

Study the Prevalence of Anestrus in Relation to Some Threats in Heifer and Postpartum Cows

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Abstract

The objectives of current study were to assess the prevalence and risk factors associated with postpartum anestrus in lactating dairy cows in Rajshahi, Bangladesh. A total of 160 postpartum cows of different breed, genotype and age were selected randomly from different dairy farms in studied area. Structured questionnaire was used to collect data from farm owner on prevalence and risk factors for postpartum anestrus. Observed heat within 60 days after parturition was considered as normal cyclic cows and others were considered as postpartum anestrus. The prevalence of postpartum anestrus was 54.42%. The study shows that older cows take relatively more time for ovarian resumption. The highest percentage (54.64%) of cows showed anestrus in crossbred cows that native in Rajshahi. When compared with genotype the highest percentage anestrus was observed 100.00 in Local x Jersey than 66.66% in Local x Sahiwal genotype to 53.07% in Local x Friesian and lowest was 50.00% in indigenous cattle. The age of cattle also relation to anestrus and the highest, lowest and average percentage of anestrus were showed 60.00%, 39.39% & 50.49% in < 4 year, > 6 years and 4 to < 6 years age group of cattle at Rajshahi area of Bangladesh.

Keywords: Anestrus, breed, Age and genotype.

Introduction

Livestock of Bangladesh is backbone bone of rural economy. Among the livestock, cattle are most available and multipurpose component. It plays an important role to promote human health and wealth by supplying animal protein in the form of milk and meat. The main aim of dairy farmers is one calf/cow per year. High reproductive efficiency is very much important for accomplishing maximum return from this animal. The reproductive performance of high yielding cows with high genetic merit declines in many dairy industries. One of the major limits of profitable dairy farming is low pregnancy rate in cows [1, 2] (Alam *et al.*, 1994, Shamsuddin *et al.*, 2001). The productivity of cattle could be low because of poor nutrition [3] (Alam *et al.*, 2006), and incorrect detection of estrus [4, 5 & 6] (Roelofs *et al.*, 2010; Macmillan, 2010; Paul *et al.*, 2011). However, the specific explanations for the decline have not been documented. These might be directly related to or intensified by environmental and management conditions. The same management advantages are less important to reproductive management where each animal must be considered as an individual within its own estrus cycle so that estrus, ovulation, insemination, fertilization and conception occur within a sequence that is within restricted behavioral and

biological limits. Estrus detection and animal identification have become increasingly difficult in large dairying operations to the extent that decisions related to the breeding management of individual cows are usually made by “barn” staff working with cows that may only have limited periods to interact in a free manner [5] (Macmillan, 2010).

Anestrus problems causes interfere animal production. Ultimately the reduce number of calf and less amount of milk production resulting farmer’s become economically looser. The commercial success of a dairy farm generally depends on the success of demonstrating an optimal calving interval of roughly 365 days (Uddin et al., 2019) [7]. To achieve the optimal calving interval in dairy cows, an anestrus period after calving shouldn't exceed 65 days [7] (Uddin et al., 2019). There are many factors influencing the occurrence of anestrus like breed, age, parity, poor body condition score, nutritional deficiencies, hormonal imbalance etc. Anestrous is a big problem in dairy cows worldwide including Bangladesh. So, the present study was undertaken with the following objectives.

Observation of the prevalence of anestrus in relation to some risk factors in heifer and postpartum cows.

Materials and methods

The data was collected directly from the dairy farms owner by using questionnaires and gynecological examination of cows were made on the basis of history, clinical examination and observation. The risk factors of anestrus in cows such as breed, age, and genotype were classified with different groups.

Grouping of selected cows

To achieve the goal, animals were grouped according to following considering risk factors:

Breed

The cows was classified broadly in Indigenous or Local and Cross-bred. These were

- Group I : Indigenous (n = 14)
- Group II : Cross-bred (n = 280)

Genotype of Cows

Selected cows were further grouped into their genetic composition. These were

- Group I : Indigenous (n=14)
- Group II : Local × Friesian (n=260)
- Group III : Local×Sahiwal (n=15)
- Group IV : Local× Jersey (n=05)

Age group

Age of these cows was divided in the following groups:

- Group I : <4 years (n = 160)
- Group II : 4 to <6 years (n = 101)
- Group III : >6 years (n = 33)

Determination of Anestrus cows: When the cows fail to mate even if it has attained 2.5 years old in case of crossbred heifer and 36th months in case of local heifer. But in case of cows of 60 days have passed since the last delivery.

No. of detected anestrus cows

- **Anestrus Rate (%)**:------×100
Total no. of adult cows studied

Statistical Analysis

Data which was collected, sorted and complied with the help of computer software SPSS. Various statistical tools such as %, mean, standard deviation, incidence & chi-square test and the significant difference among therapeutic treatment means will be identified by least significant difference (LSD) test.

Results and discussions

The present study undertaken about of 160 postpartum cows of different breed, genotype and age were selected according to their full history from private dairy farms at Rajshahi, Bangladesh. The prevalence of anestrus in cows with respect to different areas is presented in Table 1 to 3. The Effect of breed on prevalence of anestrus in cow is presented in Table-1.

