The Pharma Innovation Journal 2025; 14(1): 19-21

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
TPI 2025; 14(1): 19-21

www.thepharmajournal.com
Received: 23-10-2024
Accepted: 27-11-2024

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A survey on feeding practices of Murrah buffalo calves in Dr. Ambedkar Nagar (Madhya Pradesh) India

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Abstract
A survey was conducted on existing feeding practices in buffalo calves across 10-15 villages. Around 10-15 farmers from each village were selected randomly and information was collected from selected farmers through common questionnaire on general information about owner, feeding pattern and herd strength along with uses of mineral mixture and salt. Samples of animal feeds and fodders were collected from each village and pooled for the analysis of proximate principles (Dry Matter, Crude protein, Ether extract, Crude Fibre, Nitrogen Free Extract and Total Ash) in%, Major elements (Ca and P) and trace elements (Fe, Co, Mn, Cu, Zn) by using atomic absorption spectrometer. Results revealed that the deficiencies of CP, TDN, P, Zn, and Co in the rations, were of 79.70%, 49.86%, 41.11%,54.96% and 79.50%, respectively.

Keywords: Growth, Murrah buffalo calves, herd strength, mineral mixture

Introduction
Calves are often underestimated and neglected by the dairy owner because they need financial investment and do not bring any immediate return. However, serious attention should be paid to calf rearing as todays calves are the future of the herd. The initial growth of an animal is the most important phase of its life and has immense bearing on the early maturity and initial body weight. Livestock play an important role in strengthening the Indian economy. India's livestock sector is one of the largest in the world. It has 56.7% of world's buffaloes, 12.5% cattle and 20.4% small ruminants. As per there has been an overall decline of 3.33% in the total livestock population in the country. Madhya Pradesh has a very large cattle population. It contributes 37.28% cattle and 21.23% buffalo population with a total of 36.33 millions livestock in national livestock population. The growth performance of calves is dependent on balanced feeding by providing adequate quantitis of all necessary nutrients to meet their requirements for a particular physiological function but in India, animal feeding is traditional in nature and generally depends upon locally available feed resources (Garg *et al.*, 2013) [7]. Crop residues that constitute a major portion of diet are poor in essential micronutrients like minerals and vitamins. Supplementation of the micronutrients is of vital importance for animals and it helps in improving the growth rates, feed utilization efficiency, reproductive efficiency, resistance against infectious diseases, and also minimizing the incidence of certain metabolic diseases, (Mohanta and Garg, 2014) [8]. Supplementation of micronutrients is not practised in most parts of the country (Garg *et al.*, 2007) [6].

Materials and Methods
Survey of existing feeding practices in Murrah buffalo calves were carried out in 10 villages of Dr. Ambedkar Nagar of Indore District, Madhya Pradesh. Around 10-15 farmers from each village were selected randomly and information was collected from selected farmers through common questionnaire on general information about owner, feeding pattern and herd strength along with uses of mineral mixture and salt. Samples of animal feeds and fodders were collected from each village and pooled for the analysis of proximate principles (Dry Matter, Crude protein, Ether extract, Crude Fibre, Nitrogen Free Extract and Total Ash) in%, Major elements (Ca and P) and trace elements (Fe, Co, Mn, Cu, Zn) by using atomic absorption spectrometer. Samples of various feedstuffs being fed to calves were collected in plastic bags and brought to the laboratory as such from owner of animals. These samples were dried in a hot air oven at 100 + 5 °C overnight then ground in a willy mill and stored in airtight

polythene bags for further analysis. The feed samples were wheat straw, gram straw, masoor straw, local green grass (M.P. chari), green maize, wheat bran, cotton seed cake and concentrate mixture. Samples of various feeds and fodders collected from the target area were analyzed for proximate principles *viz*. dry matter (DM), crude protein (CP), ether extract (EE), crude fiber (CF), nitrogen-free extract (NFE), total ash by the standard methods (AOAC, 2005) [1].

