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Effect of replacing groundnut cake with guar meal on haemato-biochemical parameters of Osmanabadi weaned kids

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Abstract

The experiment was conducted on Effect of replacing groundnut cake with guar meal on growth performance of osmanabadi weaned kids. In the present investigation total 20 kids were selected and distributed in five treatments with four kids in each treatment. The selected experimental goat kids were grouped in 5 groups viz; T₁ (Average age: 3 month and weight: 12.50 kg), T₂ (Average age: 3 month and weight: 12.69 kg), T₃ (Average age: 3 month and weight: 12.54 kg), T₄ (Average age: 3 month and weight: 12.69 kg) and T₅ (Average age: 3 month and weight: 12.84 kg) respectively. Treatment T₁ contain 100 percent groundnut cake whereas T₂, T₃, T₄ and T₅ contains 25% replace with guar meal, 50% replace with guar meal, 75% replace with guar meal and 100% guar meal, respectively. Analysis carried out by Complete Randomized Design. Haemato-biochemical parameters viz, total protein, serum albumin, serum globulin, RBC count, WBC count and haemoglobin are also showed non significant to each others.

Keywords: Guar meal, groundnut cake, blood parameters

Introduction

India possesses a significant diversity of 34 prominent goat breeds, which are raised for various purposes such as meat, milk, fiber, and skin production. According to the 20th Livestock census, the livestock population in India consists of 35.94% cattle, 20.45% buffaloes, 13.87% sheep, 27.80% goats, and 1.69% pigs. A comparative analysis with the previous livestock census (2012) reveals a noteworthy increase of 10.14% in the combined percentage share of sheep and goat population, whereas there has been a slight decline in the percentage share of cattle, buffalo, and pig populations. The total goat population in India is estimated to be 148.88 million, with Maharashtra accounting for 10.60 million goats. Among the diverse goat breeds present in India, Maharashtra is home to four notable breeds, namely Osmanabadi, Sangamneri, Berari, and Kokankanyal. Osmanabadi, specifically found in regions like Osmanabad, Beed, Aurangabad, Parbhani, and other districts of Marathwada, is primarily raised for meat production. This breed demonstrates consistent breeding patterns given favorable conditions. Moreover, Osmanabadi goats have made substantial contributions to the socio-economic well-being of pastoral communities residing in this region. They possess several desirable characteristics commonly found in meat breeds, including high prolificacy, early maturity, a high rate of kidding, rapid growth, and the production of quality meat. The oil content of groundnut cake varies depending on the extraction method employed, with ghani-pressed cake containing 10-12% oil, expeller-pressed cake containing 6-8% oil, and solvent-extracted cake containing 0.5-0.7% oil. The protein content ranges from 40-50%, and the total digestible nutrients (TDN) range from 75- 85%. Guar meal (*Cyamopsis tetragonoloba*) is becoming popular because of its high nutritive value. India is a major producer of guar that accounts for 80% of the total guar produced in world. Guar meal is good source of protein; it contains 33-47.5% crude protein and also contain 13% crude saponin on dry matter basis. The experiment was under taken to evaluate effect of replacing groundnut cake with guar meal on growth performance of osmanabadi weaned kids.

Material and Methods

The present investigation was carried out on “Effect of replacing groundnut cake with guar meal on growth performance of osmanabadi weaned kids”. The trial was conducted at Goat

Unit, Department of Animal Husbandry and Dairy Science, College of Agriculture, Vasant Rao Naik Marathwada Krishi Vidyapeeth, Parbhani. Selection of twenty weaned kids of same age and uniform conformation was done from the Goat Unit VNMKV, Parbhani to conduct the experiment. Twenty weaned kids were divided in five treatments groups and four kids in each treatment. All the kids were free from physiological disorder and diseases. The research was conducted during 1st February to 1st May 2023 at Goat Unit, VNMKV, Parbhani.

Treatment groups

- T₁: (Control) 100% groundnut cake in concentrate mixture.
- T₂: 25% Guar meal replace with groundnut cake.
- T₃: 50% Guar meal replace with groundnut cake.

- T₄: 75% Guar meal replace with groundnut cake.
- T₅: 100% Guar meal.

The observation recorded during the research was haemato-biochemical parameters. The data was statistically analyzed by Complete Randomized Design (CRD). Various haemato-biochemical parameters viz., WBC count, RBC count, Hemoglobin, Total protein, serum albumin, serum globulin was determined from local pathological lab as per standard methods.

Result and Discussion

1. Total Protein

Table 1 presents an analysis and illustration of the total protein data acquired at the initial (0th day) and final (90th day) blood draws from Osmanabadi kids.

Table 1: Effect of feeding groundnut cake replace with guar meal (*Cyamopsis tetragonoloba* L.) on average total protein (g/dl) of Osmanabadi kids

Period	T ₁	T ₂	T ₃	T ₄	T ₅	SE	CD
Initial (0 th day)	5.93	6.47	6.26	6.31	6.06	0.357	NS
Final (90 th day)	5.56	6.50	6.82	6.76	5.77	0.637	NS

Table 1 shows that the starting average total protein values for treatments T₁, T₂, T₃, T₄, and T₅ are, in order, 5.93, 6.47, 6.26, 6.31, and 6.06 (g/dl). Preliminary data from every treatment revealed no significant difference ($p < 0.05$). Treatments T₁, T₂, T₃, T₄, and T₅ had final average total protein concentrations of 5.56, 6.50, 6.82, 6.76, and 5.77 (g/dl), in that order. The total protein levels obtained from all treatments indicated no significant difference ($p < 0.05$) between them in the final data. In treatment T₁ and T₅ total protein values are decreased in final after 90 days. In T₂, T₃ and T₄ treatments protein should be increases in final.

The serum total protein concentrations found in this investigation fell within the typical goat range of 6-7.5 g/dl (Kaneko, 1989) [4]. Different protein treatments had a non-significant impact on the serum level of total protein (Lohakare *et al.*, 2006) [5].

2. Serum albumin

The data of the serum albumin of Osmanabadi kids blood obtained at initial (0th day) and final day (90th day) analyzed and illustrated in Table 2.

Table 2: Effect of feeding Groundnut cake replace with Guar meal (*Cyamopsis tetragonoloba* L.) on average serum albumin (g/dl) of Osmanabadi kids

Period	T ₁	T ₂	T ₃	T ₄	T ₅	SE	CD
Initial	4.00	3.94	4.15	3.70	3.78	0.222	NS
Final	4.02	3.67	4.29	4.33	3.69	0.485	NS

The initial average serum albumin values for treatments T₁, T₂, T₃, T₄, and T₅ were 4.00, 3.94, 4.15, 3.70, and 3.78 (g/dl), according to Table 2. The initial results from each treatment showed no significant difference ($p < 0.05$). The final average blood albumin values (gm/dl) for treatments T₁, T₂, T₃, T₄, and T₅ were 4.02, 3.67, 4.29, 4.33, and 3.69 (g/dl), respectively. This agrees with the findings of Paliwal *et al.* (1989) [6], who discovered that the range of serum albumin in growing buffalo calves fed different types of guar seed meal was 3.23 to 3.41 g/dl.

According to Anbarasua *et al.* (2004) [1], blood protein (albumin) levels were not substantially affected by substituting a mixture of leaf meal containing saponin for 50% of the dietary protein.

3. Serum globulin

The data regarding the serum globulin of Osmanabadi kids blood obtained at initial (0th day) and final day (90th day) analyzed and illustrated in Table 3.

Table 3: Effect of feeding groundnut cake replace with guar meal (*Cyamopsis tetragonoloba* L.) on average serum globulin (g/dl) of Osmanabadi kids.

Period	T ₁	T ₂	T ₃	T ₄	T ₅	SE	CD
Initial	1.97	2.53	2.11	2.61	2.28	0.275	NS
Final	1.80	2.84	2.52	2.43	2.09	0.383	NS

The initial average total blood globulin levels in kid for treatments T₁, T₂, T₃, T₄, and T₅ were 1.97, 2.53, 2.11, 2.61, and 2.28 g/dl, respectively, as shown in Table 3. Where as final treatments T₁, T₂, T₃, T₄, and T₅, the kids ultimate average blood globulin values were 1.80, 2.84, 2.52, 2.43, and 2.09 g/dl, respectively. Compared to T₁, T₄, and T₅ treatments, the serum globulin was numerically greater under T₂ and T₃

therapy; however, the difference was not statistically significant.

