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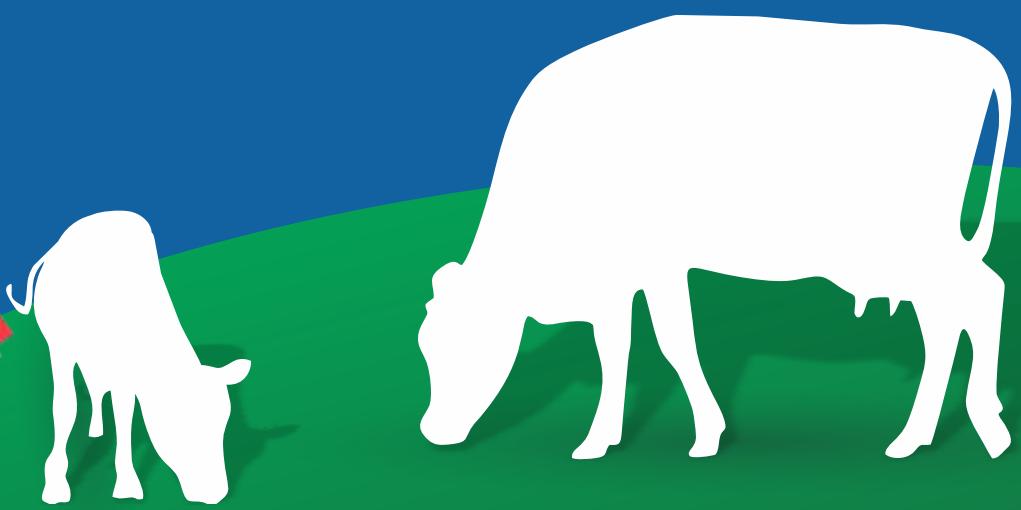

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From the Pen of Chief Editor

Beating the Heat: How Dairy Farmers Can Tackle Heat Stress

Rising temperatures are no longer just a seasonal challenge; they're a growing threat to dairy farming. Heat stress, caused by high temperatures and humidity, directly impacts cows, reducing milk production and quality. As climate change intensifies, managing heat stress is becoming a crucial priority for dairy farmers worldwide. Cows are highly sensitive to heat, struggling to cool down when temperatures exceed their comfort range of 5°C to 25°C. Unlike humans, they rely on limited sweating and respiration to regulate body temperature. When they overheat, their feed intake drops, affecting their energy levels, metabolism, and ultimately, milk yield. Prolonged heat stress also weakens immunity, making cows more vulnerable to diseases like mastitis, which further compromises milk quality.

One of the most noticeable effects of heat stress is lower milk fat and protein content, which affects dairy product quality. Increased somatic cell count (SCC), a key indicator of udder health, can lead to higher bacterial contamination, reducing shelf life and market value. The economic impact on farmers is significant, as lower-quality milk fetches lower prices and may even be rejected by processing plants.

To combat heat stress effectively, farmers can adopt several strategies. Cooling systems, such as shade structures, fans, sprinklers, and misting systems, help cows stay cool, while proper barn ventilation plays a key role in preventing overheating. Smart feeding strategies, including feeding during cooler hours, using high-energy diets, and adding minerals like sodium bicarbonate and potassium, help maintain nutrition. Ensuring proper hydration management by providing clean, cool water and electrolyte supplements prevents dehydration and supports metabolic function. Additionally, genetic selection for heat-resistant breeds is emerging as a long-term solution, while farm infrastructure upgrades, such as heat-reflective roofing, improved pasture management, and automated monitoring systems, help create a more comfortable environment for cows.

As dairy farming faces climate-driven challenges, adapting to heat stress is essential. Investing in innovative solutions and proactive farm management ensures that cows remain healthy, milk production stays consistent, and dairy farmers can sustain profitability despite rising temperatures. After all, happy cows make the best milk—even in the heat!

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PRESS RELEASE

ARTICLE

Cold Chain Management: Ensuring Freshness of Milk from Dairy Farm to Consumer

Chirag Singh[1], Varsha Vihan*[2] and Bhawna[3]

[1]Department of Livestock Product Technology, College of Veterinary Science and Animal Husbandry, U.P. Pandit Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishwavidyalaya Evam Go-Anusandhan Sansthan, Mathura, Uttar Pradesh

[2]Dairy Technology Division, ICAR-National Dairy Research Institute, Karnal, Haryana

[3]Department of Livestock Product Technology, College of Veterinary and Animal Sciences, Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut, 250110, India

Corresponding author: Email-
*varshavihan16495@gmail.com

Introduction

Milk is one of the most widely consumed dairy products worldwide, but it is also highly perishable. Rich in essential proteins, vitamins, and minerals, it serves as a staple in many diets. However, its composition makes it an ideal medium for bacterial growth if not handled and stored at the correct temperature. Once extracted, milk begins to deteriorate due to microbial activity and enzymatic reactions, leading to spoilage, health risks, economic losses, and food wastage. To preserve its quality and ensure consumer safety, Cold Chain Management plays a crucial role. This system maintains controlled temperatures throughout the entire supply chain, from milking to final consumption, by implementing a series of temperature-controlled steps, including on-farm cooling, refrigerated transportation, and proper storage at processing facilities, retail outlets, and households. By effectively managing the cold chain, milk's freshness, nutritional value, and safety are preserved, benefiting farmers, processors, retailers, and consumers alike.

For farmers, adopting proper cold chain practices ensures better milk quality, reduces losses, and increases their earnings. It also helps them meet food safety regulations and sell their milk at a higher price in premium markets. Dairy processors and retailers also benefit from an efficient cold chain, as it minimizes spoilage, extends shelf life, and ensures compliance with food safety standards. Moreover, consumers receive fresher, safer milk with better taste and nutritional value.

With increasing global demand for high-quality dairy products, cold chain management has become more important than ever. Advances in refrigeration technology, monitoring systems, and logistics have improved the efficiency of

milk storage and distribution. By implementing best practices in cold chain management, the dairy industry can enhance sustainability, reduce food waste, and ensure the delivery of safe, high-quality milk from farm to table.

Why is Cold Chain Management Important for Farmers?

For dairy farmers, proper cold storage and handling of milk can lead to multiple benefits:

Prevents Milk Spoilage and Reduces Losses

- Fresh milk starts to degrade immediately after milking. If left at room temperature, bacteria multiply rapidly, causing spoilage.
- Proper cooling slows down bacterial growth, increasing shelf life and reducing milk wastage.

Increases Profitability

- High-quality milk fetches better prices in the market.
- Farmers using bulk milk coolers (BMCs) and instant chillers can negotiate better rates with dairy processors and cooperatives.
- Less spoilage means more sellable milk, improving overall income.

Ensures Compliance with Safety Standards

- Many milk buyers and dairy companies reject milk that does not meet safety standards due to contamination or poor handling.
- Following cold chain practices helps farmers qualify for premium buyers and export markets.

Builds Farmer Reputation

- Consumers today demand fresh, high-quality, and safe milk.
- Farmers who maintain good cold chain practices can build a strong reputation and long-term relationships with buyers and cooperatives.

Key Steps in Cold Chain Management for Dairy Farmers

1. Immediate Cooling After Milking

- Freshly milked milk should be cooled to 4°C within 2 hours to prevent bacterial growth.
- Farmers can use:

✓ **Bulk Milk Coolers (BMCs) –** Large tanks that cool and store milk. Ideal for dairy cooperatives and large farms.

✓ **Instant Milk Chillers –** Quickly cools milk before transportation. Useful for small and medium farms.

✓ **Insulated Milk Cans with Ice Packs –** A cost-effective option for small farmers without electricity.

2. Proper Storage at the Dairy Farm

- If milk is not immediately sold, it should be stored in chilled storage tanks at blow 4°C.
- Avoid keeping milk in open containers, as exposure to air can cause contamination.

3. Hygienic Milking Practices

- Dirty hands, unclean utensils, or poor hygiene can introduce bacteria into milk, making cold storage less effective. - Farmers should:

✓ Wash hands and use clean equipment before milking.

✓ Use stainless steel buckets instead of plastic to prevent contamination.

✓ Cover milk storage containers to prevent dust, insects, or dirt from entering.

4. Refrigerated Transportation to Dairy Processing Units

- Once collected, milk should be transported in insulated or refrigerated tankers to maintain temperature.
- GPS tracking and temperature sensors help monitor milk conditions during transport.

5. Cold Storage at Dairy Processing Plants

- After pasteurization, milk must be stored at 4°C or below before being processed into products like butter, cheese, and yogurt.

6. Retail Cold Chain and Consumer Awareness

- Milk must be kept in refrigerated displays at retail stores.
- Consumers should be educated on proper storage (e.g., keeping milk in the fridge, not at room temperature).

Technologies That Can Help Farmers in Cold Chain Management

- **Refrigerated Milk Tankers –** Ensure milk stays fresh during transport.
- **IoT-Based Temperature Sensors –** Help track milk temperature in storage and transport.
- **Solar-Powered Coolers –** Useful for farmers in rural areas with unreliable electricity.
- **Blockchain Technology –** Helps track milk from dairy farm to consumer, ensuring authenticity.
- **Mobile Apps for Cold Chain Monitoring –** Allow farmers to monitor temperature, quality, and transportation in real-time.

Challenges Faced by Farmers in Cold Chain Management

While cold chain management has many benefits, farmers often face difficulties in implementing it:

High Cost of Cooling Equipment – Bulk milk coolers and refrigeration systems require investment, which may be challenging for small farmers.

Unreliable Electricity Supply – Power cuts in rural areas affect milk cooling. Solar-powered alternatives can help.

Lack of Awareness – Many small farmers are unaware of the importance of cold chain management and good hygiene practices.

Limited Access to Refrigerated Transport – Many farmers rely on traditional transport, which does not have cooling systems.

To overcome these challenges, government support, dairy cooperatives, and private sector investment are essential to provide affordable cooling solutions, training programs, and financial assistance for small farmers.

Future of Cold Chain Management in Dairy Farming

With growing consumer demand for high-quality milk, the future of cold chain management looks promising. Key advancements include:

- **Use of AI and IoT in Cold Chain Monitoring –** Real-time tracking of milk temperature, reducing spoilage.
- **Solar-Powered Bulk Milk Coolers –** Cost-effective cooling solutions for off-grid farms.
- **Expansion of Farmer Cooperatives –** Helping small farmers access shared cold storage facilities.
- **Blockchain for Transparency –** Digital tracking of milk from dairy farm to consumer to ensure safety.

Conclusion

Cold chain management is vital for dairy farmers to ensure milk remains fresh, safe, and of high quality. Proper cooling, hygienic milking, refrigerated transport, and modern technology can help farmers reduce wastage, increase profits, and build consumer trust. By investing in the right infrastructure and following best practices, farmers can improve their earnings and contribute to a healthier, more sustainable dairy industry.

Prevention and Control of Mastitis in Dairy Animals

Jinu Manoj* and Manoj Kumar Singh
*DIO, College Central Laboratory, LUVAS, Hisar, Haryana
Assistant Professor, COVAS, SVPUAT, Meerut, Uttar Pradesh

Introduction

Mastitis has been observed in practically all domestic mammals and has a global geographic spread. Mastitis occurs when microorganisms enter the teat through the teat canal. Almost any bacteria can infiltrate the teat canal and induce mastitis. Climatic circumstances, seasonal change, bedding, animal population housing density, and husbandry procedures, such as dairy animal milking protocols, all have an impact on incidence and etiology of mastitis. The principal reservoirs of mastitis might be either contagious or environmental in nature. Contagious spread of pathogens occurs during milking, through milkers' hands or milking equipment acting as fomites. For contagious pathogens, adult lactating cattle are most at risk of infection. Some pathogens are opportunistic invaders from the animal's environment. The bedding used to house cattle is the primary source of environmental pathogens; however, contaminated teat dips, intramammary infusions, water used for udder preparation before milking, water ponds or mud holes, skin lesions, teat trauma and flies have all been incriminated as sources of infection for mastitis. Milking hygiene also decreases the new infection risk of environmental pathogens.

Based on the presence or absence of clinical signs, mastitis can often be described as subclinical or clinical mastitis. Clinical mastitis in most dairy herds is caused by environmental pathogens. In addition, many clinical mastitis cases are transient, especially those that are initial episodes for a cow and quarter. The assessment of clinical mastitis within a herd is based on incidence and not prevalence. Prevention of clinical mastitis in cattle is possible only by decreasing microbe exposure to the teats. New subclinical mastitis infections are prevented by focusing management efforts on decreasing the presence of pathogens on the teat end. Clean and dry bedding, clean and dry udders at the time of milking, and not using water during the milking protocols as well as maintaining teat-end health have a positive effect on control of mastitis.

Prevention of mastitis

The fundamental principle of mastitis control is controlling the disease by either decreasing the exposure of the teat to potential pathogens or by increasing resistance of dairy animals to infection. To produce high quality milk and sustain udder health in dairy farming, a comprehensive strategy to control and prevention of mastitis is required. This can be achieved by adopting the following practices.

1. **Treatment of clinical cases of mastitis**

   Clinical mastitis is classified as peracute, acute, subacute or chronic based on the severity and duration of occurrence of symptoms. Mastitis should be treated based on herd data and personal experience, with a focus on eradicating the causing bacteria when possible. The mastitis case must be treated immediately at 12 or 24 hour intervals, depending on the etiology and severity of the case. In general, it is recommended to utilize narrow-spectrum antibiotics. Teat ends should be completely cleansed with 70% alcohol before delivering intramammary medicines in clinical cases. A persistently ill animal that is not responding to treatment should be culled or segregated. It is a highly effective means of eradicating existing infection and preventing transmission to other animals. However, using antimicrobials to treat subclinical mastitis during lactation can be costly and ineffective.

