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Better Feeding, Better Flocks: Improving Sheep Productivity

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Abstract

Sheep farming plays an important role in supporting rural livelihoods, particularly in semi-arid and rainfed regions of India where livestock provide a dependable source of income. Feeding management is a key factor influencing sheep productivity, growth, reproduction, and overall flock health. In many traditional production systems, sheep depend largely on grazing on natural vegetation and crop residues, supplemented occasionally with additional feed resources. However, declining pasture availability and seasonal fodder scarcity often limit animal performance. This article highlights the existing feeding systems followed by sheep farmers and emphasizes the importance of scientific feeding practices such as balanced grazing management, supplementary feeding, mineral supplementation, and proper lamb nutrition. Practical feeding recommendations including efficient use of crop residues, concentrate supplementation, and fodder conservation are also discussed. Adoption of improved feeding strategies can significantly enhance sheep productivity, strengthen flock health, and improve the sustainability of smallholder sheep farming systems.

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INTRODUCTION

Sheep farming plays a vital role in supporting rural livelihoods across many parts of India, particularly in semi-arid and rainfed regions where crop production alone often struggles due to uncertain rainfall and fragile soils. Sheep possess remarkable adaptability and can efficiently utilize sparse vegetation, crop residues, and marginal grazing resources. Through this ability, they convert low-quality feed into valuable products such as meat, wool, manure, and income. Because of this biological efficiency, small ruminants are often referred to as the "walking bank" of rural households, providing a reliable source of livelihood security for small and marginal farmers who depend on low-investment farming systems (Verma et al., 2025a).However, the productivity of sheep flocks does not depend solely on genetic potential; nutrition plays a crucial role in determining growth, reproductive performance, and disease resistance. Adequate and balanced feeding ensures efficient growth, improved fertility, and better health of animals. In many traditional production systems, sheep feeding is largely based on grazing on community pastures and harvested crop fields.

Although this grazing-based system has supported sheep farming for generations, increasing pressure on grazing lands, declining pasture quality, and seasonal scarcity of fodder often limit animal productivity.

Scientific feeding practices such as strategic supplementation with concentrates, mineral mixtures, and improved fodder resources can significantly enhance sheep productivity and flock health. Research and field observations suggest that improved feeding management is one of the most effective ways to strengthen sheep production systems. Better nutrition not only improves growth and reproduction but also reduces the risk of health disorders and enhances disease resistance (Sahu et al., 2026). In addition, farmers' knowledge, attitudes, and awareness regarding improved management practices strongly influence the adoption of scientific sheep husbandry practices (Verma et al., 2024; Verma et al., 2025a). Extension programmes that strengthen farmers' knowledge and

skills therefore play a crucial role in improving feeding management. Furthermore, advances in genetic improvement programmes can enhance growth performance, but their benefits are realized only when animals receive proper nutrition and management (Verma et al., 2026b). Hence, promoting improved feeding strategies remains essential for enhancing sheep productivity and ensuring the sustainability of smallholder sheep farming systems.

FEEDING SYSTEMS FOLLOWED BY SHEEP FARMERS

Sheep feeding systems in many parts of India largely depend on grazing on natural vegetation and crop residues, supplemented occasionally with additional feed resources. Grazing remains the most economical and widely practiced feeding method because sheep can efficiently utilize grasses, shrubs, and weeds that are often unsuitable for other livestock species. In traditional production systems, sheep are commonly grazed for several hours daily on community pastures, fallow lands, roadside vegetation, and harvested crop fields. These grazing areas provide a substantial portion of the animals' daily nutrient requirements. Crop residues such as wheat straw, paddy straw, gram haulms, and other agricultural by-products also serve as important feed resources, particularly during dry seasons when green fodder availability becomes limited.

Farmers often follow a mixed feeding system in which grazing is combined with supplementary feeding at home or in temporary shelters. In such systems, sheep graze during the day and are provided with green fodder, crop residues, or concentrate mixtures upon returning to the shed. This practice helps compensate for nutritional deficiencies that may arise from grazing alone. Scientific knowledge and awareness about improved sheep husbandry practices play an important role in encouraging farmers to adopt balanced feeding and better flock management practices (Verma et al., 2025b).

Special attention is also given to lamb feeding during the early stages of life. Lambs require adequate nutrition for proper growth and development, and farmers sometimes provide additional milk or starter feed to weak or orphan lambs to improve their survival and growth performance. Early nutritional support strengthens immunity and enhances flock productivity. Proper feeding during early growth stages enables animals to better express their genetic potential under semi-arid production systems (Verma et al., 2026a).
Supplementation of mineral mixture and common salt is another common feeding practice that helps prevent mineral deficiencies and improve digestion. However, increasing pressure on grazing lands and declining pasture availability pose serious challenges. Therefore, improved feeding management through balanced rationing, fodder cultivation, and efficient use of crop residues is essential for sustainable sheep production (Verma et al., 2026b).

