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THE MAGAZINE OF INDIAN POULTRY INDUSTRY | JUNE 2025

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THE MAGAZINE OF INDIAN POULTRY INDUSTRY

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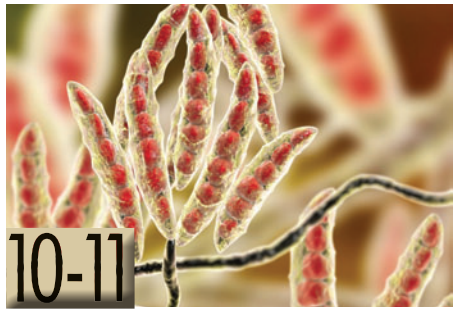

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Designed by Hushframe Ideas Pvt.Ltd

Edited and Published by G.N. Ghosh from 57-B, Townshend Road, Kolkata-700025 and printed by G.N. Ghosh at Salmoli Publication, 57-B, Townshend Road, Kolkata - 700025

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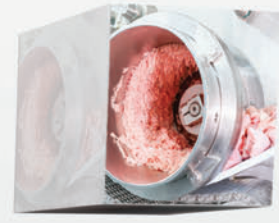

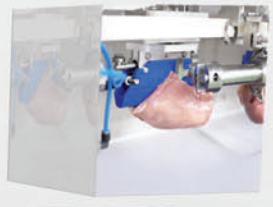

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The Edit

DRIVING POULTRY INNOVATION WITH ESG COMPLIANCE; THE INDIAN WAY FORWARD

India's poultry sector, one of the largest globally, has witnessed remarkable transformation from backyard farming to an organised, tech-enabled industry. As the country strides towards becoming a protein powerhouse, aligning this growth with Environmental, Social, and Governance (ESG) norms, as outlined by the United Nations, becomes imperative.

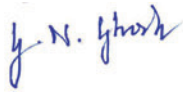
Sustainability is no longer optional. Feed efficiency, waste management, water usage, carbon footprint, and animal welfare must be integral to operational design. Encouragingly, Indian entrepreneurs are embracing innovations—precision farming, climate-controlled housing, and blockchain-led traceability—but these must now scale within a policy-backed ESG framework.

The government's push through schemes like the Animal Husbandry Infrastructure Development Fund (AHIDF), and policies encouraging FPOs (Farmer Producer Organisations) and digital traceability, show intent. However, these efforts must be deepened. ESG-specific incentives, green certification for sustainable farms, and priority lending for low-emission technologies can catalyse adoption.

Social equity is equally vital. Skilling programs for rural youth, empowering women poultry entrepreneurs, and ensuring fair labour conditions are critical ESG pillars. Governance, too, demands focus—data transparency, biosecurity compliance, and responsible antibiotic use need enforceable, yet enabling regulation.

India has the opportunity to set a global benchmark in sustainable poultry growth. A public-private-people partnership model, with ESG at its core, can create resilient supply chains that serve both national nutrition goals and global climate commitments.

As we look ahead, innovation must be purposeful—and the future of Indian poultry must be green, inclusive, and governed by the principles of responsibility.



G. N. Ghosh
Managing Editor

Indian Research

Study on Hen Housed Egg Production of Chicken Layers upon Dietary Supplementation of Aloe vera {Aloe Barbadensis}

By
D. C.Yadav*, D. S. Bidhan, S. K.Chikara, M. I.Hashmi and N. Sisodia
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**Corresponding author*

Present study was undertaken to study the effect of aloe vera supplementation on hen housed egg production for a period of 20 weeks. 225 chicken layers of 22 weeks of age, were weighed individually and randomly divided into 5 treatment groups with 3 replicates of 15 birds in each. The experimental birds in treatment group T_0 (Negative control without antibiotic) & T_1 (Control with antibiotic) were fed basal ration formulated as per BIS (2007) standards. In the experimental groups T_2, T_3 and T_4 aloe vera leaves were supplemented in basal ration @ 1%, 2% and 3%, respectively.

