

Green Feeding and High-Quality Milk Production in Cow & Buffaloes

Dr. Vinod Kumar Sharma

*Lecturer, Department of Agriculture (Animal science)
Govt. P.G College, Sawaimadhapur, Rajasthan, India*

Abstract: Dairy buffaloes were used to study the impact of green diet on milk's health-promoting macromolecules. The diets of the buffaloes were either a total mixed ration (TMR) (Control, C; n = 40) or a TMR with alfalfa green feed (Treated, T; n = 40). In milk taken twice a month, biomolecules and functional activity were assessed. The levels of milk l-carnitine, acetyl-l-carnitine, propionyl-l-carnitine, and -Valero betaine was greater in the treated buffaloes (P 0.01). Their antioxidant activity was also greater (P 0.01). T buffalo milk significantly decreased intracellular lipid peroxidation, reactive oxygen species (ROS), and cytokine release (P 0.01) when compared to milk from C buffaloes. It also increased the survival of endothelial cells exposed to high glucose (P 0.01). Human HCT116 and Cal 27 cancer cells' viability was more strongly reduced by milk from T buffaloes (P 0.001).

The research demonstrates that feeding dairy buffaloes green feed improves milk's antioxidant and anti-cancer capabilities as well as the health-promoting biomolecules present in it.

Keywords: Economics, enteric methane, green fodder, milk production, Buffalo, Cow, Investment pattern, Maintenance cost, Net income, Rajasthan

Introduction:

Green feeding, the practice of providing fresh and nutritious forage to cows and buffaloes, plays a vital role in ensuring high-quality milk production. The quality of feed directly impacts the nutritional composition and taste of milk, making it crucial for dairy farmers to focus on implementing green feeding strategies. This article explores the benefits of green feeding and its impact on the production of high-quality milk in cows and buffaloes.

Providing meaningful work to small and marginal farmers, agricultural labourers, farm women, and other underprivileged groups, livestock farming in Rajasthan State is tightly entwined with agriculture and plays a significant role in defining the rural economy. Rajasthan is the second-largest milk producing state in the nation (with a 12.61 percent share of all milk produced in India), with 785 grammes of milk available per person per day (NDDDB, 2016-2017). The only state in India where the native animal breeds are widely accessible is Rajasthan. The main sources of milk are cows and buffaloes.

In India, where the need for milk and milk products is expanding quickly, livestock production plays a significant role in economic growth, rural livelihoods, poverty reduction, and supplying those demands. Since over 80% of milk produced in India is produced by smallholder farmers, dairying has historically been and continues to be a significant source of livelihood support. More than 70% of the whole cost of producing milk goes into feeding, which is the basis of the livestock system. It has an impact on the environment, animal production, animal health and welfare, and the overall cattle industry (Makkar, 2016). According to Devendra and Leng (2011), the main factor influencing an increase in animal output in developing nations like India is the availability of local feed supplies.

To increase dairy farming's profitability, one must make sure that dairy cows obtain the necessary amounts of protein, energy, minerals, and vitamins in an economical manner, ideally from locally accessible feed resources including native grasses, natural forages, and green fodder.

Nutritional Benefits of Green Feeding:

A. Enhanced Nutrient Profile: Green forage, such as fresh grass and legumes, provides a rich source of essential nutrients, including proteins, vitamins, minerals, and antioxidants. These nutrients contribute to the overall health and productivity of dairy animals.

B. Improved Digestibility: Green feed is highly digestible due to its lower fiber content compared to dry forages. Enhanced digestibility ensures efficient nutrient absorption and utilization, leading to better milk production.

C. Balanced Diet: Green feeding allows for a more balanced diet for cows and buffaloes by providing a wider range of nutrients. This helps prevent nutritional deficiencies and imbalances, leading to optimal milk production.

