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A review: Feeding practices and status of nutrition of the lactating buffaloes

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Abstract
Dairy animals inherit certain genetic potentialities which could be exploited fully by proper feeding and management. Proper feeding is the cornerstone of a successful dairy operation because feed cost account for over half of the total costs of milk production. The primary purpose of keeping dairy animals is to transform feeds into high quality human foods i.e. milk. But this conversion could be made efficiently and economically by applying the principles of nutrition which can further be augmented by superior breeding, good health and competent management.

Keywords: management, feeding, dairy and nutrition

Introduction

Concept of optimum production and feeding

Most of the dairy farmers manage their herds for maximum milk production. The question still remains whether maximum production and economical production is the same under most conditions. Factors that tend to decrease profitability of increased production per buffalo include decreased digestibility of feeds with increased feed intake and substitution of higher priced concentrates for lower priced forages and increased health costs (Soliman, 2007) [31].

Broderick (2003) [4] reported that maximum production of milk by a cow reduces its reproductive efficiency. As the level of feeding increases, the digestibility of the diet decreases. Grains are the essential component of ration of high yielding animals to meet energy requirement, and the point of optimum level of grain feeding is, where the last increment of grains fed still makes a profit in terms of milk production. Arzul (1994) [2] observed that changes in the milk industry encourage trends towards large herds and fewer dairy units and using complete feeds. The advantages of using such diets is that it provides easier and efficient herd management, better economic gains and choice of feed mixer, and feed formulation and management in batches. Sharma *et al.* (1991) [27] suggested that a better understanding of the dynamics of rumen function and more accurate prediction of nutrient flow from the rumen are necessary. Feeding system, design management and diet formulation technique need to be developed that recognize the dynamic nature of buffalo physiology and the variability in feedstuffs and buffalo requirements.

Leng (1991) [15] gave two concepts to optimize feeding strategies for farmers in tropics: (i) making the cows digestive system as efficient as possible by ensuring optimum conditions for microbial growth in the rumen. (ii) Balancing the nutrients so that those are used most efficiently for milk production without jeopardizing reproduction and health. These concepts can be implemented by feeding a combination of Non-Protein Nitrogen (NPN), minerals and bypass proteins as demonstrated by studies in India. Milk production can also be improved by feeding alkali treated straw but for economic, sociological and logistic reasons this practice is not widely adopted by small farmers.

The negative energy balance was greater and lasted for one week longer in overfed animals. Mixed farming of livestock and crop husbandry in rain fed areas is the common practice in India (Rangnekar, 1993) [22]. Providing quality feeds and developing breeding programs led to improved quality and quantity of milk production (Gill, 1995) [7]. Adult buffaloes could maintain their body weight when fed oat straws as the whole ration (Kakkar *et al.*, 1997) [13]. There are certain constraints in the adoption of improved feeding practices in the home tract of Murrah buffaloes (Yadav and Yadav, 1997) [32].

Feeding of milch animals

A balanced ration is essential for optimum performance. A shortage or an imbalance in the supply of energy, protein, vitamin or minerals may subject the animal to nutritional stress, resulting in metabolic disorders or reduced milk production. Requirements for these nutrients depend largely on milk yield and body weight. Maximum dry matter intake and milk production can be obtained if buffaloes are fed during the dry period so that they are in good body condition without becoming excessively fat (Mudgal *et al*., 2003)[18]. Overfeeding during dry period is more common than underfeeding because in many situations dry buffaloes are group fed with lactating buffaloes. Fat cows are more susceptible to calving difficulties, metabolic disorders and infectious diseases (Ferguson, 2001) [6]. Decreased feed intake after parturition may result in a serious shortage of nutrients, thus reducing milk production or leading to metabolic disorders. The most critical period for nutrient supply to the high yielder animals is from parturition until peak production which usually occurs 4-10 weeks postpartum. Therefore, feeding the buffalo during early lactation presents special problem, because often she is not offered either adequate amount of feed or it cannot consume enough feed to supply the energy and protein needed for maximum milk production.

