



SHORT COMMUNICATION

Blood Biochemical Profile in Repeat Breeding Crossbred Dairy Cows

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ABSTRACT

In Theni district of Tamil Nadu, India thirty blood samples were collected from repeat breeder and normal dairy cows. The plasma glucose, serum cholesterol, serum protein, serum total lipid, serum calcium and serum phosphorus were estimated as per the standard biochemical methods. The plasma glucose level (mg/dl) in regular breeding animals and repeat breeding animals were 60.27 ± 2.28 and 55.18 ± 3.10 respectively. The serum total cholesterol level (mg/dl) of regular and repeat breeding cows were 114.14 ± 9.72 and 98.90 ± 12.48 respectively. The serum protein level (g/dl) of regular and repeat breeding cows were 6.70 ± 0.09 and 6.32 ± 0.04 respectively. The serum total lipid content (mg/dl) in regular and repeat breeding cows were 273.50 ± 12.64 and 248.30 ± 8.79 respectively. The serum calcium level (mg/dl) in regular and repeat breeding cows were 11.10 ± 0.01 and 9.98 ± 0.04 respectively. The serum phosphorus level (mg/dl) in regular and repeat breeding cows were 6.01 ± 0.32 and 4.46 ± 0.30 respectively. We conclude that the significantly decreased levels of blood glucose, total cholesterol, total protein, total lipids, calcium and phosphorus in repeat breeding dairy cows compared to normal dairy cows.

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INTRODUCTION

The breeding efficiency of dairy cows is lowered by a number of reproductive disorders like endometritis, an-oestrus and repeat breeding, affecting adversely the productive and reproductive performance of cows, and resulting in great economic losses to dairy farmers (Dutta *et al.*, 1988). The basic causes of the reproductive problems in a herd are multiple and include managerial, nutritional and pathological factors.

The normal blood levels of various biochemicals constituent are indispensable for normal function of various systems of body including reproductive system (Balakrishnan and Balagopal, 1994). Changes in various biochemical constituents have been blamed for reproductive failures. Thus, serum biochemical profile might be a potential aid in characterizing these problems. Blood glucose appears to be one of the key nutrients affecting cyclicality (Duke, 1970) or infertility (Dowine and Gelman, 1976) or an-oestrus (Dutta *et al.*, 1988) in farm animals. Burle *et al.* (1995) reported lowest serum concentration of cholesterol in an-oestrus than in normal cycling fertile cows. Greatly variable reports were available on the level of these biochemical constituents, hence the present study was planned to assess the levels of

selected biochemical constituents in repeat breeder and normal dairy cows.

Crossbred dairy cows brought to health camps from various villages of Theni district were utilized for the study. Thirty blood samples were collected from those animals that exhibit regular estrous cycle, clear vaginal discharge but failed to conceive even after three successful artificial inseminations. Blood samples were also collected from regular cyclic animals but without history of repeat breeding that conceived within three artificial inseminations utilized as control.

MATERIALS AND METHODS

Blood samples collected from the jugular vein as two separate vials; without anticoagulant for serum and with sodium fluoride for plasma. Serum and plasma were separated and preserved at -20°C for analysis. Plasma samples were analyzed for blood glucose (GOD/POD method) immediately. Total cholesterol (Enzymatic method), total serum protein (Modified biuret method) total lipids (Phosphovanillin method), calcium (Trinders method) and phosphorus (Gomorris method) were using kits supplied by SPAN Diagnostic Pvt. Ltd, India. The

data's were statistically analyzed as per Snedecor and Cochran (1967).

RESULTS AND DISCUSSION

The plasma glucose level (mg/dl) in regular breeding animals and repeat breeding animals were 60.27 ± 2.28 and 55.18 ± 3.10 respectively. This agrees with reports of Chandrahar *et al.* (2003), there was a significant decrease in blood glucose level of repeat breeding. Blood glucose level may influence the pituitary function there by interfere with fertility (Arthur, 1975). Mechanism by which hyperpituitarism resulted is incompletely understood; however it may be revealed to increased production of adrenocorticotrophic hormones (Coles, 1986). The serum total cholesterol level (mg/dl) of regular and repeat breeding cows were 114.14 ± 9.72 and 98.90 ± 12.48 respectively. Similar levels were observed by Khan *et al* (2010). Lower cholesterol level in repeat breeding cows positive correlation between total cholesterol concentration and better reproductive performance. (Nair *et al.*, 1987). The serum protein level (g/dl) of regular and repeat breeding cows were 6.70 ± 0.09 and 6.32 ± 0.04 respectively. Similar levels were observed by Khan *et al* (2010). Lower serum protein level may lead to deficiency of certain amino acids which are essential for gonodotropin synthesis (Vohra *et al.*, 1995). The serum total lipid content (mg/dl) in regular and repeat breeding cows were 273.50 ± 12.64 and 248.30 ± 8.79 respectively. This agrees with the findings of Jayachandran *et al.* (2007). Low fat diet can contribute to low energy status due to which follicles fail to develop and embryos are affected (Robert, 1971).

The serum calcium level (mg/dl) in regular and repeat breeding cows were 11.10 ± 0.01 and 9.98 ± 0.04 respectively. Moodie (1965) reported calcium sensitizes reproductive organs through various hormones. The serum phosphorus level (mg/dl) in regular and repeat breeding cows were 6.01 ± 0.32 and 4.46 ± 0.30 respectively. Similar findings were reported by Chandrahar *et al.* (2003) in repeat breeding cows and Jayachandran *et al.* (2007) in repeat breeding buffaloes. Phosphorus deficient heifers showed reduced fertility rate and required more number of services per conception (Morrow, 1969).

Table 1: Blood biochemical (Mean \pm S.E) values profile of regular and repeat breeding dairy cows

Biochemical constituents	Regular dairy cows (control)	Repeat breeding dairy cows
Plasma glucose(mg/dl)	60.27 \pm 2.28	55.18 \pm 3.10*
Total cholesterol(mg/dl)	114.14 \pm 9.72	98.90 \pm 12.48*
Total serum protein(g/dl)	6.70 \pm 0.09	6.32 \pm 0.04*
Total lipids(mg/dl)	273.50 \pm 12.64	248.30 \pm 8.79*
Calcium(mg/dl)	11.10 \pm 0.01	9.98 \pm 0.04*
Phosphorus(mg/dl)	6.01 \pm 0.32	4.46 \pm 0.30*

(n=30); * significantly low (P<0.05)

Conclusion

Our findings enlighten the significantly lower level of blood glucose, total cholesterol, total protein, total lipids, calcium and phosphorus in repeat breeding dairy cows as compared to normal dairy cows in Theni district of Tamilnadu.

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