The overall prevalence of anestrus in cows was 54.42% and statistically the lowest occurrence was observed in native (50.0%) and the highest occurrence was observed in cross-bred (55.00%). The prevalence of the present study is comparable with some earlier reports in Bangladesh (Kamal et al., 2012, 2014) [8 & 9]. The prevalence of postpartum anestrus in different herds is dependent on various factors (Mwaanga and Janowski, 2000) [10] but the major causes of types are subestrus and true anestrus (Zduńczyk et al., 2002) [11]. Subestrus is mainly because by poor estrus detection or a high incidence of silent estrus (Lyimo et al., 2004; Shamsuddin et al., 2006) [12 & 13]. Inaccurate estrus detection is also an important problem in Bangladesh (Shamsuddin et al., 2006) [13]. Moreover, the prevalence of estrus in cows was almost similar in different small holding dairy farms in the present study. In Wrzecińska et al. (2023) cited the cow-level prevalence of anovulation was 19.5%, with a herd-specific range from 5 to 45%. The highest percentage (55.00%) of cows observed anestrus in Crossbred cows compared to native (50.00%). The result of this research was similar to the study of Sveberg et al., (2015) [15] where they found that duration and intensity of estrus in crossbred cows were fewer and displayed fewer estrus behavioural episodes with a shorter duration of estrus than in other cows (Sveberg et al., 2015) [15]. Although Glencross et al., (1983) [16] considered that intensity of estrus behavior was unrelated to estrogen concentrations; more studies have found that preovulatory estrogen concentrations are lower in high yielding than low-yielding cows and that the intensity of estrus behaviour is related to those estrogen concentrations (Kurte et al., 2004; Rivera, Lopez and Fricke, 2004) [17 & 18]. In other words, high-yielding cows have a lower estrogen concentration and a reduced intensity of estrus behavior [19].

Table 1: Effect of breed on prevalence of anestrus in cow

Breed	No. of Observation	No. of normal cow	No. of anestrus cow	% of anestrus cow
Native	14	7	7	50.00%
Crossbred	280	127	154	55.00%
Total	294	134	160	54.42%

The Effect of genotype on prevalence of anestrus in cow is presented in Table-2. The numerically the highest and lowest occurrence of anestrus was observed in Local × Sahiwal (66.66%) and Indigenous (50.00%). The Local × Frisian was observed 53.96% anestrus in dairy cow at Rajshahi. Dutta et al., (2023) [8] said their article the most Holstein Friesian and Sahiwal cows have observed estrus ≤60 days after parturition than those of Indigenous and Jersey. The genotype of cows had significant effect on anestrus (Table-2). The result of this research was similar to the study [15 & 19] where they found that duration and intensity of estrus in Holstein Friesian cows were fewer and displayed fewer estrus behavioural

episodes with a shorter duration of estrus than in other cows [15]. Abeygunawardena and Dematawewa (2004) also [20] showed that genotype has a significant effect on postpartum reproduction in cow.

Table 2: Effect of genotypes on prevalence of anestrus in cow.

Genotypes	No. of Observation	No. of normal cow	No. of anestrus cow	% of anestrus cow
Indigenous	14	7	7	50.00% ^{bc}
Local × Frisian	265	122	143	53.96% ^b
Local × Sahiwal	15	5	10	66.66% ^a
Total	294	134	160	54.42%

a, b,c with different superscript letters in the same column differs significantly with each others (P<0.05) Effects of age of cows on occurrence of anestrus are presented in Table 3. Among the affected cows, significantly lower proportion of cows (39.39%) suffered from anestrus at > 6 years of age than that of cows at 4-6 years (50.49%) and cows age <4 years (60.00%). Dutta et al., (2023) [19] stated that the highest percentage (49.25%) of postpartum anestrus was observed in the group of 48 - <72 months age cows, whereas lowest (25%) in <48 months age group. The age had highly significant (P<0.001) effect on the prevalence of anestrus in dairy cows at Sylhet, Bangladesh.

Table 3: Effect of age on prevalence of anestrus in cow.

Age group	No. of Observation	No. of normal cow	No. of anestrus cow	% of anestrus cow
< 4 years	160	64	96	60.00% ^a
4 to <6 years	101	50	51	50.49% ^b
> 6 years	33	20	13	39.39% ^c
Total	294	134	160	54.42%

a, b,c with different superscript letters in the same column differs significantly with each other's (P<0.05) The highest occurrence of anestrus was recorded in cows 60.00% in < 4 years age group and the lowest occurrence were in cows' of > 6 years age (39.39%). The variation in anestrus occurrence among cows with different age groups was significant (P<0.05). Compared to other Dutta *et al.* 92023) [19] shows that the average age of postpartum anestrus cows is significantly (p<0.001) higher than that of cyclic cows.

Conclusions

The overall prevalence of anestrus cows was 54.42%. The lower prevalence of anestrus was observed in indigenous cattle (50.00%). The cows which having <4 years of age had more chance of anestrus among the others.

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