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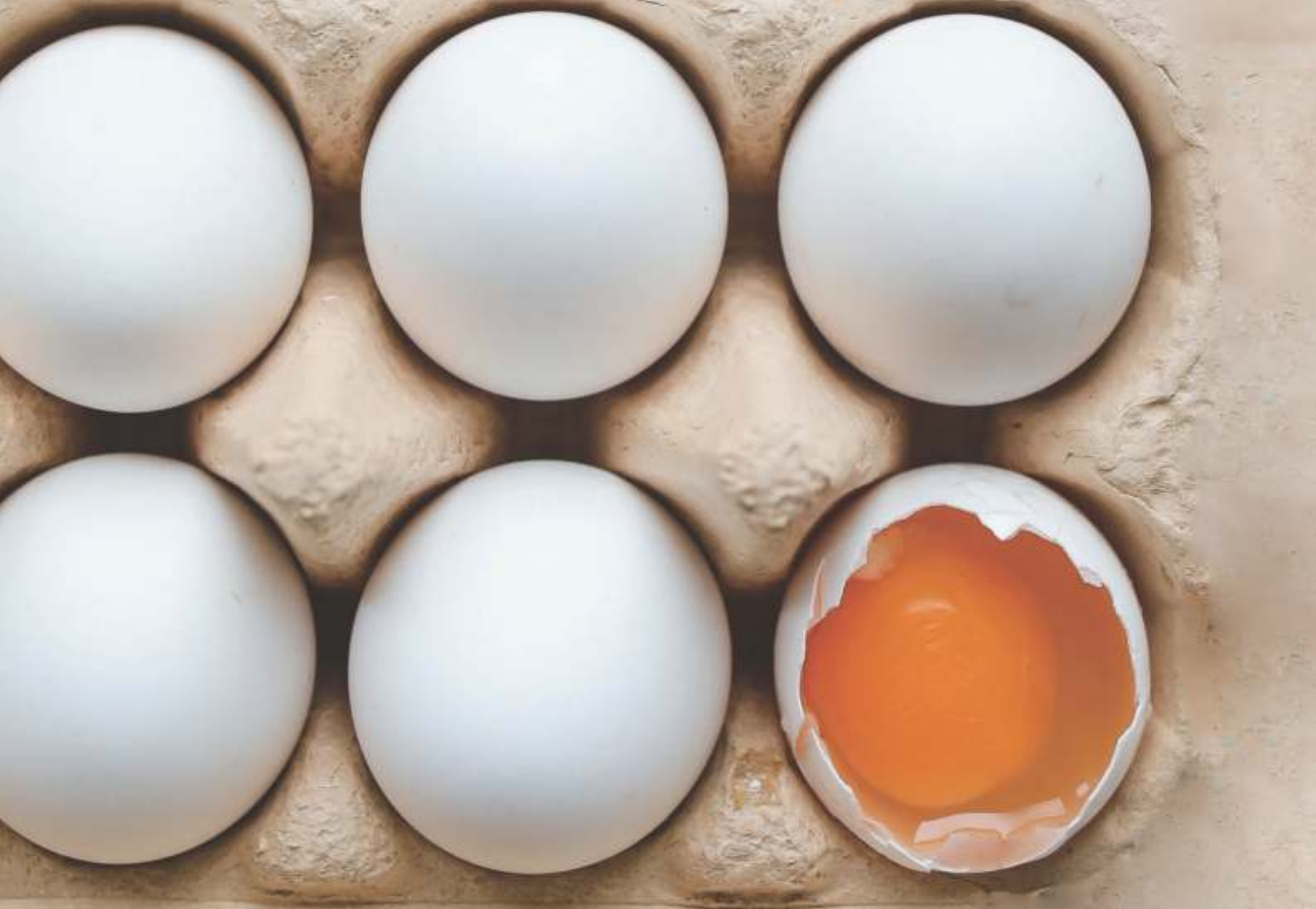

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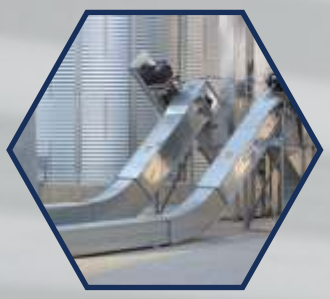

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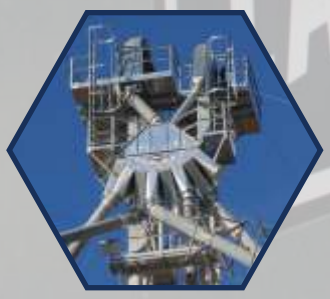

Contact Us

Avra Raychaudhuri - Director of Sales, South Asia
avrar@lambtonconveyor.com - +91-99234-25577

India Office: Lambton Kunstwerk Machinery India Private Ltd, Plot No. 136A2, Harohalli Industrial Area 2nd Phase, Kanakapura, Taluk, Harohalli, Karnataka.
Canada Office: Lambton Conveyor, 102 Arnold St, Wallaceburg, Ontario - www.LambtonConveyor.com - 888-238-9713

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Publisher & Editor
Prachi Arora
prachi.a@benisonmedia.com

Managing Editor
Dr T.K. Walli
Former Head,
Dairy Cattle Nutrition, NDRI

Content Manager
Gaurav Chander
g.chander@benisonmedia.com

Subscription Managers
Leena Chauhan
l.chauhan@benisonmedia.com
Shakti Thakur
s.thakur@benisonmedia.com

Designing & Online Marketing Head
Ashwani Verma
info@benisonmedia.com

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Partial Biosecurity Better Than No Security in Preventing HPAI

The global poultry industry continues to face mounting pressure from recurring outbreaks of infectious diseases, particularly Highly Pathogenic Avian Influenza (HPAI). These outbreaks not only result in substantial economic losses but also threaten food security, disrupt supply chains, and create instability in poultry product prices. Amid these challenges, recent research from Texas A&M University has highlighted the importance of practical and cost-effective biosecurity measures that can significantly reduce disease transmission at the farm level.

The study focused on evaluating how commonly used biosecurity tools perform under real farm conditions rather than ideal laboratory environments. Researchers observed that disease-causing microorganisms often accumulate on high-contact surfaces and equipment such as door handles, vehicle tires, floor mats, ventilation systems, and cooling pads. These contaminated surfaces become major pathways for disease spread between poultry houses and farms, especially when hygiene protocols are inconsistently followed.

One of the major findings of the study was that relatively simple interventions can substantially reduce contamination risks. Footbaths, boot covers, and tire washes were found to be effective barriers against pathogen transfer when used correctly. However, researchers stressed that the effectiveness of disinfectants depends heavily on proper cleaning before application. Organic matter such as dust, litter, and manure can reduce disinfectant activity, making routine cleaning a critical first step in any biosecurity program.

Interestingly, the study also found that powdered disinfectants performed particularly well under challenging farm conditions. Compared to liquid disinfectants, powdered products maintained better efficacy even in the presence of dirt and organic debris. In addition, they may offer logistical and economic advantages for poultry producers, especially in regions where water availability or storage conditions are limiting factors.

Another important takeaway from the research is the recognition that "perfect biosecurity" is often difficult to achieve in commercial poultry operations. Time limitations, labour shortages, environmental conditions, and operational pressures frequently prevent farms from maintaining ideal standards at all times. Nevertheless, the researchers emphasized that even partial compliance with biosecurity protocols can significantly lower disease risk. This practical perspective is especially relevant for small and medium-scale poultry farms, where implementing highly sophisticated systems may not always be financially feasible.

The findings also reinforce the growing understanding that biosecurity should not be viewed as a one-time intervention but rather as a continuous management culture. Employee training, routine monitoring, and consistent implementation remain essential to ensure that preventive measures are effective over the long term. Even small behavioural changes, such as proper footwear sanitation or restricting unnecessary farm traffic, can collectively contribute to meaningful disease reduction.

For countries like India, where poultry production continues to expand rapidly, strengthening farm-level biosecurity has become increasingly important. Dense poultry populations, variable climatic conditions, and frequent movement of birds and vehicles create ideal circumstances for rapid disease spread. Cost-effective and adaptable biosecurity solutions therefore hold immense value for safeguarding poultry health and minimizing economic disruption.

As the poultry sector navigates the evolving threat of emerging diseases and antimicrobial resistance concerns, preventive strategies are likely to become even more central to sustainable production systems. Research such as this provides valuable scientific evidence that practical, affordable, and realistic biosecurity measures can make a measurable difference in disease control.

Ultimately, the study serves as an important reminder that while advanced technologies and vaccines remain critical tools, basic hygiene and consistent preventive practices continue to form the foundation of effective poultry health management.

Source: "New research offers practical biosecurity tools to limit poultry disease spread" by Karn Dhingra, Texas A&M University, published in Phys.org.

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Prof. Devegowda: The Mentor Who Built People Beyond Poultry Science

In the world of Indian poultry science, some individuals are remembered for their research, some for their leadership, and a rare few for the lives they transform. Prof. G. Devegowda belonged to the latter category — a teacher, guide, disciplinarian, motivator, and above all, a humane soul who shaped generations of professionals through values as much as through science.

For many of his students, the first impression of Prof. Devegowda became a lifelong memory. His neatly groomed appearance, disciplined demeanor, elegant dressing style, and soft-spoken personality immediately set him apart. There was a quiet dignity in the way he carried himself — humble, yet commanding immense respect. His classroom presence was so inspiring that several students chose Poultry Science as their career path simply after attending his lectures.

The First Impression That Lasted Forever

For many students, their first meeting with Prof. Devegowda during orientation programs or classroom lectures became unforgettable moments. His neatly groomed appearance, elegant dressing style, calm demeanor, and soft-spoken nature immediately commanded admiration.

Students often recall how his presence alone created an aura of discipline and professionalism. Even a brief interaction left a lasting impact. Several students decided to pursue Poultry Science purely because of the inspiration they drew from his lectures and personality.

Dr SS Pattabhirama fondly remembers:

"When I met Professor for the first time, I was immediately impressed by his elegant dressing style, his gentle way of speaking, his neatly groomed appearance, and his disciplined demeanor."

