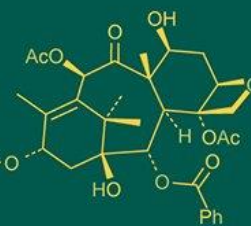
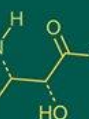
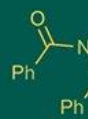


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A comprehensive study on prevalence and distribution of reproductive disorders in crossbred cows in urban and peri-urban areas of Assam

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Abstract

The current study was carried out in the crossbred cattle available in Institutional Livestock Farm (ILF) of College of Veterinary Science (CVSc), Assam Agriculture University (AAU), Khanapara, Guwahati as well as in other private cattle farms located in and around Guwahati, to explore the incidence of multitudes of reproductive anomalies and disorders in crossbred cattle. Out of 3553 crossbred cows and heifers examined, 1074 were found to have one or the other reproductive disorders, thus revealing an overall incidence of 30.23%. The incidence of diverse reproductive disorders were viz., retention of placenta, 7.23 percent; repeat breeding, 6.98 percent; prolonged oestrus behaviour, 5.43 percent; silent oestrus, 5.21 percent; anoestrus, 1.83 percent; dystocia, 1.55 percent; abortion, 0.84 percent; postpartum prolapse of uterus, 0.65 percent; pre-partum cervico-vaginal prolapse, 0.42 percent and foetal mummification/maceration, 0.08 percent. Among several reproductive disorders investigated, the incidence of retention of placenta, repeat breeding, prolonged oestrus behaviour, silent heat, anoestrus and dystocia were 23.93, 23.09, 17.97, 17.23, 6.05 and 5.12 percent respectively.

Incidence of such disorders highlights the importance of various measures essential to be taken up to boost reproductive health and minimize economic repercussions incurred due to multitudes of reproductive disorders.

Keywords: Cattle, reproductive disorder, retention of placenta, reproductive health, productivity

Introduction

Today, India is the global leader in term of milk production, contributing approximately 24% of world's milk production, having market value of more than 146 billion. It is the corner stone of rural economy and provides livelihood opportunities to small and marginal farmers. India has the highest bovine herd in the world with over 300 million bovines which produce over 190 million of milk. Milk production in India during the period 1950-51 to 2023-24, has increased from 17 million tonnes to 239.0 million tonnes, which is expanding at a rate of 5.7%. The Indian dairy sector is anchored by an augmented cooperative network and is heading towards digital technology in milk procurement as well as in transportation. With the initiative of National Dairy Development Board, the per capita availability of milk in the country has grown from 130 grams per day during 1950-51 to 471 grams per day in 2026. This represents steady growth in the availability of milk and its products for our ever expanding population. The emergence of India as a distinguished dairy nation could be attributed to intensive crossbreeding programmes which have been implemented across the length and breadth of the country, over the last few decades. The primary reproductive objective of dairy husbandry is to obtain a healthy calf per cow per year. It implies that cows should get pregnant after artificial insemination (A.I), maintain the pregnancy and deliver after full gestation of about 280 days and should be able to be successfully inseminated again after a period of 60-90 days postpartum. However, this cannot be achieved always and cows need to be re-inseminated during several consecutive oestrous cycles. Conception failures in cattle could be aligned with several forms of infertility associated with multitudes of reproductive disorders. Dawit *et al.* (2013) [3] observed that 40.3 percent of the dairy cows are affected with at least one clinical reproductive health disorder.

The milk yield of indigenous breeds of cattle in Assam is considerably low for which the Govt. of Assam have paid necessary attention to increase the productivity of these cattle by crossbreeding with high yielding superior germplasm of recognized Indian as well as exotic breeds of cattle. Till the year 1995, exotic Jersey germplasm was most frequently used for crossbreeding of indigenous breeds. In the recent years, germplasm of Red Sindhi has also been introduced for crossbreeding purpose. Since the last two decades, in addition to Jersey, Holstein-Friesian germplasm has also been utilized in several parts of the state. Owing to crossbreeding of indigenous animals, milk production of the state has increased by several folds. Inappropriate crossbreeding with varying exotic germplasm have reinforced reproductive disorders in crossbred cows, thereby traumatizing the economy of dairy farmers. The incidences of several reproductive disorders vary between herds and within the herd from year to year, between different age groups, herd sizes, milk yield, seasons, etc. (Deka *et al.* 1980; Sukhla and Pandit 1989; Songsasen *et al.* 1986) [4, 27, 26]. Enhanced milk yield coupled with increasing level of exotic inheritance, poor feeding and management, altering climate due to global warming might be the reasons linked with reproductive disorders of crossbred cows.

