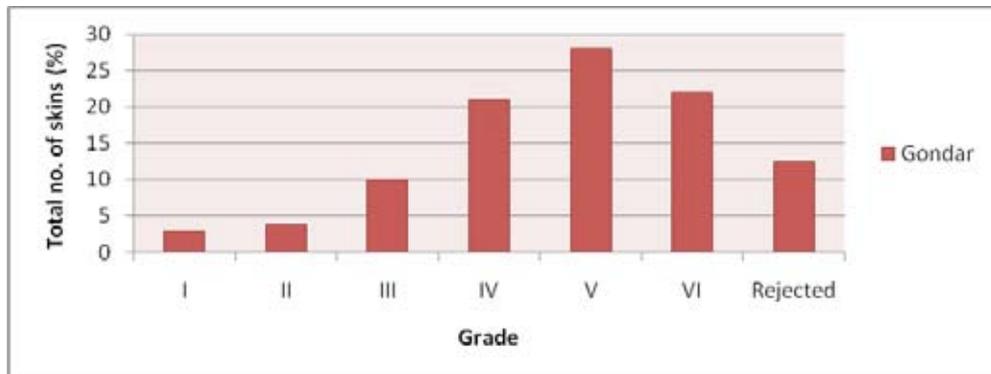


Figure 4. Semi-processed skins originated from Gondar at Mersa Tannery

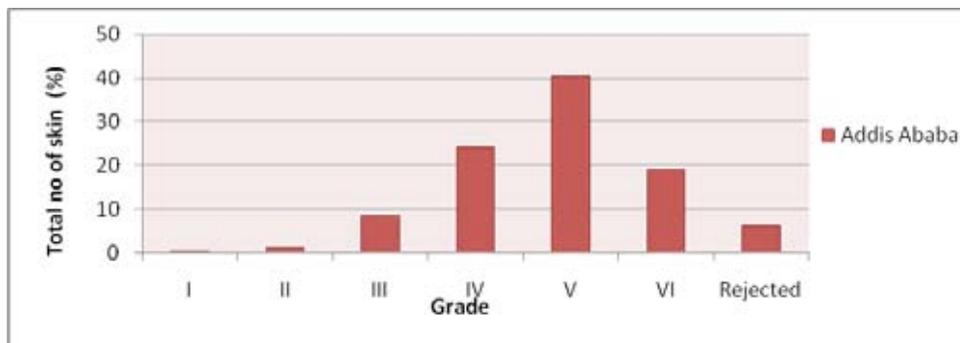


Figure 5. Semi-processed skins originated from A.A at Mersa Tannery.