Results and Discussion

The results from the survey on feeding practices adopted by farmers for buffalo calves in various villages around the Veterinary College are summarized in. A total of 251 calves were observed across 10 villages. Among these, the feeding patterns were categorized into six groups: wheat straw + local green grass + compound feed, wheat straw + CSC, masoor straw + CSC, wheat straw + gram straw + wheat bran, supplemented, and unsupplemented feeding regimes. In terms of feeding preferences, 33.33% of the farmers (34 farmers) used a combination of wheat straw and local green grass and compound feed while 26.47% (27 farmers) preferred masoor straw and CSC. The feeding pattern involving masoor straw and CSC was adopted by 22.55% of farmers (23 farmers). A lesser number of farmers, 17.65% (18 farmers), opted for the wheat straw and gram straw and wheat bran combination. Only 10.78% (11 farmers) used a supplemented feeding strategy, while the majority, 89.22% (91 farmers), did not include any supplementation in their feeding practices. This indicates a strong dependence on more traditional feeding methods without additional nutritional inputs, which might reflect the availability of resources or local feeding practices in these regions. This data helps to highlight both the diversity in feeding practices across the surveyed villages and the high percentage of unsupplemented feeding, which may have implications for animal nutrition and productivity. Further analysis could focus on the impact of these feeding patterns on animal health and output. Similar to our survey results, Lall *et al*. (2000) [3] reported that feeding practices of buffaloes in a village in Hisar district revealed that more than 80 percent of the lactating buffaloes were in short supply of essential minerals like calcium, phosphorus, zinc and manganese as indicated by the analysis of samples of feeds and fodders, collected from the village. These rations were deficient in calcium and phosphorus to the extent of 30-40 percent and zinc, manganese and copper to the extent of 50 percent. Feeding of greens was rare and that mineral mixtures were absent from the ration, with straw supplying 62.23% of dry matter (DM). Similarly, According to Mudgal *et al*. (2003) [5], the animals were not given a balanced diet; instead, they were fed only oil cakes and straw, as was the custom. Greens were rarely fed, and the ration did not contain a mineral blend. According to Bhanderi *et al*. (2011) [2], lactating buffaloes' average intake of digestible crude protein (DCP) ranged from 92.87 to 107.64% of their requirements, while their average intake of total digestible nutrients (TDN) ranged from 103.51 to 105.89%. According to Maan *et al*. (2014), animals in the Bhiwani district of Haryana would benefit from supplements containing 0.9 g Ca, 8 mg Zn, 3 mg Cu, and 5 mg Mn/kg food. Heifers that do not receive concentrate should be fed 300 g of rice or wheat bran or an extra 0.5 P g per kilogramme of food. Similarly, Mishra *et al*. (2018) [4] observed that, only a small number of medium and big farmers were giving the buffaloes concentrate, and they were generally doing well on the grazing land. The two main types of dry roughage used to feed livestock were wheat and paddy straw. The majority of respondents occasionally gave their animals regular salt and infrequently mineral mixtures. From the study, it is observed that the scientific feeding practices are generally not followed by most of the farmers in and around Mhow tehsil.

The average percentages of proximate components, including crude protein (CP), ether extract (EE), crude fiber (CF), total ash (TA), and nitrogen-free extract (NFE) on a dry matter (DM) basis, for the available feedstuffs are detailed in Table 01. The available feeds are wheat straw, gram straw, masoor straw, Green (Local grass), Green maize, compound feed, Cotton seed cake and Wheat bran.

Among the straws, DM content of wheat straw was 92.83±0.20% and the crude protein (CP), ether extract (EE), crude fibre (CF), total ash (TA) and nitrogen-free extract (NFE) contents were 2.65±0.28%, 1.35±0.14%, 37.2±0.61%, 06.52±0.22% and 52.29±1.19%, respectively. Similarly, the DM content of gram straw was 91.38±0.19% and the CP, EE, CF, TA and NFE contents were 8.42±0.21%, 1.27±0.20%,38.22±0.17%, 11.50±0.25% and 40.58±0.25%, respectively. The DM content of masoor straw was 93.62±0.18% and the CP, EE, CF, TA and NFE contents were 6.47±0.26%, 2.37±0.22%, 39.30±0.17%, 09.43±0.28% and 42.43±0.23%, respectively. Among the green roughages, DM content of local grass was 25.87±0.62% and the CP, EE, CF, TA and NFE contents were 6.53±0.22%, 1.39±0.17%, 34.63±0.33%, 09.40±0.21% and 48.04±0.63%, respectively. Similarly, the DM content of green maize was 20.38±0.19% and the CP, EE, CF, TA and NFE contents were 6.12±0.12%, 1.35±0.22%, 30.27±0.30%, 11.81±0.18% and 50.45±0.26%, respectively. Among the concentrate feeds, DM content of compound feed was 91.93±0.43% and the CP, EE, CF, TA and NFE contents were 18.73±0.23%, 2.45±0.26%, 11.95±0.36%, 10.7±0.32% and 56.17±0.41%, respectively. Similarly, the DM content of cotton seed cake was 91.12±0.46% and the CP, EE, CF, TA and NFE contents were%, 24.93±0.07%, 3.32±0.18%, 22.57±0.35%, 04.80±0.04% and 44.39±0.16%, respectively. The DM content of wheat bran was 92.37±0.21% and the CP, EE, CF, TA and NFE contents were%, 13.26±0.17%, 3.45±0.21%, 12.37±0.16%, 04.58±0.18% and 66.35±0.13%, respectively.

