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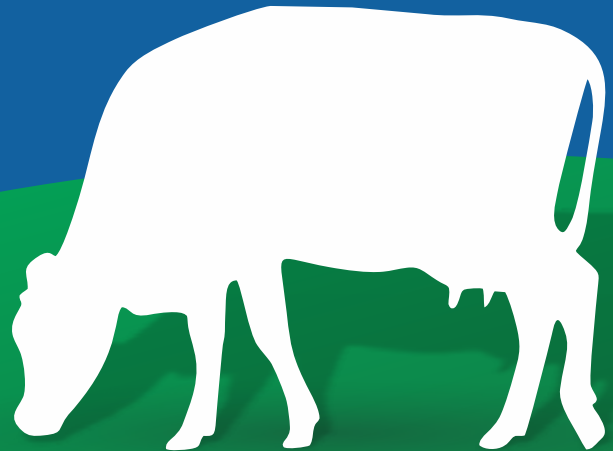


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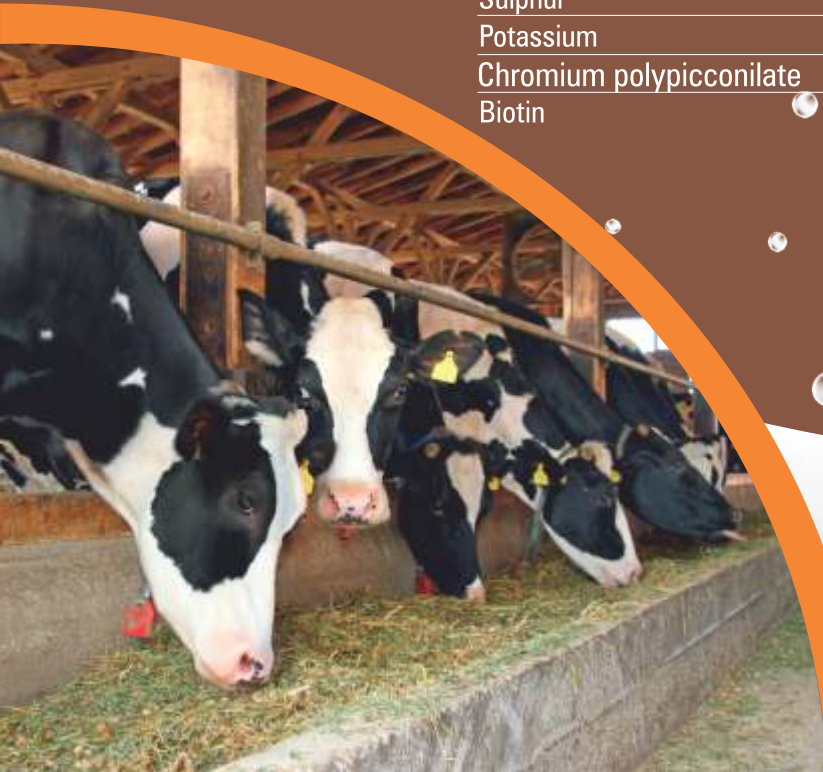
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# From the Pen of Chief Editor



## The Crucial Role of Sustainability in Dairy Farming

In recent years, the global focus on sustainability has intensified, with various sectors reevaluating their environmental impact. Dairy farming, a cornerstone of agriculture and a major food source, is no exception. As the world grapples with climate change, resource depletion, and environmental degradation, embracing sustainable practices in dairy farming is not just beneficial but essential for the future of our planet and food security.

Sustainability in dairy farming encompasses a range of practices aimed at minimizing environmental impact while ensuring economic viability and social responsibility. Traditional dairy farming, often criticized for its substantial carbon footprint and intensive resource use, is under scrutiny. The livestock sector contributes significantly to greenhouse gas emissions, primarily through methane produced by enteric fermentation in ruminants. Moreover, dairy farming requires considerable water and land resources, contributing to deforestation and water scarcity.

To address these issues, sustainable dairy farming practices must be adopted. One of the most significant areas of focus is improving feed efficiency. By optimizing the diet of dairy cows, farmers can reduce methane emissions and improve milk production efficiency. Incorporating high-quality forages and advanced feed additives can enhance digestion and reduce the amount of methane produced during digestion. Additionally, adopting precision agriculture technologies can help monitor and manage resources more effectively, reducing waste and optimizing input use.

Manure management is another critical aspect of sustainability. Manure, if not handled properly, can lead to water pollution through runoff. Implementing practices such as anaerobic digestion can convert manure into renewable energy, reducing reliance on fossil fuels and decreasing greenhouse gas emissions. Furthermore, using manure as a fertilizer in a controlled manner can reduce the need for synthetic fertilizers, which are energy-intensive to produce and can contribute to nutrient runoff and water pollution.

Water use is another area where sustainability can make a significant impact. Efficient water management practices, such as rainwater harvesting and recycling, can help reduce the strain on freshwater resources. Technologies like automatic waterers and precision irrigation systems can ensure that water is used efficiently, minimizing waste and ensuring that dairy operations have a reliable water supply.

In addition to environmental benefits, sustainable dairy farming also offers economic and social advantages. By reducing input costs through improved efficiency and resource management, farmers can enhance their profitability. Sustainable practices can also improve animal welfare, which is increasingly important to consumers and can lead to higher milk quality and better herd health. Moreover, by adopting sustainable practices, dairy farms can enhance their resilience to climate change and market fluctuations, securing their long-term viability.

Consumer demand for sustainably produced food is rising, with more people willing to pay a premium for products that are environmentally friendly and ethically produced. Dairy farmers who embrace sustainability not only contribute to a healthier planet but also position themselves to meet this growing market demand.

In conclusion, the importance of sustainability in dairy farming cannot be overstated. By adopting practices that minimize environmental impact, improve resource efficiency, and enhance animal welfare, the dairy industry can play a pivotal role in addressing global environmental challenges. As consumers, policymakers, and producers work together to support and implement these practices, we can ensure that dairy farming remains a viable and responsible part of our agricultural system for generations to come.

*Vishal*

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# Cows and Climate: The Role of Sustainable Practices in Dairy Farming

## Introduction

Dairy farming is an integral part of the global agricultural landscape, providing essential nutrients through milk and dairy products. However, the industry faces significant challenges related to sustainability. As the world grapples with environmental concerns, climate change, and the need for responsible resource management, sustainable dairy farming practices have become more crucial than ever. In this article we explore the multifaceted aspects of sustainability in dairy farming, focusing on environmental, economic, and social dimensions.

## Environmental Sustainability

### 1. Greenhouse Gas Emissions

One of the most pressing environmental issues in dairy farming is the emission of greenhouse gases (GHGs), particularly methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and carbon dioxide (CO<sub>2</sub>).

Methane, a potent GHG, is produced during enteric fermentation in ruminant animals like cows. Nitrous oxide is primarily released from manure management and the application of nitrogen-based fertilizers.

To mitigate these emissions, several strategies are being implemented:

- **Dietary Adjustments:** Altering the diet of dairy cows can reduce methane production. For instance, adding fats or certain feed additives like tannins and seaweed can suppress methane emissions.
- **Manure Management:** Improved manure management techniques, such as anaerobic digestion, can capture methane for energy production, turning a

waste product into a resource.

- **Carbon Sequestration:** Practices like rotational grazing and planting cover crops can enhance soil carbon sequestration, offsetting some of the carbon emissions from dairy operations.
- ### 2. Water Usage and Management
- Dairy farming is water-intensive, requiring substantial amounts of water for animal hydration, cleaning, and crop irrigation. Sustainable water management practices are essential to minimize the environmental footprint:
- **Efficient Irrigation:** Implementing drip or sprinkler irrigation systems can reduce water wastage and ensure that crops receive only the necessary amount of water.
  - **Recycling Water:** Reusing water in dairy operations, such as using wastewater for irrigation or cleaning, can significantly reduce overall water consumption.

- **Protecting Water Quality:** Preventing nutrient runoff and managing waste effectively helps protect local water bodies from contamination.

### 3. Land Use and Biodiversity

The expansion of dairy farming can lead to deforestation, habitat loss, and soil degradation.

Sustainable land management practices are crucial to maintaining biodiversity and soil health:

- **Rotational Grazing:** Moving cattle between pastures allows vegetation to recover, preventing overgrazing and promoting soil health.
- **Agroforestry:** Integrating trees into dairy farming

systems can enhance biodiversity, provide shade for animals, and improve carbon sequestration.

- **Conservation Tillage:** Reducing tillage preserves soil structure, enhances water retention, and prevents erosion, contributing to long-term land sustainability.

### Economic Sustainability

#### 1. Profitability and Efficiency

Economic sustainability in dairy farming involves ensuring that farms remain profitable while minimizing environmental impacts. This requires optimizing efficiency in all aspects of production:

- **Precision Farming:** Utilizing technology, such as GPS-guided equipment and

sensors, can optimize the use of inputs like feed, water, and fertilizers, reducing waste and costs.

- **Diversification:** Diversifying farm income streams, such as through agritourism or on-farm processing, can provide financial stability and resilience against market fluctuations.

#### 2. Cooperatives and Collaboration

Joining cooperatives or forming partnerships can help small and medium-sized dairy farms access markets, reduce costs, and share resources.

#### 2. Access to Markets and Fair Trade

Ensuring fair trade practices and access to markets is





essential for the economic viability of dairy farms, especially in developing regions:

- **Certification Programs:** Participating in sustainability certification programs, such as Fair Trade or organic certification, can provide access to premium markets and increase profitability.
- **Market Access:** Developing infrastructure and policies that improve market access for small-scale dairy farmers can enhance their economic sustainability.

## Social Sustainability

### 1. Animal Welfare

Animal welfare is a critical aspect of social sustainability in dairy farming. Ensuring that dairy cows are healthy, well-nourished, and free from stress is not only ethical but also contributes to higher productivity:

- **Comfortable Housing:** Providing cows with comfortable, clean, and spacious housing can reduce stress and improve milk yield.
- **Health Management:** Regular health checks, proper nutrition, and prompt veterinary care are essential for maintaining animal welfare and productivity.
- **Ethical Breeding:** Avoiding practices that compromise animal welfare, such as excessive use of hormones or antibiotics, is crucial for sustainable dairy farming.

### 2. Labor Conditions and

## Community Engagement

Social sustainability also involves ensuring fair labor practices and contributing positively to local communities:

- **Fair Wages and Safe Working Conditions:** Dairy farms should provide fair wages, benefits, and safe working conditions to their employees. This not only improves worker satisfaction but also enhances farm productivity.
- **Community Involvement:** Engaging with local communities, whether through education programs, sponsorships, or participation in local events, strengthens the social fabric and supports the sustainability of the farming operation.

### 3. Consumer Awareness and Education

Educating consumers about the sustainability practices of dairy farms is essential for driving demand for sustainably produced dairy products:

- **Transparency:** Providing clear information about farming practices, animal welfare, and environmental impact can build consumer trust and loyalty.
- **Sustainable Branding:** Developing a strong brand around sustainability can attract environmentally and socially conscious consumers, enhancing marketability and profitability.

## Innovations in Sustainable Dairy Farming

Technological advancements are playing a significant role in enhancing sustainability in dairy farming:

- **Automated Milking Systems:** Robotic milking systems reduce labor costs, improve milk quality, and allow for more flexible management of dairy herds.
- **Data-Driven Decision Making:** Utilizing data analytics to monitor herd health, feed efficiency, and environmental conditions can lead to more informed decisions and improved sustainability.
- **Alternative Protein Sources:** Research into alternative protein sources for feed, such as insect-based proteins or algae, offers the potential to reduce the environmental impact of dairy farming.

## Conclusion

Sustainability in dairy farming is a complex and multifaceted challenge that requires a holistic approach. By adopting environmentally friendly practices, ensuring economic viability, and upholding social responsibilities, the dairy industry can move towards a more sustainable future. Continuous innovation, collaboration, and education are key to achieving long-term sustainability in dairy farming, ensuring that it remains a vital part of the global food system while minimizing its environmental impact.



# Managing Heat Stress to Reduce Ketosis in Dairy Farming

As dairy farming in India and other tropical regions continues to grow, understanding the challenges unique to these climates becomes increasingly important. One significant concern is the prevalence of ketosis in dairy cows, which can be exacerbated by the intense heat stress common in these areas. At Ecolex Animal Nutrition, we are dedicated to providing innovative solutions to improve animal health and productivity, and understanding the link between heat stress and ketosis is crucial for dairy farmers in these warmer climates.

## Understanding Ketosis and Its Causes

Ketosis is a metabolic disorder that occurs when dairy cows experience a negative energy balance. This often happens when cows produce large amounts of milk, as the energy required for milk production exceeds the energy intake from their diet. While high milk production is the primary cause of ketosis, it's not the only factor. In tropical regions, even though milk production might not be as high as in other parts of the world, the prevalence of ketosis remains a significant concern due to heat stress.

## The Impact of Heat Stress on Dairy Cows

Heat stress is a major challenge for dairy cows throughout the Indian Subcontinent. High temperatures and humidity can lead to a variety of health issues, including an increased risk of ketosis. Here are some of the key ways in which heat stress affects ketosis prevalence in these regions:

### 1. Reduced Feed Intake

One of the most immediate effects of heat stress on dairy cows is reduced feed intake. When cows are exposed to high temperatures, they naturally eat less to lower their metabolic heat production. This reduction in feed intake leads to a negative energy balance, which is a critical factor in the development of ketosis. Ensuring that cows receive adequate nutrition despite the heat is essential for preventing this metabolic disorder.

### 2. Metabolic Changes

Heat stress can significantly alter the metabolic processes in dairy cows. High temperatures can



cause changes in hormone levels and energy metabolism, making cows more susceptible to ketosis. The stress from heat can also lead to increased levels of cortisol, a hormone that affects energy metabolism and can contribute to the onset of ketosis.

### 3. Increased Energy Demands

In hot environments, dairy cows expend more energy to maintain their body temperature. They do this through increased sweating and respiration, which raises their overall energy demands. This additional energy expenditure can exacerbate the negative energy balance, further increasing the risk of ketosis. Managing these energy demands is crucial for maintaining the health and productivity of dairy cows.

