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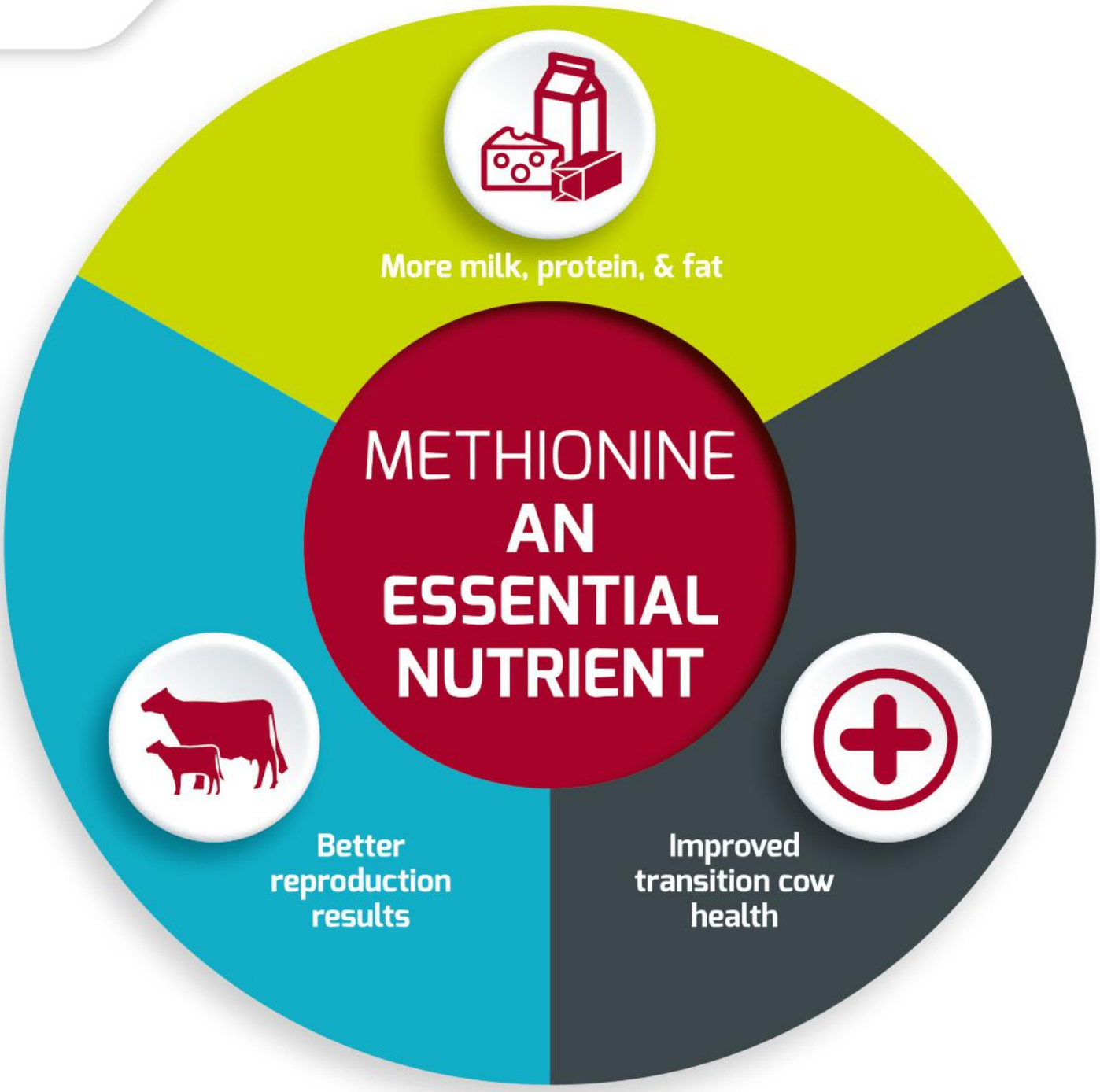

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From the Editor's Desk

Ashokbhai Chaudhary elected as GCMMF Chairman unopposed

The Gujarat Cooperative Milk Marketing Federation (GCMMF), also known as Amul, has unanimously elected Ashokbhai B. Chaudhary (Chairman, Mehsana Milk Union) as chairman and Gordhanbhai P. Dhameliya (Chairman, Rajkot Milk Union) as vice chairman of the Federation. In FY25, GCMMF recorded a turnover of Rs 65,911 crore, representing a 11.2 percent growth. During the same period, the Federation procured over 12 billion litres of milk and achieved a brand turnover of Rs 90,000 crore through its member unions. With more than 24 billion product packs distributed across India and over 50 countries, Amul has been recognised as the world's strongest food and dairy brand by Brand Finance UK.

The government imposed penalties worth Rs 36.72 crore in 8,815 cases related to fake and adulterated milk during 2024-25, marking an increase from the previous financial year. Targeted enforcement and surveillance drives are conducted during peak and festive seasons to curb milk adulteration. 33,405 milk samples were analysed during the year, leading to 12,057 cases being launched.

The Himachal Pradesh Government has approved the establishment of new milk processing plants at Nahan, Nalagarh, Mohal, and Rohru, along with a milk chilling centre at Jalari (Hamirpur) and a bulk milk cooler at Jhalera (Una). The move aims to modernize the State's dairy infrastructure, enhance farmers' incomes and strengthen the rural economy. 90% of the state's population resides in rural areas and is engaged in farming, making dairy development a key priority. To enhance operational efficiency and ensure transparency, the Himachal Pradesh Milk Federation (Milkfed) will soon roll out an Enterprise Resource Planning (ERP) system. This digital platform will allow farmers to access essential information directly on their mobile phones, including real-time updates on milk collection, payment status, quality test results and procurement rates. By recording all transactions digitally, the ERP system will minimize manual errors and prevent manipulation. Himachal Pradesh has become the first state in India to introduce a Minimum Support Price (MSP) Scheme for milk procurement. Under the scheme, cow milk is procured at Rs. 51 per litre and buffalo milk at Rs. 61 per litre.

India's ghee market reached ₹3,200–3,480 billion in 2023–24. It is projected to nearly double by 2033, growing at an estimated CAGR of 8–9% (as per Imarc). This surge is driven by deep-rooted cultural preferences, rising health awareness, and growing affinity for branded and organic variants. As per a study by Businessline, the per capita annual consumption of ghee, which was 2.68 kg in 2014, has reached 3.27 Kg in 2024 and will be 4.07 kg in 2034, which is almost 25 % growth. Key trends are Desi/cow ghee dominance, with buffalo-sourced ghee gaining prominence as a premium variant due to its flavor and nutritional profile. The rise of A2 ghee and organic alternatives, accelerating consumption among health-conscious consumers and fuelling premium market segments (A2 market expected to grow at ~22% CAGR through 2033). Increased adoption of modern retail and online channels, gaining traction with hygienic, labeled, and packaged variants versus loose/unbranded ghee.

In a significant relief measure for Kerala's struggling dairy farmers, local self-government institutions have been directed to allocate emergency financial assistance to ensure fodder availability. The state government has recognized the fodder crisis caused by irregular monsoons and increased input costs. Funds under the "Plan Head of Agriculture" and other local schemes will be diverted to support dairy units by promoting fodder cultivation and subsidizing green fodder procurement. This move aligns with the Kerala government's commitment to retain rural livelihoods and stabilise the dairy supply chain amidst rising feed costs and climate volatility. This policy demonstrates how decentralized governance can address feed security—a major cost driver in dairy. A replicable model for other states facing similar climatic challenges.

Editor

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Address:
1325-P, Second Floor,
Sector-32, Urban Estate
Near Hotel Noor Mahal
KARNAL-132 001 (Haryana) INDIA

E-mail:
poultrytechno@gmail.com
dinesh@srpublication.com

Website:
www.srpublication.com

Editor:
Dinesh Kumar Arora
+91-98965 23333
+91-86408 23333

Associate Editor:
Sudhir Aheriya
+91-70150 26527

Circulation Incharge:
Vivek Soni
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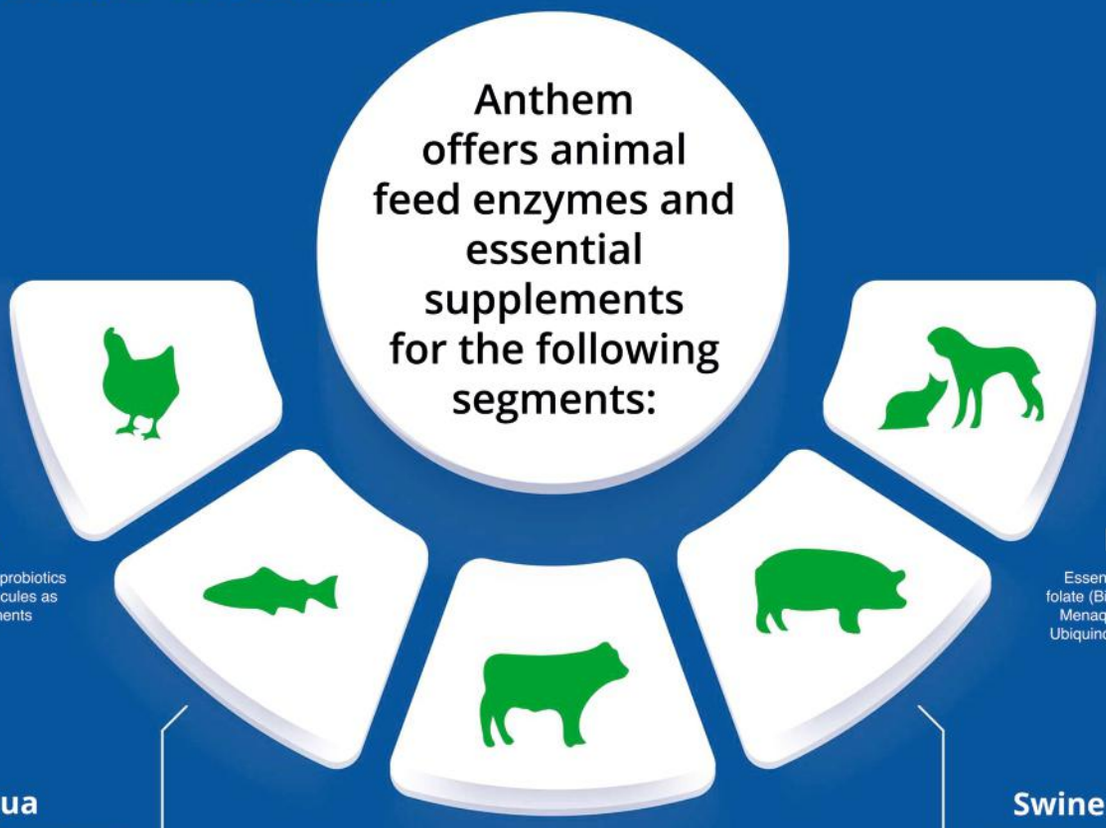

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+91-910 864 8326

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Stabilizing the flow: How digestion and metabolism drive milk production in dairy cattle

Introduction

Efficient digestion and metabolic processes in dairy cows drive both milk production volume and component quality. A healthy microbial fermentation in the rumen enables optimal nutrient extraction, while well-regulated metabolism ensures the conversion of these nutrients into milk constituents like fat, protein, and lactose.

Rumen Microbial Digestion: Foundation of Nutrient Supply

- The rumen microbiome breaks down structural carbohydrates, starch, proteins, and lipids into volatile fatty acids (VFAs)-primarily acetate, propionate, and butyrate. These VFAs supply up to ~60% of the cow's energy needs for maintenance and lactation.
- Microbial biomass contributes 60-90% of the amino acids absorbed post-rumen in the small intestine, acting as the primary protein source for milk production.
- Efficient microbial fermentation also minimizes energy losses via methane, which otherwise consumes 2-12% of gross energy intake.

Metabolic Pathways Linking Digestion to Milk Output

- Propionate, absorbed from the rumen, is the primary precursor for gluconeogenesis in the liver and critical for lactose synthesis; acetate and butyrate support de novo fat synthesis in the mammary gland.
- On high intake diets, metabolizable energy usage for milk is ~60-64% efficient, while body tissue mobilization yields ~82% efficiency toward milk production.

Effects on Milk Quantity

- Improved nutrient digestibility leads to higher dry matter intake (DMI) and more efficient conversion of feed to milk, supporting greater milk volume.
- Proper VFA ratios enhance energy partitioning to milk synthesis, maximizing milk yield per unit feed.

Effects on Milk Quality & Composition

- Milk fat percentage correlates positively with ruminal acetate ratio. When the acetate ratio exceeds ~2.2, milk fat percentage is maximized; high-grain or highly digestible starch diets lower fiber fermentation and depress fat content
- Enhanced fiber-degrading bacteria improve VFA output and microbial phospholipid synthesis resulting in higher unsaturated fatty acids in milk and improved fat quality
- Microbial proteins produced are later digested post-rumen in the abomasum and small intestine.

This microbial biomass supplies 60-90% of absorbed amino acids, supporting milk protein synthesis.

Management Strategies

1. **Optimize forage quality and physical fiber:** Ensure neutral detergent fiber (NDF) levels ≥ 28% and proper particle length to maintain acetate production and stable rumen pH. A target range of 31.2% physically effective neutral detergent fiber (peNDF) from particles greater than 1.18 mm, or 18.5% peNDF from particles greater than 8 mm, is recommended in the diet (on a dry matter basis).
2. **Balance concentrate levels:** Avoid abrupt increases in fermentable starches to prevent acidosis, while adjusting forage-to-concentrate ratio appropriately. The ideal forage to concentrate (F:C) ratio for dairy cows varies based on production stage and forage quality, but generally ranges from 40:60 to 60:40 on a dry matter basis.
3. **Cow comfort:** Enhance cow comfort-ensure access to fresh feed, encourage lying down and rumination, manage heat stress to support rumen function and metabolic efficiency.
4. **Use feed additives:** Incorporate probiotics or direct-fed microbials to enhance cellulolytic bacteria, boost propionate production, curb methane, and improve microbial protein synthesis.

Conclusion

In dairy cattle, effective rumen digestion ensures supplies of VFAs and microbial protein, while precise metabolic efficiency converts these nutrients into milk components. When rumen health and metabolic balance are optimized, cows produce greater milk volume, with higher fat and protein percentages, and better overall efficiency. Conversely, disturbances in digestion (e.g. acidosis) or metabolism (e.g. fatty liver) reduce both milk yield and quality. Strategic feeding, proper forage structure, additive use, and transition support are key to maximizing dairy performance.

Dr. A V Siva Reddy, MVSc.
Brand Manager - Natural Remedies Pvt. Ltd.

ARTICLE

Role of Micronutrients on Animal Immunity

Nutrition of animal interacts with their immune system. Major nutrients like energy protein and fat and micronutrients like vitamins and minerals are play a vital role in evoking animal immune response. The relation ship between nutrition and disease resistance is complex. But it is well documented that the micronutrients play important role in animal immunity. Minerals like zinc, copper chromium, iron, cobalt, selenium and manganese and vitamins (antioxidant) like Vitamin E, Carotenoids (beta carotene) and vitamin A, vitamin C are having significant role in animal immune status. Some vitamins and minerals the amount required for optimal growth response is greater than the amount required for growth and reproduction. Cattle can have sufficient vitamin and minerals intake for adequate growth and reproductive performance but not have optimal immune response.

Stress associate with weaning and transportation has a negative effect the immune system. This stress typically occurs when the animal is exposed to a variety of infectious agents as a result of marketing /transporting/ management procedures. Nutrition can interact with these two primary factors mostly likely us a result of infectious agents. Preweaning nutritional deficiencies or through decreases feed intake associated with stress. Decreased feed intake/ nutrient has further depressed the immune function and potentially increases susceptibility to infection. Nutrients derived from dietary proteins, carbohydrate and fats as well as micronutrients, vitamins and minerals interact with immune cells systematically in the circulating blood, regional lymph nodes and specialized immune system of gastrointestinal tract.

