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DAIRY PLANNER

HARBIL/2004/22481

Title Code HARBIL00698

Vol. 22 | No. 08 | August - 2025

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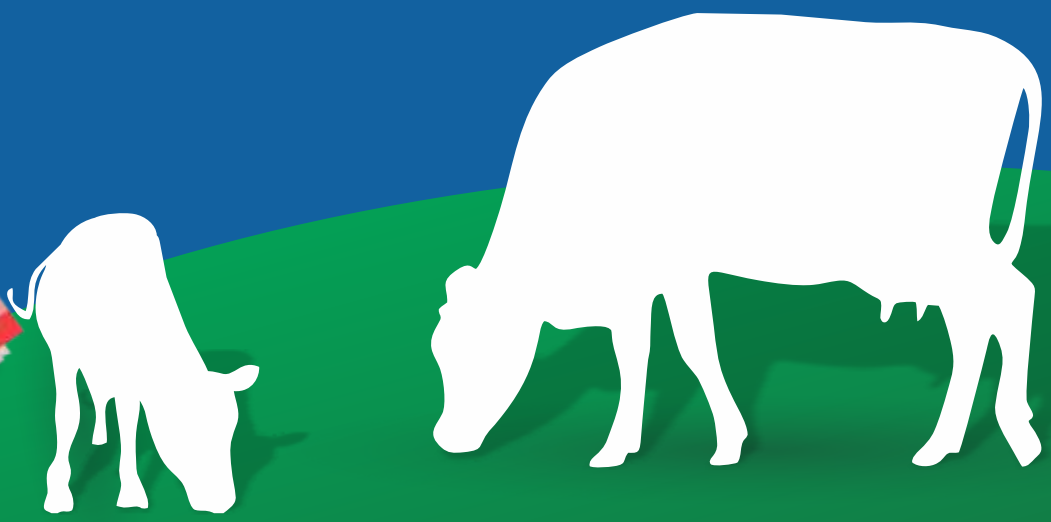

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From the Pen of Chief Editor

"Sustainability In Dairy: Securing Tomorrow, Today"

Sustainability in the dairy industry is no longer an option—it is an urgent responsibility. As climate change, resource scarcity, and environmental degradation challenge global agriculture, the dairy sector must adapt and innovate to ensure long-term viability while meeting the nutritional needs of a growing population.

A sustainable dairy system focuses on efficient use of natural resources such as water, land, and feed. By adopting eco-friendly practices like improved manure management, renewable energy integration, and climate-smart feeding strategies, dairy farmers can significantly reduce greenhouse gas emissions and environmental impact. Technologies such as anaerobic digesters, solar panels, and precision milking systems are already proving their worth in many progressive dairies.

But sustainability goes beyond environmental stewardship. It includes ensuring the health and welfare of animals, economic security for farmers, and fair treatment of labor. Building resilient dairy systems means supporting smallholder farmers with access to knowledge, veterinary care, credit, and modern infrastructure.

Consumer awareness is also driving change. Today's dairy consumer values transparency, ethical practices, and quality over quantity. This shift is pushing the industry to embrace traceability, reduce waste, and adopt more humane and responsible practices from farm to shelf.

At Dairy Planner, we believe sustainability is the bridge between tradition and innovation. By investing in sustainable practices today, we not only protect our planet but also secure the future of dairying for generations to come. The time to act is now—towards a cleaner, smarter, and more sustainable dairy industry.

Office :
Pixie Publication
Anand Vihar, near gogripur railway crossing, hansi road, karnal-132001 (Haryana)

Editorial Policy is Independent. Views expressed by authors are not necessarily those held by the editors.

Registered as Newspaper by Register of Newspaper for India : **RNI No. HARBIL/2004/22481**

Publisher, Printer : **Mr. Vishal Gupta** on Behalf of **Pixie Publication** Karnal.

Printed at : Jaiswal Printing Press, Chaura Bazar, Karnal-132001 (Haryana).

Published at : Anand Vihar, near gogripur railway crossing, hansi road, karnal-132001 (Haryana)

Editor-In-Chief : Mr. Vishal Rai Gupta

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PRESS RELEASE

ARTICLE

Automated Milking System in Dairy Farm: A Boon to Dairy Industry

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Introduction

Automatic milking machines, also known as robotic or automated milking systems (AMS), offer several advantages for dairy farmers. These include reduced labor costs, increased milk yield, and improved milk quality. AMS also leads to enhanced flexibility in daily operations and better herd management.

In India, Automatic milking systems (AMS) are an alternative to conventional milking practices, whereby a robotic arm completes the milking related activities at the dairy (e.g. attaches and removes milking cups and cleans teats post-milking). In an AMS, cows can move about within the farm system without human help. Instead, careful farm and feed management is required to encourage cows to move around the farm and be milked regularly, this is often referred to as voluntary cow movement. Accurately allocating feed allowances can be a challenge, particularly when first adopting the technology, but is essential to ensure cows return to the dairy for milking while receiving enough feed to meet their nutritional demands.

Advantages of Automatic milking systems (AMS)

1. Labor Savings:

Automatic milking systems significantly reduce the need for manual labor during milking, freeing up farmers to focus on other tasks and potentially reducing labor costs.

Farmers can enjoy more flexibility in their work schedules as the machines can operate around the clock. This can also lead to improved work-life balance for dairy farmers.

2. Increased Milk Yield:

Automatic milking systems can lead to higher milk production due to more frequent milking and increased cow comfort.

Cows can choose when to be milked, potentially increasing milk yield as they are milked when they are ready.

Studies show that cows milked more frequently in AMS systems produce more milk compared to those milked twice daily in conventional parlors

3. Improved Milk Quality:

Automatic milking systems can improve milk quality by reducing the risk of contamination and mastitis. The machines ensure consistent and hygienic milking practices, minimizing the potential for human error. Automated systems can also monitor and detect potential health issues in cows earlier, allowing for prompt intervention.

4. Enhanced Herd Management:

AMS provides valuable data on individual cow milk production, feed intake, and health status.

This data can be used to optimize feeding strategies, identify potential health problems early,

and improve overall herd management.

Individualized milking schedules and feeding regimes can be implemented, leading to improved cow well-being and productivity.

5. Other Benefits:

- Reduced risk of injuries for both cows and farmers due to the elimination of manual handling.
- Improved working environment for farmers due to less physical labor and more flexible schedules.
- Increased efficiency and productivity on the farm.

Components of Automatic Milking System

1. Recording Individual Milk Quantity

The milk quantity of dairy farms is the most important data in farm management. For the big farms using pipeline milking machines, the digital flow milk meters are installed at the stanchion barns to measure the milk quantity of each cow, which is automatically recorded by a computerized system. While small-scale dairy farms use bucket milking machines, the individual milk quantity can be measured by several methods.. Farmers must carefully read the scales and record the results by hand at the start and end of milking in each cow, using a scale flow milk meter or graduated glass milk flasks. Using weighing, after milking for each cow, the milk bucket has to be measured by weighing and calculated for the real milk weight. These methods are very difficult and cause the milking time to increase. While the digital flow milk meter can be used, however, it is very expensive. The record system was developed using smartphone application programming to aid in the management of small-scale dairy farms. However, these recording systems still need the data on milk quantity from measurements.

2. Milk Quantity Recording System

The main functions of the control unit are to measure the milk quantity and record the data such as real-time clock, cow ID, and individual and total milk quantity in the recording system: microSD memory card and a Google sheet.

3. Control Unit

- It consists of the weight scale mechanism and the embedded system. The weight scale mechanism functions by loading the milk bucket while the embedded system processes the key switch input, milk quantity measurements, displaying the texts on an LCD and recording and sending the data to a Google sheet
- **Weight Measurment**

When the milk bucket is put on the circle base, the resulting electrical signal is changed corresponding with the milk bucket weight and sent to the embedded system for processing the milk quantity.

“Silage and Hay Work Wonders-Feed Your Buffaloes and Cows and Trigger a Milk Boom!”

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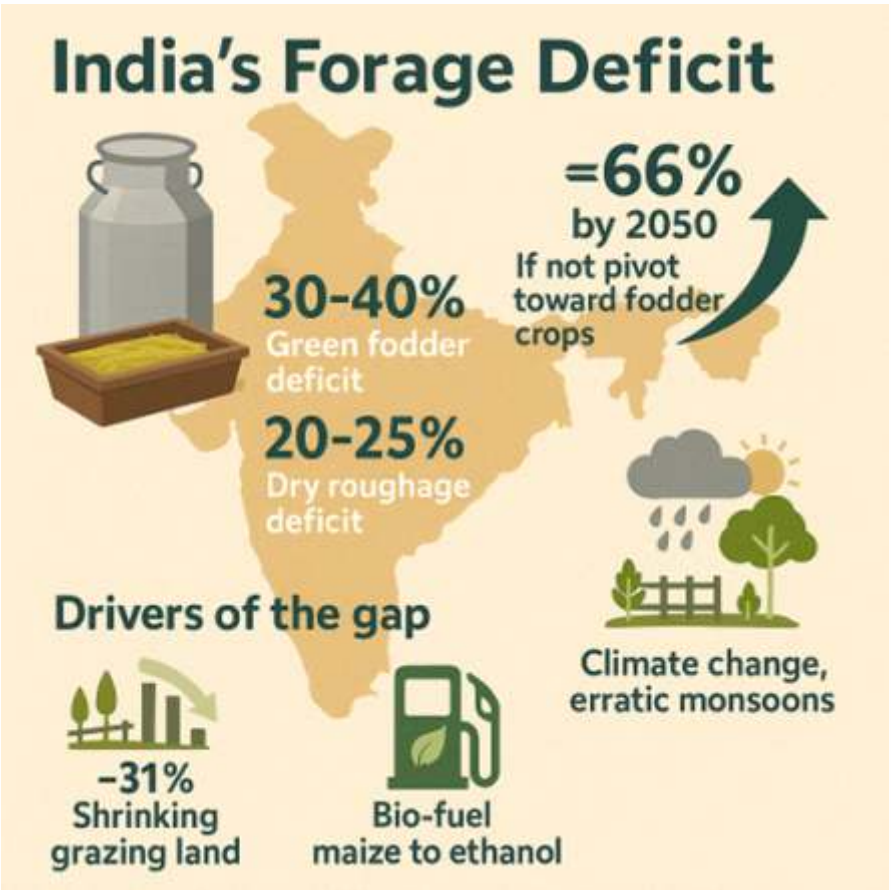
The Feed Bottleneck in Indian Dairy

India may be the world’s largest milk producer, but it wrestles with a structural forage deficit: 30-40% in green fodder and 20-25 % in dry roughage on a national nutrient-requirement basis, a figure that has held stubbornly steady for two decades (igfri.icar.gov.in).

ICAR-IGFRI’s Vision 2030 scenario warns that if land use does not pivot toward fodder crops, the green-fodder gap could widen to 66 % by 2050 (igfri.icar.gov.in).

Drivers of the gap include shrinking common grazing lands (-31 % since 2000), climate change or erratic monsoons that wipe out 10–15 million t of standing forage annually, and a bio-fuel push that is diverting at least 1 million t of maize toward ethanol blending by 2025-26 (reuters.com). Because



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feed already consumes 60–70 % of the cost of producing a litre of milk, any shortfall immediately erodes farm margins.

Silage vs Hay—Beyond the Basics

Attribute	Silage	Hay
Moisture at storage	28–35 %	10–13 %
Preservation driver	Anaerobic lactic-acid fermentation (pH < 4.2)	Rapid moisture removal (< 48 h ideal)
Nutrient retention	85–90 % of soluble sugars & carotenoids	65–75 % (field-drying losses)
Usual crops	Maize, sorghum, napier (Mostly from gramineae family)	Lucerne, clover, ryegrass (Mostly from leguminous family)

Field trials show that every 25 mm of unseasonal rain during hay curing strips ≈ 5 % TDN one reason maize- or sorghum-silage diets consistently deliver more energy per kg of dry matter than cereal hays (6.5 MJ NEL kg^{-1} DM vs. ~5.2 MJ) (mdpi.com).

Nutritional Edge & Milk-Yield Impact – Fresh Evidence

In the evolving landscape of dairy farming, one of the most influential factors in improving milk production lies not in genetics or medicine, but in nutrition. Recent insights from field practices and small-scale trials highlight how the inclusion of quality feed especially processed and conserved fodder like silage, hay, and enriched straw can significantly enhance both the quantity and quality of milk.

Conserved fodder provides dairy animals with a consistent supply of nutrients throughout the year, especially during lean seasons when green fodder is scarce. Silage, for instance, retains much of the energy and protein value of fresh forage and ensures a steady intake of digestible fibre. Hay, although drier and less energy-dense, contributes to rumen health and improves dry matter intake. Together, these inputs create a balanced nutritional base that supports sustained lactation.

Farmers who adopt better feeding strategies report noticeable improvements not only in daily milk yield, but also in the fat and SNF (solids-not-fat) content of milk, which are crucial for commercial dairy success. In particular, buffaloes and high-yielding cows respond quickly to better nutrition with more consistent lactation patterns, improved fertility, and better overall health.

The key takeaway is that feeding systems that prioritize quality, consistency, and variety whether through home-made silage, enriched crop residues, or strategic use of supplements can give farmers a strong nutritional edge. This in turn translates into higher milk productivity, reduced stress during fodder-scarce periods, and more resilient dairy livelihoods.

Ruminants being herbivorous need better fodder quality to perform sustainably, common farmers ignore this factor, for economical dairying and nutrition isn't just a support factor it's a strategic lever for dairy growth. As awareness and access to improved fodder increase, nutrition-led dairy enhancement is becoming a reality for many smallholders across India.

Economics That Matter to Farmers

A comprehensive meta-analysis of 37 Indian farm-level studies confirms the economic efficiency of incorporating silage into dairy feeding systems. When 25–30% of the total ration is replaced with maize silage, farmers achieve a 15–18% reduction in feed cost per litre of milk, even after accounting for silo construction and amortisation expenses (Rego & Bernardes, 2024). This cost advantage stems from the high energy content and consistent nutritional quality of silage, which reduces reliance on costly concentrates and supplements. Moreover, high-quality lucerne hay can meet up to 55% of an animal's daily neutral detergent fiber (NDF) requirement, particularly during dry seasons. This allows dairy farmers to reduce concentrate feeding costs by ₹2 to ₹2.5 per litre of milk in lean months while maintaining yield and animal health (Rego & Bernardes, 2024).

In terms of storage efficiency, properly ensiled fodder—produced under anaerobic conditions with optimal dry matter and compaction restricts aerobic spoilage to less than 4%, preserving nutrient content during storage. In contrast, barn-stored hay, particularly in humid climates, suffers dry matter losses ranging from 9–15%, leading to wastage and higher per-unit feed cost (Chandra et al., 2024). These findings underscore the need for improved forage management practices, such as silage preparation and hay preservation technologies, to boost productivity and profitability in India's dairy sector while minimizing post-harvest feed losses.

Environmental & Climate Dividends – New Insights for Dairy Sustainability

Emerging data continues to reinforce the environmental and economic value of transitioning dairy animals to silage-rich or hydroponic forage diets. Compared to conventional straw-based feeding, maize silage and hydroponic barley forage (HBF) are proving to be significant climate-smart alternatives. These advanced feeding systems can reduce enteric methane emissions by 5–8% per kilogram of milk, while cutting blue-water usage by up to 22%, particularly in buffalo dairies. Such outcomes are backed by trials indicating that methane emissions drop from 14.8 g CH_4/kg ECM in straw diets to 12.7 g CH_4/kg ECM with HBF. Water use for milk production drops from 430 to 305 L/L, highlighting the immense water-saving potential in water-stressed regions.

Notably, Brown-Mid-Rib (BMR) sorghum hybrids have been shown to improve neutral detergent fiber (NDF) digestibility by 9%, making them a dual-impact solution for boosting yield and reducing emissions. BMR and high-starch maize, when harvested at the ideal ½ to ⅔ milk line with 32–35% dry matter (DM), maximize nutrient retention. Implementing best practices like chop length of 1–1.5 cm, dense packing to over 220 kg DM/m^3, and inoculation with Lactobacillus plantarum (10^5 cfu/g) ensures rapid fermentation and silage stability. Innovations such as double-layered 150-µm silage films with 35% recycled plastic and solar hay dryers are reducing spoilage and plastic waste, while improving silage quality across several Indian states.

On-Ground Adoption Stories – Transformative Impact at the Farm Level

Case studies from across India demonstrate the real-world impact of these practices. Success story of Punjab- From import of silage balers, harvesters and other machinery to setting us of approximate 200 commercial silage units in just 5-6 years and now replicated those balers, harvesters available locally at much economical prices. In Kapurthala, Punjab, a 60-buffalo dairy cooperative that ensiled 600 tonnes of maize experienced a jump in average milk yields from 8.2 to 9.6 litres per buffalo per day, resulting in a monthly surplus of ₹4.3 lakh. In Baramati, Maharashtra, women-led self-help groups successfully baled 400 tonnes of lucerne hay at ₹9/kg, achieving a 28% return on investment in a single season. Meanwhile, in Dharwad, Karnataka, a 60 m^2 hydroponic barley rack was used to replace 20% of maize silage, enabling a 22% reduction in water use without compromising milk production. These examples

underscore the viability of climate-resilient feeding solutions and their potential to generate strong economic returns, particularly in smallholder and cooperative models.