The results of this study unveiled that aloe vera supplemented groups had significantly ($P<0.05$) higher hen housed egg production than that of negative control. But there was no significant difference in hen housed egg production in groups fed different dietary levels of aloe vera as compared to control group. The data of the study revealed that feeding of hens with aloe vera at different dietary levels had significant ($P<0.05$) positive effect on percent hen housed egg production as compared to negative control group as well as aloe vera supplementation showed significantly at par results in terms of hen housed egg production compared to control group.

There was no significant ($P<0.05$) difference in hen housed egg production in groups fed different dietary levels of aloe vera as compared to antibiotic (control) group.

Influence of Egg Size on Fertility and Hatchability of Vanaraja Parent Stock Eggs from an Organised Farm

By
I.U. Sheikh*, A.A. Khan, S. Adil, M.T. Banday, Z. Haq, I.A. Baba, H. Hamadani and M.A. Wani
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**Corresponding author*

A study was conducted on 500 Vanaraja eggs of different sizes viz. T_1 (40-45g), T_2 (45-50), T_3 (50- 55), T_4 (55-60) and T_5 (60-65) to determine the fertility, hatchability and weight of day old chicks in an organised farm. A total of minimum 100 eggs in each group were selected and loaded in the incubator with optimum temperature, humidity and other conditions required for incubation was maintained in setter. On 18th day candling was done to determine fertility of the eggs and fertile eggs were transferred to hatcher. The fertility was recorded as 71.3±4.67 per cent in T_1 to 84.0±7.0 per cent in T_4 without any significant differences among the groups and hatchability was highest in T_3 and T_4 groups but statistically non-significant. The body weight of day old chicks was ranged from 27.67±1,49 in T_1 to 42.34±0.85 in T_5 groups with significant ($P<0.05$) differences among the groups. The dead germ was significantly ($P<0.05$) higher in T_1 (7.33±0.67) in T_1 group than all other groups. The dead in shell was lowest in T_3 (14.5±0.50) and highest in T_5 (21,7±4.25) without any significant differences among the groups.

From the present study it could be concluded that the size of egg has no effect on fertility, hatchability and dead in shell of Vanaraja parent stock eggs and the body weight of day old chicks was significantly ($P<0.05$) increased linearly as the egg weight increased.

Gastrointestinal Metagenomics of Kadaknath Chicken

By
A. Harshini, S. Tomar and A. K. Tiwari
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**Corresponding author*

Gut health and microbiota plays a pivotal role on health and production of bird. Microbiota of GIT is responsible for the competitive exclusion of pathogenic microbes and maintaining the integrity of mucosa. With the advent of NGS platforms, the study of gut microbiome was made possible. Indigenous chicken are a rich repository of microbiota responsible for their resistance to harsh environments and pathogens. Metagenomic analysis of the whole gastrointestinal tract was studied by collecting whole gut content of 12 weeks old Kadaknath chicken DNA was isolated and outsourced after DNA isolation for 16s rRNA sequencing of V1-V3, V3-V4, V4-V6 hypervariable regions. Taxonomic profiling of sequences was performed using NCBI data utilizing MEGAN and MG-RAST software.

Bacteria is the major domain in the microbiome of gut, archaea accounted for 0.4% of the total sequences. The major bacterial phyla in the gut microbiome was Bacteroidetes 45.69% followed by Firmicutes 35.66% and Proteobacteria 10.24%. Lactobacillus genus accounted for 0.75% of total bacterial population with 29 species. The major species include L.salivarius 18.78%, L.crispatus 9.63%. L.delbrueckii 7.52%, L.acidophilus 12%,L.johnsonii 6.69%, L.plantarum 6.60%, L.reuteri 6.57%, and L.fermentum 5.01%. Functional annotation studies using bioinformatic tools KEGG and SEED analysis revealed that most of the functional pathways of the whole gut metagenome constituted for the synthesis of cofactors, vitamins, prosthetic groups, and pigments, followed by carbohydrate metabolism, whereas the reads accounting for the stress response and virulence were lowest among functional pathways. Third dominant phyla of bacteria in the metagenome was pathogenic in nature, however the majority of functional pathways constituted for metabolic pathways.