Visual documentation of on-farm practices helps illustrate how feeding management influences the productivity and health of sheep. The following figures depict common feeding practices observed under smallholder sheep production systems. These images highlight the integration of traditional grazing practices with improved feeding interventions that support better growth and survival of animals.

Fig: illustrating sheep feeding practices

a. Supplementary feeding of lamb using a milk bottle

The image (Figure 1) depicts a farmer providing milk to a young lamb through bottle feeding. Supplementary feeding is an important management practice, particularly for weak, orphaned, or undernourished lambs. Adequate nutrition during the early stages of life is essential for proper growth, immune development, and survival of lambs. Colostrum and milk feeding during the neonatal stage provide essential nutrients and antibodies that protect lambs against diseases and improve survival rates. Early nutritional support also promotes better weight gain and improves future productivity of animals (Sahu et al., 2026). In situations where lambs are unable to suckle adequately from the dam, bottle feeding becomes a practical management strategy to ensure sufficient nutrient intake. Proper lamb nutrition during the early stages of life plays a significant role in strengthening the immune system and reducing mortality in sheep flocks.

b. Sheep grazing on natural pasture and crop fields

The photograph (Figure 2) illustrates sheep grazing on natural vegetation in open fields. Grazing remains the primary feeding system in traditional sheep farming, particularly in semi-arid and rainfed regions where cultivated fodder resources are limited. Sheep possess a unique ability to utilize a wide range of grasses, shrubs, weeds, and crop residues available in community pastures and harvested crop fields. These grazing resources form the backbone of sheep feeding systems and provide a substantial portion of the animals' daily nutrient requirements (Devendra and Burns, 1983). However, increasing pressure on common grazing lands and shrinking pasture resources pose significant challenges for sustainable sheep production. Therefore, efficient utilization and scientific management of grazing resources are

essential for maintaining flock productivity and ecological balance.

c. Stall feeding of sheep with fodder in village conditions

The image (Figure 3) demonstrates stall feeding of sheep using a wooden feeder, where animals are provided with green fodder or concentrate feed. Stall feeding serves as an important supplementary feeding strategy, particularly when grazing resources are insufficient to meet the nutritional requirements of animals. Supplementary feeding improves the intake of energy, protein, and essential nutrients, which ultimately enhances growth performance, reproductive efficiency, and overall flock productivity. Balanced feeding through the use of fodder crops, crop residues, and concentrate mixtures has been widely recommended for improving sheep production under smallholder farming systems (Ranjhan, 2001). Providing additional feed resources during critical physiological stages such as pregnancy, lactation, and early growth of lambs can significantly improve animal performance.

d. Feeding of green fodder inside traditional sheep housing

This photograph (Figure 4) shows sheep being fed green fodder within a traditional thatched shed. Integrating feeding with housing management is a common practice in smallholder livestock systems, where animals are provided with supplementary feed during resting periods. Feeding inside the shelter helps ensure that animals receive adequate nutrition during seasons when grazing availability declines. This practice also facilitates better management of young lambs, pregnant ewes, and lactating animals. Improved feeding management combined with appropriate housing conditions contributes to better health, productivity, and welfare of sheep (Devendra and McLeroy, 1982). Time to turn principle into practice. Farmers do not feed nutrients; they feed materials grass, residues, grains, leaves. Science simply helps arrange those materials so the animal's biology can run at full efficiency. When feeding is slightly improved, the animal's physiology does the rest. Below is a clear section you can include after the figure discussion.

SCIENTIFIC FEEDING RECOMMENDATIONS FOR SHEEP FARMERS

Efficient feeding management is the cornerstone of productive sheep farming. Balanced nutrition supports growth, reproduction, disease resistance, and overall flock performance. In many traditional systems sheep depend mainly on grazing, but strategic supplementation and improved feeding practices can substantially enhance productivity. The following scientific feeding recommendations can help farmers maintain healthy and productive flocks.

Maintain Adequate Grazing Duration

Grazing remains the most economical feeding practice for sheep. Animals should be allowed to graze for 6–8 hours daily on natural pastures, fallow lands, and harvested crop fields. Grazing provides essential nutrients through grasses, legumes, shrubs, and weeds available in the environment. Efficient grazing management also helps animals meet a major portion of their daily nutrient requirements (Devendra and Burns, 1983). However, overgrazing of community pastures should be avoided. Rotational grazing and controlled use of grazing lands help maintain pasture productivity and prevent degradation.

Utilize Crop Residues Efficiently

Crop residues such as wheat straw, paddy straw, gram haulms, and mustard residues serve as valuable feed resources for sheep, particularly during the lean seasons when green fodder is scarce. Sheep are efficient converters of these low-cost feed resources into meat and manure. Farmers should combine crop residues with green fodder or concentrate supplements to improve nutrient availability. Treatment of crop residues using simple methods such as chopping or mixing with concentrates can enhance digestibility and feed intake (Ranjhan, 2001).