Raju Kushwaha*, Vinod Kumar, Muneendra Kumar, Mokshata Gupta, Dhapse Sanket Rajkumar

Immunology

Immunity refers to reactions by an animal's body to foreign substances such as microbes and various macromolecules, independent of a physiological or pathological result of reaction. Immunity is generally classified as either innate immunity (natural) or acquired (specific). Innate immunity includes physical /chemical barriers, the complement system, phagocytes such as macrophages, neutrophils, and natural killer cells and macrophages derived cytokines such as alpha and beta interferon's and tumor necrosis factor. Acquired immunity, which is induces by natural exposure or vaccination, includes antibiotics, lymphocytes and lymphocyte-derived cytokines such as interleukin-2 interleukin–4 and transforming growth factor. Acquired immunity if further divided into either Humoral or cell mediated immunity. Humoral immunity is mediated by B-lymphocytes, which respond to antigens to become antibody producing cells and memory cells and provide defense against intracellular microbial infection. In cell-mediated immunity, the T lymphocytes and associated cytokines provide defense against intracellular pathogens and tumor cells. Humoral immune response can be measured by estimating the antibody production by zinc turbidity method.

Zinc

Zinc is an essential trace element for the immune system. The innate as well as specific parts of immune system are influenced by Zn. Zinc is component of numerous enzymes like Superoxide dismutase (SOD), RNA polymerase, DNA polymerase, Thymidine kinase and Ribonuclease. Zinc deficiency results in atrophy of the thymus and increase leukocyte count with reduced number of lymphocytes. Immature neutrophils are elevated in zinc deficient animals. Zinc is important in activation of B cells and NK cells. Zinc is essential co factor for the thymic hormone thymulin. Thymulin is secreted by thymic epithelial cells and induces differentiation in immature T cells. Zinc influences host defense mechanism via: phagocytic activity, cell mediated immunity and humoral immunity. Zinc enhances the phagocytic activity of macrophages and neutrophils. Phagocytic cell consume large quantities of oxygen during the so-called respiratory burst, which accompanies the ingestion and killing of microorganisms and production of H_2O_2 and O_2^- radicals in response to challenge by foreign particles. The protection of neutrophils against the damaging effects of super oxide radicals is probably the function of the cytosolic cu-zn containing super oxide dismutase.

Copper

Copper is a component of Superoxide diamutase enzyme. Through this enzyme activity, copper enhances the phagocytic process of neutrophils and macrophages. ceruloplamin a copper containing protein. Around 90% the circulatory copper present in form. The concentration of ceruloplasmin higher in inflammatory site due to increased blood supply. The copper present in the ceruloplamin used by neutrophils and macrophages used for their phagocytosis process. Copper deficient animals exhibit severe symptoms of immune dysfunctions. These include: Decreased functions of T cells, decreased NK cell cytotoxicity and distorted lymphocyte population. Copper deficient animal show decrease in antibody cell response with increased susceptibility to infection. Copper deficiency appears to alter the plasma membrane thus altering immune response to infection.

Chromium

Chromium so important to health maintenance particularly during stress. Cr seems to be an essential trace element because it is a component of Glucose Tolerance Factor that potentiates the action of insulin. GTF is organo metallic compound consist of trivalent chromium ions bound to several molecules of niacin, and amino acids. GTF facilitate interaction between insulin and insulin receptor in target tissue. Supplemental chromium enhances the immune response of stressed calves. Stress result in elevated blood concentration of cortisol, which is known to depress immune function. Periparturient and early lactation dairy cows are under great physical and metabolic stress. Under these conditions Cr supplementation enhances immune responses. Chromium supplementation enhances both Humoral and cell mediated immune response under stress.

Iron and Cobalt

Iron important for heam synthesis. It exerts immune role via catalyze enzyme which converts hydrogen peroxide to water in anti oxidant system. Impaired cell mediate immune response was observed in iron deficient animals. Primarily affect antibody formation associated with B cells. In pigs, iron deficiency prone to more disease susceptibility. Cobalt deficiency affects neutrophil function. Its deficiency affects resistance to parasitic functions. Higher faecal egg counts are observed in Co deficient lambs after natural infection with gastrointestinal nematodes.

Vitamins (antioxidant)

Antioxidant function as to remove harmful free radicals produced through normal cellular activity, there by maintaining structural

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integrity of immune cells. Major free radicals found in biological system are super oxide, hydrogen peroxide, hydroxyl radical and fatty acid radicals. Free radicals are highly reactive compounds because they are missing an electron. Free radicals can react with nucleic acids causing mutation, they can react with enzymes and render them in active and they can react with fatty acids in membranes causing membrane instability. Free radicals can eventually kill cells and damage tissue. Reactive oxygen metabolites are unavoidable products of normal metabolism process and are not ways harmful. Super oxide and hydrogen peroxide are involved physiologically in the chemistry of several enzymes and are used by phagocytic cells to kill bacteria. In balance between production to ROM and their safe disposal however can initiate oxidative chain reactions and lipid per oxidation. Natural antioxidant includes vitamin E, vitamin A carotenoids (beta carotene) and vitamin C. Beta carotene potent direct acting anti oxidants where as vitamin A is less active anti oxidant but its role in disease registance was well documented as maintaining the epithelial integrity of immune cells. In general minerals do not act directly act antioxidant but are critical components of the antioxidant enzymes.

Vitamin E and Selenium

Primary function of vitamin E as an anti oxidant. Its supplementation enhances the neutrophil function. Both vitamin E and Se are important in cellular antioxidant system. High dietary vitamin E reduces the requirement for selenium. The principle biochemical role of selenium is through enzyme ie. Glutathione peroxidase. Glutathione perxoidase is an important part of cellular antioxidant system. Selenium supplementation also improves neutrophil function. Neutrophils from cows supplemented with 0.3 ppm of supplemental selenium killed mastitis pathogen more effectively than non-supplemented group. Vitamin E and Se influences the function of immune cells especially mammary gland. Vitamin E and the selenium containing enzyme glutathione peroxidase are important in the function on PMN. When pathogen invades the mammary gland they trigger an influx of PMN and other white cells. These cells engulf and destroy bacteria and other harmful organism. If vit E and Se are not in adequate supply, the total no. of PMN and the life span of these cells will be greatly reduced.

Vitamin A and beta-carotene

Carotenoids are red and yellow pigments serve as precursor (beta carotene) to vitamin A. Beta-carotene is an efficient quencher of singlet oxygen and can function as antioxidant. Vitamin A cannot quench singlet oxygen and has less antioxidant activity then other antioxidant. But vitamin A prevents epithelial keratinization and maintains the cellular integrity of lymphoid organs, which is important for combating disease stress. Beta carotene increases lymphocyte cytotoxic activity, stimulate production of various cytokines, enhances phagocytic activity of neutrophils and macrophages and increase activity of natural killer cells. It enhances both cellular and humoral immunity. Beta-carotene enhances peroxidase activity in macrophages and myelo peroxidase activity of neutrophils.

Conclusion

Micronutrients effectively modulate the animal immune response. Zinc and copper enhance both cell mediated and Humoral immune response. Chromium evokes animal immune status especially in stress condition. Vitamins i.e. antioxidants prevent the tissue against the free radicals generated in normal cellular metabolism. Vitamin E and Se particularly important for mammary gland immunity. Beta-carotene act as potent antioxidant and prevent the tissue damage caused by free radicals. Thus, the possibility if dietary nutrient manipulation for optimization of immune response with out compromising the genetic potential of animals for growth and production appears to be feasible and thus will economically benefit the livestock farmers and the sector as whole.

Raju Kushwaha*, Vinod Kumar, Muneendra Kumar,
Mokshata Gupta, Dhapse Sanket Rajkumar
Department of Animal Nutrition, College of Veterinary Science and Animal husbandry, DUVASU, Mathura-281001
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ARTICLE

Close-up Period Management: a practical, science-first approach to udder involution, metabolic resilience and micronutrient Importance:

The 3-4 weeks immediately before parturition – the close-up period – remains the single most important window to influence lactation performance, udder health and early-lactation metabolic resilience. Proper management in this short interval requires coordinated control of udder involution and "udder rest," endocrine milieu, follicular dynamics, and metabolic substrates; it also demands surgical attention to micronutrients (biotin, cobalt/B12, phosphorus) and to potassium management in forages. Below I synthesize current molecular and applied findings and convert them into actionable, evidence-based recommendations.

1 Mammary involution and "udder rest": molecular drivers and practical control

Mammary involution after cessation of milk removal is an active, immune-mediated remodeling process driven centrally by milk stasis, epithelial cell apoptosis and conserved transcriptional programs (notably STAT3 activation). Milk stasis triggers local factors and proteases that increase epithelial cell lysosomal permeabilization and apoptotic cascades; STAT3 is a principal regulator coordinating epithelial cell death and macrophage recruitment during involution. In practice, a controlled and timely involution reduces intramammary infection risk at calving, preserves secretory tissue integrity for the next lactation and improves colostrum quality when managed correctly.

Applied takeaways: for high-yielding cows, accelerate controlled involution by ensuring an effective dry-off protocol (reduce milking frequency abruptly or use incomplete milking systems in the last milking events), apply internal teat seals where indicated, and avoid overfilling during the far-off dry period. These operational steps reduce chronic milk stasis and lower intramammary bacterial load at calving.

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2 Hormonal control: prolactin, oxytocin, glucocorticoids and the involution of udder.

Endocrine status during the close-up period sets the mammary gland's sensitivity to involutional cues. Lactogenic hormones (prolactin, growth hormone, thyroid hormones) sustain secretory activity, while oxytocin mediates milk ejection and ductal physiology. Conversely, local and systemic stressors (elevated glucocorticoids) and milk stasis shift the balance toward STAT3-mediated apoptosis and involution. Modulating these hormones is not about pharmacology in routine herds, but about management: minimizing prepartum stressors (heat, overcrowding, abrupt diet changes) helps maintain a favorable lactogenic environment and prevents premature or incomplete involution that predisposes to mastitis

Practical rule: maintain low-stress handling, consistent pen moves, and heat-abatement starting in the late dry period; these measures reduce cortisol spikes that antagonize lactogenic signaling and impair coordinated involution.

3 Follicular dynamics in the close-up cow - timing reproductive readiness and metabolic load

Prepartum follicular waves continue despite the metabolic upheaval of late pregnancy. Energy deficits and systemic inflammation can suppress dominant follicle function and delay ovulation postpartum. Recent reproductive reviews emphasize that metabolic status (NEFA, glucose, insulin) at calving influences follicular growth and oocyte competence, thus linking close-up nutrition to early postpartum fertility. The corollary is clear: managing energy balance and inflammation prepartum protects follicular function and shortens time to first ovulation.

Operationally, target a close-up diet that maintains moderate body condition, avoids excessive adiposity, and provides fermentable fiber with controlled energy density — this preserves DMI, stabilizes insulin signaling and readies the reproductive axis.

4 NEFA: biochemistry, pathology and prevention

Non-esterified fatty acids (NEFA) are liberally mobilized from adipose during negative energy balance; elevated circulating NEFA predispose to fatty liver, ketosis, immunosuppression and poor reproductive outcomes. Mechanically, lipolysis is driven by catecholamines and decreased insulin action; adipose remodeling during the transition amplifies NEFA efflux when dietary intake fails to match mammary energy demand. Reviews of lipolysis and adipose remodeling stress that controlling the amplitude of negative energy balance is the fastest way to curb NEFA peaks.

Proven prevention protocol

Feed close-up cows a controlled energy diet that does not provoke over conditioning; use palatable, moderate-energy TMR or step-up strategies to protect DMI.

Consider rumen-protected glucogenic precursors (propionate sources) and rumen-protected choline to support hepatic lipid export and reduce NEFA accumulation.

Strategic fat supplements (oleic blends) can supply energy without depressing rumen fermentation — but monitor body condition and avoid excessive mobilization.

5 Micronutrients with outsized returns: Vitamin H (biotin), cobalt/B12, phosphorus

Vitamin H (biotin)

Biotin supports keratinization, hoof integrity and metabolic enzyme function. In transition cows, biotin supplementation has shown benefits for claw health and may support overall metabolic resilience; while not a primary NEFA modulator, biotin optimizes intermediary metabolism and should be considered in herds with lameness history or poor hoof horn quality.

Cobalt and Vitamin B12

Rumen microbes require cobalt to synthesize cobalamin (B12), essential for propionate metabolism and gluconeogenesis. Emerging trials indicate that targeted cobalt supplementation in the peripartum period can support energy metabolism and reproductive performance by ensuring adequate microbial B12 production and efficient propionate utilization. In practical terms, verify forage cobalt status and correct deficiencies; small, sustained cobalt supplements in the close-up diet are low-cost insurance for gluconeogenic competence.

Phosphorus

Phosphorus is central to energy transfer (ATP), muscle function and appetite. New meta-analytic requirement systems have refined close-up P targets; both deficiency and excess carry costs. During the close-up, avoid chronic P deprivation which can impair appetite and muscle function, but also avoid overfeeding P (environmental loss). Closely align dietary P to updated requirement models and monitor blood/urine markers where indicated.

BioPhilia HEALTHCARE

Innovation is in our DNA

GutAid™

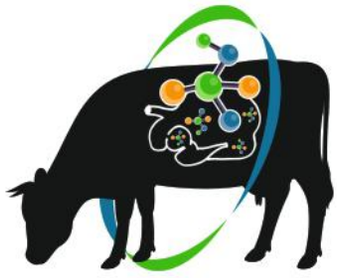
Nourish the Gut

- Leaky Gut
- Heat Stress
- Transition stress
- Risk of Disease

BioRum™

Blend of additives with Slow release buffering action in Rumen

- Fibre digestion
- Milk fat
- Lameness



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- Anti-Fibrolytic action on chronic wound
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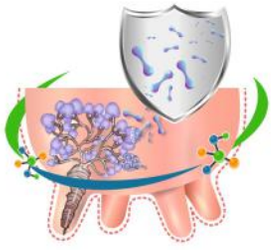

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6 Potassium : the forage problem and "binders" – realistic strategies

High-K forages (many grasses, silages) raise DCAD and blunt the efficacy of negative-DCAD prepartum diets that reduce hypocalcemia risk. In practice the first line of defense is forage management: select low-K cuts, avoid early-cut high-K fields for close-up cows, and use conserved forages with known K profiles. Technical literature explores the use of cation-exchange materials (clinoptilolite) as dietary modulators; small trials and mechanistic studies show zeolites can sequester cations and influence mineral bioavailability, but their use should be conservative and evidence-based (monitor DMI and mineral balance). The pragmatic route remains forage selection + DCAD mineral balance; consider clinoptilolite only as a targeted adjunct under veterinary guidance

7 Integration : A 7-point close-up protocol I would use today

High-K forages (many grasses, silages) raise DCAD and blunt the efficacy of negative-DCAD prepartum diets that reduce hypocalcemia risk. In practice the first line of defense is forage management: select low-K cuts, avoid early-cut high-K fields for close-up cows, and use conserved forages with known K profiles. Technical literature explores the use of cation-exchange materials (clinoptilolite) as dietary modulators; small trials and mechanistic studies show zeolites can sequester cations and influence mineral bioavailability, but their use should be conservative and evidence-based (monitor DMI and mineral balance). The pragmatic route remains forage selection + DCAD mineral balance; consider clinoptilolite only as a targeted adjunct under veterinary guidance

1. **Segregate close-up cows 21–28 days prepartum; minimize pen moves and stress**
2. **Feed a tested, low-K forage base; calculate DCAD and aim urine pH targets per your lab-validated program.**
3. **Control dietary energy (avoid over conditioning) and include rumen-protected glucogenic precursors and, where indicated, protected choline.**
4. **Ensure cobalt adequacy and include biotin in herds with hoof or metabolic history; align dietary P to modern factorial requirements.**
5. **Execute a dry-off protocol that allows effective udder involution (teat seals and selective dry-cow therapy where required).**
6. **Use environmental controls (shade, ventilation, cooling) to avoid heat-stress-induced endocrine disruption.**
7. **Monitor outcomes (DMI, urine pH, NEFA/BHB, SCC, colostrum IgG) and loop back to nutrition and housing changes .**

Closing perspective

The close-up period is deceptively short but enormously consequential. Modern molecular insights (STAT3 and the involution program), coupled with robust metabolic science around NEFA, gluconeogenesis and micronutrient biology (biotin, cobalt/B12, phosphorus), give us precise levers to improve outcomes. The challenge in the field is integration: forage choice, DCAD management, controlled energy intake, micronutrient correction and low-stress housing must be combined, monitored, and iterated. When these elements are aligned, udder involution proceeds cleanly, NEFA surges are blunted, follicles are preserved for early postpartum fertility, and the fresh cow starts life in lactation on the front foot.