2. **Teat-dipping**

   Teat dipping is a process that involves applying a germicidal solution to the teats of lactating animals after milking. Postmilking teat dipping reduces bacteria on teat and prevents new intramammary infections between milking. Teat dips can be of two distinct classes. 1. Non-barrier type teat dips and 2. Barrier type teat dips. Non-barrier teat dips have traditionally focused on the use of fast acting antimicrobial compositions for both premilking and postmilking operations. Barrier type teat dips, used mostly in the postmilking operation, typically also comprise an antimicrobial agent, but are applied for longer term contact and form a coating or a film protecting the teat skin from microbes that otherwise would have access and infect the skin.

   A number of different types of disinfectants are used in teat dips, including iodine with iodophors, chlorhexidine, acidified sodium chlorite, organic acids, peroxides, quaternary ammonium chlorides and others. Another group of active compounds that are gaining favor are organic acids. These include lactic acid, dodecylbenzene sulfonic (DDBSA), caprylic, salicylic, glycolic and capric acids. These products should be applied as a dip, rather than as spray immediately after milking.

3. **Dry Cow Therapy**

   Dry cow therapy (DCT) has become an essential component of the mastitis control plan in dairy bovines. Cows are naturally protected against intramammary infections during the dry period by formation of a keratin plug in the teat canal. However, time of teat canal closure varies among cows. Teats which do not form a plug-like keratin seal are thought to be most susceptible to infection. DCT is carried out at the end of lactation. In this, dairy cows are treated with antibiotics to prevent and treat mastitis during the dry period.

   Two types of DCT are followed.

   1. Blanket dry cow treatment (BDCT): In this, all the cows are treated with antibiotics during the dry period.2. Selective dry cow therapy (SDCT): In this, only infected cows or quarters are treated. Uninfected quarters/cows are not administered with intramammary antibiotics. These are to be used under the supervision of a veterinarian. Treatment with the help of intramammary antibiotics resolves mastitis and averts new infections from recurring over the dry phase. Usage of alcohol wipes before attaching dry cow tubes is a hygienic practice that prevents the spread of bacteria and other forms of contamination. Selective Dry Cow Therapy is becoming more popular as it may reduce antibiotic resistance when compared to BDCT.

4. **Nutrition**

   A balanced diet plays an important role in udder resistance to infection because certain nutrients affect various mammary resistance mechanisms. Correctly compiled and mixed feed ration which meets all the requirements during the individual stages of lactation (phase nutrition) can achieve increased resistance of dairy cows to mastitis causing pathogens. When composing and mixing the feed ration, it is necessary to use feeds that are safe from fungi and mycotoxins. A feed ration with the necessary amounts of vitamins, minerals and other immunostimulatory additives improves the body's defenses against pathogenic bacteria

and subsequent risk of causing mastitis. Vitamin E and selenium compounds are among the most effective antioxidant nutrients. Humic acids have been added to feed ration in recent years to increase the body's defenses and eliminate adverse conditions that could lead to the occurrence of various metabolic diseases and ailments. They are based on lignin collectively with other components of plant biomass. The supplementation of humates to the feed, stimulates the immune system and the growth of symbiotic rumen microflora also.

5. **Herd Environment and Management practices**

Dairy farm management methods are critical in preventing and controlling mastitis. Improving udder health and getting rid of mastitis depends on the cleanliness of the area where the animals are kept. It is advised to replace the bedding material (straw, sawdust) at regular intervals and removal of dung should be frequently done. The shed must always be dry and clean to prevent the formation of a breeding ground for bacteria, which causes environmental mastitis. It is good to use lime or special commercial products available on the market to disinfect and absorb excess moisture from sheds. The floor of the shed should be non-slippery and smooth flooring is not preferred in dairy farms because of chances of injuries. The animal shed should have proper ventilation also. Mastitis exposure is minimized when all areas of the environment are clean, cool and dry. The animal should have no access to manure, mud, or pools of stagnant water and calving area must be clean. Resistance is maximized by providing a stress free environment that minimizes teat injury and by feeding balanced diets.

A proper milking hygiene program fulfilling all the biological and hygienic requirements of the dairy animal is required. Regular cleaning and disinfection of the milking parlor should be observed. It is important to separate sick dairy cows from healthy animals until they are completely cured or eliminated. Milkers must adhere to a well defined procedure involving personal hygiene measures like washing hands with soap and water, washing teats and udder in sanitizing solution, thoroughly drying teats and udder with individual towels, dipping teats in an effective germicidal teat dip, allowing 30 seconds of contact time before wiping off teat dip with an individual towel, thoroughly scrubbing the teat end with a cotton swab soaked in alcohol, first strips from all the quarters in a container with a black bottom and perform a sensory assessment of the quality of the milk, postmilking dip application, rinsing and regular technical maintenance of milking equipment, feed the cows after milking for about 20-30min to keep them upright until the teat close etc.

6. **Vaccination Procedures**

Immunoprophylaxis of mastitis involves means and methods for targeted enhancement of specific immunity to an infectious agent. The possibility of vaccinating cows against specific pathogens causing intramammary infections is a relatively new specific tool for suppressing, controlling and preventing udder inflammation. Monovalent or polyvalent vaccines can be used in a mastitis control programs. Available vaccines can shorten the duration of infection and limit the circulation of some contagious microorganisms causing udder inflammation. However, the preventive use of the vaccine in production herds is an economic burden associated with higher costs of purchase and administration.

Conclusions

The effective prevention programs against mastitis must include clean and dry housing of animals, correctly chosen milking procedure, initiation of early and adequate treatment of clinical cases of mastitis, effective management and selective use of antibiotics in the drying off cows, strict adherence to the hygienic protocol for milking etc. These measures can create a complete approach for controlling the most critical activities that are directly related to the initiation and spread of mastitis in the herd. Current scientific information and the daily implementation of established prevention and control measures in the dairy farms, can significantly affect the overall production, quality and nutritional value of milk with a favorable impact on consumer health

Economic Losses Due to Heat Stress in Dairy Farming

Introduction

Heat stress is one of the most significant challenges facing dairy farmers worldwide. As global temperatures continue to rise due to climate change, the frequency and intensity of heat waves have increased, severely impacting dairy productivity. Heat stress not only reduces milk yield and quality but also affects the overall health and reproduction of dairy cows, leading to substantial economic losses. The financial burden extends beyond direct losses in milk production to increased veterinary costs, reduced fertility rates, higher mortality rates, and the need for additional management interventions. This article explores the economic impact of heat stress on dairy farming, cost-effective solutions for both small and large dairy farms, and the role of government policies and subsidies in mitigating these challenges.

Economic Impact of Heat Stress on Dairy Farms

1. Reduced Milk Yield and Quality

Heat stress negatively affects dairy cows by reducing feed intake, leading to lower energy availability for milk production. Studies indicate that milk production can decline by 10-30% during extreme heat stress conditions. Lower milk yield translates to reduced income for dairy farmers, especially those relying on high production levels to sustain their operations. Additionally, heat stress affects milk composition by reducing fat and protein content, which in turn lowers the market value of the milk.

2. Increased Veterinary and Healthcare Costs

Heat stress weakens the immune system, making cows more susceptible to diseases such as mastitis, respiratory illnesses, and metabolic disorders. This leads to:

- Higher veterinary expenses for treatment and medications
- Increased use of antibiotics, which can affect milk safety and marketability
- More frequent herd health

checks, requiring additional labor costs

The long-term impact includes reduced productive lifespan of dairy cows, leading to higher replacement costs as farmers need to purchase or breed new cattle more frequently.

3. Reproductive Challenges and Lower Fertility Rates

Heat stress disrupts reproductive hormones, leading to:

- **Lower conception rates**
- **Irregular estrous cycles**, making breeding programs less effective
- **Higher rates of embryonic loss**, leading to fewer calves being born

As a result, farmers face higher artificial insemination (AI) costs and longer calving intervals, delaying milk production and reducing overall farm profitability.

4. Increased Mortality and Culling Rates

Severe heat stress can lead to higher mortality rates in dairy cattle. When cows are unable to regulate their body temperature effectively, they become more prone to heatstroke and dehydration. This results in:

- Increased culling of cows that fail to recover from heat stress
- Additional costs of replacing lost animals
- Financial losses due to the premature disposal of dairy cows

The impact is particularly severe for small-scale farmers, who may struggle to replace lost livestock due to limited financial resources.

5. Higher Management and Cooling Costs

To combat heat stress, dairy farmers often invest in cooling systems, ventilation, and shade structures, leading to increased operational costs. These include:

- Electricity costs for running fans, sprinklers, and water cooling systems
- Installation and maintenance expenses for shade structures and cooling barns
- Labor costs for additional monitoring and management efforts

These investments, while necessary, can put a financial strain on small and medium-sized dairy farms with limited capital.

Cost-Effective Solutions for Small and Large Dairy Farms

While heat stress poses a significant financial burden, there are cost-effective solutions that farmers can implement to minimize losses and improve herd productivity.

1. Affordable Cooling and Shade Solutions

- **Natural shading:** Planting trees around the farm or using cost-effective shading materials such as bamboo or tarpaulin can help reduce direct sun exposure.
- **Low-cost ventilation:** Small farms can use portable fans or exhaust systems to improve airflow in barns.
- **Water-based cooling methods:** Installing basic sprinkler systems that spray water at intervals can significantly lower cow body temperature without excessive water waste.

2. Nutritional Strategies to Improve Resilience

- **High-energy feed formulations:** Providing cows with energy-dense feed can help counteract reduced intake due to heat stress.
- **Electrolyte and mineral supplementation:** Adding sodium bicarbonate and potassium to feed improves hydration and maintains electrolyte balance.
- **Yeast and probiotics:** These supplements support rumen function and improve digestion efficiency, helping cows maintain milk production even under heat stress.

3. Water Management and Hydration Solutions

- **Ensuring continuous**

access to clean, cool drinking water helps prevent dehydration and maintains milk production levels.

- **Strategic placement of water troughs** near resting and feeding areas encourages cows to drink more frequently.
- **Insulated water storage tanks** can be used to keep water cool in hot climates.

4. Breeding and Genetic Selection

- **Crossbreeding with heat-tolerant breeds** can help farmers develop herds that are more resilient to high temperatures.
- **Selective breeding programs** focusing on cows with higher heat tolerance can improve overall herd productivity in hot climates.

5. Low-Cost Housing and Farm Infrastructure Improvements

- **Using light-colored roofing materials** to reflect sunlight and reduce heat buildup in barns.
- **Constructing barns with open sides** for better air circulation.
- **Installing windbreaks and shade structures** to reduce heat stress in open grazing systems.

Government Policies and Subsidies for Heat Stress Management

To support dairy farmers in managing heat stress, various governments and agricultural organizations have introduced policies and subsidies aimed at reducing financial losses and improving farm sustainability.

1. Financial Assistance for Cooling Infrastructure

Many governments offer subsidies for

- Installation of **cooling systems, fans, and sprinklers**
- Construction of **climate-resilient dairy housing**
- Adoption of **renewable energy solutions** such as solar-powered cooling systems

2. Subsidies for Heat-Resistant Breeds and Genetic Improvement

- Funding support for **breeding programs** that promote heat-resistant dairy breeds
- Incentives for **farmers adopting crossbreeding practices**
- Financial aid for **AI services** to improve herd genetics

3. Grants for Research and Technological Innovations

Governments and research institutions provide grants for:

- Developing **heat-resistant feed formulations**
- Advancing **sensor-based monitoring systems** for real-time heat stress detection
- Funding **climate adaptation projects** in dairy farming

4. Insurance Schemes and Risk Management Programs

- Heat stress insurance policies that compensate farmers for **milk production losses**
- Weather-indexed insurance schemes to cover losses due to extreme heat events
- Government-funded relief programs during severe heat waves

Conclusion

Heat stress is a growing challenge in dairy farming, leading to substantial economic losses due to reduced milk yield, increased veterinary costs, lower fertility rates, and higher mortality rates. However, through the adoption of cost-effective solutions, such as improved cooling, optimized nutrition, and better breeding strategies, dairy farmers can minimize financial losses. Furthermore, government policies and subsidies play a crucial role in providing financial relief and supporting the adoption of innovative technologies to combat heat stress. As climate change continues to pose threats to dairy farming, proactive management strategies and continued investment in heat-stress mitigation will be essential for sustaining productivity and profitability in the dairy sector.

Nutritional Ways to Tackling Heat Stress in Dairy Animals

Aman Singh[1] and M.S. Mahesh[2]
[1]Internee of BVSc & AH
[2]Assistant Professor (Animal Nutrition), Livestock Farm Complex, Faculty of Veterinary & Animal Sciences, Banaras Hindu University, Mirzapur-231001, UP

Introduction

India is endowed with livestock mega-biodiversity contributing to about one third of total agricultural gross value added. Meeting the surging future exigency for livestock-source foods including dairy requires sustainable farming practices. Among the prevailing challenges threatening livestock (feed/forage crisis, emerging diseases, poor productivity, etc.), the environmental stress particularly "heat stress" has also been identified as a potential constraint for the sustainability of livestock sector. Given the fact that "climate change" is an ongoing reality and by the year 2100, the global surface temperature is predicted to increase by 1.8-4 °C, which implies that livestock production has to adapt to the adverse effects caused by the heat stress. As a matter of fact, consequent to El Niño in 2024, India has experienced severe heat waves, negatively affecting the health of animals and humans.

