

Prevalence of Cattle Diseases and Productive and Reproductive Traits of Cattle in Ilu Aba Bora Zone, South Western Ethiopia

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Abstract: A cross-sectional survey was conducted in three districts of Ilu Aba Bora zone of Oromia Regional State to assess prevalent diseases and productive and reproductive performance of cattle. A pre-tested, structured questionnaire was used to collect data. Using a stratified sampling technique, a total of 180 households from three districts were included in the survey. Collected data were analysed using descriptive statistics. Results indicated that the major diseases of cattle reported by respondents included Trypanosomiasis, Black leg, Pasteurellosis and mastitis with indices of 0.295, 0.212, 0.19 and 0.114, respectively. Majority (83.3%) of the respondents used traditional medicine to treat their sick animals. The overall mortality of cattle in the study area was found to be 19.2%, with 15.7 and 11.2% mortality of heifers and oxen, respectively. The overall average milk production per cow per day, lactation length, age at first calving and calving interval was 1.31 ± 0.03 liter, 8.87 ± 0.12 months, 49.37 ± 0.25 months, 18.76 ± 0.23 months, respectively and there was a significant ($P < 0.05$) difference in all productive and reproductive traits of cows among the different study districts.

Key words: Cattle • Disease • Mortality • Productive • Reproductive

INTRODUCTION

Diseases are a major constraint to the improvement of the livestock industry in the tropics [1]. Animal health issues are barriers to trade in livestock and their products, whilst specific diseases decrease production and increase morbidity and mortality [2, 3].

In Ethiopia, cattle produce a total of 3.2 billion liters of milk from about 10 million milking cows, an average of 1.54 liters per cow per day over a lactation period of about 6 months and 0.331 million tones of meat annually [4, 5]. The national milk production had increased by 1.6% and per capita production declined by about 0.8% annually during 1966–2001 [6].

In Ethiopia, the productivity of the indigenous breed is low. Usually cows do not produce their first calve earlier than 35-53 months of age [7]. In the traditional mixed farming and pastoral/agro-pastoral systems local breeds produce 400-680 kg of milk per cow per lactation period of less than seven months [8]. The lactation length of Horro cows was on average six months, which is very short ones [9]. The calving interval

for Ethiopian Zebu ranged from 12 to 24 months, which varies among breeds and animals within a breed [10]. According to CSA [11], an average lactation length of cows in private holding ranged from 5-7 months. The low productivity is due to a number of factors, among which are, quantitative and qualitative deficiencies in the feed resource base, diseases, poor animal performance level and insufficient knowledge on the dynamics of the different types of farming systems existing in the country [12].

In the study area, there is little information on prevalent diseases of cattle and productive and reproductive performance of indigenous cows. Thus, studying the existing diseases and performance of cattle will generate baseline information to extension agents, researchers, policy makers and other stakeholders so that intervention can be made available to control diseases and improve performance of cattle. With this background, the objective of this study was to assess diseases of cattle and productive and reproductive performance of indigenous cows in three districts of Ilu Aba Bora Zone.

MATERIALS AND METHODS

Study Area: The study was conducted at three districts (namely Bacho, Algie and Chewaka) of Ilu Aba Bora zone in Oromia Regional State, south western Ethiopia. Ilu Aba Bora zone has 1633156.56 hectares (ha) of land of which 10% is high land, 67% medium land and 23% low land. The altitude of the zone ranges from 500-2575 meter above sea level. It is mostly known for its vegetation coverage, suitability for coffee, crop, livestock and bee production. The dominant crops being Maize, Teff, Coffee, Sorghum, Barley, Wheat, different pulse crops, finger millet, fruits, vegetables, spices and rice. Human population of the zone is 1,492,183 people. Out of the total population, 88% live in the rural areas. Annual precipitation ranges from 1500-2200mm with 6 to 9 months of rain fall [13].

Bacho, Algie and Chewaka are the three districts of the zone selected for this study based on variation in altitude and potential for cattle resource. Bacho, Algie and Chewaka districts represented high, medium and Low land, respectively. Bacho, Algie and Chewaka districts are located at a distance of 640, 654 and 560 km, respectively from Addis Ababa and are situated at an altitude ranging from 1650 to 2500, 1139 to 2165 and 900 to 1400 meters above sea level, respectively, with area coverage of 49,249, 94,344 and 54,220 ha, respectively. Bacho, Algie and Chewaka districts receives an average annual rainfall ranging from 1500 to 2200, 1371.6 to 2275 and 1000 to 1200 mm, respectively and the minimum and maximum daily temperature of 12 and 25°C, 14.9 and 25.1°C and 36 and 41°C, respectively. Human population of Bacho, Algie and Chewaka was estimated to be 42,335, 90,290 and 92,027 people [13].