Source: XXXVII Indian Poultry Science Association Conference, November 2022

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Research Looks at Laying Hens Best Adapted to Cage-Free Housing

With more eggs in the grocery store coming from hens in cage-free housing — about 40% in early 2024 — commercial egg producers want to know which hens are best adapted to that environment.

To help answer their questions, an in-depth study at North Carolina State University evaluated egg production, egg quality, stress and behaviour in two strains of white and two strains of brown hens.

Over 70 years, poultry breeders have developed strains of white leghorn hens like the H&N White and Hy-Line W-36 for conventional poultry houses. Strains like the Hy-Line Brown and Bovan Brown, in contrast, are typically raised in cage-free, pasture or free range systems.

For the 72-week cage-free comparison, hens from the four strains were housed in separate pens with a three-rung ladder perch, a roost and four nesting boxes.

"It's an environment that would be equivalent to a single level, cage-free system on a commercial scale," explained Bhavisha Gulabrai, an NC State Master's graduate and lead author of the study in the journal Poultry Science.

In cage-free housing, thousands of hens can fly around freely inside a poultry barn. However, fearful or skittish hens can injure themselves by crashing into walls or workers. Researchers hope to find genetic strains of birds that are calmer and better adapted to a cage-free environment.

To measure stress in the birds, Gulabrai worked with Allison Pullin, an assistant professor of animal welfare in NC State's Prestage Department of Poultry Science.

Pullin developed two new tests to measure behavioural reactivity in the hens. The first uses a startle chamber, where birds eat tasty mealworms as they acclimate to the space. After a few days of acclimation, a loud sound is played to startle the hens, and their responses are measured.

The second test is an inversion test in which handlers turn birds upside down and look at how intensely they flap their wings. Thermal imaging is used before and after each test, producing colorful maps of blood flow in the chickens.

"When you think about a fight or flight response, an animal undergoes these almost immediate vascular changes to try to direct blood flow to the most crucial arteries," Pullin said. "Looking at the degree of temperature change, as well as how rapidly it changes, can give us an interesting physiological measurement about how that animal is really coping with stress."

Fast, steep changes indicate higher stress than slower or lower-level reactions, she added.

One of the white strains of hens, the Hy-Line W-36, did not undergo the behavior tests because they had been reared in cages prior to the start of the study.

Based on production and quality metrics, one of the brown strains performed best.

"When we looked at production and egg quality, the Hy-Line brown strain did better than the three other strains used in the study. They just had better egg production and better egg quality metrics compared to the three other strains," said Gulabrai, who is currently pursuing her doctorate in agricultural and human sciences at NC State.

The H&N White hens ranked lowest. "We think that they probably had a more difficult time adjusting to the cage-free system," Gulabrai said. "Visually and anecdotally, white strains are more flighty and our H&N White strain remained pretty flighty throughout the entire 72 weeks."

But all of the results were not as clear cut. Bovan Browns, surprisingly, were the least efficient, consuming the most feed while laying smaller eggs.

Overall, both strains of white hens, the Hy-Line W-36 and H&N White, produced lower-quality eggs than the brown strains in the cage-free environment.

Because types of cage-free poultry housing vary, egg producers will have to look at the research findings with their own facilities in mind, said Gulabrai, who is pursuing a Ph.D. in agricultural and human sciences at NC State with a concentration in agricultural communication.

"The farmer knows what kind of housing they have, so they would have to consider these results and make decisions based on what they think the best strain would be for their particular housing environment."

