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REPRODUCTIVE DISEASES AND DISORDERS OF DAIRY COWS IN THE GAZIPUR DISTRICT

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Abstract

Reproductive diseases and disorders of dairy cows significantly reduce their productivity which is of great concern to dairy producers because most reproductive disorders adversely affect future fertility. The objective of this study was to determine the incidence of reproductive diseases and disorders in dairy cows at Gazipur Sadar Upazila of Bangladesh. A total of 2430 dairy cows from total 150 small (<10 dairy cows) and large scale (>10 dairy cows) dairy farms were studied using predesigned questionnaires during January 2016 to December 2018. Twenty reproductive diseases and disorders were diagnosed. Among them, the major reproductive diseases and disorders were anestrous, mastitis, repeat breeding, metritis, retained placenta, and the minor problems were heat detection diseases and disorders. Total incidence of reproductive diseases and disorders was 21.51%, among the major reproductive diseases and disorders, incidence of anoestrus 6.79%, mastitis 3.66%, repeat breeding 3.20%, metritis 2.34%, retained placenta 1.31% and heat detection 1.06%. The highest occurrence of reproductive disease was anoestrus in dairy cows with low body condition score (BCS $\leq$ 2) than that with fair (2.5) and good ($\geq$3-3.5) body condition scores. Anoestrus, mastitis, and repeat breeder should get top priority considering reproductive diseases and disorders research to gain more knowledge to control them in the study area context.

Keywords: Body condition score, Incidence, Rectal palpation, Reproductive diseases Reproductive disorders, Ultrasonography

Introduction

Reproduction is a vital factor in determining the efficiency of animal production. In cattle production, good reproductive performance is essential to efficient management and production as a whole. However, the successful economy of a dairy farm either large or small scale lies in proper and optimal reproductive rhythm of each individual cow within the normal physiological range. Any deviation in the breeding rhythm or abnormality in the reproductive system results in a progressive economic loss (Islam *et al.,* 2013). In Bangladesh, mostly small-scale dairy producers are depended on crop residues with a limited supply of concentrates. Recently, large-scale dairy producers

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increased in a number and play an important role to fulfill the milk and meat production and national demand. Reproductive diseases and disorders are the major causes of reduced productivity in cattle that result in failure to produce or delay in producing the annual life calf and reduced lifetime production of cows (Maruf *et al.*, 2012). In case of small ruminant (sheep and goat), the most pressing constraint on goat and sheep reproduction in Bangladesh is dystocia, abortion, and mastitis (Sultan *et al.*, 2015). Reproductive diseases and disorders leading to prolonged intervals between calvings and low conception rate were reported earlier in Bangladesh (Shamsuddin *et al.*, 2001). It is accepted that bovine genital infections, either specific or non-specific in nature, account for the large number of pregnancy failures in cows (Sirohi *et al.*, 1989). Some researchers studied reproductive diseases in large government dairy farms and identified retained placenta, metritis, pyometra, endometritis, cervicitis, persistent corpora lutea, cystic ovaries, and non-functional ovaries (Shamsuddin e*t al.* 1988). The percentage of retained placenta was as high as 42.3% (Ahmed, 2005). Large scale dairy farms increase along with small scale dairy farms. Therefore, a cross-sectional study of the amplitude of reproductive diseases and disorders in small and large scale dairy farms in the Gazipur Sadar Upazila of the Gazipur district

Materials and Methods

Study areas, periods and animals

Gazipur Sadar Upazila in the Gazipur district of Bangladesh was selected as study area. A total of 2430 dairy cows from 150 small (<10 dairy cows) and large scale (≥10 dairy cows) dairy farms were selected. The reproductive diseases and disorders data were collected using predesigned questionnaires from January 2016 to December 2018. Information was collected on the total number of cows in the farms, history of reproductive diseases and disorders, and diagnosed reproductive problems by rectal palpation and ultrasonography. The recorded diseases from computerized and written data serve as an essential tool for the rapid and accurate presumptive diagnosis of incidence of reproductive diseases and disorders in a dairy farm. The incidence rate of reproductive diseases and disorders were calculated from the collected on-farm and recorded data.

Incidence rate of reproductive diseases and disorders = Affected cows/Total cows × 100

The assessment of BCS was done by visual and tactile appraisal of specific body regions to subjectively assess heifer's body energy reserves as fat. A scoring system from 1 to 5 scales with 0.5 fractions is used for scoring body condition (Heuer *et al.*, 1999).

