Major Reproductive Health Problems of Dairy Cows in and around Bako, West Ethiopia

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Abstract

An investigation was made into major clinical reproductive health problems of 217 dairy cows (146 local and 71 crossbreds) on-station and on-farm in and around Bako in west Ethiopia. Prevalence and major risk factors of major clinical reproductive health problems were studied between October 2007 and May 2008. Questionnaire survey and clinical examinations were used to identify major reproductive health problems and risk factors. Of a total of 217 dairy cows assessed, 30.4% (n=66) were found to be affected either with one or more of the clinical reproductive problems. Major reproductive problems found were repeat breeding 8.72%, retention of placenta 6.88%, abortion 5.96%, dystocia 2.75%, anoestrus 2.29% and prolapses 0.92%. The prevalence of clinical reproductive problems showed significant differences ($p<0.05$) with respect to parity, production system and body condition of dairy cows. Breed had no significant effect ($p>0.05$) on the prevalence of these problems. Repeat breeding, retention of placenta, and abortion, were among the major factors responsible for the low reproductive performance of the dairy cows in and around Bako town, eastern Wollega and western Shoa zone of Oromiya, Ethiopia. The results showed that reproductive health problems, coupled with management system and poor body condition, are important factors that contributed to reproductive inefficiency. Regular reproductive health management and production based ration formulation could be the management options to reduce or alleviate some of the problems.

Keywords: abortion, retention of placenta, repeat breeding, Bako, dairy cows

Introduction

Crossbreeding of improved exotic dairy cattle breeds on a wide scale was introduced five decades back to upgrade the genetic potential of the indigenous zebu cattle, and subsequently to improve the dairy sector in Ethiopia. Since then, various efforts have been made to improve the dairy sector through artificial insemination or shared crossbreed bull service or by distributing crossbred F_1 heifers particularly to the smallholder dairy farmers (Fikre, 2007). However,

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the overall cost of keeping dairy cattle in terms of costs associated with the healthcare, nutrition, and management has not matched to their contribution to the livelihood and the economic contribution of the people (Takele *et al.,* 2005).

Though the country is endowed with substantial potential for dairy production, the current productivity is significantly low as compared to the domestic demands of dairy products suggesting a chronic shortage (Tigrie, 2004).

Reproductive health problems result in considerable economic losses to the dairy industry and are the main causes for poor reproductive performance (Bekana *et al*., 1994a). Among the major reproductive problems that have a direct impact on reproductive performance of dairy cows, retention of placenta and the subsequent endometritis and pyometra have been reported **(**Bekana *et al*., 1994b**)** to be the most common clinical and economical problems. Others include dystocia, abortion, uterine and vaginal prolapses (Bekana *et al*., 1994b, 1997).

In Ethiopia dairy cattle are maintained under different management systems. The difference in management systems and environmental conditions under which cattle are maintained could greatly affect the occurrence of reproductive health problems (Takele *et al.,* 2005). This particular study is therefore, carried out to determine the major reproductive health problems of the dairy cows in and around Bako area, West Ethiopia and assess possible risk factors that play a role in reproduction.

Materials and Methods

Study site

The study was conducted in and around Bako which is located in eastern Wellega and western Shoa zones of Oromiya. It is a high rainfall and humid environment and is situated at 251 km west of Addis Ababa. The area lies between 09° 6'N latitude and 37° E longitude at an attitude of 1650 m above sea level. The mean annual rainfall is 1210 mm, and it is uni-modal in distribution. The rainy period covers April to October. It has a warm humid climate with mean minimum; mean maximum and average temperatures of 13°c, 27°c, and 20°c respectively. According to the new agro-ecological zonation, it represents tepid to cool sub humid highlands. A number of livestock including cattle, sheep, goat, and donkey are reared in this area and are managed extensively with the

exception of few farms at Bako Agricultural Research Center and few others which are managed in semi intensive form.

Study animals' management system

The study involved both management systems extensive and semi-intensive. Classification of the management systems was based on the criteria adopted by Richard (1993). Accordingly, semi-intensive system included all animals that were kept indoor and fed and watered in their barns or shade by cut and carry system or zero grazing. Extensive management system included all animals that were kept outdoor during the day time and allowed to graze on a communal or private owned pasture land.

Study design

A cross sectional study (longitudinal or follow up) and questionnaire survey were used. Questionnaire surveys – a standard questionnaire formats were prepared and about 115 household heads were interviewed. The interview was made randomly to those households that came to the clinic for different veterinary service. Accordingly, a total of 142 dairy cows were examined during the interview process.

