

PJN

ISSN 1680-5194

PAKISTAN JOURNAL OF
NUTRITION

ANSI*net*

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Blood Progesterone Level of Intensively Managed Savanna Brown Does Fed Maize Bran and Protein Concentrate Diet

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Abstract: The effect of feeding Maize Bran and 10% crude protein concentrate diet on the blood progesterone level of intensively managed savanna brown doe was investigated. Twelve nulliparous savanna brown does with mean body weight of 8.70 ± 1.12 kg were used for the experiment which lasted for a period of eight weeks. The animals were randomly assigned into two groups (A and B) with a replicate each. Does in treatment A were fed diets containing 10% CP while those in treatment B had Maize Bran. Blood progesterone level were monitored 18 days prior to and 30 days following oestrus. It was observed that levels of progesterone in both groups were low prior to oestrus and mating but increased following oestrus and mating. The rate of increase was slightly higher in the group that had 10% CP diet particularly between day 21 and 27 post oestrus. Even though level of hormone in the serum of does in both groups did not differ significantly ($p > 0.05$). It was concluded that protein have an effect on the level of circulating progesterone in the blood of Savanna Brown does. Therefore incorporation of protein into the ration of Savanna Brown does is highly recommended.

Key words: Blood progesterone, intensive, savanna brown does, maize bran and concentrate

INTRODUCTION

The role of protein in the reproductive performance of most domestic animals particularly ruminants cannot be overemphasized. The inherent property of the biochemical breakdown of protein allows it participate in the precursor of most reproductive hormones particularly progesterone (Sonderman *et al.*, 1987).

In the reproductive organ, particularly uterus, a progesterone binding receptor site is present. This progesterone receptor can be induced by oestrogen since inhibitors of Ribonucleic Acid (RNA) and protein synthesis administered 15 min before the hormone prevented its effect. An assertion of the stimulation of the uterine progesterone binding activities may account for the synergistic action of oestradiol and progesterone on the uterus (Carroll *et al.*, 1990).

The need to ensure sufficient amount of protein in the ration of ruminant become inherent. Most nutritional materials have ingredients which could be precursor or even elicit effect that conventionally known reproduction hormone (Sonderman and Larson, 1989). Therefore, this study was conceived to evaluate the effect of feeding Maize Bran and a 10% CP concentrate diet on the level of blood progesterone in Savanna Brown does.

MATERIALS AND METHODS

Twelve Savanna Brown does with mean body weight of 8.70 ± 1.12 kg were used to determine the effect of feed type on the level of progesterone in the blood. The animals were allowed a pre-treatment period of two weeks to enable them acclimatize following which they

were randomly divided into two groups with a replicate each. Does were allowed to run with buck throughout the study period of eight weeks.

Animals in the treatment group were given compound protein concentrate feed containing 10% CP while those in the control group had Maize Bran (Table 1). Mango leaves at the rate of 1.5 kg per group per day was fed as supplement to the animals throughout the study period. Water and salt lick were also supplied ad-libitum.

10 mls of blood was collected from the jugular vein of does every other day (18 days) prior to and 30 days following oestrus in clean plastic test tubes which were immediately transferred into test tube rack placed in an ice chest. Blood samples were later taken to the laboratory and the serum was separated from the plasma by centrifugation at 5,000 revolutions per minute for ten minutes. This was done in order to minimize enzymatic progesterone degradation. The serum collected was stored at a temperature of -20°C until ready for radio-immunoassay.

Data generated from this study were subjected to t-test using a computer package "minitab" for window release 9.2". Graph of progesterone profile was plotted using Microsoft Excel.

RESULTS AND DISCUSSION

The composition of experimental diets and the proximate composition of diets are presented in Table 1 and 2 while the effect of type of diet on the serum progesterone profile of Savanna Brown does is presented in Fig. 1 and Table 3.

Table 1: Composition of concentrate portion of experimental diet

Ingredient	Composition	
	T	C
Maize	67.03	Maize bran
R. celusk	24.00	-
Soya bean	6.38	-
Blood meal	1.59	-
Premix	0.50	-
Salt	0.50	-
Total	100.00	100.00
Calculated CP (%)	11.06	-

Maize bran not compounded, supplemented with salt lick,
T = Treatment; C = Control

Table 2: Proximate composition of experimental diet

Component %	T	C	ML
Dry matter	90.70	84.07	48.42
Crude protein	10.83	7.10	10.00
Ether extract	5.44	5.00	6.28
Crude fibre	6.80	9.93	21.30
Ash	7.48	7.50	13.37
Nitrogen free extract	60.15	70.47	50.04

T = Treatment group (concentrate); C = Control (maize bran);
ML = Mango Leave

Serum progesterone concentration (ng/ml) were similar for both groups from day 18 to day 6 prior to oestrus. On day 3 after oestrus, this trend was remarkably altered as does on 10% CP diet recorded very sharp increase in the level of serum progesterone. This declined appreciably between the 12th and 15th day post oestrus and rose again to about twice the level of hormone in the Maize Bran fed group from day 18-30 following oestrus. However, the differences in hormone level were not statistically significant ($p > 0.05$).