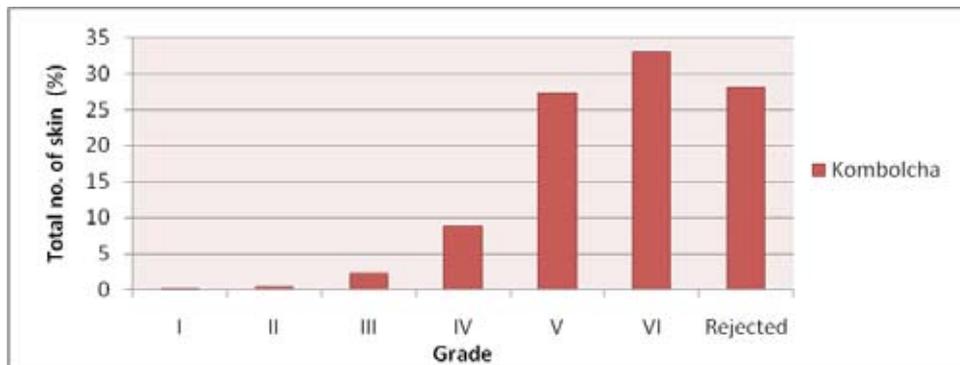


Figure 6. Semi-processed skins originated from Kombolcha at Mersa Tannery

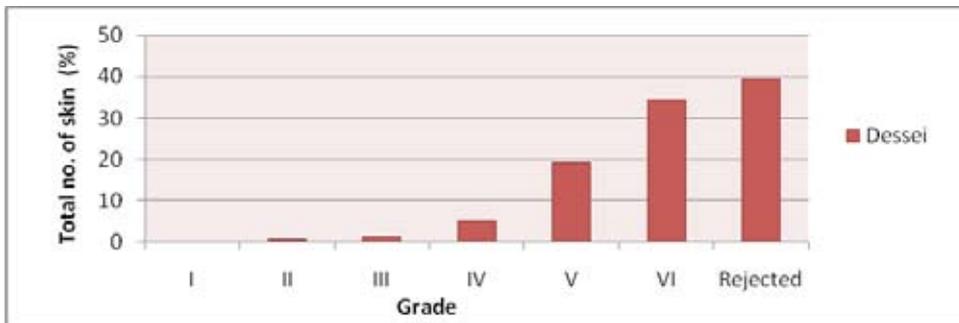


Figure 7. Semi-processed skins originated from Dessei at Mersa Tannery

Efforts were made to compare best quality sheep and goat skins processed at Dessei Tannery between the years of 1998 and 2002 EC. As shown in Figure 8, the quantity of best quality semi-processed skins decreased from 1999 to 2001, but this has increased in 2002. This is probably the positive gradual effect of ectoparasite control campaign conducted in different parts of the region.

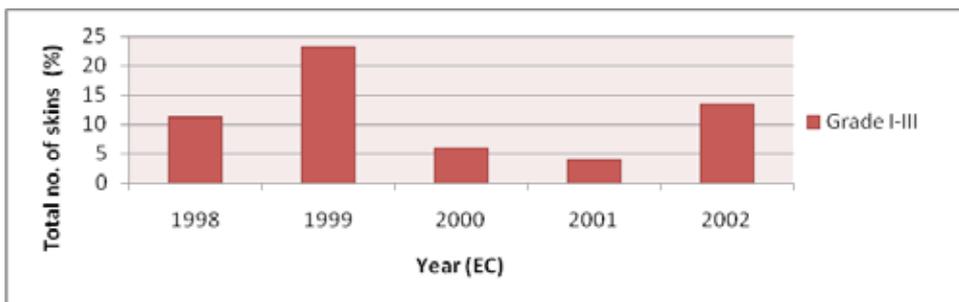


Figure 8. Comparison profile of best quality skins in the years 1998 to 2002 at Desse Tannery

The impact assessment programme reveals that high proportion of unwanted skins which were classified as rejects was observed in 2001 (Fig.9). The likely explanation may be that the export value of leather and leather products, especially semi-processed skins, was lower during that period. As a result of this, many skins stored in different areas of the region were exposed to putrefaction which worsened their quality. Furthermore, result obtained from questionnaire survey showed that many traders were exposed to bankruptcy during the years 1998 and 2001.

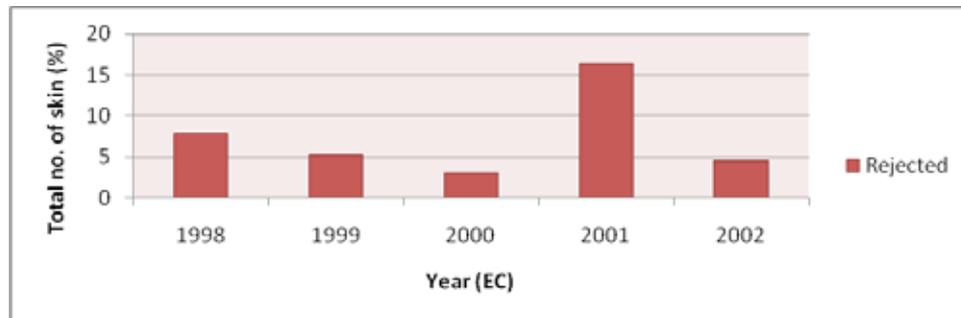


Figure 9. Comparison profile of poor quality skins in the years 1998/2002 at Dessei Tannery

Laboratory Result

Survey on ectoparasites of sheep and goats was carried out in November 2002 EC in northwestern Amhara Region by Bahir Dar Animal Health, Investigation and Diagnostic Laboratory. It was found that the prevalence of ticks was 60.2% and that very few animals were infected with mange parasites. Summary of the result is shown in Figure 10. The laboratory result clearly showed that ticks were the major external parasites of livestock widely spread in the study woredas. Heavy tick infestations can damage hides and skins. However, the parasites are commonly found on the extremities of the livestock body and therefore their contribution to skin rejection is negligible.

