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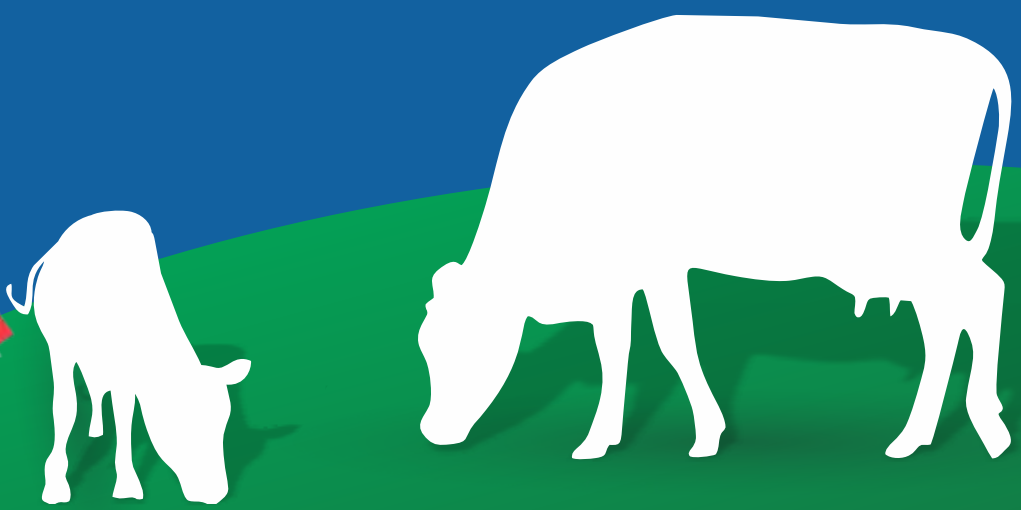

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Reduce Stress
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Energy Booster
When you're struggling to get through the day and you need a little pick-me-up, reach for an ice cold glass of milk. You will feel revitalized in no time.

From the Pen of Chief Editor

The 2025 Budget and the Future of India's Dairy Industry

The 2025 Union Budget has introduced several key provisions aimed at revitalizing India's dairy industry, a sector that forms the backbone of rural economy and feeds millions across the nation. For years, dairy farmers have grappled with challenges such as fluctuating prices, inadequate infrastructure, and limited access to technology. The budget promises to address these pain points head-on, offering hope for a more sustainable and efficient dairy sector.

At the heart of the budget is the recognition of rural empowerment. With an emphasis on strengthening rural infrastructure—be it roads, electricity, or water supply—the government is laying the groundwork for improved productivity in the dairy sector. Farmers will find it easier to access markets, transport their goods, and ensure better care for livestock, which ultimately translates into higher yields and more stable incomes.

Equally important is the focus on dairy cooperatives. India's dairy cooperatives have long been a symbol of fair pricing and collective growth, and the budget's support for these institutions could make a significant difference. With financial aid and technology-driven solutions like mobile apps and transparent payment systems, cooperatives are poised to offer better services to farmers, ensuring timely payments and encouraging productivity.

Technology is another standout feature of the 2025 budget. By promoting AI and machine learning in dairy farming, the government is ushering in an era of modern agriculture. From disease management to improving milk yields, these technological advancements have the potential to transform the dairy landscape. If leveraged correctly, India could position itself as a global leader in dairy production, tapping into international markets like never before.

Moreover, the budget recognizes the delicate balance between producer and consumer interests. With provisions for controlled pricing and subsidies, dairy farmers will be shielded from market volatility, while consumers can expect affordable dairy products. It's a win-win scenario that ensures the sustainability of the industry.

However, the budget also calls attention to the environmental challenges faced by the dairy sector. With sustainability at its core, the government is promoting eco-friendly practices such as waste management and renewable energy solutions. This forward-thinking approach could help India's dairy industry meet global demands for environmentally conscious products.

In conclusion, the 2025 budget offers a well-rounded vision for the future of dairy farming in India. By focusing on infrastructure, technology, cooperatives, and sustainability, it lays the foundation for a more prosperous and sustainable dairy sector. While challenges remain, this is undoubtedly a step in the right direction for India's dairy farmers and consumers alike.

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PRESS RELEASE

ARTICLE

2025 Budget and Its Implications for India's Dairy Industry

Siddhi Gupta
Co-Editor

The Union Budget of 2025 has been eagerly anticipated by various sectors of the economy, but few are as intertwined with both rural and urban life as the dairy industry. With millions of farmers, dairy producers, and businesses involved in this vital sector, the budget could be a game-changer. But what does it really mean for the dairy industry? Let's break it down in simple terms and explore how the new budget could impact everything from production to the pricing of milk and dairy products.

Focus on Rural Empowerment

The government has consistently acknowledged the importance of rural India, and dairy farming plays a significant role in this context. In the 2025 budget, rural empowerment remains at the forefront, with provisions that could benefit the dairy sector in more ways than one. By strengthening rural infrastructure like roads, electricity, and water supply the budget aims to improve conditions for dairy farmers, making it easier for them to operate and expand.

A stronger rural infrastructure means better access to markets, improved transportation for dairy products, and more reliable sources of water for livestock. All of this ultimately contributes to the efficiency of the dairy industry and the livelihoods of the farmers involved.

Support for Dairy Cooperatives

In India, dairy cooperatives have been a game-changer in ensuring fair prices for milk producers. The government's continued focus on strengthening these cooperatives is evident in the 2025 budget. Financial assistance to cooperatives could boost their ability to provide better facilities to farmers, improve their dairy production systems, and ensure timely payment for milk deliveries.

Moreover, with the inclusion of technology-driven solutions, the dairy cooperatives may soon provide better services like mobile apps for tracking milk procurement, transparent payments, and even training for new farmers to boost productivity.

Incentives for Technology Integration

One of the most promising aspects

of the 2025 budget is the emphasis on technology. The dairy sector, long reliant on traditional methods, is undergoing a transformation, thanks to new technologies. The government has earmarked funds for digitization and modern farming practices, with a special focus on artificial intelligence (AI) and machine learning (ML) for livestock management.

AI can help in areas such as genetic selection, disease management, and even milk yield prediction. Moreover, the integration of technology into dairy farming can improve the quality of dairy products, which is crucial for the global competitiveness of India's dairy industry. This could open up new avenues for exports, making Indian dairy products more attractive in international markets.

Financial Support and Credit Availability

Dairy farmers often face the challenge of accessing affordable credit to expand their operations or improve infrastructure. The 2025 budget addresses this issue by enhancing access to low-interest loans and providing subsidies on equipment for modern dairy practices.

In addition, the budget introduces a simplified process for availing of financial support, making it easier for small-scale dairy farmers to obtain credit. This financial assistance can go a long way in reducing operational costs and increasing productivity.

Pricing and Subsidy Adjustments

Another key area of focus in the 2025 budget is the pricing of essential commodities like milk. While the government has committed to keeping milk prices stable, there are provisions for subsidies that can cushion the impact of price fluctuations on both producers and consumers. For dairy farmers, this means a buffer against sudden price drops, ensuring that their livelihoods aren't compromised by market volatility.

On the flip side, consumers will benefit from controlled milk prices, ensuring that dairy products remain affordable. This balance between producer and consumer interests is crucial for sustaining the dairy industry's long-term growth.

Support for Dairy Exports

India is the largest producer of milk globally, but it faces challenges when it comes to exporting its dairy products. The 2025 budget aims to change this by introducing new initiatives to make Indian dairy products more competitive in the global market.

This includes easing export regulations, offering financial incentives to dairy exporters, and helping small and medium-sized enterprises (SMEs) in the dairy sector meet international quality standards. By focusing on quality and increasing the competitiveness of Indian dairy products, the government hopes to tap into more international markets and boost the sector's economic potential.

Addressing Environmental Concerns

As the dairy industry grows, so do concerns about its environmental impact. The 2025 budget touches upon the importance of sustainable practices in agriculture and dairy farming. There are provisions for adopting environmentally friendly practices, such as waste management systems and renewable energy solutions, which could help mitigate the sector's carbon footprint.

By promoting sustainability, the dairy industry can meet global demands for eco-friendly products, helping farmers reduce their environmental impact while also staying competitive.

Consumer-Friendly Initiatives

While the focus on dairy farmers is crucial, the 2025 budget also recognizes the need to safeguard consumers' interests. With rising inflation and fluctuating commodity prices, the budget includes measures aimed at controlling inflation in essential sectors like dairy. Government-backed programs to regulate prices and ensure fair trade could make dairy products more affordable, especially for low-income families.

Additionally, the budget promises to support the promotion of dairy-based value-added products, such as flavored milk, cheese, yogurt, and ice cream. These products are not only high in demand but also offer higher profit margins for producers. By providing support for these value-added products, the budget could contribute to the growth of India's dairy processing industry.

Conclusion

In essence, the 2025 Union Budget brings a comprehensive package for the dairy industry. By addressing everything from infrastructure to technology, financial support to pricing regulations, the government is laying a strong foundation for the growth and sustainability of this vital sector. With these initiatives, we can expect the dairy industry to become more efficient, competitive, and sustainable in the years to come. While challenges will remain, the 2025 budget demonstrates a strong commitment to nurturing the dairy industry for the benefit of farmers, businesses, and consumers alike.

Bovine Respiratory Disease (BRD) A Silent Threat to Cattle Health and Productivity

Parth Rai Gupta
Co-Editor

Bovine Respiratory Disease (BRD), often referred to as "shipping fever" or "pneumonia in cattle," is one of the most significant and costly health challenges facing the global cattle industry. This complex disease affects the respiratory system of cattle, leading to severe economic losses due to reduced productivity, increased veterinary costs, and high mortality rates. BRD is particularly prevalent in feedlots, dairy farms, and among young calves, making it a critical issue for farmers, veterinarians, and researchers alike. In this article, we will explore the causes, symptoms, prevention, and management of BRD, as well as its impact on the cattle industry.

Bovine Respiratory Disease

BRD is a multifactorial disease, meaning it is caused by a combination of factors, including pathogens, environmental stressors, and host immunity. It primarily affects the lower respiratory tract of cattle, leading to inflammation, lung damage, and, in severe cases, death. The disease is most common in young cattle, particularly those transitioning from pasture to feedlots or undergoing transportation, which is why it is often called "shipping fever."

BRD is responsible for significant economic losses in the cattle industry. According to studies, it accounts for over 50% of all feedlot illnesses and 70-80% of all feedlot deaths. The costs associated with BRD include treatment expenses, reduced weight gain, and decreased milk production, making it a top priority for cattle producers.

Causes of BRD

BRD is caused by a combination of viral and bacterial pathogens, often exacerbated by environmental and management factors. The primary pathogens involved in BRD include:

1. **Viruses**

- **Bovine Herpesvirus-1 (BHV-1):** Causes Infectious Bovine Rhinotracheitis (IBR), which weakens the immune system and predisposes cattle to secondary bacterial infections.
- **Bovine Viral Diarrhea Virus (BVDV):** Suppresses the immune system, making cattle more susceptible to respiratory infections.
- **Bovine Respiratory Syncytial Virus (BRSV):** Directly damages the respiratory tract, leading to severe pneumonia.
- **Parainfluenza Virus-3 (PI3):** Often involved in the early

stages of BRD, causing mild respiratory symptoms.

2. **Bacteria**

- **Mannheimia haemolytica:** The most common bacterial cause of BRD, known for producing toxins that damage lung tissue.
- **Pasteurella multocida:** Another significant bacterial pathogen that contributes to pneumonia.
- **Histophilus somni:** Causes respiratory and systemic infections, including pneumonia.
- **Mycoplasma bovis:** A challenging pathogen to treat, often leading to chronic respiratory disease.

3. **Environmental and Management Factors**

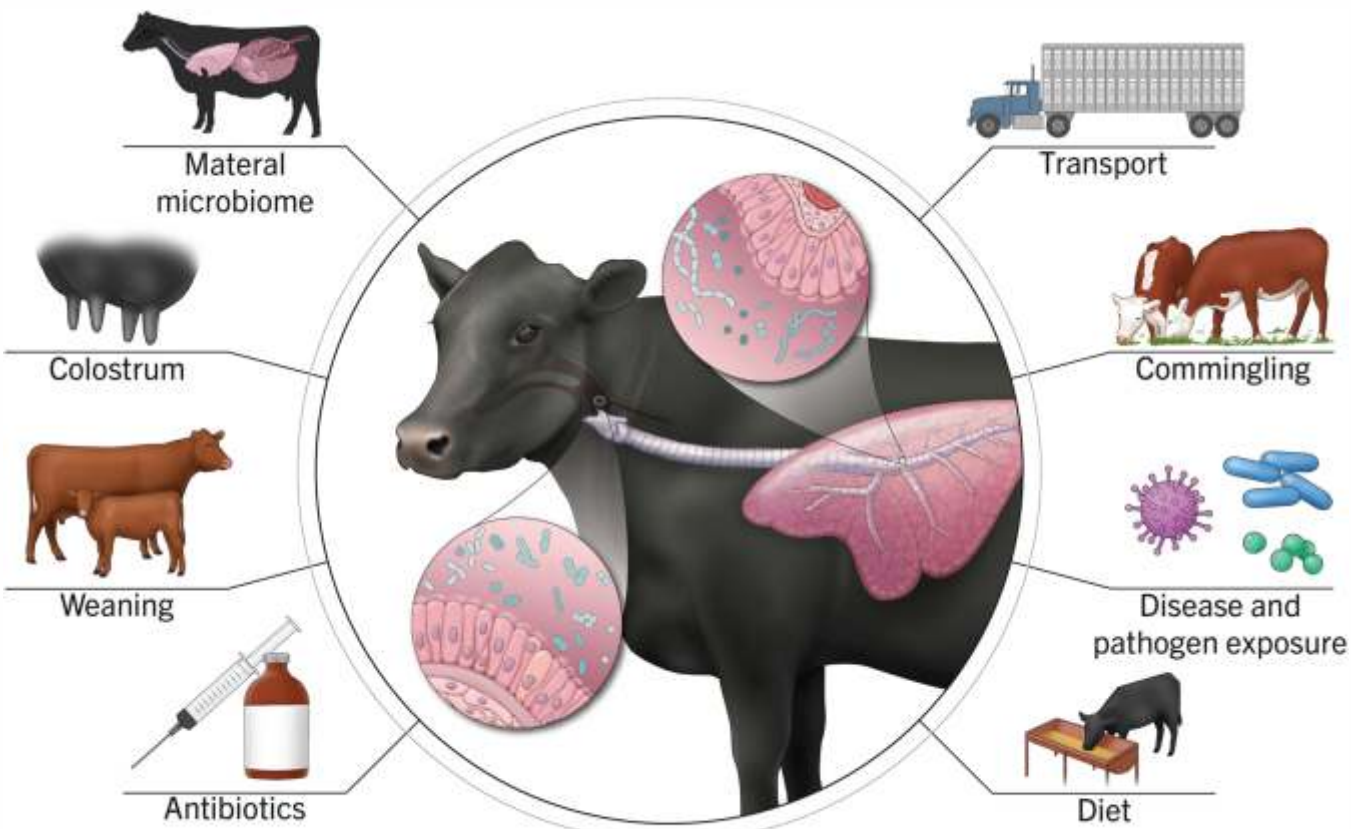
- **Stress:** Transportation, weaning, overcrowding, and poor ventilation can weaken the immune system, making cattle more susceptible to BRD.
- **Poor Nutrition:** Inadequate nutrition can compromise the immune system, increasing the risk of infection.
- **Weather Changes:** Sudden temperature fluctuations, humidity, and poor air quality can exacerbate respiratory issues.