## Strategies to Manage Heat Stress and Reduce Ketosis

Given the significant impact of heat stress on ketosis, it is crucial for dairy farmers in tropical regions to adopt effective strategies to manage heat and reduce the risk of ketosis. Here are some recommended practices:

### 1. Enhanced Cooling Systems

Investing in enhanced cooling systems, such as fans, misters, and shade structures, can help reduce the heat load on dairy cows. Proper ventilation in barns and the provision of shaded areas in pastures can significantly alleviate heat stress.

### 2. Optimised Hydration

Ensuring that cows have constant access to clean, cool water is essential. Water helps regulate body temperature and supports overall metabolic functions. During periods of extreme heat, consider increasing the number of water stations to encourage regular drinking.

### 3. Nutritional Adjustments

Working with a nutritionist to adjust the cows' diet can help manage the negative energy balance associated with heat stress. Providing high-quality forage and supplements that support energy intake can mitigate the effects of reduced feed consumption.

### 4. Rumen Bypass Technology

At Ecolex Animal Nutrition, we specialize in rumen bypass technology, which allows essential nutrients to bypass the rumen and be directly absorbed in the

intestines. This technology can be particularly beneficial in managing the nutritional needs of dairy cows under heat stress, ensuring they receive the necessary nutrients to maintain energy balance and reduce the risk of ketosis. Our latest innovation, Lipo EN+, delivers rumen bypass glycerol to dairy cows, specifically designed to alleviate the stress of ketosis. This advanced nutritional solution supports energy metabolism and enhances overall cow health, providing a powerful tool for farmers to combat the challenges of heat stress and ketosis.

## Conclusion

Managing heat stress is critical for reducing the prevalence of ketosis in dairy cows in tropical regions. By adopting effective cooling strategies, optimizing hydration, making nutritional adjustments, and leveraging advanced technologies like rumen bypass, dairy farmers can significantly improve the health and productivity of their herds. At Ecolex Animal Nutrition, we are committed to supporting dairy farmers with innovative solutions to overcome the challenges posed by tropical climates and ensure a sustainable and profitable future for the dairy industry.



For more information about Lipo EN+, contact Ecolex Animal Nutrition via <http://www.ecolexanimalnutrition.com> or follow the QR code below:





# Potassium Chloride

## Supplement In Lactating

### Animals

#### Introduction

Nutrition is the most important aspect of animal production, as it has direct effects on health and productivity. Providing well-balanced diets according to the stage and body condition can enhance productivity and prevent common disorders of dairy cows. Animal nutrition is one of the most researched subjects and great advances have been made in the past on nutritional management of dairy animals. With the increasing productivity there have been proportionate increase in the requirements of different nutrients of dairy cows. High-yielding dairy cows require a particular composition of nutritional ingredients depending on their production status. The optimal supply of nutrients in the diet are indispensable for the prevention of imbalances. Potassium is one of the crucial macro-minerals in dairy cow nutrition that plays a vital role in numerous physiological functions. However, it is often underappreciated in the cows' ration and its requirement varies according to the lactation stage. Research suggests that high yielding cows frequently deficient in potassium during their early lactation period due to higher excretion of potassium in milk and low dry matter intake. NRC indicates that extreme potassium deficiency in lactating cows' results in substantial reduction in feed intake, decreased weight gains and diminished milk

production. To overcome the deficiency, it is therefore important to provide diet with potassium supplements. Potassium helps in different body functions as below -

1. **Electrolyte Balance:** Potassium is a key electrolyte, which helps maintain fluid balance and osmotic pressure in cells and tissues.
2. **Nerve and Muscle Function:** It is necessary for proper nerve impulse transmission and muscle contraction, including the smooth muscle contractions involved in digestion.
3. **Acid-Base Balance:** Potassium helps regulate the acid-base balance in the blood and tissues, which is crucial for overall health.
4. **Support for Metabolic Health:** Potassium is involved in many biological processes and thereby supports proper metabolic function. This balance is crucial during periods of stress, such as lactation, when the cow's physiological demands are high.
5. **Milk Production:** Potassium is involved in the production of milk, affecting both the quantity and quality of milk produced.

#### Potassium regulation

The potassium regulation has carried out by two functions:

1. **External potassium balance**
2. **Internal Potassium balance**

External potassium balance is

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difference between dietary consumption of potassium and its elimination through different route like renal, salivary and gastrointestinal route. In dairy cattle the dietary potassium usually gets completely absorbed (>85%). The main source of potassium are forages rich in potassium contain and potassium balance is maintained through elimination of excessive potassium. Maximum potassium excreted via urine i.e. 75%, followed by faeces -13% (mostly unabsorbed dietary potassium) and 12% in the milk. The excretion of potassium is higher in lactating cow compared to non-lactating animals, because those animals are adopted to fed forages and hence eliminate excessive dietary potassium.

Internal Potassium balance is defined as the shift of potassium ions between the intracellular and extracellular space. Alteration in the

equilibrium between intracellular and extracellular potassium can result in hypokalaemia or hyperkalaemia without altering the actual concentration of potassium in the body. Internal potassium level commonly influenced by disturbed acid base balance in the body. In metabolic acidosis the increased extracellular fluid concentration of hydrogen ion enters into the cells and then potassium ions present intracellular compartment enter into extracellular which increase the plasma concentration of potassium. Similarly, in metabolic alkalosis, extracellular potassium enters intracellular compartment which results into condition called hypokalemia.

### Hypokalemia

Hypokalemia is a condition characterized by low levels of potassium in the blood. Animal with normal appetite usually do not suffer from potassium deficiency.

One of the primary causes is inadequate intake or absorption of potassium-rich feed. Animals with hypokalemia have generalized muscle weakness, depression, and muscle fasciculations. Severely affected animals are unable to stand or lift their head from the ground. A serum potassium concentration <2.5 mEq/L reflects severe hypokalemia; most animals will be weak, and some will be recumbent. A serum potassium concentration of 2.5–3.5 mEq/L reflects moderate hypokalemia.

### Causes for hypokalemia

- 1. High milk yield in early lactation:** The average potassium retention for early lactation cows (less than 75 days in milk) was 66 g/d. It seems that potassium intake and excretion are closely correlated. Early lactation cows were in a negative potassium balance because of higher potassium secretion in milk.
- 2. Heat stress:** With an increase in ambient temperature dairy cows rely on adaptive mechanisms to dissipate heat and these include, moving to shade if available, decreasing DMI, increasing water intake, and increasing evaporative loss via respiration and sweating. during hot weather, they can lose significant amounts of potassium through sweat.
- 3. Medications:** Certain corticosteroids with a mineralocorticoid action can increase potassium excretion in the kidneys. Hypokalemic states can also result after the combination of glucose plus certain diuretics, such as furosemide, when administered in the urinary obstruction. Lastly, multiple treatments of dextrose and insulin are also responsible for Hypokalemic

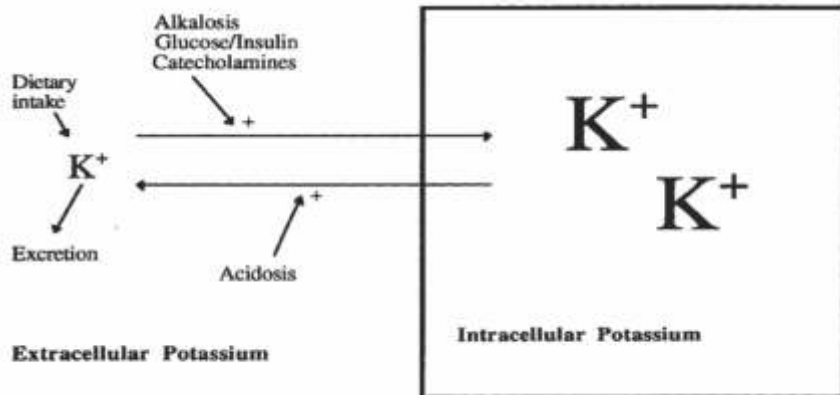
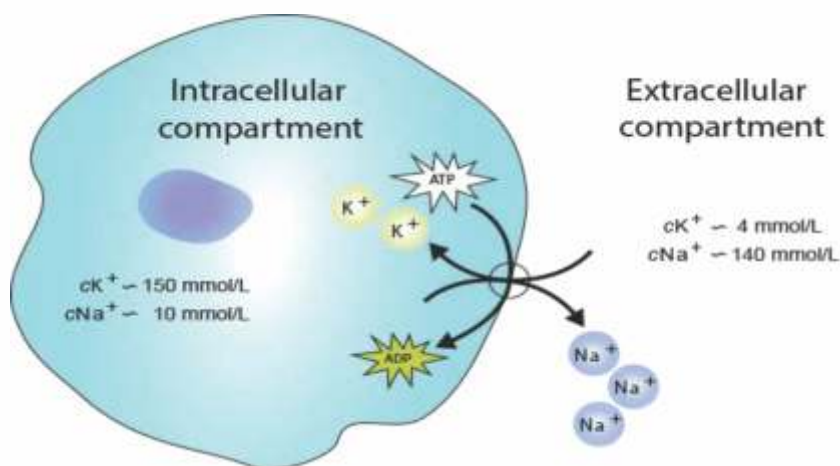


Figure 1. Factors affecting intracellular and extracellular potassium equilibrium.



condition.

- 4. Other diseases:** Furthermore, certain diseases and conditions can also contribute to hypokalemia in cattle. For instance, cows with milk fever or ketosis have an increased risk of developing low potassium levels due to the high calcium and glucose demand in their bodies. Other conditions such as kidney disease, liver disease, or acid-base imbalances can also lead to hypokalemia in cattle.

#### Symptoms of hypokalemia

The signs and symptoms of hypokalemia in cow may vary depending on the severity of the condition. In mild cases, an animal may not show any noticeable symptoms, but as the potassium levels continue to drop, the following signs may become apparent:

- 1. Decreased Appetite:** Cow with hypokalemia may show a decreased appetite and may not be interested in eating their regular feed.
- 2. Weight Loss:** As a result of decreased appetite, the animal may also experience weight loss.
- 3. Weakness and Lethargy:** Low potassium levels can cause weakness and lethargy in cattle, making them less active and alert.
- 4. S-shaped Neck curvature/Muscle Tremors:** Potassium is essential for proper muscle function, and a deficiency can lead to muscle tremors or twitching in cattle. Typical S-Shape position can be observed in low body potassium in case of dairy cow.
- 5. Recumbency/Downers Cow:** In severe cases, an animal may have difficulty standing or

walking due to muscle weakness and impaired coordination.

- 6. Abnormal Heart Rhythms:** Potassium is crucial for proper heart function, and any disruption in its levels can lead to abnormal heart rhythms in cattle.
- 7. Increased Urination and Thirst:** Cow with hypokalemia may have an increased need to urinate and drink water due to the excessive loss of fluids from the body.

#### Potassium supplements in lactating cows

There are several supplemental sources of potassium that can be used, namely, potassium carbonate, potassium bicarbonate, or potassium chloride. The preferred choice for treating hypokalemia in lactating dairy cow is oral potassium supplementation. Oral potassium supplementation is better than intravenous as it is less expensive, convenient to administer, and allows for higher doses with fewer risk of side effects. One method that has gained popularity in recent years is the use of potassium chloride supplements. While potassium is needed in cow with whole-body potassium depletion, chloride is needed in cow with alkalaemia and pH-induced compartmental shift of potassium to the intracellular space. Hence, potassium chloride administration appears to be suitable formulation in addressing hypokalemia in cows.

Potassium chloride supplements come in different forms, including powders and liquids, and are designed to provide a concentrated dose of potassium to support the overall health of the animal. Inappetent lactating dairy cow should be given with 60–120 g of potassium chloride twice at a 12-hour interval. Adult cow with severe

hypokalemia (< 2.5 mmol/L) should initially be treated with 120 g of KCl PO, followed by a second 120- g dose of KCl 12 hours later, for a total 24-hour treatment of 240 g KCl. It is also important to note that high potassium rations may interfere magnesium (Mg) absorption; therefore, 4:1 ratio of K to Mg need to be maintained to avoid magnesium deficiency.

#### Conclusion

Potassium is transported across intra- and extracellular spaces, absorbed with food, and eliminated through urine, faeces, sweat and milk. Since milk contains around 1.4 g of potassium per liter, it plays a significant role in the body's excretion and loss, particularly in dairy cows with large yields. Potassium is absorbed in the small intestine and its availability in digestion is nearly 100 percent. The dairy cow's minimum requirement for K is 0.90% to 1.0% of the ration dry matter (NRC 2001). However, 1.0 % potassium is too low in the lactation diet. This mild deficiency of potassium may become marginally deficient in high yielding cows, especially during their first 10 weeks of lactation. Prevention is always better than cure, and the same applies to hypokalemia in cattle. To prevent this condition from occurring, it is essential to ensure that the animal's diet is properly balanced and contains adequate amounts of potassium. Potassium chloride supplements have the potential to offer many benefits, such as electrolyte balance, improved muscle function, and increased milk production. Effective use of potassium chloride involves understanding the appropriate dosage and monitoring strategies. With careful management, potassium chloride supplements can be a valuable tool in maintaining the health and productivity of lactating cows.





# Repeat Breeding Syndrome in Dairy Animals



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**Repeat Breeding Syndrome (RBS):** When a normal cyclic female animal with apparently normal genitalia, normal estrous cycle (inter-estrus length 21-22 days), normal estrus period (18-24h) and normal cervico-vaginal mucus discharge, fails to conceive when mated in three or more consecutive estruses with fertile bull or inseminated artificially with fertile semen is called as Repeater/Repeat breeder/ Cyclic non-breeder animal and the condition is termed as Repeat Breeding.

- The condition is multifactorial in origin so refereed as Repeat Breeding Syndrome (RBS).
- Incidence of RBS in a herd is around 5-30% (average 10-15%) and it could be more in solitary animal rearing.
- The causes of RBS are mainly categorized under two headings:
  1. Failure of fertilization
  2. Early Embryonic Mortality (EEM)

- 1. Failure of fertilization:** The fertilization rate in normal cases is more than 90% in dairy animals but, there are some animals which have some abnormalities due to which fertilization don't take place and animal comes in estrus again after a period of 21-22 days.
- 2. Early Embryonic Mortality (EEM):** When after proper fertilization, the embryonic survival is impaired (embryo dies) before the time of maternal recognition of pregnancy (MRP) resulting in luteolysis at 16-17 days post estrus and the animal comes in heat at a regular interval without affecting the length of estrous cycle, it is termed as EEM. The incidence of EEM could be up to 25-30% in a herd.

