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Variation in blood biochemical constituents during post-partum period in crossbred cows

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ABSTRACT

Recently normal parturited twenty cows were selected for this experiment. Ten cows in treatment and ten cows in control group were taken for this study. Blood samples were collected weekly from day of parturition up to 17th week of post partum period for estimation of blood glucose, serum cholesterol, serum protein and triglycerides. In results the values of glucose, cholesterol, protein and triglycerides at the time of parturition were declined. The values of glucose, cholesterol, proteins were higher during estrus period and the triglycerides were at normal level. After completion of uterine involution PGF_2 alpha treatment was given to all the 20 cows. These values of glucose, cholesterol protein was higher in pregnant cows in early gestation up to 17th week in post-partum period. The levels of all the constituents were normal level in non-pregnant cows. There was significant difference between pregnant and non-pregnant cows.

Key words: Blood, biochemical constituents, post-partum cows, crossbred

Anoestus and infertility are the problematic events in Livestock production. Particularly in post partum period, a biochemical constituent plays a major role in different reproductive phases. In this view the study was under taken to investigate the changes in blood glucose, serum cholesterol, total proteins and triglycerides levels in relation to reproduction events during post partum period.

MATERIALS AND METHODS

The study consisted of 20 apparently normal healthy recently parturited cows were selected ten each from Cattle Cross Breeding Project (CCBP), Balsa Farm and Red Kandhari Unit Farm, MAU, Parbhani. Blood samples were collected from jugular vein at weekly interval from day of parturition up to 17th week in post-partum period. After completion of involution period (35-45 days) the cows were treated with PGF_2 alpha (illiren 5 ml) and estimations of the biochemical constituents were carried out to see variation of biochemical constituents in post-partum period and to see the difference between biochemical constituents in pregnant and non-pregnant cows. For the estimation kits were used like, glucose was estimated by enzymatic PAP method from Sidham Diagnostics, Nagpur. Protein was estimated by BCG dye binding and Biuret method, from Sidham Diagnostics, Nagpur. Triglycerides were estimated by GPO/PAP method from Gest Bio-systems, Goa. The test was carried out by following protocol supplied with kits.

RESULTS AND DISCUSSION

The average values of blood glucose, cholesterol, total serum proteins and triglycerides are presented in Table 1.

Glucose : Perusal of results revealed increased blood glucose at the time of parturition in all the experimental cows. It might be due to storage of glucose during advanced pregnancy, and the level remain maintained at the time of parturition but after calving the lactation starts and the concentration of glucose level declined up to 1 month in all the experimental cows, as drainage through milk.

During heat period the glucose level was higher in normal cows (56.79mg/dl) whereas the glucose level was comparatively low in cows, which did not show oestrus. These levels indicated a low energy status probably affecting the follicular development resulting follicular atresia and anoestrus. Results are in agreement with Nair *et al.* (1987), Prasad (1984), Agarwal *et al.* (1985), Ghosh *et al.* (1991), Pareek and Deen (1985), McDonald (1980), stated low conception rate have been associated with hypoglycemia due to energy deficiency. Arthur (1975) reported that pituitary function might be particularly influenced by blood glucose level.

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Table 1. Variation in blood biochemical constituents during reproductive events in cows

Blood and serum	Pregnant cows				Non-pregnant cows			
	Parturition	One month	Heat period	Four months	Parturition	One month	Heat period	Four months
Blood glucose (mg/dl)	59.17	48.96	56.79	53.87	57.05	44.31	44.79	52.60
Serum cholesterol	101.25	174.75	243.25	276.00	102.50	174.50	185.75	188.50
Total protein	6.38	7.14	7.64	7.92	6.14	6.47	7.32	7.71
Triglycerides	29.82	29.28	27.88	27.76	22.35	28.47	27.94	26.01

Cholesterol : In present experiment the cholesterol value was low at the time of parturition. Similar results were observed by Pareek and Deen (1985); Saha *et al.* (1991) reported low level of cholesterol at the time of parturition and increasing trend one week after parturition. The cholesterol level was increased upto one month in all the experimental cows 174.75 and 1`74.50 mg/dl whereas the cholesterol values were much increased in (243.25 mg/dl) cows which showed oestrus as against normal level (185.75) in cows which did not show oestrus. This variation in post-partum levels may be due to female steroidal sex hormones, bio-climatic factors as well as manage mental practices. Vadoria *et al.* (1976) reported higher cholesterol content in estrogen domination phase of oestrus cycle. Kavani *et al.* (1987) cholesterol is regarded as widely distributed precursor in blood in free and esterified forms. Hydrolysis of cholesterol ester is essential for positive synthesis of steroid based sex hormones. The results of this study indicated that cholesterol level was increased in pregnant cows and low in non-pregnant cows. Many authors reported the relation of cholesterol with oestrus induction. Sarvaiya and Pathak (1981), Prasad *et al.* (1984), Dindorkar (1984), Nair (1987) reported the low cholesterol level in anoestrus cows and high cholesterol level in normal cycling cows.

Protein : The protein values are at low level at the time of parturition and increased up to one month in all the experimental animals. But the values are comparatively high in cows which showed estrus and low in cows which did not show estrus. The protein level is increased in cows up to 4th month but comparatively high in pregnant cows than in non-pregnant cows. Pareek and Deen (1985) reported the similar range of protein values in post-partum period. Ghose *et al.* (1991) and Pareek and Deen (1985) reported the similar level of protein at parturition and during post-partum period. Total protein circulation represents a balance between biosynthesis and catabolism or mechanical loss. Variation in total protein in early stage of gestation revealed its demand and utilization for the physiological events that take place during this period. Agarwal *et al.* (1985), Mailot *et al.* (1991), Kavani *et al.* (1987), Dhaliwal *et al.* (1991) reported the low level of proteins in anoestrus cows than in normal cycling cows.

Triglycerides : In the present study the triglycerides values variation were non-significant in post-partum period up to 4th month. Mesaric *et al.* (1997) found the same results. Guedon (1999) reported the same that triglycerides concentration and was not related to the resumption of ovarian cycling. On the basis of results of this study, it may be concluded that glucose values declined at the time and after parturition and again reached to normal level 1-2 month's post-partum. A low level of glucose was oftenly found in anoestrus cows and hypoglycemia may be associated with low conception rate. Cholesterol level was significantly lower at the time of parturition and higher levels were found during heat period i.e. cholesterol level was higher in estrogen dominant phase. Protein values were significantly lower at parturition, which reached to normal by one-month post-partum. Protein values were higher in normal cycling cows than in anoestrus cows. The variation in triglycerides level was non-significant in post-partum period of cows.

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