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A Survey of Sheep and Goat Diseases in Ilu Abba Bora Zone of Oromia Regional State, Southwestern Ethiopia

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Abstract: The aim of the study was to assess the diseases affecting sheep and goat production and productivity in three districts of Ilu Abba Bora Zone, southwest Ethiopia. Results of the study revealed that 38, 35.5, 34.4, 12.2 and 4.4% of the respondents identified gastrointestinal worms, persistent nasal discharge, coughing, trypanosomiasis and anthrax as the major health problem of small ruminants, respectively. The average mortality of sheep and goats over the last 12 months was significantly ($P<0.05$) lower in Mettu than that of Bacho and Darimu districts. The majority (92.6%) of the respondents used veterinary medicines to treat their sick animals. It can be suggested that technological intervention by concerned stakeholders is vital consideration to improve small ruminant health through efficient health maintenance scheme.

Key words: Goats · Gastrointestinal Parasites · Mortality · Sheep

INTRODUCTION

In Ethiopia, spread of disease still a major constraint for high livestock production. The annual total economic losses due to diseases, mortality and reduced productive and reproductive performance were estimated by 150 million USD [1].

Ethiopia has large sheep and goat population, estimated by 24 and 22.3 million heads, respectively [2] and found widely distributed across the different agro-ecological zones of the country [3, 4]. In spite of the large number of small ruminant population, it is difficult to optimally utilize this resource as the sector is suffering from lower productivity. Among many factors which limit the economic return from small ruminant production diseases stands in the front line [5]. In Ethiopia, 5-7 million sheep and goats die each year due to diseases [6]. Losses due to helminth infection significantly resulting from inferior weight gains, milk yield, condemnation of infected carcasses and organs. The overall economic loss in meat industry due to parasitic diseases in Ethiopia is estimated at 400 million annually [6].

Many of the diseases in Ethiopia are still uncontrolled and are causing devastating effects both to the producers and to the national economy [3]. In sheep, body weight losses due to endoparasitism range from 3-8% while liver fluke alone result in mortality of up to 28% [7]. Moreover, gastrointestinal nematodes cause high mortality among kids and lambs and reduce benefits of smallholders [8, 9].

Even if sheep and goat play a very important socio-economic role, little is known about health problems of these animals in the study area. In order to design relevant disease control strategies, assessment of the existing small ruminant diseases in the area is vital to devise appropriate technological interventions. The aim of this study was, therefore, to assess diseases affecting sheep and goat production and productivity in three districts of Ilu Abba Bora Zone.

MATERIALS AND METHODS

Study Area: Ilu Abba Bora zone has relatively high forest coverage and Eutric Vertisols, Humic alisols and Humic Nitosols are the dominant soil types in the zone [10].

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Human population of the zone is estimated to be about 1.6 million of which 88% is rural. The major cash crops grown in the coffee-livestock based faming system include coffee, chat, spies and fruits, whereas the major food crops grown include Maize, Sorghum, Teff (*Eragrostis tef*), Barely and pulses [10].

Sampling Procedure: Systematic stratified sampling technique was used to select the study districts. The three districts were systematically stratified into three regions based on altitude variations viz. Darimu (low), Mettu (medium) and Bach (high) altitude, respectively. A total of 270 households, (90 from each district) were randomly selected.

Data Collection and Analytical Technique: Before conducting the formal survey, group discussion was made with key informants such as elders and experts in the respective Office of Zonal and District Agriculture and Rural Development to have an overview about small ruminant production system in the study areas. A single-visit-multiple-subject formal survey technique [11] was used to interview the household heads using structured questionnaire. The questionnaire was pre-tested and modified as necessary. Finally the formal survey was conducted by trained enumerators under close supervision and participation of the researcher. Data was obtained on major diseases, mortality, treatment and reasons for animal exists. The quantitative and qualitative data was coded and analyzed using the means and frequency procedures of Statistical Package for Social Sciences (SPSS version 16). Chi-square test was used to examine differences between levels of significance of different quantitative variables among districts and analysis of variance (ANOVA) using the general linear model procedure of SPSS. Least Significant Difference (LSD) test was made for mean separation, when there was significant deference among districts.

