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Popular Article

Feeding Management of Dairy Animals

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Abstract

Effective feeding management is crucial for maximizing milk production and maintaining the health of dairy animals. It involves formulating well-balanced diets, considering factors such as age, weight, and lactation stage. Regular monitoring of feed quality, nutritional content, and available pasture ensures optimal nutrition. Strategic feeding plans may be employed, adjusting rations based on individual needs. Incorporating supplements like vitamins and minerals further supports animal well-being. Additionally, proper water supply is integral to digestion and milk production. Overall, meticulous feeding management contributes to higher milk yields, improved reproductive performance, and enhanced profitability in dairy farming while promoting the longevity and welfare of the animals.

Introduction

Dairy animal feeding involves a comprehensive understanding of the nutritional requirements and management strategies required to maintain optimal health, productivity, and reproduction in dairy livestock. A complex mix of nutrients, including carbohydrates, protein, fats, vitamins, and minerals, is required for effective feeding techniques. This complicated process is critical to milk production, animal health, and reproductive success. Dairy farmers may improve production efficiency, reduce risks to health, and assure the economic viability of their enterprises by using accurate feeding control.

Practical calf feeding

Calf nourishment is ensured before the birth of the calf, as they are essential for the future dairy herd. To achieve this goal, the practice of "steaming up" is employed in pregnant dairy cows during the 6-8 weeks leading up to the expected calving date. Expectant dams should be provided with 15-20 kilograms of green fodder daily, ensuring that the colostrum



they secrete is rich in Vitamin A. If green fodder is not provided before parturition, the calf should receive a Vitamin A supplement of 10,000 IU within a few hours of birth. In the subsequent seven days following birth, the daily dosage of Vitamin A should be reduced to 5,000 IU (Harris et al., 2018).

Colostrum feeding to new-born calf

Colostrum, occurring in the initial three to four days postpartum, provides vital nutrition for neonatal calves due to its rich antibody content, offering passive immunity against infections. Absorption of these antibodies into the bloodstream is time-sensitive, emphasizing the importance of providing colostrum within 15-30 minutes post-birth, followed by a second dose 10-12 hours later. It aids meconium evacuation and acts as a laxative. Effective administration involves forced feeding, as colostrum is protein, vitamin, and mineral-rich with low lactose (Verma et al., 2018). The recommended feeding quantity is a minimum of 10% of the calf's body weight for three days, yet uncontrolled intake can cause calf scours if weaning isn't managed properly. Excess colostrum can be frozen for up to a year without losing nutritional value. Thawing and gentle heating to 39°C for utilization are recommended, avoiding boiling to preserve essential antibodies.

Colostrum feeding schedule

Calf age	Quantity fed
Within 30 minutes after birth	2 liters
After 12 hours	1/20 th of body weight
At 24 hours	1/20 th of body weight
At 36 hours	1/20 th of body weight

Artificial colostrum

If colostrum is not available then artificial colostrum should be prepared immediately. It is prepared by taking 275ml of water + contents of one raw egg + 3ml of castor oil + 10,000 IU of Vitamin A + 525 ml of warm whole milk + 80 mg of aureomycin. These contents should be mixed well and fed as one meal.

A feeding schedule of calf up to 3 months of age

Age	Whole milk	Calf starter	Good quality hay
1-3 days	Colostrum @ 1/10 th B.W. in 3 feeds	-	-
4-7 days	Whole milk @ 1/10 th B.W. in 3 feeds	-	-
8-14 days	Whole milk @ 1/10 th B.W.	-	-
15-21 days	Whole milk @ 1/10 th B.W.	A Little	A Little



22-35 days	Whole milk @ 1/15 th B.W.	100g	Ad lib
Up to 2 months	Whole milk @ 1/20 th B.W.	250g	Ad lib
2-3 months	Milk is gradually reduced	500g	Ad lib

Milk replacers

High-quality hay aids young calves' rumen development for an early transition to a ruminant diet, benefiting efficient rearing and economic gains. Calves start consuming hay at 5-7 days, preferably soft-textured leguminous varieties offered freely. Regular removal of soiled hay ensures a constant supply of fresh, uncontaminated hay, supporting calf nutrition and well-being (Schubert et al., 2022).

Ingredient of a milk replacer

Ingredient	Parts
Dried skim milk	50
Dried whey	30
Dextrose	8
Oat flour	5
Brewer's yeast	5
Irradiated yeast	0.26
Trace minerals	0.04
Stabilized Vit-A supplement	1.70

Feeding schedule of calves from 3 months to 6 months of age

From 3 months, introduce Maize, Hybrid Napier, Para grass at 2 kg daily, increasing to 5-10 kg at 6 months. Reduce hay as rumen development completes by 3 months. For leguminous forages like berseem or lucerne, wilt for 3-4 hours to prevent bloat. Offer a concentrate mix of 0.75 kg, 1 kg, and 1.5 kg daily at 4th, 5th, and 6th months, respectively, to meet the calf's maturing nutritional needs practical heifer feeding.