The largest increase in milk yield is obtained when diets low in CP (9-10%) are supplemented upto 13-14% CP. Increasing CP above 14% decreased the rate of increase in the milk yield compared to the diet with lower level of CP in ration (Paul, 2002) [20]. An increase or deficiency of nitrogen in the ration also causes a reduction in overall efficiency of utilization of energy by the dairy cow (Moe *et al*., 1977) [17]. Animals of surveyed area exhibited a deficiency in DM, DCP and TDN intake. In view of the scarcity of green fodder and high cost of concentrates, use of unconventional feeds with supplementation of mineral may be beneficial to improve the nutritional status of the dairy animals. There is further scope for improvement in production by feeding the dairy animals as per recommended feeding standards (Sagar *et al*., 2013) [23].

Balanced diet for dairy animals

At present, around 95% of the world buffalo population is contributed by Asia; where animals are mostly fed on low quality roughages and crop residues with poor nutritive value resulting in poor production, reproduction with delayed onset of puberty in heifers and high mortality in young stock (Pasha *et al.*, 2013) [19]. Nutrients supplied to the dairy animals varied significantly between seasons and between categories. The DCP and TDN requirements of the animals kept by farmers were met to the level of 71.92, 76.81, 79.74, 87.02 and 90.14 percent and 97.37, 92.69, 85.92, 89.78 and 93.94 percent in landless, marginal, small, medium and large farmers respectively (Lall *et al*., 1997) [14]. Low productivity of milch animals in Tarai belt of of eastern UP was observed merely due to deficiency of nutrients in the feed and fodder existing in the area (Sagar *et al*., 2013) [23]. The large farmers offered significantly more quantity of green fodder than other type of farmers. The type of soil, irrigation facilities and size of land holding have significant effects on the fodder cultivation and feeding pattern (Singh *et al.*, 1997) [29]. Size of land holding was found directly proportional to the high cost of feeding practices by farmers due to their resourcefulness (Yadav and Yadav, 1997) [32].

In a survey conducted to study the livestock production system as a component of agricultural farming system, it was observed that landless and poor farmers keep more number of buffaloes which yield more milk than cows. Milk yield per animal increased with increasing land holding (Singh *et al*., 1997) [29]. Data recorded on mineral status of buffaloes and different fodders in Gurgaon district of Haryana indicated that dry roughages contained lesser amount of zinc than the specified level. But green fodder was rich in zinc and copper. The calcium and phosphorus contents of feeds and fodders were sufficient to meet the maintenance requirement of the buffaloes under study (Yadav *et al.*, 1997) [33]. Large-scale implementation of a ration balancing programme can help in improving the production efficiency of milch buffaloes with the available feed resources in an environmentally sustainable manner (Sherasia *et al*., 2014) [28].

The most critical period in the life of a dairy animal is from calving until its peak production. The reports available in the literature indicated that if the highest peak is to be achieved, then it must be fed a balanced ration. Energy and protein are the two nutritional factors which most likely limit the milk production. There should be a balanced proportion of degradable and non-degradable proteins in the rumen for maximum efficiency of feed utilization. Nutritional deficiency as well as imbalance was responsible for problems of production and reproduction in dairy animals. Feeding of green fodders and concentrates as a technological tool for achieving production targets is essential for avoiding breeding problems related to nutritional hazards (Goswami, 1995) [8]. Chauhan *et al*., (1992) [5] observed that nutritive value of legume hays fed to adult buffaloes provided sufficient DCP and TDN over and above the maintenance requirement when fed *adlibitum* as a sole ration.

Reports of survey studies on feeding of milch buffaloes.

Top producers as defined in a survey study (Borghese and Mazzi, 2005) [3] were adopting a large percentage of the management techniques that researchers have determined to be beneficial in enhancing the production efficiency. The producers want to increase profitability but they may face some problems of metabolic and reproductive disorders in herds, but they have been able to overcome these by management of details. The technique adopted by these producers in improved profitability should enable prediction of practices to be adopted by other producers for the same goal. New relationships may be needed among professionals from extension service and mass media.

