

## Comparitive studies on certain Bio-Chemical constituents of Anoestrus Cross Bred Jersey Rural Cows

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### ABSTRACT

Serum samples of 35 anoestrus cross bred jersey cows of 4-6½ years age group were processed for some biochemical constituents and were compared with equal number of cycling animals of same age group. Significantly low levels of haemoglobin, cholesterol, glucose, inorganic phosphorus, and serum iron were recorded.

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While cross breeding of cattle was on the rise in the rural areas nutritional management in many regions is not scientific. Systematic studies on the possible impact of nutritional inadequacies as evidenced by blood studies are lacking. A mini profile test estimating some blood constituents seems to be adequate in assessing impact of certain nutritional deficiencies on fertility.

### MATERIALS AND METHODS

Among the animals attending to infertility camps of Srikakulam District (A.P), 35 cross bred post partum (P.P) anoestrus Jersey Cows with smooth inactive ovaries of 4-½ years of age were selected. Similar number of cyclical animals were included as controls. All were found to be negative for brucellosis and for parasitic infestation.

About 10 ml. of blood was collected from each cow through jugular vena puncture and allowed for serum separation and an aliquot (about 5 ml.) was separately collected in flouride-thymol tubes for blood

glucose estimation. Total protein (T.P), albumen A/G, haemoglobin, Cholesterol blood glucose, calcium, inorganic phosphorus and serum iron were estimated utilising the reagent kits supplied by M/S. Span Diagnostics, Bombay. Serum Iron was estimated only in those animals that showed haemoglobin values less than 9 g/dl. Statistical analysis was done as per Snedecor and Cochran (1971) utilising 't' test.

### RESULTS AND DISCUSSION

Anoestrus cows showed significantly low levels of Cholesterol agreeing with Beharia *et al.*, (1993). As Cholesterol acted as precursors of steroid hormones its levels can indicate circulatory adequacy of these hormones responsible for normal estrus. Cholesterol levels might be related to energy status (Beharia *et al.*, 1993).

Glucose levels are significantly lower indicating the possibility of lower TDN than disorders of digestion and assimilation. Relative hypoglycemia in cows might possibly affect the expression of estrus symptoms. Macclure (1965) observed that variations in blood glucose was clearly linked to estrus cyclicity and fertility.

Long standing hypoproteinemia which became prominent due to advancing age might be the cause for low total proteins. Pal *et al.*, (1991) and Vhora *et al.*, (1995) observed lowered blood proteins in anoestres cows. Inadequate protein intake, increased protein requirement during pregnancy and lactation can impair the

synthesis of particular amino acids essential for gonadotropins.

Haemaglobin levels are found to be lower as compared with control animals indicating long term protein deficiency and subsequent inadequacy of globulins. Pradhan *et al.*, (1995) recorded lower levels of protein and haemaglobin in anoestrus CB cows. Low Hb levels can influence the tissue oxygenation of reproductive tract and can influence cyclicity.

Serum inorganic phosphorus is found to be significantly lower. Anoestrus, subestrus, irregular and delayed sexual maturity are the consequence of phosphorus deficiency (Blood *et al.*, 1989). This is mostly due to inadequate supplementation than due to soil deficiency that cause sub-clinical deficiency. Salisbury and Vanderman (1961) observed that most prevalent deficiency affecting reproduction appeared to be lack of phosphorus. Sukhagia and Sengupta (1986) emphasized

the need for certain levels of inorganic phosphorus for estrogen secretion.

No significant difference in levels of calcium was observed in contrary to the observations of Beharia *et al.*, (1993). Roberts (1971) stated that the calcium deficiency may not cause reproductive failure in cattle. The role of calcium in general is limited to the formation of bone, milk, blood clotting and neuromuscular excitability.

Serum iron among twelve clinically anaemic animals (Hb 9.00 g/dl) is significantly lower, which was also observed by Vohra *et al.*, (1995) among crossbred heifers. Low iron can cause anaemia, debility, lack of appetite, reduced intake of feed and a failure of estrus (Roberts 1971).

There are no observable clinical signs of deficiencies. Sub-clinical nutrient inadequacies were most probable cause for clinical anoestrus and an integrated approach for treatment of multiple deficiencies is needed.

Table 1. The serum and blood levels of biochemical constituents in anoestres and cycling Cross bred Cows

	Total Protein (g/100ml)	Albumin (g/100ml)	Glubulin (g/100ml)	A/G	Hemo Globin (g/100ml)	Cholesterol (mg/100ml)	Glucose (mg/100ml)	Inorganic Phosphorus (mg/100ml)	Calcium (mg/100ml)	Serum Iron (mg/100ml)
Anoestrus	5.91	2.88	3.16	0.82	9.1	80.94	47.09	4.29	9.40	86.33
	±0.398	±0.101	±0.169	±0.169	±0.80	±6.77	±12.03	±0.15	±2.72	±6.27
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Cycling	6.85	3.06	3.34	0.94	10.43	108.94	62.20	5.30	9.58	129.83
	± 0.168	±0.43	± 0.16	± 0.033	± 0.031	± 4.64	± 3.23	± 0.117	± 2.27	± 9.73

\* = Significant at 5% level

\*\* = Significant at 1% level

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