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## Effect of feeding of calcium treated soybean straw over untreated soybean straw on blood biochemical profile of lactating cows

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**Abstract**

In present investigation 10 lactating cows were distributed into four treatment T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, and T<sub>4</sub>, with 5 cows in each group. Treatment consist of T<sub>1</sub>- untreated SBS, T<sub>2</sub>-2% calcium treated SBS. Average plasma glucose in T<sub>1</sub>- 48.69, 48.77, 48.81, and T<sub>2</sub>- 47.52, 52.84, 53.21 (mg/dl). The average serum total protein content (mg/dl) 5.92, 6.02, 6.35 in T<sub>1</sub> and 5.76, 6.15, 7.22 in T<sub>2</sub>. The average blood urea nitrogen content in T<sub>1</sub> 13.99, 17.26, 17.47 and 14.28, 17.32, 18.41 in T<sub>2</sub> (mg/dl). The average total serum lipid content in T<sub>1</sub> 272.51, 278.70, 283.60 and 277.02, 300.38, 315.53 (mg/dl) in T<sub>2</sub>. Average total serum cholesterol content in T<sub>1</sub>- 59.92, 70.80, 74.95 and T<sub>2</sub>- 60.94, 70.29, 76.27 (mg/dl). Average total serum triglyceride content in T<sub>1</sub>- 16.07, 17.26, 17.48 and T<sub>2</sub>- 16.22, 17.98, 17.89 (mg/dl) in the month of February, April and June, respectively.

**Keywords:** Calcium, BUN, plasma glucose, lipid, cholesterol and triglyceride

**Introduction**

Maharashtra possess 16.73 and 5.56 million cattle and buffalo population, of which 2.50 and 0.48 million cattle and buffalo are locate in Amaravati division of Vidarbha region. Moreover, Gaolao and Nagpuri breed of cattle and buffalo are habitat in Vidarbha region. The focus on the development of dairying by the animal husbandry department Government of Maharashtra through the implementation of different schemes like distribution of milch animal on subsidy to farmers, AI facilities and milk procurement network will provide a base for enhancement of milk production in the state in general and particular in the region.

Soybean straw offers an alternative to conventional straw like Jowar, Bajara, Maize and Wheat etc. During couple of years it is noticed that the area under soybean crop has shown a growth of 15% in Maharashtra, giving a setback to cereals, pulses and oil seeds crops. In study area (Akola District) about 1.96 lakh ha. of land was put under soybean crop during 2016 against an acreage of 42 thousand hectares under cereal crops (Anonymous 2012). Secondly increased cost of GNC oil, people have motivated to soybean oil, resulting established of number of oil extraction plant at district level. This will boost to the availability of soybean meal on large scale. It is rich in protein (48 to 50% CP) against the established cakes (20 to 40% CP). As a result, on protein basis it appears that SBM would be cheaper protein supplement for livestock feeding.

**Methodology****Selection of Experimental Cows**

Ten early to mid-lactation stage lactating cows were selected from the herd on the nearness in stage of lactation, milk production and body weight. The selected cows were divided in the two groups on the basis of nearness in different productive characters. The differences between parameters were found non-significant, indicating formation of homogenous group.

**Feeding Treatments**

T<sub>1</sub> = untreated soybean straw + green fodder 5 kg +2 kg concentrate

T<sub>2</sub> = 2% calcium treated soybean straw + green fodder 5 kg +2kg concentrate

## Result and Discussion

### Metabolic Blood Profile

It seems necessary to evaluate whether this new feeding approach had any effect on health status judged on the basis of metabolic blood profile of cows or otherwise.

### Plasma glucose

The feeding treatments and its interaction with experimental period did not affect significantly blood glucose levels in cows, though there was numerical change in blood glucose levels of the cows with the advancement of trial. The levels increased 48.69 to 48.81, 47.52 to 53.21, 45.82 to 53.38 and 45.09 to 56.24 mg/dl in T<sub>1</sub>, T<sub>2</sub>, groups, respectively. Indicating an increase in blood glucose levels by 10.69, over initial values under T<sub>2</sub>, group with marginal increase in in blood glucose level by 0.24% under T<sub>1</sub> from February, April and June. Gawai (1995)<sup>[1]</sup> and Janorkar (1995)<sup>[3]</sup> noticed that feeding of alkali treated SBS increased the blood glucose levels in buffalo heifers. These observations agree with present trends.

