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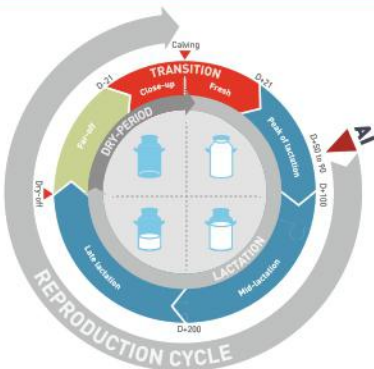


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More support for the Indian dairy sector in this year's budget

The Finance Minister reiterated commitment to agriculture and allied sectors – including animal husbandry, dairying and livestock – as engines of rural employment and farm incomes. While the budget speech highlighted interventions across fisheries, entrepreneurship and ecosystem support, a closer look at the actual allocations and scheme details reveals a mixed picture for Indian dairy. The Department of Animal Husbandry & Dairying (DAHD) in Budget 2026-27 has been allocated approximately ₹6,153 crore – a noticeable jump compared to previous years and one of the highest nominal figures ever for the department.

Livestock Health & Disease Control secures about ₹2,010 crore, sustaining crucial vaccination drives and animal health services. The National Programme for Dairy Development (NPDD) is allocated ₹1,055 crore, up from roughly ₹1,000 crore last year, aimed at chilling, processing and cooperative strengthening. Rashtriya Gokul Mission (RGM) receives approximately ₹800 crore, a significant step given its past funding volatility and its role in improving indigenous breeds. However, it is only an increase of Rs 100 crore, which is insufficient to address the productivity challenge. Animal Husbandry Infrastructure Development Fund (AHIDF) continues with ₹465 crore for interest subvention and credit guarantees to attract private investment. This is again an increment of Rs 100 crores, which is just not going to make a significant change in a sector where only 20% total milk produced is processed in the organised sector. A new Integrated Entrepreneurship Development Scheme is introduced with about ₹500 crore to spur credit-linked support for livestock and dairy value-chain enterprises.

The Budget speech outlined support for Credit-Linked Subsidy Programmes for entrepreneurship, Scaling-up and modernisation of livestock enterprises, creation of integrated livestock, dairy and poultry value chains, and encouragement of Livestock Farmer Producer Organisations (FPOs).

There is an emphasis on entrepreneurship and the creation of integrated value chains. The ₹500-crore scheme for livestock entrepreneurship – geared towards credit-linked subsidies – aims to lower entry barriers for startups and FPOs in dairy, feed, veterinary services, and allied ventures. The Finance Minister also underscored the need to expand veterinary capacity and veterinary education infrastructure – including loan-linked capital subsidies for private veterinary colleges, laboratories, and breeding centres – a positive step in addressing the chronic shortage of vets and dairy-oriented health services.

Direct incentives for mini-dairy plants, local processors, and small cooperatives are missing. Global dairy markets are increasingly competitive. Yet the Budget does not articulate a specific export promotion strategy for Indian dairy products. The absence of large, dedicated financial incentives for chilling, bulk milk cooling, and quality traceability systems is a missed opportunity. Agriculture receives Rs 1.62 lakh crore in the budget, so as per the GDP share of 25% by dairying, it should be at least 35,000 crores of allocation for dairy.

Rajasthan has significantly stepped up its commitment to the dairy sector by doubling the Rajasthan Cooperative Dairy Infrastructure Development Fund (RCDFIDF) from ₹1,000 crore to ₹2,000 crore in the State Budget 2026-27. With this decision, Rajasthan has made the largest state-level financial commitment to the dairy sector, reinforcing the cooperative model and signalling strong policy support for dairy-led rural growth.

Indian Dairy Association conducted the 52nd Dairy Industry Conference in Delhi recently. Participation from feed and feed additives/animal health products companies were missing. Progressive Dairy Farmer Association's Dairy Expo was also conducted in Jagraon, Punjab, where all sectors were represented. Farmers from all over India visited it. Instead of working in silos, all associations need to come together to take the dairy sector forward.

India has agreed to allow duty-free imports of dried distillers' grains with solubles (DDGS) and red sorghum from the USA. The move has sparked intense debate among stakeholders across the livestock, feed and farming ecosystems, with divergent views on its influence on feed costs, maize prices and downstream agricultural markets. This policy shift is calibrated to augment feed ingredient supply while protecting sensitive agricultural segments. India has capped the DDGS duty concession at 5 lakh tonnes initially. The prices of all feed ingredients for cattle feed have gone up in the last few months. Therefore, feed manufacturers and dairy farmers are hoping that imports will bring down prices in the coming months. Red sorghum can be used as a partial substitute for maize as an energy source. Duty-free DDGS and red sorghum imports are unlikely to cause a sudden collapse in maize or soybean/other protein prices.



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A Spicy Innovation: Boosting Dairy Cow Profitability with Cutting-Edge Technology

Harnessing the power of plant-based micro-encapsulated technology for enhanced milk yield and farm profitability



Dr Stephanie Ladirat
R&D Director, NUQO®

Introduction

In the ever-evolving landscape of agriculture, dairy farming remains a cornerstone of global food production, providing essential nutrients to millions of people. However, with fluctuating milk prices, rising operational costs, and increasing pressure to adopt sustainable practices, the economic viability of dairy farms is now more closely tied than ever to maximizing milk yield. Achieving higher yields per cow is not merely a matter of increasing productivity; it has a direct impact on the profitability and long-term sustainability of dairy operations. By leveraging advanced breeding techniques, optimizing feed quality, and implementing innovative herd management strategies, farmers can significantly enhance milk production, ensuring their businesses thrive in an increasingly competitive market. This article explores the critical factors influencing milk yield and the economic benefits that result from strategic improvements in dairy farming practices.

Insulin's Role in Dairy Cow Metabolism

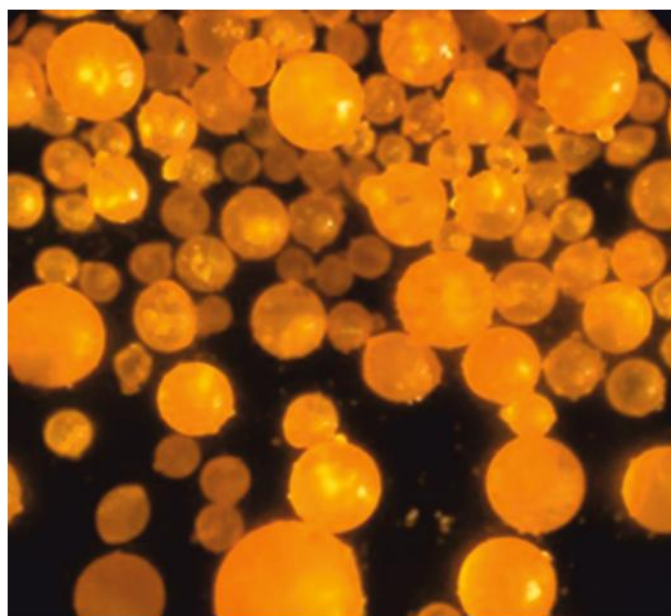
Insulin plays a crucial role in the metabolism of dairy cows, acting as a key regulator in the partitioning of nutrients between body reserves and the mammary gland. Under normal physiological conditions, insulin promotes the uptake and storage of glucose and other nutrients in body tissues, such as muscle and fat.



However, during lactation, the cow's metabolic priorities shift to support milk production. A downregulation of insulin sensitivity, particularly in peripheral tissues, can lead to a greater allocation of nutrients like glucose and amino acids toward the mammary gland, rather than being stored in body reserves. This metabolic adaptation is beneficial for dairy cows, as it enhances feed efficiency by directing more nutrients to milk synthesis, ultimately improving milk yield. By understanding and managing insulin dynamics, farmers can optimize feeding strategies to support higher milk production without compromising the cow's overall health. Such strategy can be used to ensure the optimal start during early lactation but also to extend the peak of lactation and boost productivity during mid-lactation.

Innovative Feed Additives for Enhanced Milk Production

Recently, a pioneering feed additives company (NUQO®) introduced a new technology (hereafter 'NQ Technology'), which leverages advanced micro-encapsulation manufacturing and the combination of different fractions from spices, rich in in capsaicin, a potent active molecule. This product is designed to enhance milk yield in dairy cows by safely delivering active ingredients specifically to the lower gut, and ensuring effective nutrient utilization. Unlike other spicy products, this formulation is safe to handle and targets milk production by improving feed efficiency.



NQ Technology has shown consistent effectiveness in improving feed efficiency and milk yield, driving up the profitability of dairy farms.

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Compared to other spice-based technologies or feed additives, NQ Technology offers several advantages: it is safer for users, more stable, and more cost-effective due to its innovative micro-encapsulation process. This process ensures the optimal protection and release of active ingredients throughout the product's journey. The technology's ease of use, low inclusion rate, and compatibility with other ingredients make it a practical and economically attractive option for dairy farmers. Nutritionists and feed formulators have found that it combines well with other technologies and additives, allowing for customized solutions that address various aspects of dairy cow health and productivity.

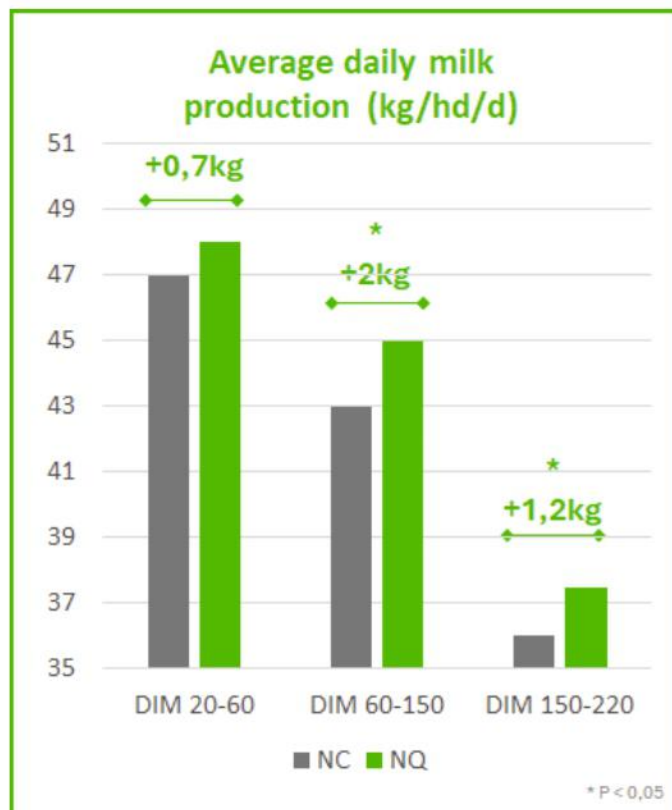
A silver bullet to secure Early Lactation and boost mid-lactation

During the transition phase and early lactation, dairy cows undergo significant metabolic changes. They must mobilize resources and nutrients to increase milk production while maintaining overall health. Often, dry matter intake is inadequate during this period, forcing cows to rely on their own reserves to fuel milk production, leading to reduced body condition scores (Hoffmann et al. 2000). Nutrient supply, particularly glucose, becomes a limiting factor for supporting milk production (Piepenbrink & Overton, 2001). Effective management of this phase is critical to ensure a successful transition to increased milk production. Understanding how to promote the flow of nutrients, especially glucose, to support lactation demands is essential for maintaining productivity, during early but also later during mid-lactation

NQ Technology, with its high content of protected capsaicinoids, offers a novel approach to nutrient partitioning in dairy cows. Capsaicinoids are known to decrease serum insulin levels without altering glucose levels, as observed in both rats (Halloran 2020) and in cows (Oh 2017). Lower serum insulin levels result in a diminished uptake of glucose by peripheral tissues and an increase in liver gluconeogenesis. This metabolic shift enables the mammary gland, which is not insulin-sensitive, to utilize available glucose more effectively for milk production. By reducing insulin secretion, capsaicin helps redirect glucose utilization towards milk synthesis, enhancing feed efficiency in lactating dairy cows. Studies consistently show that capsaicin reduces insulin secretion by activating TRPV1 receptors, which in turn increase the expression of CGRP neuropeptide. CGRP affects pancreatic β -cells, leading to decreased insulin secretion. This interaction within the small intestine ultimately modulates glucose metabolism and nutrient flow among different body tissues, prioritizing milk production without compromising overall glucose levels.

Field Trials and Results

Several trials across the world have confirmed the efficacy of NQ Technology in enhancing the performance and profitability of dairy cows. For instance, in a recent winter 2024 trial at a Belgian dairy farm, two similar groups of cows were paired and fed either a standard diet



(NC) or the same diet supplemented with 0.5g/hd/d of NQ Technology (NQ). Over six weeks, milk production and quality were measured daily, and body condition scores were assessed at the start and end of the study.

The results showed that cows fed NQ Technology produced an average of 1.5kg/hd/d more milk than those on the control diet. The most significant increase was observed in cows between 60 and 150 days in milk at the start of the trial, with these cows producing an additional 2kg/hd/d. NQ Technology was particularly effective in extending the lactation peak, with milk from cows fed NQ Technology also showing a higher average fat percentage compared to the control group. Despite the increased milk production, there was no dilution of milk quality, and protein percentages remained similar between groups. Additionally, there were no significant differences in body condition scores between the groups, indicating that the higher milk yield did not come at the expense of cow health.

Conclusion

As the dairy industry faces increasing challenges, including economic pressures and the need for sustainable practices, technologies like NQ Technology offer a promising solution for maximizing milk yield. By enhancing feed efficiency and supporting nutrient partitioning, NQ Technology helps farmers achieve higher milk production without compromising cow health. With its innovative mode of action, safety, and cost-effectiveness, NQ Technology is becoming an essential tool for dairy nutritionists seeking to improve the profitability and sustainability of dairy operations. In a competitive market, embracing such technologies is not just beneficial; it is imperative for the long-term success of dairy farming.



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Optimizing Dairy Calf Weaning: Nutritional Physiology, Milk Replacer Strategies and Evidence-Based Performance Benchmarks

Weaning represents a critical developmental transition in dairy calves, shifting from monogastric-like digestion to functional ruminal fermentation. Improper weaning is associated with impaired rumen development, reduced post-weaning average daily gain (ADG), increased morbidity, and long-term productivity losses. This review synthesizes current evidence on calf milk replacer (CMR) utilization, starter feeding strategies, common management errors, and objective performance benchmarks required for successful weaning. Emphasis is placed on scientifically measurable milestones rather than age-based decisions. Practical implementation strategies and field-level corrective approaches are discussed.



1 Introduction

Early - life nutrition exerts long-term effects on dairy cattle performance, including milk yield, reproductive efficiency, and metabolic health (1,2). Weaning is not merely cessation of milk feeding but a metabolic transition requiring functional rumen development, adequate microbial colonization, and maintenance of growth rate (3). Failure to achieve these physiological adaptations results in post-weaning growth depression and increased disease susceptibility.