For Dr NC Manju, studying under him itself was considered an achievement:

"For every student in Bangalore Veterinary College, pursuing post-graduation under Prof. Devegowda was a dream because of the immense respect he commanded in both academia and industry."

His classes were unlike conventional academic sessions. Entering the classroom with only a chalk, duster, and a few notes, he could captivate an entire hall within minutes. Students remember sitting in pin-drop silence as he explained the poultry industry, the role of veterinarians, and the immense opportunities within the sector with remarkable simplicity and clarity.

One of his most memorable teachings was:

"First comes common sense, then science."

For him, poultry science was never only about technology or textbooks; it was about observation, practicality, discipline, and understanding life itself.

A Mentor Who Built Human Beings, Not Just Professionals

Prof. Devegowda's greatest strength was his ability to recognize the individuality of every student. He believed each person carried unique strengths waiting to be nurtured.

His mentorship was deeply rooted in empathy and inclusiveness. He understood the struggles of students who carried dreams larger than their circumstances and never allowed financial limitations to become barriers for deserving individuals.

Dr Swamy Haladi, who himself came from a middle-class agricultural family in Karnataka, recalls one such deeply personal example:

"Professor supported my PhD journey in Canada financially at a crucial stage and never asked for the money back. That was his nature — helping students reach greater heights scientifically, financially, and humanly."

Many of his students experienced similar acts of silent generosity. He believed education was not merely about degrees or careers, but about enabling individuals to grow with confidence, dignity, and purpose.

Dr Swamy beautifully summarizes the essence of his mentor through what he calls the "5 C's of Prof. Devegowda":

- Clarity in thinking
- Can-do attitude
- Communication skills
- Competitiveness
- Caring nature

These qualities not only defined Prof. Devegowda as a teacher and scientist, but also made him a transformative mentor whose influence extended far beyond classrooms and laboratories.

Dr Swamy Haladi further reflects:
"He taught us to think beyond textbooks, dream big, and stay connected to real industry challenges."

For Dr MVLN Raju, Prof. Devegowda's mentorship extended far beyond academics:
"His gentleness, patience, politeness, and communication skills shaped not just my research career, but also the way I approach life and people."

He guided students not only academically, but through every major phase of life — career decisions, higher education, marriage, family, health, and personal growth. Many of his students today openly acknowledge that whatever they have achieved professionally and personally is deeply rooted in his mentorship.

Dr Krishnamurthy TN, now leading the same

department once led by Prof. Devegowda, shares emotionally:
"Sitting on the same chair where he once sat feels like the greatest blessing of my life."

Several of his students today lead academic departments, research institutions, multinational companies, feed industries, and poultry enterprises — carrying forward the values he instilled in them.

Silent Lessons in Discipline and Excellence

Prof. Devegowda had a remarkable way of teaching values without harshness.

Dr Pattabhirama recalls one unforgettable incident:

"Once Professor entered the laboratory, gently ran his finger over a dusty table, and quietly walked away without uttering a word. That silent gesture taught us discipline, cleanliness, and perfection more effectively than any lecture."

At the same time, he strongly believed in encouraging students and appreciating even the smallest sincere effort.

One of the most defining stories comes from Dr Aravind.

"He believed in us before we believed in ourselves." — Dr Aravind

One defining moment remained etched in his memory forever. During his student days, Dr Aravind had been suspended from the hostel following a disciplinary issue, just a day before a major scholarship interview. Expecting anger and disappointment, he approached Prof. Devegowda.

Instead of scolding him, the professor quietly ensured he attended the interview.

"He gave me belief, direction, and confidence when I had almost lost faith in myself."

Years later, Prof. Devegowda continued guiding him through career decisions, family life, and personal struggles — remaining a mentor far beyond academics.

His philosophy was simple: hard work, humility, and consistency ultimately create excellence.

The Scientist Who Bridged Research and Reality

Prof. Devegowda's scientific contributions transformed India's poultry and feed sectors. His pioneering research in mycotoxins and enzyme applications provided practical and cost-effective solutions that benefited farmers and feed manufacturers across the country.

Dr MVLN Raju recalls proudly:

"The mycotoxin research conducted under his guidance gained international recognition, with one of our research papers receiving more than 600 citations globally."

Dr Manju highlights his practical approach toward research:

"He constantly encouraged research that could directly solve industry challenges and improve field-level practices."

During the 1990s and early 2000s, when mycotoxin contamination emerged as a major challenge for poultry production, his work on mitigation strategies became a landmark contribution to the industry. He also played a significant role in advancing enzyme technology, alternative feed resources, and practical poultry nutrition.

Dr Swamy, who later continued work in mycotoxins globally, reflects:

"That ability to bring the lab to the field defined his life's work."

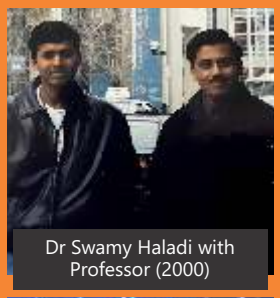
What made him exceptional was his commitment to field applicability. He firmly believed research should benefit farmers directly. Whether it was enzymes, unconventional feed ingredients, probiotics, prebiotics, or alternative protein and energy sources, he constantly encouraged research that could solve real-world industry challenges.

He also played a crucial role in promoting chicken meat and eggs as affordable, high-quality protein sources essential for India's nutritional security. Through scientific awareness campaigns, media outreach, and public engagement, he consistently worked to counter myths surrounding poultry consumption.

Though rooted in academia, he became one of the strongest ambassadors for India's poultry industry — connecting scientists, farmers, policymakers, industry leaders, and consumers alike.

Championing Farmers, Nutrition, and Rural Livelihoods

Prof. Devegowda's vision extended beyond commercial poultry farming.


Dr Swamy Haladi with Professor (2000)


Prof. G. Devegowda
(1945-2026)


Dr Aravind with Professor (2024)


Dr NC Manju with Professor (2022)


Dr TK Walli and Prachi Arora with Professor (2018)


Dr SS Pattabhirama with Professor (2024)


Dr MVLN Raju with Professor (2022)


Dr Krishnamurthy TN with Professor (2023)

He was deeply committed to improving the livelihoods of small and marginal farmers through backyard poultry development.

He contributed significantly to the development and promotion of rural poultry breeds such as Giriraja and Swarnadhara, which helped rural households generate sustainable income and nutritional security.

Dr Manju remembers:

"He always believed poultry could transform rural livelihoods and teach young professionals to embrace challenges instead of remaining confined to comfort zones."

He believed poultry could become a powerful tool against malnutrition and rural poverty. His persistent efforts in promoting egg consumption also played an important role in strengthening egg inclusion in government mid-day meal programs, helping millions of children gain access to affordable nutrition.

Students affectionately remember how neighborhood children called him "Egg Uncle" because of his constant advocacy for egg and poultry nutrition.

Compassion Beyond the Classroom

Beyond science and leadership, what touched people most deeply was Prof. Devegowda's compassion.

Dr Krishnamurthy shares one particularly moving memory:

"Even while traveling internationally, he would carefully arrange daily food portions for a dog named Kariya and upon returning home, would first ask about Kariya before entering the department."

That compassion extended equally toward students, support staff, industry professionals, and farmers.

Dr Pattabhirama beautifully summarizes:

"He brought respect and dignity to poultry veterinarians in the country."

The Legacy of a "Pitamaha"

Today, Prof. Devegowda is remembered by many as the "Pitamaha of Poultry Science" in India — a title earned through decades of selfless service to science, education, farming communities, and the poultry industry.

His legacy is not confined to awards, fellowships, scientific publications, or institutional achievements. It lives on through the countless students he mentored, the farmers he empowered, the research he inspired, and the humane values he embodied.

To his students, he was like a giant tree under whose shade generations found direction, encouragement, and strength before taking flight on their own journeys.

Dr Swamy perhaps summarizes it best:

"In life, we meet many people, but only a rare few truly shape who we become. Prof. Devegowda was one of those rare gems — a mentor who combined scientific excellence with compassion, discipline with humility, and leadership with genuine care for people."

We lost Prof. Devegowda in his physical form, but his eternal presence will always remain with the poultry fraternity — guiding students, researchers, farmers, academicians, and industry professionals alike.

Through this tribute, Think Grain Think Feed humbly attempted to honour a legend whose knowledge, simplicity, and warmth touched countless lives. Personally, I had the privilege of inviting him to several conferences, where he would always arrive before schedule, quietly deliver impactful presentations, and leave for his next journey with the same humility that defined his life. Interestingly, every aspect of his travel — from airport pickup to accommodation arrangements — was lovingly managed by his students, reflecting the extraordinary bond he shared with them.

This tribute brings together memories from only a few of his students, each of whom saw him not merely as a professor, but as a father figure who stood beside them throughout their lives. He treated industrialists, academicians, farmers, students, young entrepreneurs, and support staff with the same warmth and dignity.

The vacuum created by his loss can never truly be filled. But perhaps the greatest way to honour him is to carry forward his legacy — through integrity, compassion, discipline, scientific excellence, and service to society.

And perhaps that is the greatest tribute any teacher can receive — to continue living in the thoughts, values, and actions of the people he shaped.

