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Review Article

Study of Calf Health and Management Problems in Urban and Per-urban Dairy Farms of East Wollega Zone of Oromia Regional State, Western Ethiopia

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Abstract

Calf-care is not only essential for sustenance of the dairy industry but is also essential for preserving and maintaining good quality of germplasm. On the contrary, high levels of calf mortality have limited dairy herd expansion and genetic improvement in the study area. Therefore, the study was developed to evaluate the existing calf health and management problems of dairy calves in urban and peri-urban areas and to assess the level of farmers' knowledge on calf health and management practices in the three selected districts of East Wollega Zone. A cross sectional study design was used and the study districts and peasant association were selected purposely where as the individual household was selected randomly using systematic random sampling method. A total of 50 households were selected from these three districts and detailed questionnaire survey format was designed to generate base line information related to calf health management system with particular emphasis on major health problems. As the study result indicates diseases likes blackleg, pneumonia, internal and external parasites are the most dominant calves' health problems. About 50% of the respondents informed that mostly calf mortalities occurred due to pneumonia, blacklegs, starvation, heart water, diarrhea and bloat. Even though all calves were getting the access of colostrums feeding, they do not access optimum level. Regarding to calves feeds, natural grass is categorized in first rank where as concentrated feeds (ground maize, grain, noug cake) and food left over (local brewery by product & straw) are placed second and third rank, respectively. Even though all farmers of the study area haves the access veterinary service, they have not equally used the service due variability of remoteness among farmers. In general as the study revealed there have been poor management practice regarding both feeding (concentrate & roughage) and housing of calves in study area. The there is high economic losing in live animal mortality particularly replacement stock like calf. Therefore, identifying economically important animal disease and designing strategic preventive and control measures and improvement of calf management practice is valuable.

BACKGROUND AND JUSTIFICATION

The urban and peri-urban dairy production systems are important components of livelihood transformation in Ethiopia that provide food and income for dairy farmers. However, this dairy production is suboptimal due to multi factorial reasons such as poor dairy management and high prevalence of different diseases. Calves play an important role in the development of the dairy sector of the country, as the future of the dairy herd solely depends upon the successful raising of young calves. Calf-care is not only essential for sustenance of the dairy industry but is also essential for preserving and maintaining good quality germplasm. On the contrary, high levels of calf mortality have limited dairy herd expansion and genetic improvement. Calf morbidity and mortality are perennial problems in all countries where cattle are raised. But the mortality rates vary from 2% to 20% with mortality on individual farms varying from 0% to above 60%, although in well-managed dairy herds of developed countries, average mortality is usually between 2% and 4% [1,2] (Figures 1,2). In developing countries, under poor management and major disease problems, especially in sub-Saharan Africa and further in Ethiopia, the usual average mortality is 7% to 25% (Otte and Chilonda 2002). In the tropics, mortality rates

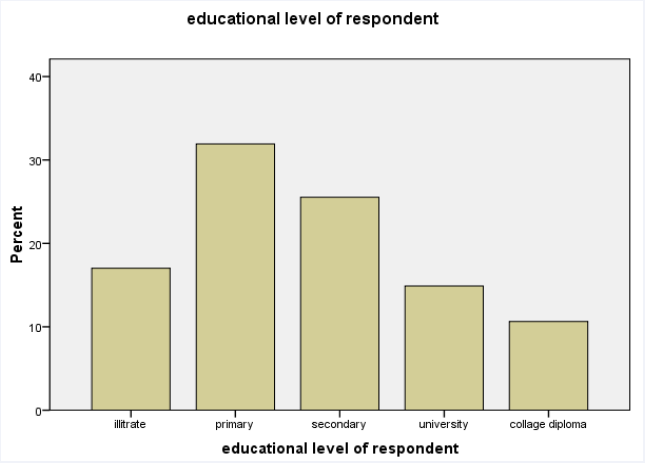

Figure 1 Shows educational background of respondent.