2 Physiological Basis of Weaning

At birth, calves function physiologically as pre-ruminants. Milk bypasses the rumen via the esophageal groove and is digested enzymatically in the abomasum and small intestine (4). Rumen development requires:

- ✓ Fermentable carbohydrates
- ✓ Production of volatile fatty acids (VFA)
- ✓ Particularly butyrate and propionate
- ✓ Papillae elongation and epithelial thickening

Butyrate is the primary stimulant of ruminal papillae growth (5). Therefore, starter intake – not milk intake – drives functional rumen development.

Key physiological indicators of readiness for weaning:

- ✓ Consistent starter intake
- ✓ Active rumination
- ✓ Stable body weight gain
- ✓ Absence of enteric disease

3 Nutritional Specifications of Calf Milk Replacers

3.1 Protein and Energy Requirements

Calf milk replacer composition must align with target growth rates.

Growth Program	Crude Protein (%)	Fat (%)	Total Solids (%)	Target ADG (g/day)
Conventional	20-22	18-20	12-15	600-750
Accelerated	24-26	20-22	15-18	800-950

(Source: NRC 2001; Hill et al., 2010; Van Amburgh et al., 2014)



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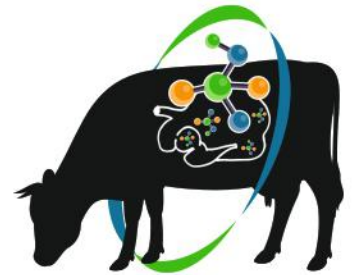
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Protein quality is critical. Milk-derived proteins (whey, skim milk powder) demonstrate superior digestibility compared to poorly processed vegetable proteins (6).

3.2 Reconstitution and Hygiene

Common technical errors include incorrect powder-to-water ratios and improper mixing temperature.

Recommended protocol:

- Water temperature for mixing: 40–50°C
- Feeding temperature: 38–40°C
- Accurate weighing of powder
- Sanitation after every feeding

Improper hygiene significantly increases bacterial load and risk of scours (7).

4 Starter Feeding and Rumen Development

Starter should be introduced by day 3–5 of life.

Recommended characteristics:

- 18–22% crude protein
- Highly palatable
- Fine-textured but not dusty
- Fresh daily

Water availability is essential. Calves without ad libitum water demonstrate reduced starter intake and delayed rumen development (8).

5 Common Management Errors in Weaning Programs

5.1 Age-Based Weaning

Weaning based solely on age (e.g., 6 weeks) without verifying starter intake is associated with post-weaning growth slump (9).

5.2 Abrupt Milk Withdrawal

Weaning based solely on age (e.g., 6 weeks) without verifying starter intake is associated with post-weaning growth slump (9).

Recommended characteristics:

- Reduced intake
- Cortisol elevation
- Transient immune suppression

Step-down weaning reduces growth setbacks (10).

5.3 Thermal Stress

Cold stress increases maintenance energy requirements. Inadequate compensation results in poor ADG (11).

6 Growth Benchmarks and Weaning Milestones

Weaning decisions should be based on objective performance indicators.

Table: Pre-Weaning Milestone Checklist

Parameter	Target Benchmark
Starter Intake	≥ 1.0–1.5 kg/day for 3 consecutive days
Age	≥ 6 weeks (flexible if intake adequate)
Body Weight	Stable or increasing for 7 days
Health Status	No diarrhea or fever for 5–7 days
Rumination	Observable cud chewing
Environment	Dry bedding, minimal thermal stress
Water Access	Continuous ad libitum
Post-Wean Plan	Defined grouping & feeding strategy

At least 9 of these criteria should be met before full milk withdrawal.

7 Evidence-Based Weaning Strategies

7.1 Step-Down Weaning Model

- Day -7 to -4** : Reduce milk volume by 25%
- Day -3 to -1** : Reduce milk by 50%
- Day 0** : Complete withdrawal

This approach maintains intake and reduces stress-induced growth suppression.

8 Post-Weaning Monitoring

Post-weaning ADG should not decline more than 5–10% in the first week.

Monitoring parameters:

- Daily feed intake
- Body weight (weekly minimum)
- Fecal consistency scoring
- Respiratory signs

Persistent ADG depression may indicate:

- Inadequate starter palatability
- Mycotoxin contamination
- Subclinical coccidiosis
- Thermal stress



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Graphical Weaning Flowchart (Text-Based Model)

Birth →

Colostrum Management →

Milk Replacer Feeding →

Starter Introduction (Day 3-5) →

Monitor Starter Intake Daily →

Starter ≥ 1 kg/day for 3 days?

↓ Yes

Step-Down Milk Reduction (5-7 days) →

Health Stable?

↓ Yes

Complete Weaning →

Post-Weaning Growth Monitoring (14 days)

10 Long-Term Productivity Implications

Studies indicate calves achieving ≥ 800 g ADG pre-weaning demonstrate:

- ✓ Higher first-lactation milk yield
- ✓ Earlier age at first calving
- ✓ Improved feed efficiency later in life (1,2)

Therefore, optimized weaning management is not merely calf care – it is lifetime productivity programming.

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- ▶ बेहतर दूध उत्पादन, वसा (फैट) और एस.एन.एफ के लिए।
- ▶ रुमन माइक्रोब द्वारा आर.डी.पी. (R.D.P) में सुधार।
- ▶ बेहतर स्वास्थ्य और बीसीएस में सुधार के लिए।
- ▶ बेहतर एवं सम्पूर्ण उत्पादक काल (लैक्टेशन पीरियड) हेतु पशुओं के लिए सर्वोत्तम आहार।
- ▶ मक्की के साइलेज के साथ खिलाने से अधिकतम लाभ।
- ▶ दूधारू पशुओं के शीघ्र गर्भधारण में सहायक।
- ▶ 1 किलो फीड प्रति 2.5 लीटर दूध उत्पादन के लिए।



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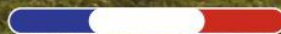
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Postbiotics and Prebiotics

Urmila K. Parmar¹ & Ankit V. Kachchhi²

¹Food Safety Officer, Health Department, Bhavnagar Municipal Corporation

²Assistant Professor, Noble Polytechnic in Animal Husbandary, Junagadh

In the world of livestock nutrition, the words **prebiotics** and **postbiotics** are gaining buzz. But what exactly are they, and why are farmers, veterinarians, and nutritionists talking about them more than ever? Let's break it down in practical terms every livestock professional can use.

What Are Prebiotics?

Prebiotics are non-digestible food ingredients that pass through the gut and serve as *fuel for beneficial microbes*. Think of prebiotics as the fertilizer that helps good bacteria grow.

- They naturally occur in fibrous plant materials like inulin, oligosaccharides, and resistant starches.
- In livestock, prebiotics help promote healthy gut flora, which can improve nutrient absorption, boost immunity, and support digestive health.

Practical benefits:

- Better feed efficiency
- Reduced diarrhea in young animals
- Lower pathogen colonization in the gut

In short, prebiotics help the good bacteria thrive so animals can get more out of the feed.

What Are Postbiotics?

While probiotics are live microbes, postbiotics are the compounds these microbes produce—such as short-chain fatty acids, enzymes, peptides, and organic acids.

Unlike probiotics, postbiotics:

- Do *not* require live organisms
- Are more stable in feed processing
- Have consistent effects without survival concerns through storage or heat

These compounds help *directly enhance gut health* and immune responses.

How They Work Together in Livestock Feeding

Think of prebiotics as the *fuel*, and postbiotics as the *working tools* inside the gut:

- **Prebiotics** feed beneficial microbes.
- **Postbiotics** are what those microbes produce to benefit the animal.

Together, they:

- Improve gut integrity

- Enhance digestive efficiency
- Support overall health
- Reduce reliance on antibiotics

Studies and field experiences show improvements in growth performance, feed conversion, and animal resilience—especially in weaning and stress periods.

Benefits on the Farm

Here's how prebiotics and postbiotics are making a difference:

1. Weaned Calves & Piglets

Stressful transitions can damage gut lining. Postbiotics help stabilize the gut, while prebiotics support beneficial flora growth.

2. Poultry Flocks

Boosted gut health means fewer digestive upsets, better nutrient uptake, and stronger immunity—translating to better weight gains and flock uniformity.

3. Dairy Cattle

Improved fiber digestion helps milk production and metabolic health. Postbiotics also help regulate rumen pH.

4. Reduced Pathogens

Together, they create an unfavorable environment for harmful bacteria like *E. coli* and *Salmonella* without using antibiotics.

How to Use Them in Feeding Programs

- **Supplementation:** Add prebiotics and postbiotics through concentrates, mineral mixes, or premixes.
- **Targeted Feeding:** Use especially during weaning, transport, heat stress, or dietary transitions.
- **Balanced Ration:** They work best in well-balanced diets; they are *enhancers*, not replacements for good nutrition.

Conclusion:

Prebiotics and postbiotics represent a new frontier in livestock nutrition—one that leverages microbial processes for better health and production. With growing emphasis on reduced antibiotic use and improved feed efficiency, these nutritional tools are becoming must-knows for modern livestock professionals.

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 **ICC**
Adding value to nutrition

Business Strategy and Execution Across the Protein Value Chain

A Management Development Program by Soy Excellence Center (SEC) India, in association with National School of Business, Bangalore

The future of the protein industry will not be shaped by production scale and efficiency alone, but by the quality of decisions that guide growth. As poultry, aquaculture and feed enterprises expand in complexity, long-term success increasingly depends on the ability to integrate strategy, execution and leadership across the value chain. In an environment marked by volatile input costs, evolving consumer expectations and rising sustainability pressures, commercial insight has become as essential as technical expertise.

While the sector has made notable progress in strengthening production systems, a gap remains in structured business and management capability. Recognizing this need, **Soy Excellence Center (SEC) India, under the leadership of Dr. Vijay Anand, Center Lead – SEC India**, conceptualized a focused Management Development Program (MDP) to strengthen managerial thinking and execution excellence across the protein ecosystem.

Developed in collaboration with the National School of Business (NSB), Bangalore, the program complemented strong technical foundations with essential competencies in business strategy, decision-making and leadership. Designed with a value-chain perspective, the MDP equipped professionals from poultry, feed milling, dairy, aquaculture and soy foods sectors with practical frameworks to translate strategy into measurable performance and sustainable growth.

Session Highlights



Dr. Sridhar Murthy – Session 1:
Foundation (Business Strategy and Execution)

Dr. Sridhar Murthy, President of the National School of Business, emphasized the growing need for strategic and commercial thinking in the poultry and animal protein sector. He highlighted that technical expertise alone is no longer sufficient for sustainable success, underscoring the importance of aligning vision, mission and execution across functions. Simplifying core management concepts, he explained the fundamental business equation linking revenue, cost and profit, driven by volume, price and efficiency. He further noted that competitive advantage across the protein value chain emerges through value creation, cost optimization, strong partnerships and differentiation, while sustainability, traceability and evolving consumer expectations present significant opportunities for future growth.



Dr. Yadu Nandan - Session 2:
Strategic Management of Businesses in the Protein Value Chain.
(Nutrition Efficiency and Performance)

Dr. Yadu Nandan highlighted the critical role of scientific nutrition and feed efficiency in strengthening productivity and profitability within the poultry sector. He also provided successful examples of value addition and waste management in the poultry sector. Emphasizing data-driven decision-making, he explained how precise nutrient management and ingredient optimization directly influence bird performance, health and cost control. With rising input prices and market volatility, he stressed the need for nutrition strategies that balance growth, efficiency and risk mitigation. His session reinforced that informed nutritional planning plays a central role in improving farm resilience and long-term value chain performance.



Dr. Abhishek Santosh Raj - Session 3:
The Art and Science of Professional Selling (Professional Selling Excellence)

Dr. Abhishek Santosh Raj focused on the art and science of professional selling, emphasizing that commercial success depends as much on understanding people as on understanding products. He highlighted the importance of identifying customer needs and aligning solutions with economic and operational realities. Stressing trust, communication and structured engagement, he explained that sustainable business growth is built through credibility rather than transactional selling. His session reinforced selling as a strategic capability that directly influences revenue generation, partnerships and organizational stability.

Interested applicants wishing to register for the upcoming courses can email to mshankar@ct.ussec.org and CC VAnand@ct.ussec.org

Session Highlights



Dr. Srinidhi K. Parthasarathy - Session 4:

Strengthening Execution through Lean Management, Kaizen, and Six Sigma (Operational Excellence)

Dr. Srinidhi K. Parthasarathy demonstrated how Lean Management, Six Sigma and Kaizen principles can transform efficiency and consistency across the protein value chain. Using case studies from milk, meat, eggs and animal feed, he illustrated how waste, variation and inefficiencies impact productivity and profitability. He emphasized that disciplined processes, data-based control and continuous improvement can deliver measurable outcomes such as improved feed conversion, reduced mortality and enhanced protein consistency. The session reinforced that sustainable competitiveness stems from mindset transformation and people-led improvement.



Dr. Naga Siddharth – Session 5:

Innovation through Design Thinking (Design Thinking and Innovation)

Dr. Naga Siddharth introduced design thinking as a structured approach to innovation and problem-solving within the agri-business ecosystem. Emphasizing empathy and real-world understanding, he highlighted the importance of observing ground-level challenges before developing solutions. He explained the iterative framework of ideation, prototyping and testing, encouraging rapid learning and continuous refinement. His session reinforced that meaningful innovation requires curiosity, experimentation and the willingness to challenge conventional thinking.



Dr. A.V. Rao – Session 6:

Business Transformation to Servitization (Leadership and People Management)

Dr. A.V. Rao provided a strategic perspective on leadership, emphasizing that organizational performance is ultimately driven by people. He highlighted the importance of role clarity, accountability and alignment between individual responsibilities and organizational goals. Stressing empathy, transparent communication and continuous feedback, he explained that effective leadership is essential in people-intensive operational environments. His session reinforced that sustainable growth depends on building capable, engaged and empowered teams.



Dr. Avinash - Session 7:

Business & Sustainability (Sustainability and Circular Economy)

Dr. Avinash concluded the program by highlighting sustainability and circular economy as critical drivers of future growth across poultry, dairy, aquaculture and animal feed sectors. He emphasized the integration of environmental responsibility, social well-being and economic viability as the foundation for long-term success. Through practical industry examples, he demonstrated how waste-to-wealth models, closed-loop nutrient systems and resource-efficient practices can reduce costs, improve resilience and create new value streams. The session reinforced that circular thinking will play a decisive role in shaping the future competitiveness of the protein value chain.

Outcomes and the Way Forward

The SEC India - NSB Management Development Program provided a comprehensive platform linking business strategy, operational discipline, market engagement, leadership development, and sustainability. By enhancing both managerial thinking and execution capability, the program enabled participants to assess performance through an integrated value-chain perspective.

