

## Reproductive Disorders that Limits the Reproductive Performances in Dairy Cows of Bangladesh

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### ABSTRACT

The reproductive disorders are the major causes of reproductive infertility in cows that affect the total annual calf crop, resulting in great economic loss in Bangladesh. The aim of the study was to find out the reproductive disorders (RD) in dairy cows that markedly influences the reproductive performances in aspect of Bangladesh. A total number of 1658 dairy cows were selected according to their body condition score (BCS) in different farms at the southern part of Bangladesh during the period of 2011 to 2012. The preliminary data (basic information) were collected directly from the dairy farmer's record books and asking questions according to a prescribed questionnaires as well as the diagnosis of RD was presumptively confirmed on the basis of history, clinical signs and examination of animals by ultrasonography and others necessary tools. There are thirteen major reproductive disorders were identified. Overall prevalence of reproductive disorders at that area were 23%, among of these anoestrus 5.1%, repeat breeder 3.7%, metritis 4.4%, poor heat detection 1.6%, ovarian cyst 0.36%, retain placenta 4.6%, dystocia 0.97% and pyometra 0.24%. It is indicated that anoestrus and retention of placenta after calving was most hazardous cause of infertility whereas the metritis and repeat breeder were the second line of consequence. RD had shown significantly higher incidence in low BCS ( $\leq 2$ ) than that of fair (2.5) and very good ( $\geq 3 \sim 3.5$ ). In conclusion, the highest RD especially anoestrus and retention of placenta is very alarming for reproductive loss which might be needed further research to identify the specific cause of these disorders for establishment a profitable dairying and dairy population.

(Key words: Bangladesh, dairy cows, fertility, reproductive disorders)

### INTRODUCTION

High reproductive efficiency of cows is very important for achieving the maximum return from dairy farming. Researches to understand reproductive physiology and the disorders that limit the reproductive efficiencies are important for improving the production system and profitability of dairy farms. Any abnormality in reproductive system can interrupt animal production performance (Shamsuddin *et al.*, 1988). The cattle of Bangladesh mostly belong to smallholder producers and are maintained on crop residues with limited supply of concentrates (Paul *et al.*, 2011). Other than artificial insemination (AI) technology uptakes by farmers are very little (Shamsuddin,

2001).

Reproductive disorders are the major causes of reducing productivity in cattle that result in failure to produce or delay in producing the annual life calf and reduced lifetime production of cows. Inefficiencies in reproduction cause losses in dairy farms because pregnancy and parturition are prerequisite for the initiation and maintenance of lactation. Arthur *et al.* (1998) identified sub-fertility as the most important limiting factor in maintaining a good productivity in a dairy farm. Reproductive diseases leading to prolonged intervals between calvings and low conception rate reported earlier in Bangladesh (Shamsuddin *et al.*, 1988; Alam and Ghosh, 1994; Shamsuddin, 2001). Economy of dairy farming largely depends on pregnancy

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rate after in semination. The twelve-month calving interval is advantageous for maximal milk yield per cow per year with good economic return (Opsomer, 1996). It is accepted that bovine genital infections, either specific or non-specific in nature, account for large number of pregnancy failure in cows (Sirohi, 1989). Shamsuddine (1988) studied reproductive diseases in large government dairy farm and identified retained placenta, metritis, pyometra, endometritis, cervicitis, persistent corporalutea, cystic ovaries and nonfunctional ovaries. The percentage of retained placenta was as high as 42.26%. However, the dairy herd of developed counties often loss as high as one third of their cows because of reproductive disorders. Therefore, there is a rationale to study the magnitude of major reproductive disorders which limit the reproductive performances in dairy farm.

## MATERIALS AND METHODS

This research was conducted in various dairy farms under the Community based Dairy Veterinary Foundation (CDVF) at the Southern part of Bangladesh. CDVF has been involved since 2002 to develop the peri-urban dairy farming community. Currently the community has become one of the largest milk pockets in Bangladesh. The community rear crossbred (non-descript indigenous zebu sired by Holstein-Friesian bulls) dairy cows and has developed a milk marketing through their cooperatives, which negotiate fair milk price mainly with different sweetmeat industries and others. The farmers have been trained and they possess good knowledge on small-scale market oriented dairy production system.

### 1. Population and Selection of Dairy Farms

Two hundred and two dairy farms were selected. These are the contact dairy farm of CDVF. The preliminary data were collected by using a pretested questionnaire to find out their major problems that faced during farming. Animals were examined where necessary to collect individual animal data.

