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Monthly Magazine for Feed Industry

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From Producing More Milk to Creating More Value

Importance of Fibre in Dairy Cow Feeding

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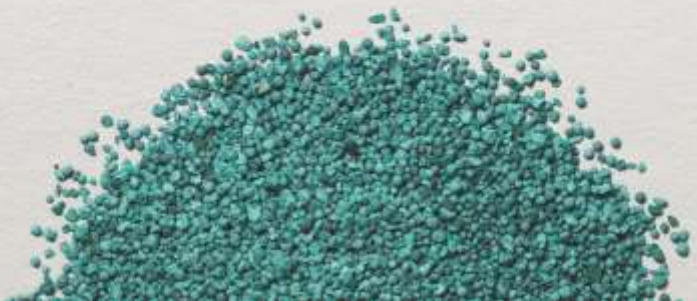

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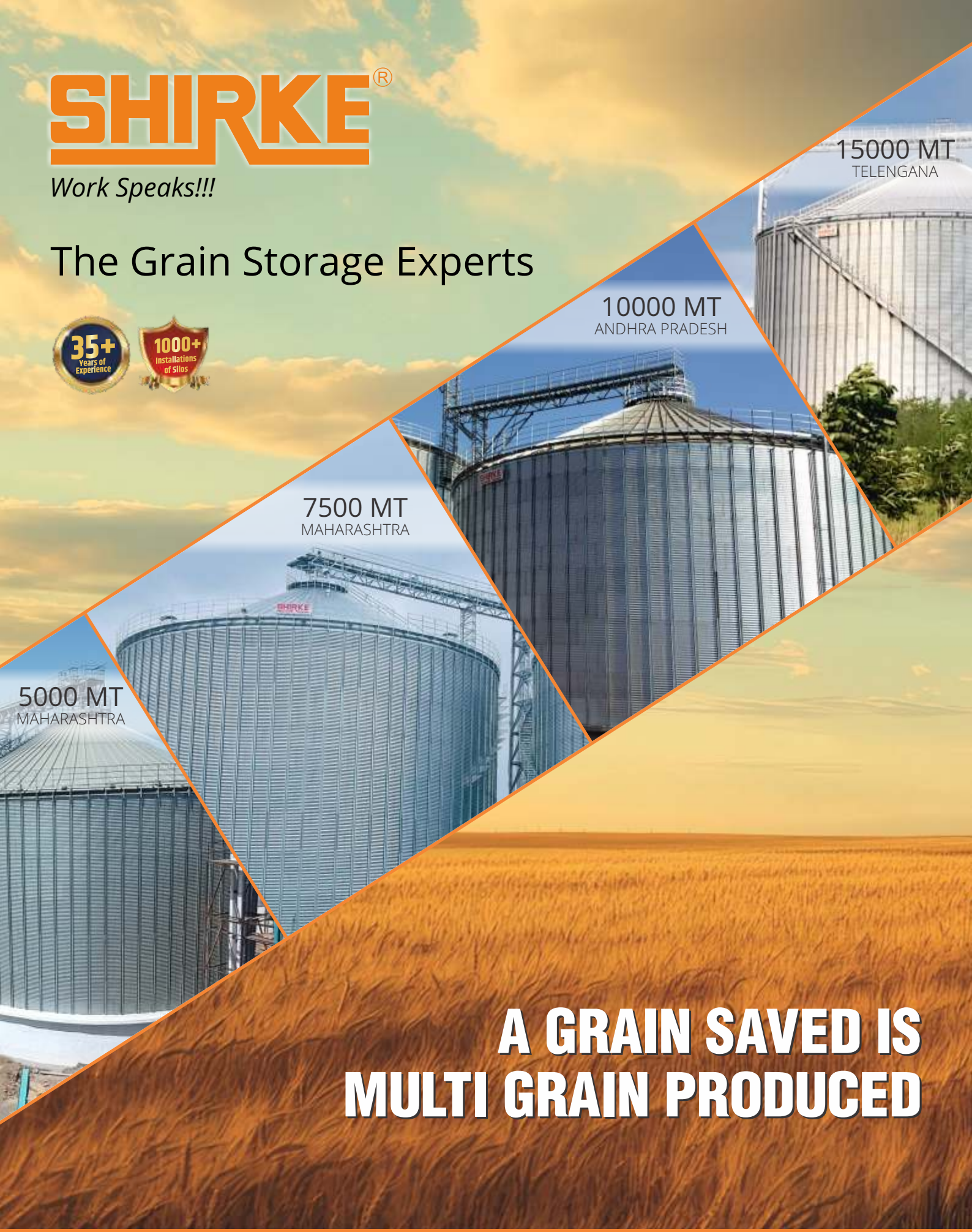

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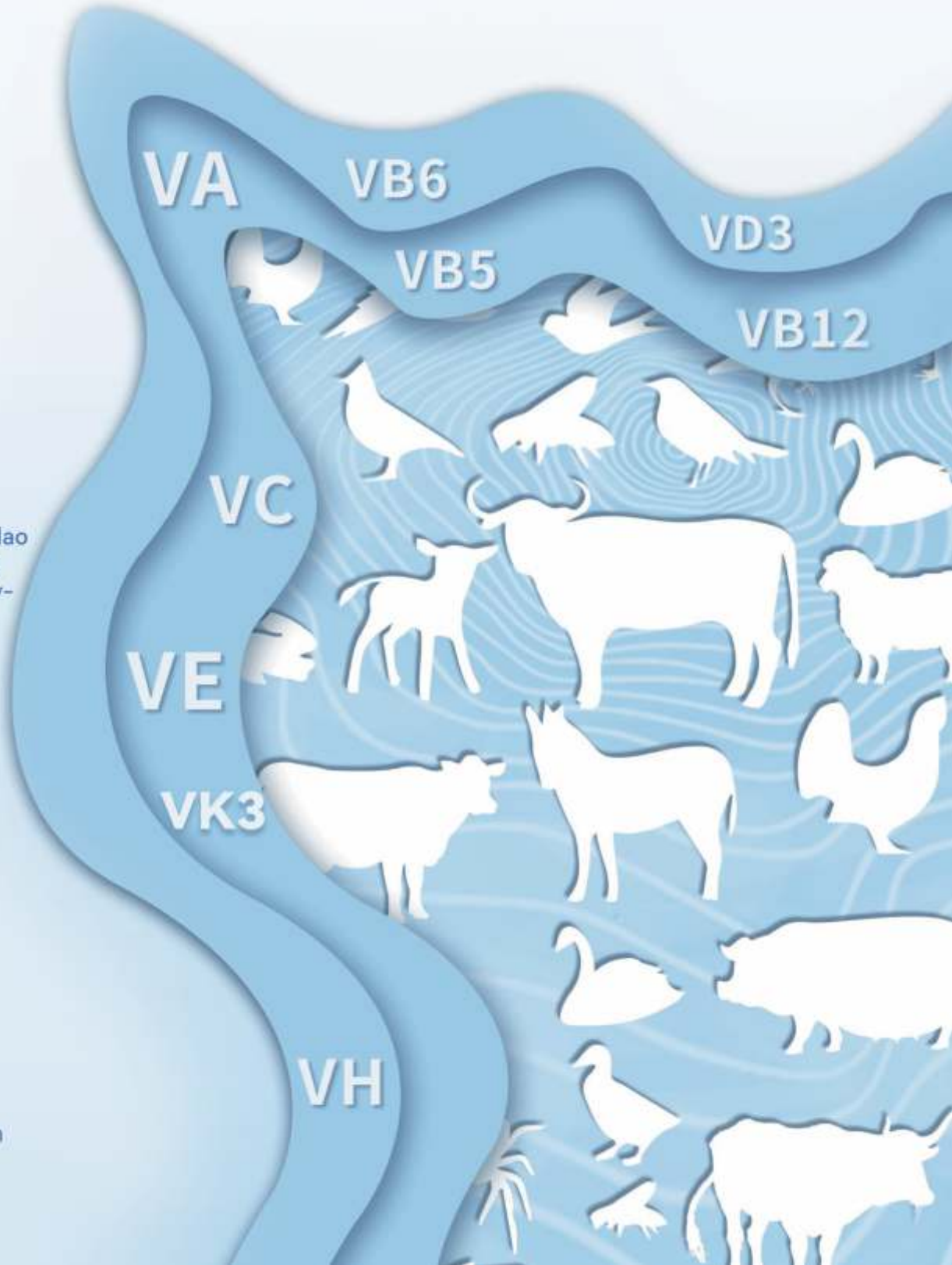

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Monthly Magazine for Feed Technology

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Erratum: In the previous issue (Volume-12, Issue-7), an image on page 26 was printed incorrectly due to an editorial error. We regret the mistake and apologize to our readers and any individuals or organizations affected.

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Far-UVC Light Tested as a New Biosecurity Tool Against Bird Flu

As highly pathogenic avian influenza (HPAI) continues to challenge poultry production, researchers at Texas A&M University are testing whether far-ultraviolet (far-UVC) light could become an additional tool for reducing airborne pathogens inside commercial poultry houses.

Far-UVC is a shorter-wavelength form of ultraviolet light that can inactivate viruses and bacteria while penetrating less deeply into biological tissue than conventional germicidal UV. This characteristic has generated interest in using the technology in occupied environments, including poultry houses. However, its effectiveness and practical safety under commercial production conditions still need to be established.

The Texas A&M study, led by Morgan Farnell and Ziteng "Tim" Xu, represents the third and final phase of a multi-year research programme. Earlier work conducted by researchers at Columbia University and St. Jude Children's Research Hospital examined far-UVC activity against pathogens under controlled conditions. The Texas A&M team will now evaluate its performance in poultry houses stocked at commercial bird densities. Researchers will collect air samples before and after far-UVC exposure and monitor indicator microorganisms, including aerobic bacteria, coliforms and Staphylococcus aureus. The results will help determine whether the technology can reduce airborne pathogen loads and potentially contribute to HPAI control.

A major challenge is the poultry-house environment itself. Dust can absorb or scatter ultraviolet radiation, reducing the amount of light reaching the air around birds. Researchers will therefore measure far-UVC exposure at bird level. AI-assisted cameras will also monitor bird behaviour, circadian rhythms and growth performance to identify any unintended effects.

The researchers are also exploring an integrated system combining far-UVC air treatment, UVC-enabled positive-pressure ventilation and robotic floor-disinfection modules.

The study will run for two years and involve four flocks, including birds raised under summer and winter conditions. If successful, the approach could eventually be evaluated for other livestock systems, including swine and dairy. For poultry producers, the technology could represent an additional layer of biosecurity alongside established measures such as hygiene, controlled movement, ventilation management and surveillance—but it is not yet a proven replacement for conventional HPAI prevention practices.

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EVENT PROGRAM

FRIDAY | 16 OCTOBER 2026

12:00 PM - 2:00 PM — DAIRY PATHSHALA (Pre-registration is mandatory)

- Reducing Infertility in Dairy Herds, **Dr Niteen Markandeya**, Reproduction Expert and **Dr D. Kamath**, Gokul
- Disease Prevention & Management in Dairy Animals, **Dr Hari Kumar**, NDDB

3:00 PM - 4:30 PM

- Rural Mart – Blinkit for Dairy Farmers, **Dr Raju Thannamel**, Kumaraguru Institutions

SATURDAY | 17 OCTOBER 2026

Dairy Leadership, Innovation & Industry Dialogue

11:00 AM – 3:00 PM — DAIRY MANCH

a. Challenges, Opportunities and Way Forward for Indian Dairy, **Dr Yogesh Godbole**, Gokul
b. The Future of Dairy Genetics: Genomics, Breeding Technologies and Productivity, **Sachin Joshi**,* BAIF
c. Buffalo-led Milk Revolution 2.0, **Dr Inderjeet Singh**, Bihar Animal Sciences University

DAIRY LEADERS ROUNDTABLE

Theme: The Future of Indian Dairy: Challenges, Opportunities & the Way Forward

1.30 – 2:15 PM — Lunch

2.15 – 2.45 PM — Innovations customised for Indian Dairy Ecosystem (5 Virtual Innovation Showcases)

2:45 PM — Way forward: Concluding observations and key takeaways from Dairy Manch

2:00 – 4:30 PM — **DAIRY PATHSHALA**

- Integrated Dairy Farming Model, **Dr. S. Gaikwad**, Govind
- Feed, Fodder & Silage Management for Dairy Profitability, **Dr Shailesh Madane,** Advanced Enzyme & **Dr VD Patil,** Gokul

4:00 – 5:30 PM — **DAIRY TECHNOLOGIST ASSOCIATION CONFERENCE**

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Exhibition & Animal Show Time: 10.00 AM – 6.00 PM & Day 3 will be concluded by 4.00 PM

For more information, please contact: info@benisonmedia.com

Raising the Bar for Gut Resilience Under Environmental Stress

By **Dr. Mounika Gali,** Nanovet Nutrition

Modern poultry production is increasingly challenged by environmental variability. Elevated temperatures, prolonged heat episodes, fluctuations in humidity and rainfall, and changes in feed and water availability can impose considerable physiological stress on birds.

In India, these challenges are particularly relevant because poultry production is closely linked to climate-sensitive agricultural and environmental resources. One important driver of climate variability is the El Niño–Southern Oscillation (ENSO). During the warm El Niño phase, changes in atmospheric circulation can influence rainfall and temperature patterns, including conditions associated with the Southwest monsoon.

For poultry, these environmental changes extend beyond farm management and production economics. Environmental stress can influence feed resources, water availability, thermoregulation, immune competence and gastrointestinal function. Among these systems, the gut deserves particular attention because it is one of the bird's most important interfaces with the external environment.

Why the Gut Matters More Than Ever

The gastrointestinal tract is responsible for digestion and nutrient absorption, but its biological role extends much further. It provides a physical, microbial and immunological barrier against potentially harmful agents entering through the oral route.

The intestinal defence system includes the mucus layer, intestinal epithelium, tight-junction complexes, microbiota and mucosal immune system. The mucus layer forms the first protective interface between luminal contents and the epithelial surface.

Beneath this layer, intestinal epithelial cells form a selectively permeable barrier that permits nutrient absorption while limiting the passage of pathogens and undesirable substances. Tight-junction proteins such

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as claudins and occludins help maintain epithelial integrity.
Effective gut defence therefore depends on maintaining both physical barrier integrity and biological balance.

When the Climate Changes, the Gut Feels It

The effects of El Niño on poultry production are largely indirect but can be significant. Changes in rainfall and temperature can influence agricultural production and consequently the availability and cost of important feed ingredients.
Reduced rainfall and prolonged dry periods may also increase pressure on water resources. At farm level, higher temperatures can increase water consumption and cooling requirements while reducing feed intake and productive efficiency.
Feed availability and quality influence the intestinal environment, while water availability affects hydration and thermoregulation.
Ambient temperature directly influences bird physiology.
Together, these factors can affect intestinal integrity, microbial balance and immune function.
Thus, climate resilience and gut resilience are closely interconnected.

Heat Stress: From Environmental Challenge to Physiological Stress

Heat stress occurs when birds cannot dissipate sufficient body heat to maintain thermal balance.
Since poultry lack functional sweat glands, they rely primarily on panting, along with physiological and behavioural adaptations, to dissipate heat.
Increasing temperature and humidity can alter respiration, blood flow, feed and water intake, metabolism and immune function.
Prolonged heat exposure can increase the generation of reactive oxygen species (ROS), leading to oxidative stress when antioxidant defences are overwhelmed.
This may trigger cellular damage, inflammation and metabolic disturbances.
In broilers, heat stress can reduce feed intake, growth and feed efficiency, while in layers it may affect egg production, egg weight and shell quality. Severe stress can result in dehydration and mortality.

When Heat Challenges the Gut Barrier

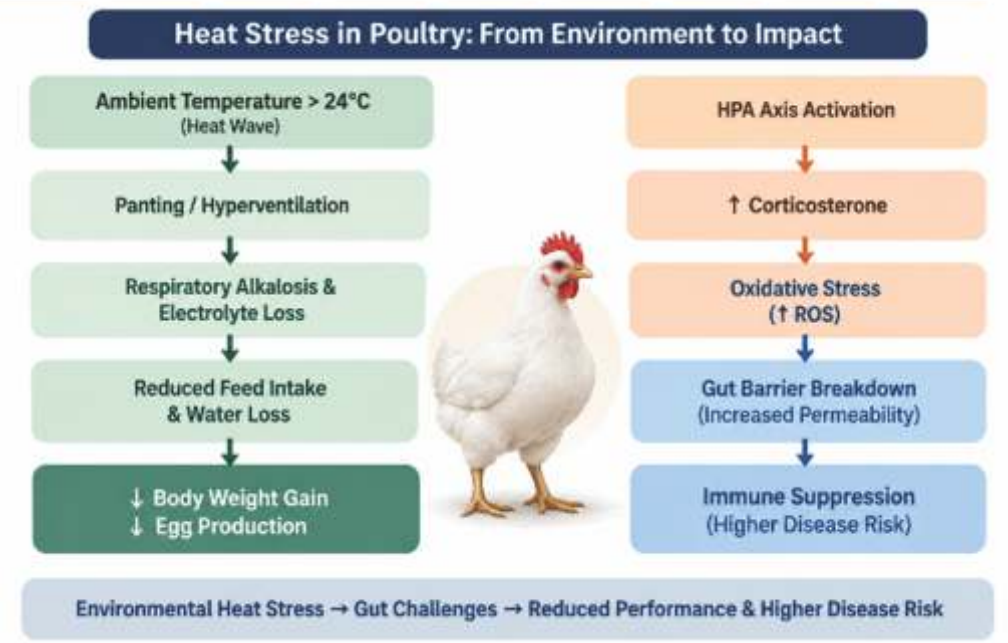
The gastrointestinal tract must continue to digest and absorb nutrients while simultaneously maintaining a barrier against luminal microorganisms and their products.
Heat stress can influence intestinal morphology, epithelial integrity, permeability and digestive function. Physiological changes in blood flow, oxidative stress and inflammatory responses can contribute to intestinal dysfunction.
When epithelial integrity is compromised, tight-junction organization may be altered and intestinal permeability may increase. This can increase exposure of underlying tissues to luminal microbial components and contribute to inflammatory responses.
The intestinal barrier is therefore not simply a structural wall. It is a dynamic physiological interface whose integrity is essential for maintaining gut homeostasis.

The Microbiome: Keeping the Gut in Balance

The intestinal microbiota contributes to nutrient metabolism, gut homeostasis and immune regulation.
Beneficial microorganisms can help limit pathogen establishment through competition for nutrients and attachment sites, as well as through interactions with the host environment.
Heat stress, altered feed intake, oxidative stress and changes in intestinal physiology can disturb this microbial ecosystem, potentially leading to dysbiosis.
Dysbiosis may further compromise intestinal integrity and influence inflammatory and immune responses. Thus, oxidative stress, intestinal barrier integrity, microbial balance and immune function are closely interconnected components of gut resilience.

When Stress Weakens the Bird's Defences

Heat stress can adversely affect immune competence by altering lymphocyte activity, antibody responses and vaccine responsiveness.
Such changes may reduce the bird's ability to respond effectively to infectious challenges.
Heat-stressed birds may become more susceptible to bacterial, viral and enteric pathogens. Organisms such as E. coli and Clostridium perfringens can become



particularly important when intestinal homeostasis and host defence are compromised.

During prolonged dry conditions, increased dust and poor air quality can add further environmental pressure, particularly when ventilation, litter management and farm hygiene are inadequate.

The Road to a More Resilient Gut

Building gut resilience requires a holistic approach. No single intervention can eliminate the effects of environmental stress; rather, resilience is built through the interaction of sound farm management, nutrition, water management and targeted gut-health strategies.

1. Start with the Environment

Effective environmental management is the first level of protection against heat stress. Ventilation, air movement and cooling should be optimized according to environmental conditions. Temperature should be considered together with relative humidity, while stocking density, bird handling and other management practices should be optimized to minimize additional thermal burden.

2. Water: The First Line of Support

Water is fundamental to thermoregulation and becomes increasingly important as environmental temperature rises. Continuous access to clean, good-quality water should therefore be ensured. Water quality, drinker flow, drinker availability and water consumption should be monitored routinely. During periods of heat stress, any restriction in water availability can further compromise the bird's ability to maintain thermal balance.

3. Nutrition: Fuel for Resilience

Maintaining consistent feed quality is particularly important during environmental stress. Raw materials should be carefully evaluated, mycotoxin risk should be managed, unnecessary abrupt feed changes should be avoided, and appropriate nutrient density and feed physical quality should be maintained. Good nutritional management helps reduce additional stress on the gastrointestinal tract during periods of reduced feed intake and climatic pressure.

4. Nurturing the Right Microbial Balance

Maintaining microbial stability is fundamental to gut resilience. Nutritional strategies including probiotics, prebiotics, symbiotics, postbiotics and yeast-derived functional compounds can be incorporated into comprehensive gut-health programmes.

MOS: Supporting the Gut from Within

Mannan-oligosaccharides (MOS) are yeast-derived compounds widely used and investigated for their role in poultry gut health. MOS can support gut resilience through complementary mechanisms, including interference with the adhesion of certain enteric pathogens, modulation of the intestinal microbial environment and interaction with host immune mechanisms.

By supporting microbial balance and mucosal defence, MOS can form part of a broader strategy for maintaining intestinal homeostasis during environmental and microbial challenges.

5. Supporting a Balanced Immune Response

During environmental stress,

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supporting an appropriate immune response becomes particularly important. Nutritional immunomodulators such as MOS, β-glucans and other yeast-derived components can interact with innate immune mechanisms and support mucosal immune function.

The objective is not excessive immune activation, but maintenance of a balanced and effective host defence response.

6. Strengthening the Gut Barrier

The mucus layer, epithelial cells and tight-junction complexes form essential components of intestinal defence. Strategies aimed at maintaining mucosal integrity, epithelial continuity and tight-junction function are particularly relevant during heat stress, nutritional disturbance and microbial challenges.

Protecting intestinal barrier function helps maintain the separation between luminal contents and underlying tissues while supporting overall gut homeostasis.

7. Keeping Oxidative Stress in Check

Heat stress can increase oxidative pressure and disturb cellular antioxidant balance. Appropriate nutritional support for antioxidant defence can therefore complement environmental heat-stress management and help maintain normal cellular and intestinal function during periods of increased physiological demand.

8. Reducing Cumulative Stress

Heat stress rarely occurs in isolation. Its effects can be compounded by poor ventilation, high stocking density, feed changes, water-quality problems, mycotoxin exposure, microbial challenges and handling stress.

Reducing avoidable stressors is therefore essential for preserving the bird's adaptive capacity and supporting consistent performance.

Beyond Disease Prevention: Building a Resilient Gut

Gut resilience is about more than preventing disease. It means maintaining digestion, nutrient absorption, barrier integrity, microbial balance and immune defence even when birds are exposed to environmental and physiological challenges. The goal is to help the gut adapt to challenges, maintain homeostasis, recover efficiently and support sustained performance.

Conclusion

Climate variability and heat stress can challenge gut integrity, microbial balance and immune defence in poultry. Building gut resilience therefore requires a combination of effective environmental management, good water and feed quality, microbiome support, appropriate immunomodulation and intestinal barrier protection. Nutritional strategies such as MOS and other functional yeast-derived components can complement farm-level management by supporting the bird's natural defence mechanisms. Ultimately, a resilient gut is an important component of a resilient bird—and, consequently, of more consistent and sustainable poultry production.

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THE FUTURE OF INDIAN DAIRY

From Producing More Milk to Creating More Value

An exclusive conversation on dairy's next decade, farmer profitability, technology, genetics, sustainability and the changing face of Indian dairy farming with **Dr Yogesh Godbole, MD, Gokul**

Dr Yogesh Godbole

"THE NEXT DECADE MUST BE ABOUT QUALITY GROWTH"

India's dairy sector is entering a new phase. The country remains the world's largest milk producer, with production rising from 239.30 million tonnes in 2023–24 to 247.87 million tonnes in 2024–25. But the next chapter cannot be defined by volume alone.

The more important question is whether every litre of milk can generate better returns for the farmer. With nearly five lakh milk producers associated with Gokul, the focus is increasingly shifting towards productivity, scientific animal management, technology, quality and sustainable farm economics.

"For a farmer, producing more milk does not necessarily mean earning more. What matters is how much income remains after meeting the cost of producing that milk."

For Maharashtra, the opportunity is significant. The state contributes around

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247.87 MT	485 g/day	~5 lakh
Milk production, 2024-25	Per-capita availability	Gokul milk producers

6–7% of India's milk production and has a strong dairy ecosystem, experienced producers and access to major consumption markets. Yet feed costs, climate variability, animal health, reproductive efficiency and quality breeding material remain important challenges.

THE COOPERATIVE AS A PARTNER, NOT JUST A BUYER

For a farmer-owned cooperative, commercial strength and farmer welfare are closely connected. Gokul has developed 32 farmer-oriented schemes and services covering animal health, breeding, nutrition, productivity, cattle feed, calf development and digital services.

32	INR 23.50 cr	INR 103 cr
Farmer-oriented schemes & services	Pension corpus as of March 2026	Cumulative calf-rearing subsidy

One of the distinctive initiatives is the Farmer Pension Scheme. Under the scheme, the cooperative society contributes 10 paise per litre, the milk producer 15 paise and Gokul 15 paise, taking the total contribution to 40 paise per litre. As of March 2026, approximately INR 23.50 crore had accumulated through LIC.

Veterinary services are available at around INR 60, while artificial insemination, cattle-purchase assistance, cattle-shed subsidies, subsidised cattle feed, calf-rearing programmes and digital services are intended to improve the producer's overall economics.

"A cooperative should help farmers save, earn and secure their future."

THE THREE LEVERS OF FARMER PROFITABILITY

1. Feed & Fodder Management

Feed is among the largest costs in dairy farming. The objective should not be simply to feed more, but to feed the animal according to its actual nutritional requirement.

Gokul's Ration Balancing Programme has produced encouraging results, with an average increase of around 440 ml of milk per animal per day and reported savings of approximately INR 2.72 per litre in feeding costs—equivalent to around INR 14,000 additional annual income per animal.

Since February 2025, mineral mixture has also been supplied at subsidised rates, with around INR 17 crore provided as subsidy. Gokul has strengthened its PTMR plant to 48 MT/day and is planning to manufacture ready-to-eat conventional TMR to address dry-fodder scarcity.

2. Productivity Per Animal

More animals do not automatically mean more profit. Better genetics, scientific nutrition, veterinary care and farm management can improve productivity from existing animals without a proportionate increase in cost. Feed efficiency should also be considered, as converting feed more efficiently into milk can directly improve farm profitability.

3. Reproductive & Animal Health

Every unproductive day carries an economic cost. Timely breeding, disease prevention and early identification of health problems can reduce unproductive periods and improve the economics of the herd.

"The objective is to generate more saleable milk from every rupee invested in the animal."

FODDER SECURITY IS MILK SECURITY

Gokul's nutrition strategy combines ration balancing, fodder development, silage and PTMR. The Ration Balancing Programme has covered more than 1.88 lakh animals, 96,000+ milk producers and 927 villages.

To improve fodder availability, farmers receive quality fodder seeds with a 30% subsidy, along with support for silage bags and silo pits. Gokul has also invested in fodder harvesting and silage infrastructure.

The focus is increasingly on replacing inconsistent feeding practices with scientifically prepared silage and balanced rations that provide better-quality fodder throughout the year.

PTMR capacity has increased from 10 MT/day to 40 MT/day, reflecting growing farmer acceptance of scientifically balanced feeding.

"Fodder security is becoming an important part of milk-production security."

BREEDING THE DAIRY ANIMAL OF TOMORROW

Genetic improvement is a long-term investment. Gokul is using high-genetic-merit semen, sex-sorted semen and IVF technology to accelerate genetic progress, particularly in buffaloes.

So far, 28 animals have successfully conceived through IVF technology, while around 270 AI technicians provide doorstep artificial insemination services at approximately INR 50 per AI. The calf-rearing programme, which began in 2005, has provided around INR 103 crore in cumulative subsidy support.

The goal is not to create larger herds simply for the sake of size. It is to develop healthier, more productive and genetically stronger animals.

THE FARM IS BECOMING A DATA CENTRE

The dairy farm of the future will generate considerably more information than the farmer has traditionally had

Image Source: Gokul

access to.

Sensors can monitor movement, rumination, feeding behaviour, temperature and resting patterns. Artificial intelligence can analyse these signals and alert the farmer to changes that might otherwise go unnoticed.

A proposed unique digital identity for every animal could eventually create a lifelong record covering health, breeding, vaccination, production and management.

This creates an opportunity to move from reactive farming towards preventive and predictive management.

"AI cannot replace the farmer or the veterinarian. It will help them see things earlier, analyse information better and take timely decisions."

Technology, therefore, should remain a decision-support tool rather than an end in itself.

QUALITY IS A JOURNEY

Milk safety begins long before the processing plant. Animal health, feed, water, medicines, milking hygiene, collection, chilling, transportation and processing all influence the final quality of milk.

Gokul's Ethno-Veterinary Medicine initiative includes its own preparation plant and six herbal products. The programme supports preventive animal healthcare through the use of herbal and alternative therapies, including homeopathic medicines, where appropriate. It can help reduce the unnecessary use of antibiotics, while recognizing that antibiotics remain essential when medically indicated.

Feed quality and aflatoxin control are another priority. Gokul focuses on quality feed and fodder, uses toxin binders in cattle feed and promotes proper fodder drying, storage and silage management. Fodder-bank initiatives and farmer awareness programmes further support this preventive approach.

At the collection level, Gokul uses FT1 and FT3 machines for rapid identification of 19 types of adulteration and residue screening.

It's cold-chain infrastructure includes 69 Bulk Milk Coolers, four chilling centres, one satellite dairy and three packing stations, supporting timely chilling and hygienic milk handling.

Quality is a culture. It depends on the farmer who stores feed correctly, the technician who performs the right test, the collection centre that maintains hygiene and the processing plant that follows disciplined systems.

THE NEXT GENERATION MUST SEE DAIRY DIFFERENTLY

For young people, dairy farming must become more than a traditional occupation. It needs to offer income, dignity, technology, professional growth and a sense of the future.

Young farmers can increasingly use digital records, data, scientific breeding, ration management, automation and professional financial management. Opportunities extend beyond milk production into fodder, heifer rearing, animal services, logistics, milk collection, dairy products and direct marketing, which can create new entrepreneurial opportunities across the dairy ecosystem.

The larger objective is to transform dairy from an inherited occupation into an enterprise that the next generation can build, expand and take pride in.

WASTE TO VALUE

Sustainability is increasingly becoming part of dairy economics.

Gokul's 6.5 MWp solar project generates around 10.4 million kWh annually, delivers approximately INR 6 crore in annual savings and reduces

Image Source: Gokul

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around 4,056 tonnes of CO_2 emissions annually.

Rooftop solar at cattle feed plants and solar systems at 12 Bulk Milk Cooler locations extend renewable-energy use across the cooperative. Concentrated Solar Thermal systems provide hot water for can and crate washing and tanker cleaning, reducing fossil-fuel consumption. Energy-recovery systems, including micro-turbines using methane generated during effluent treatment, further improve resource efficiency.

At producer level, 8,669 biogas plants of 2/3 m^3 capacity have been installed under the carbon-credit programme with support from NDDB, backed by approximately INR 28.18 crore in subsidies. The plants utilise cattle dung to generate clean cooking energy and are estimated to reduce around 72,800 tonnes of CO_2 equivalent annually, while reducing household dependence on firewood and cooking fuel.

The long-term vision is a circular dairy system in which milk production, animal nutrition, manure, energy, water and agriculture are connected rather than treated as separate activities.

Image Source: Gokul

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THE FARMER OF THE FUTURE

If Indian dairy farming is to evolve from milk production into profitable, technology-enabled and sustainable entrepreneurship, three priorities stand out:

Productivity: Produce better-quality milk at lower cost while improving output from each animal.

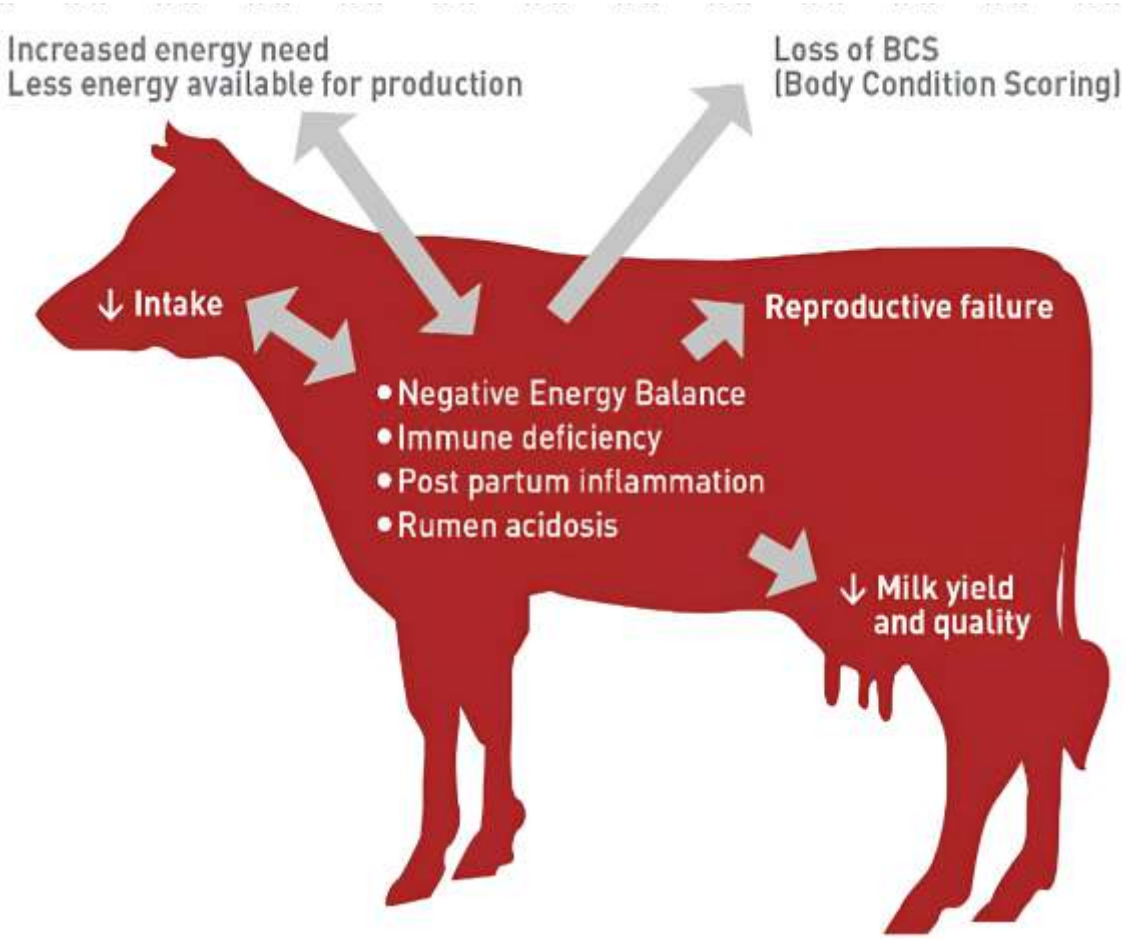
Professional Management: Track production, expenses, breeding, health, labour and cash flow, and use this information to make better decisions.

Value Creation: Move beyond simply selling milk and create value through quality, fodder, manure, digital services and new dairy enterprises.

"Our objective should not be only to produce more milk; it should be to create a better livelihood from every litre of milk produced."

THE NEXT CHAPTER OF INDIAN DAIRY BEGINS WITH THE FARMER.

Think Grain Think Feed - Volume 12 | Issue 11 | Sep 2026



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Importance of Fibre in Dairy Cow Feeding

By **Dr. T. M. Gowrisankar**, Independent Animal Nutritionist and Feed Consultant

The major reason modern dairy cows often fail to achieve their genetic potential is inadequate nutrition—and, more specifically, a lack of understanding of the role of fibre in dairy cow feeding programmes.

The greatest challenge in maximizing a dairy cow's potential is providing her with the nutrients she requires. In many cases, cows are not supplied with the right balance of nutrients to support the level of milk production they are genetically capable of achieving or to maintain optimum reproductive performance.

The problem with dairy feeding programmes is not limited to the level of protein or energy. The amount, quality and physical characteristics of fibre in the diet are equally important.

Fibre is perhaps one of the most misunderstood components of a dairy cow's ration.

Too much fibre can limit feed intake, resulting in inadequate energy and protein intake. On the other hand, insufficient effective fibre can adversely affect rumen function, reduce cud chewing and compromise rumen health and feed intake.

A successful dairy feeding programme must therefore be built around adequate quantities of high-quality forage and effective fibre.

Fibre: A Component Under the Farmer's Control

The fibre component of the dairy cow's

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ration is primarily supplied through forages such as green fodder, dry fodder and silage. Unlike many purchased feed ingredients, the quality of forage is substantially influenced by the farmer's decisions—from crop selection and cultivation to harvesting, conservation and storage.

The stage at which green fodder is harvested has a major influence on its nutritional value. Delayed harvesting generally increases dry-matter yield per unit of land, but it also increases fibre concentration and can reduce digestibility and the availability of protein and energy.

Therefore, harvesting fodder at the appropriate stage of maturity is critical to obtaining a good balance between yield, digestibility and fibre.

Grains and concentrates also contain some fibre, but the physical and functional characteristics of fibre are particularly important when considering forage-based fibre in the dairy cow's ration. Adequate effective fibre is essential for normal rumen function, cud chewing and saliva production, which helps buffer the acids produced during rumen fermentation.

What Is Fibre?

The structural components of plant cell walls primarily include cellulose, hemicellulose and lignin. In practical feed evaluation, fibre is commonly described using measures such as Neutral Detergent Fibre (NDF), Acid Detergent Fibre (ADF) and lignin.

In India, crude fibre is still commonly reported in feed analysis. However, crude fibre is a relatively less precise measure of the fibre fractions that are important for evaluating forage quality and predicting animal performance.

Understanding ADF

Acid Detergent Fibre (ADF) primarily represents cellulose and lignin in the plant cell wall. As ADF increases, forage digestibility generally decreases because a greater proportion of the plant material becomes less readily available for digestion.

While these components contribute to the physical structure of the ration and are important for normal rumen function, lignin is largely indigestible, while cellulose can be digested to varying degrees by rumen microorganisms. Therefore, higher ADF levels generally indicate lower forage digestibility and lower energy availability.

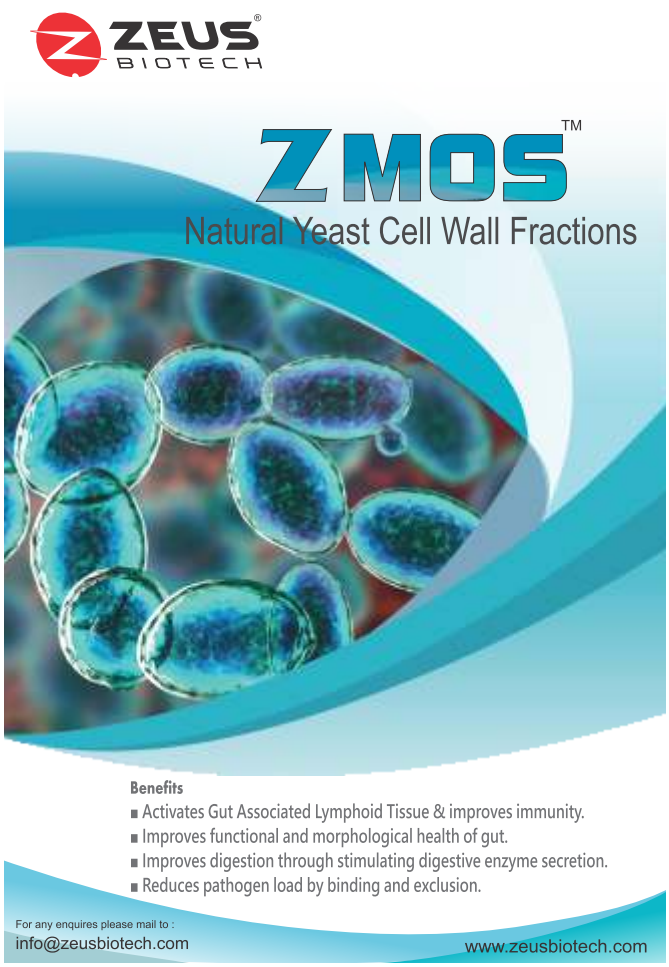
A commonly used reference range for ADF in a total dairy ration is around 16–19%, although the appropriate level depends on forage quality, stage of lactation, milk production and the overall composition of the ration. A significant proportion of dietary ADF will typically come from green fodder, dry fodder and silage.

Understanding NDF

Neutral Detergent Fibre (NDF) includes hemicellulose, cellulose and lignin. NDF is particularly important because it influences dry-matter intake, rumen function and chewing activity.

NDF can be considered an indicator of the physical bulk of the ration and, consequently, how much feed a cow can consume before feeling physically full. As NDF levels increase, the rate at which feed passes through the digestive tract may decrease, potentially limiting voluntary feed intake.

A commonly used guideline is to maintain NDF in the total ration within an appropriate range, with 27–30% often used as a reference range in certain dairy feeding programmes. However, the optimum level depends on factors such as milk yield, stage of lactation, forage quality, diet composition and the physical effectiveness of the fibre.



It is also important to consider the source of NDF. A substantial proportion should come from forage sources such as green fodder, dry fodder and silage. As a practical guideline, around 75% of dietary NDF may be derived from forage sources, depending on the overall ration formulation.

Excessively high NDF can restrict feed intake, reducing the cow's intake of energy, protein and other essential nutrients. This can be particularly important in high-producing cows, which have high nutrient requirements.

At the same time, adequate physically effective fibre is essential for rumination and saliva production. Saliva provides an important buffering mechanism against the acids produced during rumen fermentation.

Therefore, the objective is not simply to minimize NDF, but to provide the right amount and physically effective form of fibre to support feed intake, rumen health and milk production.

Too Much or Too Little Fibre Can Be a Problem

An appropriate balance of fibre is essential.

Excessive NDF can limit dry-matter intake and, consequently, the cow's intake of energy and other nutrients. This can become particularly important in high-producing cows, which already have high nutrient requirements.

At the other extreme, a diet with inadequate effective fibre can reduce chewing activity and saliva production and may contribute to a rapid decline in rumen pH. This can increase the risk of ruminal acidosis and negatively affect feed intake, milk production and animal health.

It is therefore important to remember that both fibre quantity and fibre effectiveness matter.

Test the Fodder Before Formulating the Ration

The first step in determining how much green fodder, dry fodder and silage should be offered is to understand their nutritional composition.

Forage analysis should ideally include dry matter, NDF, ADF, crude protein and other relevant nutritional parameters. Once the quality of the available forages is known, the ration can be formulated according to the cow's:

- Body weight
- Milk yield
- Milk fat and other production parameters
- Stage of lactation
- Pregnancy status
- Body condition
- Overall health and management conditions

A ration should therefore be formulated based on the nutrient requirements of the individual animal or production group, rather than relying solely on fixed quantities of fodder or concentrate.

Fibre Structure and Particle Size Matter

Fibre quantity alone does not determine whether a ration will support healthy rumen function. Particle size and physical structure are also important.

A ration may contain an apparently adequate concentration of NDF, but if the physical form of the forage does not provide sufficient effective fibre, the animal may not chew and ruminate adequately.

Conversely, excessively long particles can encourage sorting and reduce consistency of nutrient intake among animals.

Particle-size evaluation can therefore be a useful component of ration assessment. The objective should be to provide a ration with adequate physical structure while minimizing excessive sorting.

The appropriate particle-size distribution depends on the forage, total mixed ration (TMR), animal group and feeding system. Therefore, fixed particle-size limits should be used as practical guidelines rather than universal rules.

Read the Cow and Read the Feed Trough

One of the most practical ways to assess a feeding programme is to observe the cows and the feed trough.

Look at how actively cows approach the feed when it is delivered. Excessive feed refusal, particularly of the forage fraction, can indicate problems related to forage quality, ration formulation, palatability or sorting.

Cud chewing is another useful practical indicator of rumen activity. When cows are resting, a substantial proportion (at least 50%) of healthy cows should be observed ruminating. A marked reduction in cud chewing may indicate inadequate physically effective fibre, although it

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can also be associated with other nutritional, health or management problems.

The feed trough can provide additional clues. If visible "holes" appear in the ration, cows may be sorting the feed and selectively consuming certain components. This can result in inconsistent nutrient intake among cows even when the formulated ration appears nutritionally adequate.

Good Fibre Begins in the Field

The foundation of a good dairy feeding programme is high-quality forage.

Forage quality begins with appropriate agronomic practices, including:

- Selection of suitable seed or planting material
- Proper soil preparation
- Balanced fertilization
- Adequate irrigation
- Effective weed management
- Timely harvesting
- Appropriate harvesting methods
- Proper conservation and storage

For silage, correct harvesting maturity, moisture management, chopping, compaction, sealing and fermentation are critical to preserving nutrients and producing a stable feed.

Similarly, proper drying and storage of dry fodder are essential to minimize nutrient losses and prevent mould growth and other quality problems.

Thus, forage quality is influenced by decisions made long before the feed reaches the manger.

Fibre and the High-Producing Dairy Cow

High-genetic-potential cows have high nutrient requirements. If their diets do not provide sufficient energy, protein, minerals and effective fibre, they may fail to express their production potential and can experience excessive loss of body condition.

The challenge is therefore to formulate a ration that provides sufficient nutrients without compromising rumen health.

This is particularly important during early lactation, when nutrient demand rises sharply while feed intake may not increase at the same rate.

A Balanced Approach to Concentrates

Concentrates and cattle pellet feeds can help meet the additional nutrient requirements of producing cows. However, the quantity required should be determined according to the animal's production level, forage quality, body weight, stage of lactation and the nutrient density of the complete ration.

A commonly used field thumb rule is to offer concentrate according to milk production—for example, around 500 g of concentrate per litre of milk under certain feeding systems—but this should not be treated as a universal formula.

The actual requirement can vary considerably depending on the quality and quantity of forage, milk composition, animal size, production level and the formulation of the concentrate.

Building a More Productive Dairy Herd

Cows with high genetic potential require a balanced supply of nutrients to express that potential for milk production and reproduction. Fibre plays a central role because it influences feed intake, rumination, saliva production and rumen health.

The objective of a successful feeding programme is therefore not simply to increase or decrease fibre. It is to provide adequate, digestible and physically effective fibre as part of a balanced ration.

High-quality green fodder, dry fodder and silage form the foundation of this approach. Their quality depends substantially on decisions made by the farmer—from crop selection and agronomic management to timely harvesting, conservation and storage.

Summary

A productive dairy cow needs more than protein and energy. Fibre is fundamental to maintaining a healthy rumen and supporting consistent feed intake and milk production.

The right balance of fibre, together with good-quality forage, appropriate particle size, adequate concentrates, clean water and sound overall ration management, can help cows maintain rumen health and express their production potential.

For Indian dairy farmers, improving forage quality and understanding effective fibre can be an important step towards more productive, profitable and sustainable dairy farming.

Fodder Challenges in India: From Fodder Deficit to Nutrition Security

Why India's dairy future will depend not only on better animals, but on better nutrition

By **Rohit Sharda,** Silage Agro

Introduction

India produced 247.87 million tonnes of milk in 2024–25, an increase of 3.58% over the previous year, while per-capita milk availability reached 485 grams per day. Dairying continues to be an important source of income for millions of rural households. Yet, behind this growth lies a less visible question: How can India consistently meet the nutritional requirements of the animals producing this milk?

The fodder challenge is often expressed simply in terms of shortage. In reality, the issue extends well beyond volume to include availability, quality, seasonality, preservation, storage, consistency and the cost of delivering usable nutrition to the animal. Fodder therefore needs to be viewed not merely as chaara, but as an essential component of dairy infrastructure. The transition ahead is from fodder deficit to nutrition security.

Genetics Create Potential. Nutrition Realises It.

India has made significant investments in genetic improvement, breeding, artificial insemination and animal selection, but dairy productivity ultimately depends on the interaction of three interconnected factors: animal genetics, farm management and nutrition.

Improved genetics enhance an animal's

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productive potential, effective farm management enables that potential to be expressed, and nutrition provides the biological inputs required to translate genetic potential into milk production. This establishes an important principle: better genetics create greater nutritional responsibility. An animal with superior genetic potential cannot perform to its capacity when its nutritional supply is inadequate or inconsistent. The next phase of dairy development must therefore extend beyond genetic improvement to creating the nutritional environment required for animals to express their potential consistently and economically.

India's Fodder Problem Is Bigger Than the Deficit Number

ICAR-IIMR cites deficits of around 32% for green fodder and 23% for dry fodder. While these figures indicate the magnitude of the challenge, a deficit measured in tonnes does not fully capture the nutritional dimension of the problem. Fodder may be available on a farm while still failing to meet the animal's requirements because of inadequate dry matter, energy, protein, digestibility or overall quality. The more relevant question, therefore, is not simply how much fodder is available, but how much usable nutrition can be reliably delivered to the animal, at what cost and for how much of the year. This shift—from measuring physical fodder availability to assessing nutritional availability—is fundamental to the broader concept of nutrition security.

The Animal Does Not Follow the Crop Calendar

Agricultural production is inherently seasonal, but an animal's nutritional requirement is continuous. Green fodder availability is influenced by rainfall, crop cycles, land availability and local agro-climatic conditions, with periods of abundance often followed by periods of scarcity. During such gaps, farmers may have to depend on lower-quality alternatives or purchase fodder at higher prices, increasing the cost of milk production. This creates a fundamental mismatch: the crop follows the season, but the animal requires nutrition every day. Addressing this mismatch requires more than increasing fodder production during periods of abundance; nutritional resources must also be conserved and stored so that their value can be carried forward into periods of scarcity. Scientific fodder conservation is therefore becoming an important component of dairy infrastructure and year-round nutritional security.

A Kilogram of Fodder Is Not a Kilogram of Nutrition

Fodder economics cannot be assessed adequately by comparing feeds solely on their price per kilogram. Fresh green fodder contains significant amounts of water, while preserved forages can differ considerably in dry-matter concentration and nutrient composition. Consequently, two feeds with

What Does Good-Quality Maize Silage Look Like?

Parameter	ICAR-IIMR Indicative Range	Quality-Focused Organised Production
Dry Matter (DM)	25-35%	Consistent DM within the appropriate range, depending on crop and ration requirements
Starch	Around 20%	Consistent starch contribution through appropriate hybrid selection and harvest maturity
Crude Protein	Around 8-10% DM	Maintained within an appropriate range while balancing energy and fibre
NDF	About 45-50% DM	Managed with consideration to intake and digestibility rather than a single target
ADF	About 25-30% DM	Influenced through crop selection and harvest maturity
pH / Fermentation	Appropriate anaerobic fermentation	Consistent fermentation supported by disciplined storage and handling

Source: ICAR-IIMR maize-silage guidance. Values are indicative rather than universal specifications and can vary with hybrid, agronomy, harvest stage and preservation method.

similar or even very different purchase prices may provide substantially different quantities of usable nutrition. A meaningful assessment should consider the dry matter delivered, energy and digestible fibre supplied, protein contribution, consistency of quality, nutritional losses between harvest and feeding, and the ultimate cost of delivering the required nutrition to the animal. These considerations become increasingly important as dairy farms adopt scientific ration formulation and TMR-based feeding. The future of fodder economics cannot be built around INR/kg alone; it must increasingly be evaluated in terms of the cost of delivering usable nutrition.

The objective of quality-focused silage production is not to force every batch into a single laboratory specification, because agricultural production will inevitably involve variation. The greater objective is to manage that variation and maintain predictable nutritional quality. A professional silage producer should therefore focus on consistency while recognising that the optimum specifications ultimately depend on the complete ration, production system and category of animal being fed. Quality management at the fodder stage can consequently play an important role in improving the predictability of the overall feeding programme.

Whole-Crop Thinking Can Unlock More Nutrition

Agricultural biomass that is commonly regarded as residue can represent a significant source of energy and nutrients when appropriately utilised. Maize provides a useful example. Traditional agricultural economics often separates the grain from the rest of the plant because the grain has a clearly defined market value, while stalks and leaves may be treated as residue. Whole-crop maize changes this perspective. When harvested at the appropriate stage, the cob, grain, leaves and stalk form a single forage resource, with the grain contributing starch and energy and the vegetative portion contributing fibre. ICAR identifies maize as particularly suitable for silage because of its biomass production, starch content, digestibility and storage characteristics. Well-managed whole-crop maize silage can therefore make a meaningful contribution to dietary energy and starch, although its precise nutritional value will vary with hybrid, agronomic practices, harvest maturity, dry matter and composition.

The broader principle is significant: what appears to be fodder or agricultural residue can represent substantial usable nutrition when appropriately harvested and conserved. The opportunity lies in converting available biomass into valuable animal nutrition rather than viewing it merely as crop residue.

Forage Is the Foundation of the Ration

As dairy nutrition becomes increasingly scientific, forage needs to be considered a fundamental component of the ration rather than simply a filler. It provides the structural fibre required for healthy rumen function while also contributing energy and other nutrients, with the appropriate proportion depending on the animal, its production level and the formulation of the overall diet. Forage quality is therefore critical. Poor-quality forage can limit intake and reduce the effectiveness with which other feed ingredients are utilised. This becomes particularly important in TMR-based systems, where consistency in the major ingredients is essential for maintaining a predictable nutrient profile. Significant variation in forage quality from one batch to another can consequently alter the composition of the ration, with implications for intake, animal performance and feed economics. As Indian dairy farming moves towards more precise nutrition management, consistency in forage quality will become increasingly important to achieving consistent feeding and production outcomes.

Silage Changes the Way We Think About Fodder

Silage is often described simply as green fodder preserved for later use, but its significance extends well beyond preservation.

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Scientific silage involves harvesting forage at an appropriate stage of maturity, preserving it through controlled fermentation and storing it under conditions that help retain its nutritional value beyond the normal harvesting window. This transforms fodder from a seasonal resource into a feed that can be produced, preserved, stored, quality-assessed, transported and utilised when required, creating a more systematic approach to fodder management. The practice is also evolving beyond individual farms, with ICAR undertaking work on mechanised harvesting, scientific silage production, different silage formats and model silage-bale-making units for demonstration, training, quality management and entrepreneurship. The significance therefore extends beyond silage as a feed product; it points towards the emergence of a more organised fodder value chain connecting crop production, harvesting, preservation, storage, logistics and dairy nutrition. As this system develops, fodder has the potential to move from a predominantly seasonal and locally managed resource towards a more predictable component of the dairy feeding system.

India's "Chaara" Problem—and the "Chaara" for It

There is an interesting linguistic dimension to India's fodder challenge. In Hindi, chaara refers to fodder, while the same word can also signify a means, remedy, option or course of action. This provides an appropriate metaphor for the changing approach to fodder management: addressing the chaara problem may require rethinking chaara itself. For generations, fodder has largely been treated as a basic agricultural commodity—produced, harvested, transported and fed through fragmented and predominantly local systems. However, the nutritional requirements of modern dairy animals call for a more systematic approach, involving the production of appropriate forage, harvesting at the right stage, preservation of nutritional value, adequate storage and reliable year-round availability. This transition requires investment in infrastructure and organised supply chains. A commercial silage facility in Khanna, Punjab, operated by Silage Agro, provides an illustration of this emerging model. According to company-provided figures, the facility has approximately 40,000 tonnes of maximum silage storage capacity at a single location. The scale is significant not merely because of the volume involved, but because it demonstrates how fodder can increasingly be managed as an organised resource rather than as an informal, locally sourced agricultural input. Such a system can encompass crop planning, specialised harvesting, chopping, preservation, baling, storage, quality management, logistics and feeding, thereby connecting agricultural production more closely with dairy nutrition. As fodder production and distribution become more organised, the focus can shift from simply asking where fodder will be sourced to considering how a reliable system can be established to meet the nutritional requirements of dairy animals throughout the year. In that context, the chaara for India's fodder problem lies not merely in producing more fodder, but in building a reliable, quality-focused and nutrition-oriented fodder system.

Beyond Price per Kilogram: The Importance of Nutritional Value

Consider two silages: Silage A is offered at INR 7.00/kg and contains 25% dry matter (DM), while Silage B costs

Parameter	Silage A	Silage B	Green Jowar	Other Green Grass
Purchase price/kg (INR)	7.00	7.50	3.00	3.00
Dry matter	25%	32%	12%	10%
Starch	15%	25%	10%	8%
Cost/kg DM (INR)	28.00	23.44	25.00	30.00

slightly more, at INR 7.50/kg, but contains 32% DM. Now compare these with commonly fed green fodders such as green jowar and other grasses, which typically contain much lower dry matter. To a farmer comparing only the purchase price, Silage A appears cheaper than Silage B, while green fodder appears cheaper than both. However, this is an apples-and-oranges comparison because the price of fresh fodder does not indicate how much dry matter—and therefore how much usable nutrition—is actually being purchased.

Using these illustrative values, Silage B costs approximately 7% more per kilogram on a fresh-weight basis, but delivers 28% more dry matter per kilogram than Silage A. As a result, its cost per kilogram of DM is approximately 16% lower. The comparison becomes even more meaningful when the broader nutritional characteristics of the feed are considered. Dry matter is only the starting point; starch, fibre characteristics, fermentation quality, contamination risk, palatability and storage losses also influence the nutritional value ultimately delivered to the animal. Fodder economics therefore need to move beyond INR /kg towards the cost of delivering usable nutrition.

The values above are illustrative; actual nutrient composition and economics will vary according to crop, variety, harvest stage, preservation method, storage conditions and batch quality.

The Next Challenge Is Consistency, Not Simply Availability

India does not need to abandon traditional fodder systems. Crop residues, green fodder, hay, grazing resources, concentrates and preserved forage will continue to have roles depending on geography, farm size, water availability and economics. The greater challenge is to make the overall feeding system more predictable. The next generation of fodder management will require better forage crops and varieties, scientific harvest timing, mechanised harvesting, effective preservation, adequate storage infrastructure, regional supply networks, quality testing and stronger integration between crop production and dairy nutrition. The objective is not to replace chaara, but to bring greater science, consistency and reliability to its production and utilisation, so that the nutritional requirement of the animal is not dictated by the availability of fodder at a particular point in the crop calendar.

From Fodder Deficit to Nutrition Security

The dairy animal does not distinguish whether a fodder shortage arises from a poor monsoon, a gap between crop cycles, competing demand for agricultural residues or a logistics constraint; its nutritional requirement remains continuous. The next phase of dairy development should therefore be viewed not only through milk production and genetic potential, but also through the strength of the nutritional infrastructure supporting those animals. India has made significant progress in genetics, dairy infrastructure and milk production, but strengthening the nutritional foundation will be essential to translating that progress into consistent animal performance. The future of fodder is not simply about producing more tonnes; it is about producing, preserving, measuring and delivering more nutrition—consistently and economically. This requires fodder to be viewed as an essential component of dairy infrastructure rather than simply an agricultural input. India's dairy future will depend not only on better animals, but also on a system capable of feeding them better and more consistently throughout the year. This is the transition from fodder deficit to nutrition security.

About the Author:

Rohit Sharda is Founder & Director of Silage Agro Pvt. Ltd. (SAPL), behind NutriMeal, India's leading baled-silage manufacturer. Since 2015, he has focused on building a scalable silage ecosystem spanning crop sourcing, mechanised harvesting, fermentation, storage, logistics and institutional dairy supply. He holds an MBA from IMT Ghaziabad.

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Dry Spell, Pest and Disease Pressure Hit Soybean and Cotton in Nanded

Soybean and cotton crops in Nanded district of Maharashtra are facing increasing pest and disease pressure following below-normal rainfall, adding to concerns among farmers already dealing with moisture stress.

According to the district administration, Nanded has received 587.8 mm of rainfall against an average expected rainfall of 764.2 mm, representing a deficit of 23.1%. Although the shortfall is lower than that recorded in some neighbouring districts, inadequate rainfall and rising temperatures have affected crop growth.

Soybean cultivation has expanded this year, with the area under the crop increasing by around 12% to 4.69 lakh hectares, compared with the average area in previous years. The crop is currently at the flowering stage and has reportedly been affected by several pests, including leaf-eating caterpillars, stem fly, beetles, pod borers and whiteflies, along with Yellow Mosaic disease. The infestation has contributed to stunted plant growth, according to an administration report.

Cotton, another major crop in the Marathwada region, is also experiencing stress. The crop is currently at the flowering and boll-formation stage, but insufficient rainfall has resulted in moisture stress and drying in some areas. Higher temperatures have also been associated with infestations of aphids, jassids, whiteflies and thrips, with affected plants showing yellowing leaves and reduced growth.

The situation has also raised concerns over crop insurance claims. Former Maharashtra Chief Minister and Rajya Sabha MP Ashok Chavan questioned the rejection of some claims during an online meeting with State Agriculture Secretary Parimal Singh. Chavan sought greater transparency in the assessment process, particularly where government records indicate crop losses.

