

Observational Study of Major Dairy Health Problems in Ambo and Holeta Town, Oromia Region

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Abstract

Aim: The study was conducted from November 2014 to April 2015 dairy farms of the Ambo and Holleta town to assess the major observed health problem associated risk factors.

Methods: The total of 20 small and large-scale dairy farms were included in the current observational study. From these selected dairy farms, 475 dairy cattle; 201 in Holleta and 274 in Ambo were examined for different health problems. Observational study was implemented by conducting regular visit during the study period with the interval of once per three weeks.

Results: Accordingly, Dermatophilosis (25.1%), mange mites (18.3%), tick infestation (30.1), lice infestation (20.2), retained fetal membrane (3.1), dystocia (2.8) as common reproductive problem of dairy cows. Infectious disease like clinical mastitis (5.9%), black leg (1.9%), lumpy skin disease (0.63%), foot and mouth disease (0.84) were also recorded.

Conclusion: The result obtained from observational study showed that these major health problems hinder success of dairy farm operation and future expansion. Therefore, further studies should be preceded to develop a control and prevention methods to improve the productivity of the sector.

Keywords: Ambo; Dairy cattle; Holleta; Reproductive problem; Skin disease

Introduction

In sub Saharan Africa livestock plays a crucial role in economic development of the countries and living standard of rural communities by serving as source of income in which their production accounts for approximately 30% of the total agricultural GDP and 16% of national foreign currency earning and for food (IBC, 2004). Export of live animals and animal products make substantial contribution to the foreign exchange earnings of many countries. As in many other countries, livestock plays multiple roles in Ethiopia being a major natural source of food, industrial raw materials, export earnings and form an integral part of agriculture production system [1,2]. Livestock production constitutes one of the principal means of achieving and improving living standards in many regions of the agricultural productive system in Ethiopia [3].

Ethiopia is one of the few countries in the world with high livestock potential. The livestock population of the countries comprises about 31 million of cattle, 23 million of sheep, 18 million Goat, 7 million of equines, 1.2 million camels, 53 million poultry and immense bee and fisheries [4]. This population ranked Ethiopia, first from and tenth from the world in livestock population. However, their productivity is low despite their large population due to varies constraints such as diseases, poor nutrition, poor management practices and low productive performance of the indigenous breeds [5].

The low cattle productivity in tropics is attributed to poor genetic potential, malnutrition, inadequate management practices (since most of the cattle are in rural areas where traditional activities are highly practiced), high incidence of disease and parasitic burden which cause high livestock morbidity and mortality [6]. Disease of dairy animals that cause morbidity and mortality are the major problem faced in raising dairy cattle which occurs as a result of complex interaction of the management practices and environment, infectious and the animal itself. This causes annual losses of billions of dollars, a large portion of which is attributable to treatment costs and decrease feed efficiency and growth rate. Therefore, the efficient production of livestock that yields milky is a major concern of the society [7].

It is an established fact that development of urban and per-urban dairy production requires above all a sound knowledge of the magnitude, and predisposing factors of diseases with its control and preventive methods [8]. Many diseases outbreaks could be minimized or prevented proper management and nutritional practices [9]. According to ILCA [10], good management which decrease major and increase feed efficiency, breeding and feeding practices that accelerate the growth of animals (shorten the period from birth to marketing or reproduction, increase efficiency of conversion of feed to milk or meat). Small scale urban dairy farming using cross breed cattle is raising as an important business center in urban and per-urban surroundings of Ambo that are aimed to provision of milk and milk products to the society. But productivity is not as much as farmers' expectation due to different disease condition and poor management practices. However comprehensive studies made on dairy health are

limited. Therefore, this study is important to be performed earlier as urbanization of the area is increasing and help to promote the desired output of dairy products. Therefore, the major objective of the current study was concentrating on the following major objectives: To assess the major health problems of dairy farms and associated risk factor.