Sampling Procedure: A stratified sampling technique was used based to obtain the respondents for the purpose of this study based on the agro-ecological zone (high, medium and low) altitude. Bacho, Algie Sachi and Chewaka districts represented high, medium and Low land, respectively. A total of 180 households, 60 from each district were randomly selected using systematic random sampling method.

Sources of Data and Analytical Technique: Informal and formal survey tools were employed to gather primary data for this study. These were obtained by using pre-test, well-structured questionnaires. The respondents were smallholder cattle producers. The data collected were on prevalent disease of cattle, milk production and age at first calving (AFC), Caving interval (CI), lactation length (LL),

mortality and delivery of veterinary service. The data were analyzed using descriptive statistics such as mean, standard deviation, percentages and GLM ANOVA using SPSS software version 16. Indices were calculated for major diseases affecting cattle production in the study area. Least Significance Difference was employed to separate means having statistically significant difference.

RESULTS AND DISCUSSION

Prevalence of Cattle Diseases: According to the respondents, Trypanosomiasis, Black leg, Pasteurellosis and mastitis were the major diseases that affect cattle production with indices of 0.295, 0.212, 0.19 and 0.114, respectively. Workneh and Rowland [14] indicated that in Oromia region the major cattle diseases were Blackleg, Trypanosomiasis, Pasteurellosis, Anthrax, Foot-and-mouth disease (FMD), gastrointestinal disorders and respiratory diseases. In this study trypanosomiasis was reported as the first important disease limiting cattle production in Algie district with indices of 0.419 and Chewaka (0.394) and Bacho (0.072) districts, respectively. In contrast, black leg was reported by farmers as the first, second and third important disease of cattle production in Bacho, Chewaka and Algie districts, with indices of 0.316, 0.19 and 0.13, respectively. Similar result was reported by Workneh and Rowland [14] who indicated that Blackleg was more common in the highland altitudethan other agro ecologies in the region. Pasteurellosis was stated as the second major diseases in Bacho and Chewaka, while ranked third in Algie with indices of 0.22 and 0.21 and 0.138, respectively. The reason for the existence of different diseases among the study districts was probably due to the variation in agro-ecology. Belay *et al.* [15] reported that mastitis, external parasites, lumpy skin disease and heart water are the major diseases of importance around Jimma town.

Animal Treatment and Mortality: In order to reduce cattle losses due to diseases, farmers in the study area used different prevention and control measures. Majority (83.3%) of the respondents used traditional treatments to treat their sick animals. The reasons for using traditional treatment were lack of adequate veterinary services, long distance to animal clinics, lack of transport facilities and they believed that the animal can recover with traditional ethno-veterinary practices. Some of the respondents indicated that they purchase illegal drugs from open market to treat their animals, where by the dose and type of disease was not identified by

Table 1: Indices of prevalence of cattle diseases in Bach, Algie and chawaka districts of Ilu Aba Bora Zone

<i>Districts of the study</i>																
<i>Diseases</i>	<i>Bacho</i>				<i>Algie</i>				<i>Chewaka</i>				<i>Total</i>			
	R1	R2	R3	Index	R1	R2	R3	Index	R1	R2	R3	Index	R1	R2	R3	Index
Black leg	45	20	15	0.316	10	13.3	20	0.127	20	20	15	0.19	25	32	16.7	0.212
FMD	1.7	10	10	0.058	0	0	1.7	0.002	1.7	10	10	0.058	1.1	6.7	7.2	0.039
Mastitis	18.3	28.3	15	0.211	0	10	8.3	0.047	1.7	18.3	10	0.086	6.7	18.9	11.1	0.114
Trypanosomiasis	10	3.3	6.7	0.072	65	25	6.7	0.419	61.7	23.3	5	0.394	45.6	17.2	6.1	0.295
Pasteurellosis	23.3	23.3	13.3	0.22	8.3	33.3	38.3	0.216	10	18.3	16.7	0.138	13.9	25	22.8	0.19
Bloat	0	3.3	10	0.027	0	0	1.7	0.002	0	0	0	0.000	0	1.1	3.9	0.01
Internal parasites	0	3.3	6.7	0.022	0	0	0	0.000	0	0	5	0.008	0	1.1	3.9	0.01
LSD	1.7	6.7	20	0.064	1.7	6.7	6.7	0.042	0	3.3	11.7	0.03	1.1	5.6	12.8	0.045
Tick	0	1.7	3.3	0.011	0	1.7	1.7	0.008	0	5	5	0.025	0	2.8	3.3	0.014
Mitch	0	0	0	0.000	0	1.7	1.7	0.008	0	0	1.7	0.002	0	0.6	1.1	0.003
Blood urinate	0	0	0	0.000	15	8.3	11.7	0.122	5	1.7	16.7	0.058	6.7	3.3	9.4	0.06
Brucellosis	0	0	0	0.000	0	0	1.7	0.002	0	0	3.3	0.005	0	0	1.7	0.002
Total	100	100	100	1.00	100	100	100	1.00	100	100	100	1.00	100	100	100	1.00

