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

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Abstract

Buffaloes inherit certain genetic potentialities which could be fully utilized by proper feeding and management. Feeding cost account for over half of the total costs of milk production so proper and scientific feeding is of utmost importance for successful dairy operation. A well-balanced ratio of energy, protein, vitamins and minerals in a palatable and tasty feed is the best way of increasing milk production and live weight, as well as improving health and fertility.

The main purpose of buffalo farming is to transform feeds into milk. This conversion could be made more efficient and economic by applying the principles of nutrition which can further be augmented by superior breeding, good health and farm management.

Keywords: buffalo, feeding practices, management, dairy and nutrition

Introduction

Buffalo farming is an important component of rural economy and contributes a lot in milk production. Buffalo milk also fetches higher price, as it contains higher fat percentage, almost twice that from cows. Also, they are more efficient converters of low-quality feeds or coarse fodder. They are known to thrive on low-quality crop residues and green forage under harsh climatic conditions. Buffalo farming has become a livelihood and resource generating enterprise for varied strata of farmers. It is playing a major role in alleviation of poverty and the commercial buffalo enterprises now provide employment to rural communities. Livestock keeping along with crop husbandry maximizes the agricultural production (Singh *et al.*, 1997) [22]. Profit from the dairy animals depends upon the input of nutrients supplied and output received in the form of milk. The main ration for the buffalo is roughage such as grass, legumes and straw. The roughage can be fed either fresh or in a cut-and-carry-system or sometimes conserved as hay or silage. The roughage is often complemented with grains, concentrate and agro-industrial by-products such as oil-seed cakes, ready-made feed pellets etc.

Concept of balance feeding

Feeding activity is most important daily routine operation and proper understanding of nutrient requirement and feeding management will reduce the expense and cost per unit production. Dairy animals are generally allowed for free access to roughages but measured amount of concentrate is given based on body weight for maintenance, milk yield, milk fat percent, pregnancy and growth. The roughage and concentrate are generally given separately; only during milking concentrate is given. In addition, because the same feeding strategy that improves reproductive performance also increases milk production, the improved production per animal is also increased. The small farmers of developing countries have limited resources available for feeding to their ruminant livestock. They do not have the luxury of being able to select the basal diet but use whatever is available at no or low cost.

Leng (1991) [10] studied 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. To exploit fullest genetic potential of buffaloes for high milk yield, it is necessary to provide adequate and balanced ration in terms of energy, protein, minerals and vitamins.

Overfeeding and underfeeding of animals leads to various nutritional and reproductive disorders.

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The health and degree of productivity of lactating animals are dependent on balanced and adequate quantities of all necessary nutrients, to meet their requirement for a given physiological state. Accurate assessment of nutritional status of dairy animals is invaluable in modern livestock production. Cost of feeding is the single largest component in the total cost of milk production. In developing countries, where the level of production of milking animals is not high and the returns from milk production are marginal, this is primarily due to higher consumption of DM per litre of milk production. Shahjalal *et al.* (2000) [20] and Castillo *et al.* (2001) [2] reported increased FCE for milk production by balancing the ration of milking animals. This is useful to increase the profitability of milk producers, and contributes to efficient use of scarce feed resources in developing countries while achieving targeted milk production.

Providing quality feeds and developing breeding programs led to improved quality and quantity of milk production (Gill, 1995) [4]. Kakkar *et al.* (1997) [7] studied that adult buffaloes were able to maintain their body weight when fed oat straw as the whole ration. Every animal requires a different level of nutrients according to their physiological needs but this concept remains unutilized in commercial dairy farms because they offer the same level of nutrients to all animals. This was the major factor responsible for increasing the cost of milk and also causes serious disturbances in the health status of animals. Thus, nutrient supplementation beyond the need of the animals may yield only diminishing returns and hence, to elicit the maximum benefit out of the supplementation a specific strategy must be chalked out prior to the start of the nutrient supplementation.

Hence to reap maximum benefit from animals along with keeping them healthy, balance feeding is of utmost importance.

Practical feeding of buffaloes

Lactating buffaloes should be given the best feed the farm can offer. Producing milk is one of the most energy demanding biological process. Weight loss is common in high producing animals during the first month of lactation because they cannot consume a sufficient amount of energy. It is therefore important that the buffalo is in good health status at parturition. A well-balanced ratio of protein, energy, vitamins and minerals in a palatable and tasty feed is the best way of increasing milk production and live weight, as well as improving health and fertility.

Traditional feeding patterns for buffaloes all over the world is subjected to forages and crop production of the season which affects the level of milk production. Forage is insufficient during the dry season and abundant during the rainy season. Shortages are overcome by conserving forages as hay or silage.

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) [13]. 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) [3]. Decreased feed intake after parturition may result in a serious shortage of nutrients in the body, which may lead to reduced milk production and 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.

Broderick (2003) [1] 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. The negative energy balance was greater and lasted for one week longer in overfed animals. Mixed farming of livestock is common in India because a huge area is rain dependent (Rangnekar, 1993) [16]. Yadav and Yadav (1997) [23] explained that there are certain constraints in the adoption of improved feeding practices in the home tract of Murrah buffaloes.

In order of priority, available good quality feed resources are first allocated to lactating animals followed by dry pregnant animals, dry animals, heifers, growing calves and non-productive animals. Milk producers in most developing countries often do not feed adequate quantities of mineral mixtures to their animals due to non-availability, lack of knowledge on the benefits of feeding mineral mixtures or due to its high cost. Farmers often have strong preferences for feeding regionally available feed ingredients, unmindful of chemical composition and cost. For example, in the eastern states of India, farmers traditionally feed crushed maize grains to their animals (Ramachandra *et al.*, 2007) [15] which may be a good source of ME but can lead to a deficiency of CP and minerals in the diet.

Feeding of milch animals and survey reports

The largest increase in milk yield is obtained when diets low in CP (9-10%) are supplemented up to 13-14% CP level. 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 *et al.* (2002) [14]. 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 and Tyrrell (1977) [12].

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 minerals 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) [18]. A number of studies have shown that reducing the CP content of the diet, above that needed to meet animal requirements, leads to better efficiency of N use for milk production and a lesser proportion excreted in urine and faeces (Krober *et al.*, 2000; Kulling *et al.*, 2001; Broderick, 2003; Rotz, 2004) [1, 8, 9, 17].

Malik (1992) [11] reported that the large and medium farmers were feeding more concentrates as well as green fodder whereas small and landless farmers were providing less concentrate and less cultivated fodder.

Singh *et al.* (2002) [21] 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) [6] 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)^[5] 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 milk yield and nutritional status in cattle and buffalo. Sarwar *et al.* (2009)^[19] revealed that Low per head milk yield, poor reproductive performance (seasonal breeding behavior, anestrus, 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.

Conclusion

Feeding of buffaloes should be according to the recommendations and requirements. Diet having less than the recommended level of nutrients decreased both milk production and feed efficiency. So, to yield more profit by buffalo farming one should follow proper and scientific feeding practices. A well-balanced ratio of energy, protein, vitamins and minerals in a palatable and tasty feed should be used for high milk production along with improving health and fertility.

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