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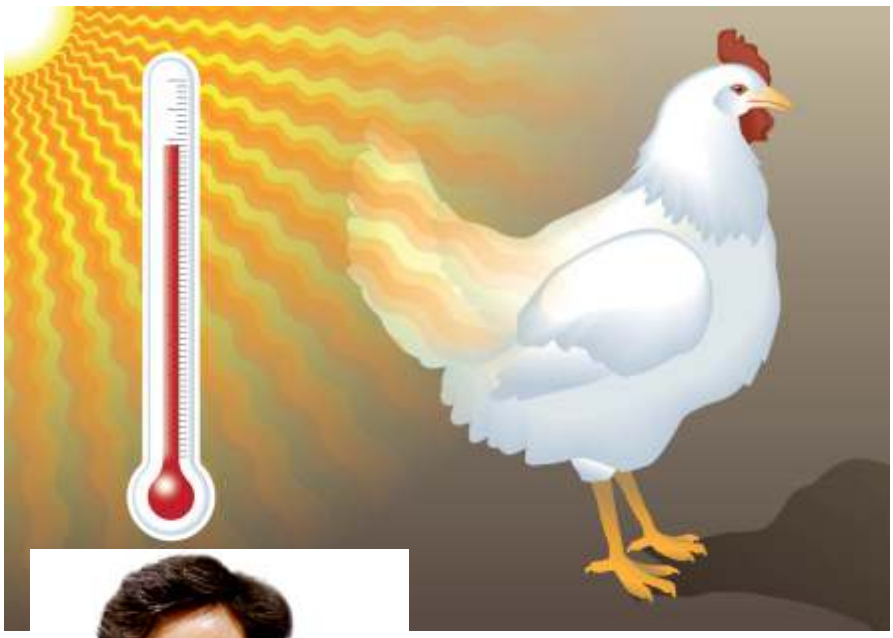
Economic Impact of Heat Stress in Poultry Production

By **Dr Nagesh Sonale**, Immeureka Animal Health



Dr. Nagesh Sonale

Introduction

Heat stress is one of the most significant environmental challenges affecting poultry production worldwide. Modern poultry strains, genetically selected for rapid growth, high feed efficiency, and elevated egg production, possess limited ability to tolerate elevated temperatures. Unlike mammals, poultry lack sweat glands and rely mainly on panting for evaporative cooling. When environmental temperature and humidity exceed the thermoneutral range—approximately 18–24°C for laying hens and 18–22°C for broilers—birds experience physiological stress that disrupts metabolic and endocrine functions (Lara & Rostagno, 2013).

Climate change has further intensified the frequency and duration of heat waves, particularly in tropical and subtropical countries such as India. As a result, heat stress has evolved from a seasonal issue into a persistent production-limiting factor. High ambient temperatures not only compromise bird welfare but also cause substantial economic losses through reduced growth, poor feed efficiency, lower egg production, impaired reproduction, increased mortality, and rising mitigation costs (Renaudeau et al., 2012).

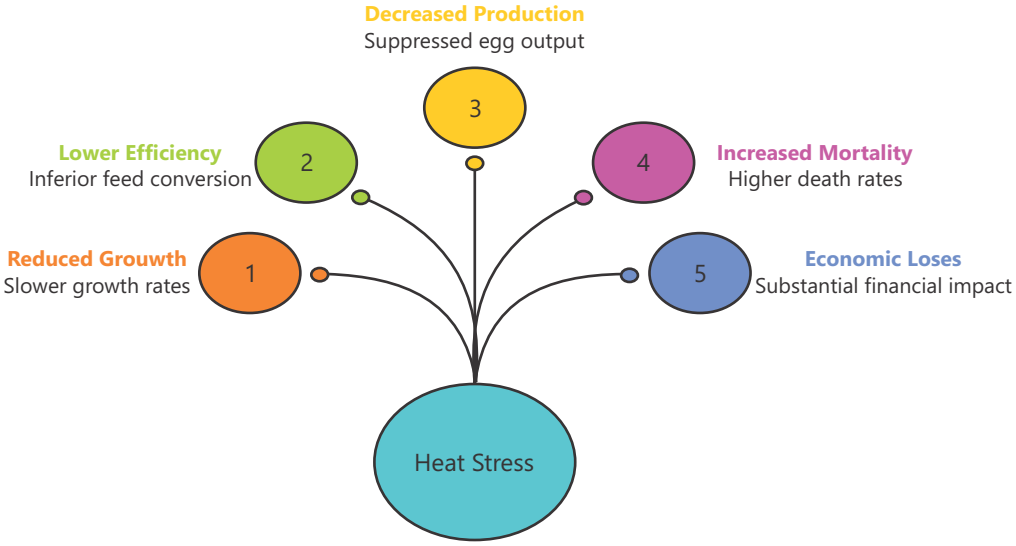
Although the biological effects of heat stress are well documented, its economic implications are often underestimated. Economic losses include both direct effects, such as mortality and reduced productivity, and indirect effects, including poor carcass quality, increased disease incidence, infrastructure investment, and labour inefficiency. In developing poultry economies like India, these losses are particularly severe due to dependence on naturally ventilated housing systems and limited access to climate-controlled infrastructure. Therefore, understanding the economic consequences of heat stress is essential for improving sustainability and profitability in poultry production.

Physiological Basis of Heat Stress

The economic impact of heat stress is closely linked to the physiological and metabolic disturbances caused by elevated temperatures. Under heat stress conditions, birds reduce physical activity, increase water consumption, and elevate respiratory rate to dissipate excess heat through panting. However, prolonged panting can lead to respiratory alkalosis, electrolyte imbalance, and disruption of acid–base balance, negatively affecting metabolism and performance (Lin et al., 2006).

One of the earliest responses to heat stress is reduced feed intake. Birds lower feed consumption to minimize metabolic heat production associated with digestion. However, this protective response reduces nutrient

Fig 1: Effect of the heat stress in poultry



availability, compromising growth, egg production, and reproductive performance. Heat stress also alters hormonal balance by increasing corticosterone levels while suppressing thyroid hormones such as triiodothyronine (T3), resulting in reduced metabolic activity and protein synthesis (Mujahid et al., 2007).

At the cellular level, heat stress induces oxidative stress through excessive production of reactive oxygen species (ROS). When antioxidant defence systems become overwhelmed, oxidative damage affects lipids, proteins, and nucleic acids, impairing cellular integrity and immune function. Consequently, heat-stressed birds become more susceptible to infectious diseases. Energy and nutrients are diverted from productive functions toward survival and maintenance, ultimately reducing production efficiency and increasing economic losses.

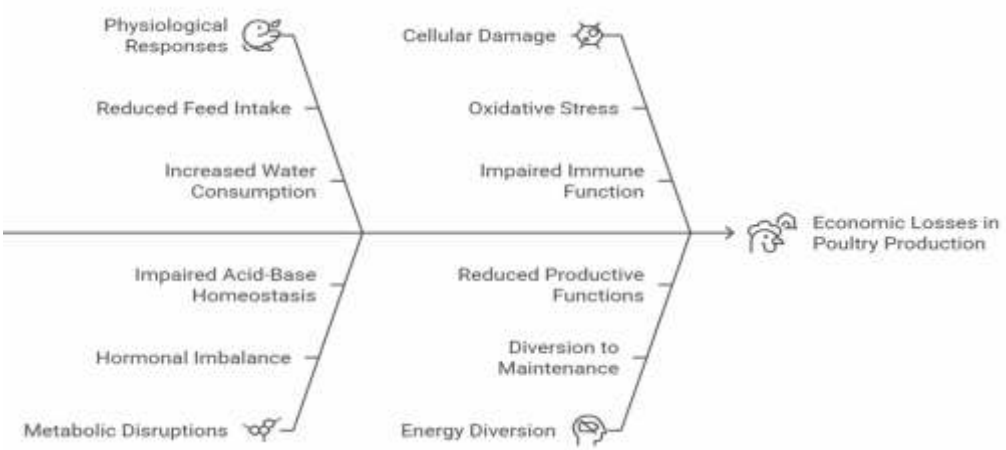
Major Economic Consequences of Heat Stress in Poultry

Heat stress significantly affects growth performance in broilers and egg production in layers. Studies indicate that feed intake decreases by approximately 1–1.5% for every 1°C rise in temperature above 25°C. Reduced feed intake leads to lower body weight gain, delayed market age, and decreased production efficiency (Quinteiro Filho et al., 2010).

Feed conversion ratio (FCR) also deteriorates during heat stress because a greater proportion of dietary energy is diverted toward thermoregulation instead of growth or egg formation. Since feed contributes nearly 70% of total poultry production costs, even small declines in feed efficiency substantially increase production expenses (Niu et al., 2009).

Heat stress is a major cause of mortality during severe summer conditions, especially when temperatures exceed 40°C. Fast-growing broilers are particularly vulnerable due to their high metabolic heat production. Mortality rates can increase from a normal 3–5% to as high as 15–20%, leading to direct financial losses from bird deaths,

Fig 2. Physiological Changes in poultry production



wasted feed investment, and underutilized housing capacity (Donkoh, 1989).

In laying hens, heat stress reduces egg production and negatively affects egg quality. Impaired calcium metabolism results in thin-shelled, cracked, and downgraded eggs with lower market value. In breeder flocks, fertility and hatchability decline because of reduced semen quality and poor embryonic viability, thereby increasing the cost per chick produced (McDaniel et al., 2004).

Indirect and Hidden Economic Losses

Beyond obvious production losses, heat stress imposes substantial indirect and hidden economic costs that are often underestimated. Heat-stressed birds exhibit weakened immune function, making them more susceptible to bacterial, viral, and parasitic infections such as Escherichia coli and coccidiosis. Increased disease incidence raises expenditure on medications, vaccines, and veterinary services while also reducing flock productivity (Hirakawa et al., 2020).

Heat stress negatively affects carcass quality in broilers. Birds exposed to high temperatures often show increased fat deposition, reduced breast meat yield, and a higher incidence of pale, soft, and exudative (PSE) meat. These defects reduce processing efficiency and consumer acceptance, lowering returns across the poultry value chain (Zhang et al., 2012).

Heat stress significantly increases water consumption, often reaching two to three times normal levels. Producers must also invest in electrolyte supplementation, antioxidant vitamins, and anti-stress additives to maintain bird survival and performance. Additionally, cooling infrastructure such as fans, foggers, evaporative cooling pads, and climate-controlled housing increases both capital and energy costs. Hidden losses also include uneven flock growth, poor uniformity, delayed market age, and labour inefficiencies. Although less visible, these factors collectively reduce overall farm efficiency and profitability.

Economic Burden Under Indian Conditions

Under Indian climatic conditions, heat stress causes substantial financial losses in poultry production. Field observations suggest losses of approximately ₹10–30 per broiler and ₹25–60 per layer per production cycle. When indirect costs are included, losses may increase to ₹30–65 per broiler and ₹40–85 per layer.