Reflecting SEC India's strong commitment to capacity building, the initiative bridged practical management insights with industry relevance, empowering participants to move beyond functional silos and adopt a holistic approach to organizational excellence across the protein value chain.

As India's poultry, feed, dairy, and aquaculture sectors evolve, such collaborative learning initiatives remain essential in shaping a resilient, competitive, and sustainable protein ecosystem, one capable not only of growth but of leading with clarity and purpose.

FOLLOW US ON:   

Holistic Approaches to Neonatal Calf Diarrhea

Linking Immunity, Nutrition, and Parasite Control

Dr Mukesh Sharma*, Dr Kranti Sharma**

In modern dairy farming, the health and survival of calves form the foundation of future herd productivity and farm profitability. Today's calf represents tomorrow's milking animal, and therefore calf health management is not only an animal welfare concern but also a critical economic priority for dairy enterprises. Among all health challenges affecting young stock, calf diarrhea (neonatal calf scours) is considered one of the most significant causes of morbidity and mortality worldwide.

In developing dairy economies such as India, the impact of calf diarrhea is often more severe due to variability in farm management standards, housing hygiene, colostrum management practices, and biosecurity implementation. Field observations and dairy health surveys consistently indicate that a large proportion of calf mortality within the first month of life is directly or indirectly associated with diarrhea, primarily due to dehydration, electrolyte imbalance, and metabolic acidosis.

Newborn calves are born with an immature immune system and rely heavily on passive immunity obtained through colostrum intake. Failure of passive transfer (FPT) remains one of the most important predisposing factors for early life diseases, including diarrhea. The first 6-12 hours after birth are considered the most critical window for colostrum absorption. Even minor delays or insufficient colostrum feeding during this period can significantly increase disease susceptibility during the first few weeks of life.

Calf diarrhea is a multifactorial condition involving infectious agents such as bacteria, viruses, and protozoa, along with non-infectious factors including nutritional mismanagement, poor housing conditions, environmental stress, and hygiene deficiencies. In many cases, infection alone is not sufficient to cause disease unless combined with underlying management-related stressors. Therefore, calf diarrhea should be viewed not only as an infectious disease but as a management-associated syndrome.

The objective of this article is to provide a practical yet scientifically sound overview of calf diarrhea management under dairy farm conditions. It covers the major causes, treatment strategies, preventive measures, vaccination protocols, deworming strategies, and supportive nutritional approaches required to effectively control calf diarrhea and improve calf survival and growth performance under field conditions.

Cause of Calf Diarrhea

- **Infectious agents:** E. coli, Rotavirus, Coronavirus, Cryptosporidium, Salmonella.
- **Parasitic causes:** Strongyloides, coccidia, and other gastrointestinal worms.
- **Nutritional factors:** Poor colostrum feeding, irregular milk feeding, contaminated utensils.
- **Environmental factors:** Poor hygiene, overcrowding, damp bedding.

The primary cause of death is dehydration and metabolic acidosis. Fluid and electrolyte imbalance must be corrected immediately to improve survival rates.

Management of a scouring calf

When a calf develops diarrhea, key goals are to prevent dehydration, restore electrolyte balance, and support continued nutrition.

- **Rehydrate with oral electrolytes:** Provide 2-4 L of oral electrolyte solution per day, in addition to regular milk or milk replacer, and feed multiple times with small quantities. In severe dehydration (sunken eyes, cold ears, very depressed calf), surfaces may be sugary sticky (skin)** intravenous fluids and veterinary support are essential.
- **Continue milk feeding:** Do not stop milk because calves still need energy and protein; total feed volume may be split between milk and electrolyte solution.
- **Use appropriate treatment (under vet guidance):** Antimicrobials should be used selectively and only where bacterial infection is confirmed or strongly suspected, to avoid resistance. Anti-inflammatory drugs and specific treatments (e.g., halofuginone/azithromycin for Cryptosporidium) may be advised in severe cases.

Prevention of Calf Diarrhea: A Comprehensive Herd-Level Approach

Prevention of calf diarrhea requires a multi-factorial and herd-level strategy rather than individual calf-level treatment interventions. Numerous field studies have demonstrated that more than 70% of calf diarrhea cases are associated with management failures, including inadequate colostrum transfer, poor environmental hygiene, inconsistent feeding protocols, and lack of structured vaccination and parasite control programs (Godden, 2008; Cho and Yoon, 2014).

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Effective prevention must therefore focus on strengthening passive immunity, reducing pathogen load, optimizing nutritional support, and minimizing environmental and physiological stress during the neonatal period.

1. Colostrum Management: The Primary Defense Barrier

Colostrum feeding remains the single most important preventive measure against neonatal calf diarrhea. Adequate transfer of immunoglobulins during the first hours of life significantly reduces susceptibility to enteric pathogens and systemic infections.

Recommended Colostrum Protocol:

- First feeding within 1 hour of birth
- Total colostrum intake: 10-12% of body weight within first 12 hours
- Minimum IgG concentration: >50 g/L
- Use of colostrum quality testing tools (Brix refractometer preferred)

Failure of passive transfer (FPT) has been directly linked to higher incidence of diarrhea, pneumonia, and mortality during the pre-weaning period.

2. Calving Area and Neonatal Hygiene Management

Environmental pathogen load is a critical determinant of calf diarrhea risk. The calving pen is often the primary source of exposure to enteric pathogens.

Key Preventive Measures:

- Dedicated clean calving pens
- Deep, dry bedding (straw/sand based)
- Disinfection between calvings
- Immediate removal of manure and wet bedding

Calves exposed to contaminated calving environments show significantly higher incidence of enteric infections.

3. Feeding and Nutritional Management

Inconsistent feeding practices increase osmotic stress in the intestine and predispose calves to diarrhea.

Recommended Feeding Practices:

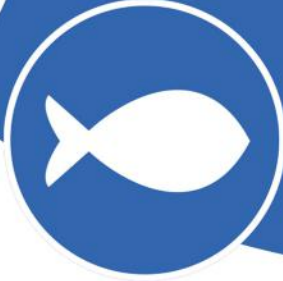
Feeding Schedule for Calves (0-2 Months of Age)

Age of Calf	Feeding Type	Quantity	Frequency	Notes
Birth – 2 hrs	Colostrum	4 liters	Once (within 2 hrs)	Essential for passive immunity; ensure good quality colostrum
Day 1–7	Colostrum / Whole Milk	10% of body weight per day	2–3 times daily	Feed warm milk at body temperature (37–38°C)
Week 2–3	Whole Milk / Milk Replacer	8–10% of body weight per day	2 times daily	Introduce calf starter feed (50–100 g/day)
Week 4	Whole Milk / Milk Replacer	6–8% of body weight per day	2 times daily	Increase calf starter to 200–300 g/day; provide clean water
Week 5–6	Whole Milk / Milk Replacer	5–6% of body weight per day	2 times daily	Starter feed 400–600 g/day; encourage solid feed intake
Week 7–8	Whole Milk / Milk Replacer	4–5% of body weight per day	2 times daily	Starter feed 700–1000 g/day; ensure water availability

** Water should be available at body temperature round the day.

4. Deworming Schedule for Dairy Calves:

Age of Calf	Target Parasites	Drug Molecule	Dose Rate	Route	Common Brand Examples (India)
3-7 Days of Age	Toxocara Vitulorum	Piperazine Hexahydrate	5 ml per 10 Kg	Oral	Piperazine Hydrate Liquid 61%
15-20 Days (High Risk Farms Only)	Coccidia	Amprolium/ Toltrazuril	Amprolium: 10 mg/kg for 5 days OR Toltrazuril: 15 mg/kg single dose	Oral	Amprol Plus, Coxgard, Baycox
1 Month	Roundworms (Toxocara, Strongyloides)	Fenbendazole	7.5 mg/kg	Oral	Panacaur , Fentas Plus
2-3 Months	Roundworms + Some Lungworm Control	Albendazole	10mg/kg	Oral Alworm	Albomar, Zentel Vet,
4-5 Months	Broad Spectrum Worms	Ivermectin	0.2 mg/kg	SC Injection	Ivomec, Neomec, Iverheal Vet
6 Months	GI Worms + External Parasite Support	Fenbendazole /Levamisole	Fenbendazole 7.5 mg/kg OR Levamisole 7.5 mg/kg	Oral	Panacur, Nilverm
9 Months	Broad Spectrum Strategic Deworming	Albendazole/ Ivermectin	As Above	Oral / SC	As Above
12 Months	Pre-Breeding Deworming	Ivermectin/ Closantel (if fluke area)	As per label	SC / Oral	Ivomec, Closamectin



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5. Vaccination Programs for Maternal and Calf Immunity

Vaccination programs targeting major enteric pathogens significantly reduce disease incidence, particularly when dams are vaccinated during late gestation.

Dam Vaccination Benefits:

- Higher colostral antibody concentration
- Improved passive immunity transfer
- Reduced early life enteric infection risk

Vaccination protocols must be region-specific and aligned with local disease prevalence.

6. Environmental Stress Reduction

Thermal stress significantly increases disease susceptibility in neonatal calves.

Critical Environmental Factors:

- Adequate ventilation without draft
- Dry bedding maintenance
- Protection from extreme cold or heat
- Adequate space allowance

Cold stress increases energy diversion from immune function to thermoregulation, increasing disease risk.

7. Nutritional Gut Health Support and Functional Feed Additives

Emerging research indicates that nutritional strategies targeting gut integrity and immune modulation can contribute to reduced diarrhea incidence. Yeast-derived products containing mannan-oligosaccharides (MOS) and

beta-glucans may support gut microbial balance, pathogen binding, and immune system activation (Spring et al., 2015).

Yeast cell wall-based nutritional technologies, including MOS-containing formulations products, may help:

- Support intestinal barrier function
- Reduce pathogen attachment
- Enhance immune response
- Improve early calf growth

However, such nutritional tools should be considered supportive interventions and must be used alongside proper colostrum management, hygiene, vaccination, and feeding protocols.

8. Integrated Preventive Herd Health Model

The most successful calf health programs implement a layered prevention model including:

1. Colostrum Quality + Timing
2. Environmental Hygiene
3. Vaccination Strategy
4. Nutritional Consistency
5. Parasite Control
6. Gut Health Nutritional Support

Farms implementing integrated preventive systems consistently demonstrate lower calf morbidity and mortality rates and improved long-term herd productivity.

Vaccine	Dose	Age	Booster	Repeat	Company Name	Vaccine Detail
Foot and Mouth Disease (FMD)	2 ML Deep 1/M	4 month	1 Month from first Vaccination	Four monthly (preferably in March, July and November)	I I L Raksha Ovac	Inactivated tissue culture FMD virus strains O, A, and Asia-1 ad juvanted with mineral oil
HS BQ combind	3 ml S/C	6 Month	1 Month from first Vaccination	Every Year Before Monsoon	I I L Raksha HS+B	Formaldehyde inactivated cultures of Pasteurella multocida and Clostridium chauvoei adsorbed on aluminium hydroxide gel.
Brucellosis	2ml S/c	6 – 8 Month of Age in Female Calf only	Not Require	Once in Life time	I I L/Hester	Live Brucella abortus strain 19 freeze dried bacteria
Theileriosis	3ml s/c	3 Month of Age	Not Require	Annually	I I L Rakshavac T	Schizont Grown in Lymphoblast Cell
IBR	2ml S/c	3 Month of Age	One Monthafter First Vaccination	Every Six Month	Not Available in India	
Lumpy Skin	3ml S/c	Above 6 Month of Age	Not Require	Every Year In Endemic Areas	Hester / I I L	Goat Pox Vaccine Disease (LSD)

Dr Mukesh Sharma*, Dr Kranti Sharma**
*-Dairy Consultant, **Assistant professor
DSVCKV Anjora Durg Chhattisgarh



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दुधारू पशुओं में लैंगिक वीर्य की उपयोगिता एवं समस्याएं

अमित शर्मा, अंकित आहूजा*, ईवा शर्मा, शगुन ठाकुर, पंकज सूद

लैंगिक वीर्य वह वीर्य (सीमन) होता है जिसमें एक्स और वाई क्रोमोसोम वाले शुक्राणुओं को अलग कर दिया जाता है। सरल भाषा में समझें तो एक्स क्रोमोसोम युक्त शुक्राणुओं से मादा पैदा होती है और वाई क्रोमोसोम युक्त शुक्राणुओं से नर पैदा होता है। इन दोनों क्रोमोसोम को अलग-अलग कर देने से मनचाहा लिंग उत्पन्न करने में सहायता मिलती है। प्राकृतिक स्थिति में मादा और नर के जन्म की संभावना लगभग बराबर (50%) होती है, लेकिन सेक्स सीमन तकनीक से नरमादा पैदा होने की संभावना 85-90% तक बढ़ जाती है। सेक्स सीमन पशु प्रजनन के क्षेत्र में एक क्रान्तिकारी तकनीक है, इसके प्रयोग से मादा बछड़े के जन्म की संभावना बढ़ जाती है, जो डेयरी उद्योग के लिए सबसे महत्वपूर्ण है।

लिंग चयन तभी संभव है जब हमें X और Y क्रोमोसोम युक्त शुक्राणु के बीच का अंतर पता हो। यदि हम यह पहचान लें कि कौन-सा शुक्राणु है और कौन सा ल शुक्राणु है, तो हमें मनचाहा परिणाम मिल सकता है।

मापदण्ड	X / Y क्रोमोसोम युक्त शुक्राणु
शुक्राणु का आकार	X शुक्राणु का आकार बड़ा होता है।
DNA की मात्रा	X शुक्राणु में 3.8-4.2% DNA अधिक होता है
शुक्राणु की गति	Y शुक्राणु तेज गति से चलते हैं।
X शुक्राणु का सतही आवेश (surface charge)	नकारात्मक
कोशिका सतह पर एंटीजन की उपस्थिति (HY)	यह केवल Y शुक्राणु में पाया जाता है

सेक्स सीमन बनाने की विधियाँ:

सेक्स वीर्य बनाने के लिए विभिन्न तकनीकों का उपयोग किया जाता है, जैसे सेक्स सीमन फ्लो साइटोमीट्री, स्विम अप प्रक्रिया, एल्ब्यूमिन ग्रेडिंट या ग्रेडिंट स्विम डाउन प्रक्रिया, पर्कॉल डेंसिटी ग्रेडिंट विधि, फ्री फ्लो इलेक्ट्रोफोरेसिस, H-Y एंटीजन की पहचान। ज्यादातर फ्लो साइटोमीट्री विधि का प्रयोग कर सेक्सिंग की जाती है।

