

STUDIES ON PHYSICAL PROPERTIES OF CERVICAL MUCUS OF REPEAT BREEDING CROSSBRED COWS*

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Received : 25.04.2013

ABSTRACT

Accepted : 20.12.2013

The examination of physical properties of cervical mucus in majority of the repeat breeding cows showed that the colour was turbid (64.44%), consistency was thick (84.44%), elasticity was elastic (62.22%) and fern pattern was typical (60.00%). The pH value of cervical mucus in repeat breeding (7.95 ± 0.096) cows was significantly ($p < 0.01$) higher than the normal (7.35 ± 0.167) cows. The conception rate of 90.00% was recorded in normal cows and 100.00% pregnancy rate was observed in clean, thin, elastic and typical fern pattern type of cervical mucus.

Keywords: Physical property, Cervical mucus, Repeat breeding cow.

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). Under the influence of gonadal hormones, the cervical mucus undergoes cyclic changes in physical and chemical properties (Eltohamy *et al.*, 1990). At the time of estrus, because of hormonal changes, the physical properties of cervical mucus viz. colour, consistency, elasticity, fern pattern and pH gets altered in repeat breeding cows which

ultimately results in lowered fertility (Mohanty *et al.*, 1996). The present experiment was undertaken to study the changes in the physical properties of cervical mucus of repeat breeding cow.

MATERIALS AND METHODS

The physical properties of cervical mucus (colour, consistency, elasticity, fern pattern and pH) of 45 repeat breeding cycling regularly, having apparently normal genitalia, inseminated three or more times but failed to conceive and showing positive reaction to white side test and 10 normal crossbred cow cycling regularly, having apparently normal genitalia, inseminated less than three times and showing negative reaction to white side test were included. The cervical mucus was collected aseptically by sterile glass pipette after passing it into the cervix through vagina by recto-vaginal technique. The physical properties of cervical mucus of each cow were examined immediately after collection. Classification of colour, consistency and elasticity was done as described by Sukh Deo and Roy (1971). Fern pattern was classified according to Luktuke and Roy (1967). The pH of cervical mucus was measured with the help of pH paper (6.5 to 9.0). The pH of cervical

* Part of M. V. Sc. thesis of first author submitted to the SKUAST-J, Jammu.

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mucus of repeat breeding and normal cows was analyzed using Student's 't' test (Snedecor and Cochran, 1989).

RESULTS AND DISCUSSION

The physical properties of cervical mucus were examined at the time of estrus in normal and repeat breeding cows and were related to the fertility in normal cows. The conception rate of 90.00% was recorded in normal cows. The occurrence of clear cervical mucus was higher in normal (80.00%) than the repeat breeding cows (35.56%). But, the turbidity was higher in repeat breeding (64.44%) than the normal cows which are in agreement with the reports of Salphale *et al.* (1993) and Selvaraj *et al.* (2002). The maximum conception rate was found with clean (100.00%) than turbid (50.00%) cervical mucus in normal cows which is supported by the findings of Salphale *et al.* (1993) and Mohanty *et al.* (1986). Clear cervical mucus is conducive for sperm penetration and conception, whereas sperm motility is arrested by turbidity of cervical mucus (Dev *et al.*, 1997).

Among the normal animals, 8 cervical mucus samples were thin (80.00%) and 2 samples were thick (20.00%) in consistency. In repeat breeding cows, higher percentage of thick consistency (84.44%) than thin consistency (15.56%) of cervical mucus during estrus was observed, which is in agreement with the findings of Rangnekar *et al.* (2002)). The pregnancy rate was higher with thin (100.00%) than thick (50.00%) cervical mucus in normal cows. It has been found that thick cervical mucus is due to differences in arrangement of glycoprotein molecules of cervical mucus which significantly influence the sperm penetrability (Dev *et al.*, 1997) thereby, preventing fertilization process.

The occurrence of less elastic, elastic and very elastic type of cervical mucus was 0.00, 70.00 and 30.00% in normal cows. In repeat breeding cows, the cervical mucus was less elastic in 11.11%, elastic in 62.22% and 26.67% samples. The results are in agreement with the report of Sukh Deo and Roy (1971). Similarly, higher conception rate was observed in normal cows with elastic (100.00 %) than less elastic (0.00 %)

and very elastic (66.67 %) type of cervical mucus. The elastic nature of cervical mucus enhances the sperm survival and favours its transport.

Out of 10 normal animals, 90.00 and 10.00 % cows showed typical and atypical fern pattern, respectively which is in close concurrence with the earlier reports of Enkhia and Kohli (1982). Out of 45 repeat breeding cows, typical, atypical and nil fern pattern was observed in 60.00, 28.89 and 11.11% cows, respectively. These results are in agreement with the findings of Sharma *et al.* (1987) and Selvaraj *et al.* (2002). With respect to fern pattern, the higher pregnancy rate was also observed with typical (100.00%) than atypical (0.00 %) and nil (0.00 %) type of cervical mucus in normal cows which is in agreement with the finding of Dev *et al.* (1997). There is a positive correlation between fern pattern and sperm penetrability. Typical fern pattern is said to favour higher sperm penetration than atypical fern pattern. Therefore, atypical/ nil fern pattern signifies unfavorable uterine environment which leads to blocking/ destruction of the sperm in the reproductive tract, thereby preventing fertilization process.

In normal cows, the pH value of cervical mucus during estrus ranged from 7.0 to 8.5 with a mean of 7.35 ± 0.167 . Similar, observations were recorded by Methai *et al.* (2005). The pH of cervical mucus ranged from 6.5 to 9.0 with a mean of 7.95 ± 0.096 in repeat breeding cows. The results are in agreement with the reports of Rane *et al.* (1992). This represents significantly ($p < 0.01$) higher pH of cervical mucus in repeat breeding than normal cows. The pH of cervical mucus indicates the status of uterine environment existing at the time of fertilization. Hafeez and Hafeez (2000) stated that acidity or excessive alkalinity of cervical mucus reduces the sperm motility, thereby causing failure of fertilization.

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