### 2. Study Design

The cross-sectional study was undertaken to collect information on farms and dairy production systems, as well as about the reproductive diseases. The cows were examined and the data were recorded by using the specific form prepared for the evaluation of reproductive problems.

Cows were examined visually for herd nutrition condition. Information was collected on total number of animals in the farms, total breedable animals (cows that calved 60 or more days before but did not conceive plus heifers 24 or more months old but are not pregnant), total pregnant cows, last two months history of reproductive diseases. Another form (only related to reproduction) was used to collection of data on reproductive problems for individual animals. Animals seemed to suffer from anoestrus, repeat breeding and poor heat detection were subjected to physical examination and per rectum palpation genital tracts to confirm the diagnosis.

### 3. Data Collection Procedure

The investigator personally visited all the selected farms and collecting data. Therefore, records of reproductive cases were collected from a total of about 200 farms of Sikolbaha, Chorlaksha Zulda, Ziri, Shahmirpur, Doulotpur, Koigram villages under the Potiya Upazilla in the Chittagong district.

### 4. Statistical Analysis

The collected data was entered in the Microsoft Excel 2007 and were coded, scored, compiled, tabulated and analyzed in accordance with the objective of the study by pared *t*-test using the statistical software MINITAB.

## RESULTS

In total 202 dairy farms were peer investigated for major reproductive problems. Anoestrus, repeat breeder, retained placenta, metritis, abortion and dystocia were the major reproductive problems. We found that the BCS of cows had significant effect on the occurrence of reproductive disorders.

### 1. Occurrence of Different Reproductive Diseases or Disorders in Dairy Cattle

Thirteen major reproduction disorders were diagnosed in 382 dairy cows among 1,658 breed able cows (Table 1). Prevalence of reproductive disorders were 23% in total population, among of the diseases anoestrus 5.1%, repeat breeder 3.7%, metritis 4.4%, poor heat detection 1.6%, ovarian cyst 0.36%, retain placenta 4.6%, dystocia 0.97% and pyometra 0.24%. Anoestrus was most important cause of infertility of cows in study area, retain placenta, metritis, repeat breeder were the next consequence.

Table 1. Reproductive disorders in dairy cows

No. of cows	RD	No. of affected cows n(%)	Proportion of RD among affected cows (%)
	Anoestrus	85 (5.1)	22.2
	Repeat breeding	62 (3.7)	16.2
	Metritis	73 (4.4)	19.1
	Poor heat detection	26 (1.6)	6.8
	Ovarian cyst	6 (0.36)	1.6
	Uterine prolapsed	7 (0.42)	1.8
1658	Vaginal prolapsed	5 (0.3)	1.3
	Retain placenta	76 (4.6)	19.8
	Abortion	14 (0.84)	3.7
	Still birth	5 (0.3)	1.3
	Dystocia	16 (0.97)	4.2
	Pyometra	4 (0.24)	1.0
	Laceration of vagina	3 (0.18)	0.79

RD = reproductive disorder.

The highest proportion of cows suffered from anoestrus (22.2%; n=85) and the lowest proportion of cows had laceration of vagina (0.7%; n=3). The retained placenta (19.8%; n=76), repeat breeding (16.2%; n=69), metritis (19.1%; n=73), poor heat detection (6.8%; n=26) were diagnosed as major reproductive problems.

## 2. Effect of BCS on the Occurrence of Reproductive Disorders in Dairy Cattle

Body condition score had great effects on reproductive disorders. On the BCS 2 or equivalent it was shown that prevalence of anoestrus 11%, repeat breeder 5.8%, metritis 7.1%, ovarian cyst 0.32%, retain placenta 10.3%, dystocia 1.6% and pyometra 0.32%; on BCS 2.5 the prevalence of anoestrus 4.8%, repeat breeder 3.8%, metritis 4.5%, ovarian cyst 0.33%, retain placenta 4.5%, dystocia 1.1% and pyometra 0.16%, and on the BCS  $\geq 3 \sim 3.5$  prevalence of anoestrus 2.9%, repeat breeder 2.7%, metritis 3.1%, ovarian cyst 0.26%, retain placenta 2.2% dystocia 0.52%, vaginal prolapse 0.13% and poor heat detection rate 0.52% and pyometra 0.26%.