The tropical Indian zebu breeds (e.g., Sahiwal, Gir, Tharparkar etc.) are inherently less susceptible than their European counterparts (humpless cattle) for heat stress. Dairy production statistics reports that, lately, about 32% of total milk production in India is attributed to crossbred/exotic cows. Furthermore, the recently concluded PDFA milking competition at Punjab as well as Dairy Mela at NDRI, Karnal have showcased the Holstein-Friesian champion cows yielding as much as over 80 kg of milk a day. These cows with exotic germplasm are more proned for thermal stress. The prolonged heat stress —due to the combination of high temperature and humidity—not only affects production (milk yield and composition), reproduction (anoestrus and low conception) and health (oxidative stress and compromised immunity), but also greatly affects welfare of cows. In this way, heat stress causes low milk realisation and directly impact farm bottom-line.

Whereas the general management measures such as providing shade, sprinkling water etc. are widely practiced, some of the important nutrition-related strategies could also be applied as ameliorative measures against heat stress. In this backdrop, the present article demystifies nutrition-centric options to tackle heat stress in dairy animals.

1. General feeding management

- Offer feed during cool hours of the day i.e., early morning and evening to encourage voluntary intake.
- Avoid feeding diets rich in straws and stovers, which are fibrous and generate more heat increment during their ruminal fermentative digestion.
- Along with easily digestible forages, consider including ingredients that provide digestible neutral detergent fibre like sugar beet pulp haylage etc. This, in turn, helps maintain milk

composition during summer months.

- Frequent push-up of farm-prepared total mixed ration is suggested to avoid secondary fermentation (heating-up) within manger.
- Always ensure free access to adequate cool drinking water. Depending on the severity of stress, water intake may increase 2-3 times or even more than the normal.

2. Enhancing nutrient density of diet

- A reduced dry matter intake (DMI; by 10% or more) as an adaptive response to heat stress decreases overall nutrient intake by cows, resulting in a reduced nutrient availability including retention of micronutrients.
- Increase in nutrient (energy) density of diet to cope-with the reduced DMI as well as increased energy requirement by cows to dissipate excess heat entails use of fat-rich ingredients like oilseeds like whole cottonseed, full-fat soybean etc. as fats provide over twice the energy than other nutrients.
- Use of bypass (rumen-protected) fat (calcium soaps with 84% and triglyceride/fatty acids with 99% fat) at 1-2% is an ideal option to increase net energy of lactation, keeping the total fat to not >6% of diet dry matter.
- Consider replacing protein sources with high rumen degradability with bypass protein.
- Use of better bioavailable organic/chelated trace minerals like glycinates, methionates, proteinates, propionates etc. are beneficial.

3. Rumen buffers

- Heat stress-responsive behaviour of cows i.e., panting and drooling result in the loss of saliva as well as bicarbonate ions in it, which otherwise would normally help in buffering the rumen fluid.
- It's estimated that about 200 L of saliva is equivalent to 2000 g/day of sodium bicarbonate, signifying the potential of saliva as an inherent rumen buffer.
- In the absence of adequate rumen buffering mechanisms, the ratio of volatile fatty acids gets affected and increased concentration of lactic acid further lowers rumen pH from 6.6-6.9 to 5.8 or below, exacerbating complications such as sub-acute ruminal acidosis, which has far-reaching negative consequences on farm profitability.
- It's recommended to feed rumen buffer like sodium bicarbonate and alkaliniser magnesium oxide in 3:1 ratio for effective rumen conditioning. Alternatively, potassium carbonate and other related salts can also be used.
- Depending on the dietary (corn silage-based ration etc.) and animal factors, buffers may be included at 0.6-0.8% of ruminant ration.

4. Electrolytes

- Heat stress causes loss of electrolytes through sweating and hence, it's necessary to replenish their levels through extraneous supplementation.
- The recommended levels for sodium, potassium and magnesium are 0.4-0.6%, 1.5-1.6% and 0.35-0.4%, respectively in the summer diets of cows.
- Electrolytes can either be included in the concentrate mixture or offered directly along with drinking water to cows.
- Alternatively, fresh lemon juice, vitamin C (ascorbic acid) powder, salt (NaCl) and jaggery are also found effective.

5. Yeast

- Saccharomyces cerevisiae yeasts as direct-fed microbials (live, active dry or metabolites etc.) are useful in summer as these are known to increase voluntary intake, improve rumen fermentation/buffering (oxygen scavenging) and thus possibly influence nutrient digestibility.
- Increase in DMI could translate to an increased milk revenue of farm as every kg DMI is associated with a corresponding milk volume of 1.2-1.7 kg and 0.7-0.9 kg in cows and buffaloes, respectively.
- Improvements in manure (dung) score along with some advantages on milk composition could be evident on feeding 40-60 billion CFU live yeast/cow a day.

6. Other feed supplements/ micronutrients

Some other micronutrient supplements that are proven to safeguard cows from the adversity of heat stress are niacin, betaine, chromium propionate, exogenous fibrolytic enzymes, antioxidant nutrients (vitamins, minerals, astaxanthin etc.), gamma-aminobutyric acid, melatonin and some herbal supplements.

Conclusion

Since heat stress adversely affects vital physiological functions and behaviour of dairy cows, it's utmost vital to protect them from the adverse effects. In addition to general management tools, the various dietary strategies as discussed above are useful to increase tolerance of dairy cows to scorching heat to a great extent. By incorporating these strategies, dairy producers could able to sustain productivity under the conditions of heat stress, thus ensuring farm sustainability.

Heat Stress in Dairy Cattle: Causes & Prevention

Siddhi Gupta
Co-Editor

Heat stress in dairy cattle is a significant challenge, particularly in regions with high temperatures and humidity. As global temperatures rise and climate variability increases, the impact of heat stress on dairy cows has become a growing concern for farmers worldwide. Heat stress can lead to reduced feed intake, lower milk production, poor reproductive performance, and an overall decline in animal health. Therefore, understanding the causes and implementing effective prevention strategies is crucial for maintaining productivity and ensuring animal welfare.

Causes of Heat Stress in Dairy Cattle

Heat stress occurs when a cow's heat load surpasses its ability to dissipate heat. Several factors contribute to this condition:

1. **High Ambient Temperature & Humidity:** Dairy cattle are highly sensitive to temperatures above 25°C (77°F). When combined with high humidity, their ability to cool down through sweating and respiration becomes less effective.
2. **Poor Ventilation & Housing Conditions:** Inadequate airflow

in barns and overcrowded housing can lead to the accumulation of heat, making it difficult for cows to stay cool.

3. **Direct Sun Exposure:** Cows exposed to direct sunlight without adequate shade experience increased body temperature, leading to discomfort and reduced feed intake.
4. **Metabolic Heat Production:** Dairy cows generate substantial heat during digestion and milk production. High-yielding cows are at greater risk as they produce more metabolic heat.
5. **Limited Water Intake:** Insufficient water consumption can exacerbate heat stress, as hydration plays a crucial role in thermoregulation.

Symptoms of Heat Stress in Dairy Cattle

Recognizing early signs of heat stress is essential for timely intervention. Common symptoms include:

- **Increased Respiratory Rate & Panting:** Cows attempt to dissipate heat through rapid breathing.
- **Reduced Feed Intake:** Heat-stressed cows eat less, leading to lower milk production.
- **Excessive Salivation & Sweating:** Increased sweating and drooling indicate thermal discomfort.
- **Lethargy & Reduced Activity:** Cows tend to stand for prolonged periods to increase heat dissipation.
- **Drop in Milk Yield & Quality:** Milk production declines due to reduced feed intake and metabolic inefficiencies.
- **Fertility Issues:** Heat stress negatively impacts estrus expression, conception rates, and embryo survival.

Preventive Strategies to Manage Heat Stress

Preventing heat stress requires a combination of farm management practices, nutritional adjustments, and environmental modifications.

1. Environmental Management

Proper environmental control plays a critical role in reducing heat stress:

- **Ventilation & Airflow:** Ensure barns have adequate ventilation using fans, ridge vents, or tunnel ventilation systems.
- **Shade Management:** Provide sufficient shade using natural tree cover, artificial structures, or shade cloth.
- **Cooling Systems:** Utilize misters, sprinklers, and evaporative cooling pads to lower ambient temperature.
- **Mud Pits or Cooling Ponds:** Allow cows access to water pools for heat relief in extreme conditions.

2. Nutritional Strategies

Adjusting the diet helps cows cope with heat stress effectively:

- **Increased Energy Density:** Feed highly digestible fiber and fat sources to compensate for reduced intake.
- **Electrolytes & Mineral Supplementation:** Supplement sodium, potassium, and bicarbonate to maintain electrolyte balance.

- **Higher-Quality Forages:** Low-quality roughage generates excess heat during digestion. Use high-quality silage and hay.
- **Feed Timing Adjustments:** Provide fresh feed during cooler parts of the day, such as early morning and late evening.

3. Hydration Management

Ensuring adequate water intake is essential:

- **Clean & Cool Water Supply:** Provide unrestricted access to clean and cool drinking water.
- **Multiple Watering Points:** Install additional water troughs to reduce competition and ensure all cows have access.
- **Encourage Water Consumption:** Add electrolytes or flavor enhancers to improve water intake.

4. Genetic Selection & Breeding

Breeding heat-resistant dairy breeds can be a long-term solution:

- **Crossbreeding Programs:** Introduce heat-tolerant breeds like Gir, Sahiwal, or Jersey into high-producing Holstein herds.
- **Genetic Selection for Heat Tolerance:** Select cows with traits such as shorter hair coats, lighter body color, and better sweating ability.

5. Farm Management Practices

Daily management changes can improve cow comfort:

- **Reduce Handling & Transportation:** Minimize movement of cattle during peak heat hours.
- **Adjust Milking Schedules:** Milk cows during cooler times of the day to reduce stress.
- **Monitor Body Condition:** Maintain optimal body condition to prevent excessive fat deposits that can trap heat.

Economic Impact of Heat Stress

Heat stress not only affects cattle health but also has significant economic implications for dairy farmers:

- **Milk Production Losses:** Studies suggest heat stress can reduce milk yield by 10-25% during peak summer months.
- **Lower Reproductive Efficiency:** Increased days open and reduced conception rates lead to prolonged calving intervals.
- **Increased Veterinary Costs:** Heat-stressed cows are more prone to diseases like mastitis and metabolic disorders.
- **Feed Inefficiencies:** Reduced feed conversion efficiency results in higher feeding costs per liter of milk produced.

Conclusion

Heat stress is a major concern in dairy farming, impacting both productivity and animal well-being. By implementing a combination of environmental modifications, nutritional adjustments, proper hydration, and genetic improvements, farmers can significantly reduce the effects of heat stress on dairy cattle. Proactive management strategies ensure optimal milk production, improved reproductive performance, and overall better health for dairy herds. Investing in heat stress mitigation techniques is essential for sustainable and profitable dairy farming in the face of rising global temperatures.

Impact of Heat Stress on Milk Production & Quality

Introduction

Heat stress is a significant challenge in dairy farming, particularly in regions experiencing rising temperatures due to climate change. High temperatures, combined with humidity, create stressful conditions for dairy cows, affecting their health, milk production, and overall productivity. Heat stress leads to increased body temperature, changes in metabolism, and decreased feed efficiency, which all contribute to reduced milk yield and deteriorated milk quality. This article explores how heat stress impacts milk yield and quality, the physiological effects on cows, and strategies to mitigate its adverse effects.

Understanding Heat Stress in Dairy Cattle

Heat stress occurs when cows are unable to regulate their body temperature efficiently due to excessive environmental heat. Unlike humans, cows rely primarily on respiration and limited sweating to cool themselves. When ambient temperatures exceed the cow's comfort zone (between 5°C and 25°C), it struggles to dissipate heat, leading to physiological stress.

Cows experiencing heat stress show signs such as excessive panting, reduced movement, increased

water intake, and decreased feed intake. If left unmanaged, prolonged heat stress can lead to long-term damage, including reproductive issues, compromised immune function, and increased susceptibility to diseases.

Effects of Heat Stress on Milk Production

Heat stress negatively impacts milk production due to several physiological and behavioral changes in cows:

1. **Reduced Feed Intake**

   One of the first responses to heat stress is a drop in feed intake. Cows eat less to reduce metabolic heat production, leading to:

- Lower energy availability for milk synthesis
- Decreased body condition, affecting lactation cycles
- Altered rumen function, which reduces digestion efficiency and nutrient absorption

  The impact of reduced feed intake becomes more severe during prolonged heatwaves, leading to significant losses in milk production. Additionally, poor feed efficiency results in reduced microbial protein synthesis, which is crucial for maintaining milk yield.

2. **Hormonal and Metabolic Changes**

   Heat stress triggers hormonal imbalances, leading to:

- Increased cortisol levels, which suppress appetite and increase stress responses
- Altered insulin function, affecting glucose metabolism critical for milk synthesis
- Disruptions in reproductive hormones, leading to poor fertility rates and irregular estrous cycles

Furthermore, heat-stressed cows experience an increase in plasma urea nitrogen (PUN) levels, which negatively impacts protein metabolism. The shift in metabolic pathways to manage heat stress results in reduced milk output and composition changes.

3. **Increased Water Requirements**

   Cows drink more water under heat stress to compensate for fluid loss through sweating and panting. However, inadequate hydration can still lead to dehydration, further impacting metabolic efficiency and reducing milk yield. Increased water consumption also leads to more urination, which may contribute to mineral imbalances and electrolyte depletion.