In a study by Randhe *et al.* (1993) [21] on nutritional status of different categories of buffaloes owned by farmers with different land holding capacity in Maharashtra revealed that there was deficiency of DM supply in all the groups. DCP intake was also deficient except in dry buffaloes where it was surplus. However, TDN supply was significantly above the normal requirements in all the groups. Malik (1992) [16] reported that the large and medium farmers were feeding more concentrates as well as green fodder where as small and landless farmers were providing more grazing, less concentrate and less cultivated fodder.

Singh *et al.* (2002) [30] revealed that in Mohindergarh district of Haryana state, DM intake of buffaloes reared by small holding farmers were significantly lesser than others. They also reported that digestible CP supplementation in buffalo diets were deficient in small as well as medium land holding farmers. Jarial *et al.* (2013) [12] reported that in Tehri Garhwal and Pithoragarh districts of Uttarakhand, the lactating buffaloes were underfed in terms of quantity (DM). They

suggested that the approach of 'utilize better' (improving the quality of present feed stuffs), 'produce more' (increasing biomass production) and 'import' (bringing nutrient supplements) could be resorted to fill the nutritional gap and optimize milk production in both the districts. Hayashi *et al.* (2006) [10] had done a survey to identify the feeding traits, milk productivity and nutritional status of lactating cattle and buffalo in Terai, Nepal. Constituents and dry matter (DM) of feed supplied, body condition score (BCS), heart girth (HG), bodyweight (BW), milk yield (MY) and plasma metabolites were obtained in the pasture-sufficient, pasture decreasing and fodder-shortage periods. The different supplies of CP, NDF and TDN among the periods and between the villages might have affected MY and nutritional status in cattle and buffalo. Sarwar *et al.* (2009) [25] revealed that Low per head milk yield, poor reproductive performance (seasonal breeding behavior, anestrous, and longer calving interval) and low growth rate in buffaloes have been attributed to insufficient supply of nutrients. Balanced nutrition and better management can enhance buffalo productivity.

Economic feeding and milk production

Feed cost per Kg of milk production was lowest in green berseem based diets than the concentrate based diet suggesting that leguminous forage based diet reduced the cost of milk production in Murrah buffaloes (Sagar *et al*., 1997) [24]. Animals of surveyed area exhibited a deficiency in DM, DCP and TDN intake. In view of the scarcity of green fodder and high cost of concentrates, use of unconventional feeds with supplementation of mineral may be beneficial to improve the nutritional status of the dairy animals. There is further scope for improvement in production by feeding the dairy animals as per recommended feeding standards (Sagar *et al*., 2013) [24]. Jabbar *et al.* (2013) [11] reported that feeding lactating Nili- Ravi buffaloes a diet containing more (i.e.,120 %) than the NRC level of ME recommended for large breed dairy cows conferred no advantage while feeding a diet containing less than the recommended level decreased both milk production and feed efficiency.

The national strategies for the irrigated intensive agricultural system in developing countries should focus upon producing less expensive milk from dairy buffaloes that, efficiently, utilize the limited expensive produced feed resources. The less costs of production will strength the competition of domestic supply either against in the international export market or against the dumping policies followed by exporters to the domestic market (Soliman, 2007) [31]. Hamid *et al.* (2003) [9] concluded from the study that buffaloes maintained in farms located in urban and periurban areas had better performance than those in rural areas. Improvement in peak and lactation yield and growing own fodder crops would increase profit. Shah (2012) [26] revealed that milk production performance and interrelationship among traits of economic importance in buffaloes were maintained at commercial dairy farms.