### Serum Total Protein (STP)

The STP levels exhibited an increasing trend with the progress of trial. However, the content showed significant changes. It increases from initial content of 5.92 to 6.35, 5.76 to 7.22, mg/dl in T<sub>1</sub> and T<sub>2</sub> groups, in the month of February, April and June, respectively. This increase worked out as 5.92 and 25.34% over initial values in T<sub>1</sub>- untreated soybean straw and T<sub>2</sub>- 2% calcium treated soybean straw, respectively. Indicating substantially improvement by feeding SBS diet to bring the STP levels within normal range (6 to 8 mg/dl). Shelke (2013)<sup>[4]</sup> also reported an increase in STP level by 15.44% with feeding of 2% urea treated soybean straw to lactating cows.

### Blood Urea Nitrogen (BUN)

Feeding treatments and its interaction with experimental period reflected significantly on the content of BUN in cows. Significantly more BUN (14.28, 17.32, 18.41 mg/dl) was noticed in T<sub>2</sub>- 2% calcium treated soybean straw and 2%-sodium bicarbonate treated soybean straw, respectively. Despite of this, BUN levels noticed in all cows were within the normal prescribed limits of 6 to 27 mg/dl. Moreover, the BUN levels of cows remained more or less equal within the experimental period in T<sub>1</sub> group i.e. 13.99, 17.26, 17.47 mg/dl in February, April and June. The past worker like Hagwane *et al.* (2009)<sup>[2]</sup> and Shelke (2013)<sup>[4]</sup> reported BUN values in lactating cows as 13.85, 16.66 and 17.82 mg/dl respectively which appears to be nearer to present value found in T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub> groups.

### Serum Total Lipids (STL)

Irrespective of feeding treatments there was significant increase in serum total lipids (STL) content. The average STL level were 272.51, 278.70, 283.60 in T<sub>1</sub>- untreated soybean straw while 277.02, 300.38, 315.53 mg/dl T<sub>2</sub>- 2% calcium treated soybean straw, respectively. Moreover, STL levels were significantly less in T<sub>1</sub> cows as compared T<sub>2</sub>. However, the STL levels of all cows were meeting out the prescribed range of 276 to 300 mg/dl. This means the cows fed either on untreated SBS or treated SBS improved STL level as the initial content in all cows were just nearer to lower limits of the normal range 276 mg/dl. Talokar (1993)<sup>[5]</sup>, Gawai (1995)<sup>[1]</sup> and Janorkar (1995)<sup>[3]</sup> reported increase in lipid content of blood.

### Serum Total Cholesterol (STC)

The feeding treatments and their interaction with experimental period had a significant effect on STC content. The average mean of STC 59.92, 70.80, 57.95 mg/dl on feeding T<sub>1</sub>- untreated soybean straw, 60.94, 70.29, 76.27 T<sub>2</sub>- 2% calcium treated soybean straw. Moreover, STC content of cows noticed in T<sub>1</sub> was significantly lower than that of STC content in T<sub>4</sub> cows. Despite of this the cows from all the groups were meeting out the normal range of 35 to 160 mg/dl. Shelke (2013)<sup>[4]</sup> also reported an increase in STC level by 31.36 in untreated soybean fed group and about 54.22% in 2% urea treated soybean straw group.

### Serum Triglyceride Content (STL)

The serum triglyceride content of blood increased significantly on feeding in cows maintained on 16.07, 17.26, 17.48 T<sub>1</sub>- untreated soybean straw, and 16.22, 17.98, 17.89 T<sub>2</sub>- 2% calcium treated soybean straw. Moreover, the serum triglyceride content exhibited an increasing trend with the advancement of trial, reaching to the value of in T<sub>1</sub> and T<sub>2</sub> group respectively. The increase rate worked out as 8.77, 10.29, 10.38 and 07.42 from that of respective initial values in T<sub>1</sub>, T<sub>2</sub>, groups respectively. Shelke (2013)<sup>[4]</sup> also reported an increase in STC by 7.41 in untreated soybean straw fed group and by 7.66% in urea treated SBS fed group. These finding agrees with the present results.

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