



Occurrence of repeat breeding in crossbred dairy cattle



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Abstract

The present research work was undertaken to evaluate the occurrence of repeat breeding (RB) among crossbred dairy cattle for three years from January 2017 to December 2019. Crossbred cows having apparently normal genitalia and showing regular oestrous cycle but failing to conceive even after three consecutive inseminations were selected as RB cows based on data collected from breeding registers. The occurrence of RB in the year 2017, 2018 and 2019 were 29.20, 24.12 and 19.52 per cent, respectively with an overall occurrence of 23.60 per cent. Detailed clinico-gynaecological and ultrasonographic examinations of 41 RB cows were carried out for the identification of various etiological factors during the study period (September 2019 to August 2020). Samples for endometrial cytology were collected during oestrus by cytobrush technique to rule out cytological endometritis (sub clinical endometritis). The occurrence of various identified causes of RB were cytological endometritis (17.07 %), fibrosis of cervix (7.31 %), endometritis (7.31 %), follicular cyst (4.88 %), kinked cervix (2.44 %), uterine unicornis (2.44 %) and other reasons (58.54 %). Repeat breeding is a major cause of infertility in crossbred dairy cattle and early diagnosis is essential for the effective management and to enhance production.

Keywords: Cytological endometritis, occurrence, repeat breeding

Repeat breeding (RB) is one of the most serious reproductive problems in dairy cattle causing considerable economic loss to farmers due to more number of inseminations, prolonged inter calving interval, lowering of calves production and increased culling rates. Roberts (1971) defined a repeat breeder cow as one that has a nearly normal oestrous cycle with apparently no palpable abnormalities of the genital tract, but has failed to conceive on three or more consecutive artificial inseminations (AI) with good quality semen. About 36.0 per cent of infertility conditions among crossbred cattle have been reported to be contributed by RB (Azeez *et al.*, 2017). Subclinical endometritis (SCE) is known as cytological endometritis on the basis of elevated ratio of polymorphonuclear leukocyte (PMN) cells in the endometrial cytology sample (Baranski *et al.*, 2013). About 12.50 per cent RB cow syndrome among bovines was due to SCE and post-partum

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complications such as dystocia and retention of foetal membrane, which predisposed to SCE in cattle (Noakes *et al.*, 2012).

The present study was conducted at Livestock Research Station (LRS), Thiruvazhamkunnu, Kerala Veterinary and Animal Sciences University during the period September 2019 to August 2020. Forty one RB cows with a history of not conceiving even after three consecutive inseminations and with apparently normal genitalia were selected for the study based on data collected from breeding registers maintained on the farm. The selected animals were closely observed for any external signs of oestrus. Detailed clinico-gynaecological and ultrasonographic examination of the reproductive tract was conducted. Uterine size, consistency and structures in the ovaries were assessed to confirm oestrus or to rule out any anatomical or other causes of RB. The samples for endometrial cytology were obtained by cytobrush technique as per Kasimanickam *et al.* (2004) to rule out cytological endometritis in RB cattle. Cows with more than one per cent PMN cells in endometrial cytology smears during oestrus were considered as positive for cytological endometritis (Pascottini *et al.*, 2017).

The stock density of the cattle herd in the year 2017 was 137, out of which 40 cows were found to be repeat breeders and the occurrence of RB in the herd was 29.20 per cent. There was a progressive decrease in the occurrence of RB from the year 2017 to 2019. In the year 2018, 41 out of 170 cattle were RB (24.12 %), while in 2019, it further decreased to 19.52 per cent (41 out of 210). The overall occurrence of RB in the herd from January 2017 to December 2019 was 23.60 per cent. Out of the 41 RB cows examined in detail during the study, the various etiologies of RB diagnosed were seven cows with cytological endometritis (17.07 %), three cases of cervicitis (7.31 %), three cases of endometritis (7.31 %), two cases of follicular cysts (4.88 %) confirmed later with ultrasonography, one case of kinked cervix (2.44 %) and a case of uterus unicornis (2.44 %) and the remaining 58.54 per cent of cows were found to be repeaters due to unknown reasons.

Arun *et al.* (2020) reported 25.96 per cent occurrence of RB, whereas, Azeez *et al.* (2017) reported a high prevalence of RB (36 %) among crossbred cattle of Kerala. The various reasons attributed were reproductive tract infections (63 %), ovulatory defects (15 %) and reproductive tract infection with ovulatory defects (22 %). Kutty and Ramachandran, (2003) also observed a high prevalence of RB (35 %) among crossbred cattle of Kerala. However, Harichandan *et al.* (2018) reported the highest (51.94%) incidence of RB in dairy cows, in India. The incidence of RB varied with the season, number of calvings, body condition score, average days in milk etc. The probable reasons for an increased occurrence of RB among post-partum cows included a negative energy balance, post-partum complications and lactation stress (Mesafint and Guesh, 2014).

Kasimanickam *et al.* (2004) effectively used cytobrush technique for the first time to identify SCE in clinically normal post-partum dairy cattle. They used a PMN threshold value of 18 per cent at 20 to 33 days in milk (DIM) and 10 per cent at 34 to 47 DIM to detect SCE. In the present study, 17.07 per cent of RB was contributed to by cytological endometritis. Singh *et al.* (2016) reported a higher prevalence (29.40%) of cytological endometritis among RB crossbred cattle at their spontaneous oestrus using cytobrush technique. While Pascottini *et al.* (2017) observed a lower prevalence (7.86%) of cytological endometritis in nulliparous dairy heifers and the threshold level of PMN cells for diagnosing SCE at oestrus was considered as one per cent with cytotape technique.

The incidence of follicular cyst in dairy cattle was 5 to 25 per cent and it varied with age, body condition score, milk production status etc. (Bors *et al.*, 2018). About 54.15 and 12.80 per cent of dairy cows were repeat breeders due to endometritis and various types of acquired cervical problems (Thakur *et al.*, 2006).

According to Maurer and Echternkamp (1985), about 40.10 per cent of RB problems in cows were caused by hormonal insufficiency and dysfunctions. Singh *et al.* (2005) observed that delayed ovulation associated with extended

follicular phase was one of the causes of RB in cattle. Cenariu and Jospe (2017) stated that hormonal effect as well as timing of AI had a significant influence on the occurrence of RB in cows and they could achieve 70 per cent conception rate by treatment with Ovsynch protocol. The highest proportion of unknown causes of RB in the present study (58.54%) might be due to endocrine dysfunctions which could be attributed to micro-nutrient deficiencies (Singh *et al.*, 2000).

Summary

The present study conducted in an organised dairy farm for three years revealed 23.60 per cent overall occurrence of RB in cows. Various identified causes of RB were cytological endometritis, fibrosis of cervix, endometritis, follicular cysts, kinked cervix and uterine unicornis. Early diagnosis is essential for the effective management of RB syndrome in cattle.

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Conflict of interest

The authors declare that they have no conflict of interest.

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