4. **Impaired Mammary Gland Function**

   Studies indicate that heat stress negatively affects the function of the mammary gland, resulting in:

- Reduced synthesis of lactose, fat, and protein, which are critical components of milk
- Altered milk composition, including lower casein levels essential for dairy processing
- Decreased activity of mammary epithelial cells, leading to lower milk production

  Prolonged heat stress damages mammary tissue, reducing overall lactation efficiency and shortening the productive lifespan of dairy cows.

Effects of Heat Stress on Milk Quality

Apart from reducing quantity, heat stress also deteriorates milk quality, affecting its composition and market value.

1. **Lower Fat and Protein Content**

- Heat stress alters lipid metabolism, leading to lower butterfat percentage, which affects dairy product yield
- Reduced casein and whey protein levels affect cheese yield and milk processing efficiency
- A decline in milk solids results in lower revenue for dairy farmers and reduced consumer acceptance

2. **Increased Somatic Cell Count (SCC) and Mastitis Risk**

   Heat stress weakens the immune system, making cows more prone to infections such as mastitis. This leads to:

- Elevated somatic cell count (SCC), an indicator of milk quality and udder health
- Increased antibiotic use, which can affect milk safety regulations and result in milk rejection by processing plants
- Higher risks of bacterial contamination, leading to reduced shelf life of dairy products

3. **Changes in Milk Composition**

- Higher pH levels can cause milk spoilage faster, leading to increased rejection rates at dairy processing plants
- Increased oxidative stress leads to off-flavors, reducing consumer acceptability
- Decreased lactose content affects taste, texture, and processing capabilities for dairy products like yogurt and cheese

Mitigation Strategies for Heat Stress in Dairy Farming

To maintain milk production and quality, farmers must adopt proactive management strategies to combat heat stress.

1. **Cooling Systems for Cows**

- **Shade and Ventilation:** Providing natural shade and installing fans in barns improves airflow and prevents overheating.
- **Sprinklers and Misting Systems:** Cooling cows with water through sprinkler systems reduces body temperature and stress levels.
- **Tunnel and Cross Ventilation:** Proper barn design with effective airflow prevents heat buildup and improves cow comfort.
- **Cooling Pads and Foggers:** Advanced cooling technologies help maintain optimum body temperature in cows.

2. **Optimized Feeding Strategies**

- Feeding during cooler parts of the day to maximize intake
- Providing high-energy, nutrient-dense diets to compensate for reduced feed intake
- Including buffers and yeast cultures in feed to maintain rumen function and digestion efficiency
- Adding essential vitamins and minerals, such as sodium bicarbonate and potassium, to help maintain electrolyte balance

3. **Hydration Management**

- Ensuring clean, cool, and adequate water supply throughout the farm
- Using electrolytes and mineral supplements to prevent dehydration and maintain metabolic function
- Encouraging frequent water intake by strategically placing water troughs near resting and feeding areas

4. **Genetic and Breeding Solutions**

- Selecting heat-resistant breeds or crossbreeding for better adaptability
- Researching genetic markers associated with thermotolerance to develop resilient dairy cows
- Improving breeding programs to focus on cows with superior heat tolerance and milk production traits

5. **Farm Infrastructure Adaptations**

- Designing heat-reflective roofing for barns to minimize heat absorption
- Using automated monitoring systems to track heat stress levels in real time
- Implementing rotational grazing practices to prevent overgrazing and maintain cool pastures

Conclusion

Heat stress poses a serious threat to dairy farming, reducing milk yield and deteriorating milk quality. However, with strategic interventions, such as improved cooling systems, optimized feeding, proper hydration, and genetic selection, farmers can mitigate its adverse effects. As climate conditions continue to evolve, proactive heat stress management will be key to ensuring sustainable dairy production and maintaining high milk quality in the future. By investing in innovative solutions and adopting best practices, dairy farmers can protect their herds and ensure consistent milk production despite challenging environmental conditions.

Shade & Housing Innovations for Cooling Cattle

Introduction

Heat stress is a major challenge for dairy farmers, particularly in regions experiencing rising temperatures due to climate change. Excessive heat affects milk production, cow health, and overall farm efficiency. Traditional cooling methods such as fans and sprinklers help, but proper shade and housing innovations offer long-term, sustainable solutions for reducing heat stress in dairy cattle. This article explores sustainable and energy-efficient cooling barns, the importance of proper shading, and strategies for optimizing airflow in dairy sheds.

The Impact of Heat Stress on Dairy Cattle

Cows are highly sensitive to heat, and prolonged exposure can lead to:

- Reduced feed intake, leading to lower milk production.
- Increased body temperature and respiration rate.
- Lower fertility rates and compromised reproduction.
- Increased susceptibility to diseases such as mastitis.
- Reduced overall farm profitability.

To mitigate these issues, innovative shade structures and housing designs are essential in keeping cattle cool and improving productivity.

Sustainable and Energy-Efficient Cooling Barns

Modern cooling barns are designed to provide optimal ventilation, thermal insulation, and strategic cooling mechanisms. These barns utilize natural airflow, energy-efficient materials, and innovative cooling systems to ensure

cattle remain comfortable in high temperatures.

1. **Design Features of Cooling Barns**

   A well-designed cooling barn should incorporate:

- **High Roofs and Open Eaves:** Allows for better air circulation and heat dissipation.
- **Reflective Roofing Materials:** Reduces heat absorption, keeping the barn cooler.
- **Insulated Walls and Ceilings:** Prevents heat build-up inside the barn.
- **Optimized Barn Orientation:** Positioning barns east-west minimizes direct sun exposure.
- **Natural Ventilation Systems:** Encourages continuous airflow to remove hot air and maintain cooler conditions.

2. **Energy-Efficient Cooling Technologies**

   Energy-efficient systems help regulate barn temperature without excessive electricity consumption. These include:

- **Solar-Powered Fans:** Utilize renewable energy to improve airflow and cooling.
- **Geothermal Cooling Systems:** Use underground temperatures to regulate barn conditions.
- **Automated Ventilation Controls:** AI-driven ventilation systems adjust airflow based on real-time temperature data.

The Importance of Proper Shading

Providing adequate shade is one of the most cost-effective ways to reduce heat stress in dairy cattle. Shade structures help lower body temperatures, improve cow comfort, and maintain milk production levels.

1. **Types of Shade Structures**

   Farmers can implement various shading solutions, including

- **Natural Shade from Trees:** A sustainable option that provides cooling and enhances environmental benefits.
- **Permanent Shade Structures:** Metal or polycarbonate roofing designed to block sunlight while allowing airflow.
- **Portable Shade Shelters:** Movable structures that allow flexibility in pasture-based dairy systems.
- **Albedo-Enhancing Materials:** Reflective shade materials that reduce heat absorption.

2. **Strategic Placement of Shade**

- Shade should be placed in high-traffic areas such as feeding zones and resting areas.
- Overcrowding under shade can be an issue—distributing multiple shade sources ensures all cattle benefit.
- Providing adequate space per cow (at least 3.5-4.5 m^2 per animal) prevents competition and heat stress.

Optimizing Airflow in Dairy Sheds

Airflow management is critical in maintaining an ideal barn environment, preventing heat accumulation, and enhancing overall cattle well-being.

1. **Ventilation Systems in Dairy Sheds**

   Effective ventilation ensures constant air exchange, removing heat, moisture, and harmful gases like ammonia. Common ventilation strategies include:

- **Cross Ventilation:** Openings on both sides of the barn allow for natural airflow.
- **Tunnel Ventilation:** Fans pull air through the barn, creating a

continuous cooling effect.

- **Ridge Ventilation:** Heat escapes through roof vents, reducing barn temperature.

2. Placement of Fans for Maximum Efficiency

- Fans should be placed at strategic intervals to ensure uniform airflow.
- Angle fans downward towards cows for better cooling efficiency.
- High-volume, low-speed (HVLS) fans reduce heat stress with minimal energy consumption.

Benefits of Shade and Housing Innovations

1. Increased Milk Production

Cows kept in cool, stress-free environments maintain higher feed intake and better milk production levels.

2. Improved Animal Health and Welfare

Properly cooled cattle experience fewer heat-related illnesses, lower respiratory distress, and enhanced overall well-being.

3. Energy and Cost Savings

Sustainable shade and housing solutions reduce reliance on electric cooling methods, cutting down electricity and water costs.

4. Environmental Sustainability

Utilizing solar energy, natural ventilation, and eco-friendly building materials contributes to sustainable dairy farming.

Challenges and Considerations

1. Initial Investment Costs

- Constructing energy-efficient barns and shade structures requires upfront capital.
- However, long-term savings in energy and medical expenses justify the investment.

2. Land and Space Constraints

- Farmers with limited space may need compact yet efficient cooling designs.
- Rotational shade systems can be a viable alternative for smaller farms.

3. Maintenance and Management

- Regular maintenance of shading structures and ventilation systems ensures efficiency.
- Monitoring dust accumulation and airflow obstructions is crucial for proper ventilation.

Future Trends in Dairy Housing Innovations

- **Smart Climate-Controlled Barns:** AI-driven cooling and ventilation for automated temperature management.
- **Eco-Friendly Cooling Materials:** Use of green roofs, bamboo shades, and thermal-reflective coatings.
- **Modular Housing Units:** Easily adaptable housing designs for different climates and farm sizes.
- **Integration with IoT Sensors:** Real-time tracking of barn temperature and humidity to trigger automated cooling interventions.

Conclusion

Shade and housing innovations play a crucial role in reducing heat stress in dairy cattle, ultimately improving milk production, animal health, and farm profitability. Investing in sustainable cooling barns, efficient shading systems, and optimized airflow management ensures long-term benefits for dairy farmers. As climate change continues to impact agriculture, implementing smart, energy-efficient housing solutions will be key to ensuring sustainable and profitable dairy farming in the future.

Shielding Herds: The Vital Role of Vaccination in India's Livestock Industry

Deepti Arya[1], Simran jeet Singh[2] and Niddhi Arora[3]

[1]Veterinary Officer, Government of Uttarakhand,

[2]PG Scholar, Department of Veterinary Medicine

[3]Professor, Department of Veterinary Medicine

[2,3]College of Veterinary and Animal Sciences, GB Pant University of Agriculture and Technology, Pantnagar, Udhamsingh Nagar, Uttarakhand-263145

The livestock industry is a crucial component of India's food production, contributing significantly to economic stability, rural development, and nutrition. However, infectious diseases pose a constant threat to the health and productivity of livestock, potentially leading to devastating economic losses and food insecurity. One of the most effective strategies for combating these threats is vaccination. Through well-planned immunization programs, Indian farmers can protect their animals, enhance productivity, and contribute to national food safety.

The Importance of Vaccination in Disease Prevention

Livestock diseases such as foot-and-mouth disease, brucellosis, bovine respiratory disease, rabies, and Newcastle disease can spread rapidly, leading to high mortality rates and economic losses. Vaccination provides a proactive approach to disease management by stimulating the immune system to recognize and combat pathogens before an infection occurs.

In India, where a large portion of the population depends on livestock for their livelihood, controlling disease outbreaks is crucial. Vaccination minimizes the need for emergency responses, such as culling infected herds or imposing trade restrictions. It also aids in eradicating certain diseases, as seen with rinderpest, which was officially declared eradicated in 2011 due to extensive global and national vaccination efforts.

Economic Benefits of Vaccination

The economic impact of livestock diseases extends beyond direct losses from animal deaths. Farmers incur significant costs in treating sick animals, managing outbreaks, and handling reduced productivity. Vaccination helps mitigate these costs by preventing infections, reducing veterinary expenses, and ensuring stable production levels.

Moreover, disease outbreaks often result in trade restrictions that can cripple entire industries. India, being one of the largest producers of milk and meat, can gain a competitive advantage in the global market through robust vaccination programs. Ensuring that livestock products meet stringent health standards leads to increased export opportunities and economic growth.

Improved Animal Welfare and Productivity

Healthy animals are more productive, yielding higher milk, meat, and egg outputs. Livestock diseases often cause stress, malnutrition, and decreased fertility, ultimately reducing farm efficiency. Vaccination ensures that animals remain in optimal

health, leading to improved reproductive performance and longer lifespans.

Animal welfare is a growing concern among Indian consumers, who demand ethically raised livestock. Vaccination contributes to humane farming practices by reducing the need for painful medical interventions and lowering mortality rates. By prioritizing disease prevention, Indian farmers can maintain ethical and sustainable livestock operations.

Reducing Antibiotic Dependence and Combating Antimicrobial Resistance (AMR)

The overuse of antibiotics in livestock farming has contributed to the rise of antimicrobial resistance (AMR), posing a significant threat to human and animal health. Preventing diseases through vaccination reduces the reliance on antibiotics, helping to slow the spread of resistant bacteria.

The Indian government and international organizations advocate for responsible antibiotic use, emphasizing preventive measures such as vaccination. By reducing the occurrence of bacterial infections in livestock, vaccines play a crucial role in the global and national fight against AMR.

Enhancing Food Security and Public Health

Zoonotic diseases, which transmit from animals to humans, pose serious public health risks. Rabies, brucellosis, and avian influenza are examples of livestock-related diseases that can affect human populations. Vaccination programs not only protect animals but also safeguard human health by controlling disease transmission.

India's livestock sector plays a significant role in food security. Stable livestock production ensures a consistent food supply, preventing shortages that could lead to malnutrition and economic instability. By maintaining healthy herds, vaccination supports food security on both local and national scales.

Challenges and Future Prospects

Despite its benefits, vaccination in India's livestock industry faces several challenges. Inadequate access to vaccines, particularly in remote rural regions, limits disease control efforts. Poor infrastructure, lack of farmer awareness, and high vaccine costs further hinder widespread immunization.