**1. Failure of Fertilization**  
**The failure of fertilization could occur due to**



Fig. 1: Various causes of repeat breeding syndrome in dairy animals

- A. Male factors
- B. Female factors
- C. Management factors
- A. Male factors:** The failure of fertilization could be due to use of infertile bull for mating or semen collection, high sperm abnormalities, poor post-thaw motility of semen due to low level of liquid nitrogen in the semen storage containers. Therefore, all these factors leading to poor sperm health and can lead to fertilization failure, so, checking of the semen quality and use of only fertile good quality semen is necessary to ascertain fertilization.
- B. Female Factors:** There could be many factors related to female animal which could lead to failure of fertilization including ageing of ovum, failure of meeting of sperm and oocyte, failure of implantation etc. The major female associated factors are:
  - i. Ovulatory defects:** The failure of ovulation which is also referred as anovulation, delayed timing of ovulation are major ovulatory defects due to which spermatozoa ageing occurs as well as there is reduced quality of oocyte in the delayed ovulation cases. One cause of delayed or anovulation is suprabaasal progesterone at the time of ovulation due to improper luteolysis of the corpus luteum. Another cause of ovulatory defect could be lesser concentration of GnRH and LH hormones which are required for late follicular maturation and ovulation.
  - ii. Oviduct blockage:** The oviduct is the route for the transport of the gametes as well as site of

fertilization, so, any blockage of oviduct shall impair the fertilization process either due to impaired transport of gametes or zygote. The oviduct blockage could occur due to salpingitis (inflammation of oviduct), hydrosalpinx (accumulation of watery fluid in oviduct), pyosalpinx (pus in oviduct) or pachysalpinx (connective tissue in oviduct).

- iii. Ovario-bursal adhesions:** The bilateral ovario-bursal adhesions make the animal sterile. Unilateral ovario-bursal adhesions ipsilateral to ovary undergoing ovulation lead to repeat breeding.
- iv. Subclinical/Cytological endometritis (SCM):** The inflammation of endometrium due to infiltration of polymorphonuclear cells (PMNs)/ neutrophils in the lumen of the uterus is termed as SCM. The incidence of SCM could be up to 25-40% and lead to failure of implantation and RBS.

**C. Management Factors:** Various human associated factors responsible for fertilization failure & ultimately RBS are:

- Improper heat detection
- Environmental stress
- Nutritional deficiencies
- Improper timing of AI
- Untrained inseminator/faulty AI
- Unhygienic conditions at the

time of AI

- Improper thawing of straw
- 2. Early Embryonic Mortality (EEM)**

**The major causes of EEM are:**

- i. Luteal insufficiency:** The adequate progesterone concentration is mandatory for the embryonic survivability as under the luteal environment proper implantation establishes as well as early nourishment of embryo occurs by uterotroph (uterine milk) which is secreted by endometrium under influence of progesterone. The luteal insufficiency can occur either due to poor development of corpus luteum (CL), lesser production by CL or early luteolysis of CL. The buffaloes are more prone to luteal insufficiency due to smaller CL size and lesser number of luteal cells in CL. Thus, the lower concentration of progesterone will result in EEM and RBS.
- ii. Subclinical endometritis:** Presence of subclinical endometritis leads to failure of implantation of embryo and thus, RBS.
- iii. Nutritional deficiencies:** Deficiency of wide range of specific nutrients has been observed in poor reproductive performance. Particularly, Vitamin E and Selenium are reported to cause early embryonic death. Feeding of

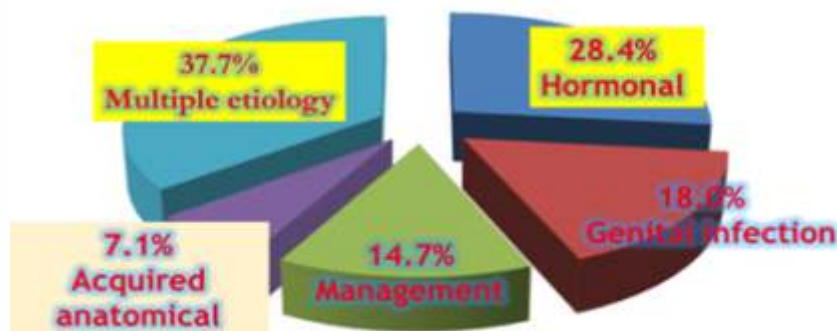


Fig. 2: Incidence wise female causes of RBS in cows

estrogenic forages to the cows and buffaloes also affects the embryonic survival.

- iv. Stress:** Elevated temperature due to persistent fever or high environmental heat and humidity may lead to the early embryonic death. As well, the high yielding animals have lactation stress which leads to poor oocyte quality and poor embryonic development and ultimately EEM and RBS.

### Diagnosis of RBS

The diagnosis of proper cause of RBS depends upon the underlying causal factor so to arrive at final diagnosis, it need thorough examination of animal along with sophisticated techniques.

1. Clinical History: The appropriate clinical history can rule out many causes of RBS.
2. Oviduct defects/ blockage/ adhesions can be diagnosed by PSP (Phenolsuphthalein dye test).
3. Ovulatory defects of anovulation and delayed ovulation can be ruled out by per rectal palpation of genitalia or by using transrectal ultrasonography. Palpation of ovulatory follicle at 24 h after standing estrus indicates ovulatory defect.
4. Luteal insufficiency can be ruled by estimation of plasma or serum progesterone concentration.
5. Subclinical endometritis diagnosed by uterine cytology by Cytobrush technique. The cytobrush technique is superior in all respects as more consistent and reliable method than the lavage method and accurately diagnose based on the PMNs cells % in the uterine sample collected using the

cytobrush assembly. Modified Giemsa staining is done to evaluate smears. In a more than 50 days postpartum animal, if PMNs % is more than 5% then, it is termed as subclinical endometritis.

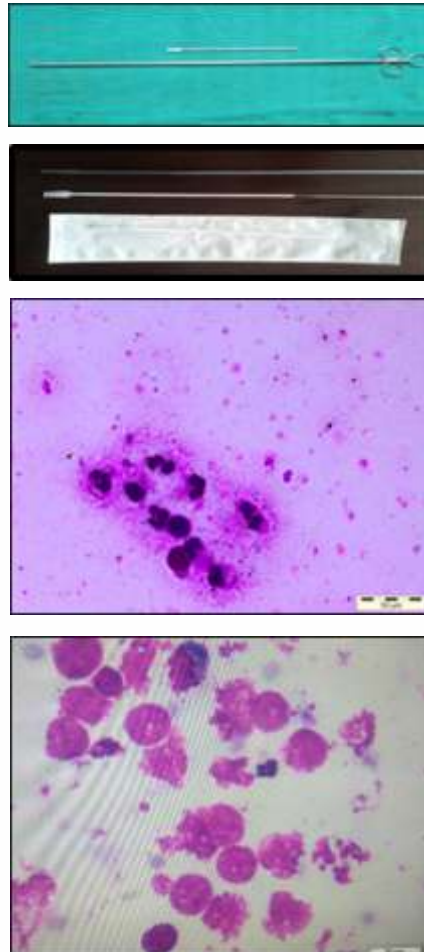


Fig. 3: Uterine Cytobrush assembly and Giemsa stained cytology smears with PMNs and uterine epithelial cells

### Therapeutics/ management of RBS

1. Animal should be maintained on good ration with proper housing. Rest before and after AI is advised because elevated cortisol interferes with LH secretion thus interfering with ovulation. Feeding of mineral mixture regularly @ 50-100g on daily basis should be done.
2. The AI should be done in late estrus by following AM-PM rule (animal coming in estrus at

morning should be inseminated in evening). At least twice insemination at 12 h interval should be followed. Bull parading is advised thrice (every 8h) a day in the herd for proper estrus detection. Semen quality for the AI must be good with more than 50% post-thaw motility, lesser sperm abnormalities. Thawing of semen should be done at 37°C for 30s and thawed semen must be used within 5-10 minutes for AI.

3. Progesterone injection at time of AI never to be used as it leads to failure of fertilization.
4. Animal diagnosed with subclinical endometritis should be treated with intrauterine administration of antibiotics like Cephalexin, Levofloxacin or Cephapirin (drug of choice).
5. To compensate ovulatory defects injection Buserelin acetate 10µg/ Chorulon 1500IU should be administered with first AI. This shall also help in better CL development.
6. To overcome luteal insufficiency either injection progesterone at day 5/12/both post-AI (500 mg hydroxy progesterone caproate) or Injection buserelin acetate at day 5/12/both post-AI (10 µg) or Injection hCG at day 5/12/both post-AI 1500 IU) can be used.

**Conclusion:** Good quality semen from disease free bulls should be used for AI with AM-PM rule and twice AI at 12 h interval. Subclinical endometritis should be treated by intrauterine drugs. Use of GnRH/hCG at first AI, Progesterone/GnRH/hCG at day 5 and 12 post AI compensates ovulatory defects and luteal insufficiency, respectively. If still animal fails to conceive then culling of the animal is recommended.





# From Farm to Fridge: The Art of Processing and Packaging Dairy Products

## Introduction

Milk and dairy products play a critical role in nutrition, serving as primary sources of protein and calcium for all population groups. The processing and packaging of dairy products, especially milk, is essential for preservation during storage, transportation, and distribution. The advent of pasteurization necessitated effective packaging to prevent post-pasteurization contamination. Technologies such as membrane filtration and high-pressure processing have become integral in dairy processing, offering benefits like microbial reduction and improved product yield.

Milk, a natural secretion of healthy animals, is fundamental to human diets worldwide. The production of clean, uncontaminated milk is crucial, emphasizing the importance of animal health, hygiene, and timely cooling to maintain milk quality. The dairy industry utilizes advanced processing techniques, including pasteurization and homogenization, to ensure safety and quality. Packaging technologies have evolved to meet the needs of modern

consumers, incorporating innovations like modified atmosphere packaging (MAP), nanomaterials, and active packaging to extend the shelf life and improve the safety of dairy products.

The dairy processing stages begin with raw milk intake, where it is pumped into large storage silos, typically cooled to 4–6°C using a heat plate exchanger. Efficient pump operation and optimized truck scheduling are essential for smooth processing. Following this, the milk undergoes separation, clarification, and centrifugation to remove impurities and reduce microbial load, with centrifugation separating milk fat from skim milk. Advanced techniques like bacto-fugation or microfiltration can remove up to 99.9% of spore-forming bacteria, enhancing product quality.

Pasteurization is then carried out to eliminate harmful bacteria such as *Coxiella burnetii*, typically at 71.7°C for 15 seconds. Although this process can affect taste and nutritional content, it significantly reduces foodborne illness risks.



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Compliance with regulatory standards ensures product safety. Finally, pasteurization is verified using the PasLite test, which detects alkaline phosphatase levels to confirm that pasteurization has been effective, ensuring the safety of the dairy products. Packaging is the technique of using the most appropriate containers and components to protect, carry, identify and merchandise any product. Packaging is today an essential part of any industry and an integral part of the modern marketing Complex.

### **Classification of Dairy Products**

Dairy products are categorized into four main groups:

#### **1. Liquid Milk:**

- Pasteurized milk
- Flavored milk
- Condensed and evaporated milk

#### **2. Dairy Products:**

- Milk powder
- Butter
- Ghee
- Ice cream
- Malted milk food

#### **3. Relatively Newer Dairy Products:**

- Cheese
- Yogurt

#### **4. Traditional Dairy Products:**

- Paneer
- Khoya

- Shrikhand
- Indian sweets

As dairy processing and packaging continue to advance, the focus remains on balancing product safety, quality, and environmental impact, particularly through the adoption of biodegradable materials and antimicrobial packaging. These innovations address consumer demands and ecological concerns, ensuring that dairy products remain a staple of global nutrition.

#### **• Liquid Milk**

**Pasteurized Milk:** Initially sold unprocessed, milk was prone to contamination until dairy cooperatives introduced packaged options. Glass bottles were first used for their hygiene and transparency but were eventually replaced in the 1980s by lightweight, recyclable LDPE plastic pouches. Aseptic packaging, like Tetrapak, now allows milk to be stored for up to three months without refrigeration.

**Flavoured Milk:** Flavoured milk, often low-fat, is packaged in materials like OLLDPE, which is puncture-resistant. Packaging includes glass bottles, plastic sachets, and aseptic packs. HDPE and PET containers have been introduced for their

durability and light weight.

### **Condensed and Evaporated Milk:**

Traditionally packed in tinplate containers, these products are now also available in aseptic Tetrapaks, offering longer shelf life and convenience.

#### **• Dairy Products**

**Butter:** With 80-82% fat, butter is prone to rancidity and mould. It is typically wrapped in parchment paper laminated with aluminium foil to protect against oxygen and light. For longer storage, plastic tubs and sealed tinplate containers are used.

**Ghee:** Due to its high fat content, ghee is traditionally packed in tinplate containers to prevent oxidation. For shorter shelf life, polyethylene pouches are used, while laminated pouches with high barrier materials extend shelf life.

**Milk Powder:** Milk powder, which absorbs moisture easily, is packed in multiwall paper sacks with plastic liners or in tinplate containers with nitrogen flushing for extended shelf life. Flexible plastic pouches and laminated packaging are increasingly common.

**Ice Cream:** Ice cream packaging has shifted from paperboard cartons to

# Table 1. Classification of packaging and distribution systems

Liquid milk	Returnable containers		Single service containers					Despatch by tankers to vending machines
	Glass bottles	Plastic bottles	Cans	Cartons	Sachets	Plastic bottles	Bag in box	
Pasteurized	+	+	+	+	+	+	+	+
Sterilized	+					+		
UHT-aseptic				+	+	+		

thermoformed or injection-molded plastic containers made from materials like HIPS, PP, or HDPE, which are more hygienic and durable.

**Malted Milk Food:**

Sensitive to moisture and oxidation, malted milk food has transitioned from glass or tins to plastic containers and flexible laminated pouches for better protection and cost efficiency.

**Cheese:** Cheese, sensitive to moisture and oxygen, has moved from traditional tins to flexible laminates and plastic tubs, offering better protection and convenience.