Deka *et al.* (1980) [4] reported for the first time the incidence of several reproductive disorders in non-descript as well as in crossbred cattle of Assam on the basis of 840 cases presented in the Clinics. Singh *et al.* (2003) [25] recorded several reproductive disorders by conducting a study on 98 crossbred animals. However, a systematic study on the incidence of various reproductive disorders including repeat breeding in crossbred cattle is lacking. Among all the diverse reproductive disorders, repeat breeding constitutes to be one of the major concerns, confronting the dairy industry, leading to infertility in both organized as well as in unorganized farms. The incidence of repeat breeding in cattle has been reported to vary widely ranging from 4.26 to 33.33 percent during the past few decades (Deka *et al.* 1980; Rao *et al.* 1980; Narladkar *et al.* 1994; Saxena 2004; Mohteshamuddin *et al.* 2012; Khan *et al.* 2016) [4, 19, 14, 22, 13, 10]. Taking these facts under consideration, the present study was planned to determine the incidence of several reproductive disorders in crossbred cattle.

Materials and Methods

Location of the study

The study was carried out on crossbred cattle available in the ILF (Cattle), CVSc, AAU, Khanapara, Guwahati-22 as well as in the private farms which were located in and around Guwahati. Duration of the study period was 15 months i.e. the study was being conducted from April, 2015 to June, 2016. The study aims to assess the incidence of reproductive disorders in cross bred cattle available in the farms located in and around Guwahati.

Housing and management

The entire cross bred cattle were kept stall fed. The floor of the stall was either wooden, kutcha or concrete and roof was made of bamboos and thatch or asbestos sheet. Feeding and watering were done 3 times a day at 6-8 hours interval with concentrate feed added with water and salt along with roughages. The concentrate ration consisted of broken rice,

wheat bran, oil cake, broken maize and molasses. The roughages consisted of variety of indigenous grasses, wild grasses, banana leaves, bamboo leaves and paddy straw. During lean period paddy straw was mostly fed.

On the basis of history as well as with clinico-gynaecological examination, the incidence of different reproductive disorders, were recorded. A total of 3553 crossbred cows and heifers were included in the study for recording the incidence of diverse reproductive disorders. The data was analyzed in order to determine the proportion of cattle affected by different reproductive disorders.

Incidence Calculation

The incidence of reproductive disorders was calculated by dividing the total number of animal affected with reproductive disorders by total number of animals observed during the study period. And the incidence of different disorders was calculated by dividing the number of cows affected by a particular disorder by total number of reproductive disorders recorded during the study period.

Results and Discussion

The incidence of reproductive disorders was recorded on the basis of history and clinico-gynaecological examination. Out of the total 3553 crossbred cattle examined, 1074 were found to have one or the other reproductive disorders, thus revealing an overall incidence of 30.23 percent. The incidence of reproductive disorders out of the total animals and the incidence of different disorders out of the animals with reproductive disorders are presented in table 1 to facilitate appropriate understanding of distribution of these disorders among crossbred cows.

The incidence of reproductive disorders recorded in the present study is found to be higher than Walikar *et al.* (2024) [29] and lower than that reported by Kaikini *et al.* (1981) [9], Dawit *et al.* (2013) [3] and Esheti and Moges (2014) [7]. This aligns with the necessity of maintaining reproductive health in cattle, since it is essential for sustained productivity of dairy cattle. Kaikini *et al.* (1981) [9] recorded overall incidence of reproductive disorder in Holstein-Friesian crossbred cattle as 36.50 percent. Dawit *et al.* (2013) [3] and Esheti and Moges (2014) [7] observed at least one clinical reproductive disorder in 40.30 percent and 37.10 percent dairy cows, respectively. The difference in the overall incidence of reproductive disorder in the dairy cattle might be due to genetic makeup of the animal, management, feeding and breeding practices followed. The variation in incidence of reproductive disorders in different studies might be due to differences in age, and parity of animals used in different studies.

