

Evaluation of Haemato-Biochemical Profile of Camels Fed on Diet Supplemented with Fruit Waste

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ABSTRACT

This study evaluated the impact of fruit waste supplementation on the haemato-biochemical profile of camels. A 42-days trial was conducted with 10 camels, randomly assigned to two groups (five per group) using a randomized block design (RBD). T₁ (control) received a 50:50 mix of guar and groundnut straw, while T₂ was supplemented with 5% fruit waste (banana, papaya, watermelon) in the basal diet in fresh form (DM basis). Results showed significantly higher haemoglobin ($p \leq 0.01$) and packed cell volume ($p \leq 0.05$) in T₂, whereas no significant changes were observed in biochemical parameters. Thus, fruit waste can be used as a cheaper feed resource at level of 5% of the diet without any adverse effects on haemato-biochemical parameters of camels.

Keywords: Biochemical profile, Camel, Fruit waste, Haematology.

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INTRODUCTION

In India, approximately 30-40% of the total horticultural produce goes unused, resulting in a loss of INR 33.9 billion (NHB, 2018). Around 10-20% of horticultural waste ends up in disposal sites worldwide, contributing to environmental degradation. To minimize environmental impacts and address feed shortages from the growing livestock population, connecting waste management with sustainable animal feed production is vital (Sahoo *et al.*, 2021) as these wastes like rinds, skins, seeds and pomace, are rich in valuable nutrients, including dietary fiber, vitamins, minerals and phytochemicals (e.g., pigments and polyphenols), (Ahmadi *et al.*, 2020). They can also provide essential protein and carbohydrates (Khattak and Rahman, 2017) and, when processed through drying, ensiling, or other methods, can serve as cost-effective feed for livestock (Bakshi and Wadhwa, 2013). Thus, an experiment was planned to evaluate the effect of a diet supplemented with available fruit wastes on haemato-biochemical profile of camel.

MATERIALS AND METHODS

An experiment was carried out at the ICAR-National Research Centre on Camel and the Department of Animal Nutrition, College of Veterinary and Animal Science in Bikaner to examine the haemato-biochemical profile of camels fed on diets supplemented with fruit waste. Ten experimental camels were assigned to two treatment groups (T₁ and T₂) using a randomized block design (RBD), with five camels in each group. To assess the impact of incorporating fruit wastes (banana, papaya, and watermelon) into the basal diet on camel physiological health, a 42-days feeding trial was conducted. Groundnut (*Arachis hypogea*) and guar (*Cymopsis tetragonoloba*) crop residues were provided as basal roughage in equal amounts to the experimental

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animals. Group T₁ (control) animals received a 50:50 mix of guar straw and groundnut straw, while in group T₂, 5% fruit waste (on DM basis) was incorporated into the basal diet, replacing an equal portion of the guar and groundnut straws. Blood samples were collected from each animal on the first and final days of the trial via jugular vein puncture, using tubes with or without anticoagulant (sodium heparin) for various analyses. Serum was obtained after blood clotting at 37°C for 4 h, followed by centrifugation at 2795 g for 20 min. Haematological parameters, including haemoglobin, PCV, MCH, and biochemical parameters such as glucose, total serum protein, blood urea nitrogen, SGPT, and SGOT, were measured using standard procedures.

RESULTS AND DISCUSSION

Haematological Parameters

Statistical analysis revealed significant differences in haemoglobin and PCV between the groups, while no significant effect was observed for MCH. Haemoglobin

and PCV were significantly higher in T₂ ($p \leq 0.01$ and $p \leq 0.05$, respectively) compared to T₁ (Table 1). These findings suggest that fruit wastes, particularly watermelon pomace and peel, are rich in iron, which plays a crucial role in haemoglobin

production and may aid in treating anaemia. These results aligned with studies of Al-Absawi *et al.* (2020) and Abdelhamid *et al.* (2009), wherein improvements in haemoglobin and PCV levels was reported following supplementation with fruit waste.

Table 1: Effect of feeding fruit waste on blood parameters

Attributes	Period (Week)	Treatment groups		SEM	P value
		T ₁	T ₂		
Hb (g/dL)	0	9.60a	9.76a	0.156	0.221
	VII	9.96a	10.54b	0.158	0.003**
PCV (%)	0	30.64b	28.00a	0.877	0.061*
	VII	31.00a	31.60b	0.888	0.048*
MCH (pg/cell)	0	12.24	12.15	0.111	0.228
	VII	12.36	12.47	0.121	0.229

Means bearing different superscripts in a row differ significantly at * $p \leq 0.05$), and ** $p \leq 0.01$.

Biochemical Parameters

Statistical analysis showed no significant differences in blood glucose, total serum proteins, BUN, SGOT, or SGPT levels between the groups (Table 2). All biochemical parameters remained within the physiological range, indicating that the inclusion of fruit waste in the basal diet had no adverse

effect on these parameters. These findings were consistent with previous studies by Khattab *et al.* (2000), Abdelhamid *et al.* (2009), Abdullazadeh (2012), Hassan *et al.* (2016), and Sahoo *et al.* (2021), who also reported no significant changes in blood metabolite concentrations following fruit waste supplementation.

Table 2: Effect of feeding fruit waste on biochemical parameters

Attributes	Period (Week)	Treatment groups		SEM	P value
		T ₁	T ₂		
Blood glucose (mg/dL)	0	92.6	95.2	5.648	0.269
	VII	104.31	106.9	5.864	0.281
Total serum protein (g/dL)	0	10.98	11.98	0.662	0.412
	VII	11.50	10.36	0.748	0.479
BUN (mg/dL)	0	18.60	16.40	1.552	0.140
	VII	22.20	19.00	1.678	0.150
SGPT(IU/L)	0	7.45	8.05	0.326	0.401
	VII	7.35	8.03	0.376	0.420
SGOT(IU/L)	0	62.27	61.60	3.400	0.912
	VII	63.79	61.10	3.461	0.951

Based on the findings of the present study, it can be concluded that inclusion of fruit wastes in the diet of camel resulted in improvement in Hb and PCV, whereas no significant effect was observed on biochemical profile. Thus, fruit waste can be used as a cheaper feed resource at a level of 5% of the diet without any adverse effects on haemato-biochemical parameters of camels.

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