Future advancements in vaccine technology, such as DNA vaccines and thermostable formulations, hold promise for overcoming these barriers. Innovations in delivery methods, including oral and needle-free vaccines, can improve accessibility and effectiveness. Additionally, increased government support and international collaboration are essential in expanding vaccination coverage across India.

Conclusion

Vaccination is an indispensable tool in India's livestock health management, offering protection against devastating diseases, enhancing economic stability, and promoting food security. By preventing outbreaks, reducing antibiotic dependence, and improving animal welfare, vaccination contributes to a sustainable and thriving livestock industry. To maximize its benefits, stakeholders—including farmers, veterinarians, policymakers, and researchers—must work together to implement comprehensive immunization programs. Investing in vaccination is not merely a precautionary measure; it is a fundamental necessity for the future of livestock farming and national food security in India.

Dairy productivity growth – a glass half full

National dairy productivity has continued to stall since 2010-11, achieving an average annual growth rate of -0.04% from 2010-11 to 2022-23.

Yet, under the surface of these national level aggregates, the story has some positive elements.

ABARES Executive Director, Dr Jared Greenville said Australian dairy is operating as a 'multi speed' industry, with clear differences in productivity growth between dairy regions.

"While dairy farm productivity growth has slowed in some regions, it has accelerated in others," Dr Greenville said.

"We are seeing variability in productivity performance driven not only by climate but also differences in input use and the degree of intensive management practices.

"Large dairy farms have also been able to achieve stronger productivity growth than small- and medium-sized dairy farms.

"Further incremental productivity gains are expected to stem from continued on-farm innovation, increased scale, and the gradual exit of dairy farms with marginal profitability and lower productivity.

"Continued investment in research, development and extension will also help as it's a well-established driver of productivity.

"We need to make sure innovation is reaching the farm gate and being adopted to ensure prosperity of this integral industry.

"Differences seen across regions and between farms also point to opportunities for cross learnings to help kick-start productivity.

"Efforts to increase productivity growth will be important in offsetting any further increases in input prices, and to buffer against any future fall in milk price."

Dairy Value Chain

Animal Husbandry is an important sub-sector of Indian agricultural economy and plays a multifaceted role in providing nutrition and livelihood support to the rural population. Milk plays an important role in nutritional security as it is important source of animal protein. Milk is a near complete food and has high nutritive value. It contains body building proteins, bone forming minerals, health giving vitamins, furnishes energy giving lactose and milk fat. Milk and dairy products are vital sources of nourishment for billions globally, benefiting people of all ages, from young children to older adults, by supporting health and active lifestyles. Nutrient-dense and energy-rich, milk provides high-quality protein along with essential micronutrients, including calcium, magnesium, potassium, zinc, and phosphorus, all in forms that the body can readily absorb. Numerous studies highlight the key role of milk and dairy in supporting healthy nutrition and development throughout life, particularly during childhood. As of date per capita availability of milk has increased to 471 gram / day higher than, ICMR recommendation of 300 gram/ day. The livestock sector apart from contributing to national economy in general and to agricultural economy in particular also provides employment generation opportunities, asset creation, handling mechanism against crop failure and social and financial security. The benefit of the schemes has been accruing to all farmers engaged in dairying in terms of enhancement in milk production and productivity of bovines. Value of output of milk is more than Rs.11.16 lakh crore during 2022-23 (As per National Accounts Statistics 2024) which is the highest of the agriculture produce and even more than the combined value of Paddy and Wheat. The schemes are playing important role in enhancing milk production and productivity of bovines to meet growing demand of milk and making dairying more remunerative to the rural farmers of the country.

In order tostrengthen the dairy value chain right from quality feed, breed, processing, value addition to market linkages the following steps are undertaken by Government of India:

1. **Rashtriya Gokul Mission:** Department of Animal Husbandry and Dairying, Government of India is implementing Rashtriya Gokul Mission since December 2014 for development and conservation of indigenous breeds, genetic upgradation of bovine population and enhancement of milk production and productivity of bovines. Following steps are taken under the scheme to enhance milk production and productivity of bovines:

(I) Nationwide Artificial Insemination Program: Under the Rashtriya Gokul Mission, the Department of Animal Husbandry and Dairying, Government of India is expanding artificial insemination coverage to boost the milk production and productivity of bovines, including indigenous breeds. As on date, 8.32 crore animals have been covered, with 12.20 crore artificial inseminations performed, benefiting 5.19 crore farmers.

(ii) Progeny Testing and Pedigree Selection: This program aims to produce high genetic merit bulls, including bulls of indigenous breeds. Progeny testing is implemented for Gir, Sahiwal breeds of cattle, and Murrah, Mehsana breeds of buffaloes. Under the Pedigree selection programme Rathi, Tharparkar, Hariana, Kankrej breed of cattle and Jaffarabadi, Nili Ravi, Pandharpuri and Banni

breed of buffalo are covered. So far 3,988 high genetic merit bulls have produced and inducted for semen production.

(iii) Implementation of In-Vitro Fertilization (IVF) Technology: To propagate elite animals of indigenous breeds, the Department has established 22 IVF laboratories. The technology has important role in genetic upgradation of bovine population in single generation. Further, to deliver technology at reasonable rates to farmers Government has launched indigenously developed IVF media.

(iv) Sex-Sorted Semen Production: The Department of Animal Husbandry and Dairying, Government of India has established sex sorted semen production facilities at 5 government semen stations located in Gujarat, Madhya Pradesh, Tamil Nadu, Uttarakhand and Uttar Pradesh. 3 private semen stations are also producing sex sorted semen doses. So far 1.15 crore sex-sorted semen doses from high genetic merit bulls have been produced and made available for Artificial Insemination.

(v) Genomic Selection: To accelerate genetic improvement of cattle and buffaloes, the Department has developed unified genomic chips—Gau Chip for indigenous cattle and Mahish Chip for buffaloes—specifically designed for initiating genomic selection in the country.

(vi) Multi-purpose Artificial Insemination Technicians in Rural India (MAITRIs): Under the scheme MAITRIs are trained and equipped to deliver quality Artificial Insemination services at farmers' doorstep. During the last 3 years 38,736 MAITRIs have been trained and equipped under Rashtriya Gokul Mission.

(vii) Accelerated Breed Improvement Programme using sex sorted semen: This program aims to produce female calves with up to 90% accuracy, thereby enhancing breed improvement and farmers' income. Farmers receive support for assured pregnancy upto 50% of the cost of sex sorted semen. As of now, 341,998 farmers have been benefited from this program. Government has launched indigenously developed sex sorted semen technology to deliver sex sorted semen at reasonable rates to farmers.

(viii) Accelerated Breed Improvement Programme using In-Vitro Fertilization (IVF) technology: This technology is utilized for the rapid genetic upgradation of bovines and an incentive of Rs 5,000 per assured pregnancy is made available to farmers interested in taking up IVF technology.

2. National Livestock Mission (NLM): The Department of Animal Husbandry and Dairying, Government of India is implementing NLM scheme since the financial year 2014-15. In view of the present need of the sector the NLM scheme has been revised and realigned from financial year 2021-22. The National Livestock Mission along with along other components and subcomponents of the scheme covers Sub-Mission on feed and fodder development.

The Sub-Mission of the feed and fodder is covering the following activities:

Activity I:

Assistance for quality Fodder seed production: 100% incentivization for production of all categories of fodder seed production by Central and State Govt. institutions;

Activity II:

Entrepreneurial activities in feed and fodder: One time 50% capital subsidy up to Rs 50 lakh is provided to the Individuals. SHG, FCOs JLG, FPOs, Dairy Cooperative societies, section 8 companies are incentivized for the value addition such as Hay/Silage/Total Mixed Ration(TMR)/ Fodder Block.

Activity III:

Establishment of Entrepreneurs for Fodder Seed processing Infrastructure (processing and grading unit/ fodder seed storage godown): One time 50% capital subsidy up to Rs 50 lakh is provided to companies, start-ups/ SHGs/ FPOs/ FCOs/ JLGs/ Cooperative societies Section 8 companies and other credible organizations

for establishing fodder seed processing infrastructure.

Activity IV:

Fodder production from Non-Forest Wasteland / Rangeland / Non-arable Land" and "Fodder Production from Forest Land: The Central assistance is provided for production of various fodder in the degraded non-forest wasteland / rangeland / grassland/ non-arable land and forest land to enhance the vegetation cover of problematic soils like saline, acidic and heavy soil.

The Scheme National Livestock Mission also provides assistance to States/ UTs for livestock Insurance and component is implemented on 60:40 sharing basis between the Central Government and States and 90:10 sharing basis for North-Eastern and Himalayan States. Along with other livestock species dairy animals including cattle buffaloes are covered under the component.

3. **National Programme for Dairy Development:** This scheme focuses on creating dairy infrastructure for the procurement, processing, and marketing of milk and milk products in the cooperative dairy sector inter alia training and awareness programs for dairy farmers, input services such as cattle-feed and mineral mixtures, and assistance for quality testing of milk and milk products, thereby improving the economic condition of dairy farmers enrolled in cooperatives.
4. **Livestock Health and Disease Control (LH & DC):** The scheme is implemented for providing assistance for control of animal diseases like Foot and Mouth Disease, Brucellosis and also to provide assistance to State Governments for Control of other infectious diseases of livestock including dairy animals. Mobile Veterinary Units are established under the scheme to deliver quality livestock health services at farmers doorstep. Under the vaccination programme:

(I) more than 100 crore vaccinations have been done against FMD including 35 crore vaccination performed during current year; and

(ii) about 4.3 crore calves vaccinated against Brucellosis under brucellosis control programme including 1.3 crore calves vaccinated during current year. Under the component of Establishment and Strengthening of Veterinary Hospitals and Dispensaries (ESVHD- MVU), 100% financial assistance is provided towards procurement & customization of Mobile Veterinary Units (MVUs) with recurring operational expenditure in the ratio of 90:10 for North Eastern & Himalayan States; 60% for other States, and 100% for UTs for delivery of veterinary healthcare services through Mobile Veterinary Units (MVUs) through a Toll-Free Number (1962) at farmers' doorsteps which include disease diagnosis, treatment, vaccination, minor surgical interventions, audio-visual aids and extension services. So far, 4016 MVUs are operational in 28 states and 65 lakh farmers benefitted.

5. **Animal Husbandry Infrastructure Development Fund (AHIDF):** The scheme is to facilitate incentivisation of investments to establish

(I) Dairy processing and product diversification infrastructure,

(ii) Meat processing and product diversification infrastructure and

(iii) Animal Feed Plant

(iv) Breed Improvement Technology and Breed Multiplication Farm,

(v) Veterinary Vaccine and Drugs production facilities,

(vi) Animal waste to wealth management (Agri-waste Management). Keeping in view of the success of AHIDF, the erstwhile Dairy Processing Infrastructure Development Fund has been subsumed with the AHIDF on 01.02.2024. Now total size of the fund is Rs 29110 crore. So far 131 projects of dairy processing with the total project cost of Rs 5976 crore has been sanctioned under the scheme and 77 breed improvement projects with the total project cost of Rs 1027.82 crore.

JKMPCL inaugurates bulk milk cooler, Amul cattle feed store to mark Int'l Year of Cooperatives-2025

The newly established Bulk Milk Cooler at Rehal is expected to reduce milk wastage, particularly during the summer months, thereby enhancing the income of dairy farmers. By ensuring proper storage and cooling facilities, the initiative will help maintain milk quality, thereby increasing marketability and consumer confidence. Additionally, the collaboration with Amul is poised to bring valuable insights into best practices such as quality standards, branding, and efficient supply chain management, bolstering the dairy industry in the region. This partnership is also expected to provide training programs and knowledge-sharing sessions for local dairy farmers, equipping them with modern techniques in cattle management, feed optimization, and hygienic milk production.

Furthermore, the establishment of the Amul Cattle Feed Store will ensure a consistent supply of high-quality feed, which plays a crucial role in enhancing milk yield and improving cattle health. Farmers will have access to nutritionally balanced feed at competitive prices, reducing dependency on external suppliers and improving overall farm efficiency. The availability of quality cattle feed is expected to significantly contribute to increasing milk production in the region, reinforcing Jammu's position as a growing hub for dairy farming.

This event is part of a series of activities planned across District Jammu to mark the International Year of Cooperatives 2025. These initiatives aim to empower cooperative societies, promote sustainable development, and encourage community-driven economic growth. Through strategic collaborations, infrastructural improvements, and farmer-centric policies, the Jammu and Kashmir Milk Producers' Cooperative Limited is taking substantial steps towards fostering a resilient and self-sufficient dairy sector, ultimately improving the livelihoods of thousands of dairy farmers across the region.

Nationwide Celebration of Animal Husbandry and Animal Welfare Awareness Month extended till 13th March 2025

Prof. S.P.Singh Baghel interacts with over 23000 Stakeholders from the Livestock Sector; Emphasizes on Sustainable Practices & Expanding Employment Opportunities

Workshops, Health Camps, Vaccination Drives & Awards Aim to Educate Stakeholders; Improve Rural Prosperity and Economic Resilience

Animal Husbandry and Animal Welfare Awareness Month celebration by the Department of Animal Husbandry and Dairying (DAHD) under the Ministry of Fisheries, Animal Husbandry and Dairying, has been extended until 13th March 2025 in its inaugural year to maximize outreach and impact. This initiative was started from 14th January 2025 wherein nationwide activities were organised by the department of animal husbandry and dairying in association with state animal husbandry and welfare departments that was earlier slated till 13th February 2025. In order to further promote and give boost to ethical animal husbandry practices, animal health and welfare in India, the awareness campaign will now be continued till 13th March 2025 across the country. To support the campaign, DAHD has also developed a dedicated dashboard for tracking and uploading all extension activities across the country. To mark the occasion, the Department organized an online webinar on 14th February, graced by the esteemed presence of Prof. S. P. Singh Baghel, Union Minister of State for Fisheries, Animal Husbandry & Dairying, and Panchayati Raj. The webinar witnessed an overwhelming response, with over 23,000 participants, including representatives from State Animal Husbandry Departments,

veterinarians, para-veterinarians, Pashu Sakhis, farmers, and livestock rearers, joining via YouTube and Webex platforms.