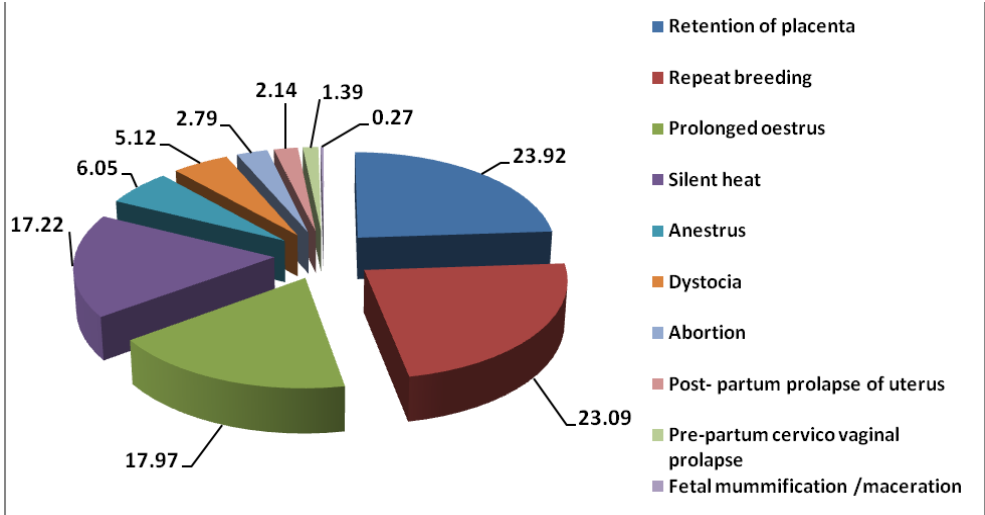
The incidence of different reproductive disorders in crossbred cattle investigated in the study are retention of placenta 7.23 percent, repeat breeding 6.98 percent, prolonged oestrus 5.43 percent, silent oestrus 5.21 percent, anoestrus 1.83 percent, dystocia 1.55 percent, abortion 0.84 percent, post-partum prolapse of uterus 0.65 percent, pre-partum cervico-vaginal prolapse 0.42 percent and foetal mummification/maceration 0.08 percent. Amongst the cattle with reproductive disorders, the incidence of different disorders was retention of placenta 23.93 percent, repeat breeding 23.09 percent, prolonged oestrous 17.97 percent, silent heat 17.23 percent, anoestrus 6.05 percent, dystocia 5.12 percent, abortion 2.79 percent, post-partum prolapse of

uterus 2.14 percent, pre-partum cervico-vaginal prolapse 1.40 percent and foetal mummification/maceration 0.28 percent (Table 1, Fig. 1.1, 1.2). Among all the diverse reproductive disorders, retention of placenta, surface out to be prominent concern affecting 7.23 percent of the cases highlighting the vital role of reproductive health for successful reproduction. Our findings are inconsistency with the findings of Erb 1979 [6]; Sukhla *et al.* 1980 [23]; Kaikini *et al.* 1981 [9]; Singh and

Sharma, 1984 [24]; Ahmed *et al.* 1992 [1]; Dawit *et al.* 2013 [3]; Walikar *et al.* 2024 [29]. These findings reinforce the urgency for early investigation to overcome the impact of retention of placenta on reproductive performance. On the other hand, a few workers reported lower incidence of retention of placenta in cattle (Dutta *et al.* 1985; Verma *et al.* 1986; Pandey *et al.* 1994; Narladkar *et al.* 1994; Singh, 2003) [5, 16, 14, 25]. However, much higher (16.9%) incidence of retention of placenta was reported by Gogoi, (1987) [8].

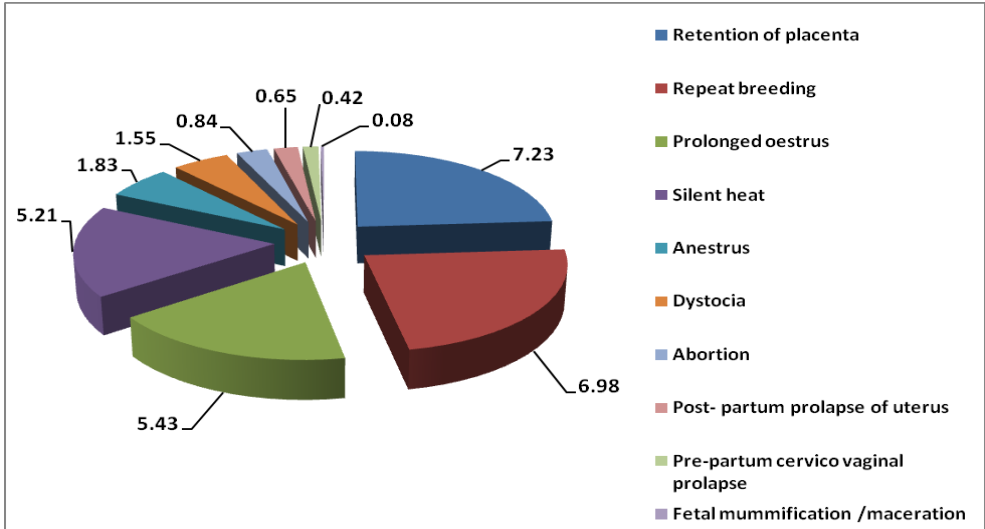
Table 1: Incidence of different reproductive disorders in crossbred cattle

Sl. No.	Reproductive disorders (n)	Incidence (%)	
		Out of total number (n = 3553)	Out of animals with reproductive disorders (n = 1074)
1.	Retention of placenta (257)	7.23	23.93
2.	Repeat breeding (248)	6.98	23.09
3.	Prolonged oestrus (193)	5.43	17.97
4.	Silent oestrus (185)	5.21	17.23
5.	Anoestrus (65)	1.83	6.05
6.	Dystocia (55)	1.55	5.12
7.	Abortion (30)	0.84	2.79
8.	Post-partum prolapse of uterus (23)	0.65	2.14
9.	Pre-partum cervico vaginal prolapse (15)	0.42	1.40
10.	Fetal mummification/maceration (3)	0.08	0.28
	Total (1074)	30.23	100.00



*Figures in the Parentheses indicate number of animal.

Fig. 1.1: Incidence of different reproductive disorders in 3553 numbers out of total number (3553)



*Figures in the Parentheses indicate number of animal.

Fig. 1.2: Incidence of different reproductive disorders out of animals with reproductive disorders (1074)

Notably, the incidence of repeat breeding was recorded to be 6.98 percent, indicating a serious concern among the dairy herd. The present findings are in line with studies conducted by Narladkar *et al.* (1994) ^[14] and Mohteshamuddin *et al.* (2012) ^[13]. On the other hand, a few workers reported much higher incidence of repeat breeding in cattle (Rao *et al.* 1980; Deka *et al.* 1980; Esheti and Moges 2014) ^[19, 4, 7]. The incidence of prolonged oestrus behaviour recorded in the present study was 5.43 percent, which is found to be lower than that reported by Nath (2014) ^[5], who observed the incidence of prolonged oestrus behaviour to be 16.75 percent. These findings underscore the significance of early estrus detection and appropriate timing of artificial insemination. It puts in place the significance of addressing the errors in breeding techniques to minimize its impact on reproductive health and productivity.

In the present study, the incidence of silent heat and anoestrus was recorded to be 5.21 percent and 1.83 percent respectively. The findings are comparable with the work conducted by Narladkar *et al.* (1994) ^[14]. However, much higher incidence was reported by Rao *et al.* (1972) ^[18]; Ahmed *et al.* (1992) ^[1]; Pandey *et al.* (1994) ^[16] and Singh (2003) ^[25]. These findings highlight the intricate link between reproductive performance with nutrition, hormones and timely postpartum uterine recovery. Negative energy balance can lead to prolong anovulatory period affecting the dairy herds' overall reproductive performance.

The incidence of dystocia in crossbred cattle in the present study was found to be 1.55 percent. This aligns with the similar observation made by Gogoi (1987) ^[8] and Singh (2003) ^[25]. However, lower incidence of dystocia was reported by Dutta *et al.* (1985) ^[5]; Narladkar *et al.* (1994) ^[14]; Pandey *et al.* (1994) ^[16] and Mandal *et al.* (2001) ^[11]. The incidence of dystocia reported by Brestzlaff *et al.* (1982) ^[2]; Sarmah (1993) ^[21]; Dawit *et al.* (2013) ^[3]; Esheti and Moges (2014) ^[7] and Sardar *et al.* (2015) ^[20] was higher than that reported in the present study. Occurrence of dystocia hinges on both herd as well as management practices. It impacts both maternal as well as neonatal health. Appropriate management practices coupled with timely assistance during calving is crucial to minimize its occurrence and to reduce the complications associated with it.

Abortion was recorded to be 0.84 percent in the present study. The findings of the present study corroborates with the work carried out by McClure *et al.* (1968) ^[12] and Kaikikni *et al.* (1981) ^[9]. Diverse workers found the incidence of abortion to be higher than that recorded in the current study (Raman and Bawa 1977; Sukhla *et al.* 1980; Singh and Sarmah 1984; Dutta *et al.* 1985; Gogoi 1987; Sarmah 1993; Pandey *et al.* 1994; Mandal *et al.* 2001 and Singh 2003) ^[17, 23, 24, 5, 8, 21, 16, 11, 25].

The variations in the incidence of different reproductive disorders recorded in different studies might be due to breed variation, individual variation, and nutritional status of the animals, feeding, and breeding and management practices followed, age as well as parity of animals.

Conclusion

The present study provided a comprehensive overview on prevalence and distribution of reproductive disorders in crossbred cows in urban and peri-urban areas of Guwahati. Amongst the various reproductive disorders, retained fetal membrane, repeat breeding, prolonged oestrus and silent

oestrus are major impediments to optimum reproduction and profitable dairy farming. The current understanding of the underlying causes of such disorders enable us to interfere with use of hormones, pharmacological agents, improved nutritional practices and maximize oestrus detection in problematic cows to ensure regular reproduction and consequent life time milk production. The other disorders encountered such as dystocia, abortion, postpartum uterine prolapse, prepartum cervico-vaginal prolapse are likely to decrease by adoption of improved scientific husbandry practices. Foetal mummification and maceration with low incidence is not of much concern.

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