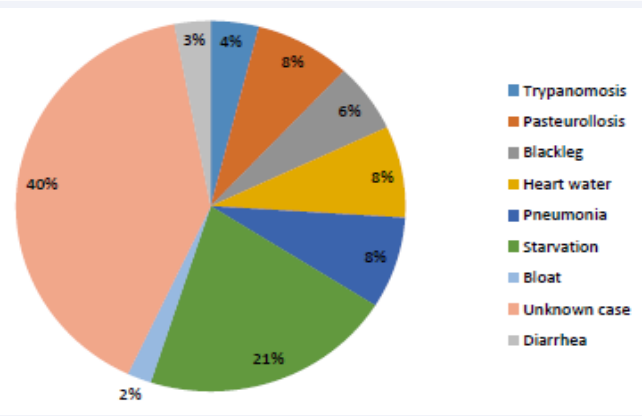

Figure 2 The above graph shows Major cause of calf mortality in the study area.

of young calves vary depending on management and severity of the diseases. Studies on calf mortality rate in different African countries ranged from 9% to 45% [3-9].

Study on calf morbidity and mortality that was conducted in smallholder dairy farms in Ada'a Liben district of Oromia of Ethiopia, reported the overall incidences of crude morbidity and crude mortality of 62 % and 22%, respectively. The most frequent disease syndrome that affects calves was calf diarrhea with the incidence of 39% followed by joint ill 6% [10-12]. Abraham et al., studied agents associated with neonatal diarrhea and mortality in Ethiopian dairy calves. They reported that out of 108 diarrhea cases 38.9% bovine enteric Coronavirus (BEC), 16.7% sero-group a rotavirus (RV) and 11.1 per cent K99 (F5) fimbrial adhesin-positive Escherichia Coli (K99 ETEC,/ Entero-Toxigenic Echerichia Coli/) that has zoonotic importance for calf attendants and consumers . A relationship between housing and health during the rearing period has been described by several authors [13]. Cleanliness of the barn influences calf health, as calves housed in unclean barns are at higher risk of disease than calves housed in clean barns [14]. Diarrhea, pneumonia, septicemia, parasitism, congenital problems and miscellaneous cases account for most calf illnesses, deaths and post natal treatment [15,16]. Skin diseases and pink eye are also causing health problems of young calves in intensified dairy farms of different areas and calf diseases have a significant financial impact on dairies. The costs associated with calf disease include treatment costs, replacement costs, genetic loss, and impaired future performance of dairy farm. Studies have also shown that calf disease results in a decreased in a heifers likelihood of surviving until calving, place them at increased risk of being culled prior to calving, and result in increased age at first calving. Dairy husbandry activities are mostly performed by women besides fulfilling their responsibilities as home makers. The crucial role of women in agriculture and allied activities has however been grossly under estimated and undervalued. In dairy production system, women and children are highly involved in taking care of young and large animals. To have a sound calf health management it also requires a dairy calf attendants or dairy house hold keeper are at least be oriented with simple disease diagnostic and treatment techniques of their animals .

The above mentioned threats are considered limiting factors on the production and productivity of dairy cattle at present and in the future where much more care should be taken. In Ethiopia most farmers do not have enough knowledge on proper calf-feeding regimes. Apart from that, farmers aim to optimize income by selling more milk and calves are, therefore, underfed. This is more serious in bull calves, resulting lack of bulls and oxen. Therefore, understanding the management, the causes of common calf hood diseases, their methods of transmission and developing effective control programs through intensive household participation to minimize the negative impact on calf health is of paramount important. Therefore, this study was developed with the objectives of to evaluate the existing calf health and management problems of dairy calves in urban and peri-urban areas, to assess the level of farmers' knowledge on calf health and management practices and to establish improved calf health management practices.

MATERIAL AND METHODS

Study area

The study was conducted at three districts namely Digga, Guto-Gidda and Wayu-Tuka, East Wollega Zone in Oromia regional states of Western Ethiopia. The attitude of the study districts ranges from 1500-3000 meters above sea level. It is mostly known for mixed agriculture production system mean suitable for both crop and livestock production. The maximum and minimum temperature of the area is 22.4c0 and 10.9c0, respectively. The mean annual rain fall of the area ranges from 800mm - 2400mm and about 352km distance from Addis Ababa [17].

Study design

Cross sectional study design was carried out in above mentioned areas. The study districts and peasant association (PA) were selected purposely where as the individual households were selected randomly using systematic random sampling method. Therefore, 50 households were selected from these three districts.

Data collection

Detailed questionnaire survey format was designed in an attempt to generate base line information related to calf health management system with particular emphasis on major health problems; it was mainly based on socio-economic household characteristics, mortality of calves and access to veterinary services, identification of a particular calves diseases, gender and education background of the responsible personnel, size of the farm, calf rearing practices, feeding and housing of the animals, and disease-control practices. The questionnaire was pre-tested in a pilot study and modified before the main survey conducted.