He also called for insurance companies to share survey reports with district authorities and ensure field-level assessment of affected crops.

The developments highlight the vulnerability of soybean and cotton production to the combined effects of rainfall deficits, moisture stress, high temperatures and pest outbreaks.

India's Fodder Area Shrinks 23% as Livestock Demand Rises

India's livestock sector is expanding rapidly, but the land dedicated to fodder cultivation is moving in the opposite direction. According to an ICAR assessment, the area under fodder crops declined from 8.30 million hectares in 2018-19 to 6.39 million hectares in 2023-24, a reduction of about 23% in six years. Fodder crops now account for less than 5% of the country's gross cropped area.

The decline assumes significance as demand for milk, meat and eggs continues to grow. ICAR's assessment notes that the livestock sector recorded a compound annual growth rate of 12.77% between 2013-14 and 2023-24, contributing more than 31% of agricultural GVA in 2023-24.

India's milk production has nevertheless continued to rise, increasing from 146.3 million tonnes in 2014-15 to 247.9 million tonnes in 2024-25, according to the Department of Animal Husbandry and Dairying. The growth has been supported by improvements in animal productivity, feeding practices and the use of higher-yielding fodder varieties. However, continued expansion of livestock production will increase demand for nutritionally adequate feed and fodder.

The ICAR assessment highlights the need to make better use of crop residues and other alternative feed resources to bridge the growing gap. Improved processing, conservation and utilisation of residues from crops such as paddy, wheat and maize could reduce pressure on dedicated fodder land.

The shrinking fodder acreage also highlights the importance of improving forage productivity rather than relying solely on additional land. Greater adoption of multi-cut fodder varieties, better harvesting and conservation practices, silage production and scientific ration formulation could help improve the efficiency of available resources.

For India's dairy sector, the challenge is increasingly about producing more milk from limited land and feed resources, while maintaining animal health, productivity and farmer profitability.

India's Ethanol Push Needs a Feedstock Reality Check

India's ethanol blending programme is aimed at reducing crude-oil imports and improving energy security. However, the rapid expansion of ethanol production also raises an important question: how should India balance fuel demand with the competing needs of food, feed and water?

Ethanol can be produced from maize, rice and sugarcane-derived feedstocks. Maize is particularly important for the feed industry, where it is a major energy source for poultry and dairy rations. Diverting larger quantities of maize towards ethanol could therefore tighten supplies and increase feed costs, with potential implications for the prices of milk, meat and eggs.

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The challenge is further complicated by water use. Sugarcane and rice are relatively water-intensive crops, while maize also requires substantial water depending on production conditions. Therefore, expanding ethanol production cannot be considered only from the perspective of fuel economics; feedstock availability, regional water stress and competing agricultural demand also need to be considered.

International experience offers some useful lessons. The US has continued to support corn-based ethanol, with biofuel demand remaining an important market for maize. Brazil has also retained ethanol as a major component of its fuel system, with sugarcane being the principal feedstock; mills continue to adjust the sugar-ethanol mix according to market and production conditions.

The European Union provides a different example. Rather than abandoning biofuels, it has introduced limits on food- and feed-crop-based biofuels because of concerns over indirect land-use change and competition with food production. Its policy increasingly promotes advanced biofuels made from wastes, residues and other non-food feedstocks. EU projections also indicate a gradual decline in crop-based bioethanol use towards 2035.

For India, the lesson is not necessarily to slow ethanol adoption, but to diversify its feedstock base. Greater use of agricultural residues, cellulosic materials and other non-food feedstocks could reduce direct competition with livestock and poultry feed. At the same time, policies supporting higher maize productivity, efficient irrigation and improved water management will be important.

As E20 becomes the national benchmark, India's ethanol strategy will increasingly need to account not only for litres of fuel produced, but also for the food, feed and water resources used to produce those litres.

Gujarat Tightens Regulation of Livestock and Poultry Feed

The Gujarat Legislative Assembly has passed the Gujarat Livestock Feed, Poultry Feed and Mineral Mixture (Regulation of Production, Storage, Distribution, Sale and Quality Control) Bill, 2026, introducing a comprehensive regulatory framework for livestock feed, poultry feed and mineral mixtures in the state. The Bill was initially introduced ahead of the Assembly's monsoon session on 8 September.

The legislation makes licensing mandatory for businesses involved in the manufacture, storage, distribution and sale of livestock feed, poultry feed and mineral mixtures. Manufacturers and other licensees will be required to comply with prescribed quality standards, while provisions have been included for periodic testing and analysis of feed samples, as well as requirements relating to packaging and labelling. The standards will also apply to products manufactured outside Gujarat and brought into the state for sale, distribution or storage.

The Bill provides stringent penalties for adulterated and sub-standard feed. Manufacture or sale of adulterated feed that does not result in animal death can attract imprisonment of up to one year and a fine of up to INR 5 lakh. Where adulterated feed results in the death of livestock or poultry, imprisonment may extend to seven to 10 years, along with a fine of up to INR 10 lakh. Sub-standard products may attract a penalty of up to INR 5 lakh and suspension of the licence for one year, while misbranding or misleading trade practices may result in a similar fine and licence suspension for up to three years.

The legislation also seeks to prevent the use of prohibited antibiotics, pharmacologically active substances and other adulterants. Feed prepared by farmers for their own livestock or poultry, as well as products produced by universities and research institutions for research purposes, have been kept outside its scope.

CIMMYT Announces New Maize Hybrid for South Asia

The International Maize and Wheat Improvement Center (CIMMYT) has announced a new tropical maize hybrid developed through its South Asia Breeding Program, making it available for licensing to public and private-sector partners seeking to produce and disseminate hybrid maize seed across the lowland tropics of South Asia and similar agro-ecologies.

The newly available hybrid, CIM24ADTY-01, is medium-maturing, yellow-grained and high-yielding, with tolerance to drought and resistance to tar spot complex (TLB), Fusarium stalk rot (FSR) and fall armyworm (FAW).

CIMMYT said the hybrid was selected following several years of testing through a stage-gate advancement process, culminating in the 2025 ADTY On-Farm Trials. The trials assessed product performance as well as farmer acceptance, with the breeding programme focused on developing maize products suited to smallholder farmers in stress-prone agro-ecologies of South Asia.

National Agricultural Research and Extension Systems (NARES) and seed companies can apply for licences to pursue national release, scale up seed production and commercialise the hybrid in accordance with applicable national regulations. Applicants are required to submit a proposed commercialisation plan for each product requested.

Applications can be submitted through CIMMYT's maize licensing system. The first-round application deadline is 16 October 2026, while applications received after this date will be considered in subsequent allocation rounds.

The announcement is part of CIMMYT's continuing effort to make improved maize genetics available to partners across South Asia, with an emphasis on productivity and resilience under climate and other production stresses.

China Cuts US Farm Tariffs, but Soybeans Remain Excluded

China has announced tariff reductions on a broad range of US agricultural products, including corn, wheat, sorghum, vegetable oils and meals, meat and dairy products, but has kept whole US soybeans outside the latest tariff-relief package. US soybeans will continue to face an additional 10% tariff, according to China's Ministry of Commerce. More than 90% of the products covered by the list are expected to return to most-favoured-nation tariff rates. The move follows the September 23–25 summit between US President Donald Trump and Chinese President Xi Jinping in Washington and forms part of a broader framework involving approximately USD 30 billion of tariff reductions on each side. The two countries have also agreed to establish a trade council to address bilateral trade issues and market access. For the global feed and oilseed market, the treatment of soybeans is particularly significant. China is the world's largest soybean importer and a major destination for US supplies. Chinese state-owned buyers Sinograin and COFCO have purchased more than 12 million tonnes of US soybeans, according to Reuters, approaching half of the 25 million tonnes that the White House says China has committed to purchase annually through 2028. China has not publicly confirmed that annual target. The soybean purchases have continued despite the additional tariff. Reuters reported that traders believe the 10% duty remains too high for many private crushers to absorb, although state-owned buyers have continued purchasing US beans. This creates an unusual situation in which soybeans remain commercially important but are being handled separately from the wider agricultural tariff concessions. The broader tariff reductions could nevertheless support US agricultural exports to China. Reuters estimates that trade in the agricultural and related products covered by the latest list was worth around USD 17 billion in 2024, roughly matching the annual agricultural purchase figure cited by the White House when soybeans are excluded. For soybean markets, the immediate significance lies in what happens next. China's continued purchases from the US provide some support to American soybean demand, while the absence of whole soybeans from the tariff-cut list leaves the commodity exposed to further negotiations. Meanwhile, China's purchases from the US come against a global oilseed market in which supply, crushing margins and competition from other exporters such as Brazil remain important price drivers. The latest agreement therefore represents partial easing rather than a complete reopening of US-China agricultural trade. For feed manufacturers, the direction of soybean tariffs and China's sourcing decisions will remain important indicators for global soybean meal availability and prices.

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