Challenges and Mitigation – 2025 Snapshot

Despite the promise, several challenges persist in silage and hay adoption. Capital costs remain high, with bunker construction estimated between ₹55–100 lakh for 1,000 tonnes of forage. However, programs like NABARD's Fodder-Plus now offer a 33% subsidy and encourage cluster ownership models. Skill gaps also hamper efficiency—only 42% of silos achieve optimal density (>180 kg DM/m^3). To address this, initiatives such as mobile "Silage Shiksha" vans and the Silage360 app have increased adoption rates by 38%. Meanwhile, India generates 15,000 tonnes of plastic bale wrap annually, prompting Gujarat's village-level buyback schemes and the development of recycled and biodegradable films. Other mitigation tools include solar dryers and propionic-acid preservatives, particularly effective against climate shocks like unseasonal rains during hay curing.

Policy, Finance & the Road Ahead

Policy support has grown significantly in 2024–25. Under National Livestock Mission 2.0, ₹1,600 crore has been allocated until 2029 for infrastructure like fodder banks, balers, and hay sheds, with 50% capital subsidy for collective units. AHIDF(Animal Husbandry Infrastructure Development Fund),NDDB(National Dairy Development Board) is promoting strongly 100 FPOs exclusively for fodder production and processing. NABARD has aligned its Rural Infrastructure Development Fund (RIDF) to provide 3% interest subvention on loans for silage and hay infrastructure. Adding to this, carbon-credit pilots in Rajasthan now pay ₹2.4 lakh per tonne of CO_2-equivalent avoided, rewarding methane-reducing practices like BMR silage feeding. On the flip side, India's ethanol policy has created fodder shortages by diverting maize for fuel, prompting dairy cooperatives to lobby for dedicated feed-grade maize allocations in the 2025 ethanol roadmap.

The Bigger Picture – Why Action Is Urgent

The integration of high-quality conserved forage is no longer just a production enhancement it is a health, economic, and climate imperative. For veterinarians, there's evidence that such feeding reduces animal health issues like acidosis, ketosis, and displaced abomasum by 10–30%, which should be better documented and publicised. For rural women, SHG-run baled silage units have shown that micro-units on less than 2 acres can earn ₹3–4 lakh per year in net profit. Meanwhile, digital innovations such as e-Fodder and Silage360 apps, combined with Bluetooth pH probes, are making expert-level guidance accessible to ordinary farmers. Lastly, breeding innovations from BMR sorghum to tannin-suppressed lucerne must be mainstreamed through public-sector seed programs to maximize the methane-abatement and yield potential.

Conclusion-From Bottleneck to Boom

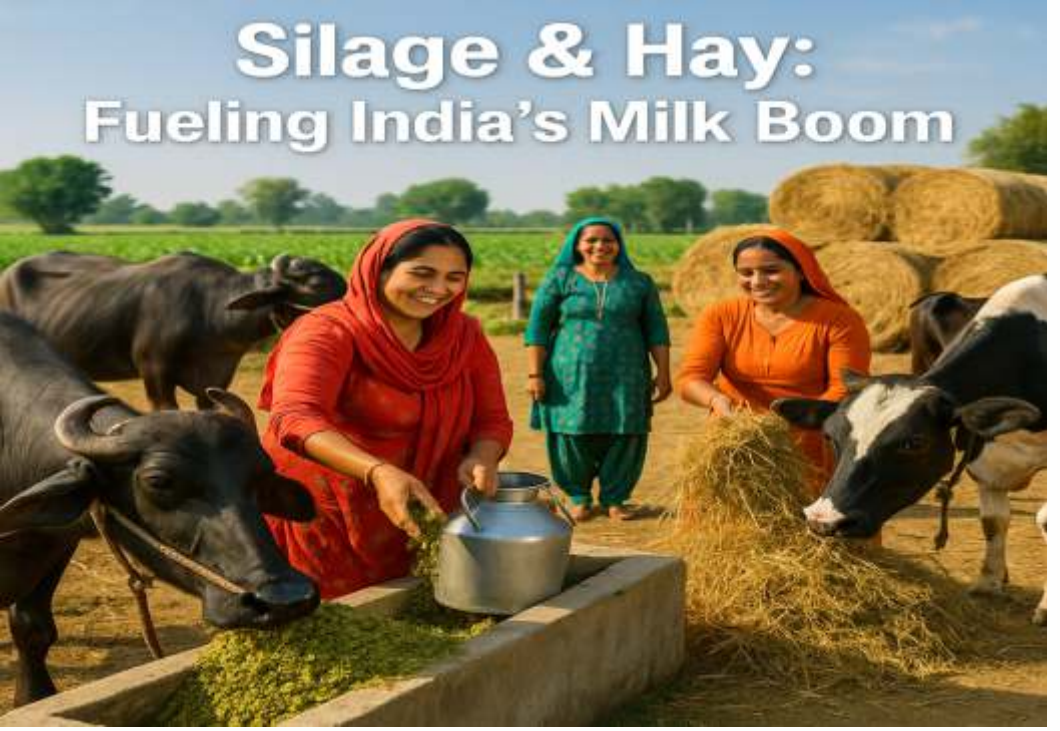
The strategic use of silage and hay is no longer a secondary consideration—it is a core necessity for ensuring the long-term sustainability, productivity, and profitability of India's dairy sector. With rising input costs, increased climate variability, and a widening green fodder deficit, traditional feeding systems based on seasonal greens or unprocessed crop residues are proving increasingly inadequate.

Research and field data strongly support the fact that well-prepared conserved forages especially maize silage, sorghum silage, lucerne hay, and grass-based hays deliver multiple simultaneous benefits:

- Enhanced milk productivity (1–2 kg/day gain per animal)
- Improved feed efficiency and nutrient digestibility
- Better animal health and reproductive performance
- Reduced methane emissions per unit of milk produced
- Lower water and land use per kg of dry matter
- Year-round stability of milk supply, leading to better market contracts

Importantly, the economic case is as strong as the nutritional one: a 15–20% reduction in cost per litre of milk production can dramatically improve margins for smallholder farmers who make up over 70% of India's milk production. Even where initial investments in silage pits or hay barns may seem high, the availability of government-backed schemes such as NABARD's Fodder Plus initiative and capital subsidies under the National Livestock Mission make this transition not just viable but economically attractive.

At a broader level, promoting silage and hay aligns perfectly with national priorities on food security, climate mitigation, and rural income generation. Climate-smart dairy development is only possible when fodder availability is



decoupled from rainfall and seasonality this is exactly where silage and hay step in.

To scale these benefits equitably and efficiently, multi-stakeholder collaboration is vital:

- Veterinarians must promote the health and productivity gains of high-quality forages.
- Extension agencies and KVKs must strengthen demonstration models and capacity-building for farmers.
- FPOs and dairy cooperatives should take the lead in community-level bunkers and baled fodder enterprises.
- Start-ups and agritech firms can digitize best practices and enable real-time fodder quality monitoring.
- Policy makers must continue to incentivize fodder infrastructure, quality seed development, and carbon-linked credits for methane abatement.

In conclusion, silage and hay are not just a feed option they are a dairy revolution in waiting. For India's 80 million dairy-farming households, especially women-led SHGs and smallholder families, adopting conserved forages means securing a more reliable income, producing higher quality milk, and contributing to a more resilient rural economy. With the right blend of policy support, scientific innovation, and on-ground implementation, India is fully capable of unleashing a true "milk boom" one that is green, inclusive, and future-ready.

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Colostrum Counts: The Golden Hour for Newborn Calves

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The neonatal phase is a critical period in the life of dairy calves, where survival, immunity, and productivity are highly dependent on the timely and appropriate administration of colostrum. Colostrum, the initial mammary secretion produced by the dam following parturition, is substantially different from mature milk in its composition. It is a biologically active fluid enriched with immunoglobulins, nutrients, growth factors, and antimicrobial proteins, all of which are vital for neonatal calf health and development.

Physiological Basis of Passive Immunity in Calves

Due to the syndesmochorial structure of the bovine placenta, immunoglobulins are not transferred from dam to fetus during gestation. As a result, calves are born agammaglobulinemic and are entirely dependent on the ingestion of colostrum for passive immunity (Weaver et al. 2000). The intestinal epithelium of the neonatal calf is uniquely permeable to immunoglobulin G (IgG) during the first few hours post-birth. This process, known as “gut closure,” rapidly reduces immunoglobulin absorption after 6–12 hours, and is nearly complete by 24 hours postpartum (Godden 2008).Therefore, colostrum should be administered as early as possible after birth. Numerous studies have confirmed that the first hour post-partum—often referred to as the "golden hour"—offers the maximum efficiency of immunoglobulin absorption. Delay in colostrum feeding beyond this period significantly compromises the immunological protection of the calf (Furman-Fratczak, Rzasa & Stefaniak 2011).

Colostrum Quality and Its Assessment

Colostrum quality is primarily determined by its IgG concentration, microbial contamination, and overall nutritional profile. High-quality colostrum contains more than 50 mg/mL of IgG and low levels of pathogenic bacteria. The use of a Brix refractometer has become a routine on-farm method to evaluate colostrum quality. A Brix reading ≥22% generally correlates with adequate immunoglobulin concentration (Quigley et al. 2013).The factors influencing colostrum quality include dam parity, breed, vaccination status, and the interval between parturition and first milking. Typically, older cows produce colostrum of higher immunoglobulin concentration compared to heifers. In addition, delays in colostrum harvesting post-calving lead to dilution with transitional milk and reduced immunoglobulin levels.

Recommended Colostrum Feeding Protocols

Colostrum administration must consider timing, volume, temperature, and hygiene. It is widely recommended that calves receive colostrum equal to at least 10% of their body weight within the first 6 hours of life—half of this ideally within the first hour. For a 40 kg calf, this equates to approximately 4 liters, administered in two feedings (Chigerwe et al. 2009). The colostrum should be fed warm (around 39°C) to mimic natural conditions and promote suckling reflex.Hygienic collection and storage are equally important. Improper handling can result in bacterial contamination, which not only reduces immunoglobulin absorption but also increases the risk of neonatal infections. If colostrum cannot be fed immediately, it should be refrigerated (used within 24 hours) or frozen (used within 6 months).

Thawing should be done using warm water not exceeding 60°C to preserve immunoglobulin integrity.

Alternatives: Replacers and Banked Colostrum

In instances where maternal colostrum is unavailable or unfit (e.g., due to Johne's disease, mastitis), high-quality frozen colostrum or commercial colostrum replacers are viable alternatives. Commercial products should be selected based on IgG concentration—preferably above 100 g per dose—and their bioavailability should be verified through field trials or manufacturer documentation (McGuirk & Collins 2004).Storing frozen colostrum in pre-measured, labeled containers enhances management efficiency and traceability. Farms are encouraged to develop colostrum banks with strict quality control protocols.

Consequences of Inadequate Colostrum Feeding

Failure of passive transfer (FPT) is diagnosed when serum IgG concentration is less than 10 g/L at 24–48 hours of age. Calves with FPT are at significantly higher risk for morbidity and mortality. FPT is associated with increased incidence of diarrhea, pneumonia, navel ill, reduced weight gain, and extended time to first calving. Moreover, it can lead to decreased milk production in the first lactation, highlighting the long-term economic impact of poor colostrum management (Furman-Fratczak, Rzasa & Stefaniak 2011).Monitoring passive transfer success can be achieved through serum total protein measurement or radial immunodiffusion assays. Regular evaluation of colostrum management protocols and calf serum IgG levels can guide improvements in on-farm practices.

Colostrum's Additional Biological Roles

Beyond immunoglobulin transfer, colostrum has several biological effects that promote gastrointestinal development and metabolic stabilization. It is rich in growth factors such as insulin-like growth factor 1 (IGF-1) and transforming growth factor-beta (TGF-β), which support intestinal maturation and enhance epithelial integrity. Additionally, antimicrobial components like lactoferrin and lysozyme inhibit the colonization of enteric pathogens (Godden 2008).Nutritionally, colostrum provides a dense source of energy, essential for thermoregulation and early metabolic demands. Calves with inadequate energy intake during the early postnatal period are more susceptible to hypothermia and hypoglycemia, particularly in cold climates.

Implementing Best Practices on Farms

Effective colostrum management requires education and commitment from farm personnel. Training programs should focus on early identification of calving, hygienic milking practices, accurate measurement of colostrum quality, and timely administration. Standard operating procedures (SOPs) should be documented and consistently followed.Use of checklists, monitoring charts, and on-farm audits can help assess compliance and identify areas for improvement. Incorporating routine measurement of serum IgG or total protein in calves at 24–48 hours provides feedback on the effectiveness of colostrum management protocols.

Conclusion

Timely, adequate, and hygienic colostrum feeding is a cornerstone of neonatal calf health. Administering high-quality colostrum within the first hour of life—the "golden hour"—ensures successful passive transfer, reduces disease risk, and enhances long-term performance. Implementation of standardized colostrum management protocols, supported by quality testing and personnel training, is essential for optimizing calf health outcomes in modern dairy systems.

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Different Milking Parlour in Automatic Milking System

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Introduction

Milking parlors are designed for optimal cow and farm worker comfort. Here are five main designs of milking parlors used by dairy farmers. There are several types of milking parlors used on dairy farms, each with its own advantages and disadvantages. Common types include herringbone, parallel, rotary, and robotic parlors.

1. The herringbone system:

The herringbone system is a well-regarded milking method for its efficiency, space optimization, and ability to facilitate a comfortable milking experience for both the cows and the operator. High-capacity systems is an side-by-side milking parlour with a short distance between the cows, where you can choose the size of milking parlour you need. The system is easy to upgrade. In the side-by-side milking parlour, the cows go straight out, which gives a very fast change. It is available in different versions, so you can choose between a standard version side-by-side, rotor side-by-side, and also an industrial versions, which are designed to last for many years. Cows stand at an angle (typically 45 degrees) to the

operator, who works from a pit between two rows of cows.

Advantages:

Efficient for smaller to medium-sized herds; allows for good access to the udder.

Good visibility in the milking parlour during milking

Short distance between the cows, faster milking

The cows leave the barn quickly, which results in quick changes of cows and thus faster milking

Posibility of indexing so that the cows can be moved back to the milking parlou

Disadvantages:

Can be less efficient for larger herds compared to rotary or robotic systems.

2. Parallel Milking Parlor:

A parallel milking system, also known as a rapid exit parlor, is a type of milking parlor where cows stand side-by-side in a parallel orientation to the operator's pit. The cows enter in a single file and are positioned with their tails facing the operator, allowing for easy access to the udder. This system is designed for efficient and rapid milking, with cows often exiting the parlor simultaneously.

Advantages:

Relatively simple design, good for medium-sized herds; good for ergonomic access to the udder.

Disadvantages:

Can require more space than herringbone; may be slower than rotary systems.

3. Rotary Milking Parlor:

A rotary milking parlour is a type of automated milking system used on dairy farms. It features a circular platform that rotates, allowing cows to be milked in a continuous and efficient process. This system significantly reduces manual labor and improves milking efficiency compared to traditional methods. Cows stand on a rotating platform (carousel) with milking units attached as they rotate past the operator.

Advantages:

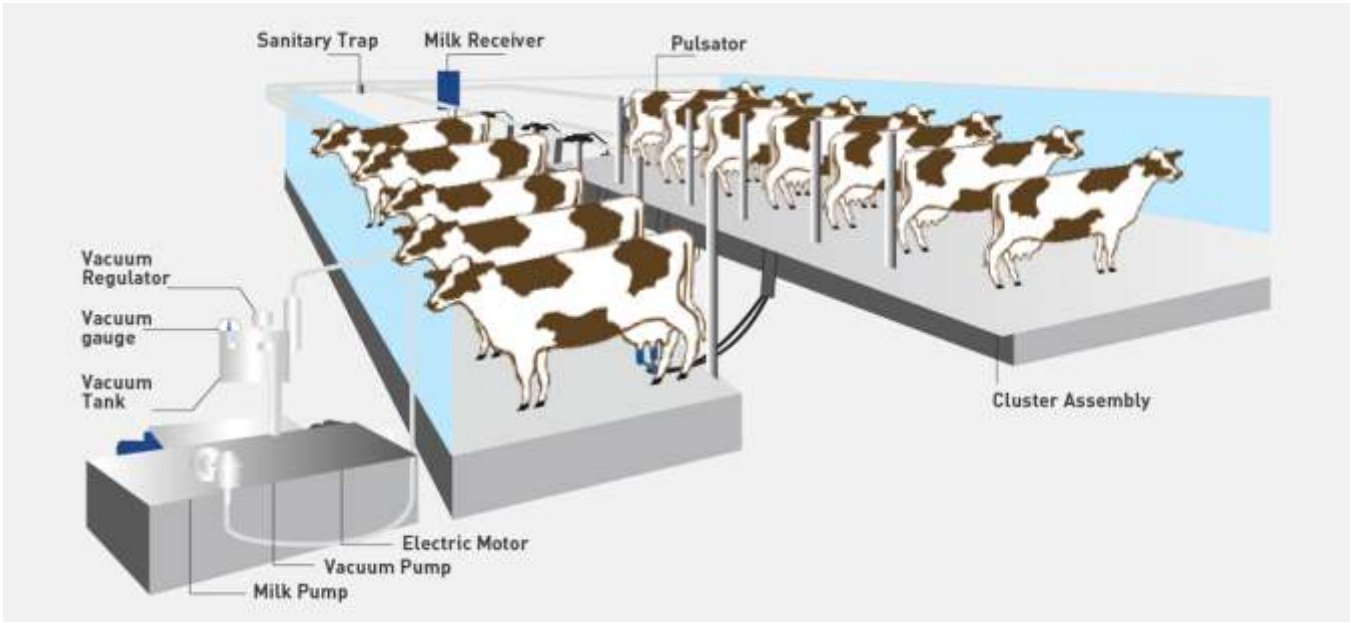
Very efficient for large herds; high throughput of cows; good for labor efficiency.

Disadvantages:

Requires a larger investment; can be less flexible for individual cow attention.