Materials and Methods

Study area

The study was conducted in and around Ambo and situated at 8°56'30"- 8°59'30"N latitude and 37°47'30"- 37°55'15" E longitude in central Oromia, Ethiopia, 114 km west of Addis Ababa. The latitude of the area ranges from 1380-3030 m.s.l, characterized by warm temperature weather which is locally called Bada dare (mid latitude). The temperature ranges from 15°C-29°C with average temperature of 22°C. It receives a mean annual rain fall ranging from 800-1000 mm with an average of 900 mm. The highest rain fall concentration occurs from June to September and the mean monthly relative humidity varies from 64.6% in August to 35.8% in December, which is comfortable for human life. Livestock are major agricultural resource in this area. The total animal population of the area is 144,243 cattle, 95,661 ovine and caprine, 23,100 equine and 92,030 poultry. The total human population of the Ambo is estimated to be 112,129 with total of 55, 4919 (50.08%) and 769 (57.69%) female and 55,305 (49.92%) and 564 (42.31%) male in rural and urban, respectively [11].

Study animal population

Study was conducted according to the availability of dairy farms in urban or per-urban area of Ambo and Holleta from the November 2016 to April 2017. Small holder and large dairy farms found in Ambo and Holleta town area, both kept under intensive semi-intensive area and animals at different age productive status were all included in the study.

Sampling and sample size determination

In the current study both large small-scale dairy farms were considered based on management practices activity of health services and willingness to participate in the study. Accordingly, the total 20 dairy farms, 6 from Ambo and 14 from Holleta town were selected. From these selected farms 201 from Ambo and 274 from Holleta were examined for different health problems in which all age group were included. However, young animals were not included in study of reproductive health problem.

Study design

Observational study was conducted on dairy farms to see the occurrence of major health problems in the study area. To do this observational data collection format was prepared and filled so as to increase the reliability of information collected in observation. On the

observational study techniques like knowledge of clinical diagnosis, history taking, and response to previous treatment were tools used to group the disease and problems in systematic and comprehensive manner.

Data management and analysis

Finally, the data obtained from observational study was entered micro soft-excel spread sheet and coded appropriately. For the data analysis SPSS version 17 was used and the prevalence was calculated by dividing the number of positive animals by the total sampled population. The chi-square (χ^2) test was used to access the association among risk factors, namely the age, sex, body condition, management system with the occurrence of the disease. In all the analysis, confidence level was held at 95% and statistical analysis was considered significant at $p < 0.05$.

Results

Out of the total 475 dairy cattle examined, 119 (25.1%), 87 (18.3%), 143 (30.1), 96 (20.2%) were found harbor dermatophilosis, mange mite, tick infestation, and lice infestation, respectively as shown in Table 1.

The study found that the prevalence of echo-parasitic infestation compared with different risk factors like age group, district, body condition, management status, ticks were the major health problems relation with skin infestation as compared to other problems, followed by dermatophilosis and lice. The study accessed the occurrence of tick was significantly higher ($p < 0.05$) in young animals, whereas for others (lice, mange mite and dermatophilosis) it is significantly higher ($p < 0.05$) in adult animals. The comparison with district shown that prevalence of tick is significantly higher in Ambo whereas there is no significant difference ($P > 0.05$) in poor body conditioned animals, while the others were more significant in medium conditioned animals. The comparison with management system revealed that the prevalence tick infestation and dermatophilosis to be significantly higher in animals kept under semi-intensive management system as indicated in Table 2.

Skin disease	No of positives	percentage	Stand Error	95% con. Interval	
				Lower	Upper
dermatophilosis	119	25.1	4.2	21.1	29.1
Mange mite	87	18.3	3.6	14.9	21.7
Tick infestation	143	30.1	4.4	26.7	34.5
Lice infestation	96	20.2	3.6	16.8	24.0

Table 1: Over prevalence of skin disease of dairy cattle in the study area.

Factors	Categories	No of animal examined	Prevalence			
			Ecto-parasite infestation			
			Tick	Lice	Mange mite	Dermatophilosis
Age	young	152	87 (57%) *	21 (13.8%)	25 (16.4)	38 (25%)

	mid age	92	19 (20.6)	7 (7.6)	13 (14.1%)	16 (17.4%)
	Adult	231	37 (16%)	68 (29.4) *	49 (21.2%) *	65 (28.1%) *
District	Holleta	201	34 (16.9%)	39 (19.4%)	35 (17.4%)	45 (22.4%)
	Ambo	274	109 (39.8%) *	57 (20.8%)	52 (19%)	74 (27%)
Body condition	Good	340	55 (16.1%)	49 (14.4%)	22 (6.4%)	40 (11%)
	Medium	114	68 (59.6%) *	35 (30.7%)	61 (53.5%) *	72 (63%) *
	Poor	21	20 (95%)	12 (57.1%) *	4 (19%)	7 (33%)
Management	Intensive	289	57 (19.7%)	59 (20.4%)	25 (8.7%)	45 (15.6%)
	Semi-intensive	186	86 (46.3%)	37 (19.9%)	62 (33.3%)	74 (39.8%) *