Symptoms of BRD

Early detection of BRD is critical for effective treatment and management. However, the symptoms can vary depending on the severity of the infection and the pathogens involved. Common signs of BRD include:

- **Respiratory Symptoms**
  - Coughing
  - Nasal discharge (clear, white, or yellowish)
  - Rapid or labored breathing
  - Wheezing or grunting sounds
- **Systemic Symptoms**
  - Fever (body temperature above 104°F)
  - Lethargy or depression
  - Reduced appetite or feed intake
  - Weight loss or poor growth
- **Advanced Symptoms**
  - Open-mouth breathing
  - Drooping ears
  - Isolation from the herd
  - Death in severe cases

Cattle with BRD often exhibit a combination of these symptoms, and early intervention is crucial to prevent the disease from progressing to a severe or fatal stage.



Factors that affect the bovine respiratory microbiome

Diagnosis of BRD

Diagnosing BRD can be challenging due to its multifactorial nature and the overlap of symptoms with other diseases. Veterinarians typically rely on a combination of clinical signs, history, and diagnostic tests to confirm BRD. Common diagnostic methods include:

- **Physical Examination:** Checking for fever, respiratory distress, and other clinical signs.
- **Blood Tests:** To assess white blood cells counts and detect systemic infections.
- **Nasal Swabs or Lung Samples:** To identify specific viral or bacterial pathogens.
- **Ultrasound or Radiography:** To evaluate lung damage and inflammation.

Prevention and Management of BRD

Preventing BRD requires a comprehensive approach that addresses the various factors contributing to the disease. Key strategies include:

1. **Vaccination**

- Vaccines are available for many of the viral and bacterial pathogens involved in BRD. A well-designed vaccination program, tailored to the specific risks of the herd, can significantly reduce the incidence of BRD.
- Common vaccines include those for BHV-1, BVDV, BRSV, PI3, and Mannheimia haemolytica.

2. **Biosecurity Measures**

- Isolate new or sick animals to prevent the spread of pathogens.
- Maintain clean and disinfected facilities to reduce the risk of infection.

3. **Stress Reduction**

- Minimize stress during transportation, weaning, and handling.
- Provide adequate space, ventilation, and comfortable housing.

4. **Nutritional Support**

- Ensure cattle receive a balanced diet to support their immune system.
- Provide access to clean water and high-quality feed.

5. **Early Detection and Treatment**

- Monitor cattle closely for signs of BRD, especially during high-risk periods.
- Administer antibiotics and anti-inflammatory drugs as prescribed by a veterinarian.

Economic Impact of BRD

The economic impact of Bovine Respiratory Disease (BRD) on the Indian cattle industry is significant, causing substantial financial losses for dairy and livestock farmers. While exact national estimates are limited, BRD leads to increased expenses for treatment, including antibiotics, anti-inflammatory drugs, and veterinary services. It also results in reduced productivity, with lower milk yields in dairy cows and slower weight gain in beef and buffalo farming. In severe cases, BRD causes mortality, leading to direct financial losses for farmers. Additionally, the disease increases labor costs as extra efforts are required for monitoring and treating affected animals. Implementing effective preventive measures such as timely vaccinations, better farm management practices, and early disease detection can help reduce these losses and improve overall herd health and productivity.

The Future of BRD Management

Advancements in research and technology are paving the way for more effective BRD management. Some promising developments include:

- **Improved Vaccines:** Researchers are working on next-generation vaccines that provide broader and longer-lasting protection against BRD pathogens.
- **Diagnostic Tools:** Rapid diagnostic tests and portable imaging devices are being developed to enable early and accurate detection of BRD.
- **Genetic Selection:** Breeding cattle with enhanced resistance to respiratory diseases could reduce the incidence of BRD in the future.

Conclusion

Bovine Respiratory Disease remains a formidable challenge for the cattle industry, but with proper understanding, prevention, and management, its impact can be significantly reduced. By prioritizing vaccination, stress reduction, and early detection, cattle producers can protect their herds from this costly and devastating disease. As research continues to advance, the future holds promise for even more effective strategies to combat BRD, ensuring the health and productivity of cattle for generations to come.

For farmers and veterinarians, staying informed and proactive is the key to winning the battle against BRD. Together, we can safeguard the well-being of cattle and secure the sustainability of the cattle industry.

Feeding Mangement of Dairy Animals During Monsoon Season

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Introduction

In India, the monsoon or rainy season start from June to September and by the first week of July the entire country experiences monsoon rain, on average south India receives more rainfall than north India along with most precipitation in northeast India.However, this period also brings with it a number of difficulties for dairy production, such as problems with water, bacterial and viral infections, and general management concerns.

Dairy animals, just like humans need extra attention during the monsoon season to stay healthy and productive. During this season, the health and productivity of dairy animals may be negatively impacted by heavy rainfall, high humidity, and temperature fluctuations. Effective feeding management during the monsoon is crucial to maintaining the well-being of the animals and ensuring consistent milk production.During the monsoon season, different challenges arise for dairy animal, rainwater can mix with mud and contaminants and cause

(Source: www.google.com)

gastrointestinal disease.Ticks and flies increase in humid conditions, causing anaemia.Worm infestations, such as liver fluke and roundworms, are common during monsoon.

Feeding habbit during monsoon season

Farmers need to follow scientific feeding and management practices to maintain milk production. While giving green fodder in plenty during rainy season, in order to reduce the chances of diarrhoea, it can be mixed with straw or can be allowed to dry in sunlight for 2-3 hours. Chances of aflatoxicosis can be reduced by avoiding moist feeds or oil cakes, which are the potential sources of fungal toxins. Avoid letting animals graze on rain-soaked pastures as the grass may have high moisture and fibre content, leading to digestive issues and nutrient deficiencies. Add mineral mixtures to the feed to maintain nutrient balance.Store feed in dry, hygienic places to prevent mould formation and mouldy feed can be harmful if consumed by dairy animals.To prevent the scarcity of fodder, farmers can prepare unconventional feed like hay and silage. Along with these they can also use mineral blocks like urea molasses mineral blocks (UMMB) to fulfil the mineral requirement of animals. Livestock may refuse to consume forages in areas that have been contaminated by rainy water because of palatability problem. The animals should also be frequently observed for signs of distress. Young, growing animals may be most susceptible to nutritional disturbances.

Abruptly changing cattle diets can result in bloat or other nutritional disorders that threaten livestock health. Trees are often downed as a result of heavy rain. Sudden drop of the trees can damage the livestock directly or indirectly. Many trees like buckeye (horse chestnut), wild cherry (black cherry) and oak, can also cause potential livestock disorders if their leaves or nuts are consumed. So, animals should be prevented from consumption of such things.

Conclusion

During the monsoon season, dairy cattle face significant health challenges due to increased humidity and fluctuating temperatures.High moisture content contaminates water, which increases the proliferation of pathogenic microbes and causes gastrointestinal disorder. Ectoparasites and endoparasites thrive in these conditions, therefor regular deworming is necessary and the use of ectoparasiticides to prevent anaemia.Proper housing management is essential. Excessive moisture can cause feed quality to decline, therefore it's critical to store feed correctly and keep it dry. Maintaining cow productivity during the monsoon season and preventing infectious illnesses need timely vaccines and routine health monitoring.

(Source: www.google.com)

Foot and Mouth Disease (FMD) A Global Threat to Livestock and Agriculture

Foot and Mouth Disease (FMD) is one of the most contagious and economically devastating diseases affecting cloven-hoofed animals, including cattle, sheep, goats, pigs, and deer. Known for its rapid spread and severe impact on livestock productivity, FMD has been a major concern for farmers, veterinarians, and governments worldwide. This article delves into the causes, symptoms, prevention, and global implications of FMD, as well as the ongoing efforts to control and eradicate this disease.

Foot and Mouth Disease (FMD)

FMD is a highly contagious viral disease that affects cloven-hoofed animals. It is caused by the Foot and Mouth Disease Virus (FMDV), which belongs to the Picornaviridae family. The virus has seven distinct serotypes (O, A, C, SAT1, SAT2, SAT3, and Asia1), each requiring specific vaccines for effective protection. FMD is not a direct threat to human health, but its impact on livestock and agriculture is profound, making it a significant

concern for food security and trade.

The disease is characterized by fever, blister-like lesions on the mouth, tongue, hooves, and teats, leading to severe pain, lameness, and reduced productivity. While the mortality rate in adult animals is relatively low, FMD can cause high mortality in young animals due to myocarditis (inflammation of the heart muscle).

Causes and Transmission of FMD

FMD is caused by the FMD virus, which is highly contagious and can spread rapidly through direct and indirect contact. Key modes of transmission include:

1. **Direct Contact**

- Infected animals can spread the virus to healthy animals through saliva, nasal secretions, milk, and feces.
- Close contact in crowded conditions, such as markets or transport vehicles, facilitates the spread of the virus.

2. **Indirect Contact**

- The virus can survive in the environment for extended periods, especially in cool and damp conditions.
- Contaminated equipment, vehicles, clothing, and feed can act as vehicles for transmission.
- Airborne transmission is possible, with the virus traveling several kilometers under favorable weather conditions.

3. **Human-Mediated Spread**

- People can inadvertently spread the virus through contaminated clothing, footwear, or equipment.
- Movement of infected animals or contaminated products can introduce the virus to new areas.

Symptoms of FMD

The clinical signs of FMD can vary depending on the species, age, and immune status of the animal. Common symptoms include:

- **Fever:** A sudden rise in body temperature is often the first sign of infection.
- **Lesions:** Blister-like sores (vesicles) appear on the mouth, tongue, gums, nostrils, hooves, and teats. These lesions can rupture, causing pain and discomfort.
- **Excessive Salivation:** Animals may drool excessively due to mouth sores.
- **Lameness:** Lesions on the hooves can cause severe pain, leading to reluctance to move or stand.
- **Reduced Productivity:** Infected animals often experience a drop in milk production, weight loss, and reduced growth rates.
- **Mortality in Young Animals:** Calves, lambs, and piglets may die suddenly due to myocarditis.

Diagnosis of FMD

Accurate and timely diagnosis of FMD is crucial for controlling outbreaks. Veterinarians and diagnostic laboratories use a combination of clinical signs and laboratory tests to confirm the presence of the virus. Diagnostic methods include:

- **Clinical Examination:** Observing characteristic lesions and symptoms.
- **Virus Isolation:** Collecting samples (e.g., saliva, tissue, or blood) to isolate and identify the virus.
- **Serological Tests:** Detecting antibodies against FMDV in the blood.
- **Molecular Techniques:** Using polymerase chain reaction (PCR) to detect viral genetic material.

Prevention and Control of FMD

Preventing and controlling FMD requires a coordinated effort involving farmers, veterinarians, and government agencies. Key strategies include:

1. **Vaccination**

- Vaccination is the most effective tool for preventing FMD in endemic regions. Vaccines are available for specific serotypes, and regular booster shots are required to maintain immunity.
- In FMD-free countries, vaccination is often restricted to avoid masking the presence of the virus.

2. **Biosecurity Measures**

- Restrict movement of animals, people, and equipment in and out of farms.
- Disinfect vehicles, equipment, and footwear to prevent contamination.
- Isolate new or sick animals to prevent the spread of the virus.

3. **Surveillance and Monitoring**

- Regular monitoring of livestock for signs of FMD.
- Reporting suspected cases to veterinary authorities immediately.

4. **Stamping Out**

- In FMD-free countries, infected and exposed animals are often culled to prevent the spread of the virus.
- Proper disposal of carcasses and contaminated materials is essential.

5. **Public Awareness**

- Educating farmers and the public about the risks of FMD and the importance of biosecurity.

Economic Impact of FMD

The economic impact of FMD is immense, affecting both individual

farmers and national economies. Key consequences include:

- **Loss of Productivity:** Reduced milk production, weight loss, and poor growth rates in infected animals.
- **Trade Restrictions:** FMD-free countries often impose bans on livestock and animal products from affected regions, leading to significant trade losses.
- **Control Costs:** Expenses related to vaccination, surveillance, and culling can be substantial.
- **Livelihoods:** Small-scale farmers are particularly vulnerable to the economic impact of FMD, as they often lack the resources to recover from outbreaks.

