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Nutritional Status of Buffaloes in Tribal District Mandla of Central India

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Abstract

A participatory field study on nutrient management of buffaloes by resource poor tribal farmers and its correlation with milk production was carried out in Bichhia Block of Mandla District in Central India with 41 buffalo owners in 2015. A 15 point questionnaire was developed to gather information on the feeding management and milk production of buffaloes. The body weight of the buffaloes was calculated by the Schaeffer's formula. The average body weight of buffaloes was 538 ± 7.5 kg. The average milk production and 4% FCM yield was 5.88 and 8.74 kg, respectively. The total nutrient fed (DCP, TDN) was compared with nutrient requirement. It was found that DCP, TDN, calcium and phosphorus were deficit by 28.00, 19.01, 21.30 and 37.76 %, respectively. It was concluded that the low milk production in buffaloes was due to nutrient deficit ration fed to the lactating buffaloes. Therefore, a massive extension follow up programme for creating awareness on nutrient management of buffaloes should be made.

Keywords: Buffaloes, Lactating, Nutrient management, Milk yield, Tribal farmers.

Introduction

India, though is the largest milk producer in the world (Anon, 2014) with 132.4 MMT of milk production, the productivity of the dairy animals is very low, *i.e.* 4.5 kg/day (Hegde, 2006). Among the causes of low milk production in Indian dairy animals inadequate nutrition is the most widely reported one (Qureshi *et al.*, 2002). According to the 19th Livestock Census (2012), buffalo population in India is 108.7 million constituting 57% of world's buffalo population. Madhya Pradesh with 8.18 million buffalo population ranks 6th in India. Mandla is a predominant tribal district of Madhya Pradesh and harbours a buffalo population of 54,681. The milk production of the district is 92,500 ton, while the mean milk productivity is 1.21 lit/day/animal. The present six month intensive field study was carried out during the year 2015 among 41 buffalo owners to explore the nutritional status of buffaloes in Mandla district.

Materials and Methods

Geographically district Mandla has nine development blocks. The study was conducted in Bichhia block which has a population of 217,838. Sixty buffaloes belonging to 41 buffalo owners who were willing to participate in the study were selected and information was collected through a set of 15-

point questionnaire and group discussion. The primary information collected was verified with sources and personnel in the Department of Veterinary Services, Government of Madhya Pradesh. Below mentioned parameters were recorded following the methods suggested by earlier workers.

Body weight: Body measurements of all the buffaloes were recorded before feeding and watering in the morning, and body weight was calculated following the Schaeffer's formula suggested by Sastry et al. (1982).

Feed intake: The daily feed intake of all the selected animals was calculated by measuring feed offered and residue left, for three consecutive days.

Proximate analysis: Representative samples of various feeds (Concentrate, mustard seed cake, wheat bran, left over chapatis-baked Indian wheat bread and green fodder) were collected for proximate analysis as per AOAC (1995). Intake of crude protein (CP), Ca and P, digestible crude protein (DCP) and total digestible nutrients (TDN) were calculated following Sen et al. (1978). On the basis of dry matter intake (DMI) of each animal and chemical composition of their feed, nutrient supply was determined. Deficiency/excess of various nutrients was calculated following Ranjhan (1998).

Milk analysis: The milk samples collected in both the morning and evening were pooled for the fat estimation by the Gerber's method. The solid not fat (SNF) percentage in milk was estimated by evaporating the water content of milk and by subtracting its fat percentage. The morning and evening milk yield of individual lactating buffaloes as well as 4% fat corrected milk (FCM) was recorded using the formula: 4% FCM= 0.4 x milk yield (kg) + 15 x fat yield (kg).

Results and Discussion

Composition of feed

The chemical composition of feed used for feeding buffaloes is presented in Table 1, which is in agreement with earlier findings (Ranjhan, 1998). The left-over of human food like chapatis (bread) was used very frequently for feeding of dairy buffaloes in villages as a non-conventional feed resource. The wheat bran was also the most commonly used feed ingredient. Feeding milch animals with wheat bran and left over chapatis has been reported by Bakshi *et al*. (2010). Buffalo owners prepared their own feed concentrates from locally available mustard-seed cake and available green fodder for feeding animals. The buffalo owners never used readymade mineral mixture for feeding their buffaloes. The role of minerals in biological systems, growth, production and reproduction is vital (McDowell *et al.,* 1984).

