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Fern Pattern of Cervico-Vaginal Mucus in Relation to Fertility in Crossbred Cows and Heifers

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Abstract

This study was carried out on crossbred cows and heifers 20 each belonging to Dairy farm of the College of Veterinary Sciences & A.H. Mhow and clinical cases of progressive farmers brought for AI to the Teaching Veterinary Clinical Complex and at the doorstep of farmers in nearby villages. The cervico-vaginal mucus (CVM) samples were collected from the animals at oestrus before AI and were immediately evaluated for physical properties particularly fern pattern. Pregnancy was confirmed by rectal palpation after 2 months of insemination. Physical profile revealed that the variations in per cent incidence of typical, atypical and nil fern patterns of CVM samples were highly significant ($P < 0.01$) in both the groups of conceived and non-conceived cows and heifers.

Key words: Crossbred cows, Heifers, Estrus, Cervico-vaginal mucus, Fern pattern.

Introduction

The nature of cervical mucus has pronounced influence on the fertilizing capacity of the spermatozoa in female reproductive tract and its physical properties have direct relationship with the fertility status of the animals (Rangnekar *et al.*, 2002). Estrus, the most visible phase of the estrous cycle is characterized by various behavioral signs including discharge of cervico-vaginal mucus. Fertility of a dairy cow is the ability of the animal to conceive and maintain pregnancy if served at the appropriate time in relation to ovulation. Lack of determination of estrus sign lowers the bovine fertility resulting in significance economic loss to the dairy industry. This study was planned to determine the fertility with physical properties of CVM in crossbred cows and heifers.

Materials and Methods

The study was carried out on crossbreed cows (n=20) and heifers (n=20) belonging to the Dairy farm of College of Veterinary Science and Animal Husbandry, Mhow and clinical cases of progressive farmers brought for AI to the Teaching Veterinary Clinical Complex and at the doorstep of farmers in nearby villages. All the animals included in this study were apparently healthy, cycling having no palpable reproductive abnormality on two consecutive rectal palpations, 10 days apart, and were negative to white side test to rule out subclinical endometritis, and were inseminated during estrus.

Pregnancy was confirmed by rectal palpation after 2 months of insemination. The cervico-vaginal mucus (CVM) samples were collected from the animals at oestrus before AI and were immediately evaluated for physical properties. The fern pattern was classified as described by Verma *et al.* (2014). The data was analyzed as per the standard statistical method by employing X^2 tests (Snedecor and Cochran, 1994).

Results and Discussion

The frequency of typical, atypical; and nil fern pattern of CVM in conceived and non-conceived crossbred cows and heifers at estrus is presented in Table 1.

Table 1: Distribution of fern pattern of cervico-vaginal mucus in conceived and non-conceived crossbred cows and heifers

Groups	Status	Per cent	Fern pattern of CVM (%)		
			Typical	Atypical	Nil
CB cows (n=20)	Conceived	75.00 (15)	86.67 ^a (13)	13.33 ^a (2)	0.00
	Non-conceived	25.00 (05)	60.00 ^b (03)	40.00 ^b (2)	0.00
Heifers (n=20)	Conceived	60.00 (12)	83.33 ^a (10)	16.67 ^a (2)	0.00
	Non-conceived	40.00 (08)	62.50 ^b (06)	37.50 ^b (2)	0.00
Overall (n=40)	Conceived	67.50 (27)	85.19 ^a (23)	14.81 ^a (4)	0.00
	Non-conceived	32.50 (13)	61.54 ^b (08)	38.46 ^b (5)	0.00

Figures in parentheses indicate number of animals. Calculated x^2 : 7.65; Table $x^2 = 6.63$ at 1 df $P < 0.01$. Means bearing uncommon superscription within column for a group differ significantly ($P < 0.01$).

The per cent incidence of typical fern pattern of CVM in conceived crossbred cows (86.67 %) and heifers (83.33 %) was very close to that (81-87%) reported in cows by Selvaraj *et al.* (2002), Bennur *et al.* (2004), Rathod (2016) and in buffaloes by Sharma *et al.* (2008), whereas, comparatively lower per cent values of 50 to 75 % were reported in crossbred cows by Srivastava *et al.* (2000), Rangnekar *et al.* (2002), Modi *et al.* (2011), and in Murrah buffaloes by Verma *et al.* (2014). However, comparatively higher values from 91 to 96% were reported by Bishnoi *et al.* (1982) and Gavit (2010) in cows and by Jethva (2010) in rural buffaloes.

The frequency of atypical fern pattern of CVM in conceived cows (13.33 %) and heifers (16.66 %) was very close to that reported by Bennur *et al.* (2004) in cows and Sharma *et al.* (2008) in buffaloes, whereas, comparatively higher per cent values from 25 to 50% were reported in crossbred cows by Srivastava *et al.* (2000), Rangnekar *et al.* (2002), Selvaraj *et al.* (2002), Modi *et al.* (2011) and Rathod (2016), and in Murrah buffaloes by Verma *et al.* (2014), whereas, comparatively lower values of only 4 to 9% were reported by Bishnoi *et al.* (1982) and Gavit (2010) in cows and by Jethva (2010) in rural buffaloes.

The per cent occurrence of typical fern pattern of CVM in non-conceived cows (60.00 %) and heifers (62.50 %) was in accordance with Selvaraj *et al.* (2002), but was lower than 70-80% reported by Bennur *et al.* (2004) and Gavit (2010) in crossbred cows, and by Panchal *et al.* (1994) and Jethva (2010) in buffaloes, whereas, comparatively much lower frequency was reported in crossbred cows by Rangnekar *et al.* (2002), and Modi *et al.* (2011).

The incidence of atypical fern pattern of CVM in non-conceived cows (40.00 %) and heifers (37.50 %) was in line with Selvaraj *et al.* (2002), but lower than 55% reported in cows by Rangnekar *et al.* (2002) and Modi *et al.* (2011). However, it was comparatively higher than 9 to 30% reported by Bennur *et al.* (2004) and Gavit (2010) in crossbred cows, and by Panchal *et al.* (1994), and Jethva (2010) in buffaloes.

Among the conceived and non-conceived crossbred cows and heifers, none was found to have a nil fern pattern. Similar findings were also reported by Bennur *et al.* (2004) and Gavit (2010) among

conceived and non-conceived animals. Further, there was no variation in frequency of typical or atypical fern pattern of CVM between cows and heifers. Overall, 75% cows and 60% heifers conceived and the frequency of typical and atypical fern pattern was 85.19 and 14.81% in 67.5% of conceived animals (Table 1), and concurred with many of the reports cited above. The findings proved that the typical fern pattern of CVM favours conception in cattle.

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Conflict of Interest: All authors declare no conflict of interest.

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