फ्लो साइटोमीट्री आधारित वीर्य (स्पर्म) सेक्सिंग तकनीक

सर्वप्रथम कृत्रिम योनि तकनीक का उपयोग करके नर पशुओं से वीर्य एकत्र किया जाता है। इस तकनीक में प्रत्येक स्पर्म को डीएनए-बाइंडिंग फ्लोरोसेंट डाई (जैसे Hoechst 33342) से रंगा जाता है। एकत्रित वीर्य को एक विशेष फ्लो साइटोमीटर मशीन में डाला जाता है। तत्पश्चात प्रत्येक शुक्राणु को एक फ्लो चैनल से गुजारा जाता है, जहाँ उन्हें यूवी लेजर से रोशन किया जाता है। चूंकि X क्रोमोसोम वाले शुक्राणु में Y की तुलना में लगभग 3-8%-4.2% अधिक DNA होता है, इसलिए वे अधिक फ्लोरोसेंस दिखाते हैं। लेजर बीम द्वारा शुक्राणुओं की फ्लोरोसेंस को कंप्यूटर के माध्यम से मापा जाता है और फिर उन्हें इलेक्ट्रोस्टैटिक चार्ज देकर अलग किया जाता है। इस प्रक्रिया से 90%

तक सटीकता के साथ X या Y क्रोमोसोम युक्त शुक्राणु अलग किए जा सकते हैं। चुने गए शुक्राणुओं से "सेक्स सीमन" की तृण बनाई जाती है, जिन्हें तरल नाइट्रोजन में सुरक्षित रखकर किसानों के लिए कृत्रिम गर्भाधान में इस्तेमाल किया जाता है।

फ्लो साइटोमीट्री की सीमाएँ:

उच्च लागत— इस तकनीक के लिए अत्याधुनिक मशीनें और लेजर सिस्टम चाहिए, जो बहुत महंगे होते हैं।

विशेषज्ञ तकनीशियन की आवश्यकता— इसका संचालन करने के लिए प्रशिक्षित वैज्ञानिक/टेक्नीशियन की जरूरत होती है।

सीमित उत्पादन क्षमता— शुक्राणुओं की छंटाई (sorting) की धीमी गति (15 million sperms/hr) के कारण एक बार में सीमित संख्या में ही शुक्राणुओं को प्रोसेस या वर्गीकृत किया जा सकता है, जिससे पूरी प्रक्रिया में अपेक्षा से अधिक समय लगता है, अंततः सीमित उत्पादन होता है।

शुक्राणुओं को क्षति का खतरा— फ्लो साइटोमीट्री में लेजर और डाई (dye) का उपयोग होता है, जिससे कुछ शुक्राणु क्षतिग्रस्त हो सकते हैं और उनकी जीवित रहने की क्षमता कम हो सकती है।

सभी X या Y क्रोमोसोम वाले शुक्राणु की पहचान नहीं हो पाती— आमतौर पर केवल लगभग 40-50% से लेकर 85-95% तक ही सही X या Y क्रोमोसोम वाले शुक्राणु की पहचान होती है, जो तकनीक और उपकरण की सीमा पर निर्भर करती है।

सीमित उपयोग योग्य नमूना— मूल वीर्य नमूने (semen sample) का केवल 20-30% हिस्सा ही सेक्स सीमन (X/Y) के रूप में उपयोग या बाजार में लाया जा सकता है।

सेक्स सीमन की उपयोगिता:

मनचाहे लिंग के बछड़े/बछड़ी का उत्पादन (डेयरी या बीफ पशु)।

मादा बछड़ों की अधिकता से दूध उत्पादन बढ़ता है, जिससे किसान की आय में वृद्धि होती है।

ब्याई गई मादा बछड़ियों का संतति परीक्षण (progeny testing) कम समय में किया जा सकता है।

प्राकृतिक जनसंख्या में नर बछड़ों की अत्यधिक वृद्धि से होने वाली समस्याओं जैसे फसलों को नुकसान, सड़क दुर्घटनाएं आदि में कमी आती है, जिससे पर्यावरण की सुरक्षा और संतुलन में सुधार होता है।

उत्तम गुणवत्ता वाले सांडों (superior bulls) का उत्पादन किया जा सकता है।

सेक्स सीमन के प्रयोग से कठिन प्रसव (dystocia) की संभावना कम रहती है, क्योंकि नर बछड़ों के उत्पादन को रोका जा सकता है।

इन-विट्रो फर्टिलाइजेशन कार्यक्रम में, सेक्स सीमन की एक खुराक से मनचाहे लिंग के अनेक भ्रूण तैयार किए जा सकते हैं।

इस तकनीक के प्रयोग से बाहरी पशुओं को खरीदने की आवश्यकता कम हो जाती है, जिससे बीमारियों की रोकथाम में भी मदद मिलती है।

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सेक्सड सीमन की समस्याएं:

फर्टिलिटी/गर्भधारण दर में कमी:- सेक्सड सीमन का गर्भधारण दर (बवदबमचजपवद तंजम) सामान्य सीमन की तुलना में 10-15% कम होता है। इसके दो मुख्य कारण हैं:- सेक्सड सीमन में शुक्राणुओं की कम मात्रा एवं सेक्सड शुक्राणुओं की कम अर्ध-आयु (half-life)

सेक्सड सीमन में शुक्राणुओं की कम मात्रा: सेक्सड तृण में सिर्फ 2 मिलियन शुक्राणु होते हैं, जबकि सामान्य तृण में 20 मिलियन। जिससे गर्भधारण की संभावना कम हो जाती है।

सेक्सड शुक्राणुओं की कम अर्ध-आयु (half-life): मादा प्रजनन तंत्र में पारंपरिक रूप से प्रोसेस किए गए शुक्राणुओं की तुलना में सेक्सड शुक्राणुओं की अर्ध-आयु कम होती है।

सेक्सड तृण की कीमत सामान्य तृण से अधिक होती है। सामान्य तृण कीमत- ₹150, सेक्सड तृण ₹1500-3000

शुक्राणु वर्गीकरण की प्रक्रिया के दौरान लगभग 50% शुक्राणुओं की हानि होती है, जिससे कुल उपयोगी मात्रा में उल्लेखनीय कमी आती है।

सेक्सड तृण का उपयोग खराब प्रजनन प्रदर्शन वाले झुंडों, जन्मजात एवं मूलभूत बांझपन और दूध पिलाती गायों के पशुओं में वर्जित है। सेक्सड तृण का उपयोग केवल उन बछड़ियों में किया जाना चाहिए, जो समुचित प्रबंधन, उत्तम शारीरिक स्थिति (Body Condition Score), स्पष्ट एवं समयानुकूल हीट संकेतों की उपस्थिति और प्रजनन दृष्टि से सक्षम हों।

भविष्य की चुनौतियाँ एवं संभावनाएँ:

शुक्राणु लिंग निर्धारण तकनीक की लागत को कम करना- शुक्राणु वर्गीकरण की प्रक्रिया को अधिक सुलभ एवं आर्थिक रूप से व्यवहार्य बनाने हेतु नवाचार आवश्यक है।

बहु-नोजल युक्त फ्लो साइटोमीटर का विकास- फ्लो साइटोमेट्री में दक्षता वृद्धि हेतु ऐसे उपकरणों का निर्माण जो एक से ज्यादा नोजल्स के माध्यम से उच्च गति एवं सटीकता से शुक्राणुओं का वर्गीकरण कर सकें।

X अथवा Y शुक्राणुओं के विशिष्ट प्रोटीन मार्कर की पहचान- लिंग-विशिष्ट शुक्राणुओं की पहचान के लिए जैव-रासायनिक संकेतकों (बायोमार्कर्स) का पृथक्करण, जिससे चयन प्रक्रिया को आणविक (उवसमबनसंत) स्तर पर सुदृढ़ किया जा सके।

निष्कर्ष:

सेक्सड तृण का उपयोग मुख्य रूप से उच्च गुणवत्ता, स्वस्थ और बेहतर प्रजनन प्रदर्शन वाले झुंडों में अनुभवी और प्रशिक्षित कर्मियों द्वारा ही किया जाना चाहिए, ताकि सर्वोत्तम परिणाम प्राप्त हो सकें और डेयरी फार्मिंग की आर्थिक दक्षता बढ़ाई जा सके। इस तकनीक के उपयोग से किसानों को मादा पशु परिवार बढ़ाने में मदद मिलती है, जिससे दुग्ध उत्पादन में वृद्धि होती है और नर पशुओं के पालन में होने वाली परेशानी और खर्च से बचा जा सकता है। भारत में यह तकनीक अब व्यापक रूप से उपलब्ध है, और कई राज्यों के पशुपालन विभागों द्वारा इसे किसानों को आर्थिक सहायता के तहत कम मूल्य पर प्रदान किया जा रहा है। भारत में इस तकनीक के लिए कई अनुसंधान और विकास कार्य चल रहे हैं ताकि यह तकनीक और अधिक किफायती और प्रभावी हो सके।

अमित शर्मा, अंकित आहूजा, ईवा शर्मा, शगुन ठाकुर, पंकज सूद

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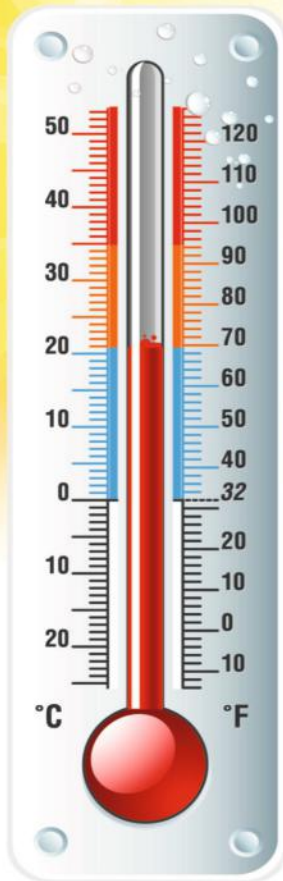
EVENT CALENDER

MARCH 2026
10-12 MARCH – VICTAM ASIA
Venue : BITEC Exhibition Center in Bangkok, Thailand
Phone : +31 33 246 4404
Email : expo@victam.com
Web : www.victamasia.com

APRIL 2026
VIV SELECT INDIA
22-24 APRIL 2026
Venue : Yashobhoomi Convention Centre, Delhi, Sector 25, Dwarka, New Delhi- 110077
Contact Person : Mr. Rajeevan Vattakat
Phone : +91 98100 33187
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Web : www.india.viv.net

SEPTEMBER / OCTOBER 2026
WORLD DAIRY EXPO
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Did you know that heat stress can cost over 400€/cow/year¹? The consequences of heat stress include significant losses in milk production, (which can be up to 35%), coupled with rumen dysfunction and reduced reproduction rates.

The level and impact of heat stress on cows is influenced by a combination of ambient temperature and relative humidity. New research has shown that temperatures in excess of 20°C and 50% relative humidity² will lead to cow discomfort and reduced milk production.

1 Saint Pierre et al., 2003 - 2 Burgos & Collier, 2011.

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- Milk yield: +1.2 to 2.5 litres/cow/day.
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*Marfola, et al, ADSA 2010.

For more information, please contact your feed distributor or Lallemand.

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ਸਾਫ਼ ਸੁਥਰਾ ਤੇ ਤਾਜਾ ਪਾਣੀ

ਪਰਮਿੰਦਰ ਸਿੰਘ

ਕਣਕ-ਝੋਨੇ ਦੇ ਫਸਲੀ ਚੱਕਰ ਨੇ ਜਿੱਥੇ ਜ਼ਮੀਨਾਂ ਦੀ ਉਪਜਾਊ ਸ਼ਕਤੀ ਘਟਾਈ ਹੈ, ਉਥੇ ਪਾਣੀ ਦਾ ਸਤੱਰ ਵੀ ਬਹੁਤ ਥਲੇ ਚਲਾ ਗਿਆ ਹੈ। ਇਸ ਦੇ ਨਾਲ ਨਾਲ ਇਨ੍ਹਾਂ ਫਸਲਾਂ ਵਿੱਚ ਵਰਤੀਆਂ ਜਾਂਦੀਆਂ ਖਾਦਾਂ, ਕੀਟਨਾਸ਼ਕ ਤੇ ਹੋਰ ਕਈ ਕਿਸਮ ਦੀਆਂ ਜ਼ਹਿਰਾਂ ਸਦਕਾ ਜ਼ਮੀਨ ਵਿਚਲੇ ਪਾਣੀ ਦਾ ਮਿਆਰ ਵੀ ਖਰਾਬ ਹੋ ਰਿਹਾ ਹੈ। ਉਪਰੋਂ ਵੱਧਦੀ ਆਬਾਦੀ ਤੇ ਨਵੀਆਂ ਪੁੰਗਰ ਰਹੀਆਂ ਕਲੋਨੀਆਂ ਨੇ ਪਾਣੀ ਦੀ ਕਿੱਲਤ ਕਰ ਦਿਤੀ ਹੈ। ਸ਼ਹਿਰਾਂ ਵਿੱਚ ਘਰ-ਘਰ 'ਚ ਪਾਣੀ ਦੇ ਫਿਲਟਰ ਲਗੇ ਹੋਏ ਹਨ। ਵਿਆਹ ਸ਼ਾਦੀਆਂ ਜਾਂ ਕਿਧਰੇ ਬਾਹਰ ਜਾਈਏ ਤਾਂ ਅਸੀਂ ਵੀ ਬੰਦ ਬੋਤਲ ਦਾ ਪਾਣੀ ਪੀਣ ਦਾ ਯਤਨ ਕਰਦੇ ਹਾਂ, ਕਿਉਂਕੇ ਸਾਨੂੰ ਭਲੀ ਭਾਂਤੀ ਪਤਾ ਹੈ ਕਿ ਬਾਹਰ ਮਿਲਣ ਵਾਲੇ ਪਾਣੀ ਦੀ ਕੁਆਲਿਟੀ ਕਿਹੋ ਜਿਹੀ ਹੈ, ਕਿੱਧਰੇ ਪਾਣੀ ਪੀ ਕੇ ਪੇਟ ਖਰਾਬ ਨਾ ਹੋ ਜਾਏ। ਇਸੇ ਤਰ੍ਹਾਂ ਲਵੇਰਿਆਂ ਨੂੰ, ਚਾਹੇ ਉਹ ਕਿਸੇ ਵੀ ਉਮਰ ਦੇ ਹੋਣ, ਨੂੰ ਵੀ ਸਾਫ਼ ਪਾਣੀ ਪੀਣ ਦਾ ਹੱਕ ਹੈ। ਲਵੇਰਾ ਜਿੱਥੇ ਮਰਜ਼ੀ ਪਾਣੀ ਪੀ ਲਏ, ਜਿਹੜਾ ਮਰਜ਼ੀ ਪਾਣੀ ਪੀ ਲਏ, ਉਹ ਪਾਣੀ ਦਾ ਮਿਆਰ ਕਿਹੋ ਜਿਹਾ ਹੈ, ਇਸ ਬਾਰੇ ਅਜੇ ਬਹੁਤਾ ਸੋਚਿਆ ਨਹੀਂ ਗਿਆ। ਦੁੱਧ ਵਿੱਚ 87% ਪਾਣੀ ਹੈ ਤੇ ਜੇ ਪੀਣ ਵਾਲਾ ਪਾਣੀ ਹੀ ਠੀਕ ਨਹੀਂ ਤਾਂ ਦੁੱਧ ਦੀ ਕੁਆਲਿਟੀ ਤਾਂ ਖਰਾਬ ਹੋਣੀ ਹੀ ਹੈ। ਪਾਣੀ ਸਰੀਰ ਦੀਆਂ ਲੱਗਭਗ ਸਾਰੀਆਂ ਕ੍ਰਿਆਵਾਂ ਵਾਸਤੇ ਜ਼ਰੂਰੀ ਹੈ। ਭੁੱਖਾ ਰਹਿ ਕੇ ਜਾਨਵਰ ਆਪਣੀ ਸਰੀਰ ਦੀ ਸਾਰੀ ਚਰਬੀ ਤੇ ਸਰੀਰ ਦੀ ਅੱਧੀ ਪ੍ਰੋਟੀਨ ਖਤਮ ਹੋਣ ਤੇ ਵੀ ਜਿੰਦਾ ਰਹਿ ਸਕਦਾ ਹੈ। ਪਰ ਸਰੀਰ ਵਿਚਲੀ 10% ਪਾਣੀ ਦੀ ਘਾਟ ਵੀ ਮੌਤ ਦਾ ਕਾਰਣ ਬਣ ਸਕਦੀ ਹੈ। ਇਸ ਲਈ ਸਾਨੂੰ ਯਕੀਨੀ ਬਣਾਉਣਾ ਚਾਹੀਦਾ ਹੈ ਕਿ ਲਵੇਰਿਆਂ ਨੂੰ ਸਾਫ਼ ਪਾਣੀ ਦੀ ਕਦੇ ਖੁੱਤ ਨਾ ਆਵੇ।