A total of 75 dairy cows that was pregnant during the study period were used for longitudinal (follow up) study for any abnormalities during pregnancy period, parturition and up to two weeks post-parturition. This was because some reproductive problems like milk fever and retention of placenta mostly occurs within few days or hours following parturition. General clinical examination including measuring vital signs, examination of the udder, and visible reproductive organs were carried out during the follow up period.

Data analysis

The prevalence and the relative frequencies of reproductive health problems were determined as the proportion of affected animals out of the total animals examined and the total number of cases, respectively. General Linear Model (GLM) procedures of SAS (SAS, 2002) were used to assess the effect of risk factors such as breed, parity, body condition and management (production system) on the prevalence of reproductive health problems.

Results

A total of 217 dairy cows from different production systems were examined and of the total cows examined, 30.41% (n= 66) were found to be affected either with one or more of the major clinical reproductive health problems (Table 1).

Table 1. The prevalence rate of clinical reproductive problems of dairy cows in and around Bako, western Ethiopia

Method of study	Total number of cows examined	Number of cows with problem	Percent affected
Questionnaire survey	142	54	24.88%
Regular follow up	75	12	5.53%
Total	217	66	30.41%

The major clinical reproductive problems encountered during the study period were repeat breeding, retention of placenta, abortion, dystocia, anoestrus and uterine prolapses. Among these repeat breeding, retention of placenta and abortion were being the most prevalent problems accounting for 8.12, 6.88, and 5.96%, respectively of the cases (Table 2).

The effect of parity (lactation stage) on the prevalence rate of major clinical reproductive problems was assessed and there was significant association (X^2: 12.75; $P<0.05$) between prevalence rate of reproductive problems and the parity of the individual cow. The prevalence was higher in pleuripara cows 36.5% (n = 61) as compared to primipara cows 10% (n= 5) (Table.3).

Reproductive problems were also assessed with respect to the breeds of the animals and there was no significant association between prevalence rate of reproductive problems and breeds of animals (X^2:0. 035: $P>0.05$) (Table 4).

Table 2. Major clinical reproductive health problems of dairy cows and their overall prevalence rate

Reproductive health problem encountered	Prevalence rate (%)
Repeat breeding	8.72
Retention of placenta	6.88
Abortion	5.96
Dystocia	2.75
Anoestrus	2.29
Prolapses	0.92

Table 3: The association of prevalence rate of major clinical reproductive problems and parity of the dairy cow.

Parity groups	Number of animals affected	Number of animals not affected	Total	X^2	P- value
Primipara heifers	5 (15.2)	45 (34.8)	50	12.76	P<0.05
Pleuripara cows	61 (50.7)	106 (11 6.3)	167		
Total	66	151	217		

Numbers in brackets indicate expected values

Table 4. The Association of prevalence rate of major clinical reproductive problems and breed of the animals

Breed	Number of animals affected	Number of animals not affected	Total examined	X^2	P- Value
Local	45(44.4)	101(101.6)	146	0.035	P > 0.05
Cross	21(21.6)	50 (49.4)	71		
Total	66	151	217		

Numbers in brackets are the expected values of the observations

Reproductive problems were also assessed in relation to body condition score of the cows and the association were found statistically significant (X^2: 9.6698 P= 0.022). And higher prevalence was obtained in lean and moderate body conditioned cows' 39.3% (n = 28), and 36.3% (n= 104), respectively than in animals with good and fat body condition, 16.44 and 33.7%, respectively (Table 5).

The effect of management on the prevalence rate of major clinical reproductive problems was significant (X^2: 16.27, P<0.05), where the prevalence rate of reproductive problems is much higher for extensively managed cows compared to those in semi-intensive management systems.

Table 5. The association of prevalence rate of major clinical reproductive problems and body condition score (BCS)

Body condition score	Number of animals affected	Number of animals not affected	Total animals examined	X^2	p- value
Lean (0-2)	11 (8.5)	17 (19.5)	28	9.67	P<0.05
Moderate (3)	40 (33.5)	70 (76.5)	110		
Good (4)	11 (20.38)	56 (46.62)	67		
Fat (5)	4 (3.65)	8 (8.35)	12		
Total	66	151	217		

Numbers in brackets are the expected values of the observation

Table 6.The association of prevalence rate of major clinical reproductive problems and production management system

Management system	Number of animals affected	Number of animals not affected	Total examined	X^2	P-value
Extensive	54 (40.14)	78 (91.86)	132	16.27	P<0.05
Semi-intensive	12 (25.85)	73 (59.15)	85		
Total	66	131	217		

Numbers in brackets are the expected values of the observation

Discussion

A lower prevalence (30.41%) rate of major clinical reproductive problems was obtained in this study when compared with the values reported by Tigrie (2004) 48.5%, Takele *et al.* (2005) 31.76% and Oumermohamed (2003) 34.9% and higher than the values reported by Tesfaye (1996) 26.7%. This variation in prevalence rate could possibly be attributed to management system, breed of animals and environmental conditions.

