



Effect of Feeding of Urea Treated Complete Feed on Blood Parameters of Crossbred Calves (HF X Deoni)

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ABSTRACT

An experiment was conducted for a period of 120 days to study the nutrient utilization and digestion efficiency of raising of male and female calves fed on ration based urea treated wheat straw. Nine growing male and female calves of 6 to 12 months were randomly divided into 3 groups of 6 each. The blood samples were collected from the jugular vein on three occasions i.e. at the start of 0, 60 days and at the end of experiment 120 days. In all, there were 54 samples of blood for analysis. The blood samples were analysed for hemoglobin, blood glucose, total serum protein and blood ammonia nitrogen, in order to assess the treatment effect on blood. The average hemoglobin in the blood of calves at 0, 60 and 120 for treatment T1, T2 and T3 was 8.68, 8.79 and 8.72, 8.75, 8.86 and 8.80 and 8.97, 8.89 and 8.93 g/dl, respectively. In case of glucose for T1, T2 and T3 were 41.64, 41.87 and 41.82 and 41.84, 41.90 and 41.97 and 41.93, 41.97 and 41.99 mg/dl, respectively. Regarding the average blood urea nitrogen in the blood of calves for treatment T1, T2 and T3 was 23.58, 24.88 and 24.28 and 23.67, 24.98 and 23.60 and 25.55, 24.75 and 22.90 mg/dl, respectively. The BUN was significantly lower under T1 and T3 than T2 indicating that urea treated straw was significantly depressed BUN content as compared to that treatment T2. The average total serum protein (TSP) in the blood for treatment T1, T2 and T3 was estimated as 6.53, 6.63 and 6.67 and 6.80, 6.78 and 6.82 and 6.95, 6.93 and 6.99 g/dl respectively. The total serum protein was slightly higher under T3 treatment than T2 and T1 treatment however, differences observed were statistically non-significant.

Key words: Jowar *kadbi*, Yashwant grass, 3% urea treated wheat straw, Haemoglobin (Hb), Blood glucose, Serum total protein (STP), Blood urea nitrogen (BUN).

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INTRODUCTION

A novel feeding system has been evolved in last decade known as complete feed. Complete feed is a system of feeding concentrate and roughages together in blended form and except water, all dietary essentials are supplied through it. Complete feed system is advantageous against conventional system of feeding by reduced labour cost, maintenance of roughage: concentrate ratio, uniform feed intake favouring uniform supply of nutrients and maintenance of rumen environment. This system of feeding is well suited as it helps for utilizing locally available crop residues, agro-industrial by-products and non-conventional feeds, therefore, minimizing feed cost and labour cost. Complete feed blocks based on chopped dry roughages are found comparatively cheaper and their feeding did not affect dry matter intake and nutrient digestibility adversely [1].

In Maharashtra state, sorghum and wheat are the major cereal crops grown in *Kharif* and *Rabi* season, respectively and hence, these are abundantly available as crop residues. Sorghum straw is used as a conventional dry fodder in the ration of ruminants throughout Maharashtra and wheat straw in some parts of the state. These are rich in cellulose, hemicellulose and complex carbohydrates which are main sources of energy, but very low in nitrogen content. Further, the maturity of crop causes increase in crude fibre content and decrease in leafy material resulting in lowering their nutritive value. The voluntary intake and digestibility of sorghum straw and wheat straw is limited due to its high lignin content. However, the nutritive value of these poor quality roughages can be improved by various physical and chemical treatments. Hence, the present study was undertaken to evaluate the utilization of urea treated straw in the ration of calves those raised for special purpose. So that, this technology can be implemented among rural masses.

Crop residues play an important role in the feeding of livestock. However, negligible amount of nitrogen, minerals and vitamins were present in the residues make them poor quality roughages. Thus, there is need to improve the nutritive value of this crop by ammoniation through urea. In this context, the efforts have been made to improve nutritive value of wheat straw by urea treatment. It is necessary to evaluate the effect of feeding of urea wheat straw on the health status of animals. The present study was undertaken to evaluate the effect of feeding of urea ammoniated soybean straw on blood parameter in lactating cows.

MATERIAL AND METHODS

The present investigation entitled "Effect of feeding urea treated crop residues (wheat straw) - based complete feed on performance of crossbred calves (HF x Deoni)" was conducted at Cattle Cross Breeding Project, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani. Eighteen crossbred calves (9 males and 9 females) of 6 to 12 months age were selected and distributed to three treatments in such a way that groups had no significant difference in respect of average body weight and age. There were three treatments *viz.*, T₁ Jawar *kadbi* 40 % + green yashwant grass 30 % + calf ration (sugras) 30 %, T₂ complete feed with untreated wheat straw 20 % + Jawar *kadbi* 20 % + green yashwant 30 % + calf ration (sugras) 30 % and T₃ 3 % urea treated wheat straw 40 % + green yashwant 30 % + calf ration (sugras) 30 %. The total experimental period was of 120 days excluding 7 days as a pre experimental period. The experimental period was divided into two parts (60 days each) and the last 7 days of each part was treated as collection period (digestion trial). The blood samples were analysed for hemoglobin, blood glucose, total serum protein and blood ammonia nitrogen, in order to assess the treatment effect on blood. The blood samples were collected from the jugular vein on three occasions *i.e.* at the start of experiment, at 0, 60 days and at the end of experiment *i.e.* (120 days). In all, there were 54 samples of blood for analysis. The samples were immediately taken for the analysis at every collection. Hemoglobin was estimated as described by Shastry [7]. Glucose in the blood sample was estimated as narrated by Dubowski [2]. Blood urea nitrogen was estimated by Urease Nesslerization method as described by Varley [8]. Total serum protein was estimated by modified Biuret and Dumas method as described by Varley [9].