Data analysis

The data was subjected to statistical analysis using Statistical Package for Social Sciences (SPSS) software, version 16.0 (SPSS Inc., Chicago, Illinois, USA) and descriptive statistics such as frequency distribution and percentages were used.

MAJOR BASE LINE SURVEY RESULT

A total of 50 dairy cattle owner were interviewed from urban and pri-urban small holder dairy farms of selected three districts namely Gutogida, Wayutuka, and Diga which are covering and bordering the Nekemte town. The majority of the respondents were male (85.7%) and the rest female (14.3%). The maximum and minimum age was 70 and 25 years, respectively. Regarding education status 17% of respondents were illiterate. As the respondent reported the agro ecology of the study area was 70% highland and 30% midland. As the result shows the number of male cattle increases as we move from urban to peri-urban and the reverse is true in case of female cattle. As the study revealed that almost equal proportion of male (50.4%) and female (49.6%) calves population present in the study area. Among the total cattle population 648, cattle owner had 39.8%, 21.76%, 19.6%, 9.4%, and 9.4% were cow, heifer, calves, bull, and oxen, respectively. Out of 324 cattle's the number of oxen is only one (0.15%) in Gutogida, this indicate almost all cattle that kept in urban area were female.

The major cattle bred found in the study area is Horro breed. Among the interviewed farmers 60% of farmers classified their calves under medium body condition score and the rest reported that under poor body conditions. As the result of questionnaire showed 96% of farmers calves were free from prenatal problems where as 4% faced the problems due to dystocia and early birth. The result revealed there are different types of infectious diseases were affecting cattle productions. Commonly known diseases that are affecting cattle in the study areas were tryipanomosis, blackleg, pasteurollosis, conjunctivitis, cawdrosis, mastitis, LSD, FMD and internal and external parasites. Out of the interviewed farmers, 25% were informed as they encountered many kinds of cattle diseases but they do not able know the symptoms and type of diseases that affecting their cattle. Among above mentioned diseases blackleg, pneumonia, internal and external parasites are the most dominant calves' health problems.

The most commonly known drugs in the study areas are Oxy TTC, Penstriptomycine, Diminazine aceturate and Anthelmentic drugs such as Albendazole and Ivermectin. Even though they were treated their diseased calves by presenting veterinary clinics that found in the nearby area, about 53% of farmers do not know any types of veterinary drugs that described. Of the total interviewed farmers, 76% of them are reported that when they have treated their diseased calves with veterinarian the prognosis was very good, however 24% of farmers are reported that the treated animals were either stay as carrier or died.

As reported about 70% of the respondents were haves the accesses of different type of cattle vaccination service. Among those farmers that got vaccination service 65% of them do not know the vaccine type that given for their animals but the rest 35% of farmers were mentioned at list one of the following vaccine types such as anthrax, FMD, CBPP, pasteurollosis and blackleg vaccines. All most all farmers of the study area do not use prophylactic drugs to treat their animals. In the study area many disease mortalities were occurred, however about half of the respondents do not know the symptoms and agents that cause mortalities whereas 50% of the respondents informed that mostly calf mortalities occurred due to pneumonia, blacklegs, starvation, heart water, diarrhea and bloat.

It is commonly known feeding of colostrums is the most important for newly born animals to resist different types of foreign bodies. Thus, almost all the respondents are gives colostrums to their calves; however the starting time is different among farmers to farmers, for example 36%,24%,34%,& 6% of the interviewed farmers gives colostrums to their calves at 1hr after birth,30 minute after birth, just after birth, and 2hrs after birth, respectively. Even though all calves were get the access of colostrums feeding, they do not have equal time duration and practicing different length of time periods such as 46%, 38%, and 14% of farmers are given colostrums for their calves one week, two weeks, and one month length of periods, respectively. In addition, at a time the amount of colostrums given to calves is different from famers to farmers. For example, out of the total interviewed farmers 51% were gives the colostrums free access where as 19%, 14%, 12% and 4% were gives 1lit, 2lits, 0.5lit and 6lits, respectively.

In this study calves weaning age is tried to be assessed, accordingly 40% of the farmers reported that calves weaning age is about 6 months where as 20% of farmers reported more than a year and the rest 40% of farmers reported that the calf weaning age is between 7-12 months. As reported in addition to milk other supplementary feeds are given for calves in the study area. These feeds are ranked as following. Natural grass is categorized in first rank where as concentrated feeds (ground maize, grain, noug cake) and food left over (local brewery by product & straw) are placed second and third rank, respectively.