The prevalence rate (8.72%) of repeat breeding found in this study fairly agrees with the 8.9% reported by Takele *et al.* (2005), but it is higher than 4.6% reported by Tigrie (2004) and lower than 21.8% reported by Mekonnen (2000). Hence, the difference between the findings of the current study and previous reports may be attributed to the climatic condition of the area and managerial factors.

The prevalence rate (6.88%) of retention of placenta found in this study is lower than those reported in and around DebreZeit (14.28%) by Mamo, (2004), in central high lands of Ethiopia (7.1-28.9%) by Tekleye *et al.* (1992) and in and around Holeta (10.6%) by Tigrie, (2004). The variation in the incidence of re-

tention of placenta may be attributed to variations in predisposing factors to which the animals are subjected, such as nutritional status and management.

The prevalence rate (5.96%) of abortion recorded in this study is similar to the 6.3, 5.33, 5.4 and 6.3% reported by Tigire (2004), Shiferaw (1999), Mekonnen (2000) and Kassahun (2003), respectively. Tekleye *et al*. (1992) has also reported higher (16.3%) rate. On the other hand, Oumermohammed (2003) and Takele *et al.* (2005) reported a prevalence rate of 2.23% and 3.19%, respectively, which are lower than this finding.

Previous reports of the prevalence of dystocia of 5.79 % by Mamo (2004), 7.5% by Tigrie (2004) and 6.95% by Takele *et al.* (2005) are higher than the current finding of 2.75%. However, this finding fairly agrees to the 2.2- 4.4% reported by Zewdu (1992).

The prevalence rate of anoestrus found in the current study (2.29%) is lower than that of Oumermohammed (2003) who reported an overall prevalence rate of 4.6 %. The current finding is also lower than the 30% reported by Kapitano (1990), 70.7% in older cows and 65 % in heifers by Mekonnen (2000) and 26.8% by Tigrie (2004). The lower prevalence of anoestrus obtained in this study could be due to better heat detection practices especially in the animals of Bako Agricultural Research Center farm and adequate reproductive records. Besides, the management system particularly nutrition in animals of the farm could also have a strong effect on the reduction of anoestrus prevalence in the study area.

The analysis of the occurrence of major clinical reproductive problems showed that production system had significant effect and a higher (40.0%) prevalence rate of major reproductive problem was obtained in animals managed extensively than those managed under semi-intensive management practice (14.12%) in contrary to the previous reports (Kassahun, 2003; Tigrie, 2004; Takele *et al.,* 2005).

A statistically significant association was found between body condition score and reproductive problems with lean cows being the most susceptible, followed by moderately lean and fat cows. This could be probably lean animals have poor body defense, weak expulsive force to expel the fetal membrane together with the high possibility of contamination that increases the infection rate.

Strong association of parity and reproductive problems was obtained in this study with pleuripara cows being most susceptible. This is similar to the pre-

vious findings (Tadesse, 1999; Oumermohammed, 2003; Tigrie, 2004; Mamo, 2004; Takele *et al*., 2005) and is possibly due to the repeated exposure of the genital tract to environmental risk factors that can impart uterine infection of pleuripara cows. Mild infections gaining access to the reproductive tract after repeated calving and the tendency of older cow taking longer recovery time from pregnancy and lactation stress could also be the other reasons for this age related variation.

Even though a slightly higher prevalence rate was found in local Horro breeds as compared to the crossbreed cows, there was no significant association between breed and reproductive health problems. The probable reason is that the cross breeds included in the study are having at most 50% exotic blood type and this will help them to cope up the tropical weather conditions and hence yield better result up on better management.

Conclusions and Recommendations

The results obtained in this study demonstrate that parity, body condition, and production management system had a significant effect on the prevalence rate of major clinical reproductive disorders. Breed had no effect on the prevalence of the major reproductive health problems of the dairy cows in the study area.

It also suggested that repeat breeding, retention of placenta, abortion, and subsequent endometritis are the most common reproductive problems of the dairy cows in and around Bako. From the general fact that reproductive health problems consequence and also based on the results obtained in this study, the following recommendations are forwarded:

- Regular reproductive health management and production based ration formulation could be the management options to reduce or alleviate the problems in intensive and semi-intensive farms;
- Detailed causal and management factors study should be conducted in the study area on the reproductive health problems of dairy cows to help in designing a model of reproductive health program to prevent the possible causes;
- Train all dairy farmers on the management of exotic breeds, how to keep records of their cattle and the importance of consulting animal production development agents and veterinarian about their breeding program and herd heath management.

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