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Enzymes are necessary to improve fiber digestion

Work in direct fiber breakdown

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Our data indicates a minimum ROI of 1:3

Dosage

Feed miller:	Cows and Buffaloes:
0.5-1kg/ton of feed	5g-10g/animal/day

KEMIN®
Compelled by Curiosity™

Impact of Supplementation of Fibrolytic Enzyme In Ruminants in North and Central India

The supplementation of enzymes in ruminant diets has been identified as a viable strategy to improve nutrient digestion and boost productivity. Enzymes play a vital role in the breakdown of complex fibers in the diet while stimulating the microbial population hence, synergizing fiber breakdown. This is noted to further impact volatile fatty acid production and energy availability to the animal, crucially impacting both milk yield and milk fat synthesis. The effect of exogenously supplemented enzymes in HF cows and Murrah buffaloes in the northern and central regions of India, respectively, were considered for this analysis. Briefly, the animals in these trials were divided into control and treatment groups, with the treatment groups supplemented with enzymes, apart from the regular concentrate and roughage feeds in both groups, over an average period of 21 days in cows and 27 days in buffaloes. Milk yield and Milk fat were monitored during the trial period for cows and milk yield was monitored in buffaloes. The results, on average, indicated an increment in both milk yield and milk fat in HF cows in Punjab by 8% and a 4% increment in milk yield in buffaloes in Madhya Pradesh. It can be concluded that exogenously supplemented enzymes in ruminant diets positively impact productivity by influencing fiber breakdown and nutrient utilization.

Dr. Ananth Krishnamurthy
Associate Product Manager, Kemin Industries
Dr. Tarjan Kaliaperumal
Senior Scientist, R&D, Kemin Industries
Dr Sudhir Singh
General Manager-Technical services, Kemin Industries

Introduction

India is currently one of the world's leading producers and consumers of milk. Increasing demand and subsequent supply of milk are primarily driven by an anticipated increase in milk prices and demand in the export market. Other milk products like skimmed milk powder and reconstituted milk products further drive this demand for increasing milk production (DAHD, 2018). As a tropical country, India faces challenges related to increasing raw material prices, lower quantity and quality of feed and fodder sources, and sub-optimal productivity of cows and buffaloes. Over the years, animal nutritionists have recognized the importance of improving the quality of available feed through the application of physical, chemical, and biological methods The application of exogenous feed enzymes in monogastric nutrition is a well-established concept. While research on enzyme supplementation in ruminant diets had been initiated in the 1960s, progress had been sluggish due to a lack of understanding of the rumen function, variable results, and higher cost of production of enzymes. Latest developments in the field of industrial biotechnology enhanced understanding of rumen function and increasing studies of enzymes in ruminants have fueled the confidence of nutritionists to incorporate exogenous enzymes in ruminant feeds (Sujani & Serasinhe., 2015).

Feed breakdown in ruminants is primarily carried out by rumen microbes, which produce mainly 3 types of enzymes. Fibrolytic, proteolytic and amylolytic enzymes are produced by microbes that help in fiber and protein digestion. A major challenge is the sub-optimal digestibility of feeds and fodders. It is estimated that fiber digestion occurs only to a degree of 65-70% even in ideal conditions (Zhang and Lynd, 2004; Van Soest, 1994). Fiber is a major source of energy for ruminants, and its digestion, therefore, is greatly compromised. This limits the amount of energy available to the animal, especially during the transition and lactation stages resulting in sub-optimal productivity, higher loss of body condition after parturition, and predisposed to metabolic diseases.

Fiber digestion is mainly carried out by fibrolytic enzymes produced by rumen microbes. These include cellulases, xylanases, glucanases, pectinases and so on (McAllister and Wang, 2002). These enzymes break down the cell wall structures containing cellulose, hemicellulose, and pectins to release glucose, cellobiose, and other polysaccharides. While the rumen microbes manage to break down fibers, a large fraction remains undigested due to various factors. The digestibility of feeds, ruminal environment like pH, temperature, rate of feed passage, rumen microbial status, and stage of the animal during which the feed is presented play a vital role in determining the efficiency of feed and fiber digestion (Beauchemin et al., 2003, 2004).

To mitigate such high variability in feeds, their digestion, and dynamicity of rumen environment and microbial action, exogenous supplementation of feed enzymes have been identified as a trusted alternative to ensure optimal fiber digestion, while synergistically improving rumen microbial function and environment.

A key noteworthy aspect of exogenous enzymes is their stability in lower pH conditions. The supplementation of high-grain diets in ruminants predisposes the rumen to an acidic environment which impacts the population of fibrolytic microbes whose activity is pH dependent with peak activity within the neutral pH conditions. Exogenous enzymes have a lower optimum pH activity which makes them effective even under variable pH conditions (5-6.2 pH) (Russell and Wilson, 1996) (Beauchemin et al., 2003, 2004).

The impact of exogenous enzyme supplementation in cows and buffaloes was analyzed in these trials, especially in high milk-producing areas of India. A cocktail of enzymes, namely xylanases, cellulases, mannanases, glucanases and a specialized debranching enzyme complex, called xylanase potentiating factor (XPF) were supplemented to cows and buffaloes in the respective territories and their impact was analyzed.

Objective

The objective of this study was to evaluate the effect of exogenous feed enzyme supplementation in Holstein Friesian cows in Punjab and Murrah buffaloes in Madhya Pradesh. Punjab and Madhya Pradesh are two of India's highest milk-producing states contributing 6.7% and 8.5% of India's milk production respectively (DAHD,2018). The effect of enzymes on milk yield and milk fat in HF cows and milk yield in Murrah buffaloes were considered for this study. The enzyme supplemented in this study was KEMZYME® One Advance, from Kemin Industries South Asia Pvt Ltd.

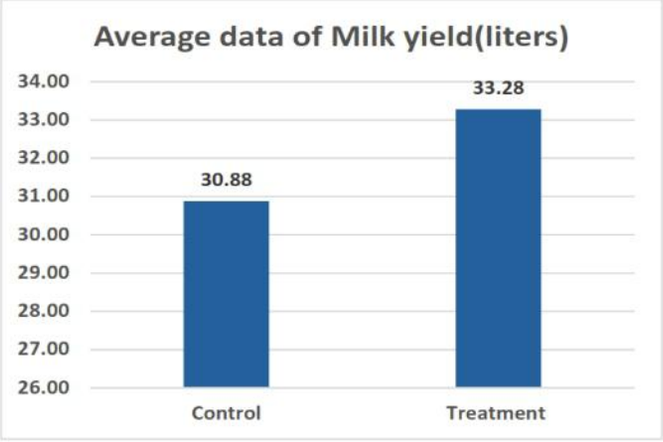
Trial Design

Two trials were conducted for the evaluation of enzyme supplementation in cows and buffaloes.

The first trial was conducted in Holstein Friesian cows, in the early lactation stage in Punjab. An average of 8 animals in control and 8 animals in the treatment group were taken, with the treatment group supplemented with 5g of KEMZYME®. The trial duration was for a period of 21 days, with an average of 5 days as a pre-trial period. Both groups were fed with an average level of 10 kg concentrate feed, 1.6kg wheat straw, 23 kg corn silage, and 10kg green fodder. Milk yield and milk fat were documented daily.

The second trial was conducted on Murrah buffaloes in the early lactation stage in Madhya Pradesh. An average of 18 animals in control and 18 animals in treatment were taken, with the treatment group supplemented with 7g of KEMZYME®. The trial duration was for a period of 27 days, with no pretrial period. Both groups were fed with 6kg of straw and 8kg of concentrate feed. Milk yield was documented on a bi-weekly basis. It may be noteworthy that the trials were conducted in the peak summer season, between April and May, when the temperature is likely to be beyond 40° C.

Results



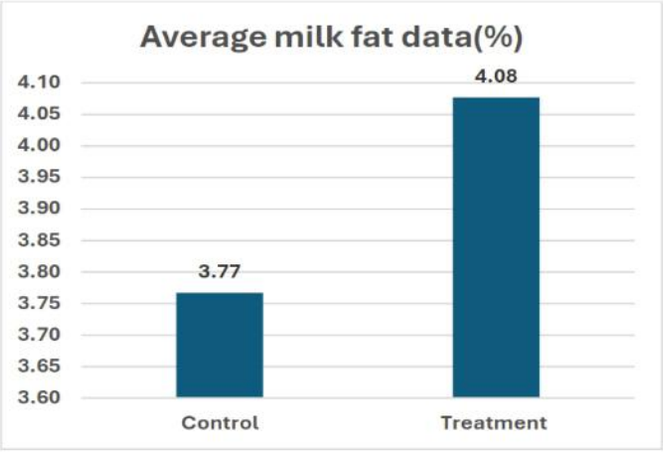


Figure 1 represents the average milk yield of HF cows in Punjab, where an increment of 8% in milk yield was noticed, while **Figure 2** represents the average increment in milk fat by 8% which was observed.

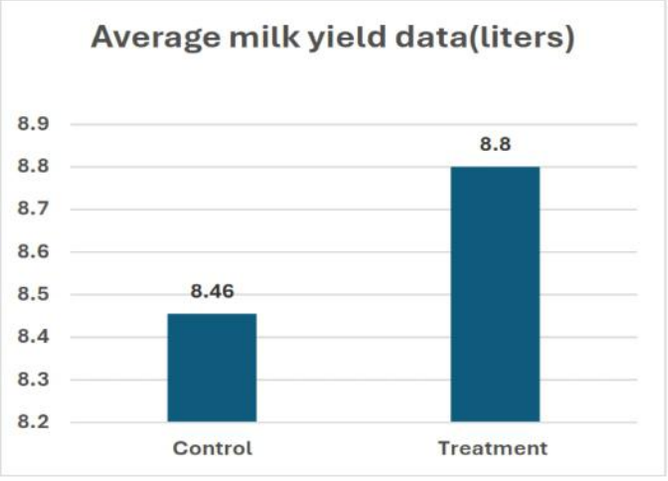


Figure 3 represents average milk yield data obtained from Murrah Buffaloes in the central region

Discussion

The usage of exogenous feed enzymes for fiber breakdown has been gaining acceptance steadily. This can be attributed to increased knowledge of enzyme action, less expensive cost of production, and greater understanding of rumen and rumen microbiome function (McAllister et al., 2003). The mechanism of action of feed enzymes can be broadly classified into four modes, the first being the direct hydrolysis or breakdown of fibers to release sugars. Secondly, the release of sugars creates a chemotactic attraction of microbes to the site of sugar release and increases their attachment to the fibers. This attachment is highly synergistic as the microbes themselves would produce fibrolytic enzymes which further degrade the fiber. Thirdly, this mechanism further stimulates the growth and multiplication of ruminal microbes. Fourthly, the increased microbial biomass due to exogenous enzymatic breakdown increases the supply of metabolizable protein to the intestine. The overall impact of exogenous feed enzymes can be noticed in the improved metabolic status of ruminants, higher feed digestion leading to better nutrient utilization, positive rumen microbial status, and enhanced productivity parameters in animals, mainly milk yield, milk fat and possibly milk protein (Kung, 2001) (Sheppy, 2001). Any inconsistency in the results is likely due to the type of enzyme prepared, synergy of enzyme activities, levels of enzyme applied and to what fraction of the diet, enzyme stability, mode of application and animal differences as well as whether the cows are in a negative energy balance and able to respond to increased available energy (Beauchemin, 2003).

The results obtained in our studies in cows are consistent with numerous in-vivo trials conducted (Lewis et al., 1999; Gado et al., 2009; Holtshausen et al., 2011). These studies reported an increase in milk production ranging from 5-16%, whereas we have reported an increase in milk production, on average by 8%. It is likely that enzyme supplementation in concentrate feeds would have improved the utilization of nutrients in the digestive tract and the rumen, along with an increase in the gain of net energy. The increase in milk fat, observed in our studies is also consistent with studies done by other workers (Yang et al., 1999) and (Mansour, 2009), who observed that milk fat increased after the application of fibrolytic enzymes. This increase has been attributed to the effect of enzymes on the production of fatty acids essential for fat synthesis, while also increasing the available energy to the ruminants (Babak and Akbar, 2012).

Buffaloes are well known for their ability to digest low-quality roughages. A combination of xylanases and cellulases was noted to have increased milk yield on numerous occasions as concluded by Azam et al., (2017), who had observed an increment in milk yield in Nili Ravi buffaloes by 12% and 17.7% when fibrolytic enzymes were given at 10g and 15g per day. Another study by Shelke et al., (2010) in Murrah buffaloes, showed an increment in milk yield by 12% when a combination of fibrolytic enzymes was supplemented at 1.5g/kg DM. there is a trend of increase in milk yield in buffaloes, which was consistent with our findings, where an increase in milk yield by 4% was noticed. A comparatively lower increment in our study could be attributed to the lower dosage supplemented in our studies, an average of 7g/animal as compared to 10-15g/animal supplemented in the studies discussed. It is likely that an increase in enzyme dose in buffaloes may have improved the milk yield linearly.

Conclusion

From the studies conducted in cows and buffaloes in northern and central India, respectively, it can be concluded that the combination of xylanases, cellulases, and debranching enzyme supplementation may have had a beneficial impact on cow's milk and milk fat production while improving the buffalo milk production.

SOY EXCELLENCE CENTER
A USSOY program

From Learning to Leadership:

How SEC India is Building a Stronger Protein Industry

Dr. P.E. Vijay Anand
Center Lead
The Soy Excellence Center, India
U.S. Soybean Export Council

The Soy Excellence Center (SEC) India Program has been making steady strides in delivering high-impact training, fostering an active professional community, and nurturing the next generation of leaders for India's protein value chain. With a focus on quality learning, innovation, and engagement, the program continues to shape a thriving ecosystem of skilled and motivated professionals. Globally, the program has trained over 35,000 members since its inception in 2020.

Learning Without Boundaries

Through its flexible 'Self-Paced Hybrid (SPH)' courses, SEC India offers practical, industry-specific training across five professional tracks: **poultry, feed milling, aquaculture, dairy, and soy foods**. To date, these courses have empowered over 900 Indian professionals to transition into the SEC community, with ongoing refinements aimed at enhancing completion rates and the learner experience.

A Community That Connects and Grows

Completion of the SPH courses, SEC India's community activities, both virtual and in-person, serve as vital platforms for continuing knowledge exchange and networking. Virtual events explore diverse topics from poultry best practices to feed formulation, while in-person programs like advanced training sessions and the flagship "Feed Formulation Lab" offer hands-on, collaborative learning.

The program also draws on the expertise of Subject Matter Experts (SMEs) and community "Champions" from within its network, enriching discussions and building a library of valuable static resources. This dynamic approach has helped maintain strong engagement levels among members.

Recognizing and Inspiring Future Leaders

In line with its mission, SEC India celebrates excellence and contribution. Selected professionals have been honoured with certificates of appreciation at USSEC and industry events, while others have earned Gold and Silver badges recognizing their active

participation and leadership potential. These recognitions not only reward dedication but also inspire others to strive for greater involvement.

