PERFORMANCE OF LACTATING BUFFALOES FED ON DE-OILED MAHUA (*MADHUCA INDICA*) SEED CAKE IN CHHATTISGARH HILLS REGION OF CENTRAL INDIA

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ABSTRACT

A study was conducted to determine the effect of De-oiled mahua seed cake (DMSC) on the performance (milk yield, fat percent, nutrient intake, net income and body weight change) of lactating buffaloes (*Bubalus bubalis*) in Mandla district of Chhattisgarh Hills Region of Central India. Eighteen lactating buffaloes were selected nd divided into three groups (T_1, T_2 and T_3) on the basis of body weight, milk yield, parity and stage of lactation, containing 0, 5 and 10% DMSC in replacement of conventional de-oiled seed cakes in the concentrate mixture. The milk yield (kg/day), fat percent, 6% FCM yield (kg), DM intake (kg/day) and body weight gain (g/day) was comparable among the groups. However, net income (Rs./animal/day) and B:C ratio was higher in the groups containing DMSC. Thus, from the experiment it was concluded that conventional cake can be replaced with 10% DMSC economically without any adverse affect on milk yield, fat percent, nutrient intake and body weight.

Keywords: *Bubalus bubalis*, buffalo, body weight, de-oiled mahua seed cake (DMSC), lactating buffalos, milk yield, net income

INTRODUCTION

India's total livestock population is one of the largest in the world with 11.6% contribution to world livestock population which consists buffaloes 108.70 million (57.83% of world) as 19th livestock census (GOI, 2014). Buffaloes contribute about 67.67 (53%) million tones of the total milk production of 146.30 million tones in India (Rajeshwaran and Naik, 2016). Buffaloes are the backbone of Indian dairy industry and so also for the Indian farmer's economy. The de-oiled mahua (*Madhuca Indica*) seed cake (DMSC) has already been successfully tried in the cross-bred calves (Ojha *et al*., 2012; Tiwari *et al*., 1988) and in sheep (Jain and Sengar, 1995). The present study was undertaken with an objective so as to study the effect of supplementation of de-oiled mahua seed cake on the performance in lactating buffaloes.

MATERIALS AND METHODS

Eighteen lactating buffaloes of nearly same body weight, milk yield and parity were randomly selected in the Mandla district of Chhattisgarh Hills Region of Central India and allocated into three dietary treatments having 0,

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5 and 10% de-oiled Mahua seed cake (DMSC) as T_1, T_2 and T_3 in replacement of conventional de-oiled seed cakes in concentrate mixtures (Table 1). The chemical composition (AOAC, 2007) of concentrate mixtures were comparable between groups (Table 2) and were fed to lactating buffaloes to fulfill their nutrient requirement (Ranjhan, 1998). The experiment last for 90 days. The body weight of the animals was recorded at the start and at the end of experiment and milk yield was recorded daily. The milk samples were analyzed for fat percent as per standard method and 6% FCM yield were calculated (Rice *et al*., 1970). The net income Rs/day/animal was calculated using per day milk production and feed consumed by lactating buffaloes. The data collected during the experiment were analyzed statistically for significance (Snedecor and Cochran, 1994).

RESULTS AND DISCUSSION

The dry matter intake of experimental buffaloes was comparable (Table 3) which shows that all the diets were quite palatable and fulfill their nutrient requirement. These findings are in support with Jain and Sengar (1995) that DM intake of sheep did not differ significantly when fed on standard mahua seed cake, de-oiled mahua seed cake and ferrous sulphate or formaldehyde treated mahua seed cake. These findings were also supported by Sharma *et al*. (2007) in buffaloes.

Average daily gain (ADG) in all the groups was similar during the experiment. The replacement of conventional de-oiled cake by DMSC at 10% level in the concentrate mixture fed to lactating buffaloes did not affect the average daily gain among experimental groups. It is in support with the findings (Jakhmola *et al*., 1987; Ojha *et al*., 2012) that DMSC as a ingredient of concentrate mixture was found to be accepted and had no significant effect on average daily gain, or other detrimental effects, at inclusion levels of around 20% crude press cake in the diet. Similarly, Arora and Jain (1986) found that there was no significant difference in the weight gains of different groups of calves when fed with groundnut cake, 20% and 30% mahua cake, respectively.

The milk yield (kg/day), fat percent, percent change in yield, 6% FCM yield (kg), Net Income (Rs/animal/day) and B:C Ratio (benefit to cost ratio) are presented in Table 4. Results clearly state that there was no significant difference in milk yield, fat percent and 6% FCM yield (kg) between groups. Tiwari and Patle (1997) replaced groundnut cake with processed mahua seed cake at 0, 25, 50, 75 and 100% into the concentrate mixture in lactating Murrah buffaloes and found that DM intake, milk yield; milk fat percentage did not differ significantly. However, contrary to this Singhal *et al*. (1986) reported that mahua seed cake have negative impact on performance in ruminants.

The net income (Rs./animal/day) and B:C Ratio was increased at significant level in the experimental groups containing de-oiled mahua seed cake at 5% and 10% level. The increase in net income and B:C Ratio was due to the availability of DMSC at cheaper rate in the local market. Similarly, Ojha *et al*. (2012) showed the lower feed conversion ratio (FCR) in cross-bred calves with the supplementation of DMSC at 10% level.

In a different study, Jacob *et al.* (2013) found that supplementation of de-oiled mahua seed cake at 10% level in the concentrate mixture of calves is an effective strategy to reduce the severity of *Fasciola gigantica* infection and improve the growth rate in infected calves.

Table 1. Ingredient composition of concentrate mixture (%).

Ingredients	T_1	T_2	T_3
Maize (yellow)	40.00	40.00	40.00
Wheat bran	22.00	22.00	22.00
Conventional de-oiled seed cakes	35.50	30.50	25.50
DMSC	-	05.00	10.00
Mineral mixture	02.00	02.00	02.00
Common salt	0.50	0.50	0.50
Total	100.00	100.00	100.00

Table 2. Chemical composition of concentrate mixture and wheat straw (% DM basis).

Particular	T_1	T_2	T_3	Wheat straw
Organic matter	88.40	88.10	87.90	91.10
Crude protein	19.2	19.3	18.9	03.4
Ether extract	04.5	04.6	04.2	0.80
Crude fibre	06.2	06.4	06.7	38.79
Ca	01.0	01.2	01.1	0.20
P	0.9	0.8	0.8	0.07

Table 3. Plan of nutrition in different groups of lactating buffalo.

Attributes	T_1	T_2	T_3
Intake			
Dry matter (kg/day)	12.19	13.14	11.91
Dry matter (% of BW)	02.40	02.50	02.39
Dry matter (g/kg BW)	23.98	25.00	23.89
Body weight			
Initial BW (kg)	508.30	521.20	498.50
Final BW (kg)	519.70	525.60	506.90
Total gain/loss (kg)	11.40	04.40	08.40
Average daily gain (g)	126.66	48.88	93.33

Table 4. Milk yield, body weight and net income in experimental groups.

Particulars	T_1	T_2	T_3
Milk yield (kg/day)	05.80	05.71	05.66
% change in yield	-	01.55	02.41
Fat %	07.43	07.12	07.23
6 % FCM yield	06.75	06.44	06.45
Net income (Rs./animal/day)	22.50 [a]	40.70 [b]	59.04 [c]
B:C ratio	01.14[a]	01.31 [b]	01.53 [c]

The different super scripts in a row differ different significantly, P<0.01.

CONCLUSION

From the findings of the experiment it was concluded that feeding of de-oiled mahua seed cake (DMSC) at 10% level in the concentrate mixture of lactating buffaloes increase net income and B:C ratio without affecting milk yield, fat percent, dry matter intake and body weight.

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