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## Effect of feeding herb (*Allium sativum*) and probiotic (*Saccharomyces cerevisiae*) alone or in combination with ground nut straw based complete feed on haemato-biochemical parameters of Sonadi sheep

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### Abstract

This experiment was conducted to assess the effect of feeding a herb (*Allium sativum*) and probiotic (*Saccharomyces cerevisiae*) alone or in combination with ground nut straw based complete feed on haemato-biochemical parameters in Sonadi sheep. A feeding trial was conducted for 90 days in which four complete diets were prepared as T<sub>1</sub> (basal roughage + concentrate mixture), T<sub>2</sub> (basal roughage + concentrate mixture + *Allium sativum* @ 3% of feed), T<sub>3</sub> (basal roughage + concentrate mixture + probiotic (*Saccharomyces cerevisiae* @ 3g/head/d) and T<sub>4</sub> (basal roughage + concentrate mixture + *Allium sativum* @ 1.5% of feed + probiotic (*Saccharomyces cerevisiae* @ 1.5g/head/d) using roughage and concentrate ratio of 60:40. Sixteen Sonadi rams (10-12 month of age) were randomly selected and distributed in four groups of four rams each. In this study, haemato-biochemical parameters were investigated viz. haemoglobin (g/dl), packed cell volume (%), blood glucose (mg/dl), total serum protein (g/dl), blood urea nitrogen (mg/dl) and serum creatinine (mg/dl) and showed non-significant effect of garlic and yeast supplementation in Sonadi rams.

**Keywords:** herb (*Allium sativum*), Probiotic (*Saccharomyces cerevisiae*), ground nut straw

### Introduction

The emphasis has been given on sheep or sheep is an animal of great importance to the livestock in India. Additionally, it represent one of the two domesticated indigenous fauna of arid and semiarid region, accounting 25% of total livestock population in Rajasthan, where it forms a component part of mixed farming and has been an important feature of old agricultural civilization.

Concept of complete feed with use of fibrous crop residue is a noble way to increase the intake and improve the feed utilization in ruminants. The merit of complete feed also lies in providing stable rumen environment, reduced fermentation losses and less fluctuation in release of ammonia. Similarly the use of feed additives in livestock ration has immense importance for improvement in nutrient utilization as well as growth and production. Feed additives such as organic acids, yeast, enzymes and ionophores modify rumen fermentation and optimize performance of animal.

The beneficial effects of herbs in farm animals may arise from activation of feed intake and secretion of digestive enzymes. These include improved feed efficiency, reduced incidence of digestive disturbance, stimulation of digestion, methane inhibition, immune modulation, improved reproductive parameters, increased productive performance, immuno-stimulation, antibacterial, coccidiostatic, anthelmintic, antiviral and/or antioxidative characteristics (Uegaki *et al.* 2001) [9].

### Material and Method

The effect of herb (*Allium sativum*) and probiotic (*Saccharomyces cerevisiae*) alone or in combination with complete feed on nutrient utilization efficiency in Sonadi sheep was observed. A feeding trial of 90 days on 16 Sonadi rams was conducted. The blood parameters viz. haemoglobin (g/dl), packed cell volume (%), blood glucose (mg/dl), total serum protein (g/dl), blood urea nitrogen (mg/dl) and serum creatinine (mg/dl) were estimated as per standard procedure

Sixteen Sonadi rams of same age group (10 - 12 months) and of uniform confirmation were procured from livestock farm at College of Veterinary & Animal Science, Navania,

Vallabh Nagar, Udaipur. Animals were housed in well ventilated, hygienic and protected sheds and were allowed to acclimatize for a period of 7 days prior to experimental feeding. The deworming was done with an anthelmintic drug. Microscopic examination of faeces and blood smears was also conducted. The animals were given measured quantity of experimental feed and *ad lib* water.

### Experimental feeds and feeding

The ground nut straw based complete feed was used for *ad lib* feeding of experimental rams with or without feed additives, viz. *Allium sativum* (3% of feed), probiotic (*S. cerevisiae*) supplementation. Garlic was purchased from the local market and was dried under the shade for a period of ten days. After drying, the outer husk was removed and the bulbs were ground to powder by electrical mixer. Probiotic (*Saccharomyces cerevisiae*) in dried powder form was also purchased from the local market.

## Result and Discussion

### Haemato-biochemical studies

To determine the effect of garlic (*Allium sativum*) and yeast (*S. cerevisiae*) feeding in groundnut straw based complete feed on physiological of health status and haemato-biochemical parameters viz. haemoglobin (g/dl), packed cell volume (%), blood glucose (mg/dl), total serum protein (g/dl), blood urea nitrogen (mg/dl) and serum creatinine (mg/dl) were investigated.

### Haemoglobin (Hb)

The mean values of haemoglobin (g/dl) in Sonadi sheep were found to be 10.08, 9.48, 10.01 and 10.14 in T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> group respectively (Table I & Fig. I). The analysis of variance showed non-significant effect of supplementation of garlic and yeast alone and in combination along with complete feed on haemoglobin (Table II). However, the values were found within the normal range in all animals under different treated groups.