Gulabrai's research was supported with a grant from the Animal Health and Nutrition Consortium, a public-private partnership of animal health companies, biotechnology companies and university scientists. NC State co-authors Ken Anderson, professor and director of the North Carolina Layer Performance and Management Program, and Aaron Kiess, Braswell Distinguished Professor in the Prestage Department of Poultry Science, contributed to the study.

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Article

Mycotoxins in the Food Chain: Understanding Risks and Exploring Mitigation Strategies

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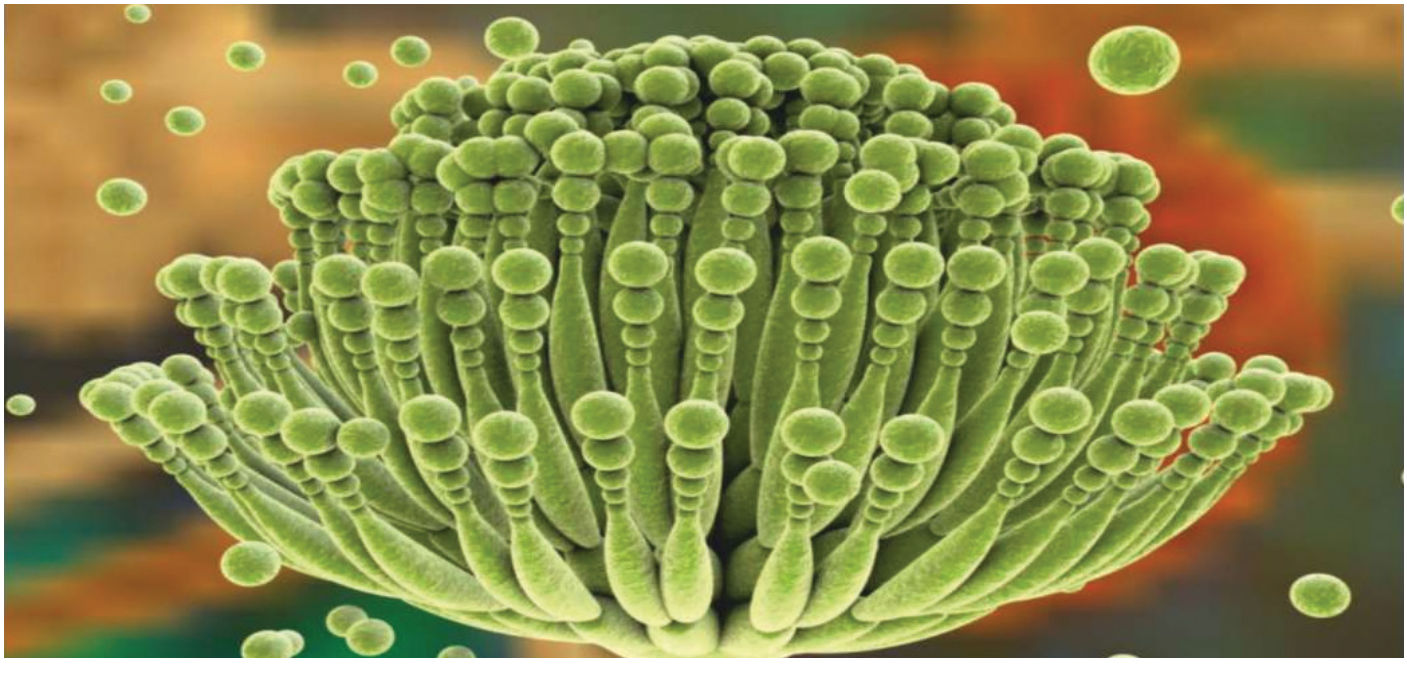
Trouw Nutrition South Asia

The safety of animal feed is increasingly compromised by a confluence of global challenges, notably mycotoxin contamination. These toxic metabolites, produced by moulds such as Aspergillus and Fusarium, pose significant health risks to livestock and, by extension, to humans consuming animal products. Contributing factors include a shortage of quality raw materials, exacerbated by supply chain bottlenecks and geopolitical disruptions. Climate change further intensifies the issue by altering temperature and precipitation patterns, creating favourable conditions for mould growth and mycotoxin production. Additionally, inadequate storage and transportation facilities, often lacking proper ventilation and climate control, facilitate the proliferation of these harmful fungi. Together, these elements underscore the urgent need for comprehensive strategies to mitigate mycotoxin risks and ensure feed safety.