Index = [3 for rank 1) + (2 for rank 2) + (1 for rank 3)] for each of the factor divided by sum of all of the factors, FMD= Foot and mouth disease, LSD= Lumpy skin disease

veterinary experts. Mirutse and Gobena [16] reported that Ethiopian farmers and pastoralists rely on traditional knowledge, practices and locally available materials, plants in particular, to control and manage domestic animal diseases. Tafese and Mekonen [17] also reported that in the central highlands of Ethiopia, 40% farmers use traditional veterinary practices, while 85% of livestock owners use both modern and traditional veterinary practices. In addition to using traditional medicines, farmers also cull cows with chronic mastitis. Majority (50.6%) of the respondents cull out their cows due to mastitis (decline in milk production), old age, fertility problem and cash need to meet some house hold necessities. During the course of this study, a high prevalence of mastitis was observed in cows.

Majority (82.8%) of the respondents were provided with animal health services from government veterinary clinics, while 17.2% used both government and private clinics. Respondents that used private animal clinics were higher in Bacho (43.3%) than Chewaka (8.3%) and none in Algie district. Contrary to our findings, 71.4% of respondents in Metema district get animal health services from private practitioners [18].

The overall percentage mortality of cattle due to disease in the study area was found to be 19.2%. The high mortality recorded for cows was associated with dystocia, placental prolapses and trypanosomiasis. The mortality rate of heifers and oxen was found to be 15.7% and 11.2%,

respectively. This shows that the study area need great attention in animal health care in order to reduce mortality associated with lack of animal health services. The level of cattle losses due to disease in the study areas was higher as compared to other causes. Most of the respondents (87.3%) indicated that the causes of cattle mortality during the last 12 months were mainly due to disease, accident, predators and human attack. Similar results were also reported by Workneh and J. Rowlands and Kedija, [14, 19].

Distance to Animal health Service: The average distance traveled to animal health services was 8.89±0.20Km, ranging from 6-14 km. Significant (P<0.05) difference was observed between districts in distance travelled to animal health centers. In contrary to the present result majority (65%) of the households in Jimma zone trek their cattle for 1-5 km to arrive at veterinary clinics [20].

Productive and Reproductive Traits of Cattle

Daily Milk Yield (DMY): The measures of different productive and reproductive traits are shown in Table 3. The overall average milk production per cow per day for the three districts was 1.31±0.03 liter. Average milk yield per cow per day in Chewaka district was significantly (P<0.05) higher than in Bacho and Algie. This might probably be due to the good management provided to lactating cows in Chewaka. The reported average daily

Table 2: Cattle mortality during the last 12 months and average distance travelled to animal health centers

Types of animals dead	Districts			Overall
	Bacho	Algie	Chewaka	
Calves	28.1	35	18.2	30.5
Heifers	17.7	17.7	7.6	15.7
Cows	24.5	24.6	31.8	26.5
Steer	16.9	13.5	24.2	16.1
Oxen	11.8	9.2	18.2	11.2
Distance to clinic (km)	10.85±0.29 ^a	9.18±0.34 ^b	6.82±0.10 ^c	8.89±0.20

Means with same superscript within the same row are not significantly differ at 5% level of significance. SE= Standard errors.