Heifer care is pivotal for productive dairy farming. Divided into pre- and post-first-service stages, it demands an average daily gain of 500g for optimal calving readiness. A daily diet of 4-7 kg dry matter green feed, supplemented by straw, concentrate, or grain is advised. Leguminous feed reduces grain while upping straw. To acclimate heifers to this diet, include a minimum 0.5 kg/day of concentrate. Ammonia-treated straw, particularly with low-quality feed, aids intake. Heifers usually consume 1-1.5 kg straw, 3 kg green feed, and 1 kg concentrate, with ammoniated straw, green feed, hay, and concentrate recommended for



growing stock.

Crude protein is set at 14%–15% for heifers, while M.E. ranges from 3.01 - 2.84 Mcal/kg of intake.

Age (months)	Approx. B.W.	Conc. Mixture (kg)	Grass (kg)
6-9	70-100	1.5-1.75	5-10
9-15	100-150	1.75-2.25	10-15
15-20	150-200	2.25-2.5	15-20
Above 20	200-300	2.5-2.75	15-20

Practical feeding of lactating dairy animals

Efficient dairy cattle feeding optimizes milk production by minimizing nutrient waste. A concentrate mix includes protein supplements, energy sources like maize, jowar, tapioca chips, and laxative feeds such as rice bran, wheat bran, and gram husk. It's advised to incorporate a mineral mixture at a 2% level. Dry matter requirements per 100 kg body weight range from 2-2.5 kg for Zebu Cattle and 2.5-3 kg for Buffalo & Cross-bred Cow.

Maintenance ration

S.N.	Items	Zebu cattle	Buffalo/cross bred cow
1.	Straw	4 kg	4-6 kg
2.	Concentrate	1 kg	kg

Production ration

Zebu cattle = 1kg concentrate/2.5 kg milk; Buffalo / Crossbred cow = 1.75kg concentrate/2 kg milk. The dry matter from roughage should not exceed 2% of the cow's live weight.

Feeding dairy cows at different stages of lactation

Early lactation

A recently calved, high-producing cow experiences a temporary inability to consume sufficient feed to sustain her milk production. The cow must possess adequate nutrient reserves that can be mobilized to meet the elevated nutritional demands during the early lactation phase, a period during which the cow typically experiences weight loss.

Mid & Late Lactation

Cows should receive a balanced diet comprising high-quality forage and concentrate tailored to their milk yield and milk fat percentage. In late lactation, the cow's feed intake capacity surpasses its immediate nutritional requirements. During this phase, the cow increases its food intake to accommodate the developing fetus, while simultaneously replenishing body



reserves and gaining weight rapidly. Between 7½ and 10 months into lactation, an additional 1-2 kg of concentrate feed may be supplied, beyond maintenance and milk production needs, to restore body condition lost in the early lactation stage.

Feeding high-producing dairy cows

High-yielding dairy cows demand a substantial daily intake of nutrients to sustain their elevated milk production. However, excessive concentrate feeding can disrupt the rumen's microbial and chemical environment, leading to dysfunction. An optimal diet for high producers should include high-quality forage, reducing the need for significant concentrate supplementation. Crude fiber plays a pivotal role in the diet of lactating cows, as it influences rumen fermentation and the production of acetic acid, a crucial factor for maintaining normal milk fat percentage and overall milk production. Ruminant rations should encompass a minimum of 20-25 % crude fiber, as higher grain content can impair cellulose digestibility and result in issues such as reduced milk fat content and milk production.

Challenge feeding

Period	Allowance
The last 2 weeks before calving	Starting from 500g, increase 300-400g daily until the cow is eating 500 – 1000g per 100kg body weight.
First 2 weeks of lactation	Increase 500g per day to free choice level.
Second week to peak yield (test day)	Free choice
From test day onwards	According to production as per thumb rules. e.g., 1.0 Kg for every 2.5 kg of milk produced
Remaining lactation	Concentrate adjusted to the monthly test of milk Production
All periods	Green fodder and dry fodder given adequately

Water intake per kg dry matter intake of various animals:

Animal	Water intake/kg dry matter intake
Adult cattle	3-5 liters
Milking cattle	3-5 liters & an additional amount of 4-5 liters of water per kg of milk produced.
Suckling calf	6-7 liters

In Conclusion, effective feeding management is a cornerstone of successful dairy farming, playing a pivotal role in optimizing milk production and ensuring the well-being of animals. By formulating balanced diets, monitoring feed quality, and implementing strategic feeding plans, farmers can achieve higher productivity and profitability. The careful



consideration of individual nutritional needs and the incorporation of supplements contribute to overall animal health and longevity. Additionally, recognizing the significance of proper water supply further supports optimal digestion and milk production. A holistic approach to feeding management not only benefits the dairy industry economically but also underscores the ethical responsibility of maintaining the health and welfare of the animals involve.

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