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Komal
Department of Livestock Production Management, Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar, Haryana, India

Devender Singh Bidhan
Department of Livestock Production Management, Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar, Haryana, India

Amandeep
Department of Animal Nutrition, Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar, Haryana, India

Jyotsana
Department of Animal Nutrition, Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar, Haryana, India

Sajjan Sihag
Department of Animal Nutrition, Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar, Haryana, India

Corresponding Author:
Komal
Department of Livestock Production Management, Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar, Haryana, India

Effect of Faba bean (*Vicia faba*) as a cheap protein source on body weight of Murrah buffalo

Komal, Devender Singh Bidhan, Amandeep, Jyotsana and Sajjan Sihag

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Abstract
The present study was carried out to study the effect of Faba Bean (*Vicia faba*) as protein source on the performance of Murrah Buffaloes. For this, eighteen Murrah buffaloes in transition phase were selected and divided into 3 treatment groups having six animals in each on the basis of milk yield, body weight and parity following completely randomized design i.e. Treatment 1 (control): given concentrate as per ICAR standard 2013 (T_0), Treatment 2: given concentrate by replacing 15% of the crude protein of the control group with faba bean (T_1) and Treatment 3: given concentrate by replacing 30% of the crude protein of the control group with faba bean (T_2). At the end of the experiment, digestion trial was conducted. It was reported that replacement of protein source with 15% and 30 % faba bean did not have significant effect on average body weights of experimental animals. So, it can be concluded that replacement of high cost protein source with faba bean (cheap protein source) upto 30% level does not have any deleterious effect on weight of the animal and also economical to the farmers.

Keywords: Faba bean, murrah, protein, buffaloes

Introduction
Faba bean (*Vicia faba* L.) is a legume seed adapted to most climatic areas. It can be a practical alternative to costly protein in the diet of high-yielding dairy animals as it has approximately 25 to 33% crude protein content (Yu, 2005; Larsen *et al*., 2009 and Crepon *et al*., 2010) [7, 3, 2] and starch 32-44% (Yu, 2005; Larsen *et al*., 2009 and Crepon *et al*., 2010) [7, 3, 2] which makes faba bean a good source of protein and energy. Ruminal solubility and degradability of crude protein of faba bean is higher than soybean meal (Rotger *et al*., 2006 and Zagorakis *et al*., 2015) [5, 8]. Moreover, it contains relatively high content of lysine and a relatively low amount of methionine (Makkar *et al*., 1997) [4], therefore, making an attractive supplement for dairy diets. There is no available literature on the positive and negative consequences of replacing protein source by faba bean as an alternative protein source on nutrient utilization of Murrah buffaloes. Therefore, the present investigation was conducted to study the effect of faba bean (*Vicia faba*) as protein source on body weight of Murrah buffaloes.

Materials and Methods
The experiment was conducted at buffalo farm of Livestock Production Management, College of Veterinary Sciences, Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar for a period of 180 days. For this eighteen Murrah buffaloes in transition phase (one month before calving) were selected and divided into three treatment groups having six animals in each on the basis of milk yield, body weight and parity following completely randomized design (CRD). The experimental Murrah buffaloes were kept on a ration as per ICAR, 2013 feeding standards containing concentrate mixture and roughage (wheat straw as dry and berseem as green fodder). During milking phase, the concentrate mixture was offered to each animal at the time of milking i.e. in the morning and evening as per the experimental diet while during transition phase concentrate were fed in the shed itself. The main difference amongst the treatments was in the composition of concentrate viz. Treatment 1 (control): concentrate fed as per ICAR (2013) feeding standards (T_0), Treatment 2: concentrate fed by replacing 15% of the crude protein (CP) of the control group with Faba bean (T_1) and Treatment 3: concentrate fed by replacing 30% of the CP of the control group

with Faba bean (T_2). Experimental buffaloes were weighed (kg) three times, namely at the starting of the experiment, at the time of calving and thereafter at the end of the experiment using platform weighing balance (AVERY, capacity 1000 kg) installed at the Animal Farm, LUVAS, Hisar. The weights were recorded in the morning before providing feed and water to the buffaloes.

Results

Body weight

The average initial body weights, body weight at the time of calving, final body weight and calf weight of experimental buffaloes were shown in Table 1. The results of the present study revealed a statistically non-significant body weight change amongst different dietary treatments.

Table 1: Average body weight (kg) at start of experiment, at time of calving and final body weights of experimental Murrah buffaloes and calf weight under different dietary treatments

Attributes	Treatments		
	T_0	T_1	T_2
Initial Body weight (Kg)	563.66±20.13	570.66±17.05	560.66±21.04
At Time of Calving (Kg)	528.83±20.02	533.50±16.90	523.33±20.31
Final Body Weight (Kg)	539.50±20.02	544.00±17.32	535.83±20.16
Calf weight (Kg)	33.83±1.24	32.66±1.78	32.50±1.33

The mean values with different superscripts in a row differ significantly ($p<0.05$)

Discussion

In the present study, there was no significant effect of replacement of 15% and 30% crude protein of control group with faba bean on body weight of buffaloes. The findings of present study was in agreement with Tufarelli *et al*. (2012) [6] as they reported that there was no significant effect of inclusion of faba bean as a substitute of soybean meal on body weight (BW) of Holstein cows. Cherif *et al*. (2018) [1] also reported that feeding soybean meal, ground faba bean, or rolled faba bean to cows had no effect on initial BW (684, 680, and 682 kg, respectively; P = 0.63), final BW (704, 698, and 701 kg, respectively; P = 0.37), or BW gain (0.57, 0.54, and 0.54 kg/d, respectively; P = 0.98).

Conclusions

On the basis of results obtained in the above described experiment, it may be inferred that there was non-significant difference between the treatment groups in terms of overall body weight. It can be concluded that replacement of high cost protein source with faba bean (cheap protein source) upto 30% level does not have any deleterious effect on performance of the animal. Therefore, it can be inferred that faba bean does not have any deleterious effect on animal and also economical to the farmers as it reduced the milk production cost. So, it can be used in the ration of dairy animals.

The above study was conducted under loose housing system and from period July to Feb. So, further studies are required under different agro-climatic conditions and with larger herd size.

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Statement of Animal Rights

The animal experiment was conducted in accordance with guidelines approved by the Institutional Animal Ethics Committee (IAEC), 21/CPCSEA dated 12-03-2021 in the Department of Livestock Production Management, LUVAS.

Conflict of Interests Statement

The authors declare no competing interest regarding publication of this paper.

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