ਸਰੀਰ ਅੰਦਰ ਪਾਣੀ ਦੇ ਕੰਮ

- ਪਾਣੀ ਸਰੀਰ ਦੇ ਹਰ ਸੈਲ, ਤੰਤੂ ਲਈ ਜ਼ਰੂਰੀ ਹੈ।
- ਪਾਣੀ ਪਸ਼ੂ ਦਾ ਤਾਪਮਾਨ ਸਥਿਰ ਰਖਣ ਵਿੱਚ ਸਹਾਈ ਹੁੰਦਾ ਹੈ।
- ਜੁਗਾਲੀ ਕਰਨ ਲਈ ਵੀ ਪਾਣੀ ਦੀ ਜ਼ਰੂਰਤ ਹੁੰਦੀ ਹੈ।
- ਪਾਣੀ ਖੂਨ ਦਾ ਇਕ ਅਹਿਮ ਹਿੱਸਾ ਹੈ। ਖੂਨ ਵਿਚਲੇ ਪਾਣੀ ਸਦਕਾ ਹੀ ਵੱਖ-ਵੱਖ ਖੁਰਾਕੀ ਤੱਤ ਸਰੀਰ ਦੇ ਹਰ ਕਿ ਸੈਲ ਤਕ ਪਹੁੰਚਦੇ ਹਨ।
- ਪਾਣੀ ਸਾਹ ਲੈਣ ਲਈ ਵੀ ਮਦਦ ਕਰਦਾ ਹੈ।
- ਜੋੜਾਂ ਵਿੱਚ ਇਹ ਗਰੀਸ ਦਾ ਕਮ ਕਰਦਾ ਹੈ।
- ਅੱਖਾਂ ਤੇ ਚਮੜੀ ਦੀ ਚਮਕ ਵੀ ਪਾਣੀ ਸਦਕਾ ਬਰਕਰਾਰ ਰਹਿੰਦੀ ਹੈ।
- ਪਾਣੀ ਸਰੀਰ ਦੇ ਵਾਧੂ ਪਦਾਰਥਾਂ ਨੂੰ ਬਾਹਰ ਕੱਢਣ ਵਿੱਚ ਵੀ ਸਹਾਇਤਾ ਕਰਦਾ ਹੈ।

ਪਾਣੀ ਦੀ ਜ਼ਰੂਰਤ

ਇਕ ਪਸ਼ੂ ਦੀ ਰੋਜ਼ਾਨਾ ਪਾਣੀ ਦੀ ਜ਼ਰੂਰਤ ਕਈ ਗਲਾਂ ਤੇ ਨਿਰਭਰ ਕਰਦੀ ਹੈ।

1. **ਤਾਪਮਾਨ:** ਪਸ਼ੂਆਂ ਲਈ ਢੁੱਕਵਾਂ ਤਾਪਮਾਨ 15-25° ਸੈਂਟੀਗਰੈਡ ਹੁੰਦਾ ਹੈ। ਜਦੋਂ ਗਰਮੀਆਂ ਵਿੱਚ ਤਾਪਮਾਨ 40-45° ਸੈਂਟੀਗਰੈਡ ਪਹੁੰਚ ਜਾਂਦਾ ਹੈ ਤਾਂ ਪਸ਼ੂ ਦੀ ਪਾਣੀ ਪੀਣ ਦੀ ਜ਼ਰੂਰਤ ਆਮ ਹਾਲਤਾਂ ਨਾਲੋਂ ਦੁੱਗਣੀ-ਤਿੱਗਣੀ ਹੋ ਜਾਂਦੀ ਹੈ। ਇਸੇ ਤਰ੍ਹਾਂ ਸਰਦੀਆਂ ਵਿੱਚ ਪਾਣੀ ਦੀ ਘੱਟ ਲੋੜ ਪੈਂਦੀ ਹੈ।
2. **ਉਮਰ:** ਕੱਟੜੂ-ਵੱਛੜੂ ਅਤੇ ਝੋਟੀਆਂ-ਵਹਿੜੀਆਂ ਨੂੰ ਲਵੇਰੀਆਂ ਦੇ ਮੁਕਾਬਲੇ ਜ਼ਿਆਦਾ ਪਾਣੀ ਦੀ ਲੋੜ ਹੁੰਦੀ ਹੈ। ਕੱਟੜੂਆਂ ਦੇ ਸਰੀਰ ਦਾ 80% ਹਿੱਸਾ ਪਾਣੀ ਹੁੰਦਾ ਹੈ, ਜਦੋਂ ਕਿ ਲਵੇਰੀਆਂ ਦੇ ਸਰੀਰ ਵਿੱਚ ਇਹ ਤਕਰੀਬਨ 60% ਹੁੰਦਾ ਹੈ। ਇਕ ਮਹੀਨੇ ਦਾ ਕੱਟੜੂ 4-5 ਕਿਲੋ ਪਾਣੀ ਪੀ ਜਾਂਦਾ ਹੈ। ਜੇਕਰ ਪਾਣੀ ਘੱਟ ਪਿਲਾਈਏ ਤਾਂ ਉਸ ਦਾ ਸਰੀਰਕ ਵਿਕਾਸ ਰੁਕ ਜਾਂਦਾ ਹੈ। ਸਰੀਰਕ ਵਾਧੇ ਦੇ ਨਾਲ-ਨਾਲ ਉਨ੍ਹਾਂ ਦੀ ਪਾਣੀ ਦੀ ਜ਼ਰੂਰਤ ਵੀ ਵੱਧਦੀ ਹੈ। ਝੋਟੀਆਂ-ਵਹਿੜੀਆਂ ਦੇ ਪਹਿਲੀ ਵਾਰ ਆਸ ਲੱਗਣ ਤੇ ਇਹ ਲੋੜ ਸਥਿਰ ਹੋ ਜਾਂਦੀ ਹੈ।

3. **ਪਾਣੀ ਦਾ ਤਾਪਮਾਨ:** ਪੀਣ ਵਾਲਾ ਪਾਣੀ ਨਾ ਬਹੁਤਾ ਠੰਡਾ ਅਤੇ ਨਾ ਹੀ ਬਹੁਤਾ ਗਰਮ ਹੋਣਾ ਚਾਹੀਦਾ ਹੈ । ਇਸ ਦਾ ਤਾਪਮਾਨ ਲੱਗਭਗ 25° ਸੈਂਟੀਗਰੇਡ ਦੇ ਆਸ-ਪਾਸ ਹੋਣਾ ਚਾਹੀਦਾ ਹੈ । ਜਿਆਦਾ ਗਰਮ ਜਾਂ ਠੰਡਾ ਪਾਣੀ ਪਿਲਾਉਣ ਨਾਲ ਪਸ਼ੂ ਪਾਣੀ ਘੱਟ ਪੀਂਦੇ ਹਨ, ਜਿਸ ਨਾਲ ਉਨ੍ਹਾਂ ਦੀ ਸਰੀਰਕ ਲੋੜ ਪੂਰੀ ਨਹੀਂ ਹੁੰਦੀ ਤੇ ਜਿਸ ਦਾ ਅਸਰ ਦੁੱਧ ਤੇ ਪੈਂਦਾ ਹੈ । ਹਰ ਦੋ ਘੰਟਿਆਂ ਬਾਅਦ ਜੇ ਮੋਟਰ ਚੱਲੇ, ਤਾਂ ਗਰਮੀਆਂ ਵਿੱਚ ਠੰਡਾ ਤੇ ਸਰਦੀਆਂ ਵਿੱਚ ਕੋਸ਼ਾ ਪਾਣੀ ਆਪੇ ਹੀ ਆ ਜਾਣਾ ਹੈ ।
4. **ਜੱਦ:** ਦੇਸੀ ਗਾਵਾਂ ਨੂੰ ਵਲੈਤੀ ਗਾਈਆਂ ਦੇ ਮੁਕਾਬਲੇ ਘੱਟ ਪਾਣੀ ਦੀ ਲੋੜ ਹੁੰਦੀ ਹੈ । ਮੱਝਾਂ ਨੂੰ ਗਾਵਾਂ ਦੇ ਮੁਕਾਬਲੇ ਪੀਣ ਲਈ ਜਿਆਦਾ ਪਾਣੀ ਚਾਹੀਦਾ ਹੈ । ਵੈਸੇ ਵੀ ਗਰਮੀਆ ਦੇ ਮਹੀਨੇ ਮੱਝਾਂ ਨੂੰ ਤੰਦਰੁਸਤ ਰਖਣ ਲਈ ਉਨ੍ਹਾਂ ਨੂੰ ਨੁਹਾਉਣਾ ਬਹੁਤ ਜ਼ਰੂਰੀ ਹੈ । ਇਸ ਲਈ ਮੱਝਾਂ ਨੂੰ ਕਿਸੇ ਟੋਭੇ ਜਾਂ ਫਾਰਮ ਤੇ ਹੀ ਬਣਾਏ ਗਏ ਛੱਪੜ ਵਿੱਚ ਛੱਡਿਆ ਜਾਣਾ ਚਾਹੀਦਾ ਹੈ ।
5. **ਕਸਰਤ:** ਖੁੱਲੇ ਛੱਡੇ ਪਸ਼ੂਆਂ ਨੂੰ ਹਰ ਸਮੇਂ ਬੰਨ੍ਹ ਕੇ ਰੱਖੇ ਪਸ਼ੂਆਂ ਦੇ ਮੁਕਾਬਲੇ ਜਿਆਦਾ ਪਾਣੀ ਦੀ ਜ਼ਰੂਰਤ ਪੈਂਦੀ ਹੈ ।
6. **ਇਲਾਕਾ:** ਪੰਜਾਬ ਦੇ ਦੱਖਣ-ਪੱਛਮੀ ਜ਼ਿਲਿਆਂ ਵਿੱਚ ਪਸ਼ੂਆਂ ਨੂੰ ਜਿਆਦਾ ਪਾਣੀ ਦੀ ਜ਼ਰੂਰਤ ਪੈਂਦੀ ਹੈ ਕਿਉਂਕਿ ਇਨ੍ਹਾਂ ਇਲਾਕਿਆਂ ਵਿੱਚ ਵਰਖਾ ਘੱਟ ਹੁੰਦੀ ਹੈ ।
7. **ਸ਼ੁੱਧਤਾ:** ਲਵੇਰੇ ਸਾਫ਼ ਪਾਣੀ ਨੂੰ ਹਮੇਸ਼ਾਂ ਗੰਧਲੇ ਪਾਣੀ ਦੇ ਮੁਕਾਬਲੇ ਜਿਆਦਾ ਪੀਂਦੇ ਹਨ ।
8. **ਗੱਭਣ ਪਸ਼ੂ:** ਗੱਭਣ ਪਸ਼ੂਆਂ ਦੀ ਦੂਸਰੇ ਪਸ਼ੂਆਂ ਦੇ ਮੁਕਾਬਲੇ ਪਾਣੀ ਦੀ ਜ਼ਰੂਰਤ ਜਿਆਦਾ ਹੁੰਦੀ ਹੈ ।
9. **ਹਰਾ ਚਾਰਾ ਅਤੇ ਤੂੜੀ ਦਾ ਅਨੁਪਾਤ:** ਹਰਾ ਚਾਰਾ ਖਾਸ ਕਰਕੇ ਬਰਸੀਮ ਅਤੇ ਲੂਸਣ ਆਦਿ ਖਾਣ ਨਾਲ ਪਸ਼ੂ ਘੱਟ ਪਾਣੀ ਪੀਂਦੇ ਹਨ । ਜਿਆਦਾ ਤੂੜੀ ਖਾਣ ਕਰਕੇ ਪਾਣੀ ਦੀ ਲੋੜ ਵੱਧ ਜਾਂਦੀ ਹੈ । ਪੱਠਿਆਂ ਵਿੱਚ ਹਜਮ ਨਾ ਹੋਣ ਵਾਲੇ ਤੱਤ ਜਿੰਨੇ ਜਿਆਦਾ ਹੋਣਗੇ ਉਨ੍ਹਾਂ ਹੀ ਗੋਹਾ ਜਿਆਦਾ ਬਣੇਗਾ ਤੇ ਉਨ੍ਹੀ ਹੀ ਪਾਣੀ ਦੀ

ਲੋੜ ਵੱਧ ਜਾਏਗੀ । ਜੇਕਰ ਖੁਰਾਕ ਵਿੱਚ ਖ਼ਲ੍ਹਾਂ ਲੋੜ ਤੋਂ ਵੱਧ ਹੋਣ ਤਾਂ ਵੀ ਪਸ਼ੂ ਪਾਣੀ ਵੱਧ ਪੀਏਗਾ ਕਿਉਂਕਿ ਖ਼ਲ੍ਹਾਂ ਤੋਂ ਯੂਰੀਆ ਬਣਦਾ ਹੈ ਤੇ ਵਾਧੂ ਯੂਰੀਏ ਨੂੰ ਪਿਸ਼ਾਬ ਰਾਹੀਂ ਬਾਹਰ ਕਢਣ ਲਈ ਵਧੇਰੇ ਪਾਣੀ ਦੀ ਲੋੜ ਪੈਂਦੀ ਹੈ ।