Addressing the participants, **Prof. Baghel** highlighted the critical role of the livestock sector in food security, employment generation, and economic growth. He emphasized that millions of farmers, especially in rural areas, depend on livestock for milk, meat, eggs, wool, and leather, as well as for manure to enrich crop production. He highlighted that strengthening the livestock sector, directly contributes to rural prosperity and national economic resilience. Prof. Baghel reaffirmed the government's commitment towards prioritizing animal husbandry within the rural development agenda, with DAHD working closely with State Animal Husbandry Departments to enhance livestock productivity, disease control, and the well-being of those engaged in the animal husbandry sector. **He also emphasized the need to promote sustainable practices, improve animal care, and expand employment opportunities for farmers through various schemes and initiatives.**

The Union Minister of State placed special focus on the use of sex-sorted semen, stating that this innovation will help address the issue of stray cattle by ensuring more female calf births. He expressed confidence that with this technology, every household could have three female calves within the next five years. Additionally, he stressed upon the importance of expanding Artificial Insemination coverage to boost productivity, encouraging the use of IVF techniques for rapid breed improvement, and ensuring 100 percent vaccination coverage. He reiterated the government's vision for an FMD-free India as part of Prime Minister Shri Narendra Modi's goal for a disease-free livestock sector. He urged that knowledge of best animal husbandry practices and government schemes should reach even the most remote villages and pastoral communities.

In her address, Smt. Alka Upadhyaya, Secretary, DAHD, emphasized that annual observance of this campaign will help stakeholders adopt and implement good animal husbandry practices, promoting sustainable livestock management with a strong focus on animal welfare, productivity, and environmental responsibility. She also highlighted key government initiatives in the sector, such as the Rashtriya Gokul Mission, National Livestock Mission, Livestock Health and Disease Control Programme and the ongoing Livestock Census.

As part of the campaign, States are actively organizing workshops and webinars to educate farmers and stakeholders, health and infertility camps to enhance livestock well-being, deworming and vaccination drives to prevent diseases, awareness camps, cattle exhibitions, and best livestock farmer awards. Photography, essay writing, and art competitions are being held in schools and colleges, while walkathons, dog shows, and horse shows have engaged the public to spread awareness about animal health and welfare. Television and radio broadcasts have promoted animal husbandry schemes, with pamphlets and brochures being distributed to improve public outreach. The department is also undertaking social media campaigns to share best practices and the economic benefits of animal husbandry. The Animal Husbandry and Animal Welfare Awareness Month campaign is a major step towards empowering farmers, promoting scientific livestock management, and enhancing economic returns. By fostering widespread adoption of modern practices and government schemes, this initiative will play a crucial role in improving animal health, increasing productivity, and ultimately boosting farmers' incomes.

South Dakota State University Hosts Midwest Regional Dairy Challenge® Event

Brookings, S.D., February 12-14, 2025 – The 2025 Midwest Regional Dairy Challenge, hosted by South Dakota State University concluded February 14 in Brookings, S.D. The event saw significant participation with 110 students from 13 schools, along with coaches and volunteers for an immersive learning experience.

Upon arrival, students attended educational seminars covering financial management, automatic milking systems, and emerging farm technology. They also had the opportunity to meet their mentor and teammates over dinner, followed by a brief team-building activity. Afterwards, teams received farm information and began analyzing data in preparation for their farm visit on February 13 and their upcoming presentation.

On the second day, students visited MoDak Dairy, Inc., where they toured the calf & heifer barn, lactating barn, and milking parlor. Guided by industry mentors, teams assessed various aspects of each facility at the dairy farm, including animal health, parlor management, transition pens, and feed management processes. Additionally, student teams conducted interviews with the producers to gain deeper insights into farm management practices and goals. In the afternoon, teams used the data collected to develop their presentations. After submitting their work, all attendants, volunteers, and coaches gathered for dinner and a networking event.

The final day of the contest featured team presentations, evaluated by a panel of judges. Each team delivered a 20-minute analysis outlining the strengths and areas of improvement of the farm they had assessed. Additionally, students were able to attend a career and innovation fair, and educational sessions, including a Dairy Challenge alumni panel and an informational session on The Future of Dairy Products by Dr. Prafulla Salunke, a professor at South Dakota State University. The event concluded with the presentation of student awards, marking the end of the successful 2025 Midwest Regional Dairy Challenge.

The judges awarded the following teams with the first and second place ranking on each farm among the 24 total teams participating.

Panel A

First Place: Team Number 5; (Front L-R) Ailish Koerpel-South Dakota State University, Abbygail Foster-Southwest Wisconsin Technical College (Back L-R) Emma Mathison-University of Wisconsin - Madison, Tyler Machin-Iowa State University

Second Place: Team Number 6; (Front L-R) Sophia Wendt-University of Minnesota, Alaina Weaver-Purdue University (Back L-R) Kylie Konyn-University of Wisconsin - Madison, Mackenzie Waschow-Iowa State University

Panel B

First Place: Team Number 11; (Front L-R) Courtney Glenna-University of Wisconsin - River Falls, Jenna Heeringa-Dordt University (Back L-R) Delana Erbsen-Iowa State University, Isaiah Eisert-Purdue University, Rhett Vander Dussen-Kansas State University (Not pictured)

Second Place: Team Number 9; (Front L-R) Kathleen Howdeshell-

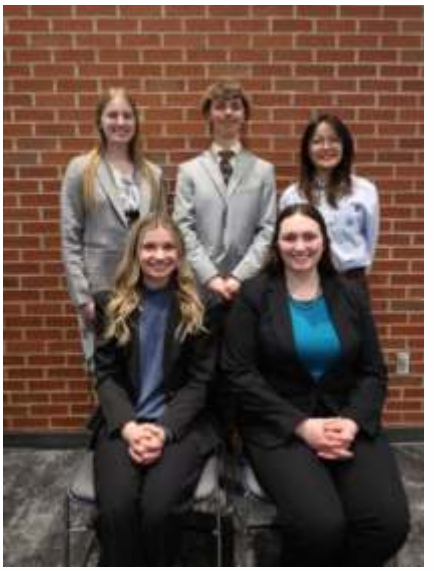
College of the Ozarks, Alexa Reavley-University of Illinois Urbana - Champaign, (Back L-R) Dillion Sparrgrove-South Dakota State University, Amelia Dauphin-University of Wisconsin - Platteville, Carson Corwin-Kansas State University

First Place: Team Number 17; (Front L-R) Sydney Haag-Purdue University, Addie DeMars-Southwest Wisconsin Technical College (Back L-R) Regan Kramer-Iowa State University, Cael Gooding-University of Wisconsin - River Falls, Aubree Topp-Northeast Iowa Community College

Second Place: Team Number 13; (Front L-R) Emma Eggenberger-South Dakota State University, Emma Wiedenfeld-University of Wisconsin - River Falls (Back L-R) Jeremiah Geise-Purdue University, Katelyn Sohrweide-University of Wisconsin - Madison

First Place: Team Number 23; (Front L-R) Emma Mulhern-South Dakota State University, Payton Van Schnydle-University of Wisconsin - Platteville (Back L-R) Megan Mosgaller-University of Wisconsin - River Falls, Owen Pritchett-College of the Ozarks, Irene Nielsen-Iowa State University

Second Place: Team Number 24; (Front L-R) Brooke Meinholz-University of Wisconsin - Madison, Anne Simpson-Iowa State University (Back L-R) Briana Maus-South Dakota State University, Riley Case-College of the Ozarks, Li Chen-Kansas State University



– More –

The Midwest event is one of four regional contests sponsored each year by North American Intercollegiate Dairy Challenge® (NAIDC). These regional contests – plus a national event for about 250 dairy colleagues – are funded through generous support by 130 agribusinesses and dairy producers. Dairy Challenge has helped prepare over 10,000 students for careers as dairy owners or managers, consultants, researchers, veterinarians or other dairy professionals.

About Dairy Challenge

NAIDC is an innovative event for students in dairy programs at North American post-secondary institutions. Its mission is to develop tomorrow's dairy leaders and enhance the progress of the dairy industry, by providing education, communication and networking among students, dairy producers, agribusiness and university personnel. The 2025 National Dairy Challenge contest will be held in Gainesville, Florida from April 6 to April 8; details are at www.dairychallenge.org.

Contact:
Molly Kelley Executive Director
mollyk@dairychallenge.com

Union Home Minister and Minister of Cooperation Shri Amit Shah to inaugurate "Workshop on Sustainability and Circularity in Dairy Sector" in Bharat Mandapam, New Delhi on 3 March

The Workshop will witness signing of MoUs for setting up of Biogas plants in multiple states

Sustainability, efficiency and circularity in dairy sector will lead to realization of Prime Minister Shri Narendra Modi's vision of 'Sahkar se Samriddhi'

Workshop to discuss expansion of circular dairy practices and highlight the role of advanced technology in making dairy farming more efficient

Union Home Minister and Minister of Cooperation Shri Amit Shah will inaugurate the "Workshop on Sustainability and Circularity in Dairy Sector" on 3rd March 2025 at Bharat Mandapam, New Delhi. The Workshop will focus on policies and initiatives of Ministry of Cooperation and the Ministry of Fisheries, Animal Husbandry and Dairying aimed at promoting sustainable dairy farming while ensuring economic growth with environmental responsibility. Circularity is an economic concept that focuses on the reuse, regeneration, and recycling of resources, products, and materials to make the most environmentally friendly use of

available resources.

The workshop will witness signing of Memorandums of Understanding (MoUs) for the establishment of biogas plants across multiple states, release of comprehensive guidelines aimed at promoting environmentally responsible practices in dairy farming and new financing initiatives under NDDB's and NABARD's Large Scale Biogas/CBG projects and the Sustain Plus Project. The workshop will have technical sessions on sustainable manure management models which convert dairy waste into biogas, compressed biogas (CBG), and organic fertilizers.

Experts from NDDB, industry, and global organizations will discuss ways to expand circular dairy practices, explore financing options, carbon credit opportunities, and waste-to-energy solutions, and highlight the role of advanced technology in making dairy farming more efficient. Sustainability and circularity in dairy sector along with increased efficiency will lead to realization of Prime Minister Shri Narendra Modi's vision of 'Sahkar se Samriddhi'.

The workshop is being organized by the Department of Animal Husbandry & Dairying (DAHD), Government of India in coordination with National Dairy Development Board (NDDB). The event will bring together key dignitaries, including Union Minister for Fisheries, Animal Husbandry and Dairying Shri Rajiv Ranjan Singh alias Lalan Singh, Union Ministers of State, Ministry of Fisheries, Animal Husbandry and Dairying Prof. S. P. Singh Baghel and Shri George Kurian, Ms. Alka Upadhyaya, Secretary of DAHD and senior officials of ministries such as New & Renewable Energy, Forest & Climate Change, Petroleum & Natural Gas, Chemicals & Fertilizers, Jal Shakti.

India to double milk processing capacity by 2025

In the Budget 2020 speech, the Union Finance Minister announced the government's intent to double India's milk processing capacity from 53.5 million tonnes to 108 million tonnes by 2025

According to a report by The Hindu Business Line, India's milk production has grown more than 10 times since 1950, reflecting the country's remarkable strides in the dairy sector. This exponential growth can be attributed to government-led initiatives such as Operation Flood, technological advancements, genetic improvements in cattle, and the widespread adoption of scientific dairy farming practices. The Finance Minister's announcement validates NITI Aayog's projections that India's milk production will touch 330 million tonnes by 2033, further solidifying its global leadership in the dairy industry.

As the country moves toward this ambitious target, there is a growing emphasis on strengthening infrastructure, ensuring efficient cold chain logistics, and enhancing dairy farm productivity through innovative techniques. The expansion of milk processing units will not only reduce post-harvest losses but also open up new markets for Indian dairy exports, improving global competitiveness. Additionally, the push towards increasing processing capacity will create millions of job opportunities across rural and urban areas, driving economic growth and improving farmers' incomes.

With rising demand for high-quality dairy products, both domestically and internationally, India's dairy industry is poised for transformation. The government's policy focus on modernisation, digital integration in dairy supply chains, and investment-friendly regulations is expected to attract significant private sector participation. This, in turn, will ensure sustained growth, higher farmer earnings, and a more resilient dairy ecosystem, making India a powerhouse in the global dairy market.

Milma to Organize Regional Workshops to Strengthen Agreement with Kerala Bank

In a significant move to boost financial support for the dairy sector, Milma has announced a series of regional workshops for its dealers to implement the Memorandum of Understanding (MoU) signed with Kerala State Cooperative Bank (Kerala Bank) last month. The partnership aims to facilitate enhanced credit flow to dairy farmers and entrepreneurs, ensuring improved business prospects and sustainability in the dairy industry.