For a 10,000-bird broiler farm, losses can approach ₹2 lakhs in a single production cycle during peak summer conditions. Large integrated operations may experience losses ranging from ₹1–5 lakhs per flock. Such cumulative financial burdens significantly erode profitability and threaten the sustainability of poultry enterprises (Lara & Rostagno, 2013; Renaudeau et al., 2012).

Mitigation Strategies

Reducing the economic impact of heat stress requires an integrated approach involving nutrition, management, housing, and genetics.

Nutritional strategies such as electrolyte balancing, antioxidant supplementation (vitamins C and E, selenium, and phytobiotics), and dietary energy adjustment help reduce oxidative stress and improve heat tolerance. Proper water management is equally important for maintaining hydration and electrolyte balance.

Housing modifications, including improved ventilation, reflective roofing, reduced stocking density, and evaporative cooling systems, can substantially lower heat load on birds. Although these interventions require investment, their long-term benefits often outweigh the costs through improved productivity and reduced mortality.

Genetic selection for heat-tolerant strains and better farm management practices can also improve resilience under high-temperature conditions.

Conclusion

Heat stress is not merely an animal welfare issue but a major economic constraint in poultry production, particularly in tropical and subtropical regions. Its direct and indirect impacts significantly reduce productivity, profitability, and overall farm efficiency. With climate change increasing the frequency and intensity of heat waves, the economic burden of heat stress is expected to rise further.

Direct Economic Losses Associated with Heat Stress in Poultry

Sr No	Cause	Heat Stress Induced Changes	Performance Effects	Economic Impact / Loss
1.	Reduced Feed Intake ? Lower Growth & Production	Feed intake decreases by 1–1.5% per °C increase above 25°C	• Poor weight gain in broilers • Reduced egg production in layers	• Broilers: 100 300 g lower final body weight • Layers: 5–15% decline in egg production • Estimated loss: ?5–15 per broiler and ?20–40 per layer per cycle
2.	Poor Feed Conversion Ratio (FCR)	Inefficient nutrient utilization despite reduced intake Energy diverted to panting and thermoregulation	• Reduced efficiency of feed utilization	• FCR worsens by 5–10 points • Increased feed cost per kg meat/egg • Feed ~70% of production cost, hence small inefficiency causes major loss
3.	Increased Mortality	Acute heat stress during severe heat waves (>40°C)	• Heat stroke • Sudden bird deaths	• Mortality rises from 3–5% to 10–20% • Example: 1000 birds × 10% extra mortality = 100 birds lost • ?240 per bird = ?24,000 direct loss
4.	Decline in Egg Quality	Impaired calcium metabolism	• Thin shells • Cracked eggs • Reduced egg weight	• 5–10% eggs downgraded/rejected • Lower market price • Loss: ?0.5–1 per egg × thousands of eggs/day
5.	Reproductive Impacts (Breeders)	Heat damages reproductive physiology	• Reduced fertility • Lower hatchability • Poor semen quality	• Hatchability declines by 10–20% • Increased cost per chick produced • Hatchery losses may reach lakhs in large operations
6.	Increased Water Consumption & Electrolyte Cost	Water intake increases 2–3 times	• Greater dependence on supplements	• Use of excess electrolytes, Salt or Antistress agents • Additional ?2–5 per bird • Higher management cost
7.	Carcass Quality Deterioration (Broilers)	Metabolic imbalance and stress	• Higher fat deposition • Lower breast meat yield • PSE (pale, soft, exudative) meat	• Reduced processing yield • Lower consumer acceptance • Decreased market value.
8.	Increased Disease Susceptibility	Heat-induced immunosuppression	• Higher incidence of E. coli, coccidiosis, and other infections	• Increased medication and veterinary costs • Production losses due to morbidity
9.	Infrastructure & Cooling Costs	Need for thermal mitigation systems	• Dependence on mechanical cooling	• Investment in fans, foggers, cooling pads etc

Therefore, adopting scientifically supported nutritional, managerial, and housing interventions is essential for minimizing losses and ensuring the long-term sustainability of the poultry industry. Proactive heat stress management will be critical for protecting both bird performance and farm profitability in the years ahead.

References are available upon request.

Transforming Feed Safety: From Compliance to Proactive Risk Management

GMP+ International Managing Director Martine Boon brings extensive experience in feed safety, sustainability, and agrifood transition to the global feed industry. Before joining GMP+ International in 2024, she held leadership roles at Rabobank, where she focused on agricultural sustainability, food systems, and future-ready agribusiness strategies.Under her leadership, GMP+ International continues to strengthen its position as one of the world's leading feed certification schemes, promoting safe, sustainable, and transparent feed supply chains across global markets. With growing emphasis on proactive risk management, harmonised sustainability standards, and practical industry solutions, she has been driving initiatives that help feed businesses navigate evolving regulatory and market expectations.In this interaction with Think Grain Think Feed, Martine Boon shares her perspective on global feed safety challenges, sustainability trends, the evolving regulatory landscape, and how the newly introduced Feed Life Cycle Assessment (LCA) standard can support the industry in moving from compliance-driven approaches toward data-backed, proactive feed risk and sustainability management.

To begin with, could you provide a brief overview of GMP+ International, its key activities, and its footprint in India?

GMP+ International is the world's largest scheme for safe and sustainable animal feed. Our mission is to enable every company in the feed chain to take responsibility for working in a safe and sustainable way. The GMP+ Feed Certification (GMP+ FC) scheme offers uniform international standards to produce safe feed, and a growing set of international standards for sustainable feed. Our standards cover the whole feed chain, from production and trade to transhipment and transport, to processing and storage. Our footprint in India is relatively small but sees potential. With a majority of certifications in productions of feed materials, and with increasing demand for protein and poultry as a fast-growing segment, the demand for feed safety and sustainability certifications is also most likely to increase.

In India, there are approximately 160 GMP+ FSA–certified companies, more than 75% of which are involved in the production of feed materials and trade.

As a globally recognised certification scheme, what differentiates the GMP+ Feed Certification system from other feed safety standards?

The GMP+ Feed certification scheme is a chain approach for feed safety and sustainability. It covers the whole supply chain with an international standard from production and trade to transhipment and transport, to processing and storage. GMP+ goes beyond compliance by offering practical, risk-based standards, strong international network acceptance, and continuous collaboration with the feed industry to address emerging market and regulatory needs.

Feed safety remains a critical

concern globally. What are the key and emerging risks in the feed sector, particularly in the Indian context, and how is GMP+ addressing these challenges?

Feed safety risks today are becoming more complex and interconnected. In the Indian context, challenges include mycotoxin contamination due to climate and storage conditions, antimicrobial resistance (AMR), and increasing supply chain complexity.

Due to increasing global population, there is a growing demand for food and therefore feed. This puts pressure on cultivation resources. Effects of deforestation and land conversion are widely contributing to imbalance of natural ecosystems. Climate change and extreme weather conditions increase crop diseases and have a possible effect on contamination. The need for clear independent assurance is growing in all relevant global markets and specific in India rapid urbanisation and rising incomes are shifting diets towards meat, eggs and poultry. This directly drives demand for compound and high-quality safe and sustainable feed.

How does the regulatory environment across different regions influence feed safety implementation, and how does GMP+ ensure consistency in compliance across diverse markets?

There are both increases and decreases in various regulations especially in the EU. Increased legislation is mainly experienced on Feed / Food sustainability (EUDR) and corporate sustainability (CSRD, CSDDD, PPWR, etc.) The EUDR leads to increase of administrative actions on traceability, setting local legislation and reporting. These accompany additional costs throughout the supply chain. The recent EU proposal on allowing NGT-1 as non-GMO is an example reducing the stringency of feed safety legislation. As an international scheme holder, we keep close track on local developments and one of the core scheme requirements for certification is companies who want to get certified must always comply with (local) legislation.

Different regions have different regulatory priorities, levels of enforcement, and market expectations, which makes global feed safety implementation complex. GMP+ International ensures consistency through a harmonised, risk-based certification system that aligns with international requirements while remaining adaptable to local regulations and market realities. This allows companies operating across diverse markets to work within one globally recognised framework with consistent assurance levels.

What are the key benefits for companies adopting GMP+ certification, particularly in emerging markets such as India?

Getting certified by GMP+ enables companies to operate internationally in the feed business in a safe and sustainable way. The Feed LCA data also can be used for CO2 emission reporting purpose.

For companies in emerging markets such as India, GMP+ International certification provides more than compliance. It strengthens market access, builds customer trust, improves risk management, and demonstrates commitment to internationally recognised feed safety practices. It also helps companies become more competitive in global supply chains where transparency, reliability, and sustainability expectations continue to grow.

The launch of the Feed Life Cycle Assessment (LCA) standard is a significant development. What industry gaps or needs led to its introduction?

There is a clear market demand for harmonised LCA data. This is exactly what the Feed LCA standard covers. It is a first step to identify where areas for improvement lie in the supply chain. The tooling in scope of the standard provides the opportunity to calculate the exact data of your operations, also called primary or branded data. The more primary data available the better the insights are where to start with

continuous improvement.

The introduction of the Feed LCA standard was driven by the growing demand for harmonised and credible environmental footprint data within the feed supply chain. The industry needed a practical and globally aligned approach to measure and communicate sustainability performance consistently. GMP+ International developed the standard to help companies better understand their environmental impact, support sustainability reporting, and respond to increasing market and regulatory expectations around carbon footprint and responsible sourcing.

From a practical perspective, how can feed manufacturers utilise the LCA standard to measure, manage, and communicate their environmental impact?

The harmonised primary data can be used for identifying the CO2 burning platforms in your supply chain. Where are areas of improvement? Where to start? The data from using the different tooling in the standard can be used to report out on your emission impact and can support to substantiate product claims towards consumers.

Feed manufacturers can use the GMP+ MI5.7 Feed LCA standard as a practical management tool across three levels: measure, manage, and communicate. It allows them to measure environmental impact in a consistent, feed-specific way across ingredients and processes; manage it by identifying hotspots and improving formulation, sourcing, and efficiency; and communicate it through credible, harmonised data that downstream customers and stakeholders can use directly.

Data harmonisation remains a major challenge in sustainability reporting. How does the new LCA framework address issues related to data consistency, accuracy, and reliability?

Through collaboration with industry and other scheme holders we developed a harmonised approach to calculate emission data. This is grounded from e.g. Greenhouse Gas Protocol and the Product Environment Footprint category Rules (PEFCR) Feed. These international protocols are prescriptive in what should be in scope and what not. The standard assures the data is calculated in the correct way following protocols. In practice, GMP+ MI5.7 Feed LCA ensures that companies are working with comparable and verifiable data, making sustainability reporting more credible and usable across global supply chains.

What immediate and long-term benefits can companies expect from adopting the Feed LCA standard?

The standard provides clear insights in emissions of your supply chain activities and identifies starting points for improvement. These improvements contribute to supply chain risk mitigation supporting more resilient and future-proof supply chains.

Companies adopting the GMP+MI5.7 Feed LCA standard benefit in three practical ways: structured support to make LCA implementation manageable, clear and credible communication of environmental performance, and easy “plug-in” integration into downstream supply chains and customer reporting.

Finally, what is your message to feed manufacturers and stakeholders aiming to align with global standards for feed safety and sustainability?

Start now! Seek collaboration in your supply chain and start improving together supported by a harmonised approach on verified data.

Treat feed safety and sustainability not as compliance costs, but as long-term value drivers. Those who invest early in robust systems will be better positioned for regulatory change, market access, and customer trust. GMP+ International offers a practical, globally recognised framework to support that journey, helping companies move from reactive compliance to proactive risk management and credible sustainability performance across the entire feed chain.

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Maximising Milk Yield and Milk Quality in Dairy Cows

Nutritional and Management Strategies for Profitable Dairy Farming

By **Dr T M Gowrisankar**- Independent Nutritionist and Animal feed consultant

Dr T M Gowrisankar

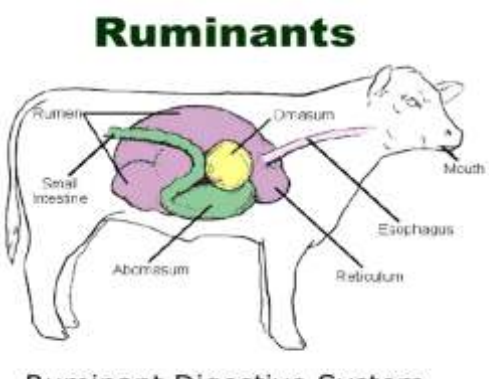
The ultimate objective of dairy farming is not only to achieve higher milk production, but also to ensure superior milk quality and sustainable profitability. In a profitable dairy enterprise, two pillars play a decisive role — milk production and reproductive efficiency.

Milk yield and milk composition in dairy cows are influenced by several interrelated factors, including:

- Genetics and breeding potential
- Stage of lactation
- Nutrition and feeding management
- Herd health and environmental management

While the genetic potential of a dairy cow cannot be altered beyond a certain limit, a large number of dairy animals in India fail to express their true productive capacity. The primary reasons are nutritional deficiencies, poor feeding practices, environmental stress, and inadequate management.

Therefore, improving nutrition, maintaining rumen health, and reducing stress are among the most effective strategies to enhance both milk quantity and milk quality.



Ruminant Digestive System

Understanding the Dairy Cow: The Role of the Rumen

Dairy cows are ruminants possessing a four-compartment stomach consisting of the:

1. Rumen
2. Reticulum
3. Omasum
4. Abomasum

Among these, the rumen functions as a highly efficient natural fermentation chamber housing trillions of microorganisms such as bacteria, fungi, and protozoa. These microbes convert green fodder, dry fodder, and concentrate feeds into valuable nutrients required for milk production.

During digestion, feed materials mix with saliva and enter the rumen, where microbes convert them into:

- Volatile Fatty Acids (VFAs) – the primary energy source for milk synthesis
- Microbial Protein – essential for milk protein production

Thus, maintaining optimal rumen health is fundamental for achieving:

- Higher milk yield
- Better milk fat percentage
- Improved SNF (Solid-Not-Fat) levels
- Enhanced feed efficiency

Balanced feeding with adequate green fodder, dry fodder, and concentrate feed is therefore critical throughout the lactation cycle.

Lactation Cycle and Nutritional Needs

A dairy cow begins producing milk immediately after calving. The period between one calving and the next is called the lactation cycle, typically lasting around 300 days, followed by a dry period of approximately 60–65 days.

The lactation cycle is broadly divided into:

- Early Lactation
- Mid Lactation
- Late Lactation
- Dry Period

Each stage has distinct nutritional and management requirements.

Early Lactation: The Foundation of Peak Production

The first 100 days after calving represent the most critical phase of lactation. During this period, cows achieve peak milk production while simultaneously experiencing increased

nutritional demands.

For instance, an HF crossbred cow may start producing 10 litres of milk per day after calving and gradually reach a peak yield of 20 litres per day within six to eight weeks.

However, feed intake during this period often remains low due to metabolic and physiological stress. Consequently, cows may enter a state of negative energy balance, affecting both production and reproductive performance.

Importantly, every additional kilogram of milk achieved during peak lactation can contribute nearly 200 kg of additional milk over the entire lactation cycle.

Key Strategies to Improve Milk Yield and Quality During Early Lactation

1. Ensure Balanced and Energy-Dense Nutrition

Provide nutritionally balanced, high-density compound cattle feed rich in energy, protein, vitamins, and minerals to support increasing milk production.

2. Supply Adequate Quality Fodder

Feed approximately 30–40 kg of quality green fodder and dry fodder per cow daily to maintain rumen activity and fibre balance.

3. Avoid Soaking Concentrate Feed

Concentrate feed should not be soaked in water before feeding, as proper chewing stimulates saliva production, which helps maintain rumen pH and microbial health.

4. Maintain Continuous Water Availability

Water is the most critical nutrient for dairy cows. Clean drinking water should be available round the clock.

5. Follow Consistent Feeding and Milking Schedules

Cows respond positively to routine. Feeding and milking should be performed at the same time every day to minimise stress.

6. Practice Complete Milking

The last strips of milk contain higher fat levels. Proper milking practices help improve milk fat percentage.

7. Provide Regular Exercise

Moderate exercise supports better metabolism, circulation, and overall health.

8. Avoid Sudden Feed Changes

Abrupt changes in fodder or concentrate composition can disturb rumen microbes and negatively affect digestion.

9. Prevent Mastitis and Control Somatic Cell Count (SCC)

Early lactation cows are highly susceptible to mastitis. Elevated SCC not only reduces milk quality and yield but also directly impacts dairy profitability.

10. Use Mineral Mixtures Regularly

Daily supplementation with quality mineral mixtures helps prevent metabolic disorders, improve fertility, reduce mastitis incidence, and support better milk fat and SNF levels.

Mid and Late Lactation: Maintaining Productivity and Body Condition

As lactation progresses, milk production gradually declines, but nutritional management remains equally important because many cows are already pregnant during this period.

The focus during mid and late lactation should shift toward:

- Maintaining body condition
- Supporting foetal growth
- Preparing the cow for the next lactation cycle

Interestingly, rebuilding body reserves during late lactation is more efficient than attempting it during the dry period.

Management Tips During Mid and Late Lactation

- Monitor feed quantity and quality carefully.
- Adjust concentrate feeding according to milk production levels.
- Maintain good rumen health and fibre intake.
- Continue mineral supplementation.
- Observe body condition to avoid excessive weight loss or gain.

During this phase, milk fat and SNF percentages are often naturally higher because total milk volume decreases.

The Dry Period: Preparing for the Next Lactation

The dry period is the non-lactating phase before the next calving and plays a decisive role in determining future productivity.

The primary objectives during this stage are:

- Restoring body reserves
- Supporting foetal development
- Preparing the udder for the next lactation

Cows entering calving with adequate body condition are more likely to:

- Resume heat cycles early
- Achieve better conception rates
- Produce higher milk yields in the next lactation

Transition nutrition during the dry period is therefore extremely important for ensuring smooth metabolic adaptation after calving.

Conclusion

Improving milk yield and milk quality is not dependent on a single factor, but rather on the successful integration of nutrition, rumen health, management, and stress reduction.

Balanced feeding, proper lactation-stage management, mineral supplementation, mastitis prevention, and consistent care practices collectively determine the productivity and profitability of dairy farming.

By focusing on both the physiological needs of the cow and scientific feeding strategies, dairy farmers can unlock the true productive potential of their animals while ensuring better milk quality, improved reproductive performance, and long-term sustainability.

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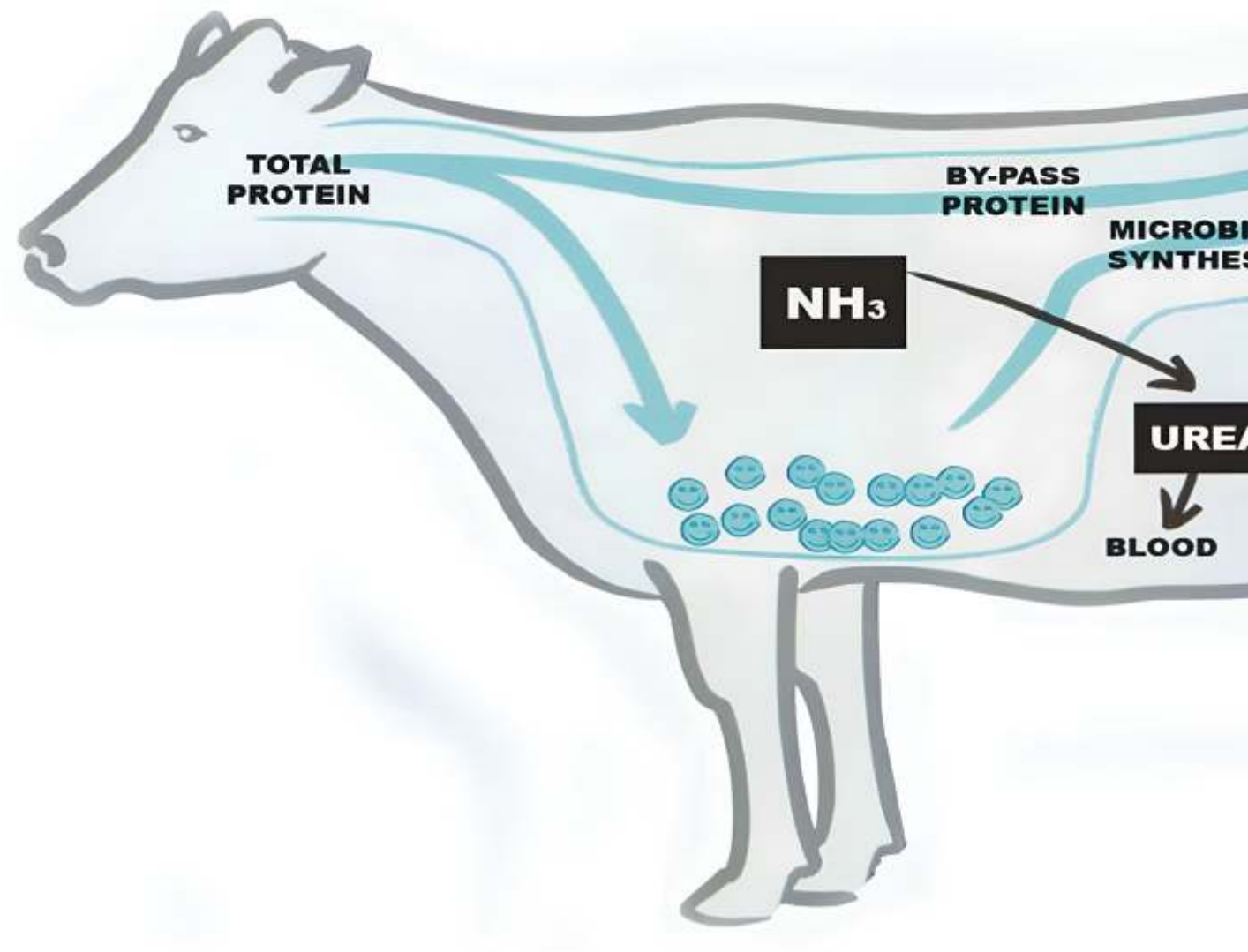


Escalating Feed Costs Demand a Smarter Protein Strategy

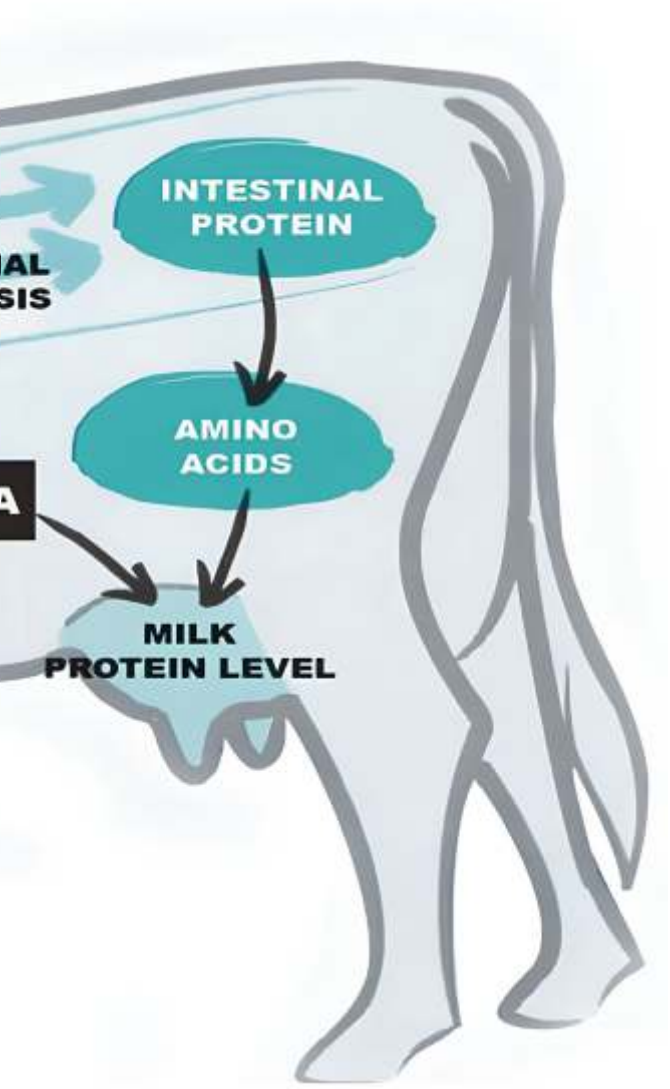
By **Dr. Medha Singh and Dr. Sudhir Singh**, Kemin Industries South Asia

Introduction

Volatility has become a constant in India's feed marke. Price and availability of maize, soybean meal, rapeseed, sunflower meal, rice bran, and other raw materials fluctuate rapidly. However, the greater challenge today is not just price volatility—it is quality variability. Inconsistent nutrient density, processing differences, rising mycotoxin pressure, and occasional adulteration mean that the "least-cost" formula on paper can ultimately become the most expensive at the farm level.

This raises a critical strategic question: are we optimizing the lowest cost per kilogram of feed, or the lowest cost per litre of milk? The answer should increasingly be the latter.

This article argues for a protein strategy that protects animal performance during reformulation rather than focusing solely on reducing feed cost. Traditionally, nutritionists have relied on RDP (Rumen Degradable Protein) and RUP (Rumen Undegradable Protein) to switch between raw materials such as soybean meal, rapeseed meal, sunflower meal,



DDGS, and other co-products while maintaining rumen stability without unnecessarily increasing crude protein (CP). While the industry is already familiar with these two pillars, the time has now come to focus critically on the third pillar: amino acid balance.

The protein system has three pillars:

Rumen undegradable protein (RUP)
to supply digestible protein post rumen

Rumen degradable protein (RDP)
to support microbial protein

Amino acid balance
to convert MP efficiently into milk protein

1. Shift the objective of reformulation: from "cheapest formulation" to

"most stable output"

The first and most important shift is strategic rather than mathematical. Many nutritionists begin formulation with the question: "How do we reduce formulation cost?" In volatile markets, a better question is: "How do we protect milk yield, milk components, and feed efficiency while still managing cost?"

In practice, this means developing formulations that can tolerate raw material variation without causing major performance fluctuations. Reformulation should increasingly focus on digestible nutrients, fibre and starch behaviour, effective fibre, and metabolizable protein (MP) supply rather than only crude nutrient specifications.

These nutritional levers help maintain intake consistency and rumen function even when ingredient quality changes, resulting in more predictable animal performance and fewer complaints from farmers.

2. Stop designing protein strategy purely on crude protein (CP)

Crude protein percentage has long been used as a shortcut indicator of feed quality. However, CP alone can be misleading. Two feeds with identical CP levels may produce completely different milk responses, especially when reformulation alters protein degradability and amino acid supply.

Crude protein measures only the total nitrogen content of a feed—it does not tell us:

How much of that protein Is actually usable by the animal

How efficiently that protein supports milk production

Crude protein measures only the total nitrogen content of a feed. It does not indicate:

- How much protein is digestible
- The balance between RDP and RUP
- The amino acid profile available to the animal
- The efficiency of microbial protein synthesis

As raw materials change frequently, formulations based only on CP% can silently alter protein quality:

- CP may remain constant while nutrient value changes
- RDP/RUP balance may shift
- Microbial protein synthesis may decline

Therefore, protein strategy should no longer depend solely

on identifying the cheapest protein source available each month. Instead, the focus should be: if soybean meal becomes expensive or unavailable, what combination of alternative proteins can maintain MP supply and amino acid balance without overfeeding CP?

This approach reduces formulation shocks, minimizes nitrogen wastage, and improves milk consistency. In modern ruminant nutrition, metabolizable protein adequacy—not crude protein percentage—should become the true benchmark of formulation quality.

3. Lower CP is not cost-cutting—it is efficiency building

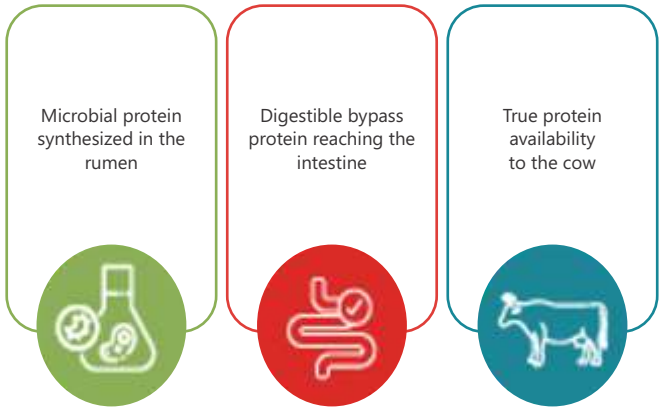
Reducing crude protein is not merely a cost-saving exercise. It is fundamentally about improving biological efficiency and reducing nutrient waste.

By optimizing metabolizable protein and amino acid supply rather than chasing higher CP levels:

- Nitrogen utilization improves
- Feed efficiency increases
- Nutrient wastage declines
- Milk production becomes more stable
- Environmental nitrogen losses are reduced

In volatile markets, efficiency becomes the most stable currency. If feed quality is ultimately measured by animal performance, then the most relevant protein metric is not crude protein, but metabolizable protein (MP)—the protein actually absorbed and utilized by the animal for maintenance and milk synthesis.

MP is a better internal quality benchmark than CP because it reflects:



4. Treat amino acids as nutrients, not premium add-ons.

Amino acids play a critical role in protecting performance when protein sources become unstable. Traditionally, amino acids have been treated as premium additives reserved for high-end feeds, making them among the first components removed when raw material prices increase. However, modern nutrition increasingly recognizes amino acids as essential nutrients rather than optional supplements.

Amino acid balancing helps maintain:

- Milk production consistency
- Protein utilization efficiency
- Lower CP formulations
- Greater reformulation flexibility under volatile conditions

Lysine and methionine, in particular, should be viewed as mandatory components of a precision protein strategy—not optional additions.

5. Strengthen quality and consistency over aggressive cost-cutting

During volatile market conditions, quality risks rise significantly due to:

- Greater ingredient variability
- Increased adulteration risk
- Frequent raw material substitution

As a result, consistency control becomes more important than aggressive cost reduction.

Feed manufacturers should tighten raw material acceptance standards and closely monitor nutrient variability when switching ingredients. A cheaper raw material with inconsistent quality often creates higher hidden costs through reduced animal performance and customer dissatisfaction.

Putting it together: the new definition of feed quality

In today's volatile geopolitical and market environment, a high-quality ruminant feed should be defined not by crude protein percentage alone, but by its ability to:

- Maintain intake stability
- Support rumen function
- Deliver consistent metabolizable protein
- Optimize amino acid supply
- Sustain milk output efficiently despite reformulation

The future competitive advantage will belong to those who can reformulate confidently without compromising animal performance. Ultimately, the goal remains unchanged: Optimize cost per litre of milk by protecting efficiency—not simply by lowering the feed bill.

You can apply several nutritional strategies to manage volatility, but the discussion always returns to one central question: "What is your protein strategy?"

A modern protein strategy cannot rely solely on crude protein or the cheapest CP percentage on paper. It must protect metabolizable protein supply, improve efficiency, and maintain milk performance consistently through reformulation.

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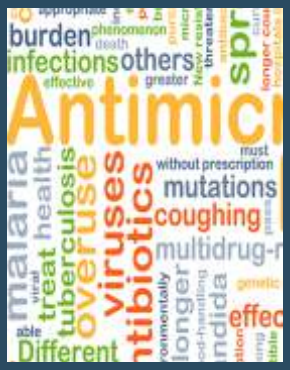

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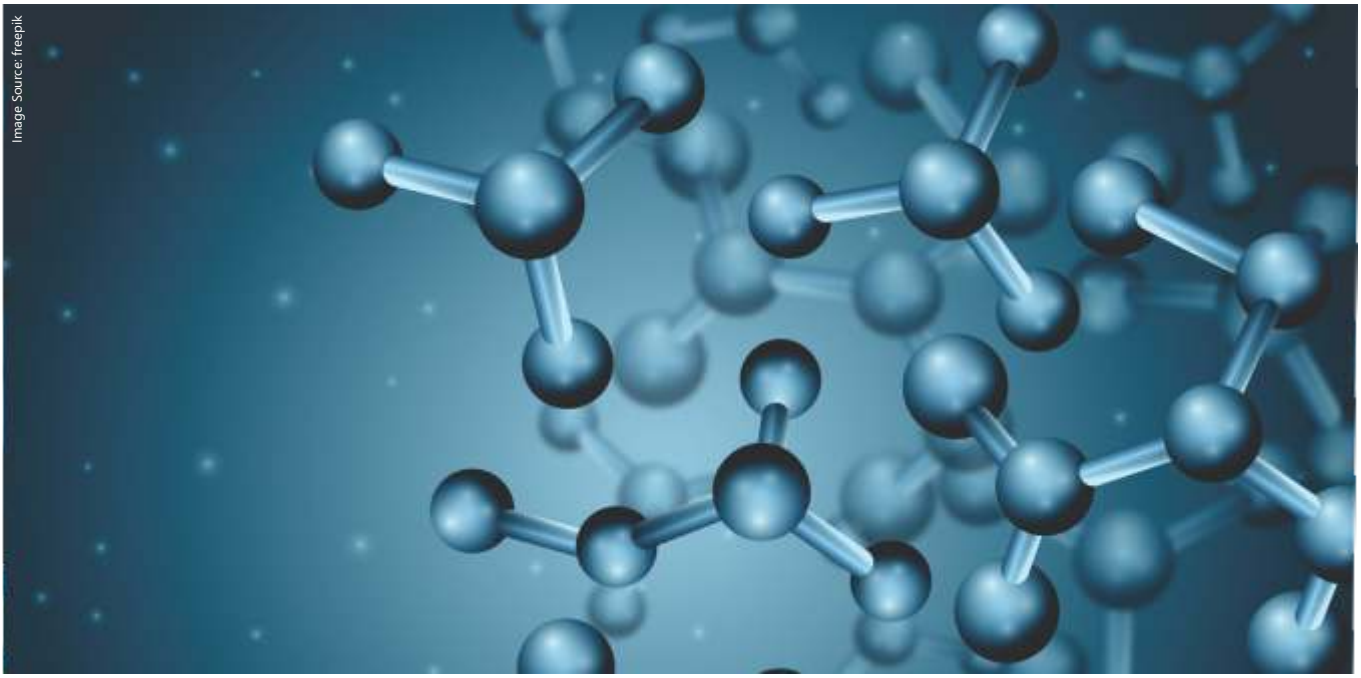

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Functional Role of Butyric Acid in Poultry Feeding Programs: Implications for Gut Health, Immunity, and Growth Performance

By **Dr Subhasish Ray**, Poultry Nutritionist, Odisha

Dr Subhasish Ray

Introduction

The poultry industry plays a crucial role in supplying affordable and high-quality animal protein worldwide. Historically, antibiotic growth promoters (AGPs) were widely incorporated into poultry diets to enhance feed efficiency, growth rate, and disease resistance. However, the emergence of antimicrobial-resistant bacteria and increasing public health concerns resulted in restrictions and bans on AGP use in several countries, particularly in the European Union since 2006 (Huyghebaert et al., 2011).

The withdrawal of AGPs created significant challenges for poultry producers, including increased incidence of enteric diseases, poor feed conversion efficiency, and higher mortality rates. Consequently, considerable attention has shifted toward alternative feed additives such as probiotics, prebiotics, phytogenics, enzymes, and organic acids.

Among organic acids, butyric acid has emerged as one of the most promising compounds because of its beneficial effects on intestinal health and bird performance. Butyrate serves as an important energy source for intestinal epithelial cells and contributes to maintaining gut integrity, microbial balance, and immune modulation.

Characteristics of Butyric Acid

Butyric acid is a short-chain fatty acid (SCFA) naturally produced during microbial fermentation of dietary fiber within the gastrointestinal tract. Chemically, it is a four-carbon fatty acid with strong antimicrobial and acidifying properties.

The main physiological functions of butyric acid include:

- Reduction of intestinal pH
- Inhibition of pathogenic bacteria

- Enhancement of epithelial cell proliferation
- Improvement of intestinal villi structure
- Modulation of inflammatory responses
- Promotion of nutrient absorption

However, free butyric acid possesses a strong unpleasant odor and is highly corrosive, limiting its direct use in poultry diets.

Forms of Butyric Acid Used in Poultry Nutrition

Free Butyric Acid

Free butyric acid is rapidly absorbed in the upper gastrointestinal tract. Although biologically active, its practical use is limited because of:

- High volatility
- Corrosiveness
- Strong odor
- Poor handling characteristics

As a result, commercial poultry nutrition primarily utilizes more stable derivatives.

Sodium Butyrate

Sodium butyrate is the most commonly used salt form of butyric acid. It is more stable and easier to incorporate into feed than free butyric acid.

Benefits

- Improved growth performance
- Enhanced feed conversion ratio (FCR)
- Better intestinal morphology
- Reduced pathogenic bacterial load

Several studies have demonstrated that sodium butyrate supplementation improves villus height and crypt depth in broilers, thereby increasing absorptive surface area (Leeson et al., 2005).

However, unprotected sodium butyrate may be absorbed prematurely in the upper digestive tract, limiting its effects in the distal intestine.

Coated Sodium Butyrate

To overcome premature absorption, coated sodium butyrate products were developed. Fat or matrix coatings protect the active ingredient and allow gradual release throughout the intestinal tract.

Advantages

- Controlled intestinal delivery
- Greater efficacy in lower gut
- Improved pathogen control
- Better intestinal integrity

Coated sodium butyrate has shown positive effects against enteric pathogens including:

- Salmonellosis
- Colibacillosis
- Necrotic enteritis

Fernandez-Rubio et al. (2009) reported significant reductions in Salmonella colonization in broilers receiving coated sodium butyrate supplementation.

Butyric Acid Glycerides

Butyric acid glycerides are esterified forms containing mono-, di-, or triglycerides of butyric acid. These forms exhibit:

- Improved stability
- Better palatability
- Slow enzymatic release
- Enhanced bioavailability

Because glycerides resist rapid dissociation in the upper gut, they can deliver butyrate effectively throughout the intestine.

Research indicates that butyrate glycerides may provide superior improvements in intestinal morphology and nutrient digestibility compared to non-protected forms.

Effects on Gastrointestinal Health

The intestinal tract is the primary target of butyric acid supplementation.

Improvement of Intestinal Morphology

Butyrate stimulates proliferation and differentiation of enterocytes, resulting in:

- Increased villus height
- Improved villus-to-crypt ratio

- Enhanced mucosal integrity

Improved intestinal morphology directly enhances nutrient absorption and feed efficiency.

Modulation of Gut Microbiota

Butyric acid suppresses pathogenic bacteria by:

1. Lowering intestinal pH

2. Penetrating bacterial cell membranes

3. Disrupting intracellular metabolism

Beneficial bacteria such as Lactobacillus spp. often increase in response to butyrate supplementation, contributing to improved microbial balance.

Anti-inflammatory Effects

Butyrate also exerts immunomodulatory functions by reducing inflammatory cytokine production and strengthening intestinal barrier function. These properties are particularly beneficial under stress conditions and enteric disease challenges.

Effects on Nutrient Digestibility

Numerous studies have shown improvements in:

- Crude protein digestibility
- Fat utilization
- Apparent metabolizable energy (AME)

Improved digestion may result from:

- Increased pancreatic enzyme secretion
- Enhanced absorptive surface area
- Better gut barrier function

Consequently, birds often exhibit improved feed conversion and body weight gain.

Effects on Growth Performance

Many researchers reported positive effects of butyric acid supplementation on:

- Body weight gain
- Feed conversion ratio
- Livability

The benefits are particularly evident under:

- High stocking density
- Heat stress
- Enteric disease pressure
- Antibiotic-free production systems

Nevertheless, responses vary depending on:

- Product form
- Inclusion level
- Coating technology
- Diet composition
- Farm management conditions

Role in Disease Prevention

Butyrate supplementation has been associated with reduced incidence and severity of several poultry diseases.

Particularly important is its role in controlling:

- Necrotic enteritis
- Salmonellosis
- Colibacillosis

The compound supports gut integrity, thereby reducing bacterial translocation and secondary infections.

Practical Applications in Poultry Production

Commercially, butyrate products are increasingly incorporated into:

- Broiler diets
- Breeder diets
- Layer feeds
- Antibiotic-free programs

Butyrate is frequently combined with:

- Probiotics
- Organic acid blends
- Essential oils
- Enzymes

Such combinations may provide synergistic improvements in gut health and production efficiency.

Limitations and Challenges

Despite promising results, several limitations remain:

- Variability among commercial products
- Differences in coating technologies
- Inconsistent responses under field conditions
- Cost considerations

Further research is required to optimize dosage strategies and identify the most effective combinations with other feed additives.

Conclusion

Butyric acid and its derivatives represent effective alternatives to antibiotic growth promoters in modern poultry nutrition. Their beneficial effects on intestinal health, microbial balance, nutrient digestibility, immune modulation, and production performance make them valuable tools in antibiotic-free poultry production systems.

Among available forms, coated sodium butyrate and butyric acid glycerides appear particularly effective because of their improved stability and targeted intestinal release.

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Maize Summit 2026: Industry Calls for Stronger Coordination Across Feed, Fuel and Food Sectors

By **Dr Harinder Singh**, Excellent Enterprises and **Maj. Rajiv Yadav**, SM (Gallantry)

Dr Harinder Singh

Maj. Rajiv Yadav

The 12th Maize Summit organised by Federation of Indian Chambers of Commerce and Industry at FICCI House on 15 May 2026 brought together policymakers, industry leaders, researchers and trade representatives to discuss the future of India's maize sector amid rising global uncertainty.

With geopolitical tensions increasing fuel and freight costs and impacting fertiliser availability, the summit highlighted maize as a strategic crop positioned at the intersection of animal feed, food processing, industrial starch and ethanol production. Discussions centred on improving productivity, strengthening market infrastructure, enhancing quality standards and balancing feed and fuel demands.

Policy and Market Outlook

During the inaugural session, Dr P.K. Singh stressed the need to align maize policy with national priorities related to food security, energy diversification and farmer welfare. He emphasised that maize should be viewed not merely as a commodity, but as strategic infrastructure capable of supporting feed security and ethanol expansion simultaneously.

Siraj Hussain presented a market outlook highlighting volatility in global corn markets due to fluctuations in supply-demand dynamics, fertiliser prices and freight costs. He noted that futures markets can help stabilise prices only when liquidity and industry participation improve significantly.

A major development at the summit was the announcement of a collaborative MoU between FICCI and the Indian Institute of Maize Research aimed at strengthening research-industry linkages in areas such as hybrid development, post-harvest management and aflatoxin control.

Focus on Quality, Storage and Market Transparency

Technical discussions featuring representatives from CLFMA of India, Roquette, Godrej Agrovet and other stakeholders focused heavily on quality differentiation and supply chain inefficiencies.

Speakers noted that processors and feed manufacturers increasingly prefer low-moisture, contamination-free maize and are willing to pay premiums for quality grain. However, fragmented procurement systems, inconsistent grading practices and inadequate storage infrastructure continue to create major challenges.

The summit also highlighted the impact of regional harvesting patterns, which often lead to seasonal oversupply followed by shortages, contributing to price volatility and quality deterioration.

Futures Trading and Risk Management

A recurring theme throughout the conference was the need to strengthen maize futures trading platforms such as National Commodity & Derivatives Exchange Limited (NCDEX).

Industry leaders recommended greater

coordination among feed, starch and poultry associations to increase hedging participation and improve market liquidity.

Participants also called for futures contracts that better reflect commercial realities, particularly regarding delivery centres and quality specifications.

Speakers agreed that without deeper commercial participation, maize futures markets would remain underutilised as effective risk management tools for processors and feed manufacturers.

Ethanol Expansion and Feed Security

One of the most significant discussions revolved around the growing role of maize in India's ethanol blending programme.

Participants acknowledged that maize offers advantages over paddy-based ethanol because of lower water requirements. However, concerns were raised about the potential impact of large-scale ethanol diversion on feed availability and livestock production costs.

The summit recommended a calibrated and region-specific ethanol expansion strategy supported by productivity improvements, feed security safeguards and water resource assessments.

Aflatoxin Remains a Major Export Barrier

Aflatoxin contamination was identified as one of the biggest constraints limiting India's maize export potential.

Experts stressed the need for stronger interventions across the value chain, including:

- Improved agronomic practices and timely harvesting
- Affordable drying and moisture management technologies
- Rapid testing infrastructure and traceable aggregation systems
- Financial incentives for low-aflatoxin maize deliveries

Industry representatives also highlighted opportunities for value addition through maize straw densification and pellet production for the fodder sector.

Bridging the Productivity Gap

The summit underscored India's relatively low maize productivity compared with leading global producers.

Discussions focused on accelerating the adoption of:

Improved hybrid seeds

- Precision nutrient management
- Mechanisation
- Integrated pest management practices

The role of biotechnology and GM traits also emerged during discussions. While acknowledging the sensitivity of the issue, panelists advocated for transparent, science-based field evaluations under proper regulatory oversight.

Key Recommendations

The conference concluded with several recommendations for industry and policymakers:

- Develop harmonised national maize quality standards
- Improve warehousing and inventory financing systems
- Strengthen aflatoxin mitigation programmes
- Enhance digital farmer advisory services
- Provide regulatory clarity for contract farming and biotechnology trials
- Align ethanol policies with long-term feed security goals

Conclusion

The FICCI 12th Maize Summit reinforced the importance of maize as a strategic crop for India's food, feed and fuel economy. The event highlighted that coordinated action among industry, researchers and policymakers will be essential to improve productivity, stabilise markets and strengthen supply chain resilience.

With appropriate investments in quality systems, storage infrastructure, research and market reforms, India's maize sector has the potential to evolve into a robust and sustainable value chain capable of supporting both domestic demand and export opportunities.

BIS Introduces Indian Standard for Maize Silage as Livestock Fodder

The Bureau of Indian Standards (BIS) has released IS 19562:2026 — "Maize or Corn Silage as Livestock Fodder — Specification", marking a significant step toward standardizing silage quality for the Indian livestock sector. Developed by the Animal Feeds and Nutrition Sectional Committee (FAD 05), the standard aims to improve fodder conservation, nutritional consistency, and feed safety for dairy and ruminant production systems.

Importance of Silage in Livestock Feeding

Green fodder remains one of the most economical nutrient sources for dairy animals. However, seasonal availability and climatic variations often create shortages. Silage — preserved green fodder fermented under anaerobic conditions — addresses this challenge by ensuring year-round availability of quality feed.

The standard highlights maize as one of the most suitable crops for silage production because of its high soluble carbohydrate content, which supports efficient fermentation. Proper silage feeding improves nutrient intake, milk production, and overall livestock productivity while reducing seasonal fluctuations.

Scope of the Standard

IS 19562:2026 specifically prescribes:

- Requirements for maize or corn

silage used for ruminant animals
- Sampling procedures
- Testing methods
- Packaging and marking requirements

The standard defines silage as conserved green fodder with moisture content ranging from 62–70%, prepared by anaerobic fermentation for about 45–50 days.

Key Quality Specifications

The standard provides clear quality parameters for maize silage:

Parameter	Requirement
Moisture	62-70%
pH	3.5-4.4
Crude Protein	Minimum 7%
Crude Fibre	Maximum 35%
Neutral Detergent Fibre (NDF)	Maximum 60%
Acid Insoluble Ash	Maximum 5%
Aflatoxin B1	Maximum 20 ppb

Additionally, good quality silage should:

- Have a light green to yellowish colour
- Possess a pleasant fruity aroma
- Be free from mould, rancidity, dirt, metallic contamination, and objectionable odour

Sampling and Testing Procedures

The standard outlines detailed methods for:

- Sampling silage from bags, bales, and silo pits
- Moisture estimation
- pH determination
- Laboratory analysis

For silo pits, samples should ideally be collected six weeks after ensiling from multiple locations and depths to ensure representative testing. Proper airtight packing and rapid transport to laboratories are emphasized to prevent aerobic spoilage and inaccurate analysis.

The moisture determination method also recognizes volatile losses during silage drying and includes correction factors for accurate dry matter estimation.

Packaging and Marking

Silage may be packed in:

- Poly-film wrapped bales
- Airtight HDPE or polypropylene bags
- Silo pits

Mandatory labelling requirements include:

- Product name
- Manufacturer details
- Batch number
- Net weight
- Date of packing
- Best-before declaration
- Compliance with Legal Metrology Rules

Products complying with the standard may also carry the BIS certification mark under applicable conformity assessment schemes.

Significance for the Industry

The introduction of IS 19562:2026 is expected to benefit:

- Dairy farmers
- Feed manufacturers
- Silage producers
- Nutritionists
- Livestock researchers

By defining measurable quality benchmarks, the standard can help improve silage consistency, reduce spoilage losses, and enhance feed efficiency. It also supports the growing adoption of scientific fodder conservation practices across India.

Importantly, inclusion of limits for contaminants such as aflatoxin B1 reflects increasing emphasis on feed safety and animal health.

Collaborative Development

The standard was formulated with contributions from a wide range of stakeholders including: ICAR institutes, Veterinary universities, NDDB, Poultry and feed industry associations, FSSAI, Animal nutrition experts and Government departments.

This collaborative approach ensures the standard remains scientifically robust while also practical for field-level adoption.

Moving Toward Quality Fodder Systems

As India's dairy and livestock sectors continue to modernize, standardized silage production will play a crucial role in ensuring nutritional security, improving milk productivity, and supporting sustainable livestock farming.

IS 19562:2026 provides a much-needed scientific framework for the production, handling, testing, and quality assurance of maize silage — helping bridge the gap between fodder availability and nutritional efficiency in the livestock sector.

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