### Packed cell volume (PCV)

The table I & Fig. I the mean values of packed cell volume (%) in sheep of 29.52, 29.44, 29.68 and 29.85 in T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> treatments groups, respectively. More ever there was non-significant effect of supplementation of garlic and yeast alone and in combination along with complete feed (Table II).

### Blood glucose

The mean values of blood glucose (mg/dl) were found as 62.51, 62.18, 62.35 and 63.54 in T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> groups, respectively (Table I & Fig. II). Which was non-significant for the effect of garlic and yeast supplementation alone and in combination in complete feed in sheep (Table II).

### Total serum protein

The mean values of total serum protein (g/dl) in Sonadi sheep were 7.09, 7.22, 7.19 and 7.12 in T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> groups, respectively (Table I & Fig. II).

The statistical analysis of data revealed non-significant effect of supplementation of garlic and yeast alone and in combination along with complete feed in sheep (Table II).

### Blood urea nitrogen (BUN)

The mean values of blood urea nitrogen (mg/dl) were 12.81, 13.73, 13.54 and 13.79 in T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> mg/dl in sheep groups respectively (Table I & Fig. II).

The statistical analysis of data revealed non-significant effect due to supplementation of garlic and yeast alone and in combination along with complete feed in sheep (Table II).

### Serum creatinine

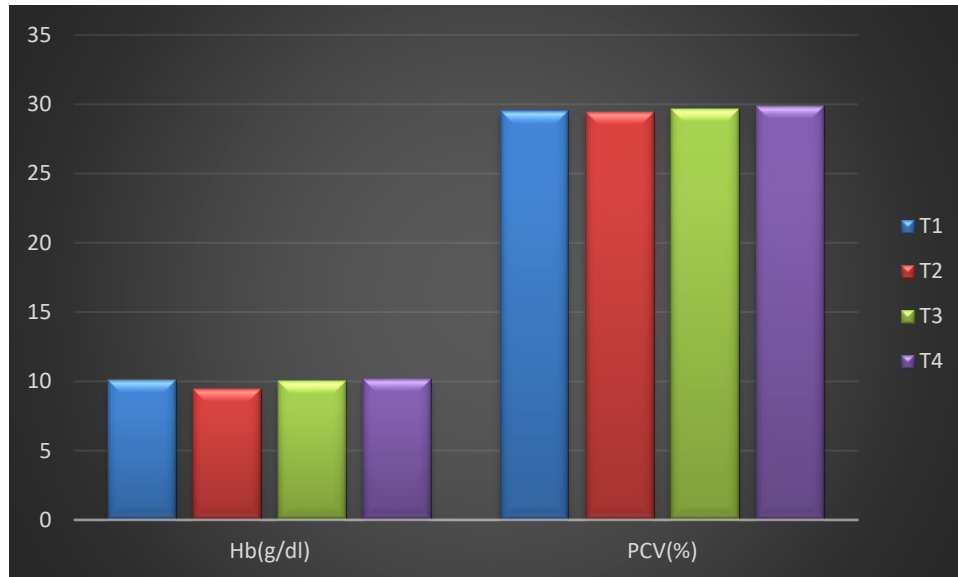
The overall mean values of serum creatinine (mg/dl) were 0.589, 0.592, 0.591 and 0.57 in T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> groups, respectively (Table I).

The analysis of variance showed non-significant effect of feed additives supplementation in complete feed in sheep (Table II). The results of the present study are in agreement with that of Galip *et al.* (2004) [3], Liu *et al.* (2007) [6] and Kowalik *et al.* (2016) [5]. They revealed non-significant effect of yeast (*Saccharomyces cerevisiae*) supplementation on haemato biochemical parameter in sheep. Likewise Gupta *et al.* (2006) [4] also reported non-significant effect of herb supplementation (*Asparagus racemosus*, *cryptolepis buchmanii*, *Bacopa monneri*, *Urtica dioica* and *Eclipta alba*) on Hb, PCV, Serum protein, blood glucose level and BUN in heifers.

