



Biochemical Status During Oestrus Cycle in Regular and Repeat Breeding Cows

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Abstract

The present study was undertaken at cattle breeding farm of Nagpur Veterinary College, Nagpur. Serum biochemical profile of repeat breeding cross bred (jersey x Sahiwal) cows was evaluated and compared with that of regular breeding cows. The average total serum total protein, serum calcium and serum inorganic phosphorus values in repeat breeding cows were significantly ($P>0.01$) lower than the values in regular breeding cows. The average serum cholesterol in repeat breeding cows was significantly ($P>0.05$) lower than the value of regular breeding cows. The difference in the values of serum total protein, serum cholesterol and serum inorganic phosphorus on 0, 7th, and 15th days of oestrus cycle in regular and repeat breeding cows was found to be non significant. However, significantly ($P>0.05$) higher values of serum calcium were recorded in regular and repeat breeding cows on 0 day, which significantly decreased on 7th and slightly increased on 15th day of oestrus cycle.

Keywords: Biochemical, regular breeding, repeat breeding, oestrus cycle, cattle

Repeat breeding is the major problem in bovine reproduction and exact cause of this is still an enigma in many cows. In spite of best diagnostic and therapeutic efforts, nearly 20 to 30% of the reproductive disorders are due to repeat breeding cows, which ultimately result in their culling, causing economic loss to the farmers (Kaikani, 1989). The maintenance of these repeat breeders corrodes the profits in dairy industry. The repeat breeding cows invariably remain irreversible and are ultimately culled and auctioned. Some of the serum constituents are known to influence the process of reproduction and oestrus behaviour in animals (Sahukar *et.al.* 1985). The knowledge

of normal level of various biochemical constituents and variation that occur during repeat breeding may help in evaluating the reproductive potential of the animals. Early detection of these problems by estimating biochemical values may effect early culling or treatment of these cows, thereby increasing the profitability of cattle owners.

Materials and Methods

Two groups of Jersey × Sahiwal cross breed, regular and repeat breeding cows, consisting of six animals each were formed on the basis of record and rectal examination. The cows, which conceived with less than two inseminations and showed normal estrus were grouped as regular breeding and cows with normal genitalia, failed to conceive with more than two inseminations were grouped as repeat breeders. The 10 ml of blood samples were collected at the time of insemination from each cow of different groups. Second and third blood samples were collected on 7th and 15th day respectively from the day of insemination. The serum samples were procured after 24 hours, centrifuged and stored in sterile glass vial in a refrigerator. The total serum protein, serum cholesterol, serum calcium and serum phosphorus were estimated by colorimetric methods using diagnostic kits and data were statistically analysed (Snedecor and Cochran, 1967)

Results and Discussion

It is observed from the results (Table – 1) that the total serum protein values were significantly ($P>0.01$) lower in repeat breeding cows than in regular breeding. these findings were in agreement with the observations of Sharma *et al.* (1984) and Gujar *et al.* (1990). they emphasized that the lower level of total protein in repeat reeding might have caused deficiency of amino acids required for synthesis of various releasing hormones and pituitary hormones, which might have affected reproductive disturbances such as fertilization failure. the higher values of total protein in both the groups on 0 day of estrus cycle indicated mobilization of protein in blood oestrus period.

The serum cholesterol level was significantly ($P>0.05$) lower in repeat breeding cows as compared to regular breeding cows. similar findings were reported by verma *et al.* (1984) and Ramkrishna (1996). Above observations though not conclusive, would correlate the utilization of cholesterol with the functional activites of ovaries, the cholesterol being a precursar in the biosynthesis of gonadal steroid hormones. the non significant increase of cholesterol on 0 and 15th days of oestrus cycle is suggestive of increased use of serum cholesterol in this phases.

The serum calcium level remained significantly higher ($P>0.01$) in regular breeding than repeat breeding cows. These results are in agreement with the findings reported by Sharma *et al.* (1984), Madhumeet and pant (1998) and Kalita *et al.* (1999). All these observations could reveal the significance of optimum level of serum calcium for

Table 1: Biochemical values of cross breed cows during oestrus cycle

Parameters	Reproductive Status	Biochemical values on			
		0 Day	8 th Day	15 th Day	Mean
Serum protein (gm/dl)	Regular Breeder	9.60 ± 0.28 ^a	8.92 ± 0.22 ^a	8.94 ± 0.20 ^a	9.15 ± 0.04**
	Repeat Breeder	8.09 ± 0.18 ^a	7.89 ± 0.18 ^a	7.85 ± 0.09 ^a	7.95 ± 0.04
Cholesterol (mg/dl)	Regular Breeder	126.02 ± 1.86 ^a	124.59 ± 3.52 ^a	131.3 ± 6.93 ^a	127.30 ± 9.72*
	Repeat Breeder	113.49 ± 6.31 ^a	109.47 ± 6.47 ^a	111.86 ± 6.99 ^a	111.60 ± 5.31
Calcium (mg/dl)	Regular Breeder	11.16 ± 0.07 ^a	10.77 ± 0.16 ^b	10.81 ± 0.16 ^b	10.91 ± 0.09**
	Repeat Breeder	8.98 ± 0.25 ^a	8.37 ± 0.29 ^b	8.47 ± 0.23 ^b	8.60 ± 0.27
Inorganic phosphorus (mg/dl)	Regular Breeder	5.42 ± 0.19 ^a	5.35 ± 0.18 ^a	5.12 ± 0.14 ^a	5.30 ± 0.14**
	Repeat Breeder	4.11 ± 0.16 ^a	4.14 ± 0.26 ^a	4.18 ± 0.32 ^a	4.14 ± 0.24

* Significant difference at 5% level with very next value in column

** Significant difference at 1% level with very next value in column.

Different superscripts in a row show significant difference.

proper function of various hormones during the reproductive cycle of regular breeding cows. The significant ($P>0.01$) increase in serum calcium level at oestrus day (0 days) indicates increased activities of reproductive organs, which decreased on mid cycle (7th day) and again slightly increased on 15th day before start of next cycle.

The serum inorganic phosphorus level found significantly ($P>0.01$) higher in regular breeding than that of repeat breeding cows. Similar findings were reported by Khan and Iyer (1993). These observations could correlate the serum inorganic phosphorus level with the functional activities of ovaries, since marginal deficiency of inorganic phosphorus would cause inactivity and dysfunction of ovary leading to reproductive failure. The higher values of serum phosphorus at oestrus, were found in regular breeding group of cows in present study. Similar findings were also reported by Verma et.al. (1984). They attributed the role of phosphorus with the onset of oestrus (0 day) through initiation and maintenance of ovarian activities and fertilization process. However, in repeat breeding cows, serum phosphorus values remained lower at oestrus and slightly varied on 7th and 15th days of cycle, which might be one of the reasons for fertilization failure in repeat breeding group of cows.

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