Rectal palpation and ultrasonography

The suspected reproductive diseases and disorders were monitored by rectal palpation and B-mode ultrasonography using a transrectal probe. Briefly, the ultrasound machine (PharVision MicroV10, Classic Medical Supply, Inc., USA) was set near the animal where electrical connection was available. The cows were restrained in a squeeze chute to reduce stress and risk of injury to the animal. Fecal material was evacuated from the rectum and the perineum was washed with clean water. The linear probe was

lubricated with an ultrasound transmission gel (Aquasonic ®, Parker Laboratories, Inc., USA) and was inserted into the rectum, was moved forward over the vagina through the rectum to place it lateral to the cervix. Specific changes on the cervix were identified. Then the body and horn of the uterus were examined and changes were recorded. The ovary was held by the hand in the rectum, was brought in front of the transducer face and the entire ovary was scanned. The development and regression of the corpus luteum and other ovarian changes, such as follicle development, were carefully noted and recorded. The changes in the uterus and cervix were also recorded on the same day.

Statistical analysis

The data obtained from the questionnaire was entered in Microsoft Excel 2016. The data were tabulated, analyzed, and compared in percentages by using the statistical software MINITAB.

Results and Discussion

In total 150 (<10 dairy cows) and large scale (>10 dairy cows) dairy farms were studied for major reproductive diseases and disorders. Anestrous, mastitis, repeat breeding, metritis, retained placenta, poor heat detection, ovarian cysts, abortion, and dystocia were the major reproductive problems. Moreover, the body condition score of cows had a significant effect on the occurrence of reproductive diseases and disorders.

Incidence of reproductive diseases and disorders in dairy cows

Twenty reproductive diseases and disorders were diagnosed in 525 dairy cows among 2430 dairy cows (Table 1). Incidence of reproductive diseases and disorders were 21.51% in total population, among of the diseases and disorders anoestrus 6.79%, mastitis 3.66%, repeat breeder 3.20%, metritis 2.34%, retained placenta 1.31%, early embryonic death 0.53%, poor heat detection 1.06%, ovarian cyst 0.08%, uterine prolapsed 0.08%, vaginal prolapsed 0.28%, still birth 0.16%, abortion 0.57%, fetal mummification 0.20%, dystocia 0.65%, pyometra 0.16%, ovarian tumor 0.12%, cervicitis 0.04%, sulphingitis 0.08%, ovobursal adhesion 0.04% and ovarian atrophy 0.04%. Anestrous was the most important cause of infertility of cows in the study area, mastitis, repeat breeder, metritis, retained placenta, and poor heat detection were the next consequence. The highest proportion of cows suffered from anestrous (31.42%; n=165), and the lowest proportion of cows (0.19%; n=1) had cervicitis, ovarian adhesion, and ovarian atrophy. The mastitis (16.95%; n=89), repeat breeder (14.85%; n=78), metritis (10.85%; n=57), retained placenta (6.09%; n=32), poor heat detection (4.95%; n=26) were diagnosed as major reproductive diseases and disorders. The prevalence of reproductive disorders was 23% in dairy cows in Patiya upazila of the Chittagong district of Bangladesh (Maruf *et al.,* 2012). Our study found the incidence of reproductive diseases and disorders was 21.51% in small and large scale dairy farms in Gazipur Sadar

Table 1. Incidence of reproductive diseases and disorders in dairy cows of Gazipur Sadar Upazilla of the Gazipur District.

Dairy cows	Reproductive diseases and disorders	Affected cows	Incidence of reproductive diseases and disorders (%)	Proportion of reproductive diseases and disorders among affected cows (%)
2430	Anoestrus	165	6.79	31.42
	Mastitis	89	3.66	16.95
	Repeat breeding	78	3.20	14.85
	Metritis	57	2.34	10.85
	Retained placenta	32	1.31	6.09
	Early embryonic death	13	0.53	2.47
	Poor heat detection	26	1.06	4.95
	Ovarian cyst	02	0.08	0.38
	Uterine prolapsed	05	0.20	0.95
	Vaginal prolapsed	07	0.28	1.33
	Still birth	04	0.16	0.76
	Abortion	14	0.57	2.66
	Fetal mummification	05	0.20	0.95
	Dystocia	16	0.65	3.04
	Pyometra	04	0.16	0.76
	Ovarian tumor	03	0.12	0.57
	Cervicitis	01	0.04	0.19
	Sulphingitis	02	0.08	0.38
	Ovobarsal adhesion	01	0.04	0.19
	Ovarian atrophy	01	0.04	0.19
		Total = 525	21.51	