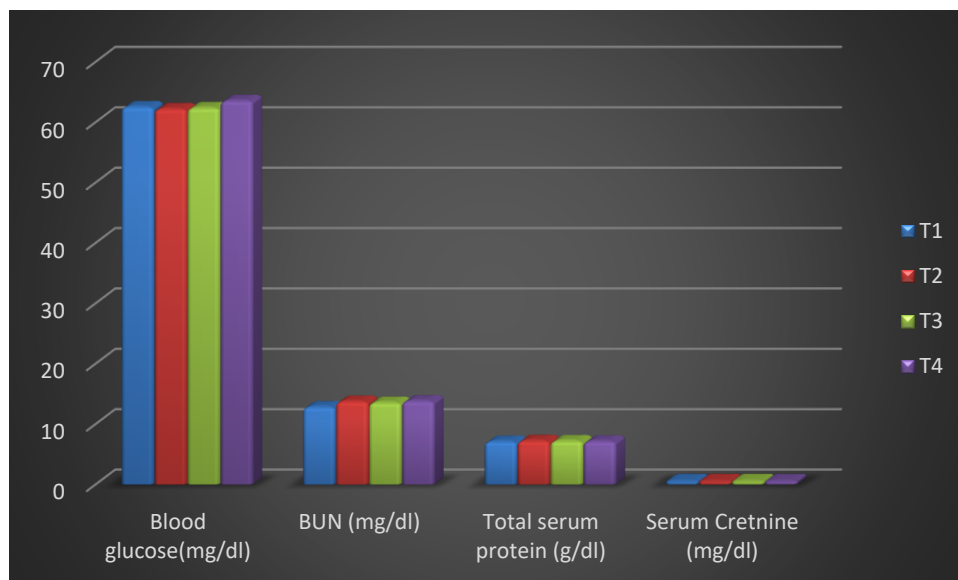
However, Galip *et al.* (2004) [3] and Maria *et al.* (2016) [7] revealed significant effect of yeast and/or Herb supplementation in ration Hb, blood urea in sheep. Dobiki *et al.* (2005) [2] and Temim *et al.* (2009) [8] revealed significant effect of dried yeast on Hb concentration in cattle. The significant effect of natural additives viz. juice of garlic, onion and lemonade supplementation was observed on blood constituents in buffalo calves (Ahmed *et al.* 2009) [1].

**Table I:** Mean values of haemato-biochemical parameter in different treatment groups in sheep

Parameter	Treatment group				SEM ±
	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	
Hb (g/dl)	10.08	9.48	10.01	10.14	0.1707
PCV (%)	29.52	29.44	29.68	29.85	0.274
Blood glucose (mg/dl)	62.51	62.18	62.35	63.54	0.9005
BUN (mg/dl)	12.81	13.73	13.54	13.79	0.1142
Total serum protein (g/dl)	7.09	7.22	7.19	7.12	0.5248
Serum creatinine (mg/dl)	0.589	0.592	0.591	0.5702	0.0066



**Fig I:** Average values of Hb (g/dl) and PCV (%) in different treatment groups in Sonadi sheep



**Fig II:** Mean values of Blood glucose (mg/dl), Total serum protein (g/dl), BUN (mg/dl) and Serum creatinine (mg/dl) parameter under different treatment groups in Sonadi she

**Table II:** ANOVA of haemato-biochemical parameters

Attributes	SOV	DF	MSS	F CAL	Sig
Haemoglobin	Treatment	3	0.3679	3.156	NS
	Block	3	0.0439	0.119	NS
	Error	9	0.1166		
Packed cell volume	Treatment	3	0.1318	0.437	NS
	Block	3	0.2024	1.535	NS
	Error	9	0.3017		
Blood glucose	Treatment	3	1.4966	0.461	NS
	Block	3	3.5462	2.369	NS
	Error	9	3.2433		
Total serum protein	Treatment	3	0.8134	0.738	NS
	Block	3	0.9085	1.117	NS
	Error	9	1.1015		
Blood urea nitrogen	Treatment	3	0.0145	0.278	NS
	Block	3	0.0423	2.908	NS
	Error	9	0.0522		
Serum creatinine	Treatment	3	0.0004	2.494	NS
	Block	3	0.0002	0.393	NS
	Error	9	0.0002		

NS = Non-significant

## Conclusion

In the present study, the haemato-biochemical parameters viz., Hb, PCV, blood glucose, total serum protein, blood urea nitrogen (BUN) and serum creatinine were estimated. The mean values of haemoglobin (g/dl) in Sonadi sheep were found to be 10.08, 9.48, 10.01 and 10.14 in T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> group respectively. The analysis of variance showed non-significant effect of supplementation of garlic and yeast alone and in combination along with complete feed on haemoglobin. However, the values were found within the normal range in all animals under different treated groups. The mean values of packed cell volume (%) in sheep of 29.52, 29.44, 29.68 and 29.85 in T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> treatments groups, respectively. The analysis of variance revealed non-significant effect of supplementation of garlic and yeast alone and in combination along with complete feed. From Hb and PCV values it could be inferred that increase in PCV was attributes due to increases in Hb concentration. The mean values of blood glucose (mg/dl) were found as 62.51, 62.18, 62.35 and 63.54 in T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> groups, respectively. The statistical analysis of data revealed non-significant effect of garlic and yeast supplementation alone and in combination in complete feed in sheep. The mean values of total serum protein (g/dl) in Sonadi sheep were 7.09, 7.22, 7.19 and 7.12 in T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> groups, respectively. The statistical analysis of data revealed non-significant effect of supplementation of garlic and yeast alone and in combination along with complete feed in sheep. The mean values of blood urea nitrogen (mg/dl) were 12.81, 13.73, 13.54 and 13.79 in T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> mg/dl in sheep groups respectively. The statistical analysis of data revealed non-significant effect due to supplementation of garlic and yeast alone and in combination along with complete feed in sheep. The overall mean values of serum creatinine (mg/dl) were 0.589, 0.592, 0.591 and 0.57 in T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub> and T<sub>4</sub> groups, respectively. The analysis of variance showed non-significant effect of feed additives supplementation in complete feed in sheep.

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