Table 1: Chemical composition of feed stuffs, % DM basis

Feed stuffs	OM±SE	CP±SE	EE±SE	Ash±SE
Concentrate (homemade)	91.70±7.20	19.45±3.55	04.40±0.30	8.30±0.90
Mustard-seed cake	91.63±3.60	28.25±2.78	12.70±1.03	8.37±0.54
Wheat bran	93.30±5.10	14.90±3.41	03.40±0.80	6.70±0.90
Chapati (bread)	92.20±6.56	13.25±1.75	03.50±0.09	7.80±1.05
Green fodder	91.50±9.52	07.65±1.18	02.95±0.75	8.50±1.22

OM, Organic Matter; CP, Crude Protein; EE, Ether Extract

Milk production and Milk quality

The average milk yield, calculated 4% FCM yield, fat, SNF and ash percentage of the buffaloes were 5.88±0.70 kg, 8.74±0.65 kg, 7.23±0.20 %, 7.42±0.09 %, and 0.70±0.006 %, respectively. These are in consistent with the standard values (Sharma *et al.,* 2007).

Feed intake of buffaloes

The mean values of daily dry matter intake (DMI), DMI/100kg BW, DM intake/$w^{0.75}$ kg and body weight were 13.58±0.49 kg, 2.52±0.15 kg, 122.01±4.96 g, and 538±7.50 kg, respectively. Agarwal *et al.* (1988) described that the mean DMI in milch buffalo ranged from 11.1 kg to 15.4 kg, while Pathak and Verma (1993) reported the DMI as 2.0-2.5 kg/100 kg body weight that is equivalent to 90-125 g/$w^{0.75}$ kg in buffaloes of different body weight and milk yield. Infact, these factors depend on the body weight, age and physiological stages of buffaloes.

The feed intake, requirements and deficiency/excess of nutrients in the lactating buffaloes are presented in Table 2. Results indicated that a shortage of DCP was to the tune of 28.00% when compared with standard requirements suggested by Ranjhan (1998) for buffaloes. In case of TDN, the shortage was to the tune of 19.01% in the present study, while that of Ca and P was 21.30 and 38.76% deficit, respectively. In pregnant buffaloes on wheat straw based diet the DCP, TDN, Ca and P was deficit by 60.32, 38.26, 41.06 and 79.57 %, respectively (Jain *et al.*, 2012).

Phosphorus deficiency is one of the main causes of infertility as its severe deficiency delays the onset of puberty, postpartum anoestrus and increases the incidence of cystic follicles, because of inactive ovaries, leading to moderate and low conception rates (Dixon, 1998). Thus imbalance or inadequate feeding is likely to lower the productivity and delay the reproduction among buffaloes as observed in Bichhia block under study.

Table 2: Daily nutrient intake, requirements and deficiency/excess in buffaloes of study area

Particulars	DCP(g)	TDN(kg)	Ca(g)	P(g)
Maintenance requirement (for 550 kg BW)	330.00	4.00	21.00	16.00
Milk production requirement (5.88 kg)	336.60	2.47	17.34	13.77
Total requirement	666.60	6.47	38.34	29.77
Total intake	479.95	5.24	30.17	18.23
Deficit/Excess (amount)	-186.65	-1.23	-8.17	-11.54
Deficit/Excess (%)	28.00	19.01	21.30	38.76

Conclusion

The ration fed to lactating buffaloes, was deficit in almost all of the macro and micro nutrients causing their deficiencies. This may have contributed to low milk production. Therefore, a massive extension follow up programme for creating awareness on nutrient management of buffaloes should be made mandatory.

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Conflict of Interest: All authors declare no conflict of interest.

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