**Yogurt:** Once sold in earthenware pots, yogurt is now commonly packaged in polystyrene or polypropylene cups with aluminium foil lids, providing about 10 days of shelf life under refrigeration. Drinking yogurt is available in plastic bottles, Tetrapacks,

and gable-top cartons. India's traditional dairy products, made by local "halwais," face challenges like microbial contamination, inconsistent quality, and rapid spoilage due to inadequate packaging and infrastructure. Traditional packaging materials like leaves and paper cartons fail to protect against contamination and spoilage. Innovative packaging, such as saran-coated films and laminated plastic cans, is needed for better preservation. With organized dairies now producing items like gulab jamun and lassi, there's a growing focus on improving quality, packaging, and global marketing. Continuous advancements in packaging, transportation, and indigenous dairy equipment are crucial for the sector's growth.

**Conclusion**

Technological advancements have significantly improved the efficiency and economy of milk and milk product distribution, driving innovation in packaging. These innovations encompass new systems,

materials, machinery, and designs that prioritize environmental considerations. As a result, consumers benefit from greater convenience, extended product shelf life, and enhanced safety and hygiene, all while reducing costs and boosting sales. Plastics have played a crucial role in these improvements by ensuring longer shelf life and safe delivery of dairy products. To remain competitive globally, the Indian dairy industry must continuously strive to meet evolving product and packaging standards through ongoing research and development.

The packaging technologies in the dairy industry are evolving to meet the demands of both consumers and the food sector. New packaging concepts offer increased protection and extended shelf life, with some advanced methods even providing information about product freshness. These innovations not only improve product safety but also enhance overall consumer experience.



# Management of Antepartum Cervicovaginal Prolapse in Buffaloes



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Buffaloes comprises 21.23% of total livestock of the India with the total population of 108.7 millions (19th Livestock Census). The India is at first rank in the world comprising with more than half population of world buffaloes found here. Buffaloes are contributing more than half in the total milk production in the India and are thus forming major part in the Indian economy. Out of total buffalo population in the India, majority is been reared by small and marginal farmers and mainly stall-fed. Buffaloes differs in many significant ways from the cows and also the incidence of many diseases are more in buffaloes leading to their poor reproductive performance. The most devastating disease causing huge economic losses to the farmers is the antepartum prolapse of vagina and cervix. It is the protrusion of the vagina and cervix through the vulva in the advanced pregnant animals. The cervicovaginal prolapse has more incidences in buffaloes and is more related to pluriparous animals as compared to primiparous animals. This is associated with mainly last 2-3 months of pregnancy but cases are also reported in 5-6 months pregnant animals also. Antepartum prolapse is associated with many complications during the pregnancy as well at the time of parturition and after parturition in the form of puerperal metritis, retention of placenta, postpartum prolapse, decreased appetite and milk yield etc. Proper care and management of buffaloes with special attention to the nutrition can decrease the incidence of prolapse and also can

also help in its management to prevent reoccurrence.

## **Causes of cervicovaginal prolapse**

The exact cause of cervicovaginal prolapse in buffaloes is not known but many factors are there which predisposes the animal and are associated with the incidence of antepartum cervicovaginal prolapse in buffaloes.

- i. High level of Estrogen:** There are more chances of occurrence of ante partum prolapse in buffaloes 6.5 months onwards of pregnancy. High level of estrogen is supposed to be one cause of prolapse in buffaloes in the late pregnancy. This increased level of estrogen is associated with the relaxation of the sacrosciatic ligaments and the pelvic structure loosening with vulvar edema and predisposes the animal for prolapse of reproductive organs. Some feeds like berseem, moldy barley and maize are also high in the level of estrogen and excessive feeding of these feed materials is also found associated with increased incidence of the prolapse.
- ii. Low level of calcium:** The low level of calcium in the diet is also associated with the high incidence of the prolapse because low level of calcium causes atony of the reproductive tract in pregnant animals leading to expulsion of reproductive organs with straining.
- iii. Increased intra-abdominal pressure:** In the advanced



pregnancy the increase intra-abdominal pressure is also a predisposing factor in occurrence of antepartum prolapse in buffaloes because this increased pressure causes more pressure on the flaccid and loosely attached structures like vagina leading to its expulsion outside the body.

**iv. Excessive deposition of fat:**

The excessive deposition of fat in the pelvic area perivaginally also increases the intrapelvic pressure and predisposes the animals to straining and

prolapse.

**v. Deficiency of micronutrients:**

It is also observed that deficiency of certain microelements like copper, iron, selenium, zinc is also associated with the occurrence of the prolapse in buffaloes.

**vi. Hereditary predisposition:**

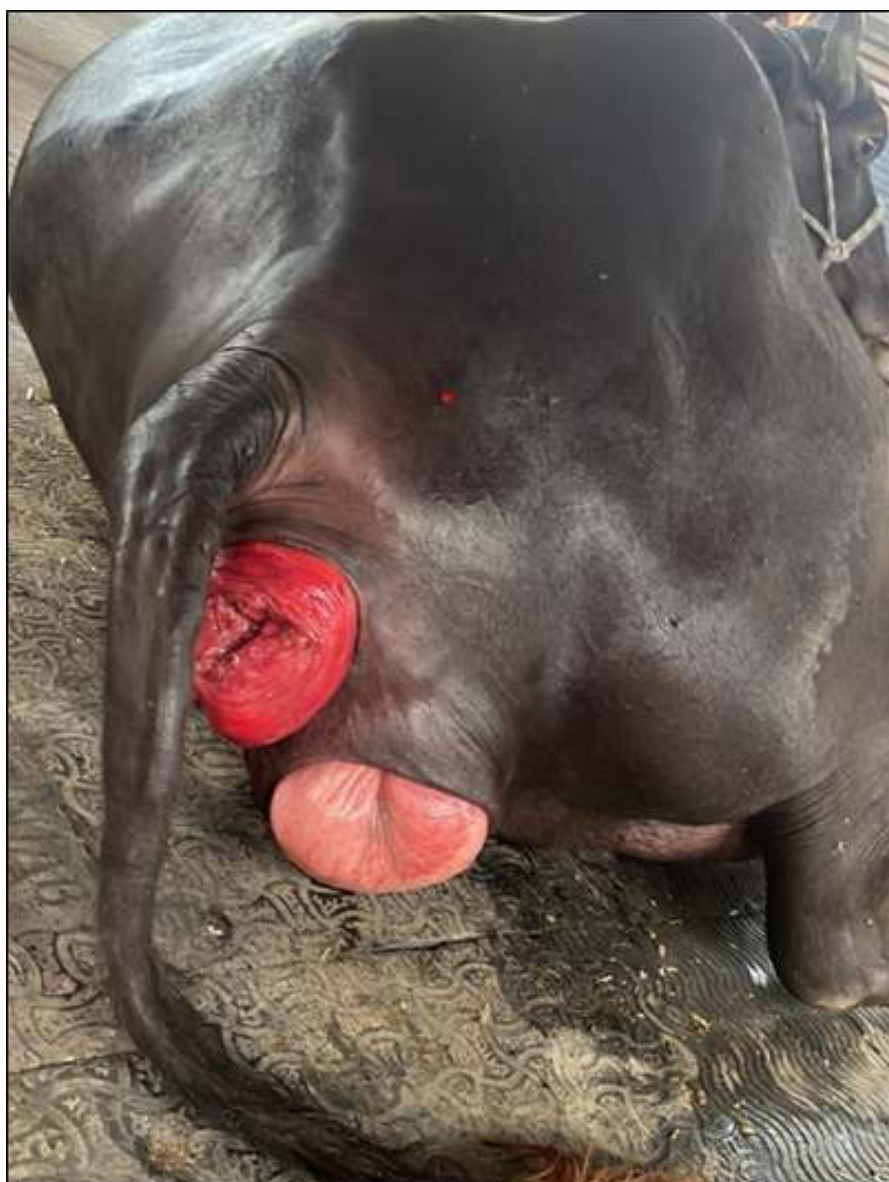
The hereditary predisposition of the occurrence of prepartum prolapse is also observed in buffaloes in which the daughters of dams affected with prolapse are also having the problem related to prolapse.

**vii. More incidences in stall-fed animals:**

High incidence of prolapse is found to be associated with stall feeding as compared to managed farms. The exact reason is not known but is thought to be due to poor plane of nutrition in the animals which are stall fed as compared to the farm nutrition level. Close confinement of the animals in the stalls also causes problems in the animals.

**viii. Excessive feeding of dry fodder:**

High level of dry fodder like, wheat straw is also a predisposing factor which causes increased straining in the animals and prolapse of reproductive organs occurs.



*Fig. 1: Ante-partum vaginal prolapse along with rectal prolapse in a buffalo*

**Clinical signs and symptoms**

There can be different stages of prolapse of reproductive organs in the animals associated with the severity of occurrence.

- a. Stage 1- In these cases the vaginal mucosa protrudes outside of the vulva when the animal is sitting or in recumbent condition but it goes inside when animal stands up.
- b. Stage 2- The prolapsed mass remains visible outside the vulva when animal stands up but it only consists of vaginal mucosa.
- c. Stage 3- Cervix along with vagina comes outside the vulva.

The cervicovaginal prolapse is most commonly encountered in the last trimester of pregnancy and protrusion may vary from mild to severe. The clinical signs associated with prolapse of vagina and cervix in buffaloes are:

- Straining.
- Prolapsed mass hanging outside the vulva.
- Edema of prolapsed mass.
- Retention of urine is most commonly associated with the prolapse and animal urinates in

more amounts after repositioning of the organs inside.

- Animal becomes offed and lethargic.
- Breakdown of the cervical seal can lead to abortion.
- In unattended cases death may also occur due to necrosis of organs, septicemia and toxemia.

### **Consequences of antepartum cervicovaginal prolapse**

The occurrence of antepartum cervicovaginal prolapse in the buffaloes is associated with many consequences which can be:

- Flies sitting on the prolapsed mass invites the infection of the vagina and cervix causing continuous irritation and straining.
- Prolonged exposure of prolapsed mass can cause inflammation of the vagina and cervix and necrosis.
- Reoccurrence of prolapse can occur.
- Abortion.
- Death of animal can occur in unattended cases.
- Infection of genital tract may result in retention of placenta, cervicitis, metritis and infertility in some cases.
- Postpartum prolapse of uterus can also occur.

### **Management and treatment of cervicovaginal prolapse**

The aim of management and treatment of the animal suffering from the prolapse is to prevent the reoccurrence of the prolapse and to prevent further damage to the prolapsed mass. For the repositioning of the prolapsed organs inside the body three things to be kept in mind are:

- i. Reduction in the size of the prolapsed mass:** The prolapsed mass which is swollen due to edema is reduced in size by

application of ice, cold water, alum salt and squeezing with a towel wrapped around the organs. The use of sugar for the reduction in the size of prolapsed mass should be avoided because sugar will invite the flies and leads to infection.

- ii. Replacement of the prolapsed mass inside the body:** The prolapsed mass should be cleaned properly with either fresh water or mixing 1:1000  $\text{KMnO}_4$  in the water. After washing the prolapsed mass, it should be smeared with the

antiseptic ointment and then this mass is kept inside the body. While pushing the prolapsed mass inside the body it should be kept in the mind that hands should be clean and nails should be trimmed otherwise it can cause the injury to prolapsed mass and can lead to infection. Pressure should be applied with the palm first and the after introducing the part near to vulvar lips pressure must be applied with fist. It is better to avoid the use of fingers.

- iii. Retention of the prolapsed**



*Fig.2: Ante-partum prolapse of vagina, cervix and uterus (having fetus in it) in a buffalo*

**mass in the body:** Different conservative and surgical methods are used to keep the prolapsed mass inside the body.

- The conservative method of retaining the organ in the position includes the application of 'Rope truss' at the vulvar lips of the animal and the farmer should be able to check it when needed.
- The surgical methods of retention are : 1. Buhner's sutures
  2. A. G. Teck profix button
  3. Flessa sutures
  4. Cervipexy/Winker's technique

The supportive therapy which should be given to the animal after the repositioning of organs includes:

- a. Calcium therapy – 450 ml of calcium borogluconate should be administered slowly intravenously.
- b. Long acting antibiotics like Ceftiofur, Enrofloxacin, Oxytetracycline should be given to prevent occurrence of infection.
- c. Anti-inflammatory and analgesic drugs should be given to the animal to decrease pain and inflammation.
- d. Supportive therapy like antihistamines, vitamin-B complex and other antistress preparations should be given.
- e. The use of herbal medicines like castor oil for the smearing on the prolapsed mass after proper cleaning with the water. 100gms of fresh leaves of *Abutilon indicum* [Indian mallow], mildly fried in castor oil and macerated finely, administered orally once daily have shown good results in some animals.

**Precautions to be adopted to control the occurrence of ante partum cervicovaginal prolapse and its management**

1. Before buying the animal it should be kept in mind that

1. animal should not have history of cervicovaginal prolapse.
2. It should be kept in mind that daughters of a dam previously suffering from prolapse should not be reared because it is hereditary in nature.
3. Proper plane of nutrition should be kept for the advanced pregnant animals as per the requirements.
4. There should be regular feeding of mineral mixture of good quality to the animals @ 2% of ration because deficiencies of different microelements is also found associated with the occurrence of the cervicovaginal prolapse.
5. The animal in the advanced pregnancy should be provided laxative diet to prevent impaction and straining.
6. Reduce the amount of total feed

offered to animal when once the prolapse has occurred to prevent its reoccurrence.

7. Lift the hind limbs of the affected animal by means of inclined platform towards the rear portion of the animal.
8. Before replacing the prolapsed mass inside the body it should be properly washed with the water or non-irritant antiseptic solution.
9. Stop the feeding of suspected fodder like berseem, moldy maize or barley to the advanced pregnant animals at risk.
10. Provide the animals clean and adlib water to drink.
11. Provide as much as cool climate to the animals during summer. Heavy plantation around the farm, sprinkling water, bathing and roof painting will help to keep the animals cool and healthy in summer.



*Fig.3: Application of Rope Truss in a buffalo as preventive measure for genital prolapse*





## Livestock Expo 2024: A Hub for Networking, Education, and Innovation in Livestock Industries

The Livestock Expo 2024, a prominent event for the poultry, dairy, and aquaculture sectors, took place from August 9 to August 11 at the India Expo Mart in Greater Noida. It included three unique expos: poultry, dairy, and aquaculture, each displaying the most recent advances and breakthroughs in their respective sectors.