Insights from Industry Leaders

Listening to the industry is central to SEC India's approach. SEC relies on its 15-member Regional Advisory Council (RAC) for advice. Engagement sessions with leaders from across the protein value chain, covering education, nutrition, technology, and entrepreneurship, have provided invaluable direction for program evolution. Such dialogues also highlight emerging talent.

Innovation and Operational Excellence

All global SECs (6 of them catering to over 40 countries) in general operate all of their learning programs on an impressive SEC Digital Platform and continually seek to improve their systems and processes. The Digital Platform serves as a massive facility for global and regional networking and is a source for a wealth of knowledge. Innovations like new communication strategies have boosted course completion rates, while a Bulk Upload registration feature has streamlined participant onboarding. Data-driven optimization reports and the JIRA Ticketing Tool have further enhanced operational efficiency and participant support. The digital platform allows SEC managers to assess data, measure programs, activities, and evaluate different aspects from a wide perspective, aiding continuous improvements in virtual programming.

Amplifying the SEC Voice

Through partnerships with leading poultry and dairy media outlets, SEC India shares stories, updates, and testimonials that reach tens of thousands in print and digital channels. A growing library of video testimonials captures the human impact of the program, motivating new participants and strengthening SEC's visibility across the industry.

In every initiative, SEC India is guided by a clear purpose: empowering professionals, connecting communities, and cultivating leaders who will champion U.S. Soy's role in a sustainable and competitive protein sector. It is gradually emerging as a great partnership mission with the entire protein value chain in India.

What SEC Members Have to Say

Dr Mukesh Sharma
Dairy Consultant

My primary objective was to gain additional knowledge and revise the previous know how with the course on basic feed milling and basic dairy courses, and I am fully accomplished my goal, and achieved my objective to attend these training. my experience was excellent though I have time shortage due to my work engagement and serving to dairy farmers. I would like to have some depth knowing on ultrasound in large animals specially in dairy cattle and equine,

My overall experience was excellent and in future I will surely attend other training programs too.

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गौ माता के लिए अब तक का सबसे तेज और सबसे सुरक्षित दूध बढ़ाने का तरीका!

MILKEASE

Milkease is a blend of balanced essential micronutrients for indigenous and high-producing lactating dairy cows and buffaloes. It helps increase dry matter digestibility, milk production, and its composition.

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RETHINK METHANE!

"25 Years ago people could be excused for not knowing much, or doing much about Climate change. TODAY, WE HAVE NO EXCUSE!" -Desmond Tutu

Dr. Riya Upadhyay

While we often associate carbon emissions with specific sectors like energy, transport, and construction, the reality is that every sector contributes to the global carbon footprint. The key distinction lies in the scale of impact. According to Climate Watch, the agriculture sector ranks as the second-largest source of greenhouse gas emissions, right behind energy, accounting for over 10% of the global emissions!

So, Where Does This Methane Come From?

Every year, a staggering 600 million tonnes of methane are released into our atmosphere, with about 60% coming from human activities - agriculture being the biggest contributor. In fact, livestock emissions

(from manure and gastro-enteric release : the infamous burps & farts) account for around 32% of human-caused methane. But it's not just cows; paddy rice cultivation, where flooded fields create ideal conditions for methane-emitting bacteria, adds another 8% to human-caused emissions.

Why Should We Care About Methane? What's The Big Deal?

While methane might not get as much attention as carbon dioxide (CO_2), this colorless, odorless gas is a serious player in the climate crisis! With a global warming potential 80 times greater than CO_2 over a 20-year period, it's a powerhouse of destruction! Methane is a primary contributor to groundlevel ozone, a hazardous air pollutant linked to around 1 million premature deaths each year. At the recent UN Climate Change Conference (COP28), methane was front and center! Responsible for about 30% of current planetary warming, its contribution to climate change is now receiving serious attention. So seriously, in fact, that signatories to the Global Methane Pledge - 155 countries, including the U.S. and the EU—unveiled USD 1 billion in new grant funding. Their goal? To cut methane emissions by at least 30% from 2020 levels by 2030.

Farting Their Ways to Headlines : Cows Farts Declared a Global Threat (Yes, you read that right!)

It's not every day that farting cows steal the show at global climate summits! But they've done it three times in a row - most recently at COP28 in Dubai in December 2023! Did you know that a single cow can produce between 70-120 kg of methane per year? With our global population nearing 10 billion by 2050, demand for animal protein is set to soar by up to 70%, making methane emissions by livestock even more concerning.

Let's Understand The Science Behind It!

Ruminants possess a unique capability to digest feeds high in cellulose, thanks to the diverse microorganisms present in their rumen. These microorganisms, including bacteria, fungi, and protozoa, break down complex compounds through hydrolysis, resulting in the production of volatile fatty acids (VFAs) such as acetate, propionate, and butyrate, which then act as a source of energy for maintenance & production. Concurrently, this fermentation process also generates hydrogen (H_2), and carbon dioxide (CO_2) as byproducts. Predominantly, methanogenic archaea in the rumen utilize H_2 to convert CO_2 into methane (CH_4). Additionally, acetate (VFA) can be used by methanogens to produce methane. The methane produced is not used by the animal itself, but instead represents an energy loss (2–12% of gross energy) to the atmosphere, mainly by burping and little by the gaseous release from intestine, that has a negative impact on the climate.

Can Reducing Methane Really Help Combat Climate Change?

Absolutely! While CO_2 lingers in the atmosphere for hundreds to thousands of years, methane has a much shorter lifespan—about 12 years. This means that unlike CO_2, where any efforts in reduction will not yield an effect until later in the century, reducing methane emissions can have a near-immediate impact. For instance, if we achieve the goals set by the Global Methane Pledge, we could

potentially avoid over 0.2°C of warming by 2050 and prevent annually 26 million tons of crop losses, 255,000 premature deaths, 775 thousand asthma-related hospitalizations and 73 billion hours of lost labour due to extreme heat.

Tackling Methane Emissions From Livestock is a Team Effort!

Addressing the animal industry's carbon footprint requires collaboration among policymakers, industry stakeholders, and consumers. By adopting best practices and promoting sustainable choices, we can bend the emissions curve while meeting global protein demand. Strategies for mitigating methane emission involve diet formulation, precision feeding with an aim to increase nutrient density & feed digestibility, manipulating rumen microbial composition, and selectively breeding animals with negative residual feed intake.

How Can You, being an Animal Industry Expert, Contribute?

By recognizing the incredible potential of the right choices in phytogenics to reduce methane emissions from livestock**! RUCHAMAX**, a scientifically developed formulation by Ayurvet (A wholly owned subsidiary of Zenex Animal Health India Limited) with a unique blend of a total of 24 herbs of proven therapeutic efficacy and rationale, is a digestive health tonic for efficient digestion and complete assimilation of feed components and nutrients and for maintaining optimum rumen health, resulting in good and optimum productivity with reduced methane emissions.

Mechanisms of action behind the methane-reducing effect of bioactives present in RUCHAMAX are:

1. Bioactives in it have the ability to cause defaunation through their binding with sterols present on the protozoal surface.
2. Direct inhibition of methanogenic microorganisms.
3. Indirect effect by reducing availability of substrates (mainly H2) to produce methane (CH4) through the formation of fiber and/or protein-tannin complexes and by reduction of H2 producing protozoal species.
4. It can shift the rumen fermentation pattern towards increased propionate production and reduce acetate production, which is a key precursor for methane production.

The partial inhibition of enteric methanogenesis led by RUCHAMAX will have the dual advantage of stabilizing the global warming process and enhancing feed efficiency by re-channelization of saved biological energy for increased animal productivity. Moreover, RUCHAMAX backed with scientific validations over the period of more than 20+ years, has a proven record of increasing animal's productivity with its therapeutic effect on indications like Inappetence, Dyspepsia, Irregular appetite, Impaired ruminal function, Poor digestion, Debility, Convalescence and as a regular health tonic.

Let's be part of the solution! Together, we can RETHINK METHANE and create a healthier planet for generations to come!

EVENT CALENDER

SEPTEMBER 2025

16-18 SEP. 2025 – SPACE

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Email : c.berthier@space.fr | info@space.fr
Web : www.space.fr

SEPTEMBER 2025

30 SEP 04 OCT 2025 – World Dairy Expo, USA

Venue : Alliant Energy Center in Madison, Wisconsin, USA
Phone : 608-224-6455
Email : wde@wdexpo.com.
Web : www.worlddairyexpo.com

NOVEMBER 2025

19-21 NOVEMBER 2025 – ANSICON

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Email : ansiconayodhya2025@qmail.com
: vksinqhnduat@qmail.com

Techna India hosts Dairy Nutrition seminar in Ludhiana, July 2025

In July 2025, Techna India organized a technical seminar in Ludhiana, Punjab, bringing together nutritionists and feed manufacturers to address key challenges in dairy nutrition. The seminar focused on optimizing strategies for heifer growing and rearing and dairy cow feeding to enhance precision nutrition.

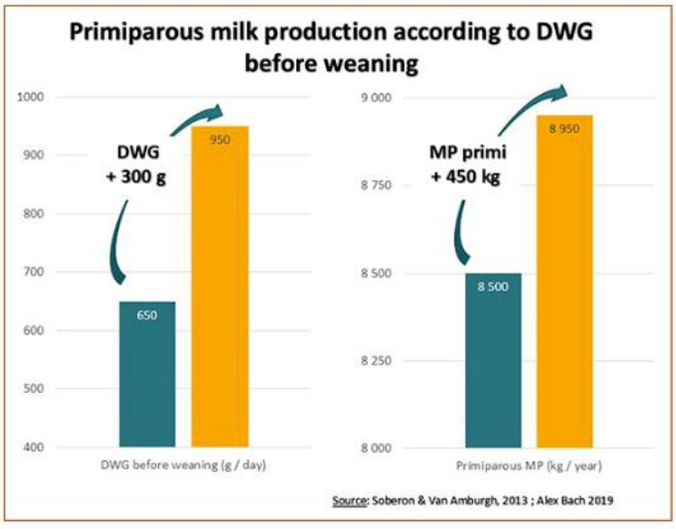
Heifer Rearing: Why the first six months matter

Raising heifers is a crucial factor in the profitability of dairy farms, particularly in reducing the age at first calving and increasing the production of primiparous cows. Techna shared its expertise in dairy heifer rearing, emphasizing nutrition, management, and profitability.

A recent Techna survey revealed that reducing the age at first calving alone does not guarantee optimal production, highlighting significant disparities in primiparous cow performance. These differences are partly due to nutritional inconsistencies such as limited or no measurement of colostrum IgG, lack of forage analysis, and insufficient diet calculations, alongside an absence of a comprehensive management strategy.

The importance of Early-Life Nutrition

To effectively reduce the age at first breeding, attention must be paid to the critical 0 to 6 month period, essential for the growth and health of heifers (see chart below). Ensuring good immune transfer and rigorous feed management during this timeframe is vital.



Feeding Dairy Cows: A new strategy based on two feeds

Faced with the limitations of traditional feeding systems, which often rely on imbalanced diets, Techna proposed a new strategy based on the use of two high-energy dairy feeds. This innovative approach aims to balance the TMR while providing a targeted concentrate intake according to days in milk.

The main objectives of this system are to secure body condition, stimulate the start of lactation, and meet the energy and protein requirements of both primiparous and multiparous cows. Testimonials from farmers and technicians confirm the technical and economic relevance of this feeding strategy.

Results demonstrated an increase in milk production alongside improvements in animal health parameters, such as body condition and locomotion, as well as an enhanced margin per cow per day. Adaptable to different production levels, this strategy leverages the expertise of feed manufacturers and contributes to improved farm profitability.

Through this seminar, Techna India reaffirms its commitment to supporting the dairy industry with practical knowledge and innovative solutions aimed at improving the productivity and competitiveness of India's dairy sector.

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Alltech Celebrates

Dr. Aman Sayed's 20-year anniversary, honouring his leadership in South Asia

Alltech is proud to celebrate a significant milestone as **Dr. Aman Sayed**, managing director of Alltech India and regional director of Alltech in South Asia, completes **20 years of distinguished service** with the company. A recognized leader in the animal health and nutrition industry, Dr. Aman has played a pivotal role in shaping Alltech's presence and impact across South Asia and beyond.

Over the past two decades, Alltech has experienced significant growth and become a major player in South Asia's animal nutrition sector. The global agri-food company now has four warehouses across India, an Alltech IFM laboratory in Bangalore, a blending plant and warehouse in Bangladesh, an office in Nepal, and an organic trace minerals production plant in Pune — the largest facility of its kind in Asia.

Under Dr. Aman's leadership, the South Asia team has excelled in bringing Alltech's global expertise to local food production challenges, introducing tailored nutritional solutions packages that help farmers improve animal performance and lower overall costs. Producers from across the region benefit from Alltech's premium, science-backed speciality ingredients, on-farm expertise and laboratory analytical services, farm sustainability programs and other educational resources.

The Alltech IFM laboratory in Bangalore, for example, allows customers to have their feed rations evaluated for protein and energy availability, providing insights into the efficacy of their feed and how supplementation might benefit performance and help lower costs. A new lab in the Pune facility, set to open this year, will offer additional services, such as screening feed for anti-nutritional factors, adulteration, mycotoxins and heavy metals.

Alltech South Asia currently serves the poultry, dairy, aquaculture, pet and equine industries. Dr. Aman is now focused on expanding the company's regional portfolio to include pig nutrition. He continues to emphasize the importance of delivering high-quality nutritional solutions with integrity and a strong commitment to clean, ethical business practices.

During his tenure in South Asia, Dr. Aman has helped to transform Alltech into a well-respected premium brand with significant annual growth and a strong manufacturing presence. In addition to leaning heavily into innovation, he has invested in training and development opportunities for his sales team, equipping them with the knowledge needed to best serve the region's agri-food producers.

An alumnus of Bombay Veterinary College, Dr. Aman holds a master's degree in veterinary science (poultry science) and earned gold medals during both his undergraduate and postgraduate studies. Early in his career, he identified a critical shortage of veterinary specialists in the field — a realization that drove him to pursue roles focused on practical support and customer engagement.

Before joining Alltech in 2005, Dr. Aman gained rich experience through several key assignments. His early contributions with Kemin included establishing a R&D farm and delivering technical services for the poultry industry. Internationally, he led the Free-Range Poultry Project with Emirates Agriculture Technologies in Sharjah and oversaw sales and distribution of Kentucky Equine Research products in the UAE and across the Middle East, supporting the equine racing industry. These diverse roles broadened his perspective and shaped the global leadership approach he brings to Alltech today.

One of the most profound influences on Dr. Aman's professional life came through his early interactions with Dr. Pearse Lyons, the late founder of Alltech. Inspired by Dr. Lyons' proactive philosophy of tackling problems head-on, Dr. Aman has embraced a leadership style grounded in innovation, teamwork and integrity.

In his pursuit of continuous growth, Dr. Aman has participated in several professional development programs, most notably the Alltech Mini-MBA, developed in collaboration with University College Dublin's Michael Smurfit Graduate Business School. The program deepened his entrepreneurial mindset and reinforced the value of calculated risk-taking to achieve sustainable innovation and profitability.

Reflecting on his journey, Dr. Aman said: "It's often said that everything comes to you at the right time — and you just need to trust the process. That perfectly sums up my career path. I'm truly grateful to be part of a company whose vision I wholeheartedly believe in. Choosing to leave my role in the Middle East and return to India has been the most rewarding decision of my career."