10. **ਦੁੱਧ ਦੀ ਪੈਦਾਵਾਰ:** ਇਕ ਕਿਲੋ ਦੁੱਧ ਪੈਦਾ ਕਰਨ ਲਈ ਤਕਰੀਬਨ 5 ਲਿਟਰ ਪਾਣੀ ਚਾਹੀਦਾ ਹੈ । ਜਿੰਨਾ ਜਿਆਦਾ ਦੁੱਧ ਉਨ੍ਹੀ ਹੀ ਪਾਣੀ ਦੀ ਮਿਕਦਾਰ ਵੱਧ ।
11. **ਖੁਰਾਕ ਵਿੱਚ ਨਮਕ ਦੀ ਮਾਤਰਾ:** ਖੁਰਾਕ ਵਿੱਚ ਔਸਤਨ ਇੱਕ ਫੀਸਦੀ ਨਮਕ ਹੋਣਾ ਚਾਹੀਦਾ ਹੈ । ਨਮਕ ਰਹਿਤ ਖੁਰਾਕ ਸਦਕਾ ਲਵੇਰੇ ਪਾਣੀ ਘੱਟ ਪੀਣਗੇ ਤੇ ਜੇਕਰ ਨਮਕ ਵੱਧ ਜਾਏ ਤਾਂ ਵਾਧੂ ਸੋਡੀਅਮ ਨੂੰ ਕਢਣ ਲਈ ਪਾਣੀ ਵੱਧ ਚਾਹੀਦਾ ਹੈ ।

ਲਵੇਰਿਆਂ ਲਈ ਪਾਣੀ ਦੀ ਉਪਲੱਭਤਾ

ਪਾਣੀ - ਹਰੇ ਚਾਰੇ, ਵੰਡ, ਸਰੀਰਕ ਕ੍ਰਿਆਵਾਂ ਤੋਂ ਉਤਪੰਨ ਅਤੇ ਆਮ ਪੀਣ ਵਾਲੇ ਪਾਣੀ ਤੋਂ ਮਿਲਦਾ ਹੈ । ਚਾਰੇ, ਵੰਡ ਅਤੇ ਸਰੀਰਕ ਕ੍ਰਿਆਵਾਂ ਵਾਲੇ ਪਾਣੀ ਦੀ ਮਾਤਰਾ ਬਹੁਤ ਘੱਟ ਹੁੰਦੀ ਹੈ । ਪਰ ਇਹ ਥੋੜੀ ਮਾਤਰਾ ਕਈ ਕਿਸਮ ਦੇ ਦਬਾਅ, ਬਿਮਾਰੀਆਂ ਅਤੇ ਗਰਮੀ ਸਰਦੀ ਤੋਂ ਬਚਾਅ ਲਈ ਅਹਿਮ ਸਿੱਧ ਹੁੰਦੀ ਹੈ । ਵੱਖ-ਵੱਖ ਖੁਰਾਕੀ ਅੰਸ਼ਾਂ ਵਿੱਚ ਪਾਣੀ ਜਾਣ ਵਾਲੀ ਮਾਤਰਾ ਸੂਚੀ ਨੰਬਰ 1 ਵਿੱਚ ਦਿੱਤੀ ਗਈ ਹੈ ।

ਸਰੀਰਕ ਕ੍ਰਿਆਵਾਂ ਸਦਕਾ ਖੁਰਾਕੀ ਅੰਸ਼ ਵਰਤਣ ਸਮੇਂ ਉਤਪੰਨ ਹੋਇਆ ਪਾਣੀ ਸੂਚੀ ਨੰਬਰ 2 ਵਿੱਚ ਦਰਸਾਇਆ ਗਿਆ ਹੈ ।

ਪਾਣੀ ਦੇ ਸਰੋਤ

ਪਾਣੀ ਹੇਠ ਲਿਖਿਆਂ ਸੋਮਿਆਂ ਤੋਂ ਪ੍ਰਾਪਤ ਹੁੰਦਾ ਹੈ:

1. **ਮੀਂਹ ਦਾ ਪਾਣੀ:** ਇਹ ਪਾਣੀ ਪੀਣ ਯੋਗ ਹੁੰਦਾ ਹੈ । ਪ੍ਰੰਤੂ ਟੋਭੇ/ਛੱਪੜ ਵਿੱਚ ਇਕੱਠਾ ਹੋਣ ਸਮੇਂ ਇਸ ਵਿੱਚ ਮਿੱਟੀ, ਗਾਰਾ ਅਤੇ ਬਹੁਤ ਸਾਰੇ ਪ੍ਰਜੀਵੀਆਂ ਦੇ ਅੰਡੇ ਆ ਰਲਦੇ ਹਨ । ਫਿਰ ਇਹ ਪੀਣ ਦੇ ਕਾਬਿਲ ਨਹੀਂ ਰਹਿੰਦਾ ।



2. **ਨਹਿਰ ਜਾਂ ਦਰਿਆ ਦਾ ਪਾਣੀ:** ਨਹਿਰ ਜਾਂ ਦਰਿਆ ਦਾ ਪਾਣੀ ਸੁੱਧ ਹੁੰਦਾ ਹੈ, ਇਸ ਨੂੰ ਪੀਣ ਲਈ ਵਰਤਿਆ ਜਾ ਸਕਦਾ ਹੈ। ਸਾਰੇ ਪਸ਼ੂ ਇਸ ਪਾਣੀ ਨੂੰ ਤਰਜੀਹ ਦਿੰਦੇ ਹਨ। ਪ੍ਰੰਤੂ ਵੱਧਦੀ ਆਬਾਦੀ ਤੇ ਸ਼ਹਿਰਾਂ ਦੀ ਗੰਦਗੀ ਨਹਿਰਾਂ/ਦਰਿਆਵਾਂ ਵਿੱਚ ਸੁਟਣ ਸਦਕਾ ਇਹ ਪਾਣੀ ਹੁਣ ਗੰਦਾ ਹੋ ਗਿਆ ਹੈ ਤੇ ਆਮ ਤੌਰ ਤੇ ਪੀਣ ਦੇ ਕਾਬਿਲ ਨਹੀਂ ਰਿਹਾ।
3. **ਟੋਭੇ/ਛੱਪੜ ਦਾ ਪਾਣੀ:** ਇਹ ਪਾਣੀ ਆਮ ਤੌਰ ਤੇ ਗੰਦਾ ਹੁੰਦਾ ਹੈ। ਇਸ ਨੂੰ ਪਸ਼ੂਆਂ ਲਈ ਨਹੀਂ ਵਰਤਣਾ ਚਾਹੀਦਾ।
4. **ਖੂਹ ਜਾਂ ਬੰਬੀ ਦਾ ਪਾਣੀ:** ਡੇਅਰੀ ਫਾਰਮ ਤੇ ਟਿਊਬਵੈਲ ਦਾ ਪਾਣੀ ਸਭ ਤੋਂ ਮਹੱਤਵਪੂਰਨ ਹੈ। ਪਾਣੀ ਪੀਣ ਤੋਂ ਇਲਾਵਾ ਇਸ ਤੋਂ ਬਾਕੀ ਕੰਮ ਜਿਵੇਂ ਕਿ ਸ਼ੈਡ ਦੀ ਸਫਾਈ, ਪਸ਼ੂਆਂ ਦੀ ਸਫਾਈ, ਚਾਰਿਆਂ ਦੀ ਕਾਸ਼ਤ ਆਦਿ ਆਸਾਨੀ ਨਾਲ ਕੀਤੇ ਜਾ ਸਕਦੇ ਹਨ।

ਪਾਣੀ ਦੀ ਕੁਆਲਿਟੀ

ਪਾਣੀ ਜਿਹੜੇ ਮਰਜ਼ੀ ਸੋਮੇ ਤੋਂ ਲਿਆ ਗਿਆ ਹੋਵੇ, ਪਰ ਇਸ ਵਿੱਚ ਹੇਠ ਲਿਖੇ ਗੁਣ ਹੋਣੇ ਚਾਹੀਦੇ ਹਨ:

1. ਇਸ ਵਿੱਚੋਂ ਕੋਈ ਗੰਧ ਨਹੀਂ ਆਉਣੀ ਚਾਹੀਦੀ।
2. ਇਸ ਵਿੱਚ ਕੋਈ ਰੰਗ ਨਹੀਂ ਘੁਲਿਆ ਹੋਣਾ ਚਾਹੀਦਾ।
3. ਇਸ ਦਾ ਕੋਈ ਸਵਾਦ ਨਹੀਂ ਹੋਣਾ ਚਾਹੀਦਾ।
4. ਇਸ ਵਿੱਚ ਕੋਈ ਜ਼ਹਿਰੀਲਾ ਮਾਦਾ ਨਹੀਂ ਹੋਣਾ ਚਾਹੀਦਾ।
5. ਇਹ ਰਸਾਇਣਕ ਪਦਾਰਥਾਂ ਤੋਂ ਮੁਕਤ ਹੋਣਾ ਚਾਹੀਦਾ ਹੈ।
6. ਇਸ ਵਿੱਚ ਕਿਸੇ ਕਿਸਮ ਦੇ ਕਿਟਾਣੂ ਨਹੀਂ ਹੋਣੇ ਚਾਹੀਦੇ।

ਪਾਣੀ ਵਿੱਚ ਗੰਧ, ਰੰਗ, ਆਦਿ ਜਾਨਵਰ ਜਲਦੀ ਪਛਾਣ ਜਾਂਦੇ ਹਨ ਤੇ ਉਹ ਪਾਣੀ ਹੀ ਨਹੀਂ ਪੀਂਦੇ। ਇਸ ਤੋਂ ਇਲਾਵਾ ਜੇ ਪਾਣੀ'ਚ ਜ਼ਹਿਰੀਲੇ ਪਦਾਰਥ, ਕੁਝ ਘੁੱਲਣਸ਼ੀਲ ਪਦਾਰਥ ਤੇ ਪਾਣੀ ਦਾ ਭਾਰਾਪਨ; ਖਾਸ ਮਾਤਰਾ ਤੋਂ ਵੱਧ ਜਾਏ ਤਾਂ ਜਾਨਵਰਾਂ ਦੀ ਸਿਹਤ ਤੇ ਮਾੜਾ ਅਸਰ ਪੈਂਦਾ ਹੈ। ਸੁੱਧ ਪਾਣੀ ਵਿੱਚ ਪਾਏ ਜਾਣ ਦੀ ਮਾਤਰਾ ਤੇ ਇਨ੍ਹਾਂ ਪਦਾਰਥਾਂ ਦੀ ਵੱਧ ਤੋਂ ਵੱਧ ਮਿਕਦਾਰ ਕਿੰਨੀ ਹੋਣੀ ਚਾਹੀਦੀ ਹੈ, ਸੂਚੀ ਨੰਬਰ 3 ਵਿੱਚ ਦਿੱਤੀ ਗਈ ਹੈ।

ਪਾਣੀ ਵਿੱਚ ਨਮਕ ਦੀ ਮਾਤਰਾ ਸੋਡੀਅਮ ਕਲੋਰਾਈਡ ਤੋਂ ਇਲਾਵਾ ਕਾਰਬੋਨੇਟ, ਸਲਫੇਟ, ਨਾਈਟ੍ਰੇਟ, ਪੌਟਾਸ਼ੀਅਮ ਆਦਿ ਨਾਲ ਵੀ ਹੁੰਦੀ ਹੈ। ਪਾਣੀ ਵਿੱਚ ਵਧੇਰੇ ਨਮਕ (2500 ਪੀਪੀਐਮ) ਹੋਣ ਕਰਕੇ ਜਾਨਵਰ ਦੇ ਖੂਨ ਦਾ ਦਬਾਅ ਵੱਧਦਾ ਹੈ ਤੇ ਉਸ ਨੂੰ ਪਾਣੀ ਪੀਣ ਦੀ ਤਾਂਘ ਹੁੰਦੀ ਹੈ। ਆਮ ਹਾਲਾਤਾਂ ਨਾਲੋਂ ਜਾਨਵਰ ਦੀ ਪਿਆਸ 7% ਵੱਧ ਜਾਂਦੀ ਹੈ। ਪਰ ਇਸ ਦੇ ਉਲਟ ਖੁਰਾਕ ਖਾਣ ਦੀ ਸੱਮਰਥਾ ਤੇ ਦੁੱਧ ਦੀ ਪੈਦਾਵਾਰ ਘੱਟ ਜਾਂਦੀ

ਹੈ। ਵਧੇਰੇ ਨਮਕ ਪਸ਼ੂ ਦੇ ਪਿਸ਼ਾਬ ਤੇ ਗੋਰੇ ਰਾਹੀਂ ਬਾਹਰ ਨਿਕਲਦਾ ਹੈ ਜਿਸ ਦਾ ਅਸਰ ਪਸ਼ੂਆਂ ਦੇ ਗੁਰਦੇ ਤੇ ਪੈਂਦਾ ਹੈ। ਜੇ ਇਹੋ ਜਿਹਾ ਪਾਣੀ ਲੰਬੇ ਸਮੇਂ ਤਕ ਮਿਲਦਾ ਰਹੇ ਤਾਂ ਪ੍ਰਜਨਣ ਅੰਗਾਂ ਤੇ ਵੀ ਮਾੜਾ ਅਸਰ ਪੈਂਦਾ ਹੈ।