Global Efforts to Control FMD

FMD is a global concern, and international organizations such as the World Organisation for Animal Health (WOAH) and the Food and Agriculture Organization (FAO) are working to control and eradicate the disease. Key initiatives include:

- **Global FMD Control Strategy:** A coordinated effort to reduce the burden of FMD in endemic regions and prevent its spread to FMD-free areas.
- **Vaccine Banks:** Establishing regional vaccine banks to ensure rapid access to vaccines during outbreaks.
- **Capacity Building:** Training veterinarians and farmers in FMD prevention and control measures.
- **Research and Development:** Developing more effective vaccines, diagnostic tools, and treatment options.

The Future of FMD Management

Advancements in science and technology are offering new hope for the control and eradication of FMD. Some promising developments include:

- **Synthetic Vaccines:** Researchers are working on synthetic vaccines that provide broader protection against multiple serotypes.
- **Rapid Diagnostics:** Portable diagnostic devices are being developed to enable on-site testing and faster response to outbreaks.
- **Genetic Resistance:** Breeding animals with enhanced resistance to FMD could reduce the incidence of the disease in the future.

Conclusion

Foot and Mouth Disease remains a significant threat to global livestock production and food security. While the disease is not a direct risk to human health, its economic and social consequences are profound. By implementing effective prevention and control measures, investing in research, and fostering international collaboration, we can reduce the burden of FMD and protect the livelihoods of millions of farmers worldwide.

Hygiene in Milk Production: Implementing Latest Practices for Quality Assurance

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Introduction

Hygienic milk production is an essential aspect of ensuring the safety, quality, and integrity of the milk consumed by millions of people worldwide. It encompasses a set of practices and protocols aimed at maintaining cleanliness, minimizing contamination, and promoting good hygiene standards throughout the milk production process. With increasing concerns about food safety and the demand for high-quality dairy products, the importance of hygienic milk production has become paramount in the dairy industry. The process of hygienic milk production begins on the dairy farm and extends through milking, storage, transportation, processing, and distribution. It involves implementing rigorous measures to prevent the introduction and proliferation of harmful microorganisms, toxins, and foreign substances that can compromise the safety and quality of milk.

Milk, being a nutrient-rich liquid, provides an ideal environment for the growth of microorganisms, some of which can pose significant health risks to consumers. Therefore, maintaining strict hygiene practices is crucial to mitigate these risks and ensure that milk is safe for consumption. Hygienic milk production involves various key aspects, such as proper facility and equipment sanitation, personal hygiene of workers, cow cleanliness and health management, efficient milk collection and storage, testing and quality control procedures, and ongoing education and training. Embracing the latest practices and technologies in hygiene further enhances the ability to maintain high standards and meet regulatory requirements. By prioritizing hygiene in milk production, dairy farmers, milk producers, and the entire supply chain can uphold consumer confidence, protect public health, comply with regulations, and contribute to the overall reputation of the dairy industry. It is a collective effort that requires continuous vigilance, adherence to best practices, and a commitment to quality and safety.

As the demand for clean and safe dairy products continues to rise, it is essential for dairy farmers and milk producers to adopt and implement the latest hygiene practices. This article explores the importance of hygiene in milk production and highlights some of the latest practices that can be employed to maintain high standards.

Principle of hygienic milk production

The principle of hygienic milk production is based on implementing practices and

measures to ensure the cleanliness, safety, and quality of milk throughout the production process. Key principles of hygienic milk production:

1. **Prevention of Contamination**

   The principle of preventing contamination involves taking proactive steps to avoid the introduction of harmful substances or microorganisms into the milk. This includes maintaining a clean and controlled environment, proper cow hygiene, and preventing cross-contamination during milking and handling processes.

2. **Sanitization of Facilities and Equipment**

   One of the fundamental steps in ensuring hygiene in milk production is maintaining clean and sanitized facilities and equipment. Regular cleaning of milking parlors, storage tanks, pipelines, and utensils is essential to prevent the growth of harmful bacteria. The use of approved sanitizers and detergents, coupled with proper cleaning techniques, helps eliminate contaminants and maintain a sterile environment.

3. **Personal Hygiene**

   Maintaining personal hygiene is vital for everyone involved in milk production, including farmers, workers, and technicians. Practicing good hand hygiene, wearing clean clothing, and using protective gear, such as gloves and boots, significantly reduce the risk of introducing harmful bacteria into the milk. Regular health checks and immunizations for workers are also important to ensure a healthy workforce.

4. **Cow Hygiene and Health**

   Healthy cows contribute to high-quality milk production. Proper hygiene practices should be implemented to maintain cow cleanliness, including regular grooming, clean and dry bedding, and effective manure management. Regular veterinary care and timely vaccinations help prevent the spread of diseases and maintain cow health. Cows with udder infections should be identified and treated promptly to prevent contamination of the milk.

5. **Milk Collection and Storage**

   Efficient milk collection and storage processes are crucial to maintaining milk quality. Properly trained personnel should handle the milk, ensuring minimal contact with the external environment. Automated milking systems help reduce the risk of contamination. Cooling milk rapidly after collection to temperatures below 4°C (39°F) inhibits bacterial growth. Milk storage tanks should be cleaned regularly, and milk should be stored separately based on quality parameters to avoid cross-contamination.

6. **Testing and Quality Control**

   Regular testing and quality control procedures should be in place to monitor the safety and quality of milk. This includes testing for antibiotics, somatic cell counts, bacterial load, and other quality parameters. Timely and accurate testing helps identify any potential issues early, enabling corrective actions to be taken promptly.

7. **Packaging and Transportation**

   Packaging and transporting milk in clean and sterile conditions are vital to maintaining its hygiene. Proper packaging materials, cleanliness, and adherence to hygiene protocols during transportation help prevent contamination and maintain milk quality.

8. **Training and Education**

   Continuous training and education are vital for dairy farmers and milk producers to stay updated with the latest hygiene practices. Regular workshops, seminars, and access to educational resources help disseminate knowledge about hygiene protocols, emerging technologies, and best practices. Encouraging a culture of hygiene awareness and accountability among all stakeholders fosters a collective effort towards maintaining high standards.

✷ These aspects presented in a tabular form highlight the various steps and practices involved in hygienic milk production, emphasizing the importance of each aspect in ensuring safe and high-quality milk for consumers.

Latest practices that can be employed to maintain high standards in hygiene milk production:

- **Hazard Analysis and Critical Control Points (HACCP)**

  Implementing a HACCP system is a proactive approach to identify and control potential hazards in milk production. It involves conducting a thorough analysis of the production process, identifying critical control points, and establishing protocols to monitor and control those points to ensure milk safety and quality.

- **Automated Milking Systems**

  Automated milking systems reduce the risk of contamination by minimizing human contact

Importance of hygienic milk production:

Aspects of Hygienic Milk Production	Importance
➢ Isolating Cows from Contaminants	Prevents the introduction of harmful substances and microorganisms into the milk.
➢ Proper Feeding and Watering Practices	Ensures that cows receive a balanced diet and clean water, promoting their health and milk quality.
➢ Maintaining a Clean and Sanitary Milking Environment	Reduces the risk of milk contamination during the milking process by minimizing exposure to dirt, bacteria, and other contaminants.
➢ Regular Cleaning and Sanitization of Milking Equipment	Prevents the buildup of bacteria and maintains equipment functionality, reducing the risk of milk contamination.
➢ Proper Milking Techniques and Hygiene Practices	Minimizes the transfer of bacteria and ensures the cleanliness of udders and hands during milking, maintaining milk quality.
➢ Proper Storage and Cooling of Milk	Rapid cooling and proper storage temperature inhibit bacterial growth, preserving milk freshness and quality.
➢ Quality Testing and Monitoring of Milk	Ensures that milk meets regulatory standards and identifies any potential contamination or quality issues.
➢ Effective Disease Prevention and Control Measures	Prevents the transmission of diseases from cows to milk, safeguarding both animal and consumer health.
➢ Packaging and Transportation in Clean and Sterile Conditions	Maintains the cleanliness and integrity of milk during packaging and transportation, preventing contamination.

with milk during the milking process. These systems use advanced technology to clean and sanitize teats, monitor milk quality, and automate the milking process, ensuring hygienic milk production.

- **Rapid Pathogen Detection**

  Utilizing rapid pathogen detection methods, such as polymerase chain reaction (PCR) and enzyme-linked immunosorbent assay (ELISA), enables quick and accurate identification of harmful bacteria, such as Salmonella, E. coli, and Listeria. Early detection helps prevent contaminated milk from entering the supply chain and facilitates prompt corrective actions.

- **Advanced Cleaning and Sanitization Techniques**

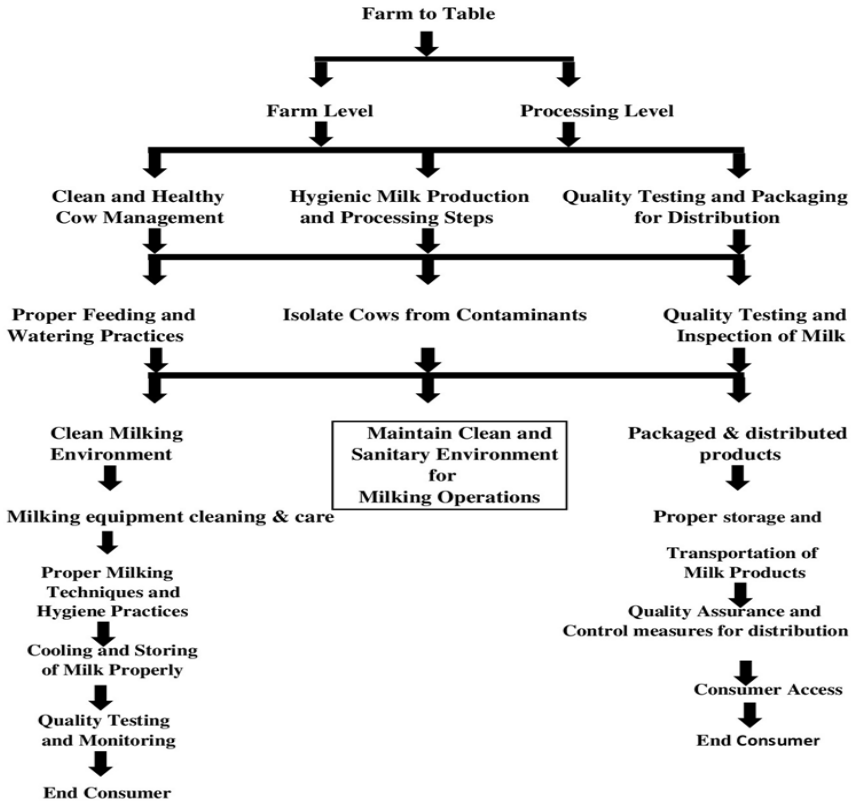
  New cleaning and sanitization techniques, such as foam cleaning and dry sanitizing, offer improved effectiveness in eliminating bacteria and biofilms. These methods help reach difficult-to-clean areas, ensure thorough sanitation of equipment and surfaces, and reduce the risk of cross-contamination.

- **Data Monitoring and Traceability**

  Implementing digital systems for data monitoring and traceability allows real-time tracking of milk production, storage conditions, and quality parameters. This data-driven approach enhances transparency, facilitates early detection of issues, and enables targeted interventions to maintain high hygiene standards.

- **UV-C Light Technology**

  UV-C light technology is increasingly used in the dairy industry for sterilizing air, surfaces, and water. UV-C light has germicidal properties that can effectively eliminate bacteria and molds without the use of chemicals, providing an



additional layer of hygiene assurance.

- **Employee Training and Hygiene Protocols**

  Continuous training and education for all personnel involved in milk production are essential. Training programs should focus on proper hygiene practices, equipment handling, cleaning protocols, and adherence to standard operating procedures (SOPs). Regular reinforcement of hygiene protocols through internal audits and monitoring systems helps maintain high standards.

- **Sustainable Hygiene Practices**

  Adopting sustainable hygiene practices not only promotes environmental responsibility but also contributes to improved milk quality. This includes optimizing water usage, proper waste management, energy-efficient processes, and the use of eco-friendly cleaning agents. Sustainability initiatives align with consumer expectations and enhance the overall reputation of milk producers.

- **Collaboration and Information Sharing**

  Collaboration among dairy industry stakeholders, including farmers, processors, regulators, and researchers, fosters the exchange of knowledge and best practices. Sharing information about emerging threats, technological advancements, and successful hygiene strategies helps raise the bar for hygiene standards across the industry.

- **Continuous Improvement and Innovation**

Maintaining high standards in hygiene milk production requires a commitment to continuous improvement and embracing innovative solutions. Staying updated with the latest research, industry trends, and technological advancements enables milk producers to adopt new practices and technologies that enhance hygiene and overall product quality.

- By implementing these latest practices, milk producers can ensure the production of safe, high-quality milk that meets the expectations of consumers and regulatory standards.

- **Diagrammatic representation of a "From Farm to Table Clean Milk Production System":**

The diagram demonstrates the various stages and actions involved in ensuring a clean and safe milk production system, from managing healthy cows on the farm to conducting quality testing, packaging, transportation, and finally providing consumers with access to high-quality milk products.

Conclusion

Hygiene in milk production is not only a legal requirement but also a moral responsibility towards consumers. By implementing the latest practices discussed above, dairy farmers and milk producers can ensure the safety, quality, and integrity of the milk they produce. Adhering to strict hygiene standards, such as preventing contamination, maintaining clean milking environments, practicing proper hygiene during milking, and implementing effective disease prevention measures, is crucial. Additionally, regular quality testing, proper cooling and storage, and maintaining clean packaging and transportation conditions are essential for maintaining the integrity of milk. By embracing the latest practices and advancements in hygiene, dairy producers can confidently deliver hygienic milk products that meet the highest standards of quality assurance, gaining the trust and satisfaction of consumers.