RESULTS AND DISCUSSION

Prevalence of Small Ruminant Diseases: The study revealed that internal parasitic infestation has the highest incidence limiting small ruminant production. Most (38%) of the respondents reported that Gastro-intestinal parasites are the major health problem of goats and sheep in the study area. About 35.5 and 34.4% of the respondents reported the occurrence of persistent nasal discharge and coughing, which might be attributed to either liver fluke or lung worm. About 12.2 and 4.4% of the respondents reported that trypanosomosis (*qoqsa*) and anthrax are also animal health problems in the study area. The effects of internal parasites followed by nasal discharges were reported to be serious problems in kids and lambs. Similar results have been previously reported by Perry *et al*. and Solomon *et al*. [8, 9], who observed that high mortality among kids and lambs attributed to diseases and parasite infestation in Ethiopia. In the nearby of the study areas, Didessa district, a prevalence rate of trypanosomiasis in sheep 4.5% and in goats 3.7% was reported [12].

Mortality of Small Ruminants: The average mortality of sheep from Mettu districts (0.22) during the last 12 months was significantly ($P<0.05$) lower than from Bacho (0.68) and Darimu (0.79) districts. Lamb mortality from Mettu was significantly ($P<0.05$) lower than those of Darimu and Bacho districts. The mortality of lambs between 3-6 months was 0.11, 0.19 and 0.25 for Mettu, Bacho and Darimu districts, respectively. The death of lambs aged from 0-6 were significantly lower for Mettu district because farmers in Mettu district has better access to veterinary services and care of lambs. Mortality of ewes was higher in Bacho district as compared to that of Mettu and Darimu districts. The respondents reported that mortality of suckling lambs followed by 3-6 months of ages was higher. The results of the present study is in agreement with Tsedeke and Belete [13, 14] who reported higher mortality of suckling lambs, followed by age group of 3-6 months old. Kids mortality was significantly ($P<0.05$) lower in Mettu than from Bacho and Darimu districts indicating better health care of kids in Mettu. The mean mortality of goats in the age group of 3-6 months was 0.09, 0.11and 0.14 for Bacho, Mettu and Darimu district respectively. The overall average mortality of breeding female (Does) over the last 12 months was 0.10. The mortality of suckling kids observed in this study was lower than the findings of Belete [13] in Gomma district. The respondents indicated that in both species more losses occurred among offspring of multiple births than those of single births. This finding agrees with observations by Wilson (1976a) who reported that the death rate of twin lambs was almost twice that of single lambs.

In general the mortality of lambs and kids was higher than adult animals. This is mainly due to poor overall management, malnutrition, less adoptability of young lambs and kids to harsh environment, inadequate housing, inadequate health services and absence of supplementary feeds. This result agrees with that of

Table 1: Prevalence of small ruminant health problems as perceived by respondents (%) in the study area

	Districts			
Diseases and parasites	Bacho	Mettu	Darimu	Overall
Gastro-intestinal parasites	55	32	26	37.7
Diarrhea	23	32	24.8	26.6
Bottle jaw	11	16	6.3	11.1
Nasal discharges (*furro*)	32	27	47	35.5
Coughing	49	31.2	23	34.4
Liver flukes (*balle*)	31	24.4	13	22.8
Trypanosomosis (*qoqsa*)	0	8	28.6	12.2
Anthrax	2	5	6	4.4
Emaciation (loss of weight)	2	2	4	2.7

Table 2: Mean age of sheep and goats mortality over the last 12 months

	Districts				
Animal structure	Bacho	Mettu	Darimu	Overall	Sig
Sheep					
<3 months	0.31±.61[a]	0.04±0.26[b]	0.49±0.77[c]	0.28±0.61	0.000
3-6 months	0.19±0.52[a]	0.11±0.38[a]	0.25±0.59[a]	0.18± 0.50	0.159
Ewes	0.14±0.28[a]	0.04±0.21[a]	0.06±0.23[a]	0.08±0.29	0.037
Rams	0.04±0.21[a]	0.02±0.15[a]	0	0.02±0.15	0.130
Castrates	0	0	0	0	-
Goats					
Less than 3 months	0.33± 0.75[a]	0.08±0.37[b]	0.39±0.76[a]	0.27±0.66	0.003
3-6 months	0.09±0.32[a]	0.11±0.38[a]	0.14±0.51[a]	0.12±0.41	0.661
Does	0.11±0.35[a]	0.18±0.7[a]	0.01±0.11[a]	0.10±0.47	0.053
Bucks	0.02±0.15[a]	0.10±0.47[a]	0	0.04±0.29	0.051
castrates	0.01±0.11[a]	0.01±0.10[a]	0	0.04±0.06	0.369