RESULTS AND DISCUSSION

Hemoglobin (g/dl) content in blood

It was revealed from table 1 that, the average hemoglobin in the blood of calves at 0, 60 and 120 days of experiment period under treatment T₁, T₂ and T₃ were observed as 8.68, 8.79 and 8.72, 8.75, 8.86 and 8.80 and 8.97, 8.89 and 8.93 g/dl, respectively. The hemoglobin content was numerically higher under treatment T₂ and T₃ than T₁, however, the differences observed were non-significant indicating that the urea treated wheat straw had no effect on hemoglobin contents in blood of calves and that animal having more or less similar physiological status. The present findings were supported Medvedev and Khorishko (1989) were of the opinion that hemoglobin remained unchanged in ruminants raised on various diets.

GLUCOSE (MG/DL) CONTENT IN BLOOD

Carbohydrate metabolism in the animal body is essentially the metabolism of glucose and substances related to glucose in their metabolic process. The characteristic sugar of blood and tissue fluid is glucose. The blood sugar level is variable throughout a day. Representing the balance between the process concerning to addition of glucose to the blood and those removing glucose from it and hence, estimation level of glucose in the blood becomes essential. The values of glucose content in the blood of calves at initial stage of experimental period, middle stage and the end of experiment were estimated. It was observed from table 1 that, the average glucose in the blood of calves at 0, 60 and 120 days of experiment period under T₁, T₂ and T₃ was recorded as 41.64, 41.87 and 41.82 and 41.84, 41.90 and 41.97 and 41.93, 41.97 and 41.99 mg/dl, respectively. The highest value was observed under treatment T₃ than the treatment T₂ followed by treatment T₁. The differences observed were statistically non-significant among the treatments. This showed that there was no effect on blood glucose content of calves under the feeding control diet.

The blood glucose level observed under, present study was in accordance with Pailan *et al.* [5] reported similar blood glucose level for all diets in Murrah buffalo raised on forage based complete diets. However, significant difference for values of blood glucose (51.600 to 59.900 mg/dl).

BLOOD UREA NITROGEN

It was observed that the average blood urea nitrogen of calves at 0, 60 and 120 days under experiment period for treatment T₁, T₂ and T₃ was recorded as 23.58, 24.88 and 24.28 and 23.67, 24.98 and 23.60 and 25.55, 24.75 and 22.90 mg/dl, respectively. The BUN was significantly ($P < 0.05$) lower under T₃ than T₂ and T₁ indicating that the urea treated straw was significantly depressed BUN content as compared to

the treatment T2. Lower concentration of blood urea nitrogen in experimental group T3 as compared to other experimental group T1 and T2 indicated that the lower concentration of BUN can be maintained by feeding urea treated fodder in complete feed base ration. This might be due to slow release of ammonia in the rumen from slowly degradable and protected urea treated fodder in the complete feed, thereby resulting in better protein utilization for microbial protein synthesis in the experimental group (T3). The blood urea nitrogen level observed under the present study was in accordance with the BUN level reported by Joshi *et al.* [3]. Non-significant results were reported by Raman *et al.* [6].

TOTAL SERUM PROTEIN (G/DL) IN BLOOD

Total serum protein level in the blood is indicative of efficiency of utilization of nitrogen, irrespective of its source for conversion into quality protein in the form of amino acid which are then absorbed and metabolized. The estimation of total protein in the serum, therefore, has its own significance. Hence, the total serum protein was estimated. It was observed from Table 1 that, the average total serum protein (TSP) in the blood of calves at 0, 60 and 120 days under experimental period for treatment T1, T2 and T3 was 6.53, 6.63 and 6.67 and 6.80, 6.78 and 6.82 and 6.95, 6.93 and 6.99 g/dl respectively. The total serum protein was numerically higher under T3 treatment than T2 and T1 treatment however, the differences observed were non-significant. The present findings were supported by Raman *et al.* [6].

CONCLUSION

From the present study, it can be inferred that the nutritive value of wheat straw can be improved significantly through wheat straw with urea treatment. In case of blood parameter, there was no significant effect on blood hemoglobin, blood glucose level and total serum protein but the blood urea nitrogen was significantly lower under treatment T3.

Table 1. Effect of Feeding of Urea Treated Complete Feed on Blood Parameters of Crossbred Calves (Hf X Deoni)

Blood Parameter (g/dl)	Treatments	Days			S.E.	C.D.
		0	60	120		
Hemoglobin	T ₁	8.68	8.75	8.97	0.035	NS
	T ₂	8.79	8.86	8.89	0.032	NS
	T ₃	8.72	8.80	8.93	0.05	NS
Glucose	T ₁	41.64	41.84	41.93	0.28	NS
	T ₂	41.87	41.90	41.97	0.042	NS
	T ₃	41.82	41.97	41.99	0.033	NS
Blood Urea Nitrogen	T ₁	23.58 ^c	23.6 ^b	25.55 ^a	0.10	0.29
	T ₂	24.88 ^a	24.9 ^a	24.75 ^b	0.12	0.32
	T ₃	24.28 ^b	23.60 ^b	22.90 ^c	0.08	0.24
Total Serum Protein	T ₁	6.53	6.80	6.95	0.05	NS
	T ₂	6.63	6.78	6.93	0.034	NS
	T ₃	6.67	6.82	6.99	0.05	NS

Means with dissimilar superscripts differ significantly ($P < 0.05$)

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