4. Robotic Milking Parlor:

A robotic milking parlour automates the process of milking cows, using robotic arms to attach milking units and manage the milking process. These systems offer benefits like increased efficiency, reduced labor, and improved cow comfort. They also provide valuable data on milk production and cow health. Cows enter a stall where a robotic arm identifies the cow, washes



the udder, and attaches the milking units automatically.

Advantages: Allows cows to be milked at their own pace; labor-saving; potential for increased milk production.

Disadvantages: High initial cost; requires careful management and cow training.

Other types of milkng parlours are:

Tandem:

Cows stand in individual stalls, one after another, with the operator working from the side.

Swingover:

A variation of the herringbone where the milking unit can swing from one side to the other.

Rapid-exit:

A feature in some parallel or herringbone parlors that allows for quick cow exit after milking.

Sustainability in Dairy Farming: Ensuring a Resilient Future for Animals and Ecosystems

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Introduction

Sustainability in dairy farming is a multi-dimensional concept that encompasses economic viability, social responsibility and environmental stewardship. Dairy animals and their derived products are vital assets for human livelihood, nutrition and overall wellbeing. They provide high-quality proteins, essential fatty acids and a range of important vitamins and minerals. Beyond nutrition, farm animals contribute to transportation, provide raw materials like hides, wool and skin and offer financial stability through savings or the sale of livestock. In this way, they play a critical role in securing livelihoods and enhancing resilience to climate change and natural disasters. Animals also offer significant psychological, emotional and social benefits, such as companionship or therapeutic effects for peoples. They hold profound cultural value not only for their owners and families but for society as a whole. With growing concerns about climate change, food security and animal welfare, dairy farmers are under increasing pressure to adopt more sustainable practices. Consumers are increasingly looking for labels that indicate sustainability. Certifications like 'organic, grass-fed or fair trade' can help dairy producers to gain a competitive edge. Offering transparency in production processes, such as traceability from farm to shelf builds consumer trust and loyalty also.

1. Environmental Sustainability

Dairy farming is a significant contributor to greenhouse gas emissions, especially methane from cow digestion (enteric fermentation). Sustainable practices for reducing greenhouse gas emissions focus on reducing these emissions through by various management practices. Feed optimization may be done by improving the nutritional quality of animal feed so that the methane production can be reduced during digestion. Manure management must be involving technologies like anaerobic digesters to capture methane from manure and convert it into biogas for energy. Sustainable grazing practices and crop rotations help to reduce soil degradation and increase carbon sequestration in soil. Dairy farming requires a substantial amount of water for cows, irrigation, and processing. Some strategies for better water management include water recycling, efficient irrigation systems and water-efficient feeding.

2. Animal Welfare

Sustainable dairy farming involves

ensuring the health and well-being of dairy animlas, which also translates to better milk production and quality. The welfare practices like animal comfort, disease prevention and ethical farming practices should be ensured in dairy farms. The animal should have provided wuth clean, dry bedding, proper ventilation and access to shade and water, reducing the stress and promoting higher productivity. Vaccinations, regular health check-ups and proper nutrition also play a role in maintaining healthy livestock, reducing the need for antibiotics thus improving the overall farm sustainability. Ensuring that cows are treated humanely, with sufficient space for movement and social interaction, supports both their physical and psychological health.

3. Economic Viability

Implementing sustainable practices may require initial investment, but in the long term, it can reduce operational costs and improve profitability. Investing in renewable energy like solar panels or wind turbines can reduce dependence on external energy sources and lower costs over time. Some dairy farms are diversifying into value-added products (cheese, yogurt) or providing eco-tourism opportunities, improving financial resilience. Reusing waste materials like manure for biogas or compost, or finding markets for dairy by-products (like whey protein), can generate additional revenue streams.

4. Soil and Land Health

Healthy soils are critical for sustainable farming. Practices like agroforestry, rotational grazing and no-till farming can increase soil carbon storage and improve soil quality, which in turn benefits both the environment and farm productivity. Proper land management, including buffer zones along streams, contour plowing, and cover cropping, helps protect the soil from erosion and nutrient loss.

5. Sustainable Feed and Alternative Diets

Feed represents the largest expense on a dairy farm. Sustainable dairy farmers focus on improving the efficiency of their feeding practices by utilizing by-products such as crop by-products or food waste (spent grain from breweries) as supplementary feed in order to reduce waste and ensuring thus lower costs for feed. Implementation of alternative feed sources like algae, seaweed, and insects, can reduce methane emissions and improve the sustainability of dairy farming.

6. Waste Management

Manure, if not managed properly, can lead to significant environmental problems, including water pollution and methane emissions. Sustainable manure management practices should utilize anaerobic digesters and composting methods in dairy farms. These systems break down manure to produce biogas, which can be used as an energy source, reducing greenhouse gas emissions. Converting manure into compost provides a nutrient-rich soil amendment for crops and reduces the need for synthetic fertilizers. Reducing the use of plastic packaging, especially single-use plastics, is part of the larger environmental sustainability movement. Many dairy farms are adopting more sustainable packaging alternatives or working with consumers to promote reusable containers.

Challenges to Sustainability in Dairy Farming

Sustainability in dairy farming requires a delicate balance between maintaining profitability, minimizing environmental impact and ensuring the well-being of animals and farm workers. It's about finding innovative, efficient and ethical solutions to the challenges that farmers face in today's world. Dairy farmers often face financial pressures from fluctuating milk prices and competition from larger industrial operations. Transitioning to sustainable practices can be cost-prohibitive without subsidies or support. Changing weather patterns, droughts, and extreme weather events are making farming more unpredictable and challenging. Local regulations may not always support or incentivize sustainable practices, particularly for smaller farms.

Conclusions

The future of dairy farming is likely to be shaped by technological innovation, changes in consumer behavior and the need for systemic shifts in policy. Precision farming technologies using data to monitor animal health, optimize feed use, and track resource consumption could significantly improve farm efficiency and sustainability. Working together in collaborative models as a cooperative or through alliances with other farms could help smaller dairy producers pool resources for sustainable technologies and initiatives. Governments and global organizations may introduce more consistent sustainability standards, allowing dairy farmers to operate on a level playing field and ensuring they can meet consumer expectations.

Emergency Preparedness For Disaster Management – A Way Forward And Mitigation From Veterinary Perspective

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ABSTRACT

Disasters can have an extreme impact on animal populations. We may face long-term ecological and economic effects as the loss of animals can be extensive and devastating. India is particularly vulnerable to disasters like floods, earthquakes, tsunamis and cyclones etc. These disasters have a profound impact on our diverse ecosystems and landscapes. They also harm livestock and wildlife as it leads to massive losses of animal life.

The loss can be immense. There is considerable economical impact on the country's food security and livelihood because of the loss of animal life, beyond the immediate human suffering. It also has an ecological impact as animal populations play a crucial role in the ecosystem and leverage the country's biodiversity.

Veterinarians play an important role in alleviating the worst impacts of disasters on animal populations. They have the experience and training to care and treat the injured, sick, and displaced animals. They are the right and key persons actively involved in developing and implementing prevention and preparedness measures for disaster risk reduction in animal populations. They contribute extensively by providing medical care, identifying the necessary resources, and conducting assessments as they are part of a country's emergency response team.

In developing countries like India, emergency preparedness is critical in disaster management to reduce losses and mitigate the impact on animals in terms of livelihood for the animal owners. To be safe we must consider these important steps, prepare contingency plans, conduct drills and simulations, and identify potential threats and their impact on animal populations. Creating awareness, educating people and communities about animal welfare and disaster preparedness can also go a long way in protecting and preserving animal life in the days to come

KEYWORDS

Disaster, Wildlife, Livestock, Pets, Super Cyclone, Drought, Veterinarian, Emergency plans, Awareness, Public Health Safety.

Introduction

A disaster is an event, occurring either for a short period or a long period, causing widespread damage to human life and the environment. The World Health Organization (WHO) defines a disaster as 'any occurrence that causes damage, economic destruction, loss of human life and deterioration in health and health services on a scale sufficient to warrant an extraordinary response from outside the affected community or area [1]. Disasters can be caused by natural, man-made, or technological hazards [2]. Natural disasters are those which are caused by nature. eg., earthquakes, floods, tsunamis, etc., whereas human-made disasters are those which are caused by man-made activities. eg., Wars, Fire, Industrial accident etc,

It's wiser to be prepared than to say sorry.

When a disaster strikes, not only humans but also animals feel the impact. Disasters like a tornado, tsunamis, floods, and earthquake, makes those helpless animals vulnerable. The catastrophic impact of a disaster on animals is the loss of their habitat, which significantly disrupts their nesting and mating habits. It also contaminates their food and water resources and dislocates

them. Some animals may even be forced to migrate to other habitats, which may be unsuitable for their survival. During these movements, some may be injured, starved, or even killed by predators. So it is the role of a veterinarian to ensure that all animals are safe and sound until the very end.

Nightmare for animal kingdom

Disasters can affect our pets, livestock and wild animals in diverse ways.

In a country like India, the geographical conformation is conducive for natural calamities like, earthquakes, flash floods etc., which are being complicated further by the climate changes due to various factors. The Asian Development Bank has reported that floods account for more than half of climate-related disasters. It has caused damages of $54.63 billion from 1990 to 2017 in India [3]. So domesticated animals like cattle, sheep, goats, and pigs may drown when floods occur and it may result in a huge economic breakdown as they provide food and income to humans. They may even get trapped in their shelters when earthquakes happen, get burned in wildfires, or even die from electrocution during a hurricane or a tornado. Disasters would also mean the interruption of transport services, which could lead to a lack of animal feed and medicine, putting their health and well-being at risk.

If we turn to the wildlife sector, wildfires are very common, affecting their ecosystem. It has been estimated Rs 440 crores (US$ 107 million) loss in India. But this estimate does not include biodiversity, nutrient and soil moisture, and other intangible benefits [4]. For instance, when wildfires occur, the soil is left unprotected and prone to erosion. Moreover, there won't be enough food for wild and domesticated animals due to the loss of vegetation cover. Hence animals may venture into other places, making themselves bait to predators and other dangers. Wild animals may come to human dwelling places in search of food, giving us a sense of fear interrupting their routine.

Our cute little fury buddies(cats) are the first to react when a disaster strikes. In case a disaster strikes when you are far away from your home, it can affect your family pet as well. They become vulnerable just like their owners. They might get injured, or lost or they could find themselves stranded. Without proper care, they may become dehydrated, starved, or even fall ill.

Past data can help us to save future

According to the report, [5] livestock is the second most affected sector after crops. It has accounted losses of $ 11 billion. It is also reported for 36 per cent of all the damages and losses are due to various natural disasters, out of which 44 per cent of production losses are caused by drought and 39 per cent of losses are caused by floods.

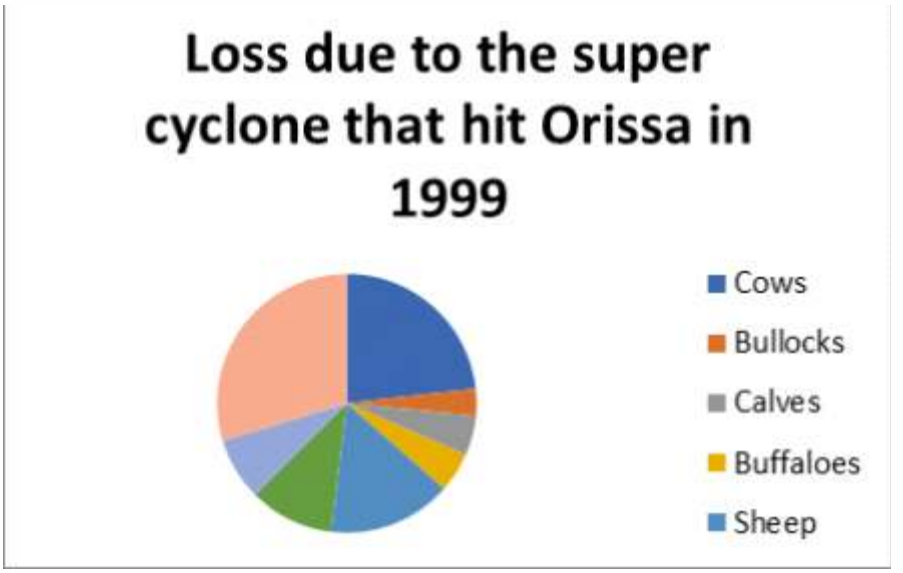
Let us look over an example, in 1999, Orissa was hit by a super cyclone that caused big havoc to the state's economy by mercilessly killing thousands of livestock.

It was reported that there is an estimated loss of 19.04% cows, 2.78% bullocks, 4.07% calves, 4.08% buff aloes, 12.7% sheep, 8.65% Goats, 6.43% pigs, and 24.37% poultry due to collapsing of houses, falling off branches of trees, heavy rain, and winds. Moreover, it was reported that the affected areas were the major producers of meat, milk, eggs, etc [6].

Another example is that there was a severe drought period in 2000-2001, which left a huge impact in eight states of India. Both the human and livestock sector were deeply affected. It was estimated that 146.3 million human population and 69.3 million livestock population were severely affected by droughts in the above said period [7].

Another event that resulted in heavy damage to crops, and livestock is the Nilam cyclone that hit the southern state of Andhra Pradesh in 2012. About 1,858 animals were reported dead which included 505 large animals, 1,353 small animals, and 98,757 poultry. An estimated loss of 1286 cattle sheds was reported along with 128 veterinary community health centres that left a huge impact on livestock farmers [8].

The National Disaster Management Agency, India reported that the primary reason for the most recent disaster happened in the Himalayan state of India, Sikkim on 4th October 2023 is attributed to the Glacier lake outburst flood(GLOF) along with incessant rainfall had severe impact on forests, wetlands, river ecosystems upon which the animal species are highly dependent.



Role of pet lover

Yes, it's all about the responsibility of a veterinarian. They play a vital role in disaster management. Due to their experience, a veterinarian is skilled enough to provide medical care to animals, that were affected by disasters, manage disease outbreaks as well as ensure the well-being of both animals and humans. Their full-fledged support plays a vital role in disease intervention. The four basic components of disaster management are as follows:

1) Mitigation
2) Preparedness
3) Response/ Emergency Relief
4) Recovery

Some specific roles that veterinarians play in disaster management include,

- **Preparing emergency plans**
  A veterinarian should preplan and take action before a disaster strikes. He should work on an evacuation plan along with emergency management authorities, to ensure easy transfer of animals to a safe location.
- **Pre-disaster preparation**
  He should make sure that all the animals are properly identified, vaccinated, and safely housed.
- **Rescue operations**
  Rescuing animals that are struck due to disaster is an important task for a veterinarian.
- **Ensuring public health safety**
  Veterinarians are responsible for disease outbreak management, especially in the case of zoonotic diseases [10]. They work along with public health officials to ensure to minimalize the spread of disease and to govern the safety of the public. They also make sure that animals that were affected are vaccinated and quarantined.
- **Providing emergency medical care**
  Veterinarians play a crucial role in the frontline. They provide emergency medical care to animals- livestock, wildlife, and pets [11], which were affected by the disaster. It includes administering first aid, performing surgeries, and providing life-saving treatments.
- **Animal welfare management**
  The main duty of a veterinarian is to provide shelter, food, and water to the animals as well as to ensure the safety and well-being of those animals affected by a disaster. They also work along with animal welfare organisations to reunite lost pets with their owners.
- **Food safety and security**
  He plays a vital role in ensuring the safety and security of the food supply chain. They inspect animal products and ensure that they meet safety standards.
- **Research on disaster management**
  Veterinarians also play an important role in conducting research on disaster management, including developing new protocols and treatments for animals affected by disasters and advocating for policies that support disaster preparedness and response efforts.
- **Creating awareness**
  The important task of a veterinarian is to educate the public about the proper care and management of animals during disasters. They also provide information on how to prepare for disasters. They also give advice on how to recognize signs of illness or injury in animals, and how to provide basic care during an emergency.

DO'S AND DON'TS IN DISASTER MANAGEMENT

- **Measures to be taken by the veterinarian before the arrival of disaster:**

1. Animal rescue team must be well trained to overcome obstacles during a disaster and to help the animals.
2. Must well plan to transfer the animals to safe and secure places during a disaster [12].
3. Must be prepared to arrange an alternate source of power (light) during disaster time.
4. Must strengthen and secure the animal shelter for anticipation.
5. Must ensure adequate storage of feed, medicines etc.,
6. Veterinarians must have a disaster first aid kit. This kit should contain all the medicines.
7. Must ensure proper vaccination must be done for livestock.
8. Must teach the animals owner to take care of the animal during a disaster.
9. Must teach the animals owner about the correct procedure of carcass disposal as it may lead to many communicable diseases.

- **Measures to be taken by the veterinarian during disaster:**

1. Veterinarians and animal protection experts should be included in the disaster assessment team and their advice should be used in community disaster planning.
2. Where possible, humanitarian relief bodies and local governments should involve animal care groups such as international animal welfare relief NGOs like an International working group on Animals in Disaster (IWGAID) to provide shelter, rescue and veterinary care and generally augment the humanitarian community [13].
3. Humanitarian aid workers should be given basic stray animal awareness training for safety reasons.
4. Joint training between animal care and humanitarian relief workers will enhance the ability of both communities to work together and ensure an approach to disaster management that saves both people and animals at the least cost.

5. Policymakers should take into account practical indigenous techniques and economic, trade or social restrictions.
6. Veterinarians must co-operate with administrative and public health authorities during surveillance.
7. Veterinarians must implement control measures including isolation and quarantine of animals.
8. Veterinarians must offer guidance to farm owners to know the shelter of the animals during a flood, barn fire, etc,
9. Veterinarians must participate as volunteers with local disaster response teams or a regional-level animal disaster team as veterinarian resource.