The event is devoted to displaying the most recent advances and developments in the cattle business. The exhibition, which brings together leaders and experts from the poultry, dairy, and aquaculture industries, offers a complete forum for researching new technology, analysing industry trends, and improving the future of animal production.

The Livestock Expo 2024 is enthusiastically sponsored by notable organisations such as the Poultry Federation of India (PFI), the Compound Livestock Feed Manufacturers Association (CLFMA), and the Broiler Breeders Association of India (BBAN). In addition, the Foundation for Aquaculture Innovations and Technology Transfer (FAITT) and the Kerala Poultry Farmers and Breeders Association (KPFBA) are working as knowledge partners, bringing their expertise to the expo. The Livestock Expo was kicked off by the Mr. Azad Rathi, President of Broiler Breeders Association, Dr. M Dhanraj, Managing Director of FAITT and Dr. Sandeep, Managing Director of Noveltech Feeds Pvt Ltd. Their involvement demonstrates the event's commitment on

developing farming via innovations in feed, technology, and health management, among other things. The event showcases cutting-edge solutions from important industry participants while also providing significant insights into the future of cattle.

The Dairy Expo included a diverse range of dairy-related areas. Dairy feed and grain equipment are key topics, with an emphasis on the most recent advances in nutrition and feed technology. Animal production innovations will focus on techniques and technology that enhance dairy output and quality. Along with advances in healthcare to guarantee the health of dairy cows. It will also cover the processing methods and technology required for effective dairy production, as well as provide





a detailed overview of the most recent industry innovations.

The Poultry Expo showcased a wide variety of industries, including poultry feed, technology, healthcare, poultry processing, and equipment. Attendees saw the most recent developments in feed nutrition, automation, veterinary care, processing processes, and farming equipment, providing a thorough picture of breakthroughs impacting the future of chicken farming.

The Aquaculture Expo featured a wide range of sectors, including aquaculture feed, which showcased advanced nutritional solutions; technology, which showcased

innovations in automation and monitoring; healthcare, which featured the latest in veterinary products and disease management; processing, which highlighted improvements in techniques and quality control; and machinery, which displayed essential equipment for efficient aquaculture operations. This thorough approach provides a detailed look of the developments that are defining the future of aquaculture.

**How did the participants benefit?**

Participating in a livestock show that focusses on poultry, dairy, or aquaculture offers various advantages. It provides important networking chances for

stakeholders to meet with industry leaders, suppliers, and possible partners. The exhibition also gives insights into market needs and customer preferences, which improves strategic decision-making. Increased brand exposure, instructional sessions, and lead generation are all additional benefits. Furthermore, participants may evaluate rivals' offers and get direct product feedback, which is critical for product refinement and market fit. Overall, it's a complete platform for industrial expansion and advancement.

**How did it benefit the visitors?**

A cattle exhibition provides various advantages to visitors as well.







Attendees have access to cutting-edge innovations and technology, which improves their grasp of industry breakthroughs. Seminars and workshops are excellent ways to learn about best practices and upcoming trends. Networking with industry people, including suppliers and specialists, encourages prospective collaborations and partnerships. Visitors may observe and assess new items in demos, allowing them to make more educated purchase choices.

Additionally, the exhibition delivers industry insights, assisting visitors in understanding trends and consumer preferences, as well as solutions to particular difficulties, hence enhancing operational efficiency and competitiveness.

The event provided excellent networking opportunities by linking stakeholders and fostering partnerships that might lead to corporate success. Furthermore, the exhibition provided crucial market information, which aided strategic

planning and decision making. The exhibition promotes professional growth and overall industry success by generating leads and extending commercial prospects, making it a critical event for moving the cattle sector forward.

The Livestock Expo 2024 was the top event for networking, education, and uncovering new prospects in the poultry, dairy, and aquaculture sectors.













# 2024 McKown Master Breeder

## Award presented to Maple-Dell Farm



**David (right) and Ann (left) Patrick, of Maple-Dell Farm, Woodbine, Md., have been awarded the 2024 Robert "Whitey" McKown Master Breeder Award.**

Family, tradition, and love for the Ayrshire breed are pillars of Maple-Dell Farm of Woodbine, Md. The generational farm owned and operated by David Patrick and his wife Ann, along with their two sons Mike and Denny, and a grandson, Derek was selected by the Klussendorf Association as this year's recipient of the Robert "Whitey" McKown Master Breeder Award. Exceptional dairy cattle breeders are awarded the title, and embody attributes associated with the Klussendorf award including character, ability, endeavor, and sportsmanship. The Patrick family is distinguished for their success in breeding excellent Ayrshires and the positive image they've established for their family farm.

The dairy farm's beginnings date back to 1928. However, it wasn't until 1941 that David Patrick's father bought him two Ayrshire calves which sparked a passion and love for the breed. Just 14 years later, the two calves had developed into a herd of 45 registered Ayrshires. The family now farms 1,200 acres, milks 165 cows, and raises over 160 heifers in the same location where it all began. The herd has been production testing for over 60 years and classified for 40, with the ultimate goal of getting productive cows with solid feet and legs and high scoring udder traits. Maple-Dell Farm earned the title of the Ayrshire Association's Master Breeder in 2010 and 14 constructive breeder awards for the herd's

outstanding production and type. It's undeniable their breeding program is an indisputable success, with their pre-fix Md-Maple-Dell.

The Maple-Dell herd has proven instrumental to the Ayrshire breed, setting a high bar for quality cattle. Over 100 cows in their herd have been classified as Excellent, with one cow scored at 95 points. Several cows with the Maple-Dell prefix have been awarded prestigious titles, with 17 All-American, 18 Reserve All-Americans, and multiple cows ranking on the Cow Performance Index (CPI) with high lifetime milk production.

Maple-Dell farm is widely recognized for producing high-profile cattle, the most recent family line being the "D's", leading with Maple-Dell Zorro Dafourth. The iconic cow was selected as Grand Champion at the 2006 All-American Dairy show and World Dairy Expo (WDE) Reserve Grand Champion. Following four generations, cows produced from the family line have ranked at high levels on the CPI cow list. The breeding line has also produced accomplished bulls seeing that three bulls from the family, Maple-Dell Modem Drew, Maple-Dell Modem Diego, and Maple-Dell O Dixon, have all had active A.I. usage.

Other infamous cows of the Maple-Dell herd include Maple-

Dell Hi-Kick Sweet Pea, which represented the Ayrshire breed on the Purina Mills "Dairy Breeds of North America" painting by Bonnie Mohr. The cow continued on as Grand Champion at the Eastern National show in 1988 and is the dam of popular A.I. sire, Maple-Dell Soldier.

Success for the Patrick family goes far beyond the breeding pen. Showing Ayrshire cattle for over 75 years, their pre-fix has traveled as far as international shows, demonstrating the quality and excellence of the family's herd. Maple-Dell Farm has championed many winning cows at various shows, including the All-American Dairy show for over 50 consecutive years, and winning the show's Obie Snider award in 2006. The accolades continued onto the Maryland State Fair with 12 grand champions, and WDE with back-to-back Grand Champions, Maple-Dell Luby in 1981 and Ardrossan Kellogg Soft Eye in 1982. The awards at WDE continued with two Junior Champions, Maple-Dell BBK Shea in 2006 and Maple-Dell Diligent Gift in 2007. One of Maple-Dell's cows made Ayrshire breed history, with Maple-Dell I.R.S. Sweetnine who won at the Royal Agricultural Winter Fair in Canada. This same cow was a junior champion Ayrshire at WDE. The Patrick family is familiar with service and leadership, being active members of the U.S. Ayrshire Breeders' Association for several decades. The Patrick family has supported a multitude of associations, including the Maryland Purebred Dairy Cattle

Association, Wills Fair Association, Maryland/Delaware Ayrshire Association, and All-American Dairy Show Board. Being recognized for this leadership in 2007, Maple-Dell farm was inducted to and now holds a place in the Maryland Governor's Agricultural Hall of Fame. In 2020, National Dairy Shrine awarded Maple-Dell its highest honor for a cattle breeder with its Distinguished Cattle Breeder Award.

Beyond their farmland, the Patrick family is actively involved in their surrounding community by providing opportunities for youth in agriculture. Whether hosting fitting and judging workshops or leasing over 20 head of dairy cattle each year to 4-H members for show, the Patrick's have inspired positive agricultural experiences among the younger generations.

Maple-Dell farm has driven success in the Ayrshire breed, having proven influential to the dairy community around them. Their motivation for producing quality Ayrshire cattle has resulted in astounding achievements for their herd and their combined love for dairy and family has undoubtedly earned Maple-Dell Farms the title of the 2024 McKown Master Breeder Award.

Past winners of the Robert "Whitey" McKown Master Breeder Award include: Spring Valley and Heath Jerseys, Westminster, Md., 2023; Palmyra Farm, Hagerstown, Md., 2022; Cutting Edge Brown Swiss, Copake, N.Y., 2021; (no winner named in 2020 due to the

COVID-19 pandemic) Woodmansee Holsteins, Preston, Conn., 2019; Ovaltop Holsteins, Richfield Springs, N.Y., 2018; Wendon Holsteins, Innisfail, Alberta, 2017; Ferme Jacobs Inc., Cap-Santé, Quebec, 2016; Walk-Era, Wisconsin Dells, Wis., 2015; Pond View Farm, Danville, Vt., 2014; Quality Holsteins, Vaughan, Ontario, 2013; Windsor Manor Farms, New Windsor, Md., 2012; Moondale, Monona, Iowa, 2011; Snider Homestead, New Enterprise, Pa., 2010; and Windy Knoll View, Mercersburg, Pa., 2009. No award was given in the pandemic year of 2020.

The Robert "Whitey" McKown Breeder Award was made possible by the family and friends of the 1997 Honorary Klussendorf honoree after his passing in 2009. McKown joined the Holstein World staff in 1956 and became widely respected as he traveled nationally and internationally, reporting on shows, sales, meetings, and other Holstein events. The 1987 National Dairy Shrine president also developed McKown Holsteins at Belleville, N.Y. He had great admiration for the farmer breeder.

The Klussendorf Memorial Association, considered by many as the Hall of Fame for dairy cattle exhibitors, began in 1937 in memory of Arthur B. Klussendorf, considered the outstanding dairy cattle showman of his time. Each year, the Klussendorf Association votes to add a new dairy cattle exhibitor to its rolls with lifetime membership for their cumulative works.

# ADM Appoints

## Monish Patolawala as Executive Vice President and Chief Financial Officer



ADM announced the appointment of Monish Patolawala as Executive Vice President and Chief Financial Officer, effective August 1, 2024, succeeding Ismael Roig, who has been serving as ADM's Interim CFO since January 2024. Mr. Patolawala brings to ADM more than 25 years of experience overseeing global finance and technology teams across leading industrial and healthcare companies, most recently including 3M. As EVP and CFO of ADM, Mr. Patolawala will be responsible for overseeing Global Finance and Accounting, Global Business Services, Global Technology and Enterprise Strategy.

Chair of the Board and CEO Juan Luciano said, "We are thrilled to have an executive of Monish's caliber joining ADM as we focus our enterprise on productivity, innovation and delivering with excellence.

Monish has extensive experience and an impressive track record leading global, sophisticated finance and technology organizations and delivering strong results. With more than 25 years overseeing innovation and sustainability focused teams across leading industrial and healthcare companies, we are confident that Monish is a strong fit for ADM's continually evolving organization. Today's announcement is the culmination of the Board's thorough and thoughtful process to identify a proven leader to oversee our finance team as we execute with excellence across our strategic and operational priorities."

Mr. Patolawala said, "It is an honor to join ADM as CFO at an important point in the Company's trajectory. As a child growing up in India, I witnessed severe poverty and hunger

firsthand, and that's what makes me so passionate about the important work that ADM is doing to feed the world through its purpose of unlocking the power of nature to enrich the quality of life. As a member of the executive team, I look forward to drawing upon my experience to advance ADM's operational excellence and discipline, as we deliver for our stakeholders and drive shareholder value."

Mr. Luciano continued, "On behalf of the Board, I would like to acknowledge and thank Ismael for stepping up to lead as Interim CFO and supporting a seamless transition. We will continue to benefit from his extensive expertise as President of EMEA and President of Animal Nutrition."

Mr. Patolawala most recently served as President and CFO of 3M Company where he led finance, country prioritization and country governance, information technology, enterprise strategy and global service centers. Prior to joining 3M, Mr. Patolawala spent more than two decades at GE in various finance roles, including as CFO of \$20 billion GE Healthcare from 2015 to 2020 and also as head of operational transformation for all of GE from 2019 to 2020. Mr. Patolawala also currently serves on the Board of Directors of biotechnology leader Biogen Inc.

### About ADM

ADM unlocks the power of nature to enrich the quality of life. We're an essential global agricultural supply chain manager and processor, providing food security by connecting local needs with global capabilities. We're a premier human and animal nutrition provider, offering one of the industry's broadest portfolios of ingredients and solutions from nature. We're a trailblazer in health and well-being, with an industry-leading range of products for consumers looking for new ways to live healthier lives. We're a cutting-edge innovator, guiding the way to a future of new consumer and industrial solutions. And we're a leader in sustainability, scaling across entire value chains to help decarbonize the multiple industries we serve. Around the globe, our innovation and expertise are meeting critical needs while nourishing quality of life and supporting a healthier planet. Learn more at [www.adm.com](http://www.adm.com).



# FAO Workshop with Animal Husbandry Department in India Sets the Stage for Standardized Veterinary Treatment Practices

The Food and Agriculture Organisation of the United Nations (FAO) and the Department of Animal Husbandry and Dairying co-hosted a two-day workshop on 8-9 August 2024 to finalise the Standard Veterinary Treatment Guidelines (SVTGs). Over 70 participants from the veterinary and animal health sectors, including representatives from ICAR Animal Science Institutes, Veterinary Universities, private sector organisations such as the Indian Federation of Animal Health Companies (INFAH), and international bodies such as USAID and Jhpiego, attended the workshop, which was supported by USAID.