As the study revealed all farmers of the study area haves the access veterinary service, however the service is not equally distributed among the interviewed farmers. For example 26% of the respondents haves both private and governmental veterinary service where as 54% and 20% of the respondents haves only governmental and private veterinary service, respectively. As discussed above even though all farmers of the study area haves access of veterinary service, the distance of the clinics among farmers to farmers are various. This variation affects to treat diseased animals equally among farmers especially those farmers far away from the clinics do not present diseased animals to the clinics due to the remoteness of clinics area to area this condition is favorable for diseases to sustain their life. The result of this survey revealed that 57% of farmers far from veterinary clinics about 1km distance,41% of farmers far from the clinic 1-5 km distance and 2% of farmers far from veterinary clinic about 6-10 kms distance (Tables 1,2)

Table 1: Shows cattle distribution among the district & their agro ecology

District	Guto gida	Wayu tuka	Diga	Total
No of owner interviewed	20(40%)	18(36%)	12(24%)	50(100%)
Agro ecology				
Highland	20(100%)	3(16.67%)	12(100%)	35(70%)
Midland	-	15(83.33%)	-	15(30%)
No of cattle				
cow	137(21.14%)	48(7.4%)	73(11.27%)	258(39.8%)
Heifer	91(13.9)	24(3.7%)	27(4.17%)	141(21.76%)
Calves	60(9.26%)	36(5.56%)	31(4.78)	127(19.6%)
Oxen	1(0.15%)	34(3.7%)	26(4%)	61(9.4%)
Bull	35(5.4%)	13(2%)	13(2%)	61(9.4%)
Total	324(50%)	155(23.9%)	169(26.1%)	648(100%)
Sex of calves				
Male	28(22%)	20(15.75%)	16(12.6%)	64(50.4%)
Female	32(25.2%)	16(12.6%)	15(11.8%)	63(49.6%)

Table 2: The result of this survey revealed that 57% of farmers far from veterinary clinics about 1 km distance,41% of farmers far from the clinic 1-5 km distance and 2% of farmers far from veterinary clinic about 6-10 kms distance

Parameters	Percent (%)
Calves body condition	
Good	10
medium	60
poor	30
Prenatal problems	
Free	96
Dystocia	3
Early birth	1
Disease type	
Trypanomiasis	9
Blackleg	18
Pasteurollosis	8
Conjunctivitis	2
Cawdrosis	6
Lumpy skin disease	3
Foot and mouth disease	4
Internal and external parasite	25
Pneumonia	15
Calf diarrheal	10
Drug known by farmer	
Oxy TTC	7.6
Pen strip	3.4
Anti-tryps	13
Ant helmet	23
No response	53
Prognosis	
Good	70
Moderate	6
poor	24
Type of Veterinary service	
Governmental	54
Private	20
Both	26
Distance to nearest vet service	
< 1 Km	57
1-5 Km	41
6-10 Km	2

DISCUSSION

Diseases are important for all small holder dairy production systems. As the report of Mulangila *et al.*, (1995) in Kenya disease of the newborn calf and calf mortality are the major causes of economic losses in cattle production. The productivity of the herd can be negatively impacted by impaired growth of calves, decreased milk production of animals that experienced chronic illness as baby calves, spread of disease from calves to adult cows, increased veterinary costs and the limited opportunity for genetic selection due to mortality of replacement. As the study revealed that the small holder farmers of the area have not had strong demand for animal health which increases demands and improved opportunities delivering animal health which in line with the study of McDermott (1999), important consequence of the large mobile and mixing livestock populations is enhancing the probability of transmission of epidemic diseases.

Epidemic diseases particularly bacterial and viral pneumonia and diarrhea and parasitism in calves are very important in the study area. As different studies reported currently in different area of Ethiopia many diseases have become more serious threat and cause significant morbidity, mortality and production loss. For example, the concurrent infection of trypanomiasis with GIT parasite is causes series economic loss in livestock production in the study area also reported by Moti et al., around Bedelle. Foot and mouth virus (FMD) also more prevalent and has been one of the major causes for considerable economic loss of the farmers that found in the study area which in line with the report of Tesfaye et al [19]. And also reported by Negussie et al. [20]. That affecting the livestock population of the country such as mortality and case fatality rates were relatively higher 1.6% and 8.9% in calves than the other age groups due to the FMD viral diseases.