- **Measures to be taken by the veterinarian after the disaster:**

1. Veterinarian's main objective is to minimize the suffering of animals.
2. Once the animals are relocated from the rescue centre, the major issue which affects the animals is their security. Generally, animals relate safety and security to familiarity with their surroundings. Therefore, while relocating, if possible, care should be taken to move them to a place where it mimics their familiar surrounding like the feel, smell, layout etc.
3. FEED: Feed/fodder and water play a significant role in disaster recovery. Animals should have access to good-quality feed and fodder.
4. WATER: Ensure that animals have adequate good quality potable water. Animals should not be allowed to consume stagnant or dirty or floodwater.
5. SHELTER: During disasters like floods or earthquakes, most of the structures in the shed might get damaged or destroyed. They should be brought back to their shelter only after ensuring that the existing structures are safe and secure. Do not overcrowd and provide adequate space to the animals since they are already under stress [13].
6. SAFETY: While relocating the animals, care should be taken to protect the animals from flooded areas, live power lines, debris etc. Protect the animals from wild animals, predators, insects etc. Clean or wash the animals with clean water to get rid of any dirt or debris.
7. MONITORING: Once the animals are relocated and get settled, it is important to monitor them regularly to ensure that they are comfortable.
8. If diseased or injured, treat the animals under the supervision of a veterinarian.

Hence, a well-planned emergency preparedness would avoid the economic, welfare, health associated losses in the event of a disaster.

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Hypothyroidism and Hyperthyroidism in Animals

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ABSTRACT

Hypothyroidism and hyperthyroidism are two prevalent thyroid disorders that profoundly influence metabolic regulation and overall health. Hypothyroidism is characterized by insufficient production of thyroid hormones, leading to symptoms such as fatigue, weight gain, depression, and cold intolerance. Common causes include autoimmune conditions like Hashimoto's thyroiditis and iodine deficiency. Conversely, hyperthyroidism involves excessive hormone production, resulting in symptoms like weight loss, increased heart rate, anxiety, and heat intolerance. Key causes include Graves' disease and toxic nodular goiter. Both disorders pose significant health risks if left untreated, but they can be effectively managed through appropriate medical interventions, such as hormone replacement therapy for hypothyroidism and antithyroid medications for hyperthyroidism. Early diagnosis and tailored treatment strategies are essential for optimizing patient outcomes and enhancing quality of life.

Introduction:

The thyroid gland, located in the neck, produces hormones that regulate metabolism, energy levels, and various physiological processes. Hypothyroidism occurs when the thyroid gland is underactive and fails to produce sufficient thyroid hormones. This condition can lead to a range of symptoms, including fatigue, weight gain, depression, and sensitivity to cold. It is often caused by autoimmune diseases, such as Hashimoto's thyroiditis, or can result from certain medical treatments and iodine deficiency. In contrast, hyperthyroidism arises from the overproduction of thyroid hormones, leading to an accelerated metabolism. Individuals with hyperthyroidism may experience symptoms like weight loss, increased heart rate, anxiety, and heat intolerance. Common causes include Graves' disease, toxic nodular goiter, and inflammation of the thyroid gland. Both conditions have significant implications for health, but with proper diagnosis and treatment, individuals can effectively manage their symptoms and maintain a good quality of life. Understanding these disorders is essential for early intervention and optimal care.

Hypothyroidism in Animals:

Hypothyroidism is a metabolic disorder caused by insufficient

production of thyroid hormones (T3 and T4) by the thyroid gland. Most commonly affected animals includes dogs, cats, horses, and cattle. This is the most common endocrine disorder in dogs mainly occurring in breeds e.g., Labrador Retrievers, Golden Retrievers etc. This disorder is less common in case of cats than in dogs and is often associated with other health issues (e.g., kidney disease). It rarely occurs in horses and is associated with equine metabolic syndrome.

Etiology:

- Congenital defects: Genetic mutations affecting thyroid gland development.
- Autoimmune thyroiditis: Immune system attacks the thyroid gland, leading to hypothyroidism.
- Radiation therapy: Damage to the thyroid gland from radiation.
- Surgical removal: Thyroid gland removal or damage during surgery.
- Medications: Certain drugs, such as sulfonamides, can induce hypothyroidism.
- Iodine deficiency: Inadequate iodine in the diet, essential for thyroid hormone production.
- Infections: Bacterial or viral infections affecting the thyroid gland.

Clinical Signs:

- Weight gain
- Lethargy
- Skin problems:
  → Hair loss (alopecia)
  → Dry, flaky skin
  → Skin infections
- Reproductive issues:
  → Infertility
  → Abnormal estrous cycles
- Cold intolerance
- Decreased appetite
- Decreased heart rate
- Decreased mental alertness

Diagnosis:

1. Blood tests:
   - T3 (triiodothyronine) and T4 (thyroxine) levels
   - TSH (thyroid-stimulating hormone) levels
2. Physical examination
3. Medical history
4. Imaging studies (e.g., radiographs, ultrasound) to rule out other conditions

Treatment:

1. Hormone replacement therapy:
   - Levothyroxine (T4) supplementation
   - Liothyronine (T3) supplementation (in some cases)
2. Monitoring:
   - Regular blood tests to adjust medication doses
   - Clinical sign assessment

Hyperthyroidism in Animals:

Hyperthgyroidism is a metabolic disorder caused by excessive production of thyroid hormones (T3 and T4) by the thyroid gland. Commonly affected animals: Cats, dogs, and horses. This is the most common endocrine disorder in cats and typically affects middle-aged to older cats.

Etiology:

- Benign thyroid tumors (adenomas): Most common cause in cats.
- Malignant thyroid tumors (carcinomas): Less common, but more aggressive.
- Hyperplasia: Excessive growth of the thyroid gland, often caused by iodine deficiency.
- Functional thyroid adenocarcinoma: Rare, but can produce excess thyroid hormones.
- Iodine excess: Consuming excessive iodine can stimulate thyroid hormone production.
- Certain medications: Some drugs, like sulfa-containing antibiotics, can induce hyperthyroidism.
- Genetic predisposition: Some breeds (e.g., Siamese cats) are more prone to hyperthyroidism.

Clinical Signs:

- Weight loss
- Increased appetite
- Hyperactivity
- Increased heart rate
- Poor coat condition
- Increased water consumption and urination
- Vomiting
- Diarrhea
- Increased shedding

Diagnosis:

1. Blood tests:
   - T3 (triiodothyronine) and T4 (thyroxine) levels
   - TSH (thyroid-stimulating hormone) levels
2. Physical examination
3. Medical history
4. Imaging studies (e.g., ultrasound, radiographs) to rule out other conditions
5. Thyroid scintigraphy (nuclear medicine test) to evaluate thyroid gland function

Treatment:

1. Medications:
   - Methimazole (Tapazole): Reduces thyroid hormone production
   - Carbimazole: Similar to methimazole
2. Radioactive iodine therapy: Destroys part of the thyroid gland to reduce hormone production
3. Surgery: Removes part or all of the thyroid gland
4. Dietary management: Feeding a low-iodine diet can help manage hyperthyroidism

Conclusions:

Hypothyroidism and hyperthyroidism are two distinct thyroid disorders that significantly impact metabolic processes in the body. Both conditions can lead to serious health complications if left untreated, but they can be effectively managed with appropriate medical interventions, such as hormone replacement therapy for hypothyroidism and antithyroid medications or radioactive iodine for hyperthyroidism. Regular monitoring and a tailored treatment approach are essential for maintaining overall health and quality of life. Understanding these disorders is crucial for early detection and effective management.

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India–U.S. Trade Deal: Deep Dive on Cattle Feed & GM Imports

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Introduction

The India–U.S. trade deal negotiations have hit a critical point over the issue of cattle feed, highlighting a deep clash between commercial interests and cultural sensitivities. While the U.S. seeks access to the Indian market for genetically modified (GM) animal feed often containing animal-derived ingredients. India insists on strict adherence to its vegetarian feed norms rooted in religious and cultural beliefs. As talks continue ahead of the looming tariff deadline, a compromise involving regulated GM feed imports for non-dairy animals is under consideration, but tensions remain high over dairy and food safety standards. This issue is under discussion since last few years, US hay exports to India was at stake against imports of mango & pomegranate from India.

Deal Deadline & Political Context

As India and the United States intensify negotiations ahead of the July 9, 2025 deadline, the pressure is mounting to finalize a "mini" trade agreement that avoids punitive tariffs. If the deal fails, the U.S. is set to impose a 26% tariff on a wide range of Indian goods, a move that could significantly affect Indian exports in sectors such as textiles, chemicals, and engineered goods.

This deadline-driven urgency stems from the U.S.'s broader strategy to rebalance trade

partnerships, reduce dependency on Chinese supply chains, and bolster domestic manufacturing. For India, the talks offer an opportunity to regain Generalized System of Preferences (GSP) benefits suspended since 2019 and expand access for key export sectors.

However, India remains cautious, that interests of local farmers & Industry may not get compromised.

India's stance reflects domestic political realities, especially in the agriculture and dairy sectors. With general elections on the horizon and farmers still recovering from past agri-reform protests, the government is unwilling to make concessions that could:

- Harm local farmers' income
- Compromise food safety
- Erode cultural values such as vegetarian food and feed practices

Meanwhile, the U.S. has linked tariff relief to India's acceptance of GM feed imports, among other demands. The U.S. is pushing hard for access to distillers dried grains (DDGS) and soybean meal, which are processed from GM crops and are widely used as cattle feed in the U.S.

Despite diplomatic momentum, India continues to flag "red lines" around:

- Genetically modified food imports
- Dairy products from animals fed on non-vegetarian feed
- Ethanol blends and biofuels
- Market access for U.S. poultry and pork

India's policymakers, analysts say, are trying to balance economic diplomacy with political sensitivity. The idea is to finalize a package that secures trade relief and promotes strategic ties without sacrificing farmer livelihoods, public trust in food safety, or religious sentiments.

Sticking Point: Agriculture & Dairy

Agriculture, though contributing only around 16% to India's GDP, remains the backbone of the Indian economy, supporting more than half of the country's population. This makes any foreign intervention in agricultural policies a politically sensitive issue. The current trade negotiations have hit a roadblock as the U.S. pushes for greater market access for genetically modified (GM) crops, soybean meal, corn-based feed, dairy products, poultry, and ethanol. India, however, has drawn a hard line, especially on GM crops and cattle feed regulations, to protect its smallholder farmers and preserve deeply rooted cultural and religious beliefs.

One of India's major concerns is the use of animal by-products in U.S. cattle feed such as blood meal, meat and bone meal, and poultry litter. These are unacceptable in India, where

dairy products must comply with vegetarian feed standards to qualify for the "green-dot" certification. This certification assures Indian consumers that milk is derived from cows fed on purely plant-based diets, aligning with religious sentiments, particularly among Hindus, Jains, and vegetarians. The fear is that allowing U.S. dairy imports would violate this trust and could provoke strong public backlash.

In addition, Indian policymakers worry that opening the market to subsidized U.S. agricultural products would flood local markets and harm the incomes of millions of small farmers. Given the memory of mass farmer protests in recent years, the government remains cautious. Thus, while the U.S. frames India's refusal as protectionist, India sees it as a necessary measure to ensure food safety, farmer welfare, and cultural integrity.

Why India Insists

- **Farmer Livelihoods:** Agriculture supports over 50% of India's population; most are smallholders (~1 hectare). Cheap U.S. feed could lower prices and hurt incomes.
- **Political Volatility:** Fear of unrest like the 2020–21 farm law protests; trade reforms affecting farmers are politically risky.
- **Anti-GM Sentiment:** Strong public and scientific resistance to GMOs; concerns over health, biodiversity, and food chain contamination.
- **Vegetarian Feed Norms:** India bans animal-based feed for dairy cows. U.S. feed contains blood meal and meat scraps culturally and religiously unacceptable.
- **Food Sovereignty:** Allowing GM feed could set a precedent for GM food, undermining India's strict food safety and labelling laws.

India's Cultural & Political Red Lines

- **Strict Vegetarian Feed Norms**

India mandates that dairy cattle must only be fed plant-based diets, banning animal fats, blood meal, bone meal, and poultry litter in cattle feed.

- **Cultural and Religious Beliefs**
  The policy aligns with the sentiments of large religious communities (Hindus, Jains, vegetarians), where cow protection and vegetarianism are deeply rooted cultural values.
- **Green-Dot Labelling System**
  India uses a “green-dot” certification to mark products derived from vegetarian sources especially dairy making feed purity crucial to consumer trust.
- **Economic Dependence on Agriculture**
  Almost 50% of India's population depends on agriculture, with smallholder farmers particularly vulnerable to price disruptions.
- **Fear of Market Disruption**
  Allowing cheaper, GM-based foreign feed could depress domestic feed prices, threatening the livelihoods of local feed producers and farmers.
- **Political Sensitivity Post-Farm Protests**
  Following the 2020–21 farm law protests, the government is extra cautious about any policy that may be seen as favouring foreign agribusiness at the cost of Indian farmers.

Next Steps & Broader Impact: India–U.S. Trade Deal

Phase	Actions	Considerations & Broader Impact
1. Deal Signing (Preparation Phase)	- Interim trade agreement expected between July 4–7, 2025, just before the July 9 tariff deadline. - Focused on non-sensitive sectors like nuts (almonds, walnuts), fruits (apples, blueberries), medical devices, electronics, and natural gas. - Agriculture, ethanol, and dairy explicitly excluded from this round.	- Avoids immediate tariff escalation (26% on Indian exports). - Political optics managed by excluding sensitive farm-related items. - Builds diplomatic momentum ahead of deeper, multi-phase trade negotiations.
2. Technical Clearances	- India to initiate internal evaluation of GM feed ingredients like soybean meal and DDGS. - Development of certification protocols to ensure: → Feed is used only for non-dairy animals → GM feed is not entering human food chain → Origin, content, and treatment of imported feed is traceable.	- Requires investment in testing labs, port inspection, and supply chain transparency. - May involve third-party verification to meet WTO compliance. - Aims to minimize ecological and food safety risks.
3. Regulatory Updates	- Potential rollout of mandatory labelling norms for products derived from animals fed with GM feed. - Introduction of "vegetarian feed verification" system aligned with India's green-dot norms for dairy. - May include audits, digital feed registry, and import licensing rules.	- Strengthens consumer transparency and safeguards cultural beliefs. - Adds a compliance layer for foreign exporters and Indian importers. - Helps preserve India's non-GMO export status (esp. to EU).
4. Deferred Negotiations (Post-Deal Phase)	- Sensitive topics like GM food crops, dairy imports, ethanol blending quotas, and poultry to be taken up in future bilateral rounds. - India to conduct stakeholder consultations, scientific assessments, and political deliberations.	- Allows time to build domestic consensus. - Mitigates risk of farmer protests or consumer backlash. - Provides phased trade liberalization pathway aligned with national interest.

- **Non-Negotiable Red Line**
  Due to a mix of cultural values, consumer protection, and political risk, India treats vegetarian feed norms as a non-negotiable condition in trade talks.

Summary

India's position in the ongoing trade negotiations with the United States is clear and cautious while the country is open to expanding trade ties, it firmly protects its agriculture and dairy sectors due to their deep economic, cultural, and political significance. The government has rejected any proposal that compromises its food safety standards or cultural norms, such as allowing dairy imports from animals fed on genetically modified or non-vegetarian feed. However, as a limited and regulated concession, India may permit the import of GM animal feed like soybean meal and DDGS, strictly for non-dairy livestock and only under stringent certification and traceability systems. This approach aims to unlock future trade opportunities without undermining biosafety, farmer livelihoods, or public trust in India's food ecosystem, ensuring that national interest remains at the core of all trade decisions.

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Monsoon and Livestock Health: Risks, Realities, and Remedies

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The Rainy season presents some of the most formidable challenges for those involved with animal livelihood. During this period, the risk of disease outbreaks among livestock significantly escalates. Hence, it becomes imperative for livestock farmers not only to remain vigilant about potential illnesses but also to adopt comprehensive animal management strategies tailored to the specific conditions of the monsoon season. This necessitates considerable adjustments in various aspects of animal care. To ensure the health and productivity of animals during the monsoon, it is essential to maintain a clean, dry environment, provide a well-balanced and nutritious diet, and implement effective measures to prevent parasitic infestations.

How does rainy season affect animals?

The monsoon season poses numerous challenges for animals, particularly in regions prone to heavy rainfall, flooding, and landslides. The impact can be both direct and indirect, affecting their health, nutrition, and overall well-being. Key concerns include:

- **Destruction of Feed Sources:** Excessive rainfall and water logging often damage standing crops and pasturelands, leading to a scarcity of fodder and feed resources for livestock.
- **Increased Humidity and Skin Disorders:** High humidity levels during the rainy season create favorable conditions for the onset of skin infections, fungal conditions, and other dermatological issues in animals.
- **Rise in insect population:** Heavy rainfall subsequently leads to the surge of insect population in humid areas which can irritate animals, spread infection and eventually contribute to parasitic infections.

- **Higher Risk of Foot and Mouth Disease (FMD):** The prevalence of viral and bacterial infections, particularly foot and mouth disease, tends to rise during the rainy season due to wet and unhygienic ground conditions.
- **Weakened immunity:** The rainy season weakens animals' immunity due to increased humidity, parasite load, poor nutrition, and exposure to contaminated feed and water.