ਪਾਣੀ ਵਿੱਚ ਨਾਈਟ੍ਰੇਟ ਦੀ ਮਾਤਰਾ ਵੱਧ ਹੋਣ ਨਾਲ ਜਿੱਥੇ ਪਸ਼ੂ ਪਾਣੀ ਘੱਟ ਪੀਂਦਾ ਹੈ ਉਥੇ ਪਸ਼ੂ ਦੀ ਉਝਰੀ (ਰਿਊਮਨ) ਵਿੱਚ ਕੀਟਾਣੂ ਇਸ ਨੂੰ ਨਾਈਟ੍ਰਾਈਟ ਵਿੱਚ ਬਦਲ ਦਿੰਦੇ ਹਨ। ਨਾਈਟ੍ਰਾਈਟ ਖੂਨ ਵਿੱਚ ਹਿਮੋਗਲੋਬਿਨ ਨੂੰ ਮੈਥ-ਹਿਮੋਗਲੋਬਿਨ ਵਿੱਚ ਬਦਲ ਦਿੰਦਾ ਹੈ ਜਿਸ ਦੇ ਨਾਲ ਖੂਨ ਦੀ ਆਕਸੀਜਨ ਲੈ ਕੇ ਜਾਣ ਦੀ ਸ਼ਕਤੀ ਘੱਟ ਜਾਂਦੀ ਹੈ। ਹਰ ਇਕ ਸਰੀਰ ਦੇ ਸੈਲ, ਤੰਤੂ ਨੂੰ ਆਕਸੀਜਨ ਚਾਹੀਦੀ ਹੈ ਤੇ ਜੇ ਘੱਟ ਮਿਲੇ ਤਾਂ ਪਸ਼ੂ ਦੀ ਸਿਹਤ ਤੇ ਮਾੜਾ ਅਸਰ ਪੈਂਦਾ ਹੈ। ਜਾਨਵਰ ਤੂ ਸਕਦਾ ਹੈ, ਜੇਰ ਨਹੀਂ ਪੈਂਦੀ, ਹੇਰੇ'ਚ ਨਹੀਂ ਆਉਂਦਾ, ਬੋਲਦੀ ਨਹੀਂ ਤੇ ਜਾਂ ਠਹਿਰਦੀ ਨਹੀਂ ਆਦਿ ਸੱਮਸਿਆਵਾਂ ਹੋ ਸਕਦੀਆਂ ਹਨ। ਪਸ਼ੂਆਂ ਦੇ ਪਾਣੀ ਵਿੱਚ ਨਾਈਟ੍ਰਾਈਟ ਦੀ ਸੱਮਸਿਆ ਉਸ ਵੇਲੇ ਵੱਧ ਜਾਂਦੀ ਹੈ ਜਦੋਂ ਪਸ਼ੂ ਛੱਪੜਾਂ ਤੋਂ ਪਾਣੀ ਪੀਂਦੇ ਹੋਣ। ਨਾਈਟ੍ਰੇਟ ਤੇ ਨਾਈਟ੍ਰਾਈਟ ਦੀ ਮਾਤਰਾ ਦਾ ਪਸ਼ੂਆਂ ਦੀ ਸਿਹਤ ਤੇ ਹੋਣ ਵਾਲਾ ਅਸਰ ਸੂਚੀ ਨੰਬਰ 4 ਵਿੱਚ ਦਰਸਾਇਆ ਗਿਆ ਹੈ।

ਪਾਣੀ ਦਾ ਭਾਰਾਪਨ ਉਸ ਵਿੱਚ ਪਾਈਆਂ ਜਾਣ ਵਾਲੀਆਂ ਧਾਤਾਂ ਸਦਕਾ ਹੁੰਦਾ ਹੈ; ਖਾਸ ਕਰਕੇ ਕੈਲਸ਼ੀਅਮ ਤੇ ਮੈਗਨੀਸ਼ੀਅਮ। ਇਸ ਤੋਂ ਇਲਾਵਾ ਪੌਟਾਸ਼ੀਅਮ, ਗੰਧਕ ਤੇ ਸੋਡੀਅਮ ਕਲੋਰਾਈਡ ਕਰਕੇ ਵੀ ਪਾਣੀ ਭਾਰਾ ਹੋ ਸਕਦਾ ਹੈ। ਸੂਚੀ ਨੰਬਰ 5 ਵਿੱਚ ਪਾਣੀ ਦੇ ਭਾਰੇਪਨ ਨੂੰ ਵੱਖ-ਵੱਖ ਸ਼੍ਰੇਣੀਆਂ ਵਿੱਚ ਵੰਡਿਆ ਗਿਆ ਹੈ।

ਪਾਣੀ ਦੇ ਭਾਰੇਪਨ ਦਾ ਜਾਨਵਰਾਂ ਦੀ ਸਿਹਤ ਤੇ ਪ੍ਰਜਨਣ ਕ੍ਰਿਆਵਾਂ ਤੇ ਕੋਈ ਸਿੱਧਾ ਮਾੜਾ ਅਸਰ ਨਹੀਂ ਪੈਂਦਾ। ਪਰ ਬਾਲਟੀਆਂ, ਭਾਂਡੇ ਤੇ ਪਾਣੀ ਦੀਆਂ ਪਾਈਪਾਂ ਜਲਦੀ ਖਰਾਬ ਹੋ ਸਕਦੀਆਂ ਹਨ। ਕੈਲਸ਼ੀਅਮ ਵੱਧ ਹੋਣ ਕਾਰਣ ਦੂਸਰੇ ਖਣਿਜ ਪਦਾਰਥਾਂ ਦੀ ਘਾਟ ਹੋ ਸਕਦੀ ਹੈ ਖਾਸ ਕਰਕੇ ਫਾਸਫੋਰਸ ਦੀ। ਪ੍ਰੋਟੀਨ ਅਤੇ ਨਿਸ਼ਾਸਤਾ ਘੱਟ ਹਜਮ ਹੁੰਦੇ ਹਨ। ਮੈਗਨੀਸ਼ੀਅਮ ਵੱਧ ਹੋਣ ਕਰਕੇ ਮੌਕ ਲੱਗ ਸਕਦੀ ਹੈ। ਗੰਧਕ ਵੱਧ ਹੋਣ ਕਰਕੇ ਸਰੀਰ'ਚ ਪਾਣੀ ਪੈ ਸਕਦਾ ਹੈ। ਵਰਤੀਆਂ ਜਾਂਦੀਆਂ ਦਵਾਈਆਂ ਦਾ ਅਸਰ ਵੀ ਘੱਟਦਾ ਹੈ। ਇਸ ਲਈ ਖੁਰਾਕ'ਚ ਧਾਤਾਂ ਦਾ ਮਿਸ਼ਰਣ ਵਰਤਣ ਤੋਂ ਪਹਿਲਾਂ ਆਪਣੀ ਜਮੀਨ ਤੇ ਪਾਣੀ ਵਿਚਲੀਆਂ ਵੱਖ-ਵੱਖ ਧਾਤਾਂ ਦਾ ਪਤਾ ਲਗਾ ਲੈਣਾ ਚਾਹੀਦਾ ਹੈ। ਕਈ ਵਾਰ ਪਾਣੀ ਦੇ ਭਾਰੇਪਨ ਸਦਕਾ ਹੀ ਜਾਨਵਰ ਦੀ 20-40% ਸੋਡੀਅਮ, 7-25% ਕੈਲਸ਼ੀਅਮ, 6-9% ਮੈਗਨੀਸ਼ੀਅਮ ਤੇ 20-35% ਗੰਧਕ ਦੀ ਪੂਰਤੀ ਹੋ ਸਕਦੀ ਹੈ।

ਪਾਣੀ ਪਿਲਾਉਣ ਦਾ ਤਰੀਕਾ

ਖੁੱਲੇ ਛੱਡੇ ਲਵੇਰਿਆਂ ਨੂੰ ਪਾਣੀ ਕੁੰਡ/ਹੌਦੀ ਵਿਚੋਂ ਪਿਲਾਉਣਾ ਚਾਹੀਦਾ ਹੈ। ਪਾਣੀ ਦੀ ਹੌਦੀ ਸ਼ੈਡ ਦੇ ਇਕ ਪਾਸੇ ਬਣਾਈ ਜਾ ਸਕਦੀ ਹੈ। ਇਹ ਹਮੇਸ਼ਾਂ ਖੱਕੀ ਹੋਣੀ ਚਾਹੀਦੀ ਹੈ। ਇਸ ਦੇ ਖੁੱਜੇ ਗੋਲਾਈ ਵਿੱਚ ਹੋਣ ਤੇ ਇਸ ਦੇ ਅੰਦਰ ਪਾਣੀ ਕਿਸੇ ਵੀ ਹਾਲਾਤ ਵਿੱਚ ਰਿਸਦਾ ਨਾ ਹੋਵੇ। ਹੌਦੀ ਦੀ ਚੌੜਾਈ 5 ਫੁੱਟ ਤੇ ਡੂੰਘਾਈ ਸਵਾ ਤਿੰਨ ਫੁੱਟ ਦੇ ਕਰੀਬ ਹੋਣੀ ਚਾਹੀਦੀ ਹੈ। ਇਸ ਦੀ ਲੰਬਾਈ ਪਸ਼ੂਆਂ ਦੀ ਗਿਣਤੀ ਤੇ ਨਿਰਭਰ ਕਰਦੀ ਹੈ ਜਾਂ ਵੱਖ-ਵੱਖ ਆਕਾਰ ਦੀਆਂ ਹੌਦੀਆਂ ਵੱਖ-ਵੱਖ ਸ਼੍ਰੇਣੀ ਦੇ ਜਾਨਵਰਾਂ ਵਾਸਤੇ ਵੀ ਬਣਾਈਆਂ ਜਾ ਸਕਦੀਆਂ ਹਨ। ਇਕ ਘੱਟ ਫੁੱਟ ਵਿੱਚ ਤਕਰੀਬਨ 28 ਲਿਟਰ ਪਾਣੀ ਆ ਜਾਂਦਾ ਹੈ। ਸਾਨੂੰ ਚਾਹੀਦਾ ਹੈ ਕਿ ਹੌਦੀ ਦੀ ਸਮਰੱਥਾ ਇੰਨੀ ਕੁ ਹੋਵੇ ਕਿ ਪ੍ਰਤੀ ਜਾਨਵਰ 60 ਲਿਟਰ ਪਾਣੀ ਮਿਲ ਸਕੇ। ਹੌਦੀ ਹਮੇਸ਼ਾਂ ਛਾਂ ਹੇਠ ਬਨਾਉਣੀ ਚਾਹੀਦੀ ਹੈ ਤਾਂ ਕਿ ਇਸ ਵਿੱਚ ਕੋਈ ਕੱਖ, ਮਿੱਟੀ ਆਦਿ ਨਾ ਆਵੇ ਤੇ ਇਸ ਵਿੱਚ ਕੀਟਾਣੂ ਨਾ ਵਧਣ, ਦੂਜਾ ਪਾਣੀ ਜਿਆਦਾ ਗਰਮ ਤੇ ਠੰਡਾ ਵੀ ਨਾ ਹੋਵੇ ਕਿ ਪਸ਼ੂ ਲੋੜ ਪੈਣ ਤੇ ਪਾਣੀ ਪੀ ਵੀ ਨਾ ਸਕਣ।



ਪਾਣੀ ਨੂੰ ਕਿਰਮ ਰਹਿਤ ਕਰਨਾ

ਪਾਣੀ ਵਿੱਚ ਕੋਈ ਵੀ ਹਾਨੀਕਾਰਕ ਕੀਟਾਣੂ ਨਹੀਂ ਹੋਣਾ ਚਾਹੀਦਾ। ਕਈ ਵਾਰ ਖੜੇ ਪਾਣੀ ਜਾਂ ਹੌਦੀ ਖੁੱਲੇ 'ਚ ਹੋਣ ਕਰਕੇ ਕੀਟਾਣੂਆਂ ਦੀ ਗਿਣਤੀ ਵੱਧ ਸਕਦੀ ਹੈ। ਪਾਣੀ ਨੂੰ ਕਿਰਮ ਰਹਿਤ ਕਰਨ ਲਈ ਬਾਜਾਰ 'ਚ ਕਈ ਤਰ੍ਹਾਂ ਦੀਆਂ ਦਵਾਈਆਂ ਮਿਲਦੀਆਂ ਹਨ ਪਰ ਅਜੇ ਵੀ ਕਲੋਰੀਨ ਦੀਆਂ ਗੋਲੀਆਂ ਜਾਂ ਬਲੀਚਿੰਗ ਪਾਊਡਰ ਸਸਤੇ ਤੇ ਉਪਯੋਗੀ ਹਨ। 5 ਗ੍ਰਾਮ ਬਲੀਚਿੰਗ ਪਾਊਡਰ ਜਿਸ ਵਿੱਚ ਕਲੋਰੀਨ ਦੀ ਮਾਤਰਾ 35% ਹੋਵੇ 1000 ਲਿਟਰ ਪਾਣੀ ਲਈ ਜ਼ਰੂਰੀ ਹੈ। ਇਸੇ ਤਰ੍ਹਾਂ ਕਲੋਰੀਨ ਡਾਇਆਕਸਾਈਡ 0.5%, ਇਕ ਮਿ.ਲੀ. ਪ੍ਰਤੀ 10

ਲਿਟਰ ਪਾਣੀ ਪਿੱਛੇ ਵਰਤ ਸਕਦੇ ਹਾਂ। ਪਾਣੀ ਨੂੰ ਕਿਰਮ ਰਹਿਤ ਕਰਨ ਲਈ ਕਲੋਰੀਨ ਦੀ ਮਿਕਦਾਰ ਇਕ ਪੀ.ਪੀ.ਐਮ ਹੋਣੀ ਚਾਹੀਦੀ ਹੈ। ਕਲੋਰੀਨ ਦੀਆਂ ਗੋਲੀਆਂ ਜਾਂ ਬਲੀਚਿੰਗ ਪਾਊਡਰ ਵਰਤਣ ਤੋਂ ਬਾਅਦ ਪਾਣੀ ਇਕ ਘੰਟਾ ਘੱਟੋ-ਘੱਟ ਨਹੀਂ ਵਰਤਣਾ। ਇਸ ਕਰਕੇ ਪਾਣੀ ਨੂੰ ਰਾਤ ਨੂੰ ਕਿਰਮ ਰਹਿਤ ਕਰੋ। ਇਸ ਤੋਂ ਇਲਾਵਾ ਪਾਣੀ ਨੂੰ ਕਿਰਮ ਰਹਿਤ ਕਰਨ ਲਈ 1 ਮਿ.ਲੀ. ਸਿਰਕਾ ਪ੍ਰਤੀ 5 ਲਿਟਰ ਪਾਣੀ ਦੇ ਹਿਸਾਬ ਨਾਲ ਵਰਤਿਆ ਜਾ ਸਕਦਾ ਹੈ। ਹੌਦੀ ਵਿੱਚ ਹਰਿਆਲੀ ਰੋਕਣ ਲਈ 2000 ਲਿਟਰ ਪਾਣੀ ਪਿੱਛੇ ਡੇਢ ਗ੍ਰਾਮ ਨੀਲਾ ਥੋਥਾ ਘੋਲ ਸਕਦੇ ਹਾਂ। ਕੁਝ ਹੋਰ ਨਹੀਂ ਤਾਂ ਹੌਦੀ ਨੂੰ ਅੰਦਰਲੇ ਪਾਸਿਉਂ ਕਲੀ ਤਾਂ ਕਰ ਹੀ ਸਕਦੇ ਹਾਂ।

ਪਾਣੀ ਪਿਲਾਉਣ ਦਾ ਸਮਾਂ

ਲਵੇਰਿਆਂ ਲਈ ਪਾਣੀ 24 ਘੰਟੇ ਉਪਲੱਭਤ ਹੋਣਾ ਚਾਹੀਦਾ ਹੈ ਤਾਂ ਕਿ ਉਹ ਲੋੜ ਅਨੁਸਾਰ ਇਸਨੂੰ ਪੀ ਸਕਣ। ਜੇ ਜਾਨਵਰਾਂ ਨੂੰ ਉਨ੍ਹਾਂ ਦੀ ਮਰਜ਼ੀ ਮੁਤਾਬਿਕ ਪਾਣੀ ਮਿਲਦਾ ਰਹੇ ਤਾਂ ਉਹ ਵਧੇਰੇ ਦੁੱਧ ਦਿੰਦੇ ਹਨ। ਜੇਕਰ ਇਨ੍ਹਾਂ ਨੂੰ ਬੰਨ੍ਹ ਕੇ ਰੱਖਿਆ ਹੋਵੇ ਤੇ ਦਿਨ ਵਿੱਚ 2-4 ਵਾਰੀ ਪਾਣੀ ਪਿਲਾਉਣ ਦੇ ਬਾਵਜੂਦ ਇਹ ਵਧੇਰੇ ਦੁੱਧ ਨਹੀਂ ਦੇਣਗੇ।