upazila of the Gazipur district. On the other hand, the major reproductive disorders recorded in goats were dystocia (41.21%), abortion (21.83%), mastitis (21.89%), retained placenta (11.82%), and pyometra (3.44%) (Sultan *et al.,* 2015). Similarly, major reproductive disorders in sheep were dystocia (53.71%), abortion (25.0%), pyometra (7.12%), mastitis (7.16%), and retained placenta (7.17%) (Sultan *et al.,* 2015). The occurrence of anoestrus was 6.79%, which was lower than that (26.52%) observed in South West Ethiopia (Bitew and Prasad, 2010). The prevalence of retained fetal membrane was 1.31%. Previously, reported 27.73% cases of retained placenta in Karan Fries cows (Satya Pal, 2003). In comparison, other researchers reported lower incidence of retained fetal membrane (0.31%, 1.47%, 8.28%, and 7.84% respectively) (Shamsuddin *et al.,* 2010). The occurrence of metritis was recorded 25.57% in South West Ethiopia (Molalegne and Shiv, 2011). Our study found the occurrence of metritis was 2.34%.

Retained placenta is an important post-parturient problem in cattle farming. Its incidence can be as high as 12% even in normal delivery, about 63% of the retained placenta out of 750 calving in the Savar Dairy farm; the highest incidence was recorded in March and the lowest in September (Shamsuddin *et al.*, 1988). The incidence of repeat breeding in the present studies was 3.20% which was lower than the findings in Ethiopia (Getachew and Nibret, 2014). In addition to these, communal use of bulls for natural services is also considered as contributing factor reported 5% repeat breeding cases (Shamsuddin *et al.*, 2010). The prevalence rate of pyometra 0.16% was lower than the prevalence rate of Savar dairy farm 8.2% (Shamsuddin *et al.*, 1988).

Body condition score (BCS) and reproductive diseases and disorders

Body condition scores had great effects on reproductive diseases and disorders. In Table 2, BCS 2 or equivalent it was shown that prevalence of anoestrus 18.09%,

Table 2. Incidence of reproductive diseases and disorders on BCS in dairy cows (N=2430); N= Number of observations; n= Number of animals affected.

Reproductive diseases and disorders	Body condition score					
	BCS ≤2, n=525		BCS 2.5, n=890		BCS ≥3-3.5, n=1015	
	No.	%	No.	%	No.	%
Anoestrus	95	18.09	45	5.05	25	2.46
Mastitis	17	3.23	25	2.80	47	4.63
Repeat breeding	19	3.61	27	3.03	34	3.34
Metritis	10	1.90	18	2.02	29	2.85
Retained placenta	05	0.95	09	1.01	18	1.77
Early embryonic death	07	1.33	05	0.95	01	0.09
Poor heat detection	13	2.04	07	0.78	06	0.59
Ovarian cyst	00	00	01	0.11	01	0.09
Uterine prolapsed	00	00	00	00	05	0.49
Vaginal prolapsed	00	00	01	0.11	06	0.59
Still birth	02	0.38	02	0.22	00	00
Abortion	02	0.38	05	0.56	07	0.68
Fetal mummification	01	0.19	04	0.44	00	00
Dystocia	09	1.71	05	0.56	01	0.09
Pyometra	00	00	00	00	04	0.39
Ovarian tumor	00	00	01	0.11	02	0.19
Cervicitis	00	00	00	00	01	0.09
Salphingitis	00	00	02	0.22	00	00
Ovobarsal adhesion	01	0.19	00	00	00	00
Ovarian atrophy	00	00	01	0.11	00	00

mastitis 3.23%, repeat breeder 3.61%, metritis 1.90%, retained placenta 0.95%, early embryonic death 1.33%, poor heat detection 2.04% and dystocia; on BCS 2.5 the prevalence of anoestrus 5.05%, mastitis 2.08%, repeat breeder 3.03%, metritis 2.02%, retained placenta 1.01%, early embryonic death 0.95%, poor heat detection 0.78% and dystocia 0.56%; and on the BCS ≥ 3-3.5 prevalence of anoestrus 2.46%, mastitis 4.63%, repeat breeder 3.34%, metritis 2.85%, retained placenta 1.77%, early embryonic death 0.09%, poor heat detection 0.59% and dystocia 0.09%. The body condition score is an arbitrary scale for estimating the amount of body fat in cows (Wildman *et al.,* 1982). Cows with good BCS (2.5) conceived at a higher rate than did thin (≤2.0) and over-conditioned (>3.5) ones (Maruf *et al.,* 2012). BCS at estrus positively correlates with the conception rate (Roche *et al.,* 2007). This variation might be due to the management system, feeding, and breed of animals.

Conclusion

According to our study anoestrus, mastitis, and repeat breeders are the three most important reproductive diseases and disorders. Knowledge in terms of risk factors and their mitigation already available about these diseases should be extended to farmers to control them.

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Conflicts of Interest

The authors declare no conflicts of interest regarding publication of this paper.

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