ASSESSMENT OF MAJOR HEALTH PROBLEMS AND ASSOCIATED RISK FACTOR OF DAIRY FARMS IN NAIROBI

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Abstract
The study was conducted from November 2021 to April 2022 dairy farms of the Dagoretti and Kibra town to assess the major observed health problem associated risk factors. The total of 20 small and large scale dairy farms was included in the current observational study. From this selected dairy farms 475 dairy cattle; 201 in Kibra and 274 in Dagoretti 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. Accordingly, Dermathophilosis (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. 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: health, health problems, farms, diary

Introduction

In sub Saharan Africa livestock plays a crucialrole in economic development of the countries and living standard of rural communities by serving as source of income in which their production accounts forapproximately 30% of the total agricultural GDP and 16% of national foreign currency earning and for food (IBC, 2014). Export of live animals and animal productsmake substantial contribution to the foreign exchange earnings of many countries (ILCA,2018),.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 (Gebramariam, 2016). Livestock production constitutes one of the principal means of achieving and improving living standards in many regions of the agricultural productive system in Ethiopia (Belihu, 2022). Ethiopia is one of the few countries in theworld with high livestock potential. The livestockpopulation 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 (CSA, 2013) .This population ranked Ethiopia, first from and tenth fromthe 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 (Lobago *et al.*, 2016).

The low cattle productivity in tropics isattributed to poor genetic potential, mal nutrition, in adequate management practices (since most of the cattleare located in rural areas where traditional

activities are highly practiced),high incidence of disease and parasiticburden which cause high livestock morbidity and mortality (Tyagi and Sing, 2019). Disease of dairy animals that cause morbidity and mortality are the major problem faced in racing dairy cattle which occursas a result of complex interaction of the management practices and environment, infectious and the animal itself. These causes ‘ annual losses of billions of dollars, a large portion of wich is attributable a treatment costs and decrease feed efficiency and growthrate (Radostits, *et al.,* 2013).Therefore the efficient production of live stock that yields milky is a major concern of the society (Radostits *et al.,* 2020).

It is an established fact that development of urban and per-urban dairy production requires above alla sound knowledge of the magnitude, and predisposing factors of diseases with it is control and preventivemethods (Shiferaw *et al.,* 2022). Many diseases out breaks could be minimized or prevented proper management and nutritional practices (IAR, 2013). According to ILCA (2018), 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 Dagoretti 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 o 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.

Research Method

The study was conducted in Nairobi, Kenya. Live stocks are one of the agricultural resource in this area. The total animal population of the area is 144,243 cattle, 95,661 ovine and caprine, 23,100 equineand 92,030 poultry. Study was conducted according to theavailability of dairy farms in urban or per-urban area of Nairobi. Small holder and large dairy farms found in Nairobi town area, both kept under intensive semi-intensive area and animals at different age productive status were all included in the study. 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 Dagoretti and 14 from Kibra town were selected. From these selected farms 201 from Dagoretti and 274 from kibra were examined for different health problems in which all age group were included. However, young animal were not included in study of reproductive health problem. 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. Finally, the data obtained from observational study was entered into 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 (x^2) test was usedto access the association among risk factors, namely the age, sex, body condition, management system with the occurrence of the disease. In all the analysis, confidencelevel was held at 95% and statistical analysis was consider significant at $p<0.05$.

Results

Table1. Over prevalence of skin disease of dairy cattle in the study area

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

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 (Table 1). The study found that the prevalence of ecto- parasitic infestation compared with different risk factors like age group, district, body condition, management status, tick 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 Dagoretti 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 managementsystem 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).

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

Factors	Catagories	No of	Prevalence

		animal examined	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	Kibra	201	34(16.9%)	39(19.4%)	35(17.4%)	45(22.4%)
	Dagoretti	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%)*

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 Kibra 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 Table 3 and 4).

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

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
	Diarrhoea		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 4. Prevalence major reproductive health problems with different risk factors

Factor			Clinical mastitis prevalence	Abortion prevalence	RFM prevalence	Dystocia prevalence
District	Kibra	142	15(10.6%)*	5(3.5%)	6(4.2%)	5(3.5%)
	Dagoretti	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	0)

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 wasfound to be relatively higher but no statisticallysignificant 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.

Discussion of Findings

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%) werethe common skin disease of dairy cattle in dairy farms of Kibra and Dagoretti town. The occurrence of tick infestation was associated with age, management, study district, and body condition of the animals. The prevalence of tick inthe current study was higher than the report from Jima, Oromia region of Ethiopia by Belay et al., 2011.These could be due variation in agro ecological and animal husbandry practice. On the other hand similar to the present finding high prevalence of (25.6%) was tickalso reported by Belew and Mekonnen (2011) from Kibra town. This indicates importance of tick in the study area. According to Radostits *et al.* (2013) ticks are known to be vectors of economically importantdiseases such anaplasmosis, babesiosis and cowdriosis.

The study indicate that dystocia (2.8%), abortion (2.8%), retained fetal membrane (3.1%) were the major reproductive health problem. Similar problemwith different percentage of occurrence were

also reported by different scholar (Molalegn and Shiv, 2011;Belay., 2011).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 was in agreement with the finding Bekele *et al*., 2021 who reported the abortion rate in the range of 1.7%-20.2% from the central high land of Ethiopia. Similarly Berisha 1990 also reported 2.2% prevalence from Addis Ababa which was nearly the same with current findings. The present finding it was also showed that theoccurrence of retained fetal membrane (3.1%). This finding is lower than the report by Shiferaw *et al.,* 2013 from central highland of Ethiopia (14.7%) and Gebremariam, 2016 in Mekelle (16.8%). 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, 2019; Melkamu, 2019 and Molalegn and Shiv, 2011 respectively. Variations; in nutritional status, geneticdifference 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., 2011 and 45.8% by kedija *et al.,* 2018. 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 includes 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 disease were also observed in daity farms of the current study areas. These findings were also reported by Yohannes, 2017 from Alamata northern Ethiopia. In conclusion the current study has demonstrated that the existence of different health problems in dairy farms located in Kibra and Dagoretti town.