ਇਸ ਕਰਕੇ ਉਮੀਦ ਹੈ ਕਿ ਪਸ਼ੂ ਪਾਲਕ ਇਸ ਲੇਖ ਨੂੰ ਪੜ੍ਹ ਕੇ ਆਪਣੇ ਪਸ਼ੂਆਂ ਲਈ ਵਰਤੇ ਜਾਂਦੇ ਪਾਣੀ ਬਾਰੇ ਥੋੜਾ ਸੁਚੇਤ ਹੋਣਗੇ ਤੇ ਇਹ ਨਿਸ਼ਚਿਤ ਬਨਾਉਣਗੇ ਕਿ ਹਰ ਪਸ਼ੂ ਨੂੰ ਪਾਣੀ ਸਾਫ਼ ਸੁਥਰਾ, ਤਾਜ਼ਾ ਅਤੇ ਖੁੱਲ੍ਹਾ ਮਿਲਦਾ ਰਹੇ ਤੇ ਉਹ ਤੁਹਾਡੀਆਂ ਬਾਲਟੀਆਂ ਭਰਦਾ ਰਹੇ।

ਸੂਚੀ ਨੰਬਰ 1: ਖੁਰਾਕੀ ਅੰਸ਼ਾਂ ਤੋਂ ਉਪਲੱਭਤ ਪਾਣੀ

ਲੜੀ ਨੰ	ਖੁਰਾਕ	ਪਾਣੀ (%)
1	ਹਰਾ ਚਾਰਾ	75
2	ਹਰੇ ਦਾ ਆਚਾਰ	70
3	ਭੋਅ	18
4	ਤੂੜੀ/ਪਰਾਲੀ	10
5	ਦਾਣਾ, ਵੰਡ, ਚੌਕਰ, ਪਾਲਿਸ਼ ਆਦਿ	10

ਸੂਚੀ ਨੰਬਰ 2: ਸਰੀਰਕ ਕ੍ਰਿਆਵਾਂ ਤੋਂ ਉਤਪੰਨ ਪਾਣੀ

ਲੜੀ ਨੰ	ਖੁਰਾਕੀ ਅੰਸ਼	ਉਤਪੰਨ ਪਾਣੀ (%)
1	ਪ੍ਰੋਟੀਨ	40
2	ਨਿਸ਼ਾਸਤਾ	60
3	ਬਿੰਦਿਆਈ	107

ਸੂਚੀ ਨੰਬਰ 3: ਪਾਣੀ ਵਿੱਚ ਲੋੜੀਂਦੇ ਅਤੇ ਵੱਧ ਤੋਂ ਵੱਧ ਸੁੱਰਖਿਅਤ ਮਾਤਰਾ ਵਿੱਚ ਪਾਏ ਜਾਣ ਵਾਲੇ ਵੱਖ-ਵੱਖ ਅੰਸ਼

ਲੜੀ ਨੰ	ਅੰਸ਼	ਲੋੜੀਂਦੀ ਮਾਤਰਾ (ਪੀਪੀਐਮ)	ਵੱਧ ਤੋਂ ਵੱਧ ਮਾਤਰਾ (ਪੀਪੀਐਮ)
1	ਕੁਲ ਘੁਲਣਸ਼ੀਲ ਪਦਾਰਥ	1000	4000
2	ਕੁਲ ਨਮਕ	500	1000
3	ਕੁਲ ਖਾਰਾਪਨ	200	500
4	ਭਾਰਪਨ	150	350
5	ਪੀ ਐਚ	6.8-7.2	6.0-8.0
6	ਕੈਲਸ਼ੀਅਮ	200	500
7	ਮੈਗਨੀਸ਼ੀਅਮ	100	250
8	ਸੋਡੀਅਮ	200	1000
9	ਕਲੋਰਾਈਡ	300	1500
10	ਬਾਈਕਾਰਬੋਨੇਟ	200	500
11	ਸਲਫੇਟ	200	500
12	ਫਲੋਰਾਈਡ	0.5	2
13	ਨਾਈਟ੍ਰੇਟ	40	200
14	ਨਾਈਟ੍ਰਾਇਟ	0	1
15	ਲੋਹਾ	0	1
16	ਤਾਂਬਾ	0	1
17	ਮੈਗਨੀਜ਼	0	1
18	ਜਿਸਤ	2	1
19	ਪਾਰਾ	0	0.002
20	ਸਿੱਕਾ	0	0.05
21	ਸਲੀਨੀਅਮ	0	0.01
22	ਸਾਇਆਨਾਈਡ	0	0.015
23	ਅਮੋਨੀਆ	0	50
24	ਕੰਰਟ (ਮਿ:ਓਮਸ/ਸੈ.)	0	2500
25	ਕੀਟਾਨੂਆਂ ਦੀ ਗਿਣਤੀ /100 ਮਿ.ਲੀ.	0	2

ਸੂਚੀ ਨੰਬਰ 4: ਪਾਣੀ ਵਿੱਚ ਨਾਈਟ੍ਰੇਟ ਅਤੇ ਨਾਈਟ੍ਰਾਈਟ ਦੀ ਮਾਤਰਾ ਤੇ ਉਸ ਦਾ ਅਸਰ

ਲੜੀ ਨੰ	ਨਾਈਟ੍ਰੇਟ (ਪੀਪੀਐਮ)	ਨਾਈਟ੍ਰਾਈਟ (ਪੀਪੀਐਮ)	ਅਸਰ
1	0-40	10	ਕੋਈ ਅਸਰ ਨਹੀਂ
2	40-130	10-20	ਸੁੱਰਖਿਅਤ, ਪਰ ਖੁਰਾਕ 'ਚ ਨਾਈਟ੍ਰੇਟ ਦੀ ਮਾਤਰਾ ਘੱਟ ਹੋਏ
3	130-220	20-40	ਭੈੜਾ ਅਸਰ ਹੋ ਸਕਦਾ ਹੈ ਜੇ ਪਾਣੀ ਲੰਬੇ ਸਮੇਂ ਤੱਕ ਦਿੱਤਾ ਜਾਏ
4	220-600	40-100	ਮੌਤ ਹੋ ਸਕਦੀ ਹੈ
5	600 ਤੋਂ ਉਪਰ	100 ਤੋਂ ਉਪਰ	ਨਾਂ ਵਰਤੋ, ਮੌਤ ਯਕੀਨੀ ਹੈ

ਸੂਚੀ ਨੰਬਰ 5: ਪਾਣੀ ਦੇ ਭਾਰੇਪਨ ਦੀਆਂ ਵੱਖ-ਵੱਖ ਸ਼੍ਰੇਣੀਆਂ

ਲੜੀ ਨੰ	ਭਾਰੇਪਨ (ਮਿ.ਗ੍ਰਾਮ/ਲਿਟਰ)	ਵੇਰਵਾ
1	0-60	ਹਲਕਾ
2	61-120	ਦਰਮਿਆਨਾ
3	121-180	ਭਾਰਾ
4	180 ਤੋਂ ਉਪਰ	ਬਹੁਤ ਭਾਰਾ

ਪਰਮਿੰਦਰ ਸਿੰਘ

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Subclinical Mastitis: A Hidden Challenge Affecting the Feed Mill

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In India's competitive dairy feed industry, feed mills invest heavily in formulating high-performance products to improve productivity. However, there is an largely unseen challenge that can influence how farmers perceive feed effectiveness due to subclinical mastitis.

While this condition shows no visible symptoms in dairy cows, it results in reduced milk yield, lower productivity, and farmer dissatisfaction, influence how feed performance is perceived and may impact feed sales, brand reputation and customer perception.

What is Subclinical Mastitis?

Subclinical mastitis is an inflammation of the

udder that is not detected by visual inspection.

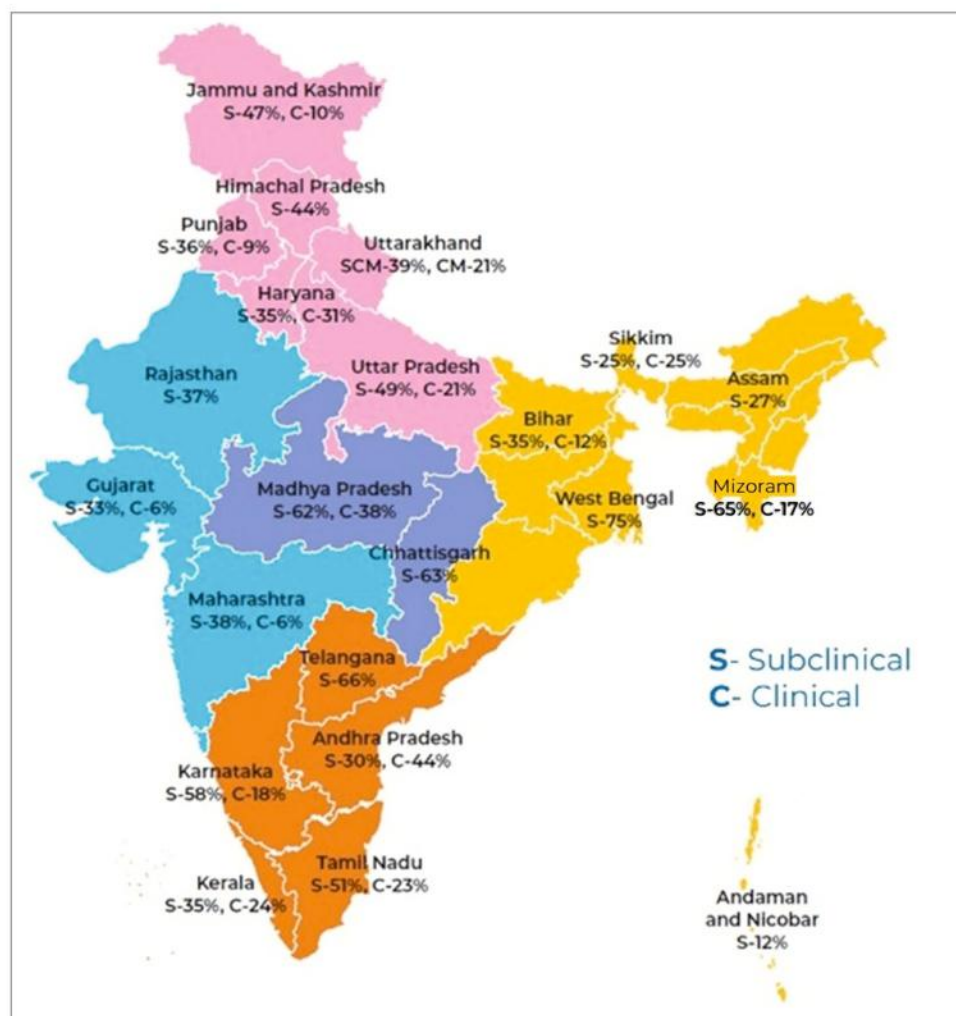
- Milk appears normal, but somatic cell count (SCC), a measurement of milk quality, is elevated.
- It often goes unnoticed for weeks.
- It may contribute to milk yield losses ranging from 05% to 25% depending on the severity of infection, stage of lactation, and herd management practices.
- It can reduce the processability of milk for procurement companies, for instance SCC can reduce paneer yield, as well milk product shelf life.

Subclinical mastitis is a herd-level management

challenge. Nutrition alone does not prevent or fix this condition, but appropriate nutrition can support overall tissue integrity and cow health, thereby helping to reduce the risk of subclinical mastitis.

Prevalence in India

This condition affects 12-70% of lactating cows depending on farm hygiene, region, and herd size (Krishnamoorthy *et al.*, 2021). These figures reflect industry-wide observations, not outcomes linked to feed or nutrition programs. The map was created using data from Research in Veterinary Science Volume 136, May 2021, Pages 561-586.



to show the incidences of subclinical and clinical mastitis by state. As you can see, instances of subclinical mastitis are high in every part of the country and can equal huge economic loss for the farmers, feed and dairy industries.

The Overlooked Challenge for Feed Mills

At first glance, a feed miller might not associate subclinical mastitis with feed performance. However, subclinical mastitis can influence how farmers evaluate their feed programs, especially when milk yield does not meet expectations.

When cows face health or management challenges, farmers may attribute reduced milk yield to feed quality—even when nutrition is not the root cause. This may influence their confidence in a feed brand and farmers may explore alternative nutritional strategies, which can affect feed purchasing patterns and possibly result in them taking their business elsewhere.

When outcomes vary due to on-farm conditions, especially due to sub-clinical mastitis, because feed is linked to cow performance, it can be difficult for feed mills to demonstrate the value of premium formulations and retain their customers. For this reason, sales and support teams may spend more time addressing farmer concerns, impacting time spent on developing new business for the mill.

Economic Impact Example: 1,000 MT Feed Mill (Monthly)

An example of how much opportunity can be lost due to subclinical mastitis:

For a feed mill producing 1,000 metric tons of feed per month, provides feed for approx. 6,500 cows every month (calculated as 5kg feed consumed per day). If 30% of 6,500 cows consume/offered half kg less feed per day due to subclinical mastitis, the mill would lose about

30 metric tons of feed in a month. This is nearly 3% of its total production. This is the opportunity lost within the mill's own customer base. In terms of revenue, assuming a price of ₹25 per kg, the monthly revenue loss would be around ₹7 lakh.

What is a Feed Mill to do?

Feed mills wanting to maintain customer satisfaction by supporting udder health have options.

The first is with the feed itself. Micro-nutrients, particularly trace minerals that are shown to support the immune system and tissue integrity. But not all minerals are the same. Prioritizing cow health with highly bioavailable trace minerals is key. Bis-chelated organic trace minerals are shown to have better absorption rates than inorganic trace minerals, ensuring more of the minerals in the ration are utilized by the cow.

Feed mills have a diverse customer base and not everyone may be as educated on the challenges that can reduce cow health, milk yield and dairy farm performance. Supporting farmer education on best practices for udder hygiene, milking routines, how to monitor SCC trends, and understanding how micro-nutrients support cow performance a few ways are feed mills can aid customers while also building their own credibility.

Mills can also encourage regular SCC/subclinical mastitis testing as part of herd-level monitoring. Feed programs can be evaluated alongside management practices to ensure farmers have a complete picture of cow performance

By supporting farmers with information, management insights, and consistent nutritional programs, feed mills can strengthen customer relationships and reinforce brand trust.



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