As shown in Figure 10 below, lice ranked second after ticks and are moderately distributed in the study woredas. Out of the total of 244 animals examined, 17 were found positive for lice indicating a prevalence of 7%. The two species were *Linognathus sp.* (11/17) and *Damalinia ovis* (6/17). *Damalinia ovis* is a chewing louse that affected the leather industry. The irritation caused by modest population of lice leads to animals scratching and rubbing, causing damage to skins.



Figure 10. Prevalence study of ectoparasites of sheep & goats in northern Amhara Region

A recent study conducted in three selected woredas (Metema, Bahir Dar and Farta) of northwestern Amhara Region indicated that the prevalence of ectoparasites in sheep and goats were 44.9% and 43.5%, respectively (Sisai Amare, 2010). In sheep, infestation with *Damalinia ovis* and *Melophagus ovinus* were recorded as 30.9% and 10.8% respectively. The ectoparasites identified on goats were *Linognathus* spp (27%), *Ctenocephalide* spp (2.6%) and *Demodex* spp (2.2%).

Conclusions and Recommendations

The study showed that skin defects became more apparent after processing in tanneries. Defects of semi-processed skins caused by external parasites are one of the major limitations in the leather industry. The quantity of semi-processed best grade skins has been decreasing for the last two years at the tanneries visited; however, specific disease agents responsible for damaging skins were not yet identified and/or not well documented at tannery level.

The present hides and skins traders are less dynamic and up-to-date than those of the past. This is probably because of the illegal trade that discouraged and reduced the number of legal traders. Hides and skins stores were poorly constructed and ventilated. In general they did not meet the international standards of good hides and skins stores.

Recommendation:

- The ectoparasites control campaign of the Region should continue so as to minimize the prevalence of major external parasites which are responsible for the causes of poor quality skins in the leather industry.

- Sheep and goats should be treated and/or vaccinated against other widespread skin diseases such as sheep and goat pox which cause skin defects.
- All relevant data on hides and skins should be collected and made available in all the tanneries of the Region for the best use and quick interventions.
- Legislations pertinent to illegal trades of hides and skins must be put in place and implemented. Integrated efforts from pertinent offices and/or appropriate systems of control must be put in place and aggressively implemented to combat the shortfall.
- Hides and skins stores should be properly designed to avoid putrefaction of raw hides and skins.
- Researches have to be carried out to identify the major skin diseases that may cause hides and skins defects.

References

- Amare, S. (2010). A cross-sectional study on ectoparasites of small ruminants and their impact on tanning industry in western part of Amhara region, Ethiopia. MSc Thesis, AAU, FVM, Debre Zeit, Ethiopia.
- Asfaw, W. (1997). Country Report: Ethiopia. In: Proceedings of a Seminar on Livestock Development Policies in Eastern and Southern Africa, 28 July-1 August, 1997, Mbabane, Organized By CTA, OAU/IBAR and The Ministry of Agriculture and Cooperative, Swaziland.
- Ayalew, W. (1999). Preliminary view on aggregating biological and socio-economic function for evaluation of goat production in subsistence agriculture with reference to smallholder mixed farms in eastern Haraghe, Ethiopia, p. 67-76. In: Proceedings of the second annual EAGODEV 8-10 December 1998. Arusha, Tanzania.
- Bayou, K., Mengiste, B., Sirak, A., and Tefera, A. (1998). Control of "Ekek", skin defect in sheep by insecticides and shearing. In: Proceedings of 12th Annual Conference of Ethiopian Veterinary Association. June 1998, Addis Ababa, Ethiopia, pp. 104-109.
- CSA (Central Statistical Agency), 2008. Ethiopian Agricultural Sample Survey, 2007/08, Vol. II, Statistical report on Livestock and Livestock Characteristics, Addis Ababa, Ethiopia.
- Sertse, T. and Wossene, A. (2007). A study on ectoparasites of sheep and goats in eastern part of Amhara Region, northeastern Ethiopia. *Small Ruminat Research*, 69: 62-67.

- Tembley, S. (1998). Small ruminant production in Ethiopia. Prospects for improving productivity. Proceedings of the 5th national conference of Ethiopia Society of Animal Production. 15-17 May 1997. Addis Ababa, Ethiopia.
- Tilahun, G. (1995). Parasites of small ruminants. In: Gray, G.D., Ullinbergh, G. (Eds), Parasitological Research in Africa. Proceedings of International Conference, BOBODIOULASSO, Burkina Faso.