Conclusion

The current study has demonstrated that the existence risk factors in dairy farms located in Kibra and Dagoretti 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 causereproduction wastage. The study has also showed that dairy farms in Dagoretti were affected than those in Kibra. Generally this study demonstrated that the existence of different health problems that hinders success of dairy farm future development of dairy farmsin Dagoretti and Kibra town.

Recommendations

Therefore based on the above conclusions the following recommendations are forwarded.

1. Improvements of feeding, housing and health management system is mandatory to

alleviate the problem.

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

3. Veterinary clinics must be strengthened in manpower, equipment's and drugs.

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

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

References

AWMAB, (2013): Oromia livestock development action program main report,vol. 1. Dagoretti woreda ministry of Agriculture Bureau Report. Pp: 1-22.

Bekele, T., kasali, O.B and Alemu, T. (2021): Reproductive problems in cross breed cattle in Ethiopia. *Anim.Sci*. 26: 41-49.

Belew, T. and Mekonn, A. (2011): Distribution of Ixodid Ticks on cattle in and around Kibra Town, Global veterinarian, 7(6): 527-531, 2021

Belihu, k., (2022): Analysis of dairy cattle breeding program in selected areas of Ethiopia.

Berisha, K. (2011): Major constraints of reproduction in small scale dairy farms around Addis Ababa. DVM Thesis FVM AAU Debre Zeit,Ethiopia.

CSA (central statistics Agency) (2013): Federal Democratic Republic of Ethiopia Agricultural sample survey, volume-, report on live stock and live stock characteristics.

Gebremariam, T. (2016): Survey on major prepartum and post partum reproductive problems of dairy cattle in Mekelle and its Environs. DVM Thesis, AAU, FVM, Debre Zeit, Ethiopia.

Hussein, A. (2018): Study on calf mortality at Adami tulu livestock research center. Proceeding of 5th conference of Ethiopan society of animal science (ESAP) 15-17 may 2017, Addis Ababa, Ethiopia. Pp: 157-162.

IAR (Institute of Agriculture Research), (2013): proceeding of the fourth national livestock improvement conference. 13-15 November 2021 Addis Ababa, Ethiopia.

IBC (Institute of biodiversity concentration), (2014): The state of Ethiopia's farm animal genetic resources country report. a contribution to first report on the state of the worlds Animal Genetic Resources. ftp://ftp.fao.org/docrep/fao/010/a125e/annexes/cou ntry

Reports/Ethiopia.pdf.

ILCA, (2018): Animal reproduction for African countries Report of a joint seminar by international foundation for and Swedish international program on animal production. ILCA, Addis Ababa, Ethiopia.

Kedija, H., Azage, T., Mohammad, Y.E. and Berhanu, G. (2018): Traditional cow and camel milk production and marketing in agro-pastoral and mixed crop- livestock systems. The case of Miesso district, Oromia Regional state, Ethiopia. IPMS (improving productivity and Market Success) of Ethiopian farmers project Workshop paper 13. ILRI (International livestock research Institute), Nairobi, Kenya, Pp: 56.

Lobago, F., M. H.Gustafson and H. kindahl, (2016): Reproductive performance of dairy cows in small holder production system in selale, central Ethiopia. *Trop. Anim. Health prod.,* 38: 333-342.

Melkamu, T. (2019): Studies on major post partum reproductive problems in Kibra Research station and holder dairy cattle. DVM Thesis, AAU, FVM, Debre-Zeit, Ethiopia. *J. Anim. vet. Adv.,* 10(6): Pp: 723-727, 2011.

Molalegne, B., Shiv, p. (2021): Study on majorreproductive health problems Indigenous and cross Breed cows in and Around Beddelle, south west Ethiopia. *J. Anim. Vet. Adv*. 10(6):723-727.

Radostitis, O.M, Leslie, K.E. and Fetrow, J. (2020): Maintenance of reproductive efficiency in dairy cattle. In heard health: Food animal production medicine 2nd, W. B. Saunders Coy, Philadelphia, pp: 141-158.

Radostitis, O.M., Gay, C.C., and Hinchliff, K.W. (2013): Veterinary medicine. A text book of disease of cattle, sheep, goats, pigs and horses, 9th Ed. Harcourt publisher Ltd., London. Pp: 303-319.

Richard, W. (2013): Dairying Agriculturalist, (1st ed.) Macmillan press London. Pp: 43-48.

Shiferaw, Y., B.A., Tanhagen, Bekana, M., and kassa T. (2015): Reproductive disorders of cross breed dairy cows in the central highlands of Ethiopian and their effect on reproductive performance. *Trop. Anim. Health prod.,* 37: 427- 441.

Tyagi, R.P.S. and Singh. (2019): Ruminant Surgery, 1st ed. Vikas ss publishing House PVT, Ltd., India. Pp: 258.

Yohanness, T. (2017): Major animal health problems of market oriented Live stock development in Alamata Woreda. DVM Thesis, Faculty of veterinary Medicine, Addis AbabaUniversity, Debre Zeit, Ethiopia.

Yoseph, S. (2011): Fertility status of cross breed dairy cows under different production system in Kibra. M.sc. Thesis, central highlands of Ethiopia, Debrezeit, Ethiopia. *J. Anim. vet. Adv.* 10(6): 723-727.