Even the smallest lapse in post-harvest handling can swiftly trigger the formation of harmful secondary metabolites like mycotoxins. Factors such as delayed drying, inadequate moisture control, and poor storage conditions can create an environment conducive to fungal growth, leading to rapid mycotoxin accumulation. For instance, aflatoxin contamination in maize has been linked to improper drying and storage practices, highlighting the critical importance of stringent post-harvest management to ensure food safety.

Mycotoxin contamination poses a significant threat to various stakeholders in the agricultural and food sectors, including farmers, feed producers, food processors, public authorities, and end consumers. These toxic compounds adversely affect animal health by impairing the gastrointestinal tract, suppressing the immune system, and disrupting nutrient absorption, leading to decreased productivity and increased susceptibility to diseases. Implementing a comprehensive 360-degree mitigation strategy—encompassing prevention, detection, regulation, and education—can effectively address this multifaceted issue and safeguard public health and economic interests.

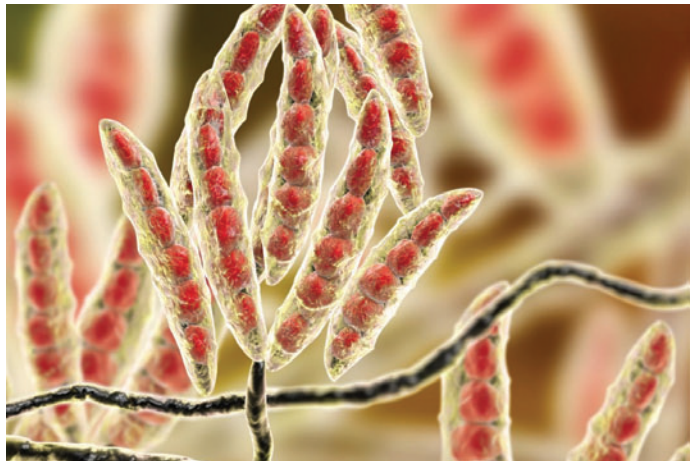
The "Big 6" mycotoxins—aflatoxins, ochratoxins, fumonisins, zearalenone, deoxynivalenol (DON), and T2 toxin—are among the most prevalent and toxic secondary metabolites produced by moulds affecting agricultural commodities. These toxins impact various species differently; for instance, aflatoxins primarily affect liver function in mammals, while zearalenone exhibits estrogenic effects leading to reproductive issues in ruminants and pigs. The incidence and severity of mycotoxin contamination are influenced by environmental factors such as temperature, humidity, and rainfall, which can create conducive conditions for mould growth and toxin production. Not all mycotoxins are equally toxic across



species; for example, DON is highly toxic to swine, whereas poultry are less affected. Climate change exacerbates the problem by altering weather patterns, potentially increasing the prevalence and distribution of mycotoxins in crops.

Aflatoxins occur worldwide in feed and feed stuffs which results in severe economic loss to poultry and livestock industries. The extent of Aflatoxin contamination varies with geographic location, farming methods and the susceptibility of commodities to fungal invasion during pre-harvest, storage, and processing periods. Numerous studies showed negative effects of Aflatoxin in broiler chickens including a decrease in the efficiency of feed utilisation and body weight gain, liver damage, poor immune response, and increased mortality. Aflatoxin is shown to induce pathological alterations in important organs such as the liver, kidneys, and lymