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Effect of Feeding Ginger (*Zingiber officinale*) Powder on Body Weight of Konkan Kanyal Kids

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

An experimental trial was carried out to assess the impact of feeding ginger (*Zingiber officinale*) powder on the body weight of Konkan Kanyal kids. Twenty kids were selected and divided into five treatment groups using a Randomized Block Design (RBD), with each treatment further subdivided into four replications. All animals received a complete feed consisting of mulato grass, jowar kadabi, and a concentrate mixture. Treatment T_1 served as the control with no ginger powder supplementation, while treatments T_2, T_3, T_4, and T_5 were supplemented with 3.0 g, 6.0 g, 9.0 g, and 12.0 g of ginger powder, respectively. The trial lasted for 90 days. There was significant ($P<0.05$) increase in body weight in treatment T_5 which was supplemented with 12 g ginger powder than T_4 T_3, T_2 and T_1, after 90 days of ginger powder feeding. From present study it showed that feeding of ginger powder @ 12 gm improved about 18% body weight of Konkan Kanyal kids than control.

Keywords: Ginger powder; Konkan Kanyal kids and body weight.

1. INTRODUCTION

In livestock farming, feed plays a crucial role in enhancing animal performance and considerable attention has been directed toward improving feed quality. Numerous studies have investigated how incorporating various feed additives can optimize feed utilization. Historically, antibiotics were commonly used in animal diets to promote growth. However, due to growing concerns, the use of antibiotics as feed additives has been banned in many countries, leading to an increased search for alternative feed enhancers. In goat farming, feeding costs represent a significant portion of the overall production expenses. To increase the profitability of goat farms, two primary goals are reducing feed costs and improving the quality of animal products. In Maharashtra's Konkan region, the Konkan Kanyal goat breed is highly valued and raised primarily for meat by small-scale farmers and landless people. Proper nutrition is essential for improving the productivity of these goats. Supplementing goat feed with ginger powder offers potential benefits for both the animals and their owners. Ginger, well-known for its medicinal properties, may enhance digestion, boost immunity, and improve the overall health of goats. By adding ginger powder to their diet, goat owners may reduce the risk of digestive issues such as diarrhea and bloating, strengthen the animal's immune systems, and potentially enhance weight gain or milk production. Ginger is rich in essential micronutrients such as potassium, magnesium, copper, manganese, and silicon. Potassium and manganese contribute to disease resistance and protect the heart, blood vessels, and urinary tract. Ginger supplementation may also help manage the microbial population in the rumen by reducing protozoa (rumen fauna), minimizing protein degradation, and lowering methane production, as suggested by Faniyi et al. [1]. Additionally, spices and flavorings like ginger have been noted for their medicinal benefits, including appetite stimulation, digestion enhancement, antimicrobial activity, anti-inflammatory effects, antioxidant properties, and immune-boosting capabilities when used as feed additives. The primary phenolic compounds in ginger include gingerols, shogaols, and paradols, which contribute to its diverse bioactivities [2]. Recent studies have shown that ginger exhibits several biological effects, including antioxidant [3], anti-inflammatory [4], antimicrobial [5], and anticancer properties [6]. Furthermore, growing research indicates that ginger may help prevent and manage various conditions, such as neurodegenerative disorders [7], cardiovascular diseases [8], obesity [9], diabetes [10], chemotherapy-induced nausea and vomiting [11], and respiratory issues [12]. In recent years, modern veterinarians have increasingly utilized the rhizome of *Zingiber officinale* (ginger) in livestock management. As a feed additive, ginger has been employed to improve the health, performance, and productivity of various farm animals.

2. METHODOLOGY

A 90-day growth trial was conducted on 20 Konkan Kanyal goat kids, all with similar average body weight. The kids were randomly divided into five treatment groups, each consisting of four kids, from the goat unit at the Instructional Livestock Farm of the Department of Animal Husbandry and Dairy Science, College of Agriculture, Dapoli. Each treatment had four replications, with one animal per replication. The

goats were housed individually in confined compartments. Live body weight (kg) of the kids was recorded weekly. The experiment followed a Randomized Block Design (RBD) with four goats per treatment.

2.1 Treatment Details

T_1 (control): Basal diet without ginger powder, T_2: Basal diet + 3.0 g ginger powder, T_3: Basal diet + 6.0 g ginger powder, T_4: Basal diet + 9.0 g ginger powder, T_5: Basal diet + 12.0 g ginger powder. Ginger powder was given along with concentrate.

3. RESULTS AND DISCUSSION

The average initial body weights for the selected Konkan Kanyal kids in the current investigation were 10.70 (T_1), 10.60 (T_2), 10.63 (T_3), 10.67 (T_4) and 10.65 (T_5) kg, while the final body weights were 16.25 (T_1), 16.51 (T_2), 16.83 (T_3), 17.03 (T_4) and 17.20 (T_5) kg. Gain in body weight (g/day) was 61.67, 65.69, 68.88, 70.63 and 72.77 g/day for treatment groups T_1, T_2, T_3, T_4 and T_5, respectively. Treatment group T_5 noticed a considerable increase in body weight compared to the other treatment groups this might be due to better nutrient digestibility. In the current study, there was significant variation between the various treatments for overall weight increase. The results of the present investigation are Similar results were reported by Ibrahim [12] were) who showed that diet containing 0, 250, 500 and 750 g/100kg ginger levels had initial body weight (kg) 17.92±0.62, 17.92±0.62, 17.83 ± 0.62, 17.75±0.62 respectively, Final body weight (kg) 19.92±0.73, 20.25±0.73, 19.00±0.73, 20.25 ± 0.73, Total weight gain (kg) in red Sokoto bucks was 2.00 ± 0.48, 2.33 ± 0.48, 1.17 ± 0.48 , 2.50 ± 0.48 respectively and daily weight gain (g/day) 22.22 ± 5.37, 25.89 ± 5.37, 13.00 ± 5.37, 27.78 ± 5.37 respectively in 0, 250, 500 and 750 g ginger /100kg feed, respectively. Ginger stimulates saliva production, leading to greater secretion and activity of digestive enzymes, which enhances digestion. The rhizome also boosts the absorption of vital nutrients, supporting animal growth [13,14].

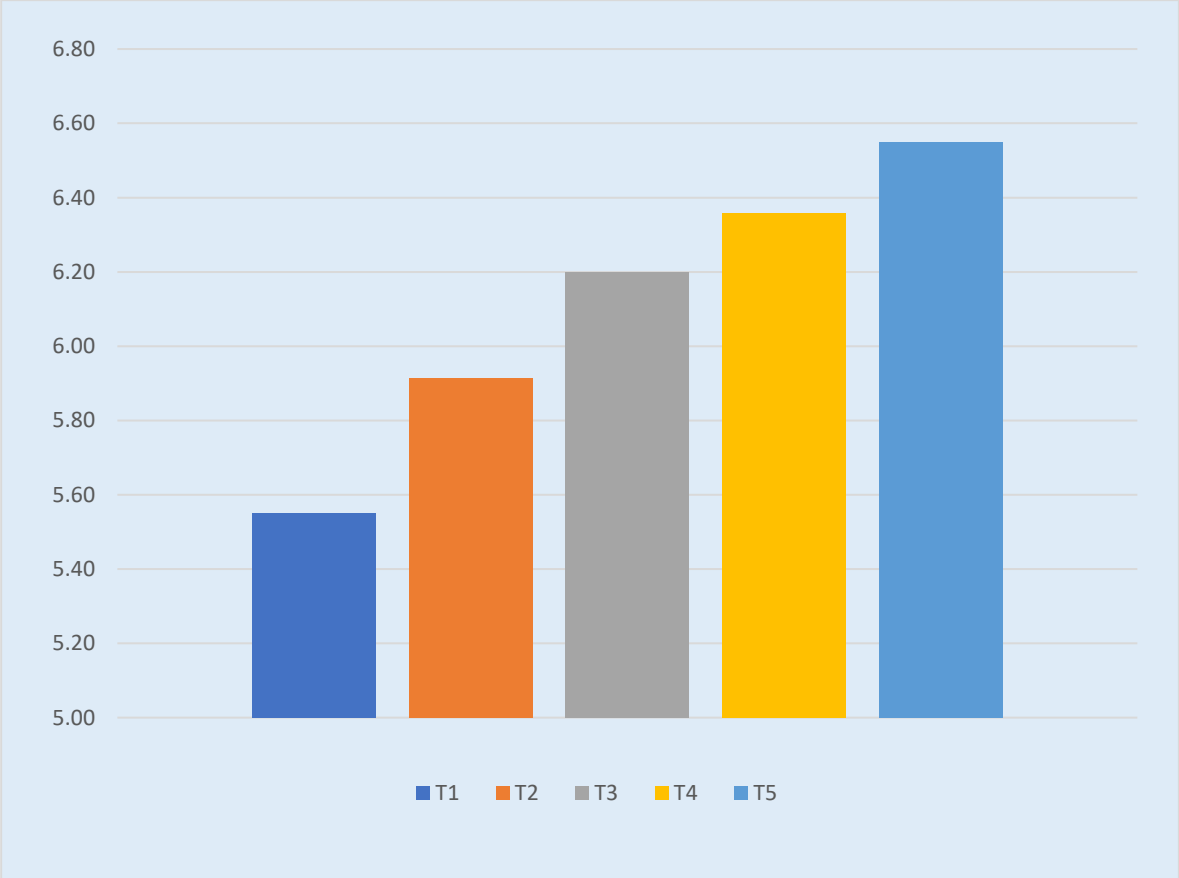

Fig. 1. Total gain in body weight of experimental kids

Table 1. Average weekly body weight in kids during experimental period (kg/week)

Week	T_1	T_2	T_3	T_4	T_5
1	10.70	10.60	10.63	10.67	10.65
2	11.11	11.05	11.10	11.13	11.12
3	11.55	11.49	11.58	11.63	11.60
4	12.00	11.95	12.06	12.13	12.13
5	12.45	12.41	12.54	12.65	12.65
6	12.90	12.88	13.05	13.18	13.18
7	13.35	13.35	13.56	13.71	13.73
8	13.81	13.85	14.09	14.25	14.28
9	14.28	14.38	14.62	14.79	14.83
10	14.75	14.90	15.16	15.34	15.40
11	15.23	15.40	15.70	15.89	15.98
12	15.73	15.95	16.26	16.45	16.58
13	16.25	16.51	16.83	17.03	17.20

Table 2. Average weekly body weight gain in kids during experimental period (kg/week)

Week	T_1	T_2	T_3	T_4	T_5
1	0.413	0.445	0.470	0.455	0.473
2	0.438	0.448	0.475	0.500	0.477
3	0.450	0.458	0.480	0.500	0.525
4	0.450	0.460	0.482	0.525	0.525
5	0.450	0.465	0.513	0.525	0.525
6	0.450	0.470	0.513	0.538	0.550
7	0.462	0.505	0.522	0.538	0.550
8	0.468	0.525	0.533	0.540	0.550
9	0.470	0.525	0.538	0.548	0.575
10	0.475	0.500	0.545	0.550	0.575
11	0.500	0.550	0.555	0.557	0.600
12	0.525	0.562	0.570	0.588	0.625
13	0.538	0.575	0.580	0.598	0.650

Table 3. Total gain in body weight of experimental kids

Treatments	Initial BW (kg)	Final BW (kg)	Gain in total BW (kg)	Av. Gain in BW (g/day)
T_1	10.70	16.25	5.55^{cd}	61.67^{cd}
T_2	10.60	16.51	5.91^{c}	65.69^{c}
T_3	10.63	16.83	6.20^{ab}	68.89^{ab}
T_4	10.67	17.03	6.36^{ab}	70.64^{ab}
T_5	10.65	17.20	6.55^{a}	72.77^{a}
SE ±	1.32	1.31	0.14	1.58
CD (5%)	NS	NS	0.44	4.86

Numbers having different superscripts differed from each other

4. CONCLUSION

The present showed that, the significant increase in body weight was noticed in treatment T_5 kids supplemented with 12 g ginger powder for 90 days trial duration. Spices and flavorings like ginger have been noted for their medicinal benefits, including appetite stimulation, digestion enhancement, antimicrobial activity, anti-inflammatory effects, antioxidant properties, and immune-boosting capabilities when used as feed additives.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of this manuscript.

CONSENT

As per international standards, parental written consent has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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