Key *P<0.05

Table 2: Prevalence of skin disease of dairy cattle compared with different risk factors.

Reproductive and other health problems

The study found that reproductive health problems such as clinical mastitis, abortion, retained fetal membrane, dystocia were the major health problem in the area with a prevalence of 19 (5.9%), 9 (2.8%), 10 (3.1%), 9 (2.8%) respectively. Comparison was made to see the association of reproductive health problems with different risk factors, it was found that the prevalence of clinical mastitis is significantly higher ($p < 0.05$) in Holleta district, older and caws having more than two calving.

Whereas no statistically significant difference ($p > 0.05$) was observed for other reproductive problems like retained fetal membrane, abortion and dystocia when compared with district, age group, parity, management system and housing shown in Tables 3 and 4.

Besides these there are another infectious disease that were found to be potential health problem to dairy cattle, these are black leg, diarrhea, lumpy skin disease and foot and mouth disease with a prevalence of 9 (1.9%), 5 (1.1%), 3 (0.63%) and 4 (0.84%), respectively. Even if their occurrence low black leg was found to be relatively higher but no statistically significant difference was observed among the different risk factors.

Other miscellaneous problems that were found to affect dairy cattle productivity were digestive problem, hoof over growth and mineral deficiencies with prevalence of 3 (0.63%), 1 (0.21%) and 14 (3%), respectively. Even though they were diagnosed in the herds they have no significant difference with different risk factors.

Disease problems	Specific diseases	No of animals examined	No of positives (prevalence)	Stand Error	95% confidence interval	
					lower	Upper
Reproductive problems	Clinical mastitis	323	19 (5.9)	1.7	2.3	8.7
	Abortion		9 (2.8)	1.1	0.8	3.0
	Retained FM		10 (3.1)	1.3	0.8	3.4
	Dystocia		9 (2.8)	1.3	0.6	3.2
Infectious	Black leg	475	9 (1.9)	1.1	0.8	3.0
	Diarrhea		5 (1.1)	0.9	0.2	2.0
	LSD		3 (0.63)	0.6	0.0	1.2
	FMD		4 (0.84)	0.6	0.2	1.4
Non-infectious problems	Digestive Problems	475	3 (0.63)	0.6	0.0	1.2
	Hoof over growth		1 (0.21)	0.2	0.0	4
	Mineral deficiency		14 (3)	2	1	5

Table 3: Prevalence of common health problems of dairy cattle in the study area.

Factor			Clinical mastitis prevalence	Abortion prevalence	RFM prevalence	Dystocia prevalence
District	Hollela	142	15 (10.6%) *	5 (3.5%)	6 (4.2%)	5 (3.5%)
	Ambo	181	4 (2.2%)	4 (2.2%)	4 (2.2%)	4 (2.2%)
Age	Adult	231	17 (7.4%) *	7 (3%)	6 (2.6%)	6 (2.6%)
	Medium age	92	2 (2.1%)	2 (2.1%)	4 (4.3%)	3 (3.3%)
Parity	1 st parity	89	1 (1.1%) *	3 (3.4%)	3 (3.3%)	2 (2.2%)
	2-3 calving	10	3 (30%)	1 (10%)	1 (10%)	1 (10%)
	Above 4	224	15 (6.7%)	5 (2.2%)	6 (2.7%)	6 (2.7%)
MGT status	Intensive	190	10 (5.3%)	6 (3.2%)	6 (3.2%)	2 (1.1%)
	Semi-intensive	133	9 (6.7%)	3 (2.2%)	4 (3%)	7 (5.3%)
Housing	Good	263	13 (4.9%)	5 (1.9%)	6 (2.28%)	9 (3.4%)
	Medium	56	3 (5.4%)	1 (1.8%)	1 (1.8%)	0 (0)
	Poor	4	3 (75%)	3 (75%)	3 (75%)	0

Key: * P<0.05

Table 4: Prevalence major reproductive health problems with different risk factors.