Precautions in animal maintenance during rainy season:

- In addition to monitoring for seasonally prevalent diseases (e.g., helminthiasis, dermatophilosis, and respiratory infections), livestock handlers must implement comprehensive biosecurity and environmental management practices during the rainy season.
- Ensure timely repair of animal shed roofs to prevent water seepage and leakage during rainfall.
- Keep the windows of the livestock shed open and use fans to avoid heat and humidity.
- Maintain strict hygiene during the rainy season by preventing water stagnation to avoid mosquito breeding and parasitic infections.
- Ensure proper disposal of animal excreta and disinfect cattle sheds daily with phenyl to minimize bacterial contamination.
- Avoid accumulation of garbage or organic waste in and around the animal enclosures. Arrange for its prompt removal and conduct regular spraying of insecticides to control flies, ticks, and other vectors.

The challenge of maintaining animal feed during monsoon:

Due to financial constraints, farmers and livestock keepers often face significant difficulties in preserving and managing animal feed during the rainy season. Key challenges include:

- Lack of adequate storage facilities makes it difficult to safely store animal feed during the monsoon.
- Rainwater goes into the troughs made in the livestock shed.
- High moisture and poor ventilation during the rainy season lead to fungal growth and spoilage of stored feed.
- Humid conditions increase the risk of insect infestation, which affects the quality and safety of animal feed.
- Grains often retain excess moisture, leading to decay and nutrient loss, ultimately causing financial losses for farmers.

Recommended Feeding Practices for Animals during the Monsoon

Many livestock owners tend to reduce the amount of green fodder during the rainy season, but this should be avoided. While a slight reduction in green fodder is acceptable, animals should still receive a balanced diet consisting of approximately 40–50% green fodder and 50–60% dry fodder. Additionally, providing mineral mixtures, salt, and supplements such as mustard oil is essential to maintain health during the monsoon. Vitamins and protein-rich feed components should also be included to support immunity and growth. If animals show a decreased appetite or reluctance to drink water, prompt veterinary consultation is crucial to identify and address any underlying health issues.

Common Diseases Affecting Animals during the Rainy Season

Foot and Mouth Disease (FMD): A highly contagious viral disease affecting cloven-hoofed animals such as cattle, sheep, goats, and pigs. Although it severely impacts animal health, it does not pose a threat to humans.

Anthrax: A serious infectious disease caused by the bacterium Bacillus anthracis. This pathogen persists in soil for years and primarily affects animals, but can occasionally transmit to humans.

Black Quarter (Blackleg): A bacterial infection caused by Clostridium chauvoei, affecting cattle, sheep, and goats. It is characterized by severe inflammation of skeletal muscles, gas formation within tissues, and high fever.

Lice Infestation: Parasitic lice populations increase during the monsoon, feeding on animal blood and causing irritation, weakness, and restlessness in affected animals.

Conclusion:

In summary, the monsoon season poses significant challenges to livestock health and productivity due to increased disease risks, environmental stresses, and feed management difficulties. To mitigate these impacts, livestock farmers must adopt vigilant and holistic management practices, including maintaining hygienic and well-ventilated shelters, ensuring balanced nutrition, implementing timely vaccinations, and monitoring animals closely for early signs of illness. By tailoring animal care strategies to the unique demands of the rainy season, farmers can safeguard animal welfare and sustain agricultural livelihoods throughout this challenging period.

Robotics in The Dairy Industry

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Introduction

The dairy and food industry has become increasingly automated, covering everything from raw material production to the manufacturing and processing of finished products. The adoption of automation in this sector presents significant opportunities to enhance safety, quality, and profitability by optimizing process monitoring and control. As technology advances and becomes more affordable, the use of robotics to automate many of the complex and repetitive tasks in dairy production is becoming more feasible. Robotics is a highly interdisciplinary field, combining mechanical, electrical, and software systems. While the dairy industry has lagged behind others in robot implementation, largely due to the variation in consistency and shape of dairy products, there are still many potential applications. Automatic milking systems, or robotic milkers, are among the most impactful robotic applications in dairy. Additionally, robotics is effectively used in packaging and palletizing dairy products. With further exploration, robotics has the potential to play a larger role in various stages of dairy processing.

Why is automation needed?

The purpose of automation is to increase process efficiency, safety, productivity and product quality. This is generally achieved by means of a control system that has been programmed with a set of instructions. Below are the few reasons for automating industrial processes:

- Need to reduce direct labor
- Can't get people to do the job
- Need to increase quality
- Difficult to do the job manually
- Need to increase production
- Difficult to meet specifications consistently
- Need to provide flexibility in processes
- Hazardous to personnel
- Eliminates a contamination source.

Robot

The term "robot" is derived from the Czechoslovakian word "robota," meaning forced labor. A robot can be described as a programmable machine made up of electrical, mechanical, or electronic components. In essence, it serves as a machine that takes over tasks usually performed by a living being. According to the British Robot Association, an industrial robot is a reprogrammable device that can manipulate or transport materials, tools, or specific manufacturing equipment through programmed movements to carry out designated tasks. The International Standards Organization (ISO) offers a more technical definition, describing a robot as, "An automatically controlled, reprogrammable, multi-functional machine with multiple

degrees of freedom, capable of being either stationary or mobile for industrial automation purposes." Robots are particularly useful in certain work environments because they don't experience fatigue like humans. They can operate in extreme or hazardous conditions, work in places lacking air, handle repetitive tasks without boredom, and stay focused on their assignments.

Robotics

Robotics is a field of technology focused on the creation, development, and operation of robots. It involves the use of computer systems for controlling robots, providing sensory feedback, and processing information. These technologies enable machines to perform tasks that would otherwise be hazardous for humans or to replicate human traits such as appearance, behavior, or cognitive functions.

Robotics in dairy industry

In recent years, the use of robotics in the food industry has grown, particularly in processing and packaging systems. However, the industry has not embraced the technology as quickly as sectors like automotive manufacturing. As robotics technology becomes more affordable and sophisticated, automating many of the complex and repetitive tasks in food production is becoming increasingly feasible. This presents opportunities for improved food shelf life, cost savings, and greater operational flexibility (Wallin, 1997). The dairy industry, in particular, has been slower to adopt robotics due to the unique characteristics of dairy products, which vary significantly in consistency and shape. Despite these challenges, there are numerous potential applications for robotics in the dairy sector. One of the most notable applications is Automatic Milking Systems (AMS), or milking robots, which have become a key innovation. Robotics are also widely used at the end of the production process, particularly in packaging and palletizing operations.

Robotic milking system

Robotic milking systems, which replace manual milking, have been around for over a century. Automatic milking systems (AMS), also known as robotic milkers, are among the most significant and successful robotics applications in the dairy industry. Developed in Europe, these systems became commercially available there in 1992, and the technology was introduced to the United States in 2000. AMS operates on a voluntary milking basis, allowing cows to decide when they are milked after an initial training period. Cows are milked with minimal human intervention. Each cow wears an electronic tag that the robot reads when she enters the milking platform, allowing the system to identify her. In return for entering the system, cows are given a feed reward based on their milk production level. The robot then cleans the cow's teats, attaches the milking cups, and begins the milking process. Once milking is complete, the cups disconnect as each quarter finishes, and the cow exits the system (Butler et al., 2012; Brogardh, 2007; Higgs & Vanderslice, 1987). This system operates continuously, milking cows day and night. A notable development in robotic milking is the world's first commercial robotic milking rotary, introduced by Swedish dairy equipment company DeLaval at a pilot farm in Quamby Brook, Tasmania, Australia. This system, which features five robots, has the capacity to milk up to 90 cows per hour, with robots accessing cows from the side. Laser technology is used to locate the cow's teats, clean them, and attach the milking cups. The first two robots clean and prepare the teats, the next two attach the cups, and the last robot disinfects the teats before the cow leaves the platform (Khodabandehlco, 1994; Legg, 1993). After milking, robotic liquid filling and finishing systems handle the product for packaging, ensuring precision in filling containers like bottles, vials, bags, and pouches. These systems can handle a wide range of container types and closure methods, making them

suitable for various production stages, from clinical trials to large-scale manufacturing.

Robotics in packaging

The commercial application of robots in food industry is widely spread at the end of processing lines like packaging and palletizing. However, there is a broad range of potential applications for robotics in food processing: in the meat industry, robots are used in slaughtering, deboning, cutting, sorting and packaging applications. Robots can also be used for picking and placing items such as cookies, hamburgers, chocolate pralines, croissants, chicken fillets or pan cakes into primary packing. Additionally, robots are already used in baking lines to handle hot trays. Reducing demands on labour can be a big plus point for robots especially when labour is expensive and in high demand. Moreover, robots minimize the human workers direct contact with the products. In the dairy industry, robots are used in cheese packaging, cheese slicing, and curd slicing etc. In cheese production, robots stir curds, transfer cheese moulds, and turn, cut, portion, package and palletize the cheeses. Integrated sensors and measuring systems enable the simple implementation of complex processes. Blocks of cheese arrive on wooden planks at the robot picking area. The special gripper allows the cheese blocks to be picked and placed onto a conveyor for further processing [Kempthome, 1995].

Robotic cleaning for hygiene

Automated cleaning robots play a crucial role in maintaining strict hygiene standards in dairy production environments. These robots are capable of performing cleaning tasks more consistently and thoroughly than human workers, which helps reduce the risk of bacterial contamination and ensures the safety and quality of dairy products. However, adapting these cleaning systems to fit various farm layouts can present challenges. Additionally, continuous monitoring is required to ensure that the robots function effectively as the needs of the farm evolve.

Automation in bottling and warehousing

Robotics also plays a vital role beyond the farm, particularly in the

bottling and warehousing stages of dairy production. Automated bottling lines improve efficiency, precision, and speed in packaging dairy products, ensuring that they are processed safely and hygienically. In warehousing, robotic systems streamline inventory management and order fulfillment, reducing the chances of human error and accelerating the distribution process. While these robotic systems greatly enhance operational efficiency, they come with significant up front costs and require skilled personnel for proper operation and maintenance.

Integrating robotics throughout dairy production offers clear advantages, such as higher productivity, improved animal welfare, and better product quality. However, shifting to a more automated system requires careful evaluation of initial expenses, technical challenges, and the specialized skills needed to fully realize the benefits of the investment.

Robotic feeding system

A robotic feeding system for cows is an advanced technological solution designed to automate the process of feeding cattle in a more efficient, precise, and scalable way. These systems are especially beneficial in large-scale dairy or beef operations where managing feed distribution manually can be labor-intensive and prone to errors. At the core of these systems are robotic feeders that can move

independently through barns or feeding areas, distributing feed to the cows based on pre-programmed schedules or real-time data.

One of the key features of robotic feeding systems is their ability to **monitor and adjust the feed** for individual cows. Sensors installed within the system, such as weight sensors, RFID tags, and cameras, track the cows' behavior and health. These sensors can monitor vital metrics like feed intake, weight, milk production, and even signs of illness or nutritional deficiencies. This information is transmitted to the system's central software, which analyzes the data and customizes the feed delivered to each cow based on its specific needs. For example, a high-producing dairy cow might need more energy-dense feed compared to a dry cow or a heifer.

The system works by **automatically mixing and delivering feed** from pre-stored ingredients such as silage, hay, grains, and supplements. Depending on the design of the system, the robot can either transport bulk feed from a central storage unit to different feeding stations or prepare individual portions for cows based on their specific dietary requirements. The robots are often capable of traveling along designated paths in the barn, stopping at various points to deliver feed to each cow or group of cows.

Conclusion

Robotics in the dairy industry offers numerous benefits, ranging from improved efficiency and productivity to enhanced product quality and animal welfare. Automated systems in milking, cleaning, packaging, and warehousing have revolutionized dairy operations, reducing human labor, minimizing contamination risks, and ensuring consistent quality. While the integration of robotics requires substantial investment, skilled personnel, and adaptation to specific farm needs, the long-term advantages, such as cost savings, increased safety, and operational scalability, make it a promising solution for modernizing dairy production. As technology continues to evolve, robotics will likely play an even more pivotal role in shaping the future of the dairy industry, driving innovation and sustainability.

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Sustainability in Dairy Animal Production: Balancing Productivity with Environmental Stewardship

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Dairy farming is a vital component of global agriculture, playing a key role in food security, rural livelihoods, and economic development. It provides millions of people with essential nutrients through milk and dairy products while also supporting smallholder and commercial farmers worldwide. However, with increasing global demand for dairy due to rising populations and shifting dietary preferences, the industry faces mounting challenges—chief among them, the need to ensure sustainable practices that do not compromise environmental integrity, animal welfare, or social equity.

Understanding Sustainability in Dairy

Sustainability in dairy animal production refers to the implementation of farming methods that ensure long-term productivity while minimizing negative impacts on the environment, maintaining animal health and welfare, and supporting economic and social viability. It encompasses the responsible use of natural resources such as water, soil, and energy, and strives to reduce greenhouse gas emissions, especially methane produced by ruminants.

Methane, primarily generated through enteric fermentation in cows and other ruminants, is a potent greenhouse gas with a warming potential many times higher than carbon dioxide. Furthermore, improper manure management can result in water pollution, odor problems, and release of additional greenhouse gases like nitrous oxide and ammonia. This growing environmental footprint has placed the dairy sector under pressure to adopt more sustainable and climate-smart approaches.

Yet, sustainability is not merely about environmental conservation—it includes economic and social resilience. A truly sustainable dairy system supports farmers' livelihoods, ensures access to markets, upholds labour rights, promotes gender equity, and contributes to the well-being of local communities. Therefore, sustainability in dairy must be pursued with a holistic, integrated approach.

Key Strategies for Sustainable Dairy Production

1. **Improving Feed and Nutritional Management**

   A critical component of reducing emissions and

improving productivity lies in enhancing the efficiency of feed use. Ruminant animals are unique in their ability to digest fibrous materials; however, the byproduct of this digestion process is methane. By optimizing feed composition and digestion, farmers can reduce methane output per unit of milk produced.

Strategies include the use of high-digestibility forages, balanced rations, feed additives (such as fats, oils, tannins, and seaweed), and better silage preservation methods. Precision feeding systems that tailor nutrient supply to individual animals' needs reduce overfeeding, lower feed waste, and promote efficient milk production.

2. **Genetic Selection and Breeding for Efficiency**

   Breeding programs aimed at improving genetic traits such as feed conversion efficiency, fertility, milk yield, and disease resistance are essential. Selecting animals that require fewer resources for the same or higher outputs improves environmental efficiency. Advances in genomic technologies now allow faster and more accurate identification of desired traits, enabling the development of high-performing, climate-resilient dairy herds.

   Breeding also includes crossbreeding with native or indigenous breeds that are better adapted to local environmental conditions, requiring fewer inputs and demonstrating greater disease resistance, especially in regions with harsh climates or limited veterinary infrastructure.

3. **Manure and Waste Management Solutions**

   Sustainable manure management is one of the most impactful areas for environmental improvement. Instead of viewing manure as a waste product, progressive systems see it as a valuable resource. Proper handling, storage, and application can improve soil fertility, reduce reliance on chemical fertilizers, and decrease environmental pollution.

   Innovative techniques such as composting, anaerobic digestion (to produce biogas), and solid-liquid separation of slurry help reduce emissions and enhance manure's value as a soil amendment. Biogas digesters not only reduce methane emissions but also provide clean energy for farm operations or household use, promoting energy independence and reducing fossil fuel reliance.

4. **Efficient Use of Water and Land Resources**

   Water scarcity is an increasing concern globally, and dairy farms are high consumers of water for cleaning, cooling, and animal hydration. Strategies for sustainable water use include recycling and treating wastewater, installing water meters to monitor usage, using efficient irrigation systems (like drip irrigation), and collecting rainwater. On pasture-based farms, rotational grazing systems help prevent overgrazing, encourage plant regrowth, and preserve soil structure.

   Conservation agriculture techniques—such as cover cropping, reduced tillage, and contour farming—help prevent soil erosion and retain moisture, which are critical for both feed production and environmental protection. Integrated crop-livestock systems can enhance nutrient cycling and biodiversity on the farm.

5. **Animal Welfare and Health as a Foundation**

   Healthy and well-managed animals are central to sustainable dairy production. When cows are comfortable, well-nourished, and free from disease or stress, they produce more milk efficiently. Ensuring proper housing conditions, hygiene, space allowance, and access to clean water and quality feed contributes to animal welfare. This reduces veterinary costs, antibiotic use, and mortality rates.

   Moreover, proactive veterinary care, biosecurity measures, and disease prevention through vaccination are cost-effective ways to maintain herd health. Stress reduction through gentle handling, minimizing transportation, and providing proper shelter during extreme

weather is equally important.

The Role of Technology in Advancing Sustainability

The integration of technology into dairy farming has opened new frontiers for sustainability. Precision livestock farming (PLF) uses sensors, cameras, and automated systems to monitor individual animal behaviour, health status, milk output, and feed intake in real time. This data-driven approach allows farmers to detect issues early, make informed management decisions, and optimize resource use.

Automated milking systems (AMS), robotic feeders, and herd management software are increasingly adopted in medium and large-scale farms. These innovations not only increase operational efficiency but also improve labor conditions by reducing manual work. Remote monitoring tools are especially valuable for farmers in remote areas, enabling veterinary consultation and support without physical presence.

Drones and satellite imaging can be used to assess pasture health, optimize grazing patterns, and plan feed production. These smart technologies reduce environmental pressure by targeting interventions precisely where they are needed.

Economic and Social Aspects of Sustainability

While environmental sustainability often takes center stage, the economic and social dimensions are equally critical. Farmers, particularly smallholders in developing countries, must see clear economic benefits to adopt new practices. Education and training are essential in this transition. Farmers need access to extension services, demonstration farms, financial literacy programs, and climate-resilient practices tailored to local contexts.

Governments and development agencies must offer incentives such as subsidies, tax relief, and grants to encourage sustainable practices. Carbon credit schemes and sustainability certification programs offer additional income streams and market advantages. Partnerships with dairy cooperatives and private sector players can facilitate access to technology, markets, and inputs.