Milk Production in the Context of the Global Demand for Food:

The immediate, ongoing, and long-term effects on the quality of our lives and the condition of the planet of the basic demands of humans and all other creatures for the proper quantity and kind of food. Those who are undernourished are unable to encourage healthy growth and development in both themselves and their progeny. Overeating hastens the process of disintegration in those who consume it. According to the Food and Agriculture Organisation (FAO) (2006), two billion people (22%) worldwide face moderate to severe food insecurity, and 9% of the world's population (820 million) is severely malnourished [Food and Agriculture Organisation (FAO), 2020]. Over 20% of kids under the age of five exhibit stunted development. 13% of people are classified as moderately to extremely obese at the same time. In addition, conditions are deteriorating on both ends of the spectrum.

The following four tenets serve as the foundation for public critique of the scope and application of existing techniques of raising animals for food.

- Most of those who can, consume too much meat and milk.

- Food that we could eat is fed to animals while the poor go hungry.
- Livestock's long shadow is destroying the planet.
- Intensive livestock production is incompatible with animal welfare.

Impact on Milk Quality:

A. Higher Nutrient Content: Cows and buffaloes fed on green forage produce milk with higher levels of essential nutrients, including proteins, fats, vitamins, and minerals. This results in milk with improved nutritional value.

B. Omega-3 Fatty Acids: Green forages, such as fresh pasture and clover, contain higher levels of omega-3 fatty acids. When cows and buffaloes consume these forages, the omega-3 fatty acids are transferred to their milk, offering additional health benefits to consumers.

C. Favourable Fatty Acid Profile: Green feeding can help achieve a more desirable fatty acid profile in milk, with higher proportions of unsaturated fatty acids, such as linoleic and linolenic acids. This promotes heart health and provides a healthier milk option for consumers.

D. Improved Flavour and Aroma: The consumption of fresh, high-quality forage positively influences the taste and aroma of milk. Green feeding contributes to the development of pleasant flavours and reduces the presence of off-flavours in milk.

Environmental Sustainability:

A. Reduced Environmental Footprint: Green feeding promotes sustainable agriculture by utilizing renewable resources such as grass and legumes. It reduces the reliance on energy-intensive feed production systems, thus lowering greenhouse gas emissions and conserving natural resources.

B. Soil Conservation: Rotational grazing and managed grazing systems, which are integral to green feeding practices, help improve soil health and prevent erosion. The incorporation of legumes in pastures

also enhances nitrogen fixation, reducing the need for synthetic fertilizers.

- C. Biodiversity Preservation: Implementing green feeding systems encourages the preservation of diverse plant species and supports the habitats of beneficial insects and wildlife. It contributes to the overall ecological balance of agricultural landscapes.

A key metric for measuring milk production efficiency is the cost per unit of milk produced. Whether milk prices should be set based on the total cost of milk production, which includes the value of family labour computed at the current wage rates for permanent farm labour, or only for the paid-out costs, which obviously excludes a significant portion of unpaid costs, is a key question.

Results and Discussion:

The economy of the milk producers is directly impacted by the size of the herd and the number of milch animals in the home. Numerous houses kept a variety of breeds, species, and animal sorts. In the research region, an average milk-producing household kept a herd of 6.68 standard animal units, which included 3.68, 0.72, 0.37, and 1.91 standard animal units of buffalo, crossbred cows, local cows, and young stock. Due to the implementation of agricultural mechanisation, there was no need for a draught animal. It is evident that milk producer families have more buffalo in their livestock resource than crossbred and native cows.

Conclusion:

Green feeding is a sustainable and effective approach to maximize high-quality milk production in cows and buffaloes. By incorporating fresh and nutritious forage into their diets, dairy farmers can enhance the nutrient profile, flavour, and aroma of milk. Moreover, green feeding promotes environmental sustainability by reducing the environmental footprint associated with traditional feed production. Embracing green feeding practices not only benefits the dairy industry but also provides consumers with healthier and more sustainable milk options.

The cost of milk production and revenue measures collected in the current study showed that raising local cows was not economical in the study region whereas milk production from buffalo was substantially more lucrative than that from crossbred cows. Therefore, it makes sense economically to convince dairy households to continue raising buffalo and crossbred cows in order to maximise their revenue from milk production. Additionally, there is a need to improve the local nondescript / indigenous cows in order to boost milk yield. The native cows can adapt to climate change better. Since additional genetic development is needed for economic features, local cows may be elevated to a recognised indigenous breed rather than being ignored.

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