Discussion

In the present observation study different diseases of dairy cattle were recorded and categorized under reproductive, Infectious, metabolic skin problem and deficiency diseases. The study revealed that, Dermatophilosis, (25.1%), mange mite (18.3%), tick infestation (30.1%) and lice infestation (20.2%) were the common skin disease of dairy cattle in dairy farms of Holleta and Ambo town. The occurrence of tick infestation was associated with age, management, study district, and body condition of the animals. The prevalence of tick in the current study was higher than the report from Jima, Oromia region of Ethiopia by Belay et al. These could be due variation in agro ecological and animal husbandry practice. On the other hand, like the present finding high prevalence of (25.6%) was tick also reported by Belew and Mekonnen [12] from holleta town. This indicates importance of tick in the study area. According to Radostits et al. [13], ticks are known to be vectors of economically important diseases such as anaplasmosis, babesiosis and cowdriosis.

The study indicates that dystocia (2.8%), abortion (2.8%), retained fetal membrane (3.1%) were the major reproductive health problem. Similar problem with different percentage of occurrence were also reported by different scholar [14,15]. This variation could be due to difference in the degree of exposure to environmental hazards, availability of animal health services, size of the farm, management system and record keeping practices. The 2.8% prevalence of abortion in the present finding, agreed with the finding by Bekele et al. [16], who reported the abortion rate in the range of 1.7%-20.2% from the central high land of Ethiopia. Similarly, Berisha [17], also reported 2.2% prevalence from Addis Ababa which was nearly the same with current findings. The present finding it was also showed that the occurrence of retained fetal membrane (3.1%). This finding is lower than the reported by Shiferaw et al. [8] from central highland of Ethiopia (14.7%) and Gebremariam in Mekelle (16.8%) [2].

Similarly the percentage of occurrence of dystocia in the current finding was also lower than the previous report of 5.5%, 7.8% and 13.9% by Yoseph [18], Melkamu [19], and Molalegn and Shiv [14] respectively. Variations; in nutritional status, genetic difference management status, age, parity, health problems could be the reason for the different between the current and the previous reports. The present study has also illustrated the occurrence of 5.9% prevalence clinical mastitis and it was significantly associated with study district, age and parity. The present finding was lower than the report of 35.25% by Belay et al. and 45.8% by Kadajah et al. [20]. Such variation in the prevalence could be due to the fact the current report was based on the clinical cases while the previous reports were including both clinical and non-clinical form of mastitis and moreover variation in hygiene of the cows' house, level of management, control measure could also be the reason. Infectious disease like black leg, foot and mouth disease, lumpy skin diseases were also observed in dairy farms of the current study areas. These findings were also reported by Yohannes [21] from Alamata northern Ethiopia. In conclusion the current study has demonstrated that the existence of different health problems in dairy farms located in Holleta and Ambo town.

Conclusion and Recommendations

The current study has demonstrated that the existence risk factors in dairy farms located in Holleta and Ambo town. Skin disease like; Tick infestation, dermatophilosis, mange mite, and lice infestation were major diseases affecting dairy cattle production in the study area. Moreover, this study also demonstrated relatively high occurrence of mastitis. In addition, retained fetal membrane, abortion, dystocia were common reproductive health problem and they are also indicators of the existence of disease that cause reproduction wastage. The study has also showed that dairy farms in Ambo were affected than those in Holleta. Generally, this study demonstrated that the existence of

different health problems that hinders success of dairy farm future development of dairy farms in Ambo and Holleta town.

Therefore, based on the above conclusions the following recommendations are forwarded:

Improvements of feeding, housing and health management system is mandatory to alleviate the problem.

Training on basic knowledge of husbandry and health management practice should be provided to the farm owners, attendants and other participants.

Veterinary clinics must be strengthened in man power, equipment's and drugs.

Shortage of veterinary professionals, accessibility of drugs should be solved.

Further detail studies should be conducted to develop strategic disease control scheme to monitor and control the major dairy health problems.

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