Feeding and managing for increased production is profitable when income over total costs is positive. Factors that affect profit in dairy enterprise are labour costs, land values, taxes, building and equipment costs and depreciation. Except for labour, others are fixed costs can't be changed by individual dairyman. A dairyman can control feeding practices and costs to a large extent, therefore maximizing income over feed costs. Individual dairyman need to adjust levels of grain feeding which would depend upon not only the costs of feeds but also the inherent capabilities of buffaloes to convert grain to milk and the quality of forages (Adkinson *et al*., 1993) [1]. Generally, feeding is the most important component of cost of rearing herd replacement which account for 78% of the total costs. Hayashi *et al.* (2006) [10] reported that the various supplies of CP, NDF and TDN among the periods might have affected milk yield and nutritional condition in buffalo. It is likely that the higher supplies of CP for buffalo in the pasture sufficient period improved the nutritional status for milk production. A priority for the future is the development of high yielding, disease resistant varieties of cultivated forages as the need to give priority to food crops for human population limits the feeding of green fodder which can reduce feed costs.

Conclusion

Feeding a diet containing less than the recommended level decreased both milk production and feed efficiency. So feeding of animal should be according to the recommendations.

Reference

1. Adkinson RW, Farmer WS, Jenny BF. Feeding Practices and Income over Feed Cost on Pasture-Oriented Dairy Farms in Louisiana1. Journal of dairy science. 1993; 76(11):3547-54.
2. Arzul P. Consideration on feeding complete diets. Bulletin Des. GTV No. 5, 1994, 187-200, (cited NAR-B 65:2392)
3. Borghese A, Mazzi M. Buffalo Population and Strategies in the World. Buff prod Res, FAO, Rome, 2005.
4. Broderick GA. Effects of varying dietary protein and energy levels on the production of lactating dairy cows1. Journal of dairy science. 2003; 86(4):1370-81.
5. Chauhan TR, Gupta R, Chopra AK. Comparative nutritive value of legume hays fed to adult buffaloes. Buffalo J. 1992; 8(3):243-2246.
6. Ferguson JD. Nutrition and reproduction in dairy herds. Intermountain Nutrition Conference Proceedings, Utah State University Publication No. 2001; 169:65-82.
7. Gill RS. Improving Quality and Quantity of Milk Production-The Role of Quality Input Services. Indian Dairyman. 1995; 47:20-3.
8. Goswami. Factors related with knowledge about feeding of green fodder and concentrate in relation to nutritional status. Indian J. Ani. Health. 1995; 33(1):45-48.
9. Hamid SK, Farooq M, Mian MA, Syed M, Jamal S. Milk production performance and inter-relationship among traits of economic importance in buffaloes maintained at commercial dairy farms. Livestock Research for Rural Development. 2003; 15(10):30-45.
10. Hayashi Y, Maharjan KL, Kumagai H. Feeding traits, nutritional status and milk production of dairy cattle and buffalo in small-scale farms in Terai, Nepal. ASIAN Australasian Journal of Animal Sciences. 2006; 19(2):189.
11. Jabbar MA, Fiaz M, Iqbal T, Abdullah M, Marghazani IB. Effect of different dietary energy levels on milk production in lactating nili-ravi buffaloes. The Journal of Animal and Plant Sciences. 2013; 23(1 Suppl):2013.
12. Jarial S, Kumar AN, Padmakumar V. Assessment of feeding practices, nutritional status and gap for dairy buffaloes in hilly districts Tehri Garhwal and Pithoragarh of Uttarakhand, India.