Dr. Aman plays a pivotal role not only within Alltech but also across the broader animal health industry. He currently serves as vice president of the Indian Federation of Animal Health Companies (INFAH), chairs INFAH's Aqua Subcommittee, and is a member of the Ad Hoc Board of Studies in Animal Husbandry and Allied Sciences at

the Faculty of Agriculture, Veterinary, Fisheries and Allied Sciences, Goa University. In recognition of his exceptional contributions to the industry, Dr. Aman was honoured with the *'Best Development Leader 2023'* award by Poultry Fortune group and an *'IPSA Fellow 2024'* award by the Indian Poultry Science Association.

With a career spanning over 25 years, Dr. Aman has navigated both calm and challenging waters, consistently making critical decisions that drive business growth and long-term profitability. Throughout his journey, he has remained grounded in three core values that guide his leadership and mentorship styles: honesty, openness and diligence. He believes these principles reflect a person's ethics, growth mindset, and degree of engagement—both personally and professionally.

"The only way to do exceptional work is to enjoy what you do," Dr. Aman said. "I feel passionate and energetic about my role at Alltech — it's what I live and breathe."

A firm believer in teamwork over individual success, he attributes his achievements to the collective spirit of collaboration within his teams.

As Alltech continues to expand its regional footprint, Dr. Aman remains focused on nurturing a purpose-driven culture centred on people, planet and producer profitability. Looking ahead, he aspires to scale Alltech's mission of Working Together for a Planet of Plenty® across broader geographies while staying firmly rooted in the values that have guided his success.

Technological Advancements Reshaping Livestock Farming

Step onto a modern Indian farm today, and you might be surprised by what you see. The familiar rhythms of rural life are still there – the lowing of cattle, the rustle of straw – but alongside them, new melodies are emerging: the quiet hum of sensors, the soft glow of a tablet screen, and the precise, data-driven decisions that are reshaping the very fabric of livestock management. Gone are the days when intuition and manual record-keeping were the sole pillars of farming. In 2025, India is witnessing the true dawn of digital solutions, transforming its vast and vital livestock sector into a powerhouse of efficiency, productivity, and sustainability.

India's livestock industry is not just an economic engine; it's a lifeline for millions of rural households, contributing significantly to agricultural GDP and ensuring food security for a burgeoning population. For decades, it thrived on traditional wisdom. However, the pressures of increasing demand, climate change, disease outbreaks, and the imperative for sustainable practices necessitated a radical shift. This shift is now well underway, driven by an array of cutting-edge digital technologies that are democratizing access to information and advanced tools for farmers, from the smallest backyard poultry keeper to large commercial dairies.

Chandan Kumar, Ajay Kumar, Md Danish and Charu Singh

The Digital Toolkit for Today's Farmers

The revolution is powered by an increasingly sophisticated digital toolkit, making farms smarter and more connected than ever before.

1. **The Internet of Things (IoT) on the Farm:** Imagine a smart collar on a cow that tracks its activity levels, rumination patterns, and even body temperature in real-time. IoT sensors are now ubiquitous. From wearable devices that alert farmers to early signs of illness or estrus in dairy cattle, to environmental sensors monitoring temperature, humidity, and ammonia levels in poultry sheds, IoT is providing invaluable, continuous data streams. This allows for proactive interventions, preventing widespread disease and optimizing comfort, which directly translates to better productivity. In aquaculture, water quality sensors offer real-time insights into dissolved oxygen, pH, and temperature, enabling precise feeding and management to boost fish health and yield.
2. **AI and Machine Learning:** The Brains Behind the Data: Collecting data is one thing; making sense of it is another. This is where Artificial Intelligence (AI) and Machine Learning (ML) algorithms shine. They analyze the vast amounts of data generated by IoT devices, identifying patterns and predicting outcomes that humans might miss. AI can forecast disease outbreaks based on behavioral changes, optimize feed formulations for specific animals based on their performance data, or even predict the optimal time for breeding. For instance, AI-powered image recognition can identify lameness in cattle or even count birds in a large flock, offering unprecedented insights into herd health and inventory.
3. **Mobile-First Approach:** Farm Management in Your Pocket: Perhaps the most impactful digital solution for the average Indian farmer is the smartphone. With rapidly expanding mobile network penetration, custom-built mobile applications have become central to farm management. These apps offer a range of services: digital record-keeping (vaccinations, breeding cycles, milk yields), direct access to veterinary telemedicine consultations, market price updates, weather advisories, and even digital payment platforms. This "farm in your pocket" approach bridges geographical distances, empowering farmers with real-time information and expert advice, irrespective of their location.
4. **Big Data Analytics & Cloud Computing:** The sheer volume of data generated by connected farms requires robust infrastructure. Cloud computing provides scalable and secure storage for this "big data," while analytics platforms extract actionable insights. Aggregated data from thousands of farms can reveal regional trends in disease, help policymakers formulate better strategies, or inform breeding programs on a national scale, fostering a more resilient and responsive livestock sector.
5. **Blockchain for Trust and Traceability:** As consumers demand greater transparency about the origin and quality of their food, blockchain technology is emerging as a powerful tool. In the livestock supply chain, blockchain can create an immutable ledger tracking an animal from birth to processing. This ensures traceability of meat, milk, and eggs, verifying animal welfare standards, feed quality, and health records. For premium products, this transparency can fetch better prices for farmers and build consumer trust.

Real-world impact and applications across India

The digital revolution isn't just theory; it's transforming operations across India's diverse livestock segments:

- **Precision Dairy Farming:** Smart collars are no longer novelties; they are becoming essential for managing heat stress, detecting mastitis early, and optimizing artificial insemination timings, leading to significant increases in conception rates and milk yield per animal. Digital platforms also facilitate direct milk procurement, ensuring fair prices and transparent transactions for dairy farmers.
- **Automated Poultry Management:** Large commercial poultry farms are leveraging digital controls for environmental management (temperature, ventilation), automated feeding, and real-time mortality monitoring. This precision minimizes stress on birds, reduces feed wastage, and significantly improves flock health and productivity. Data analytics helps identify optimal growth curves and predict market supply.

- **Disease Surveillance and Management:** National initiatives are integrating digital platforms for animal registration and health tracking. This allows for rapid reporting of disease outbreaks, enabling swift action, targeted vaccination drives, and better control of zoonotic diseases. The ability to map and predict disease hotspots through AI is a game-changer for public health and economic stability.
- **Market Linkages and Financial Inclusion:** Digital marketplaces connect farmers directly with buyers, bypassing intermediaries and ensuring better price realization. Fin-tech solutions are also emerging, offering micro-loans for purchasing high-quality feed or veterinary services, often based on digital records of farm productivity.
- **Genetic Improvement:** Advanced genomic selection techniques, aided by massive datasets and AI, are accelerating breeding programs for Indian native breeds and high-yielding crossbreeds. This data-driven approach ensures that future generations of livestock are more resilient, productive, and adaptable to local conditions.

Navigating the Indian Landscape: Challenges and Opportunities

While the progress is impressive, the path to universal digital adoption in India is not without its hurdles. Affordability of sophisticated technology remains a key challenge for small and marginal farmers. Digital literacy varies widely, necessitating user-friendly interfaces and extensive training programs in local languages. Internet connectivity in remote areas, though improving, still requires significant infrastructure investment. Furthermore, ensuring data privacy and security for farmers' valuable information is paramount.However, India's unique strengths offer unparalleled opportunities. The government's "Digital India" initiative has provided a strong foundation, with programs like e-Gopala and the proposed National Digital Livestock Mission aiming to create a comprehensive digital ecosystem for livestock. India's vibrant Agri-tech startup scene is a hotbed of innovation, with young entrepreneurs developing localized, affordable, and practical solutions tailored to Indian conditions. The inherent adaptability and entrepreneurial spirit of Indian farmers themselves also play a crucial role in embracing these new tools.

The Road Ahead: A Smarter, Stronger Future:- As we look towards the next decade, the convergence of technologies like advanced AI, drone technology for large-scale farm monitoring, and increasingly sophisticated robotics (though still niche for smallholders) promises even greater transformations. The true "dawn" of digital solutions means not just isolated applications, but an integrated, interconnected network of information that empowers every stakeholder in the livestock value chain.The vision is clear: a more productive, efficient, and sustainable Indian livestock sector that leverages the power of digital technology to enhance animal welfare, ensure food security, and improve the livelihoods of millions. India, with its unique blend of traditional farming wisdom and technological prowess, is not just adopting digital solutions; it's actively shaping them, paving the way for a smarter, stronger, and more resilient future for its beloved animals and the communities that depend on them. The revolution is here, and it's electrifying the farm.

Chandan Kumar, Ajay Kumar, Md Danish and Charu Singh
DUVASU Mathura (UP)

ਪਸ਼ੂਆਂ ਵਿੱਚ ਤੂਅ ਜਾਣਾ – ਕਾਰਨ ਅਤੇ ਬਚਾਅ

ਮੋਨੂੰ ਕਾਰਕੀ, ਮੌਸੂਮੀ ਬੋਰਾ ਅਤੇ ਪਵਿੱਤਰ ਕੌਰ
ਵੈਟਰਨਰੀ ਮਾਈਕ੍ਰੋਬਾਓਲੋਜੀ ਵਿਭਾਗ
ਗੁਰੂ ਅੰਗਦ ਦੇਵ ਵੈਟਨਰੀ ਅਤੇ ਐਨੀਮਲ ਸਾਇੰਸਸ ਯੂਨੀਵਰਸਿਟੀ, ਲੁਧਿਆਣਾ।

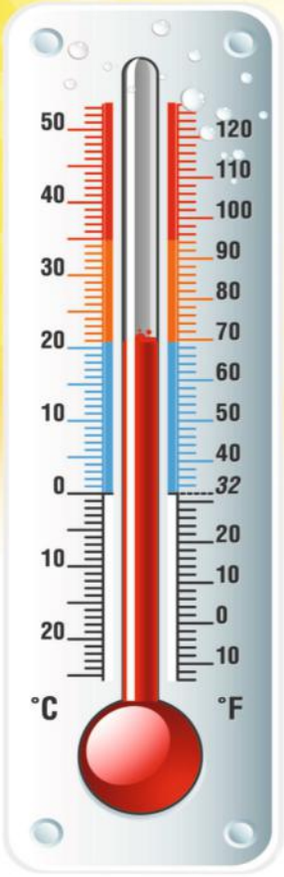
ਪਸ਼ੂਆਂ ਵਿੱਚ ਪ੍ਰਜਨਨ ਵਿਕਾਰ ਡੇਅਰੀ ਉਦਯੋਗ ਨੂੰ ਭਾਰੀ ਆਰਥਿਕ ਨੁਕਸਾਨ ਪਹੁੰਚਾਉਂਦੇ ਹਨ। ਜਾਨਵਰਾਂ ਵਿੱਚ ਗਰਭਪਾਤ ਗਰਭ ਅਵਸਥਾ ਦੇ ਸਮੇਂ ਤੋਂ ਪਹਿਲਾਂ ਖਤਮ ਹੋਣਾ ਜਾਂ ਭਰੂਣ ਦੇ ਜਨਮ ਤੋਂ ਪਹਿਲਾਂ ਹੀ ਖਤਮ ਹੋਣ ਨੂੰ ਦਰਸਾਉਂਦਾ ਹੈ। ਗੱਭਣ ਪਸ਼ੂ ਇੱਕ ਮਿੱਥੇ ਸਮੇਂ ਤੋਂ ਬਾਅਦ ਬੱਚੇ ਨੂੰ ਜਨਮ ਦਿੰਦਾ ਹੈ। ਜੇਕਰ ਪਸ਼ੂ ਮਿਥਿਆ ਹੋਇਆ ਸਮਾਂ ਪੂਰਾ ਹੋਣ ਤੋਂ ਪਹਿਲਾਂ ਬੱਚਾ ਸੁੱਟ ਦਿੰਦਾ ਹੈ ਅਤੇ ਇਹ ਬੱਚਾ ਮਰਿਆ ਹੋਵੇ ਜਾਂ ਬਹੁਤ ਕਮਜ਼ੋਰ ਹੋਵੇ ਜੋ ਕਿ ਬਾਅਦ ਵਿੱਚ ਮਰ ਜਾਵੇ, ਤਾਂ ਇਸ ਨੂੰ ਤੂ ਜਾਣਾ ਕਿਹਾ ਜਾਂਦਾ ਹੈ। ਪਸ਼ੂਆਂ ਵਿੱਚ ਤੂਅ ਜਾਣ ਦੀ ਸਮੱਸਿਆ ਦੇ ਕਈ ਕਾਰਨ ਹੋ ਸਕਦੇ ਹਨ ਜਿਵੇਂ ਕਿ ਕੀਟਾਣੂ, ਵਿਸ਼ਾਣੂ, ਪਰਜੀਵੀ, ਉੱਲੀ, ਅਸੰਤੁਲਿਤ ਪਸ਼ੂ ਖੁਰਾਕ, ਦਿਮਾਗ ਤੋਂ ਨਿਕਲਣ ਵਾਲੇ ਹਾਰਮੋਨਸ ਦੇ ਪੱਧਰ ਬਰਕਰਾਰ ਨਾ ਰਹਿਣਾ ਜਾਂ ਘੱਟ ਜਾਣਾ ਅਤੇ ਵਾਤਾਵਰਣ ਦਾ ਤਾਪਮਾਨ ਵੱਧ ਜਾਣਾ ਆਦਿ। ਵੱਧ ਤਾਪਮਾਨ ਦਾ ਖਾਸ ਤੌਰ 'ਤੇ ਮੱਝਾਂ ਉੱਪਰ ਜ਼ਿਆਦਾ ਅਸਰ ਪੈਂਦਾ ਹੈ। ਕੀਟਾਣੂ ਗਾਵਾਂ ਅਤੇ ਮੱਝਾਂ ਦੀ ਪ੍ਰਜਨਣ ਪ੍ਰਣਾਲੀ ਨੂੰ ਪ੍ਰਭਾਵਿਤ ਕਰ ਸਕਦੇ ਹਨ, ਜਿਸ ਨਾਲ ਗਰਭ ਅਵਸਥਾ ਦਾ ਜਲਦੀ ਨੁਕਸਾਨ ਹੋ ਸਕਦਾ ਹੈ ਅਤੇ ਮਰੇ ਹੋਏ ਜਾਂ ਕਮਜ਼ੋਰ ਬੱਚੇ ਪੈਦਾ ਹੋ ਸਕਦੇ ਹਨ।

ਕੀਟਾਣੂਆਂ ਕਾਰਨ ਹੋਣ ਵਾਲੀਆਂ ਬਿਮਾਰੀਆਂ ਜਿੰਨ੍ਹਾਂ ਵਿੱਚ ਪਸ਼ੂ ਬੱਚਾ ਸੁੱਟ ਦਿੰਦੇ ਹਨ ਅਹਿਮ ਹਨ ਅਤੇ ਹੇਠ ਲਿਖੀਆਂ ਹਨ:

1. ਬਰੂਸੀਲੋਸਿਸ: ਇਹ ਬਿਮਾਰੀ ਬਰੂਸੈਲਾ ਨਾਂ ਦੇ ਕੀਟਾਣੂ ਨਾਲ ਹੁੰਦੀ ਹੈ। ਭਾਵੇਂ ਇਹ ਬਿਮਾਰੀ ਗਾਵਾਂ, ਮੱਝਾਂ, ਸੂਰ, ਭੇਡਾਂ, ਬੱਕਰੀਆਂ, ਕੁੱਤਿਆਂ, ਜੰਗਲੀ ਸੂਰਾਂ ਅਤੇ ਮਨੁੱਖਾਂ ਵਿੱਚ ਹੋ ਸਕਦੀ ਹੈ ਪਰ ਗਾਵਾਂ ਮੱਝਾਂ ਵਿੱਚ ਤੂਅ ਜਾਣ ਦਾ ਮੁੱਖ ਕਾਰਨ ਹੈ ਜਿਸ ਵਿੱਚ 60% ਪ੍ਰਭਾਵਿਤ ਪਸ਼ੂ ਗਰਭ ਦੇ ਆਖਰੀ ਤਿਮਾਹੀ ਵਿੱਚ ਬੱਚਾ ਸੁੱਟ ਦਿੰਦੇ ਹਨ। ਤੰਦਰੁਸਤ ਪਸ਼ੂਆਂ ਵਿੱਚ ਇਹ ਬਿਮਾਰੀ, ਰੋਗ ਰੋਗੀ ਪਸ਼ੂ ਦੇ ਸੰਪਰਕ ਵਿੱਚ ਆਉਣ ਨਾਲ ਫੈਲਦੀ ਹੈ। ਤੰਦਰੁਸਤ ਪਸ਼ੂਆਂ ਵਿੱਚ ਬਿਮਾਰੀ ਤੋਂ ਗ੍ਰਸਤ, ਤੂਏ ਹੋਏ ਜਾਂ ਨਵੇਂ ਸੂਏ ਹੋਏ ਪਸ਼ੂ ਦੇ ਸੰਪਰਕ ਵਿੱਚ ਆਉਣ ਨਾਲ, ਕੀਟਾਣੂਆਂ ਨਾਲ ਦੂਸ਼ਿਤ ਚਾਰੇ ਅਤੇ ਪਾਣੀ ਨੂੰ ਪੀਣ ਨਾਲ, ਤੂਏ ਹੋਏ ਪਸ਼ੂ ਦੇ ਮੈਲੇ, ਜ਼ੇਰ ਜਾਂ ਤੂਏ ਹੋਏ ਬੱਚੇ ਨੂੰ ਚੱਟਣ ਨਾਲ ਹੁੰਦੀ ਹੈ। ਇਸ ਤੋਂ ਇਲਾਵਾ ਪ੍ਰਭਾਵਿਤ ਨਰ ਪਸ਼ੂਆਂ ਦੇ ਵੀਰਜ ਰਾਹੀਂ, ਦੁੱਧ ਕੱਢਣ ਵਾਲੇ ਉਪਕਰਨ ਰਾਹੀਂ ਵੀ ਬਿਮਾਰੀ ਫੈਲ ਸਕਦੀ ਹੈ। ਇਹ ਕੀਟਾਣੂ ਖਾਸ ਤੌਰ 'ਤੇ ਗੱਭਣ ਪਸ਼ੂਆਂ ਵਿੱਚ ਅਸਰ ਕਰਦੇ ਹਨ ਅਤੇ ਬਿਮਾਰੀ ਤੋਂ ਗ੍ਰਸਤ ਗੱਭਣ ਪਸ਼ੂ ਗਰਭ ਦੇ 6-9 ਮਹੀਨੇ ਵਿੱਚ ਬੱਚਾ ਸੁੱਟ ਦਿੰਦਾ ਹੈ। ਤੂਏ ਹੋਏ ਪਸ਼ੂ ਜੇਰ ਆਪਣੇ ਆਪ ਨਹੀਂ ਸੁੱਟਦੇ ਅਤੇ ਜੇਰ ਡਾਕਟਰੀ ਸਹਾਇਤਾ ਨਾਲ ਕਢਵਾਉਣੀ ਪੈਂਦੀ ਹੈ। ਜੇਰ ਚਮੜੇ ਵਾਂਗ ਸਖਤ ਹੁੰਦੀ ਹੈ ਅਤੇ ਉਸ ਉੱਪਰ ਪੀਲੇ/ਭੂਰੇ ਰੰਗ ਦੇ ਧੱਬੇ ਹੁੰਦੇ ਹਨ। ਆਮ ਤੌਰ 'ਤੇ ਪ੍ਰਭਾਵਿਤ ਪਸ਼ੂ ਇੱਕ ਜਾਂ ਦੋ ਸੂਏ ਤੱਕ ਹੀ ਬੱਚੇ ਸੁੱਟਦੇ ਹਨ। ਭਾਵੇਂ ਬਾਅਦ ਵਿੱਚ ਪਸ਼ੂ ਬੱਚਾ ਨਹੀਂ ਸੁੱਟਦੇ ਪਰ ਸੂਏ ਵੇਲੇ ਤੰਦਰੁਸਤ ਪਸ਼ੂਆਂ ਵਿੱਚ ਬਿਮਾਰੀ ਫੈਲਾਉਣ ਦਾ ਕਾਰਨ ਬਣਦੇ ਹਨ। ਪ੍ਰਭਾਵਿਤ ਨਰ ਪਸ਼ੂਆਂ ਵਿੱਚ ਅੰਡਕੋਸ਼ਾਂ ਵਿੱਚ ਸੋਜਿਸ਼ ਹੋ ਜਾਂਦੀ ਹੈ ਅਤੇ ਕੀਟਾਣੂ ਵੀਰਜ ਵਿੱਚ ਆ ਜਾਂਦੇ ਹਨ ਅਤੇ ਕਈ ਵਾਰ ਜੋੜਾਂ ਵਿੱਚ ਵੀ ਸੋਜਿਸ਼ ਹੋ ਸਕਦੀ ਹੈ।ਪ੍ਰਭਾਵਿਤ ਮਨੁੱਖਾਂ ਵਿੱਚ ਟੁੱਟਵਾਂ ਬੁਖਾਰ ਜਿਸ ਵਿੱਚ ਮਨੁੱਖਾਂ ਨੂੰ ਰੁਕ-ਰੁਕ ਕੇ ਜਾਂ ਲਗਾਤਾਰ ਬੁਖਾਰ ਆਉਂਦਾ ਹੈ, ਖਾਸ ਕਰਕੇ ਰਾਤ ਨੂੰ ਤਰੇਲੀਆਂ ਆਉਂਦੀਆਂ ਹਨ ਅਤੇ ਮਾਸਪੇਸ਼ੀਆਂ, ਪਿੱਠ ਅਤੇ ਜੋੜਾਂ ਵਿੱਚ ਦਰਦ ਰਹਿੰਦਾ ਹੈ ਅਤੇ ਮਨੁੱਖ ਅਸਾਧਾਰਨ ਤੌਰ 'ਤੇ ਥਕਾਵਟ ਜਾਂ ਕਮਜ਼ੋਰੀ ਮਹਿਸੂਸ ਕਰਦਾ ਹੈ।

ਇਸ ਬਿਮਾਰੀ ਦੀ ਪਹਿਚਾਣ ਲੱਛਣਾਂ ਤੋਂ ਅਤੇ ਪ੍ਰਯੋਗਸ਼ਾਲਾ ਵਿੱਚ ਜੇਰ, ਬੱਚੇਦਾਨੀ ਦੇ ਮੈਲੇ, ਤੂਏ ਹੋਏ ਬੱਚੇ ਅਤੇ ਦੁੱਧ ਵਿੱਚ ਕੀਟਾਣੂ ਅਤੇ ਖੂਨ ਦੀ ਜਾਂਚ (RBPT, ELISA) ਆਦਿ ਟੈਸਟਾਂ ਨਾਲ ਕੀਤੀ ਜਾ ਜਾਂਦੀ ਹੈ। ਕਿਉਂਕਿ ਇਹ ਬਿਮਾਰੀ ਪਸ਼ੂਆਂ ਅਤੇ ਮਨੁੱਖਾਂ ਦੋਨਾਂ ਉਪਰ ਅਸਰ ਕਰਦੀ ਹੈ ਅਤੇ ਇਸ ਬਿਮਾਰੀ ਦਾ ਕੋਈ ਢੁਕਵਾਂ ਇਲਾਜ ਨਹੀਂ ਹੈ, ਇਸ ਲਈ ਬਚਾਅ ਅਤੇ ਰੋਕਥਾਮ ਬਹੁਤ ਜ਼ਰੂਰੀ ਹੈ। ਤੰਦਰੁਸਤ ਪਸ਼ੂਆਂ ਨੂੰ ਬਿਮਾਰੀ ਤੋਂ ਬਚਾਉਣ ਲਈ ਜੈਵਿਕ ਸੁਰੱਖਿਆ ਉਪਾਅ ਅਪਨਾਉਣੇ ਚਾਹੀਦੇ ਹਨ। ਕਿਸੇ ਵੀ ਨਵੇਂ ਪਸ਼ੂ ਨੂੰ ਫਾਰਮ ਤੇ ਲਿਆਉਣ ਤੋਂ ਪਹਿਲਾਂ ਉਸ ਦਾ ਖੂਨ ਟੈਸਟ ਕਰਵਾਉਣਾ ਚਾਹੀਦਾ ਹੈ ਅਤੇ ਸਿਰਫ ਬਿਮਾਰੀ ਮੁਕਤ ਅਤੇ ਤੰਦਰੁਸਤ ਪਸ਼ੂਆਂ ਨੂੰ ਹੀ ਫਾਰਮ ਤੇ ਦਾਖਿਲ ਕਰਨਾ ਚਾਹੀਦਾ ਹੈ। ਫਾਰਮ ਉਪਰ ਸਾਰੇ ਪਸ਼ੂਆਂ ਦੀ ਨਿਯਮਿਤ ਤੌਰ 'ਤੇ ਬਰੂਸੀਲੋਸਿਸ ਦੀ ਜਾਂਚ ਕਰਵਾਉਣੀ ਚਾਹੀਦੀ ਹੈ। ਜਿਹੜੇ ਜਾਨਵਰ ਟੈਸਟ ਤੋਂ ਬਾਅਦ ਪੌਜੀਟਿਵ ਆਉਂਦੇ ਹਨ ਉਹਨਾਂ ਨੂੰ ਵੱਖ ਕਰ ਦੇਣਾ ਚਾਹੀਦਾ ਹੈ ਅਤੇ ਫਾਰਮ ਉਪਰ ਸਾਫ ਸਫਾਈ ਦਾ ਧਿਆਨ ਦੇਣਾ ਚਾਹੀਦਾ ਹੈ। ਮਨੁਖਾਂ ਨੂੰ ਦਸਤਾਨੇ ਪਾ ਕੇ ਬੀਮਾਰ ਪਸ਼ੂ ਦੇ ਸ਼ਾਭ ਸੰਭਾਲ ਕਰਨੀ ਚਾਹੀਦੀ ਹੈ।

Temperature is rising...



...LEVUCELL®SC maximizes milk production during heat stress

Levucell® SC
Rumen Specific Yeast

€ EU approved for use in bovine destined for milk and meat production, dairy goats, dairy ewes and lambs (E1711/4a1711/4b1711). Not all products are available in all markets nor associated claims allowed in all regions.

Heat stress adversely impacts dairy cow performance

Did you know that heat stress can cost over 400€/cow/year[1]? The consequences of heat stress include significant losses in milk production, (which can be up to 35%), coupled with rumen dysfunction and reduced reproduction rates.

The level and impact of heat stress on cows is influenced by a combination of ambient temperature and relative humidity. New research has shown that temperatures in excess of 20°C and 50% relative humidity[2] will lead to cow discomfort and reduced milk production.

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

Even under conditions of heat stress, LEVUCELL®SC will maximize diet potential and your Income Over Feed Costs

- Milk yield: +1.2 to 2.5 litres/cow/day.
- Increased Feed efficiency : up to 7%*, +120g of milk/kg/Dry Matter Intake.
- Optimizes rumen pH (less risk of acidosis).

LEVUCELL®SC is a rumen specific live yeast *Saccharomyces cerevisiae* I-1077, selected through collaboration with INRA (France).

**Marfola, et al, ADSA 2010.*

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

LALLEMAND ANIMAL NUTRITION
Tel: +33 (0) 562 745 555 Email: animal@lallemand.com

Available at Progressive Dairy Solutions Ltd. (PDS)

Contact Person at PDS: Munish Sharma : +91-87288-18900

www.lallemandanimalnutrition.com

LALLEMAND

ਜੇਕਰ ਫਾਰਮ ਦੇ ਉਪਰ ਕੋਈ ਪਸ਼ੂ ਬੱਚਾ ਸੁੱਟ ਦਿੰਦਾ ਹੈ ਤਾਂ ਤੂਏ ਹੋਏ ਬੱਚੇ ਅਤੇ ਜੇਰ ਨੂੰ ਫਾਰਮ ਤੋਂ ਦੂਰ ਕਿਸੇ ਥਾਂ 'ਤੇ ਦੱਬ ਦੇਣਾ ਚਾਹੀਦਾ ਹੈ ਤਾਂ ਕਿ ਕੁੱਤੇ ਇਸਨੂੰ ਘਸੀਟ ਕੇ ਬੀਮਾਰੀ ਨਾ ਫੈਲਾਉਣ। ਤੂਏ ਹੋਏ ਪਸ਼ੂ ਨੂੰ ਤੰਦਰੁਸਤ ਪਸ਼ੂਆਂ ਤੋਂ ਅਲੱਗ ਕਰ ਦੇਣਾ ਚਾਹੀਦਾ ਹੈ ਅਤੇ ਜਿੱਥੇ ਪਸ਼ੂ ਤੂਇਆ ਹੈ, ਉਸ ਥਾਂ ਨੂੰ ਫਿਨਾਇਲ ਆਦਿ ਦਾ ਘੋਲ ਛਿੜਕਣ ਨਾਲ ਬਿਮਾਰੀ ਦੀ ਸੰਭਾਵਨਾਂ ਘੱਟ ਜਾਂਦੀ ਹੈ। ਕਿਉਂਕਿ ਬਿਮਾਰੀ ਦੇ ਕੀਟਾਣੂਆਂ ਦਾ ਰਸਾਅ ਦੁੱਧ ਵਿੱਚ ਵੀ ਹੁੰਦਾ ਹੈ ਇਸ ਲਈ ਮਨੁੱਖਾਂ ਨੂੰ ਕੱਚੇ ਦੁੱਧ ਦੀ ਵਰਤੋਂ ਨਹੀਂ ਕਰਨੀ ਚਾਹੀਦੀ ਅਤੇ ਦੁੱਧ ਉਬਾਲ ਕੇ ਪੀਣਾ ਚਾਹੀਦਾ ਹੈ। ਨਵੇਂ ਜੰਮੇ ਕੱਟਿਆਂ/ਵੱਛਿਆਂ ਨੂੰ ਤੰਦਰੁਸਤ ਪਸ਼ੂਆਂ ਦਾ ਦੁੱਧ ਦੇਣਾ ਚਾਹੀਦਾ ਹੈ। ਤੰਦਰੁਸਤ ਪਸ਼ੂਆਂ ਨੂੰ ਇਸ ਬਿਮਾਰੀ ਤੋਂ ਬਚਾਅ ਲਈ ਚਾਰੇ ਅਤੇ ਪੀਣ ਵਾਲੇ ਪਾਣੀ ਨੂੰ ਬਿਮਾਰ ਪਸ਼ੂ ਦੇ ਮੈਲੇ ਆਦਿ ਤੋਂ ਦੂਸ਼ਿਤ ਹੋਣ ਤੋਂ ਬਚਾਉਣਾ ਚਾਹੀਦਾ ਹੈ। ਇਸ ਬਿਮਾਰੀ ਤੋਂ ਬਚਾਉ ਲਈ ਟੀਕਾਕਰਨ ਬਹੁਤ ਜ਼ਰੂਰੀ ਹੈ। 4-6 ਮਹੀਨੇ ਦੀ ਉਮਰ ਦੀਆਂ ਮਾਦਾ ਪਸ਼ੂਆਂ (ਕੱਟੀਆਂ, ਵੱਛੀਆਂ) ਵਿੱਚ ਬਰੂਸੈਲਾ ਅਬੋਰਟਸ ਸਟ੍ਰੇਨ 19 ਦਾ ਟੀਕਾ ਲਗਵਾ ਲੈਣਾ ਚਾਹੀਦਾ ਹੈ। ਇਸ ਟੀਕੇ ਨਾਲ 3-5 ਸਾਲ ਦੀ ਉਮਰ ਤੱਕ ਬਰੂਸੀਲੋਸਿਸ ਤੋਂ ਬਚਾਅ ਸੰਭਵ ਹੈ। ਨਰ ਪਸ਼ੂਆਂ ਵਿੱਚ ਇਸ ਟੀਕੇ ਦੀ ਵਰਤੋਂ ਨਹੀਂ ਕੀਤੀ ਜਾਂਦੀ।