Provide Concentrate Supplementation

Although grazing provides the bulk of feed, sheep often require additional nutrients during critical physiological stages. Concentrate feeding is particularly important for:

- Pregnant ewes (last 6 weeks of pregnancy)
- Lactating ewes
- Growing lambs

A small quantity of concentrate mixture (approximately 200–300 g per day) can significantly improve body condition, reproductive performance, and lamb growth. Balanced concentrate rations usually include ingredients such as crushed maize, wheat bran, oil cakes, and mineral mixture.

Ensure Early Nutrition for Lambs

Proper nutrition during the early life of lambs is essential for their survival and future productivity. Lambs should receive colostrum within the first few hours after birth, as it provides vital antibodies that protect against diseases. In cases where lambs are weak or orphaned, supplementary milk feeding using a bottle can help ensure adequate nutrient intake. Introducing creep feed or starter ration at an early stage further supports growth and improves weight gain.

Supplement Mineral Mixture and Common Salt

Mineral deficiencies can reduce growth rate, fertility, and overall health of sheep. Therefore, supplementation with mineral mixture and common salt should be practiced regularly. Minerals such as calcium, phosphorus, copper, and zinc play important roles in bone development, metabolic processes, and reproductive performance. Providing mineral mixture either through feed or mineral blocks helps maintain optimal health and productivity of animals (Ranjhan, 2001).

Conserve Fodder for Lean Periods

Seasonal scarcity of green fodder is one of the major constraints in sheep farming. Farmers should adopt fodder conservation practices such as hay making

and silage preparation to ensure feed availability during dry seasons. Conserving surplus green fodder during the rainy season helps maintain a stable feed supply throughout the year and reduces dependence on grazing resources.

Integrate Traditional Knowledge with Scientific Practices

Sheep farmers possess valuable traditional knowledge about grazing routes, pasture availability, and feeding practices. Integrating this indigenous knowledge with scientifically recommended feeding strategies can improve the efficiency and sustainability of sheep production systems. Extension programmes, farmer training, and demonstration activities play an important role in enhancing farmers' knowledge and encouraging the adoption of improved feeding practices (Verma et al., 2024; Verma et al., 2025b).

CONCLUSION

Feeding management plays a central role in determining the productivity and profitability of sheep farming. While grazing remains the foundation of traditional feeding systems, strategic supplementation with concentrates, mineral mixtures, and conserved fodder can significantly enhance animal performance. Ensuring proper nutrition during critical stages such as pregnancy, lactation, and early lamb growth is particularly important. By combining traditional grazing practices with scientific feeding strategies, farmers can improve flock health, increase growth and reproductive performance, and ultimately strengthen the sustainability of sheep production systems. In essence, improved nutrition truly leads to the principle highlighted in this article better feeding results in better flocks.

REFERENCES

Devendra, C., & McLeroy, G. B. (1982). *Goat and sheep production in the tropics*. London: Longman Group Ltd.

Devendra, C., & Burns, M. (1983). *Goat production in the tropics* (2nd ed.). Commonwealth Agricultural Bureaux, Farnham Royal, UK.

Ranjhan, S. K. (2001). *Animal nutrition in the tropics* (5th ed.). New Delhi: Vikas Publishing House Pvt. Ltd.

Sahu, U. K., Kumar, B., Khan, M. H., Baghel, M. S., Kumar, P., Sahu, L., & Verma, H. (2026). Major reproductive disorders in sheep and goats and its management. *Indian Farmer*, 13(2): 50–67.

Verma, H., Singh, M., Shruti, S., Singh, R. V., & Prabex, S. (2026). Social media and sociopsychological engagement among sheep farmers. *Indian Research Journal of Extension Education*, 26(1): 42–49. https://doi.org/10.54986/irjee/2026/jan_mar/42-49.

Verma, H., Singh, M., Shruti, & Meena, H. R. (2025). Farmers' livelihood security through sheep farming in Bareilly district of Uttar Pradesh. *Indian Journal of Extension Education*, 62(4): 31–37.

Verma, H., Singh, M., Shruti, Chander, M., Meena, H. R., Saran, V., & Prabex, S. (2025). Construction and standardization of knowledge test for assessing scientific sheep farming practices. *Indian Journal of Animal Health*, 64: 63–72. https://doi.org/10.36062/ijah.2025.04824.

Verma, H., Singh, M., Shruti, Chander, M., Meena, H. R., Saran, V., & Prabex, S. (2024). Development and validation of a scale to measure the attitude of sheep farmers towards scientific sheep husbandry. *Journal of Community Mobilization and Sustainable Development*, 19: 915–920.

Verma, H., Singh, M., Sahu, U. K., & Verma, U. (2026). Effects of long-term sire-based genetic upgrading on growth performance of sheep in semi-arid production systems. *Small Ruminant Research*, 258: 107730. https://doi.org/10.1016/j.smallrumres.2026.107730