Table 2. Comparison of reproductive disorders based on BCS of cows

Reproductive disorders	BCS					
	BCS $\leq 2$ (n=309)		BCS 2.5 (n=593)		BCS $\geq 3 \sim 3.5$ (n=756)	
	No.	%	No.	%	No.	%
Anoestrus	34	11	29	4.8	22	2.9
Repeat breeding	18	5.8	23	3.8	21	2.7
Metritis	22	7.1	27	4.5	24	3.1
Ovarian cyst	1	0.32	2	0.33	2	0.26
Retain placenta	32	10.3	27	4.5	17	2.2
Dystocia	5	1.6	7	1.1	4	0.52
Vaginal prolapsed	3	0.97	1	0.16	1	0.13
Poor heat detection	12	3.8	10	1.6	4	0.52
Abortion	3	0.97	7	1.1	4	0.52
Uterine prolapsed	4	1.2	2	0.33	1	0.13
Still birth	2	0.64	2	0.33	1	0.13
Pyometra	1	0.32	1	0.16	2	0.26

(N=1,658); N = number of observation.

n = number of animal affected.

BCS = body condition score.

## DISCUSSION

In this study, we have peer investigated the newly developed farm which is raised according to our CDVF supervision. It is also the great success of CDVF project to reach these areas as a milk pocket zone. However, beside the strict supervision, there are some problems which are frequently faced, related to their cows' reproduction. Therefore the present study designed to identify those problems that limit the reproductive performances.

We found that the BCS of cows influenced the occurrence of reproductive disorders. Many factors affect reproduction of dairy cows. In this study, we identified the main reproductive problems were anoestrus, repeat breeder, metritis, retained placenta, to mention a few. Prevalence of reproductive disorders

was 23% in total population.

The prevalence of anoestrus was 5.1%, which was lower than that (26.5%) observed by Bitew and Prasad (2010) in South West Ethiopia but it was higher than the findings of Bitew and Francos (1974) who recorded 1.2~1.7% occurrence of anoestrus. The higher prevalence of anoestrus may be attributed to variations predisposing factors such as nutritional status, managerial conditions, hormonal imbalance and reproductive tract infections, for instances. The prevalence of retained fetal membrane was 4.6%. Satya pal (2003) observed 27.7% cases of retained placenta in Karan Fries cows and Saini *et al.* (1988) reported 17.5% of retained placenta in different crossbred cows of Holstein Friesian, Brown Swiss and Jersey with Haryana. In comparison, Sharma (2010), Sethi and Balaine (1978), Pandit *et al.* (1981), and Agarwal *et al.* (1984) observed lower incidence of retained foetal membrane (0.3%, 1.4%, 8.8 % and 7.8 % respectively). The variation in the incidence of retained fetal membrane may be attributed to variations in predisposing factors to which the animals are subjected and among which nutritional status and management and prevalence of infectious diseases like brucellosis, tuberculosis, campylobacteriosis are considered as important.

The relatively higher prevalence rate of retained fetal membrane in the current study could also be due to dystocia that accounted 7.5% which is an important predisposing factor for occurrence of retention of placenta. Retained placenta is an important postparturient problem in cattle farming. Its incidence can be as high as 12% even in normal delivery, Shamsuddin *et al.* (1988) recorded about 63% of the retained placenta out of 750 calving in the Savar Dairy farm; the highest incidence was recorded in March and lowest in September. About 3.7% cases of repeat breeding were observed in the present study. This was higher than the prevalence rate reported by Bitew and Prasad (3%; 2010) and lower than that reported by (28%; Butler *et al.*, 2006). Repeat breeder can be caused by a number of factors, including sub-fertile bulls, endocrine imbalance, malnutrition, reproductive tract infections and poor management practices such as wrong time of insemination or faulty heat detection, inappropriate semen handling and insemination techniques (Arthur *et al.*, 1996). In addition to these, communal use of bull for natural services is also considered as contributing factor Shamsuddin *et al.* (1998) reported 5% repeat breeding cases In Bangladesh. Bitew and Prasad (2010) recorded 9 (3%) repeat breeding in Bedelle, South Western Ethiopia from