The current study's results are consistent with those of Dinani (2010) [2], who found no significant differences in blood globulin levels or the albumin to globulin ratio between treatment groups in diets containing roasted guar flour at levels of 7.5 and 15%.

4. Hemoglobin

The data regarding the hemoglobin of experimental kids

obtained at initial (0th day) and final day (90th day) analyzed and illustrated in Table 4.

Table 4: Effect of feeding groundnut cake replace with guar meal (*Cyamopsis tetragonoloba* L.) on average hemoglobin (g/dl) of Osmanabadi Kids

Period	T ₁	T ₂	T ₃	T ₄	T ₅	SE	CD
Initial (0 th day)	10.40	10.43	11.68	10.03	11.20	0.656	NS
Final (90 th day)	11.98	11.03	11.93	11.50	11.08	0.633	NS

Initial average hemoglobin values for treatments T₁, T₂, T₃, T₄, and T₅ were 10.40, 10.43, 11.68, 10.03, and 11.20 (g/dl), according to Table 4.10. There was no significant difference ($p < 0.05$) found in the first data received from all of the treatments. Treatments T₁, T₂, T₃, T₄, and T₅ had final average hemoglobin concentrations of 11.98, 11.03, 11.93, 11.50, and 11.08 (g/dl), in that order. The average hemoglobin level of kid at the last observation is non-significant, according to the statistical analysis on the hemoglobin level of Osmanabadi kid.

According to Hassan *et al.* (2007)^[3], saponins have hemolytic qualities and may reduce the amount of lead (Hb) in an animal's body; however, the levels of Hb in crossbred calves they studied were within the normal physiological range (Hb, 9–15 g/dl).

5. WBC count

The data showing the WBCs of experimental kids obtained at initial (0th day) and final day (90th day) are analyzed and presented in Table 5.

Table 5: Effect of feeding groundnut cake replace with guar meal (*Cyamopsis tetragonoloba* L.) on average WBC Count ($10^3/\mu$) of Osmanabadi Kids

Period	T ₁	T ₂	T ₃	T ₄	T ₅	SE	CD
Initial	7525	10025	9700	7625	9825	1473.714	NS
Final	7875	11600	10675	7750	10300	1391.791	NS

In treatment In treatment T₁, T₂, T₃, T₄, and T₅, the first average WBC count was 7525, 10025, 9700, 7625, and 9825 ($10^3/\mu$), according to Table 4.11. There was no significant difference ($p > 0.05$) between the treatments according to preliminary data collected from all of the treatments. Treatment T₁, T₂, T₃, T₄, and T₅ had final average WBC counts of 7875, 11600, 10675, 7750, and 10300 ($10^3/\mu$), in

that order.

6. RBC Count

The data showing the RBC count of experimental kids obtained at initial (0th day) and Final day (90th day) are analyzed and presented in Table 6.

Table 6: Effect of feeding groundnut cake replace with guar meal (*Cyamopsis tetragonoloba* L.) on average RBC Count ($10^3/\mu$ l) of Osmanabadi Kids

Period	T ₁	T ₂	T ₃	T ₄	T ₅	SE	CD
Initial	4.42	3.78	3.97	3.94	4.70	0.436	NS
Final	4.66	4.55	4.80	4.51	4.75	0.293	NS

The initial average RBC count of the kid for treatment T₁, T₂, T₃, T₄, and T₅ was 4.42, 3.78, 3.97, 3.94, and 4.70 ($10^3/\mu$), according to Table 4.12. The kids final average RBC counts were, for treatment T₁, T₂, T₃, T₄, and T₅ as 4.66, 4.55, 4.80, 4.51, and 4.75 $10^3/\mu$, respectively.

The end average RBC count did not significantly differ across the treatments. The last observation's data likewise revealed greater RBC values between the treatments, with a non-significant difference ($p < 0.05$).

Conclusion

There was no adverse effect of groundnut cake replace with guar meal on total protein, serum albumin, serum globulin, hemoglobin, RBCs and WBCs. From the present investigation it can be concluded that incorporation 50 percent guar meal and 50 percent groundnut cake in concentrate diet is economical without affecting the growth of the kids.

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