2. ਬੋਵਾਈਨ ਜੈਨੀਟਲ ਕਮਪਾਈਲੋਬੈਕਟੀਰਿਓਸਿਸ

ਕਮਪਾਈਲੋਬੈਕਟਰ ਫੀਟਸ ਵਨੀਰੈਲਿਸ ਨਾਂ ਦੇ ਕੀਟਾਣੂ ਕਾਰਨ ਹੁੰਦਾ ਹੈ। ਇਸ ਕੀਟਾਣੂ ਦਾ ਲਗਾਵ ਗਾਵਾਂ, ਮੱਝਾਂ ਅਤੇ ਝੋਟਿਆਂ ਦੇ ਪ੍ਰਜਨਣ ਅੰਗਾਂ ਨਾਲ ਹੁੰਦਾ ਹੈ। ਇਹ ਜੀਵਾਣੂ ਬਹੁਤ ਨਾਜ਼ੁਕ ਹੁੰਦੇ ਹਨ ਅਤੇ ਸਾਧਾਰਣ ਵਾਤਾਵਰਣ ਵਿੱਚ ਸਿਰਫ ਛੇ ਘੰਟੇ ਤੱਕ ਜੀਵਿਤ ਰਹਿ ਸਕਦੇ ਹਨ। ਸੀ. ਫੀਟਸ ਫੀਟਸ ਪਰਜਾਤੀ ਪਸ਼ੂਆਂ ਦੀਆਂ ਆਂਤੜੀਆਂ ਦੇ ਵਿੱਚ ਰਹਿੰਦਾ ਹੈ ਅਤੇ ਖੂਨ ਰਾਹੀਂ ਰਗਭ ਪਸ਼ੂ ਦੇ ਗਰਭ ਵਿੱਚ ਜਾ ਕੇ ਨੁਕਸਾਨ ਪਹੁੰਚਾਉਂਦਾ ਹੈ ਅਤੇ ਪਸ਼ੂ ਬੱਚਾ ਸੁੱਟ ਦਿੰਦਾ ਹੈ। ਇਹ ਪਰਜਾਤੀ ਦੇ ਕੀਟਾਣੂ ਆਮ ਤੌਰ 'ਤੇ ਭੇਡਾਂ ਵਿੱਚ ਗਰਭਪਾਤ ਕਰਦੇ ਹਨ ਅਤੇ ਗਾਵਾਂ ਮੱਝਾਂ ਵਿੱਚ ਕਦੀ ਕਦੀ ਗਰਭਪਾਤ ਹੁੰਦਾ ਹੈ। ਸੀ. ਵਨੀਰੈਲਿਸ ਪ੍ਰਭਾਵਿਤ ਝੋਟਿਆਂ ਦੇ ਮੇਲ ਦੌਰਾਨ, ਏ ਆਈ ਵੇਲੇ ਗੰਦੇ ਉਪਰਕਨ ਵਰਤਨ ਨਾਲ ਜਾਂ ਸੰਕ੍ਰਮਿਤ ਵੀਰਜ ਰਾਹੀਂ ਮੱਝਾਂ ਗਾਵਾਂ ਵਿੱਚ ਦਾਖਿਲ ਹੋ ਸਕਦੇ ਹਨ। ਗੱਭਣ ਪਸ਼ੂਆਂ ਵਿੱਚ ਗਰਭ ਦੇ ਸ਼ੁਰੂ ਵਿੱਚ ਭਰੂਣ ਦੀ ਮੌਤ ਹੋ ਜਾਂਦੀ ਹੈ ਅਤੇ ਪਸ਼ੂ ਗਰਭ ਦੇ 3-5 ਮਹੀਨੇ ਵਿੱਚ ਬੱਚਾ ਸੁੱਟ ਦਿੰਦਾ ਹੈ। ਬਿਮਾਰੀ ਤੋਂ ਗ੍ਰਸਤ ਪਸ਼ੂ ਆਪਣੇ ਆਪ ਜੇਰ ਨਹੀਂ ਸੁੱਟਦਾ ਅਤੇ ਜੇਰ ਡਾਕਟਰੀ ਸਹਾਇਤਾ ਨਾਲ ਕਢਵਾਉਣੀ ਪੈਂਦੀ ਹੈ। ਸ਼ੈੱਡ ਵਿੱਚ ਇੱਕ ਸੂਏ ਤੋਂ ਦੂਜੇ ਸੂਏ ਵਿੱਚ ਕਾਫੀ ਲੰਮਾ ਸਮਾਂ ਪੈ ਜਾਂਦਾ ਹੈ ਅਤੇ ਪਸ਼ੂ ਲੰਮੇ ਸਮੇਂ ਬਾਅਦ ਹੇਹੇ ਵਿੱਚ ਆਉਂਦੇ ਹਨ। ਪ੍ਰਭਾਵਿਤ ਨਰ ਜਾਨਵਰਾਂ ਵਿੱਚ ਕੋਈ ਲੱਛਣ ਨਹੀਂ ਹੁੰਦਾ ਪਰ ਨਰ ਪਸ਼ੂਆਂ ਵਿੱਚ ਲੰਮੇ ਸਮੇਂ ਲਈ ਕੀਟਾਣੂ ਰਹਿੰਦੇ ਹਨ ਅਤੇ ਤੰਦਰੁਸਤ ਪਸ਼ੂਆਂ ਵਿੱਚ ਬਿਮਾਰੀ ਫੈਲਾਉਣ ਦਾ ਸ੍ਰੋਤ ਬਣ ਸਕਦੇ ਹਨ। ਬਿਮਾਰੀ ਨੂੰ ਕਾਬੂ ਕਰਨ ਲਈ ਬਿਮਾਰ ਝੋਟਿਆਂ ਵਿੱਚ ਰੋਗਾਣੂਨਾਸ਼ਕ ਦਵਾਈਆਂ ਲੋਕਲੀ ਅਤੇ ਟੀਕੇ ਰਾਹੀਂ ਲਾਹੇਵੰਦ ਰਹਿੰਦੀਆਂ ਹਨ। ਏ.ਆਈ. ਲਈ ਵਰਤੇ ਜਾਣ ਵਾਲੇ ਝੋਟਿਆਂ ਨੂੰ ਹਰ 3 ਮਹੀਨੇ ਬਾਅਦ ਲੈਬ ਟੈਸਟਾਂ ਰਾਹੀਂ ਬਿਮਾਰੀ ਦੇ ਕੀਟਾਣੂਆਂ ਲਈ ਟੈਸਟ ਕਰਨਾ ਚਾਹੀਦਾ ਹੈ ਅਤੇ ਬਿਮਾਰ ਝੋਟੇ ਨੂੰ ਏ ਆਈ ਲਈ ਨਹੀਂ ਵਰਤਣਾ ਚਾਹੀਦਾ।

3. ਲੈਪਟੋਸਪਾਈਰੋਸਿਸ

ਇਹ ਬਿਮਾਰੀ ਲੈਪਟੋਸਪਾਈਰਾ ਨਾਂ ਦੇ ਕੀਟਾਣੂਆਂ ਕਾਰਨ ਹੁੰਦੀ ਹੈ। ਪਸ਼ੂਆਂ ਵਿੱਚ ਇਹ ਸਮੱਸਿਆ ਖਾਸ ਤੌਰ 'ਤੇ ਬਰਸਾਤਾਂ ਵਿੱਚ ਅਤੇ ਹੜ ਦੀ ਸਥਿਤੀ ਵਿੱਚ ਹੋ ਸਕਦੀ ਹੈ। ਬਿਮਾਰੀ ਦੇ ਕੀਟਾਣੂ ਪ੍ਰਭਾਵਿਤ ਜਾਂ ਸੰਕ੍ਰਮਿਤ ਪਸ਼ੂਆਂ ਦੇ ਪਿਸ਼ਾਬ ਰਾਹੀਂ ਪਾਣੀ ਵਿੱਚ ਜਾਂ ਛੱਪੜਾਂ ਵਿੱਚ ਦਾਖਿਲ ਹੋ ਜਾਂਦੇ ਹਨ ਅਤੇ ਦੂਸ਼ਿਤ ਕਰ ਦਿੰਦੇ ਹਨ। ਬਿਮਾਰੀ ਦੇ ਕੀਟਾਣੂ ਦੂਸ਼ਿਤ ਪਾਣੀ ਰਾਹੀਂ, ਅੱਖਾਂ ਰਾਹੀਂ, ਨੱਕ ਰਾਹੀਂ, ਮੂੰਹ ਜਾਂ ਜਨਣ ਅੰਗਾਂ ਰਾਹੀਂ, ਚਮੜੀ ਵਿੱਚ ਜ਼ਖਮਾਂ ਰਾਹੀਂ ਅਤੇ ਦੂਸ਼ਿਤ ਚਾਰੇ ਰਾਹੀਂ ਤੰਦਰੁਦਤ ਪਸ਼ੂਆਂ ਵਿੱਚ ਦਾਖਿਲ ਹੋ ਜਾਂਦੇ ਹਨ। ਕਈ ਵਾਰ ਸੰਕ੍ਰਮਿਤ ਵੀਰਜ ਰਾਹੀਂ ਵੀ ਤੰਦਰੁਸਤ ਪਸ਼ੂਆਂ ਵਿੱਚ ਬਿਮਾਰੀ ਦਾ ਫੈਲਾਅ ਹੋ ਸਕਦਾ ਹੈ। ਪ੍ਰਭਾਵਿਤ ਗਾਵਾਂ ਅਤੇ ਮੱਝਾਂ ਵਿੱਚ ਬੁਖਾਰ, ਪੀਲੀਆ, ਲਹੂ ਮੂਤਣਾ ਅਤੇ ਤੂਅ ਜਾਣ ਦੇ ਲੱਛਣ ਵੇਖੇ ਜਾਂਦੇ ਹਨ। ਗਾਵਾਂ ਅਤੇ ਮੱਝਾਂ ਵਿੱਚ ਗਰਭ ਦੇ 6 ਮਹੀਨੇ ਤੋਂ ਬਾਅਦ ਗੱਭਣ ਪਸ਼ੂ ਬੱਚਾ ਸੁੱਟ ਦਿੰਦਾ ਹੈ। ਤੂਅ ਜਾਣ ਦੀ ਦਰ 25-30% ਹੁੰਦੀ ਹੈ। ਜਨਣ ਦਰ ਘੱਟ ਜਾਂਦਾ ਹੈ ਅਤੇ ਦੁੱਧ ਦਾ ਉਤਪਾਦ ਵੀ ਘੱਟ ਜਾਂਦਾ ਹੈ। ਪਸ਼ੂਆਂ ਵਿੱਚ ਜੇਰ ਨਹੀਂ ਪੈਂਦੀ। ਲੰਬੇ ਸਮੇਂ ਤੋਂ ਚੱਲ ਰਹੀ ਬਿਮਾਰੀ ਵਾਲੇ ਜਾਨਵਰ ਬਿਨਾਂ ਲੱਛਣਾਂ ਦੇ ਬੱਚਾ ਸੁੱਟ ਦਿੰਦੇ ਹਨ ਅਤੇ ਸੁੱਟਆ ਹੋਇਆ ਬੱਚਾ ਆਮ ਤੌਰ 'ਤੇ ਗਲਿਆ ਹੁੰਦਾ ਹੈ। ਇਸ ਬਿਮਾਰੀ ਦੇ ਕੀਟਾਣੂ ਨਮੀ ਵਾਲੇ ਵਾਤਾਵਰਨ ਦੇ ਅਨੁਕੂਲ ਹਨ। ਜੰਗਲੀ ਜੀਵ ਅਤੇ ਚੂਹਿਆਂ ਤੋਂ ਬਿਮਾਰੀ ਫੈਲ ਸਕਦੀ ਹੈ। ਜੇਕਰ ਕੀਟਾਣੂ ਪਸ਼ੂ ਦੇ ਯੂਰੋਜਨਾਈਟਲ ਟਰੈਕਟ ਵਿੱਚ ਦਾਖਿਲ ਹੋ ਜਾਣ ਤਾਂ ਇਹ ਕੀਟਾਣੂ ਪਸ਼ੂ ਦੇ ਪਿਸ਼ਾਬ, ਗਰਭਾਸ਼ਯ ਦੇ ਰਿਸਾਅ, ਵੀਰਜ ਅਤੇ ਤੂਏ ਹੋਏ ਕੱਟੜੂ ਜਾਂ ਜੇਰ ਵਿੱਚ ਵਹਿ ਸਕਦੇ ਹਨ ਅਤੇ ਹੋਰ ਤੰਦਰੁਸਤ ਪਸ਼ੂਆਂ ਵਿੱਚ ਬਿਮਾਰੀ ਦਾ ਸਰੋਤ ਬਣ ਸਕਦੇ ਹਨ। ਮਨੁੱਖ ਜਦੋਂ ਬਿਮਾਰ ਪਸ਼ੂਆਂ ਦੇ ਪਿਸ਼ਾਬ ਨਾਲ ਦੂਸ਼ਿਤ ਪਾਣੀ ਦੇ ਸਿੱਧੇ ਸੰਪਰਕ ਵਿੱਚ ਆਉਂਦੇ ਹਨ ਤਾਂ ਇਸ ਬਿਮਾਰੀ ਦੇ ਕੀਟਾਣੂ ਮਨੁੱਖਾਂ ਵਿੱਚ ਦਾਖਿਲ ਹੋ ਕੇ ਬਿਮਾਰੀ ਕਰ ਦਿੰਦੇ ਹਨ।

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ਲੈਪਟੋਸਪਾਈਰਾ ਨਮੀ ਵਾਲੇ ਵਾਤਵਾਰਣ ਵਿੱਚ ਬਹੁਤ ਲੰਮੇ ਸਮੇਂ ਤੱਕ ਜੀਵਿਤ ਰਹਿ ਸਕਦੇ ਹਨ ਕਿਉਂਕਿ ਇਹ ਬਿਮਾਰੀ ਦੂਸ਼ਿਤ ਪਾਣੀ ਤੋਂ ਫੈਲਦੀ ਹੈ, ਇਸ ਲਈ ਖੜੇ ਹੋਏ ਪਾਣੀ ਦੇ ਨਿਕਾਸ ਦੇ ਉਪਰਾਲੇ ਕਰਨੇ ਚਾਹੀਦੇ ਹਨ। ਜਿਸ ਥਾਂ ਤੇ ਪਸ਼ੂ ਰੱਖੇ ਹੋਣ, ਉਸ ਥਾਂ 'ਤੇ ਚੂਹਿਆਂ ਦਾ ਖਾਤਮਾ ਹੋਣਾ ਜ਼ਰਰੀ ਹੈ। ਟੀਕਾਕਰਨ, ਪਸ਼ੂਆਂ ਨੂੰ ਚੂਹਿਆਂ ਅਤੇ ਹੋਰ ਜੰਗਲੀ ਜਾਨਵਰਾਂ ਤੋਂ ਬਚਾਉਣ ਨਾਲ ਇਸ ਬਿਮਾਰੀ ਦੇ ਫੈਲਾਅ ਨੂੰ ਰੋਕਿਆ ਜਾ ਸਕਦਾ ਹੈ। ਇਸ ਤੋਂ ਇਲਾਵਾ ਸਾਫ ਸਫਾਈ ਵੱਲ ਉਚੇਚੇ ਤੌਰ 'ਤੇ ਧਿਆਨ ਦੇਣਾ ਚਾਹੀਦਾ ਹੈ ਅਤੇ ਦੂਸ਼ਿਤ ਵਾੜਿਆਂ ਨੂੰ ਰੋਗਾਣੂ ਰਹਿਤ ਕਰਨਾ ਚਾਹੀਦਾ ਹੈ।