The generally low level of progesterone in serum prior to oestrus and mating is a normal phenomenon in the oestrus cycle (McElroy *et al.*, 1995). The author noted that during the pro-oestrus phase, growths of follicles are generally controlled by oestrogen. Following oestrus the effect of both diets became obvious. The level of progesterone in circulation increased and ranged from 0.50 at oestrus to a peak of 5.50 ng/ml in the group that had Maize Bran and 0.20 at oestrus to a peak of 9.10 ng/ml in the group that had the compound concentrate feed. However, this did not differ significantly ($p > 0.05$) among both groups.

Although Maize Bran appear to be inferior in CP than the compound concentrate feed, Shiawoya and Mohammed (1999) observed that the crude protein content of Maize Bran obtained from Minna was above the minimum of 8% CP (9.48 ± 0.13) required by the rumen microbial population to function efficiently and also above the average requirement, in Nigeria for maintenance of small ruminants (8.9%) hence its ability, to compare favourably with the compound protein diet.

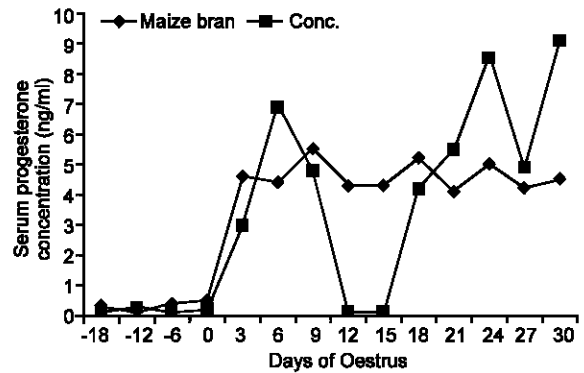


Fig. 1: Progesterone concentration of serum obtained from savanna brown does fed maize bran and 10% CP concentrate diet

Table 3: Progesterone concentration of serum obtained from savanna brown does fed maize bran and 10% CP concentrate diet

Day of oestrus	Serum progesterone A (Maize bran)	Concentration (mg/ml) B (10% Cp concentrate)
-18	0.30	0.10
-12	0.10	0.30
-6	0.40	0.10
0	0.50	0.20
3	4.60	3.00
6	4.40	6.90
9	5.50	4.80
12	4.30	0.10
15	4.30	0.10
18	5.20	4.20
21	4.10	5.50
24	5.00	8.50
27	4.20	4.90
30	4.50	9.10

0-Day of Oestrus

The level of protein in both diets helped to trigger oestrus which was immediately followed by mating in both groups. This was more pronounced in the group that had 10% CP in their diet. The progesterone profiles appear to confirm pregnancy since the levels were maintained beyond the normal duration of oestrus cycle.

Conclusion and recommendations: Results obtained from this study show that the level of protein has an effect on the level of progesterone in the blood of Savanna Brown does. Therefore, incorporation of protein into the ration of Savanna Brown does is recommended.

REFERENCES

- Carroll, D.J., R.A. Prerson and D.K. Combs, 1990. Variability of structures and plasma progesterone protein in Denny cows with ovarian cysts. *Thermogenol.*, 34: 349-370.

- McElroy, T.G., J.J. Robinson, R.P. Aitken, P.A. Findlay, R.M. Palmer and I.S. Robertson, 1995. Dietary-induced suppression of pre-ovulatory progesterone concentration in super-oriented ewes impairs the subsequent *in vivo* and *in vitro* development of their era. *Anim. Reprod. Sci.*, 39: 89-107.
- Shiawoya, E.L. and I.G. Mohammed, 1999. Nutrient composition o Groundnut Haulms (GNH) and mixed cereal bran (maize/sorghum-Dusa) from Minna municipality Nigeria. Book of proceedings, 26th annual Nigerian society for animal production conference. 21st-25th, March 1999. Ilorin, pp: 8-9.
- Sonderman, J.P., G.E. Weaver and L.L. Larson, 1987. Effect of dietary protein level and exogenous gonadotropin-releasing hormone on circulating progesterone concentrations in lactating Holstein cows. *J. Dairy Sci.*, 70: 183.
- Sonderman, J.P. and L.L. Larson, 1989. Effect of dietary and exogenous gonadotropin releasing hormone on circulating progesterone concentrations and performance of Holstein cows. *J. Dairy Sci.*, 72: 2179-2183.