Spring Diseases in Livestock Understanding and Managing Pink Eye, Bloat, and Grass Tetany

Spring is a season of renewal and growth, but for livestock producers, it also brings a unique set of challenges. As pastures turn green and animals transition to fresh forage, the risk of diseases such as pink eye, bloat, and grass tetany increases. These conditions can significantly impact animal health, productivity, and farm profitability. We will explore the causes, symptoms, prevention, and management of these common spring diseases, providing valuable insights for livestock producers.

1. **Pink Eye (Infectious Bovine Keratoconjunctivitis)**

   Pink eye, or infectious bovine keratoconjunctivitis (IBK), is a highly contagious eye infection that affects cattle, particularly during the spring and summer months. It is caused by the bacterium Moraxella bovis and is characterized by inflammation of the cornea and conjunctiva.

Causes and Risk Factors

- **Bacteria:** Moraxella bovis is the primary causative agent, but

other bacteria and viruses can also contribute.

- **Environmental Factors:**
  - Dust, pollen, and tall grass can irritate the eyes, making them more susceptible to infection.
  - Bright sunlight and ultraviolet (UV) radiation can exacerbate the condition.
- **Insect Vectors:** Face flies and other insects can spread the bacteria from infected to healthy animals.
- **Poor Nutrition:** Weakened immune systems due to inadequate nutrition increase the risk of infection.

Symptoms

- **Early Signs:**
  - Excessive tearing and redness in the eye.
  - Sensitivity to light (photophobia).
- **Advanced Symptoms:**
  - Cloudiness or ulceration of the cornea.
  - Swelling and discharge from the eye.
  - In severe cases, blindness or permanent eye damage.

Prevention and Management

- **Vaccination:** Vaccines are available for Moraxella bovis and can reduce the incidence of pink eye.
- **Insect Control:**
  - Use fly repellents, insecticide ear tags, and face fly traps to reduce insect populations.
  - Keep pastures mowed to minimize fly habitats.

Environmental Management:

- Provide shade to protect animals from UV radiation.
- Reduce dust by maintaining clean feeding and watering areas.

- **Early Treatment:**
  - Isolate infected animals to prevent the spread of the disease.
  - Administer antibiotics (topical or systemic) and anti-inflammatory medications as prescribed by a veterinarian.

2. Bloat (Ruminal Tympany)

Bloat is a digestive disorder that occurs when gas accumulates in the rumen, causing it to distend. It is most common in cattle grazing on lush, legume-rich pastures, particularly in the spring.

Causes and Risk Factors

- **Dietary Factors:**
  - Rapid consumption of fresh, high-protein forages such as alfalfa, clover, or young grasses.
  - Low fiber content in the diet, which reduces rumen motility.
- **Animal Factors:**
  - Individual susceptibility, with some animals being more prone to bloat than others.
  - Stress or changes in feeding patterns can increase the risk.
- **Environmental Factors:**
  - Wet, dewy pastures can increase the likelihood of bloat.

Symptoms

- **Mild Bloat:**
  - Distension of the left flank (rumen).
  - Discomfort and restlessness.
- **Severe Bloat:**
  - Rapid swelling of the abdomen.
  - Difficulty breathing due to pressure on the diaphragm.
  - Collapse and death if not treated promptly.

Prevention and Management

- **Pasture Management:**
  - Gradually introduce animals to lush pastures to allow rumen adaptation.
  - Provide access to dry hay or grass to balance the diet.
- **Feed Additives:**
  - Use anti-bloating agents such as poloxalene in feed or mineral supplements.
  - Add ionophores (e.g., monensin) to reduce gas production in the rumen.
- **Monitoring:**
  - Observe animals closely

during the first few weeks of spring grazing.

- Identify and treat early signs of bloat to prevent progression.

- **Emergency Treatment:**
  - Pass a stomach tube to release gas.
  - Administer anti-foaming agents (e.g., vegetable oil or commercial products) to break down foam in the rumen.
  - In severe cases, a veterinarian may need to perform a rumenotomy (surgical intervention).

3. Grass Tetany (Hypomagnesemia)

Grass tetany, also known as hypomagnesemia, is a metabolic disorder caused by low levels of magnesium in the blood. It primarily affects lactating cows grazing on lush, rapidly growing pastures in the spring.

Causes and Risk Factors

- **Dietary Factors:**
  - Low magnesium levels in spring grasses, especially those high in potassium and nitrogen.
  - Insufficient intake of magnesium supplements.
- **Animal Factors:**
  - Lactating cows have higher magnesium requirements due to milk production.
  - Older cows are more susceptible due to reduced magnesium absorption.
- **Environmental Factors:**
  - Cold, wet weather can reduce magnesium availability in plants and increase the risk of tetany.

Symptoms

- **Early Signs:**
  - Restlessness, irritability, and muscle twitching.
  - Reduced appetite and milk production.
- **Advanced Symptoms:**
  - Staggering, convulsions, and collapse.
  - In severe cases, death within a few hours.

Prevention and Management

- **Magnesium Supplementation:**
  - Provide magnesium supplements (e.g., magnesium oxide) in feed or mineral mixes.
  - Use high-magnesium lick blocks or boluses for grazing animals.
- **Pasture Management:**
  - Avoid overgrazing and ensure access to mature grasses, which have higher magnesium levels.
  - Incorporate legumes into pastures, as they are richer in magnesium than grasses.
- **Monitoring:**
  - Regularly check blood magnesium levels in high-risk animals.
  - Watch for early signs of tetany, especially during periods of rapid grass growth.
- **Emergency Treatment:**
  - Administer intravenous or subcutaneous magnesium solutions to affected animals.
  - Provide oral magnesium supplements to prevent recurrence.

The Economic Impact of Spring Diseases

Spring diseases such as pink eye, bloat, and grass tetany can pose serious economic challenges for livestock producers, affecting both productivity and profitability. The financial burden begins with treatment costs, which include expenses for medications, veterinary consultations, and emergency interventions required to manage these conditions effectively.

Additionally, diseased animals often suffer from reduced productivity, leading to lower milk yields, weight loss, and poor growth rates, ultimately impacting overall herd performance. In severe cases, mortality due to bloat or grass tetany results in direct financial losses, as the death of valuable livestock disrupts breeding programs and reduces marketable stock. Beyond direct costs, these diseases also increase labor demands, as farmers and caretakers must dedicate additional time and effort to monitoring, diagnosing, and treating affected animals. This not only raises operational expenses but also diverts resources from other essential farm activities.

Furthermore, prolonged outbreaks can weaken herd immunity, making animals more susceptible to future health issues, further compounding financial losses. To mitigate these risks, proactive health management, including proper nutrition, timely vaccinations, and effective pasture management, is crucial in preventing disease outbreaks and ensuring the long-term sustainability of livestock operations.

Integrated Approach to Spring Disease Management

Managing spring diseases requires a holistic approach that combines good nutrition, pasture management, and proactive health care. Key strategies include:

1. **Nutritional Planning:**
   - Ensure balanced diets that meet the nutritional needs of livestock during the spring transition.
   - Provide adequate mineral supplements, especially magnesium and calcium.
2. **Pasture Management:**
   - Rotate pastures to prevent overgrazing and allow forage recovery.
   - Monitor forage quality and adjust grazing practices accordingly.
3. **Health Monitoring:**
   - Regularly inspect animals for signs of disease.
   - Work with a veterinarian to develop a herd health plan tailored to your farm's needs.
4. **Education and Training:**
   - Educate farm staff about the risks and symptoms of spring diseases.
   - Train them in emergency response procedures for conditions like bloat and grass tetany.

Conclusion

Spring is a critical time for livestock producers, as the transition to fresh forage brings both opportunities and challenges. Diseases like pink eye, bloat, and grass tetany can have serious consequences for animal health and farm profitability, but with proper understanding and management, their impact can be minimized. By adopting preventive measures, monitoring animal health, and responding promptly to early signs of disease, producers can ensure a successful and productive spring season.

For livestock farmers, staying informed and proactive is the key to navigating the challenges of spring diseases. Together, we can protect the health and well-being of our animals and build a resilient and sustainable farming future.

Unlocking Nutritional Stratergies For Smooth Transition In Dairy Cow

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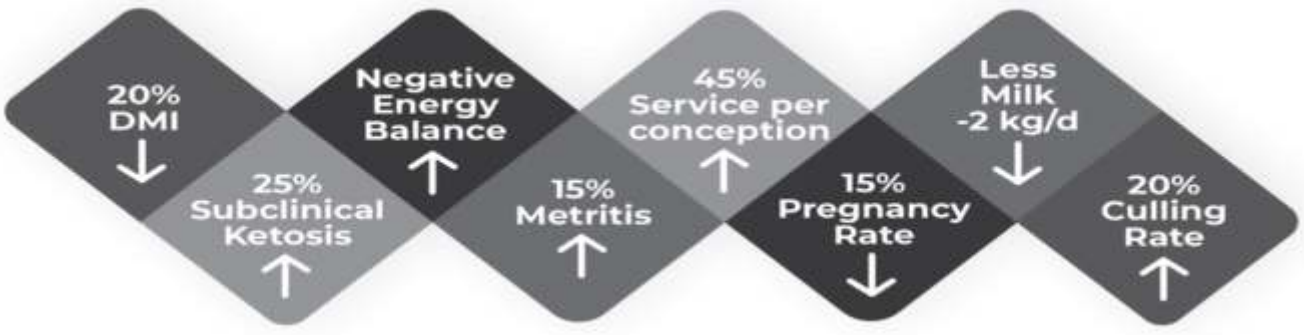
Introduction

The nutritional and disease management of dairy animals is very crucial to get maximum production and thus to get income from selling of milk, meat, manure, hide, etc. During its production life, a dairy animal pass through various physiological stages like onset of heat, early pregnancy, late lactation, drying off, late gestation & transition to lactation, early and mid- lactation, etc. Better nutritional and health management during transition period helps to improve cow health, milk production and reproductive performance. Now it's well established that the dairy animals with better nutrition and health management before calving show dramatic reductions in post-calving complications including milk fever, retention of fetal membranes and also show improvements in milk production and fertility.

Implications of Unsuccessful Transition

The management of transition dairy cattle should be done with objectives to reduce ruminal disruption, avoid micromineral deficiencies, minimise lipid mobilisation disorders, avoid immune suppression, there is great risk, if the dairy cattle fail to transit successfully to lactation and this can result in several complications like-

1. **Reduced dry matter (DM) intake:** The several rapid metabolic & hormonal changes during this high stress period, often lead to reduced DM intake.
2. **Reduced or no milk production:** Reduced intake of DM and thus nutrients hamper milk production
3. **Delayed oestrus, failure to conceive:** Compromised nutrition especially important trace minerals, during critical period of transition to lactation and contrarily high demands of nutrients for lactation, mostly disturb the follicular developments, cyclical rhythm and thus affect reproduction



4. **Increased incidence of diseases** like Hypocalcaemia and downer cow syndrome; Hypomagnesaemia, ketosis and fatty liver, Oedema of udder, Abomasal displacement, Retention of placenta and fetal membranes. Difficulties in calving invite uterine infections, often leading to metritis, pyometra, etc.
5. **Poor fertility and poor milk production:** The ultimate result of poor transition cow management can be poor fertility and severe effect on milk production.

During transition to lactation several hormonal adaptive changes occur

1. Increased fat breakdown and decreased synthesis
2. Increased gluconeogenesis, glycogenolysis to provide energy.
3. Increased mobilisation of protein and mineral reserves.
4. Increased feed intake and nutrient absorption.

Health: Supplementation of Micro-minerals, vitamins, enzymes, fibres and other nutrients can significantly support the transition adaptations to optimize rumen functions, energy and protein metabolism and immune function. Important micro-minerals as co-factors and certain vitamins, amino acids can facilitate optimum hormonal levels and also subsequent key hormonal adaptations during transition to lactation.

b. Calcium Homeostasis with DCAD: Periparturient hypocalcaemia (milk fever) is associated with the onset of lactation and mammary gland function. Nutritional strategies aim to minimize periparturient hypocalcaemia by manipulating these hormonal control points to enhance the cow's ability to manage the negative mineral balance associated with the onset of lactation onset. One such strategy involves adjusting the dietary cation-anion difference (DCAD) to prevent metabolic alkalosis and potentially induce compensated metabolic acidosis. Correcting metabolic alkalosis through a negative DCAD diet could prevent alterations in the parathyroid hormone receptor conformation on bone, facilitating calcium mobilization from bone reserves. Diets with a negative DCAD administered prepartum have consistently shown efficacy in reducing both subclinical and clinical hypocalcaemia in cows prone to milk fever.

c. Energy booster Supplements: During the onset of lactation, dairy cows have massive energy requirements to support milk production and to maintain their health status and welfare. Glucose plays a pivotal role; to produce 1 kg of milk, 72 g of glucose is required, and the mammary gland is responsible for about 50 to 85% of total glucose consumption. After calving, glucose requirements dramatically increase by up to 2.5-fold compared with those of the dry period and even more if an immune response occurs during this period. The main challenge faced by transition dairy cows is the acute and marked increase in nutrient requirements that occurs at a time when the dry matter intake of the cow remains far lower than requirements. Cows cannot cope with this increase in energy intake, which leads to an energy imbalance after which body reserves are mobilized. Feeding glucogenic

Thus, the integrated approach in transition feeding is very essential and any perturbations in nutrition during this period affect lactation, health and reproductive performance of dairy animals.