Social sustainability also entails empowering women, youth, and marginalized communities within the dairy sector. In many regions, women are the primary caretakers of dairy animals but lack access to decision-making, credit, or land ownership. Gender-inclusive programs that address these disparities lead to more equitable and sustainable outcomes.

Market-Driven Sustainability and Consumer Awareness

Today's consumers are more conscious of where their food comes from and how it is produced. There is growing demand for ethically sourced, environmentally friendly dairy products. Certification schemes such as organic, grass-fed, and animal welfare-approved labels provide a way to communicate sustainability credentials to consumers and offer producers access to premium markets.

Transparent supply chains and traceability systems build trust and allow consumers to make informed choices. Encouraging local consumption and supporting farm-to-table initiatives further reduce food miles and promote local economies.

Public education on the role of dairy in sustainable diets is equally important. While some sustainability discussions promote reducing dairy consumption, particularly in industrialized countries, the solution lies more in how dairy is produced rather than whether it is consumed.

Conclusion

Sustainability in dairy animal production is no longer a future aspiration—it is a present-day necessity. The sector must transform to meet the growing demand for dairy while minimizing its ecological footprint and maximizing positive contributions to society. This transformation will require the collective effort of farmers, researchers, consumers, governments, and industry stakeholders.

By adopting climate-smart feeding strategies, improving genetics and animal welfare, integrating modern technology, and strengthening policy and market support, dairy farming can evolve into a model of sustainable agriculture. It is not enough to produce more; we must produce better—with respect for animals, people, and the planet. Only then can dairy farming continue to nourish future generations without depleting the very resources it depends on.

Water footprint of Milk

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Milk is essential component of food and livelihood security for rural people. Milk production accounts for roughly 25% of the yearly agricultural output of many rural households (Hemme et al., 2003), and it is a significant source of income for rural women. In India, milk consumption accounts for 7.0% of daily caloric intake, compared to 5.6% of the global average (FAO 2010). A vital component of milk production is water and it is one of the most important factors on a dairy farm because it is essential for livestock consumption to support milk production. Farmers are under a lot of pressure, mostly financially, as a result of this reliance, which may result in more stringent regulation and monitoring of water use (Robinson et al., 2016).

One of the biggest current and future concerns for livestock is to continue and to deliver high quality food while conserving natural resources. This activity requires a considerable amount of water and has a high polluting potential as both a point and non-point source. The water footprint is a comprehensive indication of freshwater resource appropriation that goes beyond typical restrictions on water extraction. The water footprint is defined as the total amount of fresh water used to generate a product, assessed at each stage of the manufacturing process (Hoekstra et al., 2011). The notion is similar to the ecological and carbon footprints; however, it refers to water use rather than land or fossil energy use. Water consumption is quantified in terms of volume consumed (evaporated) or contaminated. The water footprint is a spatially explicit indicator that displays not only amount of water used and polluted, but also the location.

In a study, Mekonnen and Hoekstra (2010) found that the water footprint of any animal product is greater than that of a carefully chosen agricultural product with similar nutritional content. The global water footprint of animal production is 2,422 billion m3/year (87% green, 6% blue, and 7% gray). One-third of this total is related to beef cattle, with the remaining 19% related to dairy cattle. The water footprint of animal feed accounts for the majority (98%) of the total water footprint of animal products. Drinking water for animals, service water, and feed mixing water account for 1.1, 0.8, and 0.03%, respectively (Hoekstra, 2012). The physiological significance of water in dairy is well recognized. It is crucial for the animal's health and well-being, but it is a reductionist viewpoint if the goal is to use water efficiently in the production system and management of natural resources (Palhares et al., 2020).

Components of Water Footprint:
A water footprint is composed of three components:

1. **Green Water Footprint:** Green water is precipitation on land that does not run off or recharges the groundwater, but instead is held in the soil or momentarily rests on top of the

soil or vegetation. It consists of precipitation and soil water absorbed by the crop. All food we eat requires green water flow from plant transpiration from plants (Falkenmark & Rockström, 2004). Green water resources are rainfall that has infiltrated in the root zone of the soil, also known as soil moisture (Deutsch et al., 2010). Green water flow is made up of both evaporation and transpiration, frequently referred to as evapotranspiration.

2. **Blue Water Footprint:** In agriculture and animal production systems, blue water refers to the volume of water irrigated from diverse sources such as groundwater, rivers, and ponds etc. So, the blue water footprint is formed of irrigation, drinking water, groundwater and surface water.
3. **Grey Water Footprint:** The grey water footprint of a product is an indicator of freshwater pollution that may be related to its manufacturing across the supply chain. It is measured as the amount of water required to dilute pollutants to a level where the water's quality remains above agreed water quality criteria (Hoekstra and Chapagain, 2008).

Direct consumption of blue water contributes to local water scarcity, whereas green water does not limit the availability of blue water or environmental flows and has no impact on a local hydrological system (Berger and Finkbeiner 2010; Ridoutt et al., 2010; Doreau et al., 2012). Green water use has a low environmental impact because it does not modify hydrological processes. However, using blue water in irrigated agriculture has the potential to cause serious environmental issues such as water depletion, water-logging, salinization, and soil degradation (Aldaya et al., 2010). A grey footprint accounts only a very small proportion of the footprint per ton of output.

Water footprint of milk production:

The 'Water Footprint' of milk is defined as the total volume of freshwater consumed in various stages of the milk production chain, measured in litres per kilogram of milk. In milk production, Consumptive Water Use (CWU) is both direct (drinking, bathing and servicing) and indirect (feed and fodder consumption) (Figure 1).

$$WF_{milk} = WF_{direct} + Wf_{indirect}$$

For stall-fed animals, the direct water requirement is entirely satisfied by groundwater and/or surface water sources, hence it falls within the blue component of water footprint. Rainwater may also account for some of the water used for drinking and washing by animals that are part of a grazing system. However, given the absence of data on the ratio of rain to ground water consumption, the full amount of water is regarded in the blue component. In feed and fodder production, CWU is derived from irrigation (blue water) and effective rainfall (green water). Milk production may also cause water pollution (grey water) by lowering water quality below drinking water standards due to contamination from animal wastes and the excessive use of inputs such as chemical fertilizers in the production of feed and fodder crops.

Direct Water Use

The direct water footprint of a product refers to freshwater consumption and pollution caused by the producer's water use. Drinking, servicing, and bathing are all direct uses of water. Information can be collected through both

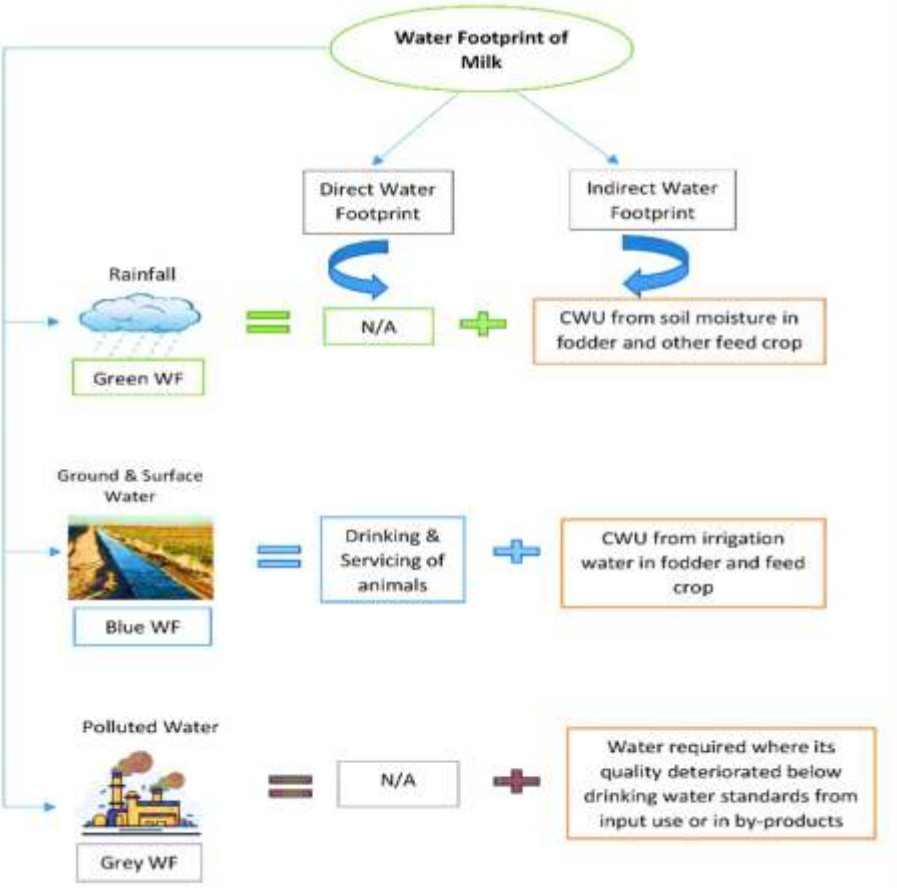

Figure : Flow diagram of different components of water footprint for milk production

observation and farmer interviews. The diameter of the pipe utilized, the duration of the water flow, and the number of animals can all be used to quantify direct use.

$$WF_{direct} = Drinking\ water + Bathing + Servicing\ (in\ litres)$$

$$CWU = m^3/tonn = \frac{WF_{direct}}{Avg.\ milk\ yield\ (L/day)}$$

As the agricultural water is specifically allocated for the purpose of generating animal feed, overall livestock water consumption could be up to 100 times larger than that required for drinking alone (Peden et al., 2003).

Indirect Water Use

Indirect water footprint, refers to the water consumption and pollution related with the (non-water) inputs used by the producer (Hoekstra et al., 2011).

$$WF_{indirect} = WF_{dry\ fodder} + WF_{green\ fodder} + WF_{concentrate}$$

Calculation of water used for feed and fodder crops (Crop Water Requirement) : Crop water requirements are based on actual evapo-transpiration (ETp) during four stages of crop growth. Crop evapotranspiration is determined by weather, crop and management conditions, and environmental factors.

$$ET_p = \sum_{i=1}^{4} k_i \times \sum_{month\ j\ in\ ith\ growth\ period} d_{ij}\ ET_0{}^{ij}$$

Where, ki = crop coefficient of ith growth period; dij = Number of days of the jth month in the ith crop growth period and Et_0^{ij} = Reference evapotranspiration of the j^{th} month in the i^{th} crop growth period.

$CWU^{effective\ rain} = Min\ (ET_o, P_{eff})$

Where, P_{eff} is effective part of rainfall at the root zone

Green Water Footprint is the CWU from rainfall = Min (ET_p, P_{eff})

When irrigation meets a portion of the crop's water deficit, the irrigation CWU is the difference between actual evapotranspiration (ET_p) and effective precipitation (P_{eff}).

Blue Water Footprint is CWU from irrigation = ET_p-P_{eff}

$CWU_{Crop} = CWU_{Green} + CWU_{Blue}$

Calculation of CWU of Animals through Feed and Fodder:

a) Data should be collected on seasonal basis, preferable for three seasons i.e. hot humid/rainy, winter and summer

b) The indirect water usage by animals is then calculated by multiplying the intake of each type of feed and fodder by the CWU (in m^3/kg) of the corresponding crop.

Indirect water $= \sum_i x_i\ CWU_i$

Where, x_i is intake of 'i' feed/fodder by the animal

CWUi is the consumptive water use of 'i' feed/fodder resource

Dairy calves obtain water from three sources: drinking water, feed water, and metabolic water. Water in consumed feeds (performed water) varies greatly depending on moisture content, which can vary from as low as 5% in dry feeds to 90% or more in succulent feeds (Sileshi et al., 2002).

Factors Affecting Water Footprints of Animal Products

The global water footprint of animal production is over one-third of that of total agricultural production (Gerbens-Leenes et al., 2011). Drinking water accounts for less than 1% of total water consumed in milk production from buffalo, crossbred cows, and indigenous cows, with embedded water accounting for the remainder (Singh et al., 2004). The main elements involved in water footprint of milk are:

a) Feed conversion efficiencies

b) Feed composition and Feed origin

Feed Conversion Efficiencies

The amount of feed required to generate one unit of animal product, or feed conversion efficiency, has a significant impact on the water footprint. Cattle's relatively low conversion efficiency results in a huge water footprint. Efficiency improves as animals' transition from grazing to mixed to industrial systems because they receive more concentrated feed, move less, and are bred to grow quicker. If the feed conversion efficiencies are poor, this will result in a greater water footprint.

Feed Composition and Feed Origin

Feed accounts for 98 per cent of the total water footprint, followed by drinking water (1.1%), service water (0.8%), and feed mixing water (0.03%) (Mekonnen and Hoekstra, 2010). Chapagain and Hoekstra (2003) examined water use by various milk production components and found that in general, concentrates have a higher WF than roughage. Green fodder, dry fodder, and feed concentrates

are the three main sources of feed for indigenous and crossbred cows and buffaloes, which account for 1, 28, and 71% of the milking animal population respectively. Climate and agricultural methods in the regions where the various feed components are sourced also have an impact on the water footprint of a particular animal product. The water footprint of concentrates is five times that of roughages. While the entire water footprint of roughages is around 200 m3/tonne (global average), the package of components contained in concentrates is approximately 1,000 m3/tonne. Because roughages are primarily rain fed and crops for concentrates are often irrigated and fertilized, the blue and grey water footprint of concentrates are even 43 and 61 times that of roughages, respectively.

Conclusion

Water footprint can serve as a tool for sustainable dairy farming for calculating the amount of water utilized in milk production. It can be mostly lowered by reducing crop production water use, which is the most significant indirect component. Furthermore, crop wastes, agricultural byproducts, and green fodder have a smaller water footprint than grains. As a result, feeding systems that use crop leftovers and agricultural byproducts have lower water footprints and are better for the environment. Crop wastes with a low water footprint can be better used through value addition, such as Total Mixed Ration. Thus, dairy farmers can significantly reduce their water footprint by implementing scientific feeding techniques and new feed delivery devices such as Total Mixed Ration. Proper management tactics are critical for maintaining livestock production systems.

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Poultry Planner and Dairy Planner Announce Official Media Partnership with ILDEX Indonesia 2025

Haryana, India – Poultry Planner and Dairy Planner, two of the leading industry-specific publications catering to the poultry and dairy sectors, are proud to announce their official media partnership with ILDEX Indonesia 2025. This strategic collaboration will further strengthen the global presence of these premier publications while supporting the growth and innovation of the livestock, dairy, meat processing, and aquaculture industries in Indonesia and beyond.

ILDEX Indonesia 2025, one of the most anticipated international livestock, dairy, meat processing, and aquaculture exhibitions, will take place from September 17 to 19, 2025, at Jakarta International Expo, Indonesia. With a focus on industry advancements, cutting-edge technology, and networking opportunities, ILDEX Indonesia serves as a key platform for professionals, suppliers, and decision-makers from across the globe.

As an official media partner, Poultry Planner and Dairy Planner will have an exclusive stall at the event, providing a hub for industry professionals to engage, exchange insights, and explore the latest trends in the poultry and dairy sectors. This partnership marks a significant milestone in expanding the reach of these magazines, bringing valuable knowledge and business opportunities to stakeholders in the region.

A Strategic Collaboration for Industry Growth

The partnership between Poultry Planner, Dairy Planner, and ILDEX Indonesia 2025 reflects a shared commitment to fostering innovation, knowledge-sharing, and business development in the livestock and dairy industries. Through this collaboration, Poultry Planner and Dairy Planner will:

- **Offer In-Depth Coverage:** Providing comprehensive coverage of ILDEX Indonesia 2025, including exclusive interviews, panel discussions, and insights from industry leaders.
- **Facilitate Networking:** Engaging with exhibitors, attendees, and key stakeholders to foster meaningful business connections and knowledge exchange.
- **Showcase Innovations:** Highlighting the latest technological advancements and trends in the poultry and dairy sectors, offering a platform for businesses to showcase their products and solutions.
- **Host Interactive Sessions:** Organizing live discussions, presentations, and networking sessions at the event stall to encourage industry engagement.

About ILDEX Indonesia 2025

ILDEX Indonesia is recognized as one of the premier international trade exhibitions for the livestock

and dairy industry. The event brings together global industry leaders, investors, suppliers, and policymakers, providing a unique opportunity to explore market trends, business prospects, and innovative solutions shaping the future of the sector.

With a strong emphasis on emerging technologies, sustainability, and best practices, ILDEX Indonesia serves as a crucial meeting point for industry professionals seeking to expand their knowledge and business reach.

Commitment to Industry Excellence

Speaking about the partnership, Mayank Arya, Project Manager with Team of Poultry Planner and Dairy Planner, stated, "We are thrilled to join hands with ILDEX Indonesia 2025 as an official media partner. This collaboration aligns with our mission to provide industry professionals with valuable insights and updates, while also creating opportunities for knowledge exchange and business growth. With our presence at the event, we look forward to engaging with global leaders and driving impactful discussions on the future of poultry and dairy industries."

As part of the collaboration, Poultry Planner and Dairy Planner will also release special editions focused on ILDEX Indonesia 2025, featuring expert opinions, market trends, and exclusive insights into the evolving landscape of the poultry and dairy sectors.

Join Us at ILDEX Indonesia 2025

Poultry Planner and Dairy Planner invite industry stakeholders, business leaders, and professionals to visit their stall at ILDEX Indonesia 2025 to explore opportunities, discuss industry trends, and engage with thought leaders.

About Poultry Planner and Dairy Planner

Poultry Planner and Dairy Planner are leading publications dedicated to delivering in-depth analysis, market trends, and industry news in the poultry and dairy sectors. With a strong readership across India and international markets, these magazines serve as a vital resource for professionals looking to stay informed and ahead of industry developments.

58th AGM & 66th National Symposium 2025

Theme: "Animal Agriculture in India - The Way Forward"

Date: 22nd & 23rd August 2025 at Taj Deccan, Road No.1, Banjara Hills, Hyderabad - 500034

Day-1: Friday, August 22, 2025	
Time	**Session**
10:00 hrs	Registration of Delegates
11:00 hrs -12:00 hrs	Managing Committee Meeting
12:00 hrs - 13:30 hrs	Lunch
13:30 hrs -14:30 hrs	58th Annual General Meeting
Inaugural Session	
16:00 hrs.	**Inviting Dignitaries to the Dais inauguration & Lighting of Lamp**
16:05 hrs	**Welcome Address by Convenor** Mr. Vijay D. Bhandare, Managing Committee Member, CLFMA OF INDIA
16:10 hrs	**Chairman Address by** Mr. Divya Kumar Gulati, CLFMA OF INDIA
16:15 hrs	**Thematic Address by** Shri. Tarun Shridhar, IAS, (Retd.) - Animal Agriculture: Setting the Context
16:30hrs	**Keynote Address by** Mr. B. S. Yadav, Managing Director, Godrej Agrovet Ltd.
16:45 hrs	CLFMA Awards & Students Awards Ceremony
17:15 hrs	**Address by Special Guest** Sri Sabyasachi Ghosh, IAS, Special Chief Secretary, Government of Telangana
17:25 hrs	**Address by Guest of Honour**, Ms. Alka Upadhyaya, IAS, Secretary AHD*
17:35 hrs	**Address by Guest of Honour** - Sri Vakiti Srihari, Minister for Animal Husbandry and Fisheries, Sports and Youth Services, Animal Husbandry, Dairy Development and Fisheries Department, Hyderabad, Telangana
17:45 hrs	**Address by Chief Guest**, Prof. S. P. Singh Baghel, Minister of State of Fisheries, Animal Husbandry & Dairying and Minister of State in the Ministry of Panchayati Raj *
17:55 hrs	**Launching Souvenir**
18:00 hrs	**Vote of Thanks by** Mr. Nissar F. Mohammed, Honorary Secretary, CLFMA OF INDIA
19:00 hrs	**Networking Dinner & Live Performance** Felicitation of Sponsors, Media, Guests, and Invitees

Day-2: Saturday, August 23, 2025	
09:00 hrs	Registration
09:15 hrs	Welcome Address by Mr. Divya Kumar Gulati, Chairman, CLFMA OF INDIA
09:30 hrs	Introduction of Symposium – Dr. Devender Hooda, CLFMA OF INDIA
10:00 hrs	**Mr. R. S. Sodhi** - Growing Towards a Globally Competitive **Dairy**
10:20 hrs	**Dr. Girish Kolwankar** - Managing Emerging Challenges and Harnessing Opportunities in **Poultry**
10:40 hrs	**Dr. Manoj M. Sharma** - **Aquaculture**: Looking Beyond Exports and Expanding Domestic Markets
11:00 hrs	**Panel discussions: Feed, Raw materials and Other Inputs– Balancing the Balance Sheet** **Moderator: Dr. P. S. Mahesh** ❖ All Indian Distillery associations (AIDA) ❖ Broiler Coordination Committee (BCC) ❖ Poultry Farmers & Breeders Association (MH) ❖ Mr. Reece Cannady, US Grain Council ❖ IFFCO ❖ Dr. O. P. Chaudhary (Retd. JS NLM/PC) ❖ Dr. N. C. Manju
13:00 hrs – 14:00 hrs	**Lunch Break**
14:00 hrs	Right to Protein initiative USSEC
14:15 hrs	**Panel Discussions with National Associations**
	Outlook of Animal Agriculture for Viksit Bharat **Moderator: Mr. B. S. Yadav** ❖ Mr. Suresh Chitturi, All India Poultry Breeders Association ❖ Mr. Divya Kumar Gulati, Chairman CLFMA OF INDIA ❖ Mr. Ranpal Dhanda, President PFI ❖ Mr. Daljit Singh, Progressive Dairy Farmers Association ❖ Mr. Saji Chacko, Society for Aquaculture Professionals (SAP) ❖ Mr. Ravi Kumar Yellanki, All India Shrimp Hatchery Association ❖ Mr. Madan Mohan Maity, West Bengal Poultry Federation Association
15:30 hrs	**Animal Agriculture: Health Challenges & Potential Solutions** **Moderator: Dr. P. K. Shukla (Head of Department, Mathura Veterinary College)** ❖ Poultry Health Dr. M. R. Reddy (General Secretary Association of Avian Health) Professions, Principal Scientist Project Directorate of Research Options. ❖ Poultry Health: Dr. Banibrata Maity ❖ Poultry Health: Dr. Ajay Deshpande ❖ Dairy Health: Dr. Prakash Joti Salunkhe, Gokul Dairy, Head of Department Veterinary Health ❖ Dairy Heath: Dr. Mukesh Sharma ❖ Shrimp Health: Dr. Ravikumar Amreneni
16:45 hrs	**Valedictory Session: Mr. S. V. Bhave**
	Felicitation of Sponsors, Media, Guests, and Invitees
	Vote of Thanks by – Mr. R. Ramkutty, Treasurer, CLFMA OF INDIA
19:00 hrs	**Networking Dinner**

Awareness Program for livestock farmers across Western and Southern States/UTs through the Common Service Centres (CSC)

The Department of Animal Husbandry and Dairying (DAHD), under the Ministry of Fisheries, Animal Husbandry and Dairying, organized a Virtual Awareness Program for livestock farmers across Western and Southern States/UTs through the Common Service Centres (CSC) on 11thJuly, 2025. The program was chaired by Prof. S.P. Singh Baghel, Hon'ble Minister of State for Ministry of Fisheries, Animal Husbandry and Dairying and Ministry of Panchayati Raj. Smt. Alka Upadhyaya, Secretary, DAHDalso graced the program with her presence.

Prof. S.P. Singh Baghel, Hon'ble Minister of State, highlighted the program as a valuable opportunity for direct engagement with the livestock farmers. He commended the Department's efforts in enhancing milk production, noting the significant contribution of initiatives such as the use of Sex-Sorted Semen (SSS). He mentioned that the price of SSS has been drastically reduced—making it significantly more accessible and affordable for farmers across the country. He urged the farmers to actively engage in the sessionas it would help them to translate knowledge "from lab to land" for practical application in livestock farming.He also interacted with farmers from various States, inquiring about their livestock, access to veterinary services, and their awareness of departmental schemes.

Smt. Alka Upadhyaya, Secretary, DAHD, underscored the critical importance of timely vaccination in safeguarding livestock health and preventing the spread of diseases. She elaborated on the concept of zoonotic diseases, which can be transmitted from animals to humans, highlighting the need for disease control measures. She also emphasized the role of advanced breed improvement techniques in enhancing productivity. She encouraged farmers to actively apply the knowledge gained from the program to their practices, thereby contributing to the overall development of the animal husbandry sector.

Livestock farmers participated in the awareness program through **2,000 locations** across **the Western and Southern States/UTs** of the country. Farmers have joined this program from the locationsacross the States and UTs including Gujarat, Andhra Pradesh,

Karnataka, Daman and Diu, Dadra and Nagar Haveli, Goa, Maharashtra, Puducherry, Rajasthan, Tamil Nadu, and Telangana. **Over 1 lakh livestock farmers participated** in the session. The program was aimed to aware farmers on critical aspects of animal husbandry including breed improvement, vaccination, zoonotic disease control, and sanitation practices.The program featured expert sessions and educational videos on SSS, and vaccination. The initiative is part of the Department's efforts to improve awareness on livestock and dairy sector by leveraging digital platforms and engaging directly with the livestock and dairy farmers.

Posted On: 23 JUL 2025 3:21PM by PIB Delhi

Ministry of Fisheries, Animal Husbandry & Dairying

Performance of National Livestock Mission

The Department is implementing the National Livestock Mission - Entrepreneurship Development Programme (NLM-EDP) which provides a 50% capital subsidy (upto Rs.25.00 lakh) for setting up rural poultry breed development ventures. Between the financial years 2021–22 and 2025–26, a total of 208 poultry sector projects have been approved under this initiative, expected to generate 1,201 employment opportunities.

Data with regard to increase of per animal productivity through breed improvement is not maintained in the records of this Department.

As per available records of the Department the percentage of increase in production of meat, egg and goat milk from FY 2019-20 to FY 2023-24 is as follows:

Year/Product	Meat		Egg		Goat Milk	
	Production (000 Tns)	Annual Growth Rate (%)	Production (Lakhs Nos)	Annual Growth Rate (%)	Production (000 Tns)	Annual Growth Rate (%)
2019-20	8599.99	5.98%	1143831	10.19%	5850.14	- 4.08%
2020-21	8797.92	2.30%	1220496	6.70%	6261.87	7.04%
2021-22	9292.14	5.62%	1296003	6.19%	6602.56	5.44%
2022-23	9768.64	5.13%	1383763	6.77%	7599.60	15.10%
2023-24	10252.65	4.95%	1427716	3.18%	7805.56	2.71%

The Department is implementing the Livestock Insurance initiative under the Centrally Sponsored National Livestock Mission (NLM) across all districts of the country. The objective is to help farmers and livestock owners manage risks and uncertainties by offering a protection mechanism against the loss of animals due to death. The scheme covers insurance for indigenous/ crossbred milch animals, pack animals (such as horses, donkey, mules, camels, ponies and male cattle/ buffaloes), as well as other livestock like goats, sheep, pigs, rabbits, yaks and mithuns.

Subsidy benefits are limited to 10 cattle units per household for all animals except pigs and rabbits, where the limit is 5 cattle units (with 1 cattle unit equalling 10 small animals). To improve affordability, the farmer's share of the insurance premium has been simplified and reduced from the earlier 20 to 50% range to a uniform 15%. The remaining 85% of the premium is jointly funded by the Centre and States in a 60:40 ratio for most states, and 90:10 for the Himalayan and North-Eastern regions.

Over the past five years, Rs.135.3215 Cr. has been released under the scheme, insuring a total of 55.86 lakh animals.

This information was given by Union Minister of State, Ministry of Fisheries, Animal Husbandry and Dairying, Prof. S.P. Singh Baghel, in a written reply in Rajya Sabha on 23rd July, 2025.

According To CM Sarma, Assam Will Have A 10-lakh-liter Milk Processing Capacity In Three Years

On Sunday, Assam Chief Minister Himanta Biswa Sarma conducted bhumi pujan for Purabi Dairy's expansion, increasing the plant's daily milk processing capacity to 3 lakh litres.

The chief minister of Assam declared that the state government and the National Dairy Development Board (NDDB) are collaborating to establish additional processing facilities in Silchar, Dibrugarh, Jorhat, and other places. According to him, the action will boost Assam's milk processing capacity to 10 lakh litres over the following three years.

Sarma told reporters that "In Assam, we decided three years ago to produce ten lakh litres of milk for daily processing... Today we are here for the Bhumi Pujan, which will see the NDDB (National Dairy Development Board) raise the plant's milk processing capacity to 3 lakh litres. Furthermore, the Assam government and the NDDB are collaborating to develop additional processing units in Silchar, Dibrugarh, Jorhat, and other sites... "I am confident that within the next 3-4 years, Assam will have a daily milk processing capacity of 10 lakh litres,".

Earlier this year, during the Advantage Assam Summit, the state's dairy and organic farming sectors received a significant boost with the signing of two key Memorandums of Understanding (MoUs). On February 26, the National Dairy Development Board (NDDB) and West Assam Milk Producers' Cooperative Union Limited (WAMUL) signed a deal that will treble the milk processing capacity at Purabi Dairy's Panjabari plant in Guwahati.

The Rs 100 crore expansion project would boost the plant's capacity from 1.5 lakh litres per day (LLPD) to 3 LLPD, assuring a consistent supply of quality dairy products to satisfy rising customer demand.

Additionally, a new ice cream facility with a capacity of 20 TLPD will be established as part of the development, and the output of fermented milk products will expand from 20 MTPD to 50 MTPD.

AHD Jammu Carries Out An Awareness Campaign In Remote Regions Of The Districts Of Rajouri and Poonch

The Animal Husbandry Department's Extension and Publicity Wing in Jammu wrapped off a three-day, comprehensive awareness campaign that was started in the remote and hilly districts of Rajouri and Poonch.

Coordination of the campaign was done with the twin districts' Animal Husbandry department authorities.

An awareness session was held at Village Planger, Tehsil Thana Mandi in district Rajouri on July 15 by a team from the Extension and Publicity Wing. On July 16 and 17, respectively, programs were held at Savjjian and Loran villages in district Poonch. The farmers who attended were also given free veterinary vitamins and medications. Approximately 400 farmers from the twin districts directly participated in the campaign.

The department of animal husbandry's many programs and schemes were explained, with a focus on entrepreneurship development, immunisations, and other beneficiary-oriented programs like the Integrated Poultry Development Program (IPDP), the National Animal Disease Control Program (NADCP), the Integrated Dairy Development Scheme (IDDS), and the Holistic Agriculture Development Programme (HADP). In addition to providing publicity materials in local languages about the programs and the newest technologies in the animal husbandry industry, the officials thoroughly described the advantages of the schemes. Under the direction of Extension Officer Dr. Mohammad Sajjad, the campaign also aimed to increase farmers' knowledge so they could apply cutting-edge methods and strategies in the production and sale of milk and milk products, hence raising their income levels.

In order to make dairy farming a lucrative endeavour, the farmers were also informed on the use of improved cattle breeds, feeding, and disease and pest management. During the camps, movies also offered valuable insights into contemporary poultry production.

American Dairy Farms Are Affected By Avian Influenza

A Cornell study demonstrates that a virus causes milk loss and severe mastitis. The dairy industry in the United States has faced unforeseen difficulties as a result of the current epidemic of highly pathogenic avian influenza (HPAI) H5N1.

According to a Cornell University study, farmers incur large losses as a result of the severe mastitis, decreased milk production, and increased mortality rates experienced by infected cows. In Ohio, researchers monitored a herd of 3,876 cows and discovered that infected animals were at a significant risk of dying or being removed early. The financial impact was enormous: for this herd alone, the cost was close to $737,500, with each diseased cow costing $950.

“The farm did its best to isolate the affected animals,” said senior researcher Felipe Peña Mosca, but the virus spread quickly, infecting 20% of the herd in just 23 days. Within two months, over 40% of the 777 sick cows departed the herd. The financial strain was highlighted by virologist Diego Diel, who said, "If you are affected by an outbreak, this represents a shock to production costs." The decrease in production is a significant setback for dairy producers, even while pasteurisation guarantees the safety of milk.

Additionally, the study found that conventional cleaning techniques used during milking may unintentionally contribute to the virus's spread. Traditional methods of preventing mastitis could not work against HPAI, which would be problematic for dairy farms. The virus, which was initially discovered in wild birds in 2024, spread to cows, sparking a fresh round of studies on animal health and food safety. The outbreak raises the poultry industry's already $1.4 billion in costs.

Biosecurity is still a major problem, particularly for open-housing dairy farms. In order to safeguard dairy herds, the experts urge further study on virus control and the creation of potent vaccinations. This growing worry highlights the necessity of ongoing study and attention to protect the dairy industry's future in America.

Gujarat: Amit Shah Establishes A New Salt Cooperative And Dairy Federation

The Sardar Patel Cooperative Dairy Federation was established in Gujarat on Sunday by Union Minister of Home and Cooperation Amit Shah, who claimed that it will help the nation's farmers in a similar way to Amul. Shah also announced the creation of the Kutch District Salt Cooperative Society, which will help the salt producers, or Agariyas as they are known in Gujarat, during a ceremony in Anand to commemorate the Ministry of Cooperation's four-year anniversary.

The Gujarat Cooperative Milk Marketing Federation Limited (GCMMF), widely known as Amul for the brand it sells, organised the event, which also commemorated Sardar Vallabhbhai Patel's 150th birthday. In the dairy industry, the multi-state Federation seeks to create a system of fair pricing, organised milk procurement, and a circular economy.

Along the lines of Amul, Shah stated, "The Sardar Patel Cooperative Dairy Federation will work to complete a cycle of organised market, input services, fair purchase of milk, difference in price, and circular economy in the dairy sector." The country's farmers will also gain from this.

Shah also officially opened the ₹365 crore Dr. Verghese Kurien cheese and chocolate plants in Kheda and Mogar, respectively. He dedicated the NDDB's Ready-to-Use Culture (RUC) Plant, which was constructed at a cost of 45 crore, and opened the new office block of the National Cooperative Dairy Federation of India (NCDFI), Maniben Patel Bhawan, which is situated in the National Dairy Development Board (NDDB) complex in Anand.

Shah stated in his speech that since

its establishment four years ago, the Ministry of Cooperation has carried out more than sixty projects centred on people, digital platforms, Primary Agricultural Credit Societies (PACS), policy reforms, and prosperity. According to him, cooperation has been a part of Indian society since the Vedic era, and Prime Minister Narendra Modi provided it legal support by establishing the ministry, which has revitalised over 8.4 lakh cooperative institutions with a combined membership of over 31 crore people.

According to Shah, six new national-level cooperative bodies—three pertaining to grain and three to dairy—as well as two lakh new PACS and a National Cooperative Database are being established. Additionally, the future Tribhuvan Sahkari University was recently founded under the name Tribhuvan Das Patel. He stated that the income from salt production will now go to the people who labour in the fields and that the Kutch District Salt Cooperative Society, which was established on Sunday, will help salt workers and develop into a powerful cooperative movement.

Over 70% of India's salt is produced in Gujarat, with the Little Rann of Kutch providing almost 30% of the total. Shah also urged cooperative organisations to prioritise member-centric procedures, technology usage, and transparency. During the International Year of Cooperatives, he pushed executives to instill these ideals into the workplace culture, stating that cooperative models cannot thrive in a competitive climate without them.

On the anniversary of Dr. Shyama Prasad Mookerjee's birth, he paid respect to him, stating that Mookerjee made West Bengal a part of India and gave his life for Kashmir. "Two prime ministers, two constitutions, and two flags would not be acceptable in the country," Shah remarked in reference to his slogan.

Regarding the milk cooperative model, he stated that 20 lakh women in different regions of the nation and 36 lakh women in Gujarat toil diligently every day. "Amul's yearly revenue is ₹80,000 crore, and it will surpass ₹1 lakh crore the following year." These 56 lakh sisters are directly benefiting from the earnings from this. Shah added that Prime Minister Modi's initiatives were made with this in mind. "Prosperity is not of a few rich people, but of the poor, labourers, and farmers. It is not of an individual, but of the entire society."

Ashokbhai B. Chaudhary Is Unanimously Elected Chairman Of The GCMMF

The largest farmer-owned dairy cooperative in the world, the Gujarat Cooperative Milk Marketing Federation (GCMMF), also known as the Amul Federation, unanimously elected Ashokbhai B. Chaudhary, the chairman of the Mehsana Milk Union, as its chairman and Gordhanbhai P. Dhameliya, the chairman of the Rajkot Milk Union, as its vice chairman today. According to the dairy major's announcement, all 18 of the GCMMF's member unions participated fully in the election meeting on Tuesday.

Shamalbhai B. Patel, the chairman of the Sabarkantha Milk Union, suggested Ashokbhai B. Chaudhary as the new name, and Ashwinbhai N. Salawiya, the chairman of the Amreli Milk Union, endorsed the idea. Valamjibhai R. Humbal (Chairman, Kutch Milk Union) nominated Gordhanbhai P. Dhameliya for the position of vice chairman, and Mohanbhai R. Bharwad (Chairman, Ahmedabad Milk Union) backed him.

The Registrar of Cooperatives, Government of Gujarat, and the District Collector of Anand were present during the election process, demonstrating the Federation's steadfast adherence to democratic principles. GCMMF has proudly upheld the custom of unanimous elections for its leadership since its founding in 1973, according to the statement.

With a turnover of Rs 65,911 crore in FY25, GCMMF reported an 11.2% increase. Over 12 billion gallons of milk were purchased by the Federation during that time, and its member unions generated a brand turnover of Rs 90,000 crore.

The statement also stated that Amul has been named the world's strongest food and dairy brand by Brand Finance UK, with over 24 billion product packs sold throughout India and more than 50 countries.

At The 2025 Global Dairy Congress, Vinamilk Wins Prestigious Awards And Displays Science-Driven Innovation

AMSTERDAM The top dairy firm in Vietnam, Vinamilk, won two important awards at the 2025 World Dairy Innovation Awards and presented its science-driven innovation strategy at the Global Dairy Congress (GDC) 2025.

Nearly 200 business executives gathered at the 18th Global Dairy Congress in Amsterdam, Netherlands, to discuss new

developments and the direction of the global dairy industry. The event, which had as its theme "Dairy for All Ages," emphasised sustainable solutions, inclusive nutrition, and innovation to cater to customers at all stages of life.

In its fifth visit at the event, Vinamilk—the only company from Southeast Asia to present—emphasized how cutting-edge technology and scientific applications unleash and improve nature's gifts, reaffirming its dedication to industry excellence.

Vinamilk displayed state-of-the-art dairy products at GDC 2025, a leading international dairy industry conference, with the theme "Born by Nature, Perfected by Science." This showcase illustrated Vinamilk's innovation strategy to preserve and enhance the natural value of dairy while satisfying a variety of nutritional and health needs. Products like Vinamilk Optimum, Plant-Based Milk, and the Green Farm product range were highlighted.

Green Farm was highlighted as an example of using cutting-edge dairy technology to maximise the possibilities of nature. Its exclusive air-sealed technique preserves milk's natural flavour, freshness, and flowery scent by reducing free oxygen radicals by up to 50%. In order to address the growing need for individualised nutrition, Green Farm High Protein Milk uses European ultra-filtration technology to provide a clever, additive-free nutritional solution that is high in protein, rich in calcium, low in fat, and lactose-free. In the meantime, Green Farm Drinking Yoghurt, which has 720 million living cultures that improve flavour and digestive health, is the first and only product in Vietnam to have six European probiotic strains.

The exclusive newborn formula Vinamilk Optimum, which was inspired by breast milk, also highlighted a significant scientific advancement. It includes six Human Milk Oligosaccharides (HMOs) for the first time in Vietnam. This amounts to 58% of the total HMO content in breast milk, which is the greatest concentration on the market. In keeping with its sustainability objectives, Vinamilk also became the first dairy company in Southeast Asia to use Tetra Pak's healthy soy grinding technology, improving soy nutrition and cutting waste.

CM Dr. Mohan Yadav Says 50% of MP Villages Will Join The State Milk Network

The Madhya Pradesh government's pledge to increase milk output in the state as a way to improve the financial standing of farmers and livestock owners was reaffirmed by Chief Minister Dr. Mohan Yadav on Sunday.

According to him, there are presently initiatives in place to establish an integrated milk supply network in half of the state's villages.

“381 new dairy cooperative societies have been established, linking 9,500 milk producers with the cooperative dairy system,” Dr. Yadav said during a meeting with senior officials from the Animal Husbandry and Dairy Development Department at his home.

Union Home and Cooperation Minister Shri Amit Shah had previously advocated for modifying Madhya Pradesh's dairy development plan to increase its efficacy, and this drive in the dairy sector is in line with his directive. The goal of the revised roadmap is to increase market accessibility by 15% while utilising 72% of the state's capacity for milk production.

The Chief Minister emphasised the significance of several important areas of focus during the conference, including increasing milk collection, enhancing the genetic quality of milch animals, and supporting native breeds through model farms in partnership with the National Dairy Development Board. Additionally, he instructed authorities to "establish a Heifer Rearing Centre under the Bhopal Dugdh Sangh" and emphasised the need to "enhance the brand value of Sanchi dairy products." Priorities were also set for expediting the digitisation of operations and guaranteeing "timely payment to milk-producing farmers."

The Chief Minister was informed by officials that increased producer engagement is reflected in the surge in milk procurement across many unions. Procurement rates have been raised by Rs. 2.50 to Rs. 6 per litre in order to safeguard the interests of dairy farmers.

The milk collecting growth of the Jabalpur and Gwalior Milk Unions has been especially robust. A working capital allocation of Rs. 2 crore has been made to each of these unions to assist outstanding payments to milk farmers.

CM Pledges 40,000 Government Employment By October And Aims For Self-Sufficiency In Dairy, Poultry, And Pork

In addition to promising a large increase in government job appointments and tourism

development, Chief Minister Himanta Biswa Sarma on Thursday announced a comprehensive plan for reviving Assam's rural economy through self-reliance in the production of dairy, poultry, and pig.

The Chief Minister gave employment letters to 481 new hires from three departments—26 in education, 12 in tourism, and 443 in veterinary—during a public event held at Srimanta Sankaradev International Auditorium in Panjabari.

1,20,840 employment appointments have been made by the state government thus far, and 40,000 more are expected to be made by October 10. Sarma talked extensively about the state's dairy potential and stated that, like Gujarat and Karnataka, Assam needs to capitalise on its traditional livestock techniques and scale them up.

Beyond domestic use, Amul manufactures 2 crore gallons of milk every day in Gujarat. The Nandini brand handles 80 lakh litres in Karnataka. "Assam has historically fallen behind in comparison," he remarked. With assistance from Amul, Kanyaka, and Sitajkhala, he continued, the state is now able to process over 2 lakh litres per day, whereas Purabi Dairy previously handled only 20,000 litres.

The state has set up North East Dairy and Foods Limited to increase dairy production. It plans to buy 1 lakh litres from Dibrugarh, Dhemaji, Cachar, and Jorhat, 25,000 litres from Bajali, and up to 3 lakh litres from Purabi Dairy in Guwahati. With multiple brand milk parlours planned throughout Assam, the long-term objective is to reach 10 lakh litres per day. "The government will soon provide dairy farmers with an extra Rs 5 per litre in aid on top of the market price," Sarma declared. Sarma also emphasised the state's creative breeding initiatives. In order to get a high milk yield and climate adaptation, Assamese "Lakhimi" cows and Gujarati "Gir" cows are being crossed to create a hybrid breed.

Over 90% of female calf deliveries have been guaranteed since the advent of sex-sorted semen technology, which helps milk producers maintain their operations. The CM brought up the fact that 90% of Assamese eggs are currently imported when talking about poultry. He disclosed that the government now purchases 5–6 lakh eggs every day, with a goal of 1 crore eggs per day in the future. "We want to develop 1,000 egg entrepreneurs and reach industrial-scale production with the establishment of layer farms and assistance from banks and the state," he said.

The importance of biogas to Assam's "Atmanirbhar Bharat" mission was also emphasised by the chief minister. The government hopes to enhance the local economy by promoting biogas as a rural energy alternative utilising cow manure and Nepiar grass. He emphasised how important veterinary field helpers are to this ecology. In Sarma's address, the tourist industry in Assam was also highlighted. He said that, in terms of visitor numbers, Kaziranga came in third place in the nation last year, while The New York Times classified Assam as the fifth most popular Indian destination. Manas has the potential to become a year-round destination, while Kaziranga is still a seasonal destination. Effective promotion of our religious and natural places can lead to a boom in tourism, Sarma stated.

He emphasised making Dima Hasao a high-end travel destination and proposed a homestay model similar to Uttarakhand.

Dodla Dairy Purchases Osam Dairy for ₹271 Crore, Expanding Into Eastern India

The premium dairy brand Osam Dairy in eastern India was acquired by South India-based Dodla Dairy on Friday for Rs 271 crore, signalling a major entry into the rapidly expanding eastern sector.

According to a joint statement from the firms, the 100% acquisition of Osam Dairy is one of the first significant transactions in the dairy industry in eastern India and highlights the area's capacity to draw in institutional capital.

A major turning point in Dodla's history is the proposed acquisition of Osam, which they are excited to announce. Dodla Sunil Reddy, Managing Director of Dodla Dairy, stated, that This strategic move demonstrates our dedication to becoming a pan-India dairy company.

According to him, eastern India is a promising market for the dairy sector, with faster growth than the national average, bolstered by robust GDP development and considerable potential for urbanisation. Along with the private equity investors that had supported the business, Osam Dairy's promoters Abhinav Shah and Harsh Thakkar are exiting the deal.

During the acquisition, which was finished in a little more than four months, Osam Dairy and its stockholders had InCred Capital as their sole financial advisor.

India Doesn't Want To Import "non-veg" milk Because

Of The Pig Blood, fowl faeces, And Cat Meat That US Cows Consume

According to US President Donald Trump, the United States and India are extremely close to signing a trade agreement. A significant snag in the trade agreement, though, is India's unwillingness to permit American dairy imports because of worries about US feed methods, particularly the use of animal-based products.

In India, milk from cows fed animal-derived items is referred to as "non-vegetarian milk." These include fats derived from rendered animal parts, meat meal, and blood meal—practices permitted under US law.

This is a red line for India, where vegetarianism is ingrained in both faith and culture. The 2023 World Atlas states that over 38% of Indians are vegetarians and that dairy products, particularly milk and ghee, are frequently used in Hindu religious ceremonies.

India has demanded that certifications attesting to the fact that the animals were never fed animal-based feeds be included with any imported dairy products. The stakes are not just cultural; they are also financial. Millions of small-scale farmers, many of whom depend on just one or three cows for their livelihoods, dominate India's dairy industry.

According to a State Bank of India (SBI) assessment, opening the market to US imports might result in a minimum 15% drop in Indian milk prices, which could cost domestic dairy farmers up to Rs 1.03 lakh crore a year.

At the moment, the dairy industry makes up between 2.5 and 3% of India's Gross Value Added (GVA), or Rs 7.5 to 9 lakh crore. Therefore, it is anticipated that any disruption will have a significant effect on rural livelihoods and income.

Trump Tariffs: India Sets Trade Deal Red Lines And Faces A Court Battle In The US Before The Deadline Of July 9

According to PTI, which cited people involved with the negotiations, Washington now has the task of finalising the proposed interim trade agreement after India drew its red lines on the dairy and agriculture sectors. Prior to July 9, which is the conclusion of the 90-day suspension period of extra US tariffs announced in April, the two nations have been working to announce the agreement.

The United States delayed a reciprocal tax of 26% on Indian imports for 90 days in April. The standard 10% tariff is still in place. India is requesting a complete exemption from the 26% charge; if this is not granted, the tariffs would be reinstated. In the agricultural sector, the United States is requesting duty exemptions for goods such as genetically modified crops, dairy products, apples, and tree nuts. It will be difficult and challenging for India to make any concessions in the agribusiness sector, though, because it is a politically sensitive industry. In the free trade agreements it has negotiated thus far, India has not allowed any of its trading partners to access the dairy industry.

Last week, India would only sign a deal that is thoroughly concluded, fully finalised, and in the country's best interests, according to Commerce Minister Piyush Goyal. With the goal of reaching a first-phase agreement by the autumn, India and the US started bilateral trade negotiations in February. Both parties have been draughting an interim agreement in the lead-up to that. Following discussions with the US on an interim trade agreement, the Indian team, headed by top negotiator Rajesh Agrawal, returned from Washington last week. President Donald Trump declared on Sunday that the United States was nearing completion on a number of trade agreements and that it will alert nations to increased tariff rates by July 9.

Howard Lutnick, the secretary of commerce, said that the increased duties would go into force on August 1 if negotiations fail. Although their implementation was postponed for the majority of countries, Trump had in April declared a 10% base tariff with extra charges of up to 50%. The top end of the new tariffs, he claimed, might be between 60% and 70%.

India's biggest trading partner is the United States. India exported $86.51 billion worth of products and imported $45.33 billion, leaving a $41.18 billion surplus in bilateral goods trade, which totalled $131.84 billion in 2024–2025. This year, the expected value of services traded between the two nations is $70.5 billion. Drug formulations, telecom equipment, jewels and gems, petroleum products, and ready-made clothing are among India's top exports to the United States. Crude oil, petroleum products, coal, diamonds, electrical equipment, and aeroplane components are among the main imports.

Since 2000, the United States has made India the third-largest investor with $70.65 billion in foreign direct investment.

Editorial Calendar 2025

Publishing Month:
January
Article Deadline :
28th, Dec. 2024
Advertising Deadline :
30th, Dec. 2024
Focus :
Opportunities and Challenges

Publishing Month:
February
Article Deadline :
28th, Jan. 2025
Advertising Deadline :
30th, Jan. 2025
Focus :
Budget

Publishing Month:
March
Article Deadline :
26th, Feb. 2025
Advertising Deadline :
28th, Feb. 2025
Focus :
Summer Stress Management

Publishing Month:
April
Article Deadline :
28th, March 2025
Advertising Deadline :
30th, March 2025
Focus :
Cold Chain

Publishing Month:
May
Article Deadline :
28th, April 2025
Advertising Deadline :
30th, April 2025
Focus :
Nutrition

Publishing Month:
June
Article Deadline :
28th, May 2025
Advertising Deadline :
30th, May 2025
Focus :
Milk - Production & Preservation

Publishing Month:
July
Article Deadline :
28th, June 2025
Advertising Deadline :
30th, June 2025
Focus :
Monsoon Management

Publishing Month:
August
Article Deadline :
28th, July 2025
Advertising Deadline :
30th, July 2025
Focus :
Sustainability

Publishing Month:
September
Article Deadline :
28th, August 2025
Advertising Deadline :
30th, August 2025
Focus :
Processing & Packaging

Publishing Month:
October
Article Deadline :
28th, September 2025
Advertising Deadline :
30th, September 2025
Focus :
Disease Prevention

Publishing Month:
November
Article Deadline :
28th, October 2025
Advertising Deadline :
30th, October 2025
Focus :
Biosecurity

Publishing Month:
December
Article Deadline :
28th, November 2025
Advertising Deadline :
30th, November 2025
Focus :
Winter Stress

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from_____to_____

Dairy Planner
☐ 1 Year ☐ 3 Year ☐ 5 Year
from_____to_____

Poultry Times of India
☐ 1 Year ☐ 3 Year ☐ 5 Year
from_____to_____

Grand Total: _____

Contact Name : _____

Company Name : _____

Postal Address : _____

City : _____ State : _____ Mob. No._____

Postal Code : _____ Country : _____

Payment Details:

Send DD or Cheque in favour of Pixie Expomedia Pvt. Ltd. payable at Karnal
Address: C/o OmAng Hotel, Namaste Chowk, Near Janta Petrol Pump, KARNAL - 132001 (Haryana) INDIA or Transfer money to Canara Bank
Bank address: Sector 12; U Estate Karnal
Account Type: Current
Account Name: Pixie Expomedia Pvt. Ltd.
Account Number: 120000991579
IFSC Code: CNRB0003264 | Swift Code: CNRBINBBBFD | PAN No. AAMCP6787A

For more detail, contact:

pixie expomedia
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Pixie Expomedia Pvt. Ltd.
C/o OmAng Hotel, Namaste Chowk, Near Janta Petrol Pump, KARNAL - 132001 (Haryana) INDIA

Date:_____ Company's Stamp & Signature

By signing this form I acknowledge that I have read and agree to the quoted cost above

5% GST Extra* **Advertisement Tariffs

Advertisement Type	Single Issue (INR)	Single Issue (USD)		Advertisement Type	Single Issue (INR)	Single Issue (USD)		Advertisement Type	Single Issue (INR)	Single Issue (USD)	
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