13. Kakkar VK, Malik NS, Makkar GS, Ahuja AK. Feeding value of oat straw in buffaloes. Proceed. National Sym. on Feeding Strategies for Eco-friendly Animal Production in India, IVRI, Izatnagar, India, 1997, 14-15.
14. Lal SN, Verma DN, Singh SP. Nutritional Status of Lactating Murrah Buffaloes Kept by Different Categories of Farmers in Eastern UP. Indian Journal of Animal Nutrition. 1998; 15(1):44-7.
15. Leng RA. Feeding strategies for improving milk production of dairy animals managed by small-farmers in the tropics. Feeding dairy cows in the tropics. (Eds. Speedy, A. & Sansoucy, R.). Proceedings of the FAO Expert Consultation held in Bangkok, Thailand, 1991, 82.
16. Malik V. Studies on Feeding and Reproduction Management of Buffaloes under Village Condition in Haryana (Doctoral dissertation, Livestock Production and Management, CCSHAU, Hisar).
17. Moe PW, Tyrrell HF. Influence of protein level on metabolizable energy value of diets for lactating cows. In Program. ADSA Annual Meeting. Divisional Abstracts American Dairy Science Association, 1977.
18. Mudgal V, Mehta MK, Rane AS, Nanavati S. A survey on feeding practices and nutritional status of dairy animals in Madhya Pradesh. Indian Journal of Animal Nutrition. 2003; 20(2):217-20.
19. Pasha TN. Prospect of nutrition and feeding for sustainable buffalo production. Buffalo Bull. 2013; 32:91-110.
20. Paul SS, Mandal AB, Pathak NN. Feeding standards for lactating riverine buffaloes in tropical conditions. Journal of Dairy Research. 2002; 69(2):173-80.
21. Randhe SR, Gaffar MA, Auradkar SK, Deshmukh SV. Nutritional status of buffaloes in rural areas of Parbhani district of Maharashtra state. Indian Journal of Animal Nutrition. 1993; 10(2):127-31.
22. Rangnekar DV. Constraints for dairy animals development, Dairy husbandry officers workshop, NDRI, Karnal, India, 1993.
23. Sagar V, Anand RK, Dwivedi SV. Nutritional status and reproductive performance of dairy cattle and buffaloes in Sonbhadra district of Uttar Pradesh. Int. J Sci. Nat. 2013; 4(3):494-8.
24. Sagar V, Verma DN, Lal SN, Ram S. Feeding effect of legume forage based diet on milk production and nutrient utilization in Murrah buffaloes. Proceed. National Sym. on Feeding Strategies for Eco-friendly Animal Production in India, IVRI, Izatnagar, India, 1997, 14-15.
25. Sarwar M, Khan MA, Nisa M, Bhatti SA, Shahzad MA. Nutritional management for buffalo production. Asian-Aust. J Anim. Sci. 2009; 22(7):1060-8.
26. Shah P. Exploring the Cost of Milk Production & Potential Economies of Scale in a Dairy Cooperative.
27. Sharma PR, Singh MP, Gupta PC. Effect of enhanced feeding and anti-parasitic measures on body measurement and physiological parameters of buffalo heifer calves. Indian J. Ani. Prod. Manag. 1991; 7(1):30-31.
28. Sherasia PL, Garg MR, Bhanderi BM. Effect of feeding balanced rations on production efficiency and enteric methane emission in lactating buffaloes under tropical conditions. Buffalo Bulletin. 2014; 33(4):323-31.
29. Singh AK, Singh M. Contribution of livestock production under rural farming system. Proceed. National Sym. on Feeding Strategies for Eco-friendly Animal Production in India, IVRI, Izatnagar, India, 1997, 14-15.
30. Singh D, Yadav AS, Yadav KR. Feeding practices of lactating buffaloes in Mohindergarh district of Haryana. Indian Journal of Animal Nutrition. 2002; 19(2):153-5.
31. Soliman I. Economic feed utilization for dairy buffalo under intensive agricultural system. Italian Journal of Animal Science. 2007; 6(sup2):1367-75.
32. Yadav BL, Yadav MC. Adoption index of buffalo feeding practices among respondents of different size of land holding in the home tract of Murrah in Haryana. Proceed. National Sym. on Feeding Strategies for Eco-friendly Animal Production in India, IVRI, Izatnagar, India, 1997, 14-15.
33. Yadav BL, Yadav MC. Constraints regarding the adoption of improved feeding practices faced by respondents in the home tract of Murrah. Proceed. National Sym. on Feeding Strategies for Eco-friendly Animal Production in India, IVRI, Izatnagar, India, 1997, 14-15.