In the study area calf diarrhea also common as mentioned by cattle owner`s which is a serious health problems affecting calves. Several factors affect the health and vigor of calves in the early period of the calf hood. Among these factors inadequate feeding of colostrums, hygiene, and environmental condition are most important (Aklilu, 2008). Parasitic gastroenteritis in calves is an important disease in the area according to the case observational study. Adult animal are comparatively immune but calves picked up the increase number of infectious larvae and the presence of dams along with their calves is likely to result in pasture contamination which are dangerous to the calves.

Lumpy skin disease (LSD) was also among the important disease in different age group of cattle's in the study area. Getachew et al., reported that from the total of 476 animals observed 22.9% and 2.3% cattle found sick and dead due to the disease, respectively. It also reported that breed specific morbidity due to LSD was 22.5% cross and 25.9% local zebu breed and the disease was observed to be more serious in young animals and females. Heartwater, blackleg, salmonellosis, and pasteurollosis were the most common diseases mentioned by the farmers which are mostly affecting replacement stocks. Blackleg is one of the important diseases of calf in the study area, as the

report of Sani et al. (2010), in Nigeria blackleg is an endemic disease in both developed and developing countries and is well known cause of financial loss to cattle raisers in many parts of the world.

Animal disease morbidity and mortality rates are high in young animals as well as reproductive performance, growth rates, and milk production are low on average and fluctuate markedly depending on environmental condition. Moreover inadequate animal nutrition is an important determinant and interacting factor for poor health and productivity. Since calves are in direct competition with human for milk, growth rate are low and significantly, morbidity and mortality are associated with management practices. As the report of Franklyn et al, management practices aimed at identifying and resolving these very early problems are single most important and cost effective way to improve calf heath.

Gitau et al, Reports that most calf deaths are attributed to infectious disease such as scour, septicemia, and pneumonia, however non infectious problems cause most of the losses in the first losses in the first 2 to 3 days, and these problems greatly increase the risk of later infectious disease if they do not kill the calf right away. Colostrem is milk produced by the dam during the first 1-3 days after calving. Feeding of colostrum is very important for calf health, because as the report of (Marie,1994) colostrums contains antibodies that are absorbed from the intestine into the calf blood stream and search for and destroy viruses, bacteria, and some parasites. Thehay et al. [18], in Ethiopia also reported that keeping of calf with its mother for the first three to four days so that it will able to suckle colostrums as much as it likes and every farmer should know about colosterum feeding if she/he wants to rear a good healthy calf.

In the study area good management regarding both feeding (concentrate & roughage) and housing of calf not such much practiced. As the report of Thehay et al. [18], in Ethiopia on calf and heifer rearing manual, since concentrate is readily not available for small holder farmer of Ethiopia feeding of concentrate to calves are not practiced at all therefore, it recommended continuing milk feeding until the age of 3 to 4 months. But, in the study area as the result of survey described most of farmers are feeding milk their calves' up to 6-12 months so that such kind of farmer practice increase the chance of getting healthy calf. In general in addition to milk feeding of good quality of roughages or hay is very important for calf going to be weaned.

As the observational assessments result of the study shows majority of farmers of the area are grouped under poor housing management practice mean there is no separate house, high dung accumulation and poor ventilation. On the report of David Pace et al., in USA calves should be kept in separate pains that are disinfected and provide clean, dry, and draft free, shade and shelter. Thehay et al.[18], also reported that the calf and the dam should be kept in awarm and clean place he also added good environment is very important, especially for young calves, since during the first three weeks calves are unable to adapt sudden changes in temperature because change in temperature may lower their resistance to diseases [19-25].

CONCLUSION AND RECOMMENDATIONS

Since no control of animal movements many infectious diseases are transmitted easily. Diseases and parasites are among the major factors that limit the benefits expected from livestock as a result of mortality and morbidity in the study area. There are no well organized vaccination and treatment systems for the control of infectious, non-infectious diseases and parasitic diseases. To consider the economics of animal diseases and disease control in the study area the problems that related to service delivery of the area should be well understood. The study indicates there is high economic losing in live animal mortality particularly replacement stock like calf. Therefore, studying the prevalence, incidence, mortality and identifying the causative agent of economically important animal disease and designing strategic preventive and control measures through farmers training, periodic vaccination, regular deworming and strengthen veterinary extension with the participation of all stakeholders is necessary. As well as improvement of calf management practice through awareness creation is valuable.

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