One of the primary goals of this workshop was to collaboratively establish guidelines that would standardise veterinary practices in India. Aiming to harmonise animal treatments, the SVTGs, in conjunction with a Ready-Reckoner, are designed to produce safer animal-source foods (ASFs) and healthier animals. In an effort to mitigate the risk of antimicrobial resistance (AMR) and reduce residues in ASFs, these guidelines

are designed to reduce the superfluous use of antimicrobials, pharmaceuticals, hormones, and other medications. Treatment protocols for 274 maladies across 12 main species, including cattle, buffalo, sheep, goat, poultry, swine, equines (horses, donkey, mule), camel, yak, and Mithun, will be covered by the SVTGs.

According to Takayuki Hagiwara, the FAO Representative in India, the SVTGs will enable more effective disease control and establish a foundation for evaluating and comparing the quality of care, thereby promoting improved planning and adherence to treatment standards.

Alka Upadhyaya, Secretary of the Department of Animal Husbandry and Dairying in the Government of India, expressed her appreciation for the initiative, affirming that the guidelines document will be a valuable resource for animal health workers, paraprofessionals, and veterinary professionals in India. It is essential that it is routinely reviewed and revised to account for the latest



research and technologies in the animal health sectors. It is commendable that FAO India has made the effort to undertake this extensive endeavour.

It is anticipated that the results of this workshop will have a substantial impact on the veterinary sector in India, thereby establishing a significant milestone in the standardisation of veterinary practices and their alignment with global best practices. By advocating for integrated health solutions for the environment, animals, and humans, this initiative also advances the objectives of the One Health approach.





# e-Pashu Chikitsa Shivir, focusing on animal health and deworming during the monsoon season, organized



ICAR-Krishi Vigyan Kendra, Askokenagar, North 24 Parganas, ICAR-Agricultural Technology Application Research Institute, Kolkata and the Reliance Foundation jointly organized e-Pashu Chikitsa Shivir, focusing on animal health and deworming during the monsoon season today through video conferencing. This initiative aims to overcome the challenges farmers face in accessing

Veterinary Officers due to limited time, long distances, and unfavorable weather conditions.

Dr. Pradip Dey, Director, ICAR-ATARI, Kolkata, emphasised the importance of e-Pashu Chikitsa in providing practical knowledge and advice on managing livestock health, particularly during the monsoon season. Dr. Dey highlighted the benefits of technology and convergence

in promoting valuable information and equipping farmers with necessary tools for livestock well-being.

The farmers participated in a comprehensive Q&A session, shared their concerns, and received suggestions for solutions.

A total of 42 farmers engaged in livestock farming from North and South 24 Parganas participated in the programme.

# Pertinent Topics Covered in 2024

## Expo en Español Sessions

MADISON, WIS. – Created for Spanish-speaking dairy owners, managers, and mid-managers, Expo en Español returns yet again to World Dairy Expo this fall. Presented exclusively in Spanish, Expo en Español will be hosted at 2:00 p.m., Tuesday through Friday during World Dairy Expo, in Mendota 1 of the Exhibition Hall. Each session includes a presentation and a question-and-answer segment.

Below is the 2024 Expo en Español schedule that can be enjoyed in person at WDE or online through ExpoTV at [www.worlddairyexpo.com](http://www.worlddairyexpo.com). Two sessions are approved for one continuing education credit for members of the American Registry of Professional Animal Scientists (ARPAS).

World Dairy Expo thanks Progressive Dairy for sponsoring the complete Expo en Español schedule.

Tuesday, October 1

### Women in Dairy - Panel

Panelists: Caitlin Cramer, Calf and Heifer Manager & HR and Animal Welfare Coordinator, Legacy Farms, LP; Rosario Ibarra, General Manager, Grotegut Dairy Farm, Inc.; Alison Pfau, M.S., Bilingual Regional Dairy Educator, UW-Madison Division of Extension

Moderator: Marcela Martinez, Research Technologist, Penn State University Department of Veterinary and Biomedical Sciences

The role of women in modern dairy farming has evolved. From the traditional bookkeeping position to training employees, managing dairies, or doing scientific research, a new generation of women are actively involved in the dairy community. Latinas are also increasing their presence in the industry, breaking gender stereotypes, but also facing racial and cultural challenges as they join the ranks in the dairy business.

Wednesday, October 2

### Leadership Starts with Us

Juan Quezada, Director of Training and Development, Milk Source, LLC

This seminar will highlight how each employee – no matter the title or length of employment – can become a better leader in the day-to-day workplace.

Thursday, October 3

### Animal Welfare: What are Dairy Managers Responsible For?

Noa Román-Muñiz, DVM, MS, Professor, Colorado State University

Approved for (1) ARPAS Continuing Education Credit

This session will highlight the challenges that dairy cattle caretakers face and key practices that managers could employ to support a team dedicated to excellent animal welfare on their dairy.

Friday, October 4

### Training Your Milking Team: The Key to Labor Retention on Dairy Farms

Carolina Pinzón, MS, Bilingual Dairy Outreach Specialist, University of Wisconsin-Madison, Division of Extension

Approved for (1) ARPAS Continuing Education Credit

Attendees will gain insights into adult education principles, educational resources, and effective strategies for training team members, especially those involved in milking and handling animals. This approach benefits the cows, the employees, and the dairy farm—a win for everyone involved.

Serving as the meeting place of the global dairy industry, World Dairy Expo is the premier forum for the global dairy community to learn, share, create commerce and showcase competition. The annual event will return to Madison, Wis. October 1-4, 2024, where dairy producers near and far can experience the world's largest dairy-focused trade show, a world-class dairy cattle show, attend seminars, meetings and presentations highlighting the latest and greatest in the industry and connect with other producers. Download the World Dairy Expo mobile app, visit [worlddairyexpo.com](http://worlddairyexpo.com) or follow WDE on Facebook, Instagram, LinkedIn, Spotify, or YouTube for more information.

# Dr Emmanuelle Soubeyran takes up position as new WOAAH Director General

**Today the World Organisation for Animal Health (WOAH) marks an important milestone in its history as Dr Emmanuelle Soubeyran officially takes up her position as the new Director General for a five-year tenure from 2024.**

Dr Soubeyran, a veterinarian by profession, has vast experience and an illustrious career in veterinary public health and animal health. Once the dean of the National Veterinary School of Lyon (VetAgro Sup), from 2016 to 2021, she is also the former Deputy Director General for Food within the French Ministry of Agriculture and Food Security, the Head of French Veterinary Services as well as the French National Delegate to WOAAH. With over fifteen years of leadership in national and regional positions, Dr Soubeyran is well poised to lead WOAAH towards attaining its objectives and furthering its mission in the global arena.

Dr Soubeyran's five-year tenure will focus on three pillars:

- 1. Increase visibility of WOAAH:** Animal Health plays a pivotal role in global issues such as food security, economy, trade, public health, biodiversity, and climate change mitigation. With a view to garner financial, technical, and public support, Dr Soubeyran will strategically mobilise significant resources by amplifying WOAAH's voice. She will convince decision makers that the cost of inaction far exceeds the cost of prevention.
- 2. Strengthen Veterinary Services:** The capacity of Veterinary Services is limited, with only 7% of WOAAH Members having optimal capacities. Dr Soubeyran proposes to strengthen this workforce considering that it is critical for safe and sustainable food production.
- 3. Modernise WOAAH:** In our fast-changing world, WOAAH must adapt to remain agile, inclusive, and innovative. Dr Soubeyran will support

increased inclusivity, digitalisation, and data-driven approaches, including big data processing and new technologies for disease surveillance.

As WOAAH builds on its century of unwavering commitment to global animal health, Dr Soubeyran is uniquely positioned to usher a new era and spearhead the Organisation in charting a sustainable future. The road ahead comes with major animal health and welfare challenges where WOAAH's leadership with its partners will be critical in finding solutions. The new Director General anticipates with great enthusiasm, the opportunity to achieve the Organisation's objectives through close collaboration with Members and their Delegates, the Council and the Regional Commissions, WOAAH staff, other international organisations and all stakeholders across sectors. Because animal health is our health. It's everyone's health.

## Fischer MV Expands into Animal Health with Strategic Partnership with Bio Angle Vacs



Fischer Medical Ventures Ltd (Fischer MV), a pioneering force in the healthcare industry, has confirmed its investment and collaboration with Bio Angle Vacs Sdn Bhd (BAV), a leading biotechnology company in Malaysia. BAV is a company that specialises in the development, manufacture, and distribution of vaccines to small and large-scale farming owners worldwide, with a particular emphasis on the prevention of health and disease in livestock and aquaculture.

BAV has secured a total of US\$ 83 million in annual sales contracts from China, Nigeria, Kenya, Chad, Uganda, Uzbekistan, and Indonesia for its selection of innovative, highly sought-after animal vaccines.

By utilising cutting-edge innovations and AI-powered software solutions in healthcare, Fischer MV (formerly known as Fischer Chemic Ltd) is recognised for its affordable and high-quality medical diagnostic and imaging technologies. Fischer MV is the first company in India to manufacture sophisticated Magnetic Resonance Imaging (MRI) systems

in-house. Additionally, the company possesses a diverse portfolio of innovative diagnostic solutions and an AI healthcare platform.

BAV, which was established in 2013, has transformed the animal vaccination industry by implementing innovative delivery methods that prioritise safety, efficacy, and quality. In collaboration with scientists from the Faculty of Veterinary Medicine at Universiti Putra Malaysia (UPM), BAV's founder, Prof. Mohd Zamri Saad, devised and patented its flagship innovation, the Spray Technology Vaccine (STVAC).

Ravindran Govindan, the Executive Chairman and MD of Fischer MV, announces the collaboration with assurance: "This partnership with BAV is our dedication to ensuring food security, beginning with India, which has the second-largest population of sheep and goats at approximately 223 million, and where food security is becoming increasingly problematic." With Fischer MV's strategic network, robust resources, and expertise in MedTech solutions, we are eager to introduce BAV's innovative, cost-effective animal vaccines and products to the global market in order to enhance food safety.

Noor Shazreena Ishak, CEO of BAV, is delighted to announce her partnership with Fischer MV. "We are dedicated to providing straightforward, cost-effective, and dependable solutions that alleviate the stress of our livestock and aquaculture and significantly enhance the return on investment for farmers in light of the increasing demand for preventive healthcare in the animal world." This partnership with Fischer MV will provide us with enhanced science, technology, and marketing support,

enabling us to satisfy the global demand for high-quality and cost-effective animal vaccines and, as a result, alleviate the global burden of animal diseases.

Fischer MV is at a critical juncture in its endeavour to enhance global food security and health as a result of this partnership with BAV. Fischer MV is dedicated to taking a significant step towards ensuring the safety and resilience of the global food supply, thereby directly contributing to the improvement of healthcare and the well-being of individuals worldwide.

## Dechra Pharmaceuticals to Acquire Invetx Inc. in \$520 Million Deal to Expand Veterinary Biotherapeutics



Dechra Pharmaceuticals Limited (Dechra), a global specialist veterinary pharmaceuticals business, has agreed to acquire Invetx Inc., a pioneer in protein-based therapeutics for animal health, for a total consideration of up to \$520 million on a cash-free and debt-free basis. The acquisition is still contingent upon antitrust approval and other customary closing conditions.



"We are delighted to be collaborating with Dechra Pharmaceuticals, a global leader in animal health." Juergen Horn, Dr.med.vet., Ph.D., chief executive officer and co-founder of Invetx, stated, "Our pipeline of monoclonal antibody therapeutics for chronic, serious diseases in cats and dogs is highly complementary to Dechra's broad portfolio of speciality therapeutics for companion animals and accelerates Dechra's differentiated position in the veterinary health industry."

Dechra will have access to the company's species-specific, half-life extension platform, in addition to the Invetx pipeline. This platform extends the duration of drug activity and allows for longer intervals between treatments, resulting in improved compliance and greater convenience for veterinarians, owners, and their pets.

Jesper Nordengaard, CEO of Dechra, stated that Invetx's capacity to create veterinary biotherapeutics with a prolonged duration of effect and longer inter-dosing intervals is a significant innovation in animal health. "The Invetx products currently under development have substantial potential and will enhance our knowledge of core therapeutic areas, including osteoarthritis and atopic dermatitis. This will enable us to conduct synergistic product development, sales and marketing, and education initiatives in the future."

Invetx's comprehensive integrated platform encompasses state-of-the-art antibody discovery technology, optimisation, development, and manufacturing to produce differentiated and best-in-class veterinary biotherapeutics. The half-life extension technology is a component of this platform.

Initially, Anterra Capital, a venture capital firm located in Boston and Amsterdam, incubated Invetx as a start-up company. The firm specialises in investments in agrifood innovation and animal health. Phil Austin, managing partner and co-founder of Anterra Capital, stated, "The exit of Invetx is an exceptional result for the broader start-up community and the animal health industry, as well as for the stakeholders in the company." Invetx serves as an exceptional illustration of how innovation can be fostered within this sector by start-ups. We are enthusiastic about the prospect of the Invetx products being introduced to the market and assisting Dechra in its ambitious growth objectives.

BofA Securities, Inc. is serving as the exclusive financial advisor to Invetx, while Latham & Watkins LLP is serving as the legal advisor.

## FAO Toolkit to Enhance Skills and Competencies of Veterinary Paraprofessionals in Developing Regions

A well-trained cadre of veterinary professionals and paraprofessionals in both the public and private sectors is necessary for the effective

delivery of animal health services.

The scarcity of veterinarians in numerous low- and middle-income countries, particularly in Asia and sub-Saharan Africa, poses a challenge for livestock producers to obtain their services. Veterinary paraprofessionals (VPPs), who outnumber veterinarians on a 1-10 ratio, frequently assist in bridging this divide.

A VPP is an individual who has been granted permission by the veterinary statutory body to perform specific duties under the supervision and guidance of a veterinarian, as per the World Organisation for Animal Health (WOAH). Qualifications, training, and necessity are the criteria by which these assignments are determined.

VPPs are indispensable in the preservation of animal health, particularly in rural regions where veterinarians may be scarce. They are responsible for a variety of critical responsibilities, such as the provision of advice on nutrition and sanitation, drug sales, laboratory diagnostics, vector control, animal welfare, research, artificial insemination, and livestock inspection, as well as the performance of fundamental medical and surgical treatments, disease surveillance, and vaccination.