Essential Components of Transition feed supplement:

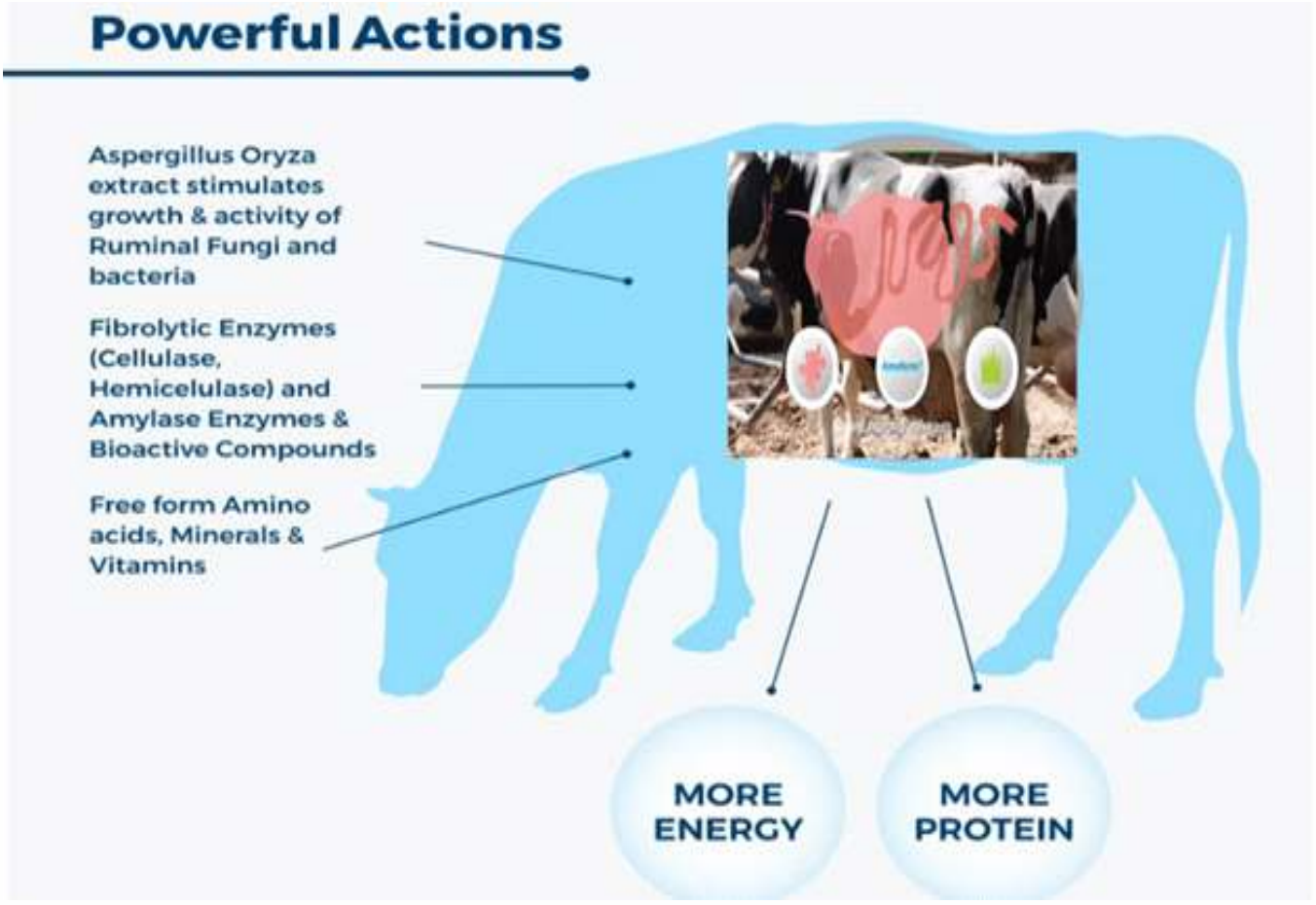
a. Micronutrients for Homeostasis, hormonal adaptations and Optimal

precursors during the first week of lactation have shown positive effect in feed intake, reduction in negative energy balance and decreasing incidence and severity of ketosis.

d. **Amino acids:** Methionine and lysine are widely recognized as the two most crucial amino acids for milk and milk protein synthesis. These amino acids also play potential roles in mitochondrial beta-oxidation of fatty acids and contribute to carnitine biosynthesis in the liver. Additionally, they are involved in the export of triglycerides. Milk yield and fat can be positively affected by methionine supplementation. The effects on milk yield and fat could be related to the enhanced availability of nutrients because of the positive effect on dry matter intake (DMI). Methionine supply helps in maintaining constant rates of DMI prepartum and in increasing DMI in early lactation, which may be due to improved inflammatory status, reduced oxidative stress, and enhanced liver function. The improvement in these functions suggests that high-producing dairy cows adapt successfully to the new lactation following methionine & lysine supplementation.

e. **Proteins are key to Health and productivity:** The requirement of transition cow is mostly estimated with focus on energy nutrition and importance of protein nutrition is largely underestimated. The feed supplement containing high number of proteins and free form amino acids, which can support high protein requirements for synthesis of colostrum- the first lacteal secretion, rich in nutrients and immunoglobulins, which prevent newborn calf from early infections. It will provide more and better-quality milk, for good healthy start of the newborn calf. It also helps to prevent calving difficulties and avoid chances of dystocia. Average cows in mid-gestation need approx. 600-650 grams of protein per day. In late gestation 8-9 months cow require closer to 700-900 grams per day. Lactating cows require even higher, which depends on level of milk production. Approx. 95-100 gram/day/kg milk production.

f. **Benefits of Prebiotic in diet:** Managing the rumen microbes through prebiotic or probiotic supplementation favours positive nutritional balance.



Strains of the eukaryotic microbe like yeast product or fungal extract help to stabilize ruminal pH and to activate fiber-degrading bacteria in the rumen, leading to improved fiber digestibility. Dietary fungal or yeast products can enhance rumen fermentation and alter ruminal digestive processes, thus they may improve animal health and energy status in early lactation. Evidence suggests that supplementation of suitable prebiotic provide a substantial benefit to transition cow during immune challenge through improving availability of energy.

- **Aspergillus oryzae:** Aspergillus oryzae (AO) extract is considered as a precision prebiotic that enhances digestibility by amplifying the nutrient supply for maximum performance. Aspergillus oryzae extract contains wide variety of polysaccharide and amylase enzymes, which increases rumen function by enhancing fibre digestion and reducing the transient post-prandial drop in ruminal pH. The combined effect of such additive help cows to adapt from high roughage diets to higher concentrate diets especially in the transition cows. An increase in feed digestibility due to the prebiotic would lead to an increase in nutrient absorption. The increase in rumen fermentation and VFA production improve overall energy supply and metabolic profiles. It helps in reduction in rumen lactic acid concentration. by stimulating lactic acid utilizing bacteria and thus minimize nutritional stress due to subacute acidosis. The extra energy made available to the cow support for a healthy transition. Besides, the prebiotic AO supplement decreases the number of cytokines and other inflammatory metabolites and thereby reduce levels of stress and boost immune function.

In recent years, it has gained popularity as a feed supplement for livestock, including dairy cows. Here are some of the potential benefits of Aspergillus oryzae supplementation in dairy cows:

Enhanced Feed Efficiency and Nutrient Utilization: AO fermentation extract is high in alpha-amylase and cellulase enzyme activities. It also contains significant hemi-celluase, pectinase activities. It will help for degradation of structural and non-structural polysaccharides and thus for maximum utilization of fiber in case of high forage diet and can optimize feed efficiency.

Increased Dry Matter Intake: Improved feed digestibility can encourage cows to eat more, leading to higher dry matter intake and potentially increased milk production.

Increased Milk Production and Quality: Supplementation of AO culture in early lactation cows increased milk yield & efficiency of milk production, nutrient digestibility and feed efficiency. By improving nutrient absorption, Aspergillus oryzae can lead to increased energy availability, potentially boosting milk production.

Modulated Rumen Microbiome: Supplementation of AO fermentation extract in cattle increases the rumen microbiome like ruminal anaerobes, especially cellulolytic bacteria like Ruminococcus albus and thus can improve efficiency of fibre degradation, promoting the growth of beneficial bacteria and reducing the population of harmful microbes. This creates a healthier environment for digestion.

Reduced Risk of Subacute Ruminal Acidosis (SARA): A healthier rumen environment can help prevent SARA, a metabolic disorder that can negatively impact milk production and cow health.

Improved Heat Stress Tolerance: Supplementation can reduce overall heat stress, which is very beneficial especially during hot weather.

Conclusion

The prime objectives of transition cow management include increase dry matter intake and energy supply, Prevention or control of ruminal disruption, Prevention of macro & micro mineral deficiencies, minimizing lipid mobilisation disorders and to optimize immune functions. An integrated transition diet should comprise of energy and protein supplement, macro-minerals and DCAD, micro-minerals, and supplementation of suitable prebiotics immunity enhancement. Aspergillus oryzae fermentation extract that is rich in non-animal source protein, free-form amino acids, minerals, vitamins, enzymes, fibres and other nutrients offer a promising approach to enhancing dairy cow health and productivity. By improving feed utilization, optimizing rumen function, and boosting immunity, these supplements can contribute to a more sustainable and efficient dairy industry.

Weather Variability Understanding Its Impact on Agriculture, Ecosystems, and Human Life

Weather variability refers to the short-term fluctuations in atmospheric conditions, such as temperature, precipitation, wind, and humidity, over days, weeks, or seasons. Unlike climate change, which refers to long-term shifts in weather patterns, weather variability focuses on the immediate and often unpredictable changes that can have profound effects on agriculture, ecosystems, and human life. We will explore the causes of weather variability, its impacts, and strategies to mitigate its effects.

Causes of Weather Variability:

Weather variability is driven by a combination of natural and human-induced factors. Understanding these causes is essential for predicting and managing its effects.

1. **Natural Factors:**

- **Atmospheric Pressure Systems:** High and low-pressure systems influence wind patterns, temperature, and precipitation.
- **Ocean Currents:** Phenomena like El Niño and La Niña disrupt normal weather patterns, leading to extreme conditions such as droughts or heavy rainfall.
- **Solar Radiation:** Variations in solar energy reaching the Earth can cause temperature fluctuations.
- **Volcanic Eruptions:** Volcanic ash and gases can block sunlight, leading to temporary cooling.

2. **Human-Induced Factors:**

- Urbanization: Cities create "heat islands," altering local weather patterns.
- **Deforestation:** Removing forests disrupts the water cycle, affecting rainfall and temperature.
- **Pollution:** Aerosols and greenhouse gases can influence cloud formation and precipitation.

3. **Geographical Factors:**

- **Topography:** Mountains, valleys, and plains affect wind and rainfall patterns.
- **Proximity to Water Bodies:** Coastal areas experience milder temperatures and higher humidity compared to inland regions.

Impacts of Weather Variability

Weather variability has far-reaching consequences across various sectors, including agriculture, ecosystems, and human health.

1. **Impact on Agriculture**

Agriculture is highly dependent on weather conditions, making it

particularly vulnerable to variability.

- **Crop Production:**
  - **Droughts:** Reduced rainfall can lead to water shortages, affecting crop yields and quality.
  - **Floods:** Excessive rainfall can waterlog fields, damage crops, and delay planting or harvesting.
  - **Temperature Extremes:** Heat waves can cause heat stress in plants, while frost can damage sensitive crops.
- **Livestock Farming:**
  - **Heat Stress:** High temperatures can reduce milk production, weight gain, and reproductive performance in livestock.
  - **Cold Stress:** Extreme cold can increase energy requirements and mortality rates in animals.
- **Pests and Diseases:**
  - Changes in weather patterns can alter the distribution and lifecycle of pests and diseases, increasing the risk of outbreaks.

2. Impact on Ecosystems

Weather variability can disrupt ecosystems, affecting biodiversity and ecosystem services.

- **Species Distribution:**
  - Shifts in temperature and precipitation can force species to migrate to new areas, leading to changes in ecosystem composition.
- **Phenology:**
  - Changes in the timing of natural events, such as flowering, breeding, and migration, can disrupt ecological relationships.
- **Extreme Events:**
  - Storms, wildfires, and floods can destroy habitats, reduce biodiversity, and alter ecosystem functions.

3. Impact on Human Life

Weather variability affects human health, infrastructure, and economies.

- **Health Risks:**
  - Heat waves can cause heatstroke and dehydration, while cold spells can lead to hypothermia.
  - Increased rainfall can create breeding grounds for disease-carrying vectors like mosquitoes.
- **Infrastructure Damage:**
  - Extreme weather events can damage roads, bridges, and buildings, leading to costly repairs and disruptions.
- **Economic Losses:**
  - Agriculture, tourism, and energy sectors are particularly vulnerable to weather variability, resulting in significant economic losses.

Strategies to Mitigate the Effects of Weather Variability

Addressing the challenges posed by weather variability requires a combination of adaptation and mitigation strategies.

1. **For Agriculture**

- **Diversification:**
  - Grow a variety of crops to reduce the risk of total crop failure.
  - Integrate livestock and crop farming to create resilient farming systems.
- **Water Management:**
  - Invest in irrigation systems to ensure water availability during droughts.
  - Construct drainage systems to prevent water logging during floods.
- **Weather Forecasting:**
  - Use accurate weather forecasts to plan planting, harvesting, and other agricultural activities.
- **Climate-Resilient Crops:**
  - Develop and adopt crop varieties that are tolerant to drought, heat, and pests.

2. **For Ecosystems**

- **Habitat Restoration:**
  - Restore degraded ecosystems to enhance their resilience to weather variability.
- **Conservation Efforts:**
  - Protect vulnerable species and habitats through conservation programs.
- **Ecosystem Monitoring:**
  - Monitor ecosystems to detect early signs of stress and implement timely interventions.

3. **For Human Life**

- **Early Warning Systems:**
  - Develop and disseminate early warnings for extreme weather events to reduce risks.
- **Infrastructure Resilience:**
  - Design and build infrastructure that can withstand extreme weather conditions.
- **Public Awareness:**
  - Educate communities about the risks of weather variability and how to prepare for extreme events.
- **Health Preparedness:**
  - Strengthen healthcare systems to respond to weather-related health emergencies.

The Role of Technology in Addressing Weather Variability

Advancements in technology are playing a crucial role in understanding and managing weather variability.

- **Satellite Imaging:**
  - Satellites provide real-time data on weather patterns, enabling accurate forecasts and early warnings.
- **Climate Models:**
  - Advanced models simulate weather variability, helping researchers predict its impacts and develop mitigation strategies.
- **Precision Agriculture:**
  - Technologies like drones, sensors, and GPS enable farmers to monitor and manage crops more effectively.
- **Renewable Energy:**
  - Transitioning to renewable energy sources reduces greenhouse gas emissions, mitigating human-induced weather variability.

Global Collaboration for Weather Resilience

Weather variability is a global challenge that requires international cooperation. Key initiatives include:

- **Data Sharing:**
  - Countries can share weather data and research findings to improve global forecasting and preparedness.
- **Capacity Building:**
  - Developing countries can receive technical and financial support to build resilience to weather variability.
- **Policy Frameworks:**
  - International agreements, such as the Paris Agreement, aim to address climate change and its impacts, including weather variability.

Conclusion

Weather variability is a complex and multifaceted phenomenon that poses significant challenges to agriculture, ecosystems, and human life. While natural factors play a major role, human activities are increasingly contributing to its intensity and frequency. By adopting adaptive strategies, leveraging technology, and fostering global collaboration, we can mitigate the impacts of weather variability and build a more resilient future.

For farmers, policymakers, and individuals, understanding and addressing weather variability is essential for ensuring food security, protecting ecosystems, and safeguarding human well-being. Together, we can navigate the uncertainties of weather variability and create a sustainable and prosperous world.

Women Empowerment in Livestock Production and Management

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Women play a crucial role in livestock production and management, particularly in rural communities where they constitute a significant portion of the agricultural workforce. Despite their contributions, women often face systemic barriers that limit their access to resources, decision-making power, and opportunities for economic advancement. Empowering women in this sector is not only essential for achieving gender equality but also for enhancing food security and improving livelihoods.

The Importance of Women in Livestock

Globally, women represent approximately **43% of the agricultural labor force** in developing countries, with rural women accounting for two-thirds of low-income livestock keepers. Their involvement in livestock management encompasses various activities, including animal husbandry, feeding, health care, and marketing of livestock products. This engagement is vital for household nutrition and economic stability, as livestock

often serve as a source of income and food security.

Women's participation in livestock farming activities

Livestock management is a gender activity, as it involves activities of both men and women. Due to economical, agro-ecological, ethnic, and religious considerations, women's involvement in livestock development is substantial and varied by location.

In addition to managing and caring for livestock, rural women also take part in livestock producing operations. It is commonly acknowledged that women perform the majority of the critical role associated with cattle farming. When it comes to tasks like cutting fodder, watering, cleaning animals and their sheds, etc., women typically contribute more labor inputs. The women have also been credited for milking the animals and processing milk products. Their exclusive responsibilities also includecollecting manure, making dung cakes, and keeping up with animal sheds.

Women's role in dairy activities

Feeding Green fodder: In several states, farmer families have recognized the value of cultivating green fodder, especially berseem, lucerne, cowpea, maize, etc., for their milch stock. Crop rotations have been developed from zone to zone and can be implemented to improve milk flow quickly. At the same time, the cost of milk production can be decreased by lowering the rate at which the farmer needs to purchase expensive concentrate mixtures from the market.

Producing Indian milk products: Farm women are forced to turn their excess milk into a variety of milk products. As a result, half of the milk is used to produce some

common milk products that has marketed successfully in different regions. These milk products, such as paneer and khoa, have a longer shelf life, are easier to transport because they require less volume, and can be used as a basis to make a variety of sweets.

Challenges faced by Women

Despite their significant roles, women in livestock production encounter numerous challenges:

- **Limited Access to Resources:** Women often have less access to financial services, land ownership, and agricultural inputs compared to men. This disparity restricts their ability to invest in livestock and improve productivity.
- **Decision-Making Power:** In many households, men are typically the primary decision-makers regarding livestock management. This lack of agency can hinder women's ability to influence how resources are allocated within the household.
- **Knowledge Gaps:** Women may lack access to training and information about best practices in animal husbandry, which can impact their productivity and profitability.

Strategies for Women Empowerment

To address these challenges, several strategies can be implemented to empower women in livestock production:

1. **Education and Training:** Providing women with training on animal health, breeding practices, and marketing strategies can enhance their skills and confidence in managing livestock.
2. **Access to Resources:** Ensuring that women have equal access to financial services, land ownership, and agricultural inputs is critical for enabling them to invest in their livestock operations.
3. **Promoting Decision-Making Roles:** Encouraging women's participation in decision-

making processes at both household and community levels can help them gain more control over resources and improve their bargaining power.

4. **Utilizing the Women's Empowerment in Livestock Index (WELI):** Developed by the International Livestock Research Institute (ILRI) in 2015, WELI measures women's empowerment specifically within the livestock sector. It assesses key areas such as decision-making regarding production, control over income, and access to opportunities.

Government Schemes for Women Empowerment in Livestock

Governments and organizations worldwide have recognized the importance of supporting women in this sector through various schemes and initiatives.

Mahila Kisan Sashaktikaran Pariyojana (MKSP):

- Launched by the Ministry of Rural Development, MKSP aims to empower women farmers by enhancing their participation in agriculture and creating sustainable livelihoods.

National Dairy Plan:

- The National Dairy Development Board promotes women's involvement in dairy farming through initiatives like organizing all-women dairy cooperatives and appointing Lady Extension Officers (LEOs). This plan has led to the establishment of over 4,000 all-women cooperative societies, enhancing women's roles in the dairy sector.

Developmental Action Plan for Schedule Castes (DAPSC):

- Implemented by the Indian Council of Agricultural Research (ICAR), this program provides resources and training for women involved in livestock and poultry management.

Self-Help Groups (SHGs):

- The Deendayal Antyodaya Yojana promotes organizing rural women into SHGs, providing them with a platform for collective action and access to financial resources. These groups empower women to engage in livestock-related activities, improving their economic status.

Interest Subsidy Scheme:

- Some state governments offer interest subsidies on loans taken by women farmers for livestock-related activities. This financial support helps women invest in their livestock enterprises without the burden of high-interest rates.

Impact of Women Empowerment on Households

Empowering women in livestock production has far-reaching benefits:

- **Improved Food Security:** Women who have greater control over livestock are more likely to ensure that household members receive adequate nutrition from animal-source foods.
- **Economic Growth:** Studies indicate that closing the gender gap in agriculture could lead to a significant increase in agricultural productivity—potentially raising output by 2.5% to 4%—and reducing malnutrition rates by 12% to 17%.
- **Social Change:** As women gain recognition for their contributions to livestock management, there is a shift towards greater gender equality within communities, fostering a more inclusive environment for future generations.

Conclusion

Women empowerment in livestock production is not merely a matter of equity; it is a strategic approach to enhancing agricultural productivity and improving food security. By addressing the barriers that hinder women's participation and leadership in this sector, we can unlock their potential as key drivers of economic growth and social change. Initiatives aimed at empowering women through education, resource access, and decision-making support are essential for building resilient communities where both men and women can thrive together.

DCHA adds Short Courses to its Annual Conference and Trade Show

The Dairy Calf & Heifer Association (DCHA) is set to host its highly anticipated Annual Conference and Trade Show in 2025, taking place from April 8 to 10 in Westminster, Colorado. This year, the conference offers new educational opportunities with the addition of two Short Courses on April 7, providing specialized sessions focused on different stages of calf development. These courses are designed to enhance the knowledge and skills of participants in key areas of dairy calf management.

The first course will center on young calves, addressing vital aspects such as their care, feeding, and management from birth. The second course will focus on post-weaned calves, covering their transition up until parturition. The speakers for these courses include Dave Renaud, from the University of Guelph, who will deliver a session titled "Optimizing Colostrum Management: From Production to Long-Term Benefits." Renaud will delve into the importance of colostrum for the health and long-term success of calves. Meanwhile, experts Mike Overton from Zoetis and Kevin Dhuyvetter from Elanco will present a session on "From Calf to Cow: Management and Economic Considerations for Dairy Replacement Heifers." This presentation will cover key management practices and economic aspects that impact the development of dairy heifers, ensuring their future productivity on the farm.

Building on the success of the previous year's offering for Spanish-speaking participants, DCHA will again offer two pre-conference sessions in Spanish. In addition, all general and breakout session presentations will feature simultaneous English-to-Spanish translation, ensuring accessibility for a broader audience. This bilingual approach reflects DCHA's commitment to inclusivity and support for diverse industry professionals, allowing individuals to attend the conference either in person or virtually.

One of the highlights of the conference will be the keynote address by Peggy Coffeen, the founder and host of Uplevel Dairy. Her talk, titled "Discovering and Knowing Your Why," will draw inspiration from Simon Sinek's "Start with Why." Coffeen will explore the concept of discovering one's core purpose or "why" and its power in driving motivation, passion, and success in both personal and professional life. According to Coffeen, a person's "why" is what fuels their actions and determines their goals. Drawing from her experience of connecting with dairy farmers nationwide and hearing their stories, Coffeen will share insights into how understanding one's "why" can lead to more meaningful work and deeper commitment.

In addition to the keynote speech, the conference will feature multiple breakout sessions divided into three key tracks: wet calf/weaning, post-weaned/reproduction, and beef cross. These specialized tracks will offer participants the chance to dive deeper into specific areas of calf management and explore challenges and opportunities across different sectors of dairy farming.

Among the breakout sessions, several prominent experts will address critical topics affecting the industry:

- Paola Bacigalupo Sanguesa from Michigan State University will present "Pain Perception in Calves and How to Prevent It," a presentation that will focus on understanding calf pain and effective strategies for alleviating it. This session will be presented in Spanish to accommodate Spanish-

speaking attendees.

- Pedro Carvalho from Colorado State University will present "The ABCs of Beef on Dairy," a session that will also be conducted in Spanish and will explore the integration of beef genetics into dairy operations.
- Catie Cramer from Colorado State University will discuss "Paving the Road to Success: What to Consider When Transporting Young Calves," offering important tips on safe and efficient calf transportation practices.
- Pauly Paul, from Complete Management Consulting LLC, will speak on "5 Pitfalls of Heifer Inventory Management," helping attendees identify and avoid common mistakes in heifer management that can lead to inefficiencies.
- Jake Charleston from Specialty Risk Insurance will offer insights into "Tools to Manage Your Risk in the Beef on Dairy Space," addressing the risk factors involved in incorporating beef cattle into dairy operations and how to mitigate them.
- Tyler Cozzens from Livestock Marketing Information Center will provide an overview of the current state of the beef-on-dairy market with his presentation, "Beef on Dairy Prices: Where are We and Where are We Headed?"
- A panel moderated by Ben Bjork from Ralco, Inc. will focus on "Dairy and Calf Ranch Communication Strategies," exploring how effective communication between dairy farms and calf-raising operations can improve outcomes for both parties.
- Another panel moderated by Peggy Coffeen will address "Managing the Risk Associated with Beef on Dairy Calves," offering advice on how to minimize financial and operational risks when integrating beef calves into dairy systems.

Following the main conference, attendees will have the opportunity to participate in a "Train the Trainer" program offered by Calf Care & Quality Assurance (CCQA). This certification program aims to educate industry leaders in calf-raising best practices to ensure the health, safety, and welfare of dairy cattle. The program covers a wide range of topics, including calf health, animal handling, stockmanship, employee training, emergency preparedness, and more. By becoming certified, participants will gain access to the CCQA Instructor Hub, a platform containing all the resources needed to conduct training sessions on their farms or at other facilities.

Julia Herman, a beef cattle specialist veterinarian with the National Cattlemen's Beef Association, will lead the "Train the Trainer" program. She explained that the goal of the training is to equip industry leaders with the tools and knowledge they need to conduct effective training sessions for their teams. After certification, participants will be able to host on-farm training events, assisting employees in obtaining their own certifications and improving their skills in calf management practices.

DCHA was established in 1996 with the mission of supporting dairy producers, calf managers, and professionals focused on the growth and management of dairy calves and heifers. With a diverse international membership, the association serves as a hub for knowledge, resources, and best practices to improve the profitability, performance, and leadership of the dairy industry. DCHA plays a key role in driving innovation and fostering collaboration across the industry, ensuring that dairy producers have the tools and information they need to thrive in an ever-evolving marketplace.

For more information about the DCHA 2025 Annual Conference and Trade Show, including registration details and hotel booking options, interested individuals can visit the official event website at: https://bit.ly/DCHAweb25. To take advantage of discounted rates, attendees should register early and secure their hotel rooms by March 20. The conference promises to be an invaluable experience for dairy professionals looking to expand their knowledge and connect with others in the industry.

ICAR-Sponsored Winter School Inaugurated at ICAR-IARI, Assam

The inaugural session of the ICAR-sponsored Winter School on Optimizing Natural Resources through New Age Technologies for Smart Agriculture commenced today at the ICAR-Indian Agricultural Research Institute (ICAR-IARI) Assam campus, located in Gogamukh, Dhemaji, Assam. The event marked the beginning of an intensive three-week training programme designed to equip participants with cutting-edge knowledge and practical skills essential for addressing the evolving challenges of modern agriculture. Under the esteemed leadership of Dr. Ch. Srinivasa Rao, Director, ICAR-IARI, the training programme aims to foster innovation, enhance resource efficiency, and promote sustainable agricultural practices using advanced technological interventions.

Importance of the Programme

The Chief Guest, Dr. R.N. Padaria, Joint Director (Extension), ICAR-IARI, delivered an insightful keynote address, stressing the significance of natural resource management in overcoming present and future agricultural challenges. He emphasized the urgent need for technology-driven, location-specific solutions to empower farmers, ensuring increased productivity while maintaining ecological balance. Dr. Padaria also encouraged the formation of informal information-sharing networks and research collaborations, which can enhance the practical applicability of scientific advancements. Furthermore, he highlighted the importance of cross-sector partnerships, urging agricultural institutions to collaborate with government agencies, private organizations, and farmer groups to scale up research efforts and implement sustainable agricultural solutions.

The Guest of Honor, Dr. D.K. Jha, Principal, Gogamukh College, underscored the transformative impact of technological innovations in agriculture, particularly in improving the livelihoods of farmers in the North-Eastern region of India. He commended ICAR-IARI, Assam, for its dedicated efforts in organizing this Winter School, acknowledging its critical role in pioneering agricultural research and development in the region. He emphasized that scientific advancements, when effectively disseminated to farmers, can lead to higher yields, better resilience to climate change, and improved soil and water conservation.

A Hub for Knowledge Sharing and Capacity Building

The Winter School is envisioned as a dynamic platform where participants will engage in knowledge exchange, skill enhancement, and collaborative innovation. The programme includes interactive lectures, hands-on training sessions, practical demonstrations, and exposure visits to research farms and progressive agricultural enterprises. Experts from leading agricultural institutions, research organizations, and industry partners will provide in-depth insights into cutting-edge

technologies, including precision farming, artificial intelligence in agriculture, climate-resilient farming techniques, and advanced soil and water management practices.

Coordinated by Dr. S. Manivannan (Course Director), along with Dr. L. K. Baishya, Dr. Alemwati Pongener, and Dr. Dibyendu Deb, the programme has attracted a diverse group of participants from multiple disciplines and states across India, including Andhra Pradesh, Arunachal Pradesh, Assam, Karnataka, Uttar Pradesh, Tamil Nadu, and Tripura. The geographical and disciplinary diversity of the participants ensures a rich learning environment, fostering a multi-dimensional approach to solving agricultural challenges through innovative and technology-driven solutions.

By the end of the three-week training, participants are expected to acquire practical expertise and theoretical knowledge that will enable them to implement efficient resource management strategies in their respective fields. The programme also aims to nurture future agricultural leaders, equipping them with the necessary tools to drive change and implement innovative agricultural solutions in their respective regions.

This Winter School at ICAR-IARI, Assam, serves as a testament to India's commitment to scientific excellence and sustainable agriculture, ensuring that future generations of farmers have access to better technology, research-based insights, and holistic farming solutions for a more resilient and productive agricultural sector.

Annual Review Meeting on Network Project on Animal Genetic Resources (NWP-AnGR)

The Annual Review Meeting of the 'Network Project on Animal Genetic Resources' (NWP-AnGR) was successfully held on 30th and 31st January 2025 at the ICAR-National Bureau of Animal Genetic Resources (ICAR-NBAGR), Karnal, Haryana. The meeting served as a crucial platform to evaluate the progress of the 33 Network Centers operating under NWP-AnGR across 26 States and Union Territories (UTs) during the 2023-24 period. The network, which operates under the Animal Science Division of ICAR, represents the largest collaborative effort in the country dedicated to the characterization, conservation, and documentation of indigenous Animal Genetic Resources (AnGR). These centers function through partnerships with ICAR institutes, State Animal Husbandry Departments, State Agricultural and Veterinary Universities, and Non-Governmental Organizations (NGOs), ensuring a diverse and multi-institutional approach to preserving India's rich genetic diversity in livestock and poultry.

Keynote Addresses and Expert Discussions

The meeting was inaugurated by Dr. Raghavendra Bhatta, Deputy Director General (Animal Science), ICAR, who emphasized the critical importance of documenting Indigenous AnGR and registering potential breeds. He stated that a systematic and time-bound approach is required to reduce the non-descript livestock population in India, urging the NWP Centers to take a proactive role in achieving this goal. Dr. Bhatta commended ICAR-NBAGR for its visionary initiative in AnGR documentation, which aligns with the mission of achieving zero non-descript AnGR in the country. He also highlighted the importance of breed awareness, particularly in the context of the upcoming Livestock Census 2024, which will play a pivotal role in shaping national livestock conservation policies.

Dr. G. K. Gaur, Assistant Director General (Animal Production & Breeding), ICAR, echoed similar sentiments, stressing the urgent need for the systematic registration of indigenous livestock and poultry breeds. He emphasized that every identified indigenous breed must be properly characterized and documented to ensure their recognition and conservation, ultimately benefiting farmers, breeders, and the overall livestock industry.

Following their addresses, Dr. Bhatta and Dr. Gaur visited the National Bovine Genome Centre—Indigenous Breeds (NBGC-IB), which is actively engaged in a genomic selection program for indigenous dairy breeds. This initiative, undertaken in collaboration with the National Dairy Development Board (NDDB), aims to enhance genetic improvement and sustainable breeding strategies for Indian cattle breeds, thereby boosting their productivity and long-term viability.

Comprehensive Review of Network Centers' Progress

The scientific sessions of the meeting involved an in-depth review of the progress made by all participating centers. Dr. B. P. Mishra, Director, ICAR-NBAGR & Project Coordinator (NWP-AnGR), presented a detailed briefing on the characterization activities undertaken across the network. He highlighted that 53 potential indigenous populations of livestock, poultry, and dogs were taken up for scientific characterization by the participating centers, with 15 populations successfully documented within the review period.

During the evaluation sessions, the Deputy Director General (Animal Science) and Assistant Director General (Animal Production & Breeding) provided constructive feedback and valuable suggestions to enhance the efficiency and effectiveness of the project. They

stressed the need for enhanced data accuracy, improved collaboration among centers, and a more strategic approach to breed conservation efforts.

Dr. A. K. Mishra, In-charge NWP-AnGR, and Dr. S. K. Niranjan, In-charge PME Cell, played a crucial role in coordinating the meeting, ensuring smooth deliberations and facilitating knowledge exchange among participants.

Engagement and Participation

A total of 44 experts, researchers, and principal investigators representing different network centers, academic institutions, and state agencies actively participated in the review meeting. Each center representative presented their progress reports, discussing the achievements, challenges, and future action plans for their respective states.

The interactive sessions provided an opportunity for participants to share insights, discuss best practices, and explore innovative approaches for the sustainable conservation of India's indigenous livestock genetic resources. The discussions also focused on:

- Strengthening breed documentation methodologies through advanced molecular and genomic tools.
- Enhancing farmer participation in breed conservation initiatives through training and extension programs.
- Developing robust policy recommendations to support the long-term viability of indigenous breeds.
- Fostering collaborations between research institutions, government bodies, and private stakeholders to scale up conservation efforts.

Conclusion and Way Forward

The Annual Review Meeting of NWP-AnGR concluded with a strong commitment to accelerating breed conservation efforts across the country. The recommendations derived from the meeting will be incorporated into future research strategies and policy frameworks, ensuring a coordinated and impactful approach to safeguarding India's animal genetic heritage.

Looking ahead, ICAR-NBAGR and the participating network centers will continue to:

- Expand AnGR documentation efforts to achieve comprehensive coverage of all indigenous breeds.
- Leverage genomic selection technologies for breed improvement and enhanced productivity.
- Strengthen farmer-led conservation models to integrate local communities into breed preservation initiatives.
- Collaborate with international organizations to align Indian livestock conservation efforts with global best practices.

With dedicated efforts, scientific advancements, and strong institutional support, the Network Project on Animal Genetic Resources is poised to make significant contributions to India's livestock sector, ensuring the preservation, improvement, and sustainable utilization of its rich animal genetic diversity for generations to come.

Climate-resilient Crop Varieties

The National Agricultural Research System (NARS), including ICAR Institutes and State/Central Agricultural Universities (CAU/SAU), operating under the Indian Council of Agricultural Research (ICAR), has made remarkable progress in agricultural innovation over the past decade. From 2014 to 2024, the research system successfully developed 2,900 new crop varieties, of which 2,661 are climate-resilient, ensuring better adaptability to changing climatic conditions. These improved varieties aim to enhance productivity, withstand abiotic stresses, and contribute to sustainable agricultural practices.

For Kerala, 63 field crop varieties have been specifically developed, comprising 23 cereal varieties, 2 oilseed varieties, 10 pulse varieties, 15 forage crop varieties, and 13 sugarcane varieties, with an impressive 58 varieties classified as climate-resilient. These crop advancements have played a crucial role in ensuring food security, optimizing yield under adverse conditions, and empowering farmers with better-performing crop options tailored to the state's agro-climatic conditions.

Water Conservation and Irrigation Efficiency through Per Drop More Crop (PDMC)

To further enhance farm-level water-use efficiency, the Government of India launched the Centrally Sponsored Scheme of Per Drop More Crop (PDMC) in 2015-16. This scheme, which initially functioned as part of the Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) from 2015-16 to 2021-22, is now being implemented under the Rashtriya Krishi Vikas Yojana (RKVY) from 2022-23 onwards. The PDMC focuses on micro-irrigation systems like drip and sprinkler irrigation, significantly contributing to water conservation, efficient nutrient delivery through fertigation, reduced labor dependency, and overall cost reduction for farmers.

To encourage adoption, the government provides financial assistance of 55% to small and marginal farmers and 45% to other farmers for the installation of drip and sprinkler irrigation systems. These initiatives have proven to enhance crop productivity, optimize water resources, and ensure long-term agricultural sustainability.

Gramin Krishi Mausam Sewa (GKMS) and Agrometeorological Advisory Services (AAS)

Extreme weather events such as cyclones, droughts, and floods pose significant challenges to Indian agriculture. To mitigate risks and equip farmers with real-time weather insights, the India Meteorological Department (IMD) operates the Gramin Krishi Mausam Sewa (GKMS) scheme. This program delivers operational Agrometeorological Advisory Services (AAS) in collaboration with ICAR, State Agricultural Universities (SAUs), and other research institutions to assist farmers in making climate-smart decisions.

Currently, 130 Agromet Field Units (AMFUs) are operational across India, located at SAUs, ICAR institutes, and IITs, providing district-level weather bulletins and advisories. These advisories are disseminated through multiple channels, including print and electronic media, Doordarshan, radio, the internet, and mobile-based platforms.

In Kerala, five AMFUs—Ambalavayal, Pillicode, Thrissur, Vellayani, and Kumarakom—prepare district-specific agrometeorological bulletins. These bulletins, issued biweekly, help farmers optimize sowing schedules, irrigation cycles, pest control strategies, and fertilizer applications based on weather predictions. Additionally, SMS-based alerts and advisories are sent via the Kisan Portal and through public-private partnerships (PPP) to warn farmers about extreme weather events such as cyclones, heavy rainfall, and deep depressions.

Farmers can also access localized weather updates and agromet advisories through the 'Meghdoot' and 'Mausam' mobile apps, launched by the Government of India. These services are further integrated into Kerala's Agriculture Information Management System (AIMS), benefitting around 40 lakh farmers by providing timely, multilingual agricultural information for informed decision-making.

Panchayat-Level Weather Forecasts and Digital Platforms

Recognizing the need for hyper-local weather forecasting, the Ministry of Earth Sciences (MoES), in collaboration with the Ministry of Panchayati Raj (MoPR), launched Panchayat-level weather forecasting services for nearly all Gram Panchayats in India on 24th October 2024. These forecasts are now accessible via multiple digital platforms, including:

- e-Gramswaraj (egramswaraj.gov.in)
- Meri Panchayat App

- e-Manchitra Portal of MoPR
- Mausamgram Portal of IMD, MoES

This initiative enhances climate preparedness at the grassroots level, allowing Gram Panchayats to incorporate weather intelligence into local agricultural planning.

Drought Monitoring and Geoportal Development

To bolster drought resilience, the Department of Agriculture & Farmers' Welfare (DA&FW), in collaboration with the Space Applications Centre (SAC), ISRO, has developed a comprehensive Geoportal for real-time drought monitoring. This single-window digital platform integrates multiple drought indicators, including:

- Rainfall patterns
- Soil moisture levels
- Remote sensing-based crop conditions
- Reservoir and water storage data

The Geoportal enables district- and tehsil-level assessments of drought conditions, facilitating early warning systems, targeted interventions, and strategic water resource management. By providing data-driven insights, the portal supports policymakers, researchers, and field officers in implementing effective drought mitigation strategies.

Government's Commitment to Agricultural Resilience and Future Outlook

These transformative initiatives underscore the Government of India's commitment to enhancing agricultural resilience, promoting climate-smart practices, and leveraging technology for farmer empowerment. The development of climate-resilient crop varieties, expansion of micro-irrigation facilities, and integration of advanced meteorological services are critical steps toward ensuring food security, optimizing resource use, and improving farmer livelihoods in the face of climate uncertainties.

Going forward, the Ministry of Agriculture & Farmers Welfare, in collaboration with ICAR, IMD, ISRO, and other scientific institutions, will continue to enhance research, strengthen digital platforms, and promote farmer-centric innovations. These efforts aim to equip Indian farmers with cutting-edge tools and knowledge, ensuring their long-term prosperity and resilience in an evolving agricultural landscape.

This information was provided by Minister of State for Agriculture and Farmers Welfare, Shri Bhagirath Choudhary, in a written reply in Lok Sabha today.

Short Courses Added to Dairy Calf & Heifer Association Annual Conference

Head to the Centennial State – Colorado – for the 2025 Dairy Calf & Heifer Association (DCHA) Annual Conference and Trade Show in Westminster, April 8-10. The 2025 conference offers new educational opportunities with two concurrent Short Courses being held on April 7 – one focusing on young calves and the other on post-weaned calves up to parturition. Dave Renaud, University of Guelph, will address "Optimizing Colostrum Management: From Production to Long-Term Benefits" and Mike Overton, Zoetis, and Kevin Dhuyvetter, Elanco, will discuss "From Calf to Cow: Management and Economic Considerations for Dairy Replacement Heifers."

Building on last year's success of offering programming for Spanish-speaking individuals, DCHA will again offer two pre-conference sessions presented in Spanish and simultaneous interpretation (English to Spanish) for all general session and breakout session presentations. Additionally, interested individuals may attend in person or virtually.

To learn more about the conference, registration and hotel links, go to: https://bit.ly/DCHAweb25. Be sure to register early to get the best registration rate. Reserve your hotel room by March 20 to take advantage of DCHA's discounted room block rate.

Peggy Coffeen, Uplevel Dairy, will deliver the keynote address – Discovering and Knowing Your Why. Based on Simon Simek's "Start with Why," Coffeen will explain what a "why" is and what a "why" is not. She describes a person's "why" as what gets that person out of bed in the morning, excited and motivated. "Your 'why' is the deep-seeded purpose, cause or belief that is your passion and inspiration," Coffeen stated.

Over the past 15 years, Coffeen has been dedicated to sitting across the table with dairy farmers around the country, asking questions, telling their stories and connecting them to resources. She is the founder and host of the Uplevel Dairy Podcast, along with the Uplevel Dairy Young Leaders Podcast. A dairy girl at heart, Coffeen grew up milking cows on her family farm in southern Wisconsin before pursuing a degree from the University of Wisconsin-Madison in agriculture journalism and a career in writing and communications.

In addition to the General Session presentations, DCHA will offer Breakout Sessions via three tracks – wet calf/weaning, post-weaned/reproduction and beef cross. Thursday morning's session features the popular panel discussions – one from each of the tracks.

Conference presentations include:

- "Pain Perception in Calves and How to Prevent it" by Paola Bacigalupo Sanguesa, Michigan State University (presented in Spanish)
- "The ABCs of Beef on Dairy" by Pedro Carvalho, Colorado State University (presented in Spanish)
- "Paving the Road to Success: What to Consider When Transporting Young Calves" by Catie Cramer, Colorado State University
- "5 Pitfalls of Heifer Inventory Management" by Pauly Paul, Complete Management Consulting LLC
- "Tools to Manage Your Rick in the Beef on Dairy Space" by Jake Charleston, Specialty Risk Insurance
- "Beef on Dairy Prices: Where are We and Where are We Headed?" Tyler Cozzens, Livestock Marketing Information Center
- "Dairy and Calf Ranch Communication Strategies" panel, moderated by Ben Bjork, Ralco, Inc.
- "Managing the Risk Associated with Beef on Dairy Calves" panel, moderated by Peggy Coffeen, Uplevel Dairy

Following the "formal conference," Calf Care & Quality Assurance (CCQA) will offer a free Train the Trainer program. CCQA is a quality assurance certification program that was built to unite calf raisers around key management practices that ensure consumers all cattle raised at a calf-raising facility are healthy and well cared for and the products they generate are wholesome and safe. Components of the program include calf health, animal handling and stockmanship, management and care, employee training, continuing education and emergency preparedness.

"The goal of a Train the Trainer session is to prepare and certify industry leaders in the techniques and instruction of the CCQA program," stated Julia Herman, National Cattlemen's Beef Association beef cattle specialist veterinarian. "Once certified, you will gain access to the CCQA Instructor Hub that houses all materials needed to host a CCQA Training. Following access to the hub, you can then host on-farm training events to assist in employee training and certification." For more information, contact Julia Herman at: jherman@beef.org.

The Dairy Calf and Heifer Association (www.calfandheifer.org) was founded in 1996 based on the mission to help dairy producers, calf managers and those professionally focused on the growth and management of dairy calves and heifers. With an international membership of producers, allied industries and research leaders, DCHA seeks to provide the industry' s standards for profitability, performance and leadership, serving as a catalyst to help members improve the vitality and viability of their individual efforts and that of their business.

Budget 2025: India Plans Over 15% Increase in Agricultural Allocation to Strengthen Rural Economy

Government's Focus on Agriculture

The Indian government is set to increase its agricultural budget by over 15%, raising the total allocation to approximately $20 billion (Rs 1.75 trillion) in the upcoming financial year (FY26). This marks the most significant increase in six years, with the objective of enhancing rural incomes, improving agricultural infrastructure, and controlling inflation. According to government sources familiar with the discussions, this additional funding will be channeled into key areas such as high-yielding seed development, expansion of storage and supply chains, and boosting the production of essential crops like pulses, oilseeds, vegetables, and dairy products.

Measures to Control Food Prices

India, one of the world's leading producers of rice, wheat, and sugar, has been battling rising food inflation, which exceeded 10% year-on-year in October 2024. Although prices have moderated since then, food inflation has averaged over 6% in the past decade. To counter rising prices, the government has implemented several measures, including imposing export restrictions on essential farm products like wheat and extending a duty-free import policy for specific pulses. These efforts are aimed at stabilizing domestic supply while keeping food prices under control.

Key Budget Allocations

The proposed increase in agricultural spending will see the budget for the Ministry of Agriculture rise from Rs 1.23 trillion in the current fiscal year. A substantial portion of this increase will be directed towards agricultural research, with investments in developing new seed varieties, currently standing at Rs 99.41 billion, expected to rise further. Additionally, farm loans are likely to see an expansion, with the maximum limit for subsidized loans increasing from Rs 300,000 to Rs 500,000 per farmer. Crop insurance schemes will also be expanded to provide greater coverage against climate-induced losses.

Enhancing Agricultural Exports

One of the government's long-term goals is to not only ensure food security but also to enhance India's agricultural export potential. The government aims to increase farm exports to $80 billion by 2030, a significant rise from the current $50 billion. Strengthening domestic production, improving storage infrastructure, and encouraging food processing industries are key elements of this plan.

Investment in Pulses, Fisheries, and Food Processing

To meet the rising demand for pulses, the government has set an ambitious target of increasing pulse production to 30 million metric tons by 2030. Additionally, the fisheries sector will receive an investment of $9 billion over the next five years, aimed at enhancing production, storage, and export potential. The government also plans to provide incentives totaling Rs 10,900 crore to food processing firms through 2027. These initiatives will not only boost rural employment but also contribute to India's vision of becoming a global leader in agricultural exports.

Challenges and Expert Opinions

Despite the increased allocations and new initiatives, experts believe that deeper structural issues in Indian agriculture, such as low productivity, stagnant farm incomes, and inefficient supply chains, still need to be addressed. Devinder Sharma, an independent farm policy analyst, noted that while these budgetary measures are a step in the right direction, they may not be sufficient to resolve long-standing challenges faced by Indian farmers.

The 2025 budget reflects the Indian government's commitment to strengthening the agricultural sector through increased investment, improved infrastructure, and export-oriented policies. By focusing on research, financial support, and market expansion, the government aims to enhance the livelihoods of millions of farmers while ensuring food security and economic growth. However, addressing deeper structural inefficiencies remains crucial for achieving long-term agricultural sustainability.

Massive Food Safety Violations Uncovered at Dairy Units in Telangana Unhygienic Conditions Discovered During Dairy Inspections

In a shocking revelation, serious food safety violations have been uncovered at a dairy product storage facility in Jangaon,

Telangana. An inspection carried out by the State Level Task Force team, under the Commissioner of Food Safety, Telangana, on February 2, exposed highly unsanitary conditions, including houseflies and mosquitoes in stored ghee, a dead lizard near food storage areas, and spider webs on the roof. These findings have raised serious concerns about hygiene and food safety practices at dairy production and storage facilities in the state.

The inspection was conducted at a dairy unit owned by Shakti Milk and Milk Products, where officials noted significant lapses in food safety norms. The team found rusted, unsterilized equipment, improper storage of raw materials, and overall poor hygiene conditions within the facility. The violations observed highlight the urgent need for stricter monitoring and enforcement of food safety standards in the dairy industry.

720 kg of Contaminated Curd Discarded; 1,700 kg Seized

The inspection team took swift action after discovering large quantities of contaminated and improperly labeled dairy products. According to an official statement by the Commissioner of Food Safety, Telangana, a total of 720 kg of curd was discarded due to severe contamination, fungal infestation, and spoilage. Additionally, another 1,700 kg of curd was seized due to labelling violations and suspicions of substandard quality.

Authorities stated that the seized curd samples were sent for further analysis to determine the extent of contamination and potential health hazards posed by consuming such products. The presence of expired or improperly stored dairy products raises concerns about foodborne illnesses, which can have serious health consequences for consumers.

Lack of Pest Control and Water Testing

The inspection also revealed the absence of recent pest control measures and water quality analysis reports, which are crucial for ensuring food safety. The establishment failed to provide documentation proving that routine pest control treatments had been conducted, increasing the risk of contamination from rodents, insects, and other pests.

Moreover, the lack of water testing records raised red flags about the quality of water used in dairy production. Contaminated water can introduce harmful bacteria and pathogens into dairy products, posing serious health risks to consumers. The inspection team has ordered an immediate review of water quality at the facility and instructed the dairy unit to implement strict hygiene and sanitation measures.

Action Under the FSS Act, 2006

Based on the severe violations observed, authorities have initiated legal action against Shakti Milk and Milk Products under the Food Safety and Standards (FSS) Act, 2006, and the FSS Rules and Regulations, 2011. These laws are in place to ensure that food businesses adhere to strict safety and hygiene standards, and violations can result in hefty fines, suspension of operations, or even legal prosecution.

The Commissioner of Food Safety has warned that further inspections will be conducted across Telangana to ensure compliance with food safety regulations. Officials emphasized that dairy producers and food processing units must prioritize hygiene and proper storage practices to maintain consumer trust and prevent health hazards.

Inspection at Durga Dairy Products in Hyderabad Uncovers More Violations

In a separate inspection conducted on December 20, 2024, at Durga Dairy Products in Hyderabad, the Commissioner of Food Safety identified multiple hygiene violations and poor storage conditions. The findings included:

- **Flaky, deteriorating ceilings** in cold storage areas, which pose a risk of debris falling into food products.
- **Lack of a proper drainage system**, leading to water accumulation and increasing the risk of microbial contamination.
- **Storage of expired food items**, including raw materials used in dairy production.
- **Expired artificial flavoring agents** such as vanilla and lemon, which should have been discarded but were still stored at the facility.
- **Poor pest control measures**, with improperly closed doors allowing pests to enter the storage areas.

The inspection report emphasized that such unsanitary conditions could lead to the production of contaminated dairy products, putting consumers at risk of foodborne illnesses such as salmonella, listeria, and E. coli infections.

Urgent Need for Stricter Regulations and Monitoring

The widespread non-compliance with food safety standards in Telangana's dairy sector highlights the urgent need for stricter enforcement and regular monitoring of food processing units. Experts have pointed out several key areas that require immediate attention:

1. **Regular Inspections and Surprise Checks**

Authorities must conduct frequent, unannounced inspections to ensure that dairy producers adhere to hygiene standards. Surprise checks can help detect violations and prevent dairy businesses from cutting corners on safety measures.

2. **Improved Hygiene and Sanitation Protocols**

Dairy units must adopt strict hygiene protocols, including regular sterilization of equipment, proper storage of raw materials, and effective pest control measures. Cleanliness should be a non-negotiable aspect of dairy production.

3. **Mandatory Water Quality Testing**

To prevent contamination, all dairy facilities should be required to conduct regular water quality testing and maintain updated records. Safe water is essential for dairy processing, and contamination can have severe public health consequences.

4. **Consumer Awareness and Transparency**

Consumers should be made aware of food safety violations, and companies found guilty of repeated infractions should be publicly listed. Transparency in food safety practices will help build trust and encourage companies to prioritize compliance.

5. **Stringent Penalties for Violators**

Stronger penalties, including higher fines, license suspensions, and criminal charges, should be imposed on dairy businesses that repeatedly violate food safety norms. Strict legal action will deter other food processing units from engaging in unsafe practices.

The recent inspections in Telangana have exposed serious lapses in food safety measures at dairy units, raising concerns about the quality and safety of dairy products consumed by the public. The discovery of contaminated dairy products, improper storage practices, expired ingredients, and unhygienic conditions underscores the urgent need for reforms in the dairy sector.

While immediate action has been taken against violators, long-term solutions such as stricter regulatory oversight, improved hygiene protocols, and increased public awareness are crucial for ensuring safe and high-quality dairy production in India. Consumers, regulatory bodies, and food manufacturers must work together to uphold strict food safety standards and prevent such alarming violations in the future.

The Evolution of the Indian Dairy Industry: Building a 15,000-Cow Mega-Farm

India's dairy sector has traditionally been characterized by small-scale farming, with most milk production coming from smallholder farmers who rear only a few cows or buffaloes. However, a significant shift is underway, with large-scale dairy farms emerging as a transformative force in the industry. One of the leading players driving this change is Parag Milk Foods, which is pioneering the establishment of mega-dairy farms in India. The company has taken a bold step by developing a 15,000-cow mega-farm, a move that is set to revolutionize the industry by integrating European genetics, Western farming expertise, and advanced dairy management techniques.

A Shift from Smallholdings to Large-Scale Dairy Farming

For decades, India's dairy industry has relied on smallholder farmers, where individual households keep two to three milking animals. These small farms contribute significantly to the country's milk production, making India the largest producer of milk in the world. However, with increasing demand for high-quality milk, improved productivity, and efficient supply chains, there has been a growing interest in large-scale dairy operations. These mega-farms aim to modernize the sector by incorporating advanced breeding techniques, superior cattle genetics, state-of-the-art milking systems, and stringent quality control measures.

The Role of Parag Milk Foods in Dairy Modernization

Parag Milk Foods has played a crucial role in modernizing India's dairy industry. The company began its journey in 2005 with the establishment of its first dairy farm, Bhagyalakshmi, located near Pune. This 35-acre farm initially housed a herd of 3,500 high-yield cows and introduced a 50-point rotary milking parlor, which was a significant leap forward for the sector. The success of Bhagyalakshmi Farm demonstrated the potential of modern dairy farming in India, paving the way for larger and more ambitious projects.

Recognizing the need for increased productivity and efficiency, Parag Milk Foods embarked on a new venture—the development of a 15,000-cow mega-farm. This facility is designed to implement best practices from leading dairy-producing countries, such as the use of European cattle genetics, automated milking systems, and advanced herd management practices. The introduction of such large-scale farms is expected to enhance milk quality, optimize resource utilization, and reduce production costs.

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 :
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Advertising Deadline :
30th, May 2025
Focus :
Milk - Production & Preservation

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

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August
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Advertising Deadline :
30th, July 2025
Focus :
Sustainability

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

Publishing Month:
October
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30th, September 2025
Focus :
Disease Prevention

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