Table 3: Least square means and standard errors of productive and reproductive performance of cows in the study areas

Variables	Districts			Overall
	Bacho	Algie	Chewaka	
DMY(Liter)	1.23±0.04 ^a	1.13±0.04 ^a	1.59±0.06 ^b	1.31±0.03
LL (Month)	9.65±0.23 ^a	8.57±0.17 ^b	8.40±0.18 ^b	8.87±0.12
AFC(month)	47.58±0.50 ^a	49.07±0.38 ^b	51.47±0.25 ^c	49.37±0.25
CI (Month)	17.07±0.27 ^a	18.60±0.37 ^b	20.62±0.39 ^c	18.76±0.29
Weaning age of calves	10.52±0.27 ^a	10.65±0.21 ^a	10.55±0.19 ^a	10.57±0.13

Means with the same superscript within the same row are not significantly different at 5% level of significance.

milk yield per cow in the present current study is higher than the value reported by Lemma *et al.* [21] which was 1.0 liters and Dagen and Adugna, (1999) which was 1.09 liters, but lower than that of Workneh and Rowland [14], Tesfaye [18] and Belay *et al.* [15] elsewhere in the country. The possible reasons of low milk production of cows in this study might be poor genetic makeup, high prevalence of disease, inadequate feed both in quality and quantity and poor management practices.

Lactation Length (LL): The present result showed that the overall average lactation length was 8.87±0.12 months, which showed significantly (P<0.05) higher lactation period for Bacho district. This is in agreement with results reported by Workneh and Rowland [14] for Oromia region. The average lactation length of cows obtained in this study is longer than the average of 5.9, 7.29 and 8.29 months in Metema, Mieso and Jimma districts [18-20].

Age at First Calving (AFC): In this study the overall average age at first calving was 49.37±0.25 months. The study areas varied significantly in age at first calving (P<0.05). This variation in AFC between the study areas

is probably due to the difference in management and feeding systems. In addition, stress due to heat, high prevalence of disease and drought were mentioned as main reasons for the prolonged AFC in Chewaka district. The average AFC in this study was higher than the value of 47.61 months reported for Fogera breed [22] and 42 month in Jimma zone [20]. However, the AFC in this study was lower than that of Mieso, Metema and Horro regions in Ethiopia [18, 19]. The reasons behind this longer AFC could be attributed by poor nutrition, diseases and lack of adequate management practices.

Calving Interval (CI): The overall average length of calving interval was 18.76±0.23 months. There was a significant (P<0.05) difference in length of CI across study districts. This variation could be associated with the difference in management practices like feeds and stress such as high temperature and drought, which resulted in too longer CI in lowland district. The average CI obtained in this study falls within the range of CI for Ethiopian zebu cattle of 12.2 to 26.6 months reported by Mukassa-Mugrewa [23]. The CI obtained in the present study was in agreement with Addisu and Hegede [24]. On the other hand, higher CI than results of this study was reported by Kedija [19] at Mieso districts. Mukasa-Mugerwa [25] reported 12.2 and 12.9-15.1 months of CI for Horro and Arsi cattle, respectively.

Weaning Age of Calves: The overall average weaning age of calves in the study area was 10.57±0.13 months. There was no significant (P>0.05) difference in average age of weaning among districts. The result obtained in this study was higher than the findings of Kedija [19], who indicated average weaning age of 7± 0.17 months at Mieso district. The value obtained in this study falls within the range of 7-12 months in Borana [25]. On the other hand, higher average weaning ages of calves (11.8 months) was reported in Bahir Dar Zuria and Mecha districts [26].

CONCLUSION

Results of the study indicated that the major diseases of cattle reported by respondents in the study area included Trypanosomiasis, Black leg, Pasteurellosis and mastitis with high prevalence of trypanosomiasis. Majority of the respondents used traditional medicine to treat their sick animals. The productive and reproductive

performance of cattle was found to be low with low milk production, short lactation length and long age at first calving and calving interval. The prevalence of contagious diseases in the study area was due to inadequate veterinary services, lack of vaccination against the common diseases and poor nutrition. Thus, to alleviate the economic loss from diseases and improve potential importance of cattle, farmers should obtain adequate training on economic importance of diseases. In addition, adequate supply of veterinary services needs to increase through government and community intervention. The possible cause of poor productive and reproductive performance of cows in this study might be poor genetic makeup, high prevalence of disease, inadequate feed both in quality and quantity and poor management practices. Thus, the poor performance of cows in the study area calls for technical intervention by all stakeholders to overcome factors attributing to such poor performance.

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