4. ਲਿਸਟੀਰੀਓਸਿਸ

ਇਹ ਬਿਮਾਰੀ ਲਿਸਟੀਰੀਆ ਮੋਨੋਸਾਈਟੋਜੀਨਸ ਨਾਂ ਦੇ ਕੀਟਾਣੂ ਕਾਰਨ ਹੁੰਦੀ ਹੈ। ਇਹ ਕੀਟਾਣੂ ਵਾਤਾਵਰਣ ਵਿੱਚ ਮਿੱਟੀ, ਮਲ ਅਤੇ ਸਾਈਲੇਜ ਵਿੱਚ ਹੁੰਦਾ ਹੈ ਅਤੇ ਮੱਝਾਂ, ਗਾਵਾਂ, ਭੇਡਾਂ, ਬੱਕਰੀਆਂ ਆਦਿ ਨੂੰ ਪ੍ਰਭਾਵਿਤ ਕਰਦਾ ਹੈ। ਬਿਮਾਰੀ ਜ਼ਿਆਦਾ ਤਰ ਠੰਡ ਦੇ ਮੌਸਮ ਵਿੱਚ ਅਤੇ ਪਸ਼ੂਆਂ ਨੂੰ ਖਰਾਬ ਜਾਂ ਗਲਤ ਢੰਗ ਨਾਲ ਖਮੀਰ ਵਾਲਾ ਸਾਈਲੇਜ ਖੁਆਉਣ ਨਾਲ ਹੁੰਦੀ ਹੈ। ਲਿਸਟੀਰੀਆ ਕੀਟਾਣੂ ਆਮ ਤੌਰ 'ਤੇ ਦੂਸ਼ਿਤ ਫੀਡ ਰਾਹੀਂ ਪ੍ਰਵੇਸ਼ ਕਰਦਾ ਹੈ, ਖਾਸ ਕਰਕੇ ਉੱਚ ਪੀ.ਐੱਚ. ਵਾਲੇ ਮਾੜੇ ਫਰਮੈਂਟ ਕੀਤੀ ਸਾਈਲੇਜ ਅਤੇ ਫਿਰ ਪ੍ਰਣਾਲੀਗਤ ਤੌਰ 'ਤੇ ਫੈਲਦਾ ਹੈ। ਪ੍ਰਭਾਵਿਤ ਪਸ਼ੂ ਆਮ ਤੌਰ 'ਤੇ ਤੀਜੀ ਤਿਮਾਹੀ ਵਿੱਚ ਬੱਚਾ ਸੁੱਟ ਦਿੰਦਾ ਹੈ। ਗਰਭਪਾਤ ਅਕਸਰ ਛਿੱਟੇ-ਪੱਟੇ ਹੁੰਦੇ ਹਨ ਪਰ ਫੈਲਣ ਦੇ ਰੂਪ ਵਿੱਚ ਹੋ ਸਕਦੇ ਹਨ।

ਬਿਮਾਰੀ ਤੋਂ ਬਚਾਅ ਅਤੇ ਰੋਕਥਾਮ ਲਈ ਗੱਭਣ ਪਸ਼ੂਆਂ ਨੂੰ ਖਾਸ ਤੌਰ 'ਤੇ ਖਰਾਬ ਸਾਈਲੇਜ ਖੁਆਉਣ ਤੋਂ ਬਚਾਓ। ਪ੍ਰਭਾਵਿਤ ਪਸ਼ੂਆਂ ਨੂੰ ਤੰਦਰੁਸਤ ਪਸ਼ੂਆਂ ਤੋਂ ਵੱਖ ਕਰੋ ਅਤੇ ਸ਼ੈਡ ਦੀ ਸਾਫ ਸਫਾਈ ਕਰਵਾਓ। ਫੀਡ ਅਤੇ ਪਾਣੀ ਦੇ ਸਰੋਤਾਂ ਦੀ ਸਫਾਈ ਬਣਾਈ ਰੱਖੋ। ਐਨਟੀਬਾਇਓਟਿਕ ਨਾਲ ਇਲਾਜ ਪ੍ਰਣਾਲੀਗਤ ਬਿਮਾਰੀ ਦੇ ਸ਼ੁਰੂ ਵਿੱਚ ਪ੍ਰਭਾਵਸ਼ਾਲੀ ਹੋ ਸਕਦਾ ਹੈ ਪਰ ਗਰਭਪਾਤ ਦੇ ਮਾਮਲਿਆਂ ਵਿੱਚ ਨਹੀਂ। ਸੰਕ੍ਰਮਿਤ ਸਮਗਰੀ ਦਾ ਸਹੀ ਢੰਗ ਨਾਲ ਨਿਪਟਾਰਾ ਕੀਤਾ ਜਾਣਾ ਚਾਹੀਦਾ ਹੈ। ਲਿਸਟੀਰੀਆ ਮੋਨੋਸਾਈਟੋਜੀਨਸ ਕਾਰਨ ਤੂਅ ਜਾਣ ਦੀ ਸਮੱਸਿਆ ਆਰਥਿਕ ਨੁਕਸਾਨ ਅਤੇ ਜਾਨਵਰ ਦੀ ਸਿਹਤ ਦੇ ਮਾਮਲੇ ਵਿੱਚ ਮਹੱਤਵਪੂਰਨ ਹੈ ਅਤੇ ਇਸ ਨੂੰ ਜੈਵਿਕ ਸੁਰੱਖਿਆ ਅਤੇ ਸਹੀ ਖੁਰਾਕ ਅਭਿਆਸਾਂ ਨਾਲ ਪ੍ਰਬੰਧਿਤ ਕੀਤਾ ਜਾਣਾ ਚਾਹੀਦਾ ਹੈ।

ਉੱਲੀ ਕਾਰਨ ਤੂਅ ਜਾਣਾ

ਉੱਲੀ ਕਾਰਨ ਪਸ਼ੂਆਂ ਵਿੱਚ ਤੂਅ ਜਾਣ ਦੀ ਬਿਮਾਰੀ ਸਭ ਤੋਂ ਜ਼ਿਆਦਾ ਬਰਸਾਤਾਂ ਤੋਂ ਬਾਅਦ ਠੰਢ ਦੇ ਮਹੀਨਿਆਂ ਵਿੱਚ ਪਾਈ ਜਾਂਦੀ ਹੈ। ਜਮ੍ਹਾ ਕੀਤੀ ਹੋਈ ਪਸ਼ੂ ਖੁਰਾਕ ਵਿੱਚ ਸਿੱਲ੍ਹ ਅਤੇ ਅਨੁਕੂਲ ਤਾਪਮਾਨ ਕਾਰਨ ਉੱਲੀ ਲੱਗ ਜਾਂਦੀ ਹੈ ਅਤੇ ਜਦੋਂ ਪਸ਼ੂ ਇਹ ਦੂਸ਼ਿਤ ਖੁਰਾਕ ਖਾਂਦਾ ਹੈ ਤਾਂ ਪਸ਼ੂਆਂ ਦੀ ਸਿਹਤ ਉੱਤੇ ਅਸਰ ਕਰਦੀ ਹੈ। ਇਹ ਬਿਮਾਰੀ ਮੁੱਖ ਤੌਰ 'ਤੇ ਸਾਹ ਰਾਹੀਂ ਹੁੰਦੀ ਹੈ। ਬਿਮਾਰੀ ਦੇ ਕਣ ਪਹਿਲਾਂ ਸਾਹ ਰਾਹੀਂ ਅੰਦਰ ਜਾਂਦੇ ਹਨ ਅਤੇ ਫਿਰ ਖੂਨ ਰਾਹੀਂ ਬੱਚੇਦਾਨੀ ਵਿੱਚ ਚਲੇ ਜਾਂਦੇ ਹਨ।ਪਸ਼ੂਆਂ ਵਿੱਚ ਇਹ ਬਿਮਾਰੀ ਮੁੱਖ ਤੌਰ 'ਤੇ ਐਸਪਰਜੀਲਸ ਫੂਮੀਗੇਟਸ ਨਾਂ ਦੀ ਉੱਲੀ ਕਾਰਨ ਹੁੰਦੀ ਹੈ। ਇਸ ਬਿਮਾਰੀ ਤੋਂ ਗ੍ਰਸਤ ਗੱਭਣ ਪਸ਼ੂ ਗਰਭ ਦੀ ਦੂਜੀ ਜਾਂ ਤੀਜੀ ਤਿਮਾਹੀ ਵਿੱਚ ਤੂਅ ਜਾਂਦਾ ਹੈ। ਤੂਏ ਹੋਏ ਬੱਚੇ ਦੀ ਚਮੜੀ ਉੱਤੇ ਖਾਸ ਤੌਰ 'ਤੇ ਸਿਰ ਅਤੇ ਪਿੱਠ ਉੱਤੇ ਗੋਲ ਗੋਲ ਨਿਸ਼ਾਨ ਹੁੰਦੇ ਹਨ। ਜ਼ੇਰ ਮੋਟੀ, ਸੁੱਜੀ ਹੋਈ, ਖੂਨੀ ਅਤੇ ਗਲੀ ਹੋਈ ਹੁੰਦੀ ਹੈ। ਪਸ਼ੂ ਦੇ ਤੂਅ ਜਾਣ ਤੋਂ ਬਾਅਦ ਆਮ ਤੌਰ 'ਤੇ ਇਸ ਬਿਮਾਰੀ ਦਾ ਕੋਈ ਲੱਛਣ ਨਹੀਂ ਰਹਿੰਦਾ ਅਤੇ ਬਿਮਾਰੀ ਤੋਂ ਅਕਸਰ ਅਗਲਾ ਸੂਆ ਠੀਕ ਰਹਿੰਦਾ ਹੈ। ਰੋਕਥਾਮ ਲਈ ਪਸ਼ੂਆਂ ਨੂੰ ਖੁੱਲ੍ਹੀ, ਹਵਾਦਾਰ ਅਤੇ ਸੁੱਕੀ ਹੋਈ ਥਾਂ ਤੇ ਰੱਖਣਾ ਚਾਹੀਦਾ ਹੈ ਅਤੇ ਗੱਭਣ ਪਸ਼ੂਆਂ ਨੂੰ ਉੱਲੀ ਰਹਿਤ ਖੁਰਾਕ ਦੇਣੀ ਚਾਹੀਦੀ ਹੈ। ਤੂਏ ਹੋਣੇ ਪਸ਼ੂ ਨੂੰ ਤੰਦਰੁਸਤ ਪਸ਼ੂਆਂ ਤੋਂ ਅਲੱਗ ਰੱਖਣਾ ਚਾਹੀਦਾ ਹੈ ਅਤੇ ਸਾਫ-ਸਫਾਈ ਵੱਲ ਧਿਆਨ ਦੇਣਾ ਚਾਹੀਦਾ ਹੈ। ਦਾਣੇ/ਵੰਡ ਨੂੰ ਉੱਲੀ ਲੱਗੀ ਹੋਵੇ ਤਾਂ ਪ੍ਰਯੋਗਸ਼ਾਲਾ ਤੋਂ ਟੈਸਟ ਕਰਵਾਉਣਾ ਚਾਹੀਦਾ ਹੈ। ਸਾਫ ਸਫਾਈ ਵੱਲ ਉਚੇਚੇ ਤੌਰ 'ਤੇ ਧਿਆਨ ਦੇਣਾ ਚਾਹੀਦਾ ਹੈ।

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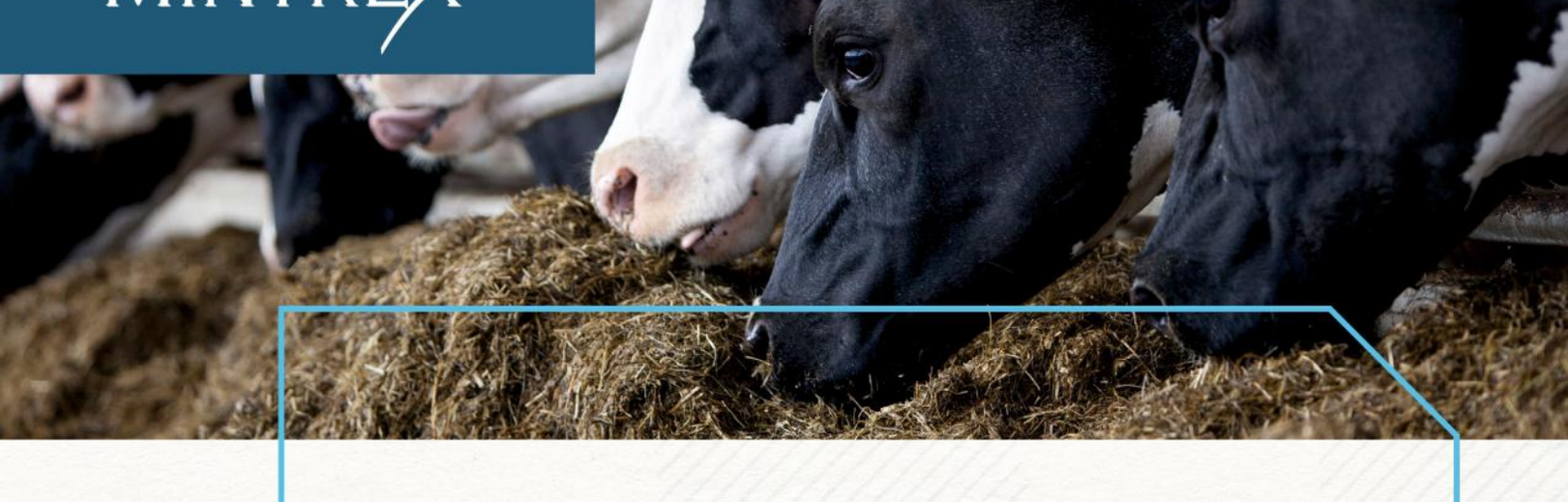

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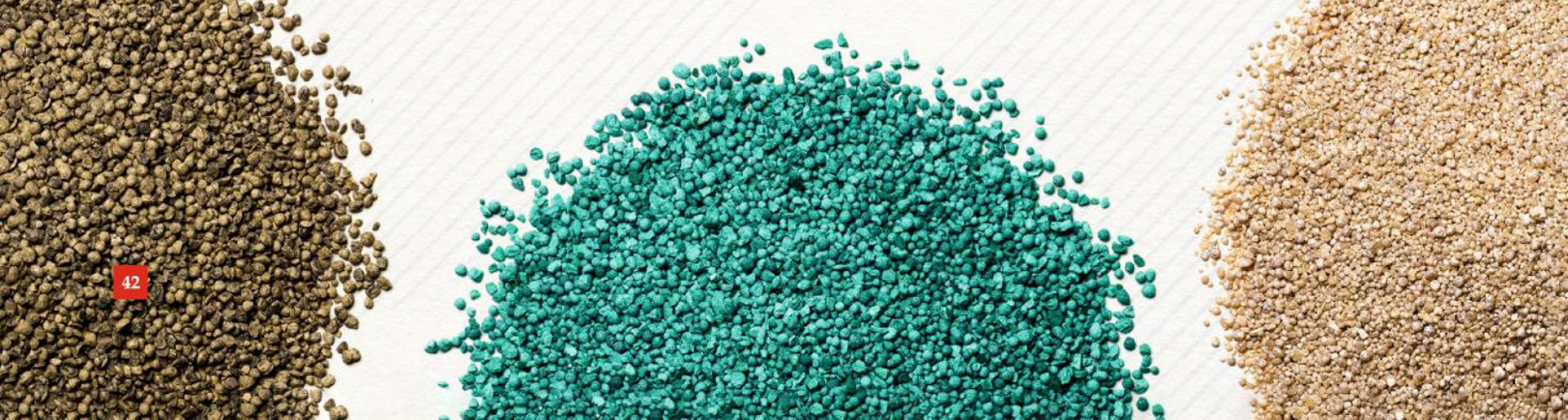

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