Superscripts with different letters across the rows differ significantly ($p<0.05$)

Table 3: Small ruminant treatment methods and veterinary services in the study area (%)

	Districts			
Variables	Bacho	Mettu	Darimu	Overall
Methods of small ruminant treatment				
Traditional medicines	10	0	12.2	7.4
Veterinary medicines (government)	88.9	96.7	87.8	91.1
Veterinary medicines (open market)	1.1	0	0	0.37
Sources of veterinary services				
Government	98.9	100	100	99.6
Private	1.1	0	0	0.4
Means of getting veterinary service				
Free of charge	0	0	0	0
With Payment	100	100	100	100

Table 4: Ranking of reasons for culling of small ruminants in study area

	Rank					
Reasons	1st	2nd	3rd	4th	5th	Index
Fertility	229	29	3	9	0	0.32
Age	12	134	94	26	2	0.23
Health	15	90	133	21	10	0.22
Physical defect	10	3	20	157	79	0.12
Undesirable characteristics	3	12	20	44	177	0.11
Total	270	270	270	257	268	1

Index= [(5 for rank 1) + (4 for rank 2) + (3 for rank3) + (2 for rank 4) + (1 for rank 5)] divided by sum of weighed value purpose mentioned by participant

Thakshala and Marapana [15]. Halpin [16] pointed out that the age of the animal has a great effect on its ability to withstand attack by both physical and biological agents

Disease Control Methods: Sheep and goats disease control measures are shown in Table 3. The majority (92.6%) of the respondents used veterinarian prescribed modern medicines to treat sick animals. Few of the respondents (7.4%) reported to have traditional practices (ethno-veterinary traditional medicines) for treating their sick animals. Veterinary clinic service was reported to be frequently accessible in Mettu than Bacho and Darimu Districts. Thus, government should establish more animal health infrastructure at Bacho and Darimu districts. About 53% of the respondents vaccinated their sheep and goats free of charge. The government run animal health centers are the major (probably the only) source of veterinary services at subsidized price. The purchase and use of illegal drugs of unknown source is reported by about 0.37% of the respondents. About 1.1% of the respondents at Bacho district were reported to sale their animals upon observations of disease symptoms at early stage. But none of the respondents reported to slaughter sick animals for home consumption.

Culling: Reasons of culling animals is presented in Table 4. Respondents ranked fertility problems, age, health problem, physical defects and undesirable characteristics as the most important reasons for animal exist with an index of 0.32, 0.23, 0.22, 0.12 and 0.11, respectively. Breeding females and young animals are rarely and occasionally culled. In Kenya, the main reasons for culling for both goats and sheep and for both smallholders and pastoral/ extensive farmers were age of the animals (28%) followed by fertility (21%), small size (19%), health (13%), performance and temperament (both 3%). Other reasons included feed scarcity, overpopulation, drought and prevention of inbreeding (2%) and conformation, colour and condition of the animal (1%) [17].

CONCLUSIONS

Internal parasites, persistent nasal discharge, diarrhea and coughing were the major identified health problem of small ruminants in the study area. Other diseases of economic importance included trypanosomiasis (*qoqsa*) and anthrax. This study revealed that the mortality rate is generally higher in lambs and kids than in adults. This is mainly due to poor overall management, malnutrition, less adoptability of young lambs and kids to harsh environment, inadequate housing, inadequate health services and absence of supplementary feeds. Thus, it is suggested that technological intervention by government, non-governmental organization and farmers is vital consideration to improve small ruminant health through provision of efficient health maintenance scheme, adequate nutrition, housing and management.

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