As part of the implementation strategy, Milma will also conduct a statewide data collection drive to compile comprehensive details of its dealers. This will help streamline the process and ensure that eligible dealers receive financial support without unnecessary delays. The decision to hold these workshops and gather dealer information was taken during a recent meeting of the Milma federation and its three

regional unions.

Workshops and Stakeholder Participation

The workshops are scheduled to take place either at the end of March or in early April. They will serve as interactive platforms where stakeholders can gain insights into the credit facility and understand its operational framework. Key officials from Kerala Bank, the Department of Industries & Commerce, Kerala Khadi & Village Industries Board, Dairy Development Department, Scheduled Caste-Scheduled Tribes Development Corporation, and State Minorities Welfare Department will participate, ensuring a multi-departmental approach to supporting dairy businesses.

Key Highlights of the Milma-Kerala Bank Partnership

Under this agreement, Milma's dealers with a minimum of one year of work experience will be eligible for a cash credit facility of up to ₹1 lakh. The credit limit for each dealer will be determined based on their stock levels and turnover. This financial support is specifically designated for purchasing and distributing Milma's products, thereby fostering business growth and ensuring smooth supply chain operations.

Furthermore, the three regional unions of Milma are responsible for furnishing detailed records of all dealers to facilitate the effective implementation of the scheme. By doing so, the organization aims to create a structured mechanism that prioritizes transparency and accessibility.

Ensuring Timely Financial Assistance

The initiative to hold workshops and collect necessary dealer statistics is intended to expedite the credit approval process, ensuring that financial aid reaches eligible dealers promptly. By enabling easy access to working capital, Milma seeks to strengthen its dealer network and enhance the overall efficiency of the dairy supply chain.

This proactive approach is expected to significantly benefit small-scale dairy entrepreneurs, allowing them to expand their operations while maintaining financial stability. The collaboration between Milma and Kerala Bank reinforces their shared commitment to supporting the dairy sector, promoting rural entrepreneurship, and contributing to the state's economic development.

Starbucks to Lay Off 1,100 Corporate Employees as Part of Global Restructuring

Starbucks has announced plans to lay off approximately 1,100 corporate employees worldwide as part of a major restructuring initiative aimed at increasing efficiency, simplifying decision-making processes, and improving overall operational agility. The layoffs, disclosed in a letter from Chairman and CEO Brian Niccol, will primarily affect corporate support roles. However, employees working in roasting plants, warehouses, and frontline retail positions, including baristas, will not be impacted by the job cuts.

Alongside these layoffs, the company is also eliminating several hundred vacant positions that were previously unfilled. This decision is part of Starbucks' broader effort to optimize its organizational structure and ensure that resources are allocated effectively in response to evolving business needs and market conditions.

Corporate Restructuring Strategy

In his letter to employees, Niccol explained that the restructuring is aimed at reducing complexity within Starbucks' corporate framework. He emphasized that the company had become burdened by excessive layers of management and small-team leadership roles that were slowing down decision-making processes. By eliminating redundant positions and streamlining managerial responsibilities, Starbucks intends to foster a more agile and responsive corporate environment.

Currently, Starbucks employs approximately 16,000 corporate staff members globally. With this restructuring, around 7% of its corporate workforce will be affected. However, the company's overall workforce of 361,000 employees—predominantly consisting of retail store personnel—will remain largely unaffected.

The restructuring reflects Starbucks' commitment to strengthening its long-term business strategy, allowing it to operate more efficiently and position itself for future growth in an increasingly competitive coffee market.

Market Pressures and Financial Challenges

Starbucks' decision to cut corporate jobs comes amid financial headwinds and shifting market conditions. The company has faced mounting challenges in recent years, including fluctuating consumer demand, rising operational costs, and increasing competition from both premium and budget-friendly coffee brands.

During the 2024 fiscal year, which ended on September 29, Starbucks reported a 2% decline in global same-store sales. In the U.S. market, customers responded negatively to higher menu prices and extended wait times, while in China, Starbucks struggled against stiff competition from lower-cost coffee chains.

Despite these hurdles, Starbucks has taken strategic steps to mitigate financial strain and improve customer satisfaction. Initiatives such as eliminating surcharges for non-dairy milk and enhancing service efficiency have helped the company surpass sales expectations in the most recent quarter.

Niccol, who assumed the role of CEO last fall, has been aggressively pursuing initiatives to enhance operational efficiency while also refining the customer experience. His strategic vision includes simplifying Starbucks' menu, optimizing order fulfillment across mobile, drive-thru, and in-store channels, and reinforcing Starbucks locations as community-centric gathering spaces.

A History of Workforce Adjustments

This is not the first time Starbucks has undergone significant workforce reductions. The company previously implemented layoffs in response to economic pressures and evolving business needs.

In 2020, Starbucks cut thousands of corporate and retail jobs due to the financial impact of the COVID-19 pandemic. More recently, in 2023, the company reduced its workforce in technology and support roles as part of its ongoing digital transformation strategy.

The latest round of layoffs aligns with a broader trend of corporate downsizing across various industries. Other major corporations have recently announced significant job cuts due to economic challenges and the need for operational restructuring. Southwest Airlines, for example, recently disclosed plans to eliminate 1,750 corporate positions—approximately 15% of its workforce. Similarly, Bridgestone Americas closed a manufacturing plant in LaVergne, Tennessee, affecting 700 employees.

As companies continue to navigate market fluctuations, many are resorting to strategic workforce adjustments to maintain financial stability and enhance long-term sustainability.

Future Outlook: Starbucks' Path Forward

As Starbucks moves forward with its restructuring efforts, the company faces the challenge of balancing cost-cutting measures with maintaining its premium brand identity and customer loyalty. While enhancing operational efficiency is critical, ensuring a seamless customer experience and maintaining high service standards will be equally essential.

Under Niccol's leadership, Starbucks is expected to continue refining its business model, focusing on streamlining operations, expanding digital ordering capabilities, and optimizing product offerings to meet evolving consumer preferences.

By strategically restructuring its workforce, Starbucks aims to create a leaner, more agile organization that can adapt to changing market dynamics while reinforcing its position as a global leader in the coffee industry. The coming months will be crucial in determining how effectively these measures contribute to Starbucks' long-term growth and resilience.

Key Takeaways:

- Starbucks is laying off 1,100 corporate employees as part of a global restructuring initiative.
- The layoffs aim to improve efficiency, streamline operations, and reduce managerial overhead.
- The company's overall workforce of 361,000 employees, including baristas and retail staff, remains largely unaffected.
- Starbucks has faced financial challenges, including a 2% decline in global same-store sales and rising competition in key markets.
- Previous workforce reductions occurred in 2020 and 2023 as

part of broader corporate adjustments.

- Starbucks is focusing on menu simplifications, digital transformation, and enhanced service experiences to drive future growth.
- The company's restructuring reflects a broader trend of corporate downsizing, with other major firms also implementing layoffs in response to economic pressures.

By aligning its workforce strategy with evolving market demands, Starbucks is positioning itself for long-term sustainability while striving to maintain its status as a dominant player in the global coffee industry.

Assam's Dairy and Organic Farming Sectors Receive a Major Boost at Advantage Assam 2.0

The dairy and organic farming industries in Assam are poised for substantial growth following the signing of two key Memorandums of Understanding (MoUs) during the Advantage Assam 2.0 investment summit. These agreements, facilitated by prominent national and regional stakeholders, are set to revolutionize milk processing capabilities, strengthen organic farming infrastructure, and provide long-term sustainable economic opportunities for farmers across the region.

The initiatives include a major expansion of Purabi Dairy's processing capacity, along with the establishment of an Organic Demo Farm cum Food Innovation Hub, both of which are expected to create a transformative impact on Assam's agricultural and cooperative farming landscape.

Purabi Dairy Expansion: Strengthening Assam's Dairy Industry

A landmark agreement was signed on February 26, 2025, between the National Dairy Development Board (NDDB) and the West Assam Milk Producers' Cooperative Union Limited (WAMUL) to expand the milk processing capacity at Purabi Dairy's Panjabari plant in Guwahati. With an investment of approximately ₹100 crore, the project aims to double the plant's processing capacity from 1.5 lakh liters per day (LLPD) to 3 LLPD.

This ambitious expansion will not only ensure a steady and increased supply of high-quality dairy products to cater to growing consumer demand but will also bolster the earnings of local dairy farmers by enhancing value-added dairy product production. As part of the expansion plan:

- The production of fermented milk products such as yogurt and curd will increase from 20 metric tons per day (MTPD) to 50 MTPD.
- A new ice cream manufacturing plant will be established, with a daily production capacity of 20 TLPD (thousand liters per day).

The initiative is expected to streamline supply chain operations while fostering innovation in dairy processing, ultimately contributing to better profit margins for farmers involved in milk production.

The MoU was formally signed by Dr. V. Sridhar, Senior General Manager of NDDB, and S.K. Parida, Managing Director of WAMUL, signifying their commitment to expanding Assam's dairy industry and strengthening cooperative milk production systems.

Promoting Organic Farming: Establishment of an Organic Demo Farm and Food Innovation Hub

In another significant development, an agreement was signed between the National Cooperative Organics Limited (NCOL) and North East Dairy and Foods Limited (NEDFL)—a joint venture between the Government of Assam and NDDB—to establish an Organic Demo Farm cum Food Innovation Hub. This initiative aims to create a sustainable and integrated ecosystem for organic farming and cooperative dairy activities in Assam.

The proposed Organic Demo Farm cum Food Innovation Hub will serve as a processing center for organic raw materials, enabling farmers to add value to their produce, improve quality, and enhance marketability. It will also act as a demonstration farm, showcasing innovative and sustainable farming techniques that can improve both yield and economic viability.

Objectives of the Organic Farming Initiative:

- Training at least 1,000 farmers in organic farming best practices over the next two years.
- Establishing a certified organic processing unit to help farmers commercialize their organic produce effectively.
- Encouraging sustainable farming techniques that align with global organic standards.
- Developing a robust organic food supply chain, connecting farmers with national and international markets.

The MoU for this initiative was signed by Vipul Mittal, Managing Director of NCOL, and Satya Brata Bose, Managing Director of NEDFL. The project is being spearheaded by the Ministry of Cooperation, with NDDB serving as the chief promoter. Additionally, organizations such as the National Cooperative Consumers' Federation (NCCF), National Agricultural Cooperative Marketing Federation of India Ltd. (NAFED), Gujarat Cooperative Milk Marketing Federation Ltd. (GCMMF), and National Cooperative Development Corporation (NCDC) are actively supporting this endeavor.

By establishing a state-of-the-art organic farming and food innovation hub, the initiative seeks to address key challenges such as the lack of certified organic processing centers and limited awareness about sustainable farming practices. Given NEDFL's extensive farmer network, this project is expected to revolutionize organic agriculture in Assam, providing substantial economic benefits to farmers while ensuring the availability of high-quality organic produce for consumers.

Boosting Assam's Industrial Sector: MoU for Pulp & Paper Manufacturing

While dairy and organic farming were key highlights at Advantage Assam 2.0, the summit also marked a major milestone for the industrial sector. An MoU was signed between M/s Kohinoor Pulp & Paper (P) Limited and RPN Specialty Paper (P) Limited for the establishment of a greenfield pulp and paper manufacturing project at the Industrial Growth Centre in Matia Industrial Area.

The project involves:

- Setting up a bamboo-based pulp plant with an annual production capacity of 1.20 lakh metric tons.
- Establishing a specialty paper manufacturing unit capable of producing 1.50 lakh metric tons per annum of coated, uncoated, writing, and printing paper.
- Developing a co-generation power plant to support industrial operations with sustainable energy solutions.
- Investing approximately ₹2,000 crore into the project, making it one of the largest industrial investments in Assam's recent history.

The project is being led by local entrepreneurs Naveen Kumar Gupta, Pijush Kanti Dey, and Amit Agarwal, highlighting the role of homegrown businesses in Assam's industrial expansion.

A Transformative Future for Assam's Agriculture and Industry

The MoUs signed during Advantage Assam 2.0 reaffirm the government's commitment to fostering economic growth, sustainability, and rural prosperity. These initiatives are expected to create new employment opportunities, increase farmers' incomes, and strengthen supply chains across the state.

Key Impact Areas:

- **Dairy Sector Growth –** The expansion of Purabi Dairy will double milk processing capacity and increase value-added dairy production, directly benefiting Assam's dairy farmers.
- **Organic Farming Innovation –** The establishment of an Organic Demo Farm cum Food Innovation Hub will train thousands of farmers, improve organic certification, and create new revenue streams for small-scale producers.
- **Industrial Development –** The ₹2,000 crore investment in pulp and paper manufacturing will diversify Assam's industrial base, creating jobs and economic opportunities in manufacturing and allied sectors.

With strategic partnerships between government bodies, cooperatives, and private enterprises, Assam is on the path to becoming a leading hub for dairy production, organic agriculture, and industrial innovation in the Northeast. These landmark initiatives will not only improve market access for farmers and businesses but also position Assam as a key player in India's growing agricultural and industrial economy.

The successful implementation of these projects will serve as a blueprint for sustainable economic

development, ensuring long-term prosperity for Assam's farming communities, entrepreneurs, and consumers alike.

Milma Announces Enhanced Cattle Feed Subsidy to Bolster Kerala's Dairy Sector

In a significant step toward supporting dairy farmers, the Kerala Co-operative Milk Marketing Federation (KCMMF), commonly known as Milma, has announced a substantial increase in the subsidy for Milma Gold cattle feed. For the month of March, the subsidy has been raised from ₹100 to ₹300 per sack, marking a threefold increase aimed at easing the financial burden on dairy farmers struggling with rising production costs.