FAO provided assistance to the veterinary statutory bodies in Nigeria, South Africa, and Uganda in 2022 to help them establish



national animal health VPP competency frameworks, recognising their critical responsibilities in preventive livestock healthcare and animal disease control. These were created through a series of workshops that convened key stakeholders, such as members of livestock associations, veterinary paraprofessional and veterinary associations, pharmaceutical companies, the veterinary statutory body, the office of the chief veterinary officer, the national drug authority, and training institutes.

The Veterinary Paraprofessional Competency Framework Toolkit has been developed to consolidate the knowledge gained from this process. It provides a comprehensive, step-by-step guide for the development of VPP competency frameworks that are specific to each country. This framework, which is based on the WOAHA competency guidelines for VPPs, which primarily focus on public good functions, encompasses a broader range of competencies required by private sector VPPs, such as business skills, Information and Communication Technology (ICT) skills, and The One Health approach. Additionally, the competency framework has been evaluated through a gender lens to guarantee gender sensitivity. In addition, they have been customised to adapt to the unique circumstances of each country, such as the legal framework, working environment, and language.

A national competency framework can be employed by a diverse array of stakeholders to assist VPPs in determining their current competency level and establishing personalised Continual Professional Development (CPD) learning objectives. It can also assist training and CPD providers in the

identification of learning objectives for training that is specifically designed for VPPs. Furthermore, the framework can be employed by mentors and supervisors to evaluate VPP competencies, pinpoint areas for improvement, and offer customised capacity development. It is intended to be a dynamic document that is updated as necessary to ensure its relevance and effectiveness.

## **World Dairy Expo 2024: Virtual Farm Tours to Spotlight Sustainable Practices and Innovation in Dairy Farming**

For more than two decades, the World Dairy Expo Virtual Farm Tours have brought some of the most exceptional dairy operations from both near and far to Madison. While demonstrating environmental stewardship, quality genetics, technology advancements, diversification, and more, the four dairies that will be showcased during WDE 2024 continue this tradition. A visual presentation is shared by dairy



owners and managers during Expo's Virtual Farm Tours, followed by an open discussion and the opportunity to ask questions. Tours are conducted daily at 10:00 a.m. in Mendota Room 1 of the Exhibition Hall.

The 2024 World Dairy Expo Virtual Farm Tour schedule is provided below. It can be accessed in person at WDE or online through ExpoTV at [www.worlddairyexpo.com](http://www.worlddairyexpo.com).

### **Tuesday, October 1**

Schoepp Farms LLC, located in Lodi, Wisconsin, serves as the host.

Schoepp Farms is a cash grain and grazing operation that is well-diversified. The operation cultivates over 400 acres of corn, soybeans, winter wheat and alfalfa, as well as 110 acres of grass pasture. These pastures are dedicated to the production of 200 dairy heifers, 30-50 dry cows and 15 grass-fed cattle. Their operation has virtually eliminated soil erosion as a result of their 30-plus years of rotational livestock and no-tilling crops, which have enabled the farm to endure droughts and extreme rainfall with minimal yield losses.

The family will exhibit the groups and organisations that facilitated their transition to land management practices that have increased profitability and demonstrate the rewards of sustainable farming methods, despite the fact that Schoepp Farms no longer manages a milking herd.

### **Wednesday, October 2**

McCarty Family Farms, located in Rexford, Kansas, serves as the host. Sponsored by DeLaval, Inc.

In a barn that was devoid of electricity, the McCarty family manually milked cows more than a century ago. The family relocated to Rexford, Kansas in 2000, and

since then, they have expanded to include six locations, including two on-site visitor centres, an on-site milk processing facility, and a partnership dairy in Ohio. At their most recent location, the McCarty family employs two 120-stall DeLaval carousel parlours to milk 19,000 registered Holsteins.

McCarty Family Farms is committed to sustainability, making it a priority to maximise genetic advancement in their cattle and to be responsible stewards of the land. McCarty Family Farms has been a recipient of numerous accolades, such as the International Dairy Foods Innovative Dairy Farm of the Year, the US Dairy Sustainability Award, and Holstein USA's Progressive Genetics Herd Award, in recognition of their efforts.

#### **Thursday, October 3**

Cleveland, Wisconsin-based Vandoske Dairy Farms serves as the host. Sponsored by: Compeer Financial

Bob and Tara Vandoske, along with their children, Brienne, Reid, and Brooklyn, currently own and administer Vandoske Dairy Farms, a dairy farm that has been in operation for three generations. Bob's ancestors established the livestock in 1945, and it has since expanded from 18 cows to more than 600 cows. The herd consists entirely of registered Holsteins, with a rolling herd average of 30,400 lbs.

Many accolades have been bestowed upon Vandoske Dairy Farms for their practices and animals. They are a consistent recipient of the Milk Quality Award from the Dairy Herd Improvement Association (DHIA) and have bred the Junior Bred & Owned Champion at the World Dairy Expo in 2019 and 2021. Additionally, the

Vandoskes recently hosted their local dairy breakfast and established a direct-to-consumer ice cream store.

#### **Friday, October 4**

Woldt Farms LLC, located in Brillion, Wisconsin, serves as the host. Sponsored by: Complete Management Consulting LLC

Since its inception in 1911, Woldt Farms LLC has expanded as a fourth-generation dairy farm. Daryl and Amy Woldt, the current proprietors, acquired the farm from Daryl's parents in 1990. They presently milk 1,650 cows in a double-16 parallel parlour. Daryl and Amy have five daughters, Kelsey, Kayla, Kristen, Karly, and Kortney, who are all involved in the operation in varying capacities.

Woldt Farms LLC is committed to sustainability as a member of the Lower Fox Demo Farms and Calumet County Ag Stewardship Alliance. In an effort to safeguard the land, 95% of their acreage is either no-till or utilises cover crops. Additionally, Woldt Farms LLC prioritises its community engagement to establish a connection with consumers of all ages by hosting the county's Sundae on the Farm twice.

World Dairy Expo is the preeminent forum for the global dairy

community to learn, share, create commerce, and exhibit competition, serving as the meeting point of the global dairy industry. The world's largest dairy-focused trade show, a world-class dairy cattle show, seminars, meetings, and presentations showcasing the latest and greatest in the industry, and the opportunity to connect with other producers will be available in Madison, Wisconsin from October 1-4, 2024. Dairy producers from near and far are encouraged to attend.

## **Mars and FrieslandCampina Launch Ambitious Initiative to Cut Dairy Emissions by Half**

Mars and FrieslandCampina have initiated a new partnership that is dedicated to the rapid reduction of greenhouse gas emissions in the dairy production that is supplied to Mars. The partnership between FrieslandCampina and Mars directly contributes to additional rewards for member dairy farms. The goal is to reduce greenhouse gas emissions by -33 percent in 2025 and up to -50 percent by 2030 in comparison to 2015 levels.





FrieslandCampina, a dependable supplier to Mars for over three decades, is instrumental in the provision of basic dairy ingredients, including milk fat and cream, for renowned brands like M&M's®, SNICKERS®, and TWIX®. A group of FrieslandCampina member farmers that are members of the FrieslandCampina development group will be specifically dedicated to Mars' dairy supply as part of this new partnership. Mars provides compensation to these farmers in order to facilitate the implementation, testing, and acceleration of innovative greenhouse gas emission reduction strategies, including feed additives that reduce methane emissions.

Sanne Griffioen, Director of Farm Sustainability at FrieslandCampina, stated, "Our goal at FrieslandCampina is to provide nourishment that is in harmony with the environment and individuals." We have established the objective of producing dairy products that are net climate-neutral by the year 2050. These partnerships are indispensable for bolstering producers, unleashing innovations, and expediting sustainability initiatives on the farm. It serves as an excellent illustration of how we, as chain stakeholders, can collaborate to advance sustainability.

Amanda Davies, Chief R&D, Procurement, and Sustainability Officer at Mars Snacking, stated, "Dairy is the second largest contributor to the carbon footprint of our Mars Snacking business. It is an absolute necessity for us to reduce this figure in order to achieve our Mars Net Zero goal." This can only be accomplished through collaboration with our primary stakeholders, such as FrieslandCampina and their producers. We can contribute to the

development of a more sustainable future for dairy by collaborating on innovative climate-smart practices, utilising unique data expertise, and maintaining a shared commitment to progress.

## **Zoetis Strengthens Presence in India with Major Expansion of Hyderabad Capability Centre**



Zoetis Inc., a global leader in animal health, announced the expansion of the Zoetis India Capability Centre in Hyderabad. This expansion is intended to further support the company's innovative technology portfolio.

The announcement was made during a meeting with Telangana Chief Minister A Revanth Reddy and the state industries minister D Sridhar Babu, who were accompanied by other senior government officials, as part of the ongoing "USA tour." In recognition of the strategic significance of the region as a centre for innovation and talent, this expansion will enhance Zoetis' presence in India and generate hundreds of new employment opportunities. "Hyderabad is the optimal location for our Zoetis India Capability Centre, as it provides an exceptional Life Sciences innovation ecosystem and offers a wealth of talent." We are dedicated to investing in the future of animal

health and technology innovation, as evidenced by our decision to expand here. Chief Information Officer Keith Sarbaugh of Zoetis expressed his enthusiasm for the prospect of sustaining our collaboration with the Government of Telangana and making a meaningful contribution to the region's growth.

With approximately 14,100 employees, Zoetis, a Fortune 500 company, generated \$8.5 billion in revenue in 2023. "We are thrilled with Zoetis' decision to expand their Zoetis India Capability Centre in Hyderabad. This is evidence of the vibrant ecosystem that we have established in Telangana, which enables businesses to expand and innovate." Zoetis' investment in futuristic technologies is consistent with our objective of establishing Hyderabad as a global hub for life sciences and advanced technologies," stated Revanth Reddy.

"Our centre will drive innovation and pioneer transformative advancements by leveraging the world-class talent available in Hyderabad, ensuring sustainable growth and a competitive edge for Zoetis worldwide, while also contributing to the development of the region," stated Anil Raghav, Vice President and Head of the Zoetis India Capability Centre. "The confidence that global companies have in Telangana's business-friendly environment is reflected in Zoetis' commitment to creating new positions over the coming years, according to Sridhar Babu. "I implore the talented workforce of Telangana to join Zoetis and co-create the future of animal healthcare." Sridhar Babu commented, "We are eager to provide Zoetis with assistance in their pursuit of innovation and expansion in Hyderabad."



## Nagaland's Dairy Sector Gets a Boost with New Training Centre Inaugurated in Mokokchung



The Mini Dairy Plant cum Dairy Farmers' Training Centre, which was established under the NPDD (National Programme for Dairy Development) and constructed under the initiative of the Directorate of Animal Husbandry & Veterinary Services and Nagaland State Dairy Co-operative Federation Ltd. Kohima, was inaugurated by Advisor, Animal Husbandry & Veterinary Services, Kazheto Kinimi on July 12, 2024, in Marepkong Ward, Mokokchung.

Kinimi stated in his speech that the PDA Government is dedicated to implementing a White Revolution in the state by establishing mass-based organisations and cooperative societies in accordance with the National Policy on Dairy Development. He stated that the state has not yet achieved self-sufficiency in the production of milk, eggs, poultry, livestock, and meat, and the modest yet significant action taken today will pave the way for further development in the future.

The Advisor stated that the residents of the state must recognise the significant potential of dairy farming in Nagaland, which has the potential to generate employment opportunities for a variety of demographics. He urged individuals, particularly those of a

younger generation, to pursue careers in this field, asserting that the Department would make every effort to provide guidance and support to prospective entrepreneurs in the field. He requested that the dairy farmers in the district provide their support and cooperation to the Department, stating that the Department is responsible for the construction of the physical infrastructure, but it can only be transformed into an economic infrastructure when the Department and the dairy farmers collaborate.

The keynote address was delivered by Dr. Joseph Angami, Managing Director of NSDCF Ltd., and the vote of gratitude was given by L. Yanger Lemtor, Secretary of MDCMPU Ltd. Dr. Achila Ao, Director of A Animal Husbandry & Veterinary Services, served as the program's chairperson.

During the technical session, Dr. Sanen Jamir, General Manager of MDP, and Zapove Swuro, Project Director of NSDCF Ltd., addressed

the topics of Fertility Management of Dairy Cattle and Quality & Clean Milk Production.

## Nova Dairy Launches Initiative to Enhance Animal Welfare Across Cattle Supply Chain



Nova Dairy has initiated a comprehensive initiative to enhance animal welfare throughout its cattle supply chain. Recognising that the health and well-being of dairy cattle are essential for the production of high-quality milk, this program emphasises Nova Dairy's dedication to sustainable agriculture and ethical practices.

Nova Dairy's initiative will concentrate on the education of producers in a variety of regions regarding the essential significance of animal welfare. The company endeavours to ensure that livestock are treated with care and respect throughout their lifetimes by providing training and resources to promote best practices in cattle management.

Nova Dairy will offer producers practical advice on how to transition to free-grazing practices as part of the initiative. This encompasses the construction or modification of existing infrastructure, such as shelters and fencing, to facilitate the cattle's

natural behaviours. Additionally, Nova Dairy is dedicated to the ongoing research and development of animal welfare practices. The company endeavours to maintain its position as a leader in ethical dairy production by fostering partnerships with agricultural specialists, veterinarians, and animal behaviourists.

According to Ravin Saluja, Director of Sterling Agro Industries Ltd., "Farmers are the foundation of our supply chain. We are confident that by providing them with knowledge and resources, we can collectively improve the health and productivity of our cattle, resulting in improved outcomes for all parties involved, from the farmers to the end consumers."

The quality and quantity of milk produced are directly influenced by the health of dairy cattle. The economic implications for producers can be substantial, as an agitated or sickly calf is less likely to produce milk efficiently. Nova Dairy endeavours to establish a more productive and resilient supply chain by emphasising animal welfare.

Nova Dairy's initiative is characterised by its advocacy for the natural grazing of cattle. Research and practical experience have demonstrated that heifers that are permitted to roam and pasture freely manifest superior mental and physical health in comparison to those that are restricted.

Ravin Saluja elucidated that cows' milk production is adversely affected by the tension and distress they endure when they are tied and restricted. "In contrast, cows that are permitted to roam freely exhibit improvements in their mental health and milk production." We are dedicated to assisting producers in comprehending and implementing this organic method of cattle husbandry.

