Repeat Breeder Syndrome in Dairy Cows: 
Influence of Breed and Age on Its Prevalence

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Abstract: The study was conducted in Mekelle the capital city of Tigray regional state from November 2013 to April 2014 with the objective to establish the prevalence of repeat breeder syndrome (RBS) in local and crossed breed cows and to assess different husbandry factors that predispose the animal into this condition. A total of 384 dairy cows 53 heifers and 331 multiparous cows were included in the present study. The total prevalence of repeat breeding in Mekelle was 7.29% (n=28). Higher prevalence of RBS (7.53%) was recorded in crossbreed cows/heifers and the prevalence of RBS was significantly higher in heifers 22.64% (n=12) in comparison to multiparous cows. In conclusion, repeat breeder cow syndrome is high in Mekelle dairy cows and the prevalence is much higher in heifers compared to multiparous cows particularly in the cross breed than the local breed.

Key words: Dairy Cows · Prevalence · Repeat Breeder Syndrome

INTRODUCTION

Agriculture in Ethiopia is the foundation of the country's economy, accounting for 43% of Growth Domestic Product (GDP) and 86% of export earnings and the sector employs about 85% of the population [1]. Livestock production is an integral part of the country's agricultural production system. A recent study by CSA [1] indicated that the livestock sector contributes 26% of the agricultural GDP and 12% to the national GDP. Among livestock species, cattle have significant contributions to the livelihoods of the farmers. It serve as a source of draught power for the rural farming population, supply farm families with milk, meat, manure, serve as source of cash income and play significant role in the social and cultural values of the society. Cattle contribute nearly all the draught power for agricultural production at smallholder level in Ethiopia [2]. Cattle are also used to generate critical cash in times of scarcity, provide collateral for local informal credit and serve other socio-cultural functions in Ethiopia [3].

Ethiopia’s livestock population is the largest in Africa. In 2008/09, Ethiopian sedentary private holdings were estimated at about 49 million heads of cattle [1]. These livestock population estimates exclude the livestock population for pastoral areas, as there are no official statistics for those areas. Some rough expert estimates indicate that pastoral areas account for about 20% of the country cattle population [4]. Thus, including these rough estimates for the pastoral areas, the estimates of national livestock populations for 2008/09 was 59 million cattle. However, in Ethiopia with this much cattle population, livestock production is below the potential due to many limitations such as inadequate feeding, mismanagement in reproduction, prevalence of diseases and lack of effective veterinary support.

One calf by cow in a year is the reproductive objective in dairy cow farms. It means that cows must get pregnant after AI, maintain the pregnancy, have parturition after 270 days and wait for a period of 40-50 days to be successfully inseminated again. Nevertheless, this is not always attained and cows must be re-inseminated during several consecutive cycles [5]. In this context, the Repeat Breeder syndrome (RBS), comprising a heterogeneous group of subfertile cows, without anatomical abnormalities nor infections, that exhibit a variety of reproductive disturbances in a consistent pattern during the course of three or more consecutive estrous cycles of normal duration (17-25 days) [6, 7].

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The term repeat breeder or RBS was created to describe cows that failed to conceive after three or four inseminations with a fertile bull or fertile semen. Repeat breeder females return to service repeatedly after being bred with a fertile male or inseminated with a fertile sperm. These cows exhibit normal signs of estrus every 18 to 24 days but require more than three services to become pregnant [8].

Repeat breeding of bovine has been recognized as one of the most serious reproductive problems. It is the main reason of infertility and has long been a problem worldwide to dairy farms. This syndrome leads to prolonged time at first caving age, prolonged inter-calving interval and economic losses due to loss of one calf per year per cow and milk loss for lactation [8].

Repeated breeding is most of the times associated with dairy cow reproductive mismanagement other than hormonal inherited problems which signifies very less. The repeat breeder syndrome can be a problem due to management or a lack thereof. Some possible management factors to be considered to improve conception rates are as follows: improper timing of insemination (too late, early, already pregnant, etc.), insemination of cows not in estrus, inadequate estrus detection, improper semen handling and insemination placement, improper cooling and cow comfort, poor transition and nutrition management [6, 7]. Therefore, objectives of the present work were:

- To study the prevalence of repeated breeding syndrome in dairy cows in Mekelle city.
- To assess the effect of age and breed on repeat breeding syndrome.

**MATERIALS AND METHODS**

**Study Area:** This study was conducted in Mekelle the capital city of Tigray regional state from November 2013 to April 2014. Mekelle is located between 13° 29 north latitude and 39° 28 east longitude and covers a total area of 3500 hectares in the north highlands of Ethiopia and located at 783 km north of Addis Ababa. The elevation of the city measures 2000-2270 meter above sea level. The maximum and minimum average temperature per year is 24.1°C 11.1°C respectively and also average annual rain fall is 579-650mm [9].

**Study Animals:** All dairy cows owned by selected households and farm animals brought to Mekelle city veterinary clinics, Kuha and AI service station for insemination with superior bulls semen distributed by the national AI center at Kaliti were included in this study.

