



# Occurrence of repeat breeding and prolonged oestrus in crossbred cattle\*

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Citation: Arun, H.D., Bibin, B. B., Jayakumar, C., Unnikrishnan, M.P., Ajith, K.S. and Kurien, M.O. 2020. Occurrence of repeat breeding and prolonged oestrus in crossbred cattle. *J. Vet. Anim. Sci.* 51(2): 132-135.

Received : 13.08.2019

Accepted : 28.09.2019

Published : 01-07-2020

## Abstract

Study was conducted to determine the occurrence of repeat breeding and prolonged oestrus among crossbred cattle in organized farms. Data were collected from breeding registers maintained on farms over a period of four years and tabulated in relation to age and parity. Overall occurrence of repeat breeding, prolonged oestrus and occurrence of prolonged oestrus among repeat breeder animals was 25.96 per cent, 25.86 per cent and 55.42 per cent, respectively. Occurrence of repeat breeding, prolonged oestrus and repeat breeding among prolonged oestrus exhibiting animals among cows was 27.35, 30.29, and 61.58 per cent, respectively. Occurrence of repeat breeding, prolonged oestrus and repeat breeding among animals exhibiting prolonged oestrus, among heifers was 23.07, 16.66, and 40.27 per cent, respectively. Among cows, the occurrence of repeat breeding was highest in the age group of 2-4 years and occurrence of prolonged oestrus among repeat breeders was highest in the age group 8-12 years.

**Keywords:** Repeat breeding, prolonged oestrus, crossbred cattle

Repeat breeding is one of the major problems in dairy industry and accounts for substantial economic losses. Repeat breeding in cattle (RB) is defined as a failure of animals to conceive from three or more regularly spaced services in the absence of detectable abnormalities (Mesafint and Guesh, 2014). Prolonged oestrus is defined as lengthened duration of oestrus in

\*Forms part of the MVSc thesis submitted by the first author to Kerala Veterinary and Animal Sciences University, Pookode, Wayanad, Kerala.

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cattle and it is one of the major contributors to repeat breeding (30-40 percent) in crossbred cattle. Prolonged oestrus leads to delayed ovulation which results in asynchrony between ovulation and insemination which in turn results in fertilization failure (Bage *et al.*, 2002). This retrospective study was conducted to determine the occurrence of repeat breeding, prolonged oestrus and prolonged oestrus with repeat breeding as well as the effect of age and parity on these conditions.

### Materials and Methods

Data for a period of four years was collected from the breeding registers maintained at Livestock Research Station (LRS), Thiruvazhankunnu and University Livestock Farm and Fodder Research and Development Scheme (ULF and FRDS), Mannuthy from January 2015 to December 2018.

A cow was considered to be a repeat breeder (RB) if it was diagnosed as non pregnant, even after three or more consecutive artificial inseminations. Cows with conditions like cystic ovaries, anoestrus, endometritis *etc.* were excluded from the study. Animals that exhibited oestrus for a duration of more than one day (24 hours) were considered as animals with condition prolonged oestrus. Data collected were tabulated according to different age groups (2-4 years, 4-8 years and 8-12 years) and parity (0, 1, 2, 3, 4 and above). Data were analyzed for occurrence of repeat breeding, prolonged oestrus and occurrence of prolonged oestrus among repeat breeding animals.

### Results and Discussion

Overall occurrence of repeat breeding, prolonged oestrus and prolonged oestrus

**Table 1.** Overall occurrence of repeat breeding, prolonged oestrus and prolonged oestrus among repeat breeding crossbred cattle

Animals	Repeat breeder animals	Animals exhibiting prolonged oestrus	Repeat breeders exhibiting prolonged oestrus
Cow	177 (27.35 %)	196 (30.29 %)	109 (61.58 %)
Heifer	72 (23.07 %)	52 (16.66 %)	29 (40.27 %)
<b>Total</b>	<b>249 (25.96 %)</b>	<b>248 (25.86 %)</b>	<b>138 (55.42 %)</b>

**Table 2.** Occurrence of repeat breeding, prolonged oestrus and prolonged oestrus among repeat breeding animals of different age group

Age group	Repeat breeder animals	Animals exhibiting prolonged oestrus	Repeat breeders exhibiting prolonged oestrus
2-4 years (n=388)	107 (27.57 %)	111 (28.60 %)	58 (54.20 %)
5-8 years (n=453)	110 (24.28 %)	103 (22.73 %)	60 (54.54 %)
8-12 years (n=148)	34 (22.97 %)	34 (22.97 %)	26 (76.47 %)

**Table 3.** Occurrence of repeat breeding, prolonged oestrus and prolonged oestrus animals among repeat breeders of different parity

Parity	Repeat breeder animals	Animals exhibiting prolonged oestrus	Repeat breeders exhibiting prolonged oestrus
0 (n=312)	70 (22.41 %)	58 (18.58 %)	33 (47.62 %)
1 (n=164)	48 (32.32 %)	48 (29.26 %)	27 (50.94 %)
2 (n=204)	47 (23.03 %)	54 (26.47 %)	28 (59.27 %)
3 (n= 133)	32 (24.06 %)	38 (28.57 %)	21 (65.62 %)
4 and above (n= 156)	49 (31.41 %)	57 (36.53 %)	40 (81.63 %)

among repeat breeder cattle and the occurrence in cows and heifers are shown in Table 1. Overall occurrence of repeat breeding in crossbred cattle was found to be 25.96 per cent. The results are in agreement with Nanda and Singh (2008) who reported an occurrence of 20 to 30 per cent repeat breeding. The reason for the higher occurrence of repeat breeding among cows when compared to heifers in present study may be due to factors like negative energy balance after calving, parturient and post parturient complications, lactational stress *etc* (Mesafint and Guesh. 2014). Overall occurrence of prolonged oestrus was 25.86 per cent which is in agreement with Shakir (2018) who reported that prolonged oestrus had an occurrence of 26.87 per cent prolonged oestrus. Among 249 repeat breeders, 138 animals exhibited prolonged oestrus with an occurrence of 55.42 per cent which is in agreement with Cummins *et al.* (2012). Elevated plasma progesterone level at oestrus decreases the preovulatory LH surge resulting in an extension of duration of oestrus duration leading to asynchrony between ovulation and insemination resulting in fertilization failure thus contributing to repeat breeding (Singh *et al.*, 2012).

Occurrence of repeat breeding, prolonged oestrus and prolonged oestrus among repeat breeder cattle in relation to age is shown in Table 2. Occurrence of repeat breeding was found to be higher in the age group of 2-4 years. This may be attributed to the negative energy balance and stress due to lactation. Animals that exhibited prolonged oestrus among the repeat breeders were highest in the age group of 8-12 years which can be attributed to the endocrine disturbances occur along as age increases. Negative energy balance and stress due to production alters insulin metabolism and leads to decreased sensitivity of corpus luteum to endogenous prostaglandins and which was also required for normal development of follicles (Singh *et al.*, 2012).

Occurrence of repeat breeding, prolonged oestrus and prolonged oestrus among repeat breeder cattle in relation to parity is shown in Table 3. Parity wise analysis of data showed that repeat breeding was highest

among animals that had calved only once and this may be due to lactational stress, negative energy balance, impairment of follicular development resulting in fertilization failure and early embryonic death (Mihm *et al.*, 1999). Occurrence of prolonged oestrus was highest among repeat breeders having parity four and above, and this may be due to endocrine disturbances and anatomical defects acquired as parity increases (Asaduzzaman *et al.*, 2016 and Safna, 2007).

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