November 2003 to April 2004 from 302. Kanuyaa *et al.* (2000) studied the reproductive performance and reproductive disorder incidence risk of dairy cattle kept in smallholder herds under a zero-grazing system in a rural highland area of Tanzania. Data on the occurrence of all normal and abnormal reproductive events were collected for 215 adult animals belonging to 74 households. The cumulative incidence of cyclic non-breeders was 6.1%. The prevalence of metritis was 4.4 % in this study, which was lower than the prevalence rate 10.3% reported by Shamsuddin *et al.* (1988) in Savar dairy farm. Soonwuk *et al.* (1996) observed 800 cows and recorded 2.3% uterine diseases. Kaikani *et al.* (1983) recorded 8.7% metritis in cows. Significant factors influencing the incidence of metritis were retention of fetal membrane, dystocia, herd size and parity of cows. Other factors includes are unhygienic parturition, unwise handling of parturition and, injury of uterus by AI guns during insemination.

The prevalence of dystocia in this study was 0.97 %. This was lower than the prevalence rate reported by Curtis *et al.* (1985) (7.2%). However, the current finding was lower than that reported by Kakar *et al.* (1997) (27%) and Johanson *et al.* (2003) (23.7%). This variation in the occurrence of dystocia may be influenced by factors such as, age and parity of cows and breed and individual variations of sires (Morrow, 1986). Inseminating cows with semen collected bulls that genetically produce large sized calves without considering the size and age of cows in ten results of dystocia due to foetal over size.

The prevalence of abortion was 0.84% in this study, which was lower to the than 5.3% and, 5.4% as reported by the Bicalho *et al.* (2007), Fricke and Cliff (2005), respectively. The lower prevalence rate of abortion may be attributed to the increasing practice of AI where the semen was collected from bulls free from brucellosis.

The prevalence of clinical vaginal prolapsed was 0.30% in this study and this was lower to 5.2% as reported by Mandali *et al.* (2004). The lower prevalence rate of vaginal prolapse may be attributed to the available of calcium supplied with feed and less chance to occurred hypocalcaemia.

The prevalence rate of pyometra 0.24% was lower than the prevalence rate reported by Alam and Rahman, (1979) and Shamsuddin *et al.* (1988) (8.2%) and (8%) respectively). Pyometra can be caused by a number of factors, including Trichomonas-foetus infection, unhygienic parturition, retained placenta, dystocia, vaginal prolapse and manual removal of retained placenta. Hence the difference between the finding of the current study

and previous reports might be resulted from variations in predisposing factors.

The prevalence of still birth in this study was 0.30%, Stevenson and Call (1988) reported occurrence of stillbirth is about 4.1%, ranging from 1.4 to 6.3% at 45,835 calvings in 2,264 herds. The highest risk for still birth was in heifers and lowest in second parity cows. The increased risk for stillbirth probably results from an oversized fetus, over conditioned dam, and increased incidence of twinning (Markusfeld, 1987).

Kalbe and Schulz (2002) studied the incidence of uterine prolapse in a total of 52,505 calving on a large dairy farm showing 167 cases of uterine prolapse (0.3%), from 1987 through 1999. Crudeli *et al.* (1999) collected data on the incidence, time of occurrence and etiology of the uterine prolapsed in 2,20,000 primiparous cows. It was reported that most of the uterine prolapsed occurred within 24 h following parturition.

The prevalence of cystic ovarian diseases was 0.4%, which was lower than 6.81% reported by Kaikini *et al.* (1983). Malnutrition, low body condition score and some undefined malfunctions in the ovarian mechanisms results cystic ovarian diseases.

Body condition score is an arbitrary scale for estimating the amount of body fat in cows. BCS has a good reflection on the reproduction as well as reproductive disorders. Cows with good BCS (2.5~3.5) conceived at a higher rate than did thin ( $\leq 2.0$ ) and over-conditioned ( $>3.5$ ) ones. BCS at oestrus positively correlate with the conception rate (Jack *et al.*, 2010). Giuseppe *et al.* (2006) did not find such relationship among BCS at breeding and pregnancy outcome. In contrast, BCS at the beginning of the breeding period and at oestrus affected estrus manifestation but did not affect conception rate of cows (Crudeli *et al.*, 1999).

## CONCLUSIONS

It is revealed that reproductive health problems particularly of anestrus, retained fetal membrane, dystocia and repeat breeding were major causes of low reproductive performance in peri-urban dairy farms. Improvements of feeding to enhance the BCS as well as heat detection, health care and artificial insemination techniques could help in minimizing reproductive health problems and hence, improve the reproductive efficiency of crossbred peri-urban dairy cows.

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