**Equipment and Tools:** Different equipments and materials including liquid nitrogen container, liquid nitrogen, thermometer, warm water, semen in straw, scissor, towel, AI sheath and gun, gloves, petridish and microscope slide which are used by AI technicians were used for this study.

**Sample Size Determination:** The required sample size for this study was estimated by considering 50% bovine repeat breeding syndrome prevalence since there was no prevalence study on bovine population in the study area previously. Thus, the sample size for this study was calculated according to Bage et al. [6]. Using 95% confidence level and 0.05 absolute precision. This is calculated by using the following formula:

\[ N = \frac{1.96^2 \times P_{exp} (1 - P_{exp})}{d^2} \]

Where:

- \( N \) = required sample size
- \( P_{exp} \) = expected prevalence
- \( d \) = desired absolute precision (usually 0.05)
- 1.96 = Z-value for 95% confidence level.

\[ N = \frac{1.96^2 \times (0.5)(0.5)}{(0.05)^2} \]

\[ N = \frac{3.84 \times (0.25)}{(0.0025)} \]

\[ N = 3.84 \times 100 \]

\[ N = 384 \]

Purposive sampling was applied. Whereas the most desired sampling units were selected. The sample was taken by detecting of heat, inseminating and record keeping from heifers and cows during standing heat.
Data Analysis: The data was first entered into Microsoft Excel worksheet and analyze using Statistical Package for Social Sciences (SPSS) software version 16 using descriptive statistics and chi square test was used to determine the variation in the prevalence of repeat breeder syndrome in dairy cows and influence of breed and age on its prevalence and also to find the magnitude of variation in repeat breeder syndrome among animals of the three groups.

RESULTS

Repeat breeding has long been considered as one of the most important reproductive disorders in cattle. The total prevalence of repeat breeders in Mekelle city was 7.29% (n=28) out of the 384 animals studied. From the total of 53 heifers 12 (22.64%) were with repeat breeder syndrome. Similarly, 16(4.83%) repeat breeders were recorded from the total of 331 cows. The prevalence of repeat breeder among local breeds from the total 145 was seen 10(6.90%) and 18(7.53%) were crossed breeds from the total of 239. Repeat breeder was observed in 5(21.74%) from the total of 23 local breed heifers and 7(23.33%) repeated breeder was seen from the total of 30 crossed breed heifers. Similarly, 5(4.10%) were repeat breeders from the total of 122 local breed cows and from the total of 209 crossed breed cows 11 (5.26) were found (table 1) with the syndrome.

DISCUSSION

Repeat breeding is one of the infertility problems which reduce the productivity and economic efficiency of dairy cattle. Most of the repeat breeders are not sterile; rather cows suffer from lowered fertility. Repeat breeders should be carefully evaluated in order to define the most probable reason for the failure to conceive (early repeats) or failure in pregnancy maintenance (early and late repeats). According to Kimura et al. [11] the incidence of repeat breeding in cows in various countries, ranged from 10 to 18%, whereas, in the present study, at Mekelle city the prevalence of repeat breeding was only 7.29%. The reduction in prevalence or incidence in Mekelle city might be due to the timely culling or slaughtering of repeaters after fattening. The prevalence of repeat breeder in Mekelle was high and the finding is in agreement with Molalegne and Shiv [12] who have reported similar prevalence rates around Bedelle, South West Ethiopia.

The prevalence of repeated breeder syndrome was higher in heifers. This implies heifers are more prone for repeat breeding in higher degree than cows. This is in conformity with Hafez [13] who has also reported early development of bovine embryo is impaired in uterine environment of repeat breeding heifer.

In addition, the study has revealed repeated breeding was common in crossed breed cows compared to local breed cows. This could be associated with the effects of cross breeding or the inadequate adaptation of the imported, more sensitive, Holstein-Friesian breed to the climate of the study area, housing and management. These cows may have inherently lower fertility [14, 15], or it can be associated with energy deficits Butler [16] and/or abnormal ovarian activity [17]. The high milk yield (average of 300kg/year more than in crossbreeds) and a possible genetic predisposition of the Holstein-Friesian breed for RBS, could be taken into consideration for a higher prevalence of RBS in the cross breed cows.

CONCLUSION AND RECOMMENDATIONS

From the finding of this study it is very clear that the prevalence of repeat breeding is higher in Mekelle city with the highest record in cross breed heifers which might be due to inseminating at puberty period on the first sign of oestrus and low hormonal secretion. The prevalence of repeat breeding is higher in crossed breed cows which may be due to the susceptibility to environmental influence, inherently lower fertility, more sensitive to housing and other management practices.

ACKNOWLEDGEMENTS

The research team members are deeply grateful to the University Industry and Community Linkage office of Mekelle University (UICL) for the financial support.
Also, the research team members would like to thank the residents of Mekelle city for their genuine informative involvement.

REFERENCES