Strengthening Dairy Farmers' Profitability

Announcing the decision, Milma Chairman K.S. Mani highlighted that the enhanced subsidy would drastically reduce cattle feed costs, thereby improving the profitability of dairy farmers across the state. The decision comes at a critical juncture, as farmers have been grappling with increasing expenses in milk production, making this initiative both timely and essential.

Since September 2024, Milma's regional unions in Malabar and Thiruvananthapuram have been offering a ₹100 per sack subsidy to keep cattle feed prices at stable levels. However, with the sharp increase in input costs and feed prices, Milma has responded proactively by tripling the subsidy to ensure that farmers can sustain and expand their dairy operations without undue financial strain.

Unprecedented Regional Union Support

For the first time in Milma's history, its regional unions have consistently provided cattle feed subsidies while also maintaining stable milk procurement prices for an entire year. This uninterrupted support underscores Milma's strong commitment to fostering stability and growth in Kerala's dairy sector. By providing direct financial assistance, Milma aims to enhance farmer confidence, encourage higher milk production, and prevent financial distress among dairy producers.

Far-Reaching Impact on Kerala's Dairy Industry

With operational costs soaring, such initiatives serve as a lifeline for the state's dairy farmers, helping them remain competitive and resilient in the face of economic challenges. By reducing cattle feed expenses and ensuring steady milk procurement rates, Milma continues to play a pivotal role in safeguarding the interests of dairy farmers while ensuring a stable milk supply for consumers.

This latest subsidy hike is expected to:

- Ease financial pressures on small and marginal dairy farmers.
- Encourage increased milk production by making cattle feed more affordable.
- Enhance overall sustainability in Kerala's cooperative dairy sector.
- Support rural livelihoods by ensuring fair compensation and cost reduction.

Milma's Long-Term Vision for

Dairy Development

Beyond the subsidy increase, Milma remains dedicated to strengthening Kerala's dairy ecosystem through strategic initiatives such as infrastructure development, modernization of milk processing plants, and expanding market access for farmers.

By reinforcing cooperative principles and farmer-centric policies, Milma continues to be a cornerstone of Kerala's dairy industry, ensuring economic stability, sustainable growth, and long-term resilience in the sector.

The latest move not only reaffirms Milma's role as a champion of dairy farmers but also sets a precedent for cooperative-driven initiatives that can transform India's dairy landscape in the coming years.

NDRI Showcases Cutting-Edge Cloning Technology and Dairy Innovations at National Dairy Mela 2025

In a groundbreaking initiative to drive advancements in dairy farming and livestock management, the National Dairy Research Institute (NDRI), Karnal, hosted the prestigious National Dairy Mela and Agri Expo 2025. The three-day event, inaugurated by Rajbir Singh, Deputy Director General (Agricultural Extension) of the Indian Council of Agricultural Research (ICAR), served as a platform for showcasing revolutionary developments in dairy science, cloning technology, and cooperative farming models.

Transforming Dairy Farming with Cloning Technology

During his inaugural address, Rajbir Singh commended NDRI's pioneering work in cloning technology, emphasizing its potential to transform dairy farming in India. The institute has successfully developed techniques to clone high-yielding dairy animals, allowing farmers to access superior breeds capable of significantly enhancing milk production and economic viability.

He also highlighted the crucial role played by NDRI's research in mineral mixtures, feed supplements, and high-quality animal semen, which are improving cattle health, genetic diversity, and overall productivity. These scientific innovations are essential for ensuring a more resilient and sustainable dairy sector.

Empowering Farmers Through Cooperatives and Technological Innovations

Speaking at the event, NDRI Director Dheer Singh underscored the importance of cooperative models in dairy farming, drawing inspiration from the success of Amul. He urged farmers to organize themselves into cooperatives to gain financial security, better access to markets, and enhanced bargaining power.

He also announced that NDRI is on the verge of commercializing its cloning technology, which will allow farmers to produce 10-12 high-yielding dairy animals annually. This breakthrough is expected to

revolutionize cattle breeding, making it more efficient and economically viable.

The Dairy Industry's Growth Trajectory

Dheer Singh highlighted the rapid growth of India's dairy industry, noting that while the agricultural sector is expanding at a rate of 3.5%, the dairy sector is outpacing it with a 5% growth rate. This accelerated expansion is a direct result of scientific advancements, genetic improvements, and improved dairy management practices.

With increased investments in modern breeding techniques, better feed quality, and technological innovations, India's per capita milk availability is steadily rising, ensuring that the country maintains its position as the world's largest producer of milk.

National Dairy Mela 2025: A Hub for Knowledge Exchange and Innovation

The National Dairy Mela and Agri Expo 2025 served as an interactive knowledge-sharing platform, bringing together dairy farmers, researchers, policymakers, and industry experts to explore the latest developments in dairy technology, cattle breeding, and sustainable farming practices.

Key highlights of the event included:

- Live demonstrations of advanced dairy farming techniques
- Workshops on cooperative farming and financial management for dairy farmers
- Exhibitions showcasing high-quality animal feed, veterinary solutions, and dairy processing equipment
- Expert-led discussions on climate-resilient dairy farming and digital transformation in the dairy industry

Future Outlook: Strengthening India's Dairy Landscape

With cloning technology nearing commercialization, enhanced breeding programs, and a renewed focus on cooperative models, India's dairy sector is poised for a major transformation. These initiatives will empower farmers, increase milk production, and strengthen the country's dairy supply chain.

As NDRI continues to drive cutting-edge research and practical innovations, the institute remains committed to ensuring the long-term sustainability and profitability of dairy farming in India. By integrating scientific advancements with traditional dairy practices, the National Dairy Mela 2025 has laid the foundation for a more prosperous and technologically advanced dairy industry.

India and UK Advance Trade Talks Amid Global Tariff Uncertainty, Aim to Double Trade in the Next Decade

India and the United Kingdom have resumed discussions for a comprehensive free trade agreement (FTA), with a shared objective of doubling bilateral trade within the next ten years. The announcement came during a joint press conference in New Delhi, where India's Commerce and Industry Minister, Piyush Goyal, and UK Business and Trade Secretary, Jonathan Reynolds, reaffirmed their commitment to strengthening economic ties between the two nations.

Reviving Negotiations Amidst Global Trade Challenges

The rekindling of trade discussions comes at a time of global economic uncertainty, including rising tariff tensions fueled by U.S. President Donald Trump, who has recently criticized what he perceives as unfair trade barriers imposed by key markets, including India. Despite these geopolitical challenges, India and the UK are pressing forward with negotiations aimed at achieving a "path-breaking" trade agreement that promotes mutual investment and economic growth.

Minister Goyal expressed confidence that the FTA would significantly boost merchandise trade, potentially expanding it two to three times over the next

decade. Current India-UK bilateral trade in goods and services stands at £41 billion (₹4.51 trillion), as per British government estimates for the 12 months ending September 2024.

Negotiations had previously stalled in March 2023 due to elections in both countries. However, they gained fresh momentum following a meeting between Prime Minister Narendra Modi and UK Prime Minister Keir Starmer on the sidelines of the G20 Summit in Rio de Janeiro in November 2024.

Key Sticking Points: Visas, Agricultural Tariffs, and Dairy Market Access

While both governments are optimistic about reaching an agreement, certain critical issues remain unresolved.

1. **Easier Visa Norms for Indian Professionals**

- India has long advocated for a more liberalized visa regime that would allow skilled professionals and businesses to move between the two nations with ease.
- Minister Goyal stressed that business visas are vital for enabling smooth operations in services and investment sectors, which are key components of the trade pact.
- He emphasized that India never discusses immigration policies in FTAs but seeks short-term business visas to facilitate trade, education, and professional services.
- UK Trade Secretary Jonathan Reynolds acknowledged these concerns, stating that immigration would be handled separately from trade talks.

2. **Reduction of Agricultural Tariffs**

- The UK has been pushing for lower tariffs on British agricultural products, including whisky and dairy exports.
- India recently reduced import duties on British whisky from 150% to 100%, following global criticism, including from U.S. President Trump. However, significant barriers remain.

3. **India's Stance on Dairy Market Access**

- One of the most contentious issues in negotiations is India's highly protected dairy sector.
- The UK is eager to gain access to India's massive dairy market by securing duty concessions for British dairy products. However, India remains firmly opposed to opening its dairy industry due to the livelihood concerns of millions of small-scale farmers.

Minister Goyal reiterated that India has never granted duty concessions on dairy products in any of its trade agreements. He cited previous stalled negotiations with New Zealand, which failed due to India's unwillingness to allow foreign dairy imports.

- The National Farmers' Union (NFU) of the UK has acknowledged the difficulties in accessing India's dairy market, recognizing that India's policies are designed to protect domestic producers from international competition.
- UK dairy exporters argue that Indian production standards and trade restrictions create market entry barriers, but Indian policymakers insist that these measures are essential to safeguard local farmers.

Potential Impact of the FTA on the Dairy Industry

If the India-UK trade deal materializes, it could have significant ramifications for both nations' dairy sectors:

For the UK:

- Greater access to India's booming consumer market for premium dairy products such as cheese, butter, and milk powders.
- Potential growth opportunities for UK dairy farmers who seek to expand exports amid slowing demand in Europe.

For India:

- Concerns over increased competition for small-scale dairy farmers, who operate on a much smaller scale than UK dairy producers.
- Possible pressure to modernize and enhance productivity to compete with foreign imports, should any market access be granted.

Future Outlook: A Delicate Balancing Act

As India and the UK progress with negotiations, balancing mutual economic interests with domestic policy priorities will be essential. While both sides see significant benefits in expanding trade, sensitive sectors such as dairy, agriculture, and professional mobility remain major hurdles.

With global trade tensions on the rise, this FTA could set a precedent for future economic cooperation. However, the ability to reach a balanced agreement that protects India's small farmers while enabling UK businesses to expand will ultimately determine the success of this landmark deal.

India and the UK continue to push forward, with both sides committed

to finding common ground in the coming months. Whether they will resolve the long-standing dairy and visa issues remains to be seen.

Huhtamaki Unveils ProDairy: A Recyclable Single-Coated Paper Cup for Yogurt and Dairy

Huhtamaki, a global pioneer in sustainable food packaging, has introduced its latest breakthrough—ProDairy, an innovative recyclable single-coated paper cup designed specifically for yogurt and dairy products. This next-generation packaging solution significantly reduces plastic content to below 10%, ensuring top-tier food safety and performance standards while promoting eco-friendly practices in the dairy industry.

With ProDairy, Huhtamaki sets a new benchmark for sustainable dairy packaging, as the product is fully recyclable across Europe and aligns with global efforts to minimize plastic waste.

Revolutionizing Dairy Packaging with Sustainability and Innovation

Dairy products, particularly yogurt, require packaging solutions that maintain freshness, hygiene, and durability. Traditionally, reducing plastic content in such packaging has been a major challenge due to barrier requirements for moisture and oxygen. Huhtamaki has tackled this issue by developing ProDairy, a cost-effective, high-performance alternative to conventional plastic-coated dairy cups.

Fredrik Davidsson, President of Fiber Foodservice Europe-Asia-Oceania at Huhtamaki, highlighted the significance of this sustainability-driven innovation:

"Dairy products play a vital role in our daily lives, and designing recyclable packaging for essentials like yogurt has been a long-standing challenge. I am incredibly proud of our team for developing a solution that is not only highly functional and cost-efficient but also meets consumer expectations for reduced plastic usage in food packaging."

Innovative Features of ProDairy Packaging

Huhtamaki has successfully overcome technical barriers by minimizing polymer content while maintaining the strength and integrity required for dairy packaging. The key innovations of ProDairy include:

- **Enhanced Rim Design:** A proprietary rim-forming process ensures a perfect lid seal, a crucial feature for yogurt and dairy product preservation.
- **Advanced Side Seam Sealing:** The use of a specialized sealing varnish strengthens the cup, ensuring durability and leakage resistance.
- **Innovative Varnish Technology:** Replacing the traditional outer polyethylene (PE) layer, this advanced varnish offers a paper-like texture with a matte finish, while also acting as a high-performance moisture barrier—essential for chilled dairy products.
- **Optimized Recyclability:** With plastic content below 10%, ProDairy meets European recyclability standards, ensuring that it can be easily processed in existing recycling streams.

Driving Global Sustainability in Dairy Packaging

Huhtamaki remains committed to sustainable sourcing and production. ProDairy cups are made from renewable wood fibers obtained from sustainably managed forests, reinforcing responsible material usage. By significantly reducing plastic content while maintaining product integrity, ProDairy aligns with global sustainability objectives, including:

- **The European Green Deal**
- **The United Nations Sustainable Development Goals (SDGs)**
- **The growing consumer demand for plastic-free packaging**

This innovation not only supports brands striving to meet eco-friendly goals but also enables retailers and consumers to make environmentally responsible choices without compromising on functionality and performance.

Market Availability and Future Prospects

ProDairy is now available for immediate adoption by dairy manufacturers, brands, and retailers seeking to transition to sustainable packaging. With this launch, Huhtamaki strengthens its position as a leader in environmentally responsible food packaging solutions.

- Looking ahead, Huhtamaki plans to:
  Expand the ProDairy product range to include additional sizes and formats.
- Invest in further research to eliminate plastic layers entirely in the future.
- Work with industry partners and policymakers to enhance recycling infrastructure.

With ProDairy, Huhtamaki is redefining dairy packaging, ensuring that yogurt and dairy products can be enjoyed with minimal environmental impact—one cup at a time.

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Energy Booster
When you're struggling to get through the day and you need a little pick-me-up, reach for an ice cold glass of milk. You will feel revitalized in no time.

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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