## Hebbevu Genetics Sets New Standards in Cattle Breeding with Advanced IVF Techniques



Hebbevu Managed Farmland has established a new subsidiary, Hebbevu Genetics, with the objective of revolutionising the field of cattle genetics and in-vitro fertilisation (IVF) in India. Hebbevu Genetics, which was established by the Kishan brothers Amith and Ashrith from Karnataka, is dedicated to the improvement of cattle breeding practices, the enhancement of genetic value, and the enhancement of productivity—all of which are essential components of the dairy farming industry.

Typically, progressive dairy producers employ conventional embryo transfer and artificial insemination to expedite genetic development within livestock. Nevertheless, a significant number of individuals are currently transitioning to IVF, a method that involves the generation of embryos from elite donor cows and their subsequent transfer into cows with inferior genetic merit. While IVF technology for humans is well-established, it is still in its infancy when it comes to animals in India. Hebbevu Genetics endeavours to rectify this situation.

The Kishan brothers recently established a new benchmark in India by effectively completing 80

embryo transfers in a single day. Particularly noteworthy is this accomplishment, as only a handful of veterinarians in India are capable of conducting one or two such procedures in a single day. Modern IVF techniques on cows result in improved genetic traits, improved disease resistance, and the revival of ancient indigenous blood to achieve 100% purity, all of which are critical for the sustainable and profitable dairy farming industry in India.

The proprietors of Hebbevu Managed Farmland, which is situated in Andhra Pradesh, are redefining the norms of success in agriculture. They are now recognised for their exceptional skills in the sale and management of farmlands, having transitioned from lucrative banking professions to this influential agribusiness. The company has achieved greater heights as a result of the success of its subsidiary brands, Hebbevu Farm Fresh Milk and Hebbevu Fresh. This accomplishment is not solely financial; it has a transformative impact on the rural communities they support. Hebbevu is significantly enhancing the local economy and empowering rural communities in their operating areas by offering employment opportunities to hundreds of men and women.

Hebbevu Genetics has already attained substantial milestones in the fields of Indian agriculture and bovine genetics. Dr. Amol Ashok Sahare, PhD in Animal Biotechnology (PGS), Dr. D Nagoorvali, PhD in Animal Biotechnology, Dr. K Vidyadhara Reddy, BVSc & AH, Dr. G Naveen, BVSc & AH, Dr. Brahmandrareddy, BVSc & AH, Dr. Raju Balu Bhai Motwadiya, DVSc & AH, Darshan NH, Sujay Kumar MS, and others are among the key contributors at Hebbevu Genetics.

Hebbevu Managed Farmland is establishing new standards for agricultural success, with its proprietors leading the charge. The brothers are currently achieving success in the sale and management of farmlands after transitioning from lucrative finance professions to an impactful agribusiness. Hebbevu Farm Fresh Milk and Hebbevu Fresh, their subsidiary trademarks, have facilitated the company's expansion and transformed the lives of the rural communities they serve. Hebbevu is generating employment opportunities for hundreds of men and women in rural communities throughout Karnataka, thereby bolstering the local economy.

## Milk Cooperative Societies in Madurai Struggle as Private Dairies Offer Higher Prices

Senior officials affiliated with the Tamil Nadu Cooperative Milk Producers Federation Limited (TNCMPFL) are concerned about the cessation of production by 122 milk cooperative societies in Madurai, despite an increase in production.

The district cooperative (dairy) department in Madurai has registered over 870 milk cooperative societies, of which 122 have become dormant, meaning they have not produced any milk in the past six



months, according to official records. The primary causes, according to industry specialists, are the advent of private dairy centres, competition within cooperative societies, and inadequate management skills.

An extremely competitive environment is characterised by the presence of approximately five cooperative societies in numerous villages. Private dairy companies provide an additional Rs 5 per litre for all types of milk.

Nevertheless, private entities usually decrease the cost of procurement when demand decreases, which results in farmers returning to cooperative societies affiliated with Aavin. These societies provide stable prices and long-term growth. Many young people are disinterested in milk production, which has a negative impact on cooperative societies that were established only recently. Consequently, the tiny and new cooperative societies are becoming dormant. There are numerous societies with a reduced number of members.

There are societies that provide Aavin with a mere 50-60 litres of milk each day. In the event that a personal dispute arises between the milk farmer and the society, the milk farmer donates his milk to another society within the same village. The lesser societies become dormant as a result of the rivalry between them. Aavin will remain unaffected, as it will acquire milk regardless of the outcome. We have recently initiated the provision of incentives to cooperative societies, and procurement has increased.

## Punjab to Use NGT Fine Funds for Eco-

## Friendly Cattle Dung Management via Vermicomposting



In Punjab, funds from a fine imposed by the National Green Tribunal (NGT) on the State for polluting the Beas and Sutlej rivers may soon be utilised to promote the eco-management of cattle dung in cowsheds (gaushalas) and dairy farms through vermicomposting. This process involves the conversion of biodegradable waste into organic fertilisers with the assistance of earthworms.

A call for applications has been issued by the Punjab Pollution Control Board (PPCB) to concerned dairy farms and gaushalas in Punjab via an Expression of Interest. The designated gaushalas and dairy farms will receive technical and financial support from the commission.

The initiative is designed to mitigate the issue of water pollution that is a result of the non-scientific disposal of manure and urinal effluent produced by gaushalas/dairies in the State. The PPCB has suggested that funds from the eco-restoration plan be allocated to the eco-management and utilisation of cattle dung through techniques such as vermicomposting, manure production, and the production of cattle dung logs/cake.



A senior PPCB official disclosed to The Indian Express that the PPCB intends to allocate Rs 63 lakh from the eco-restoration plan against the Rs 50 crore penalty imposed by the NGT. The Punjab government was fined Rs 50 crore by the NGT in 2018 for the contamination that had been caused to the Sutlej and Beas rivers.

The local bodies department received the majority of the paid fine, which was distributed among the PPCB, industry, rural development, and panchayats departments, according to a PPCB official. The official stated that the relevant departments submitted a request to the NGT to release the penalty amount. They also guaranteed that the released funds would be allocated to the eco-restoration plan, which would be used to improve the environment.

The official stated that the relevant departments subsequently devised a variety of initiatives to allocate the funds. The official stated, "We have elected to allocate our portion to the management of cow dung waste through vermicomposting."

Dr. Adarsh Pal Vig, the chairman of the PPCB, stated, "We will provide technical expertise and financial support." In the event that we receive a favourable response, we may allocate additional funds in addition to the Rs 63 lakh that was initially allocated.

"This eco-management initiative could also assist in the development of small entrepreneurs," stated Dr. Vig, a professor who specialises in vermitechnology, bioactivities of glucosinolates, solid waste management using earthworms, and earthworm biodiversity.

The disposal of dung and urinal effluent is the primary environmental concern of dairy farms and gaushalas, as stated in

the Expression of Interest that is currently being circulated to applicants. Water pollution and odour issues are the result of inadequate management and disposal of manure and effluent. Cattle dung, feed detritus, and other organic and non-hazardous solid residues generated by dairy farms and gaushalas necessitate appropriate disposal and management. The most significant obstacle in dairy farms and gaushalas is the disposal of cattle manure.

Nevertheless, cattle refuse can serve as a source of energy and manure when utilised effectively. There are numerous applications for cattle dung, including combustion (dung wood), biogas production, soil conditioning, fertilisation, and wall cladding.

The PPCB has suggested the aforementioned category-wise eco-management initiatives in accordance with the scale (small, medium, large) and location of gaushalas and clusters.

## Heritage Foods Targets Rapid Growth in Eastern India with New Dairy Offerings

Heritage Foods, the second largest private dairy company in India, is simultaneously introducing its four long-shelf life milk variants and value-added products to West



Bengal, Bihar, and Jharkhand. The company is betting that Eastern India is one of the fastest-growing dairy markets in the country.

The company is introducing a variety of beverages, including milkshakes, Lassi, flavoured milk, and chilled coffee, as well as Ghee and Laddus, in the three states. Additionally, the company is introducing long-shelf life milk.

At the same time, they announced the introduction of these products in the three Eastern states. Their presence is currently observed in 14 states. Because of its lesser starting point, East India is one of the fastest-growing dairy markets in the nation.

Despite the fact that the Eastern region had one of the lowest per capita consumption of dairy products, the region is experiencing rapid growth due to the rapid urbanisation, altering consumer attitudes towards nutrition, and the increase in disposable income compared to the rest of India. Playing in this market is exceedingly appealing.

Odisha was entered by the Hyderabad-based company approximately nine months ago, with a slightly distinct product array. In addition to its objective to enhance its revenue contribution from products such as lassi, ghee, and laddus, the second-largest dairy company listed in the country is also expanding its operations in the East.

In the next three years, Heritage Foods targets to increase the revenue contribution from value-added products to approximately 45%. Within the most recent fiscal year, the value-added product contribution increased by approximately 1.30 percent. The company is aiming to establish approximately 20,000 retail outlets

throughout West Bengal within the next six to twelve months.

## Haryana to Benefit from TACO's Rs. 100 Crore Initiative for Animal Welfare and Veterinary Services

The Animal Care Organisation (TACO), a premier animal welfare initiative under the Anil Agarwal Foundation, has committed a corpus of Rs. 100 crores to the improvement of animal welfare in Haryana by signing a Memorandum of Understanding (MoU) with the Haryana government. The MoU was signed in the presence of Sh. Nayab Singh, the Chief Minister of Haryana. TACO will undertake various projects as part of the MoU, including the construction of an animal birth control unit, laboratory, pharmacy, training centre, and shelter for critical animals. They will also upgrade the Government Veterinary Hospital in Gurugram into a 24x7 multi-speciality animal hospital. The partnership between TACO and the Haryana government is a 10-year commitment towards enhancing animal welfare services in the state.

As part of the collaboration, TACO will also deploy an ambulance and an advanced mobile health vehicle to offer emergency care services at the client's entrance. The Chief Minister expressed his enthusiasm for the partnership and stated that it will significantly enhance the quality of veterinary care services in Haryana. Priya Agarwal Hebbar, Chairperson of Hindustan Zinc Ltd and Non-Executive Director at Vedanta, expressed her excitement about collaborating with Haryana once again to improve animal welfare infrastructure in the state. Ritu Jhingon, President of the Anil

Agarwal Foundation, assured the Chief Minister that superb animal care services will be provided, including the use of best practices, modern surgical facilities, and an outpatient department.

TACO's initiatives encompass a comprehensive approach to 'One Health', which recognizes the interconnection between humans, animals, vegetation, and their shared environment. The organization's sanctuary in Faridabad is home to over 160 animals and is dedicated to their rescue, rehabilitation, veterinary care, and overall well-being. Since its inception, TACO has provided support to the farmer community through animal OPD services, rescued animals during floods, and treated thousands of animals through its health centers. The organization also focuses on education and training through the TACO Academy, which offers sessions for paraprofessionals and veterinarians.

The Anil Agarwal Foundation, under which TACO operates, addresses various areas of focus, including healthcare, women and child

development, animal welfare projects, and sports initiatives. Through sustainable and inclusive growth, the foundation aims to empower communities, transform lives, and facilitate nation-building.

The signing of the MoU was attended by several senior officials, including the District Commissioner, Police Commissioner, Chief Executive Officers of Gurugram and Faridabad Metropolitan Development Authorities, and officials from the Animal Husbandry and Dairying Department.

Overall, the partnership between TACO and the Haryana government is a significant step towards improving animal welfare in the state. The projects undertaken as part of the MoU, such as the construction of a multi-speciality animal hospital and the upgrade of existing facilities, will enhance veterinary care services and benefit both the inhabitants of Gurugram and adjacent cities. TACO's commitment to 'One Health' and its comprehensive approach to animal welfare make it a valuable initiative in the field.



# Editorial Calendar 2024

Publishing Month: <b>January</b> Article Deadline : <b>28<sup>th</sup>, Dec. 2023</b> Advertising Deadline : <b>30<sup>th</sup>, Dec. 2023</b> Focus : <b>Opportunities and Challenges</b>	Publishing Month: <b>February</b> Article Deadline : <b>28<sup>th</sup>, Jan. 2024</b> Advertising Deadline : <b>30<sup>th</sup>, Jan. 2024</b> Focus : <b>Budget</b>	Publishing Month: <b>March</b> Article Deadline : <b>26<sup>th</sup>, Feb. 2024</b> Advertising Deadline : <b>28<sup>th</sup>, Feb. 2024</b> Focus : <b>Summer Stress Management</b>	Publishing Month: <b>April</b> Article Deadline : <b>28<sup>th</sup>, March 2024</b> Advertising Deadline : <b>30<sup>th</sup>, March 2024</b> Focus : <b>Cold Chain</b>
Publishing Month: <b>May</b> Article Deadline : <b>28<sup>th</sup>, April 2024</b> Advertising Deadline : <b>30<sup>th</sup>, April 2024</b> Focus : <b>Nutrition</b>	Publishing Month: <b>June</b> Article Deadline : <b>28<sup>th</sup>, May 2024</b> Advertising Deadline : <b>30<sup>th</sup>, May 2024</b> Focus : <b>Milk - Production &amp; Preservation</b>	Publishing Month: <b>July</b> Article Deadline : <b>28<sup>th</sup>, June 2024</b> Advertising Deadline : <b>30<sup>th</sup>, June 2024</b> Focus : <b>Monsoon Management</b>	Publishing Month: <b>August</b> Article Deadline : <b>28<sup>th</sup>, July 2024</b> Advertising Deadline : <b>30<sup>th</sup>, July 2024</b> Focus : <b>Sustainability</b>
Publishing Month: <b>September</b> Article Deadline : <b>28<sup>th</sup>, August 2024</b> Advertising Deadline : <b>30<sup>th</sup>, August 2024</b> Focus : <b>Processing &amp; Packaging</b>	Publishing Month: <b>October</b> Article Deadline : <b>28<sup>th</sup>, September 2024</b> Advertising Deadline : <b>30<sup>th</sup>, September 2024</b> Focus : <b>Disease Prevention</b>	Publishing Month: <b>November</b> Article Deadline : <b>28<sup>th</sup>, October 2024</b> Advertising Deadline : <b>30<sup>th</sup>, October 2024</b> Focus : <b>Biosecurity</b>	Publishing Month: <b>December</b> Article Deadline : <b>28<sup>th</sup>, November 2024</b> Advertising Deadline : <b>30<sup>th</sup>, November 2024</b> Focus : <b>Winter Stress</b>

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