Table 1: Chemical composition of feedstuffs (% DM basis)

Sample	DM (%)	CP (%)	EE (%)	CF (%)	TA (%)	NFE (%)
Wheat Straw	92.83±0.20	2.65±0.28	1.35± 0.14	37.2±0.61	06.52± 0.22	52.29± 1.19
Gram straw	91.38±0.19	8.42±0.21	1.27± 0.20	38.22± 0.17	11.50± 0.25	40.58± 0.25
Masoor straw	93.62±0.18	6.47±0.26	2.37± 0.22	39.30± 0.17	09.43± 0.28	42.43± 0.23
Green (Local grass)	25.87±0.62	6.53±0.22	1.39± 0.17	34.63± 0.33	09.40± 0.21	48.04± 0.63
Green maize	20.38±0.19	6.12±0.12	1.35± 0.22	30.27± 0.30	11.81± 0.18	50.45± 0.26
Compound feed	91.93±0.43	18.73± 0.23	2.45± 0.26	11.95± 0.36	10.7±0.32	56.17± 0.41
Cotton seed cake	91.12±0.46	24.93± 0.07	3.32± 0.18	22.57± 0.35	04.80± 0.04	44.39± 0.16
Wheat bran	92.37±0.21	13.26± 0.17	3.45± 0.21	12.37± 0.16	04.58± 0.18	66.35± 0.13

The mean minerals content in feedstuffs are given. Among straws, wheat straw had the highest P (0.15±0.01%) and Mn (43.23±2.5) whereas lowest Ca (0.45±0.03%), and Co (0.07 ±0.00 ppm), while gram straw had the highest Ca (1.46±0.16%), Cu (8.35±0.18ppm) and Co (0.63±0.07 ppm) and lowest P (0.11±0.02%), Fe (360.63±1.37 ppm), Zn (5.26±0.17ppm) and Mn (35.45±0.28). Masoor straw was found to have the highest Fe (606.63±2.998 ppm) and Zn (23.04±0.05ppm) there after lowest Cu (4.48±0.14 ppm). In concentrate feeds, cotton seed cake had the lowest Cu (8.68±0.35 ppm) and Mn (32.28±0.25 ppm) while highest Co (0.53±0.013ppm). Wheat bran had the highest Zn (62.07±0.17 ppm) and Mn (130.68±0.36 ppm) but the lowest Co (0.2±0.05 ppm) and Ca (0.22±0.05 ppm). The compound feed was notable for the highest P (0.81±0.05 ppm), Fe (744.9±0.82 ppm), Cu (18.53±1.07 ppm) and Ca (0.91±0.05 ppm) while lowest Zn (20.23±1.17 ppm). Among green roughages, green maize fodder had the highest Ca (0.55±0.13%), Mn (130.73±1.34 ppm) and Cu (8.33±0.14 ppm) while local grasses were found to have higher Zn (12.23±0.71 ppm) and P (0.17±0.01ppm) compared to other green feeds.

Conclusion

Results revealed that the deficiencies of CP, TDN, P, Zn, and Co in the rations, were of 79.70%, 49.86%, 41.11%,54.96% and 79.50%, respectively. This indicates a strong dependence on more traditional feeding methods without additional nutritional inputs, which might reflect the availability of resources or local feeding practices in Dr. Ambedkar Nagar of Indore District, Madhya Pradesh.

Acknowledgement

The authors are thankful to the Dean, College of veterinary science &A.H. Mhow (MP) and University authorities of Nanaji Deshmukh Veterinary Science University Jabalpur (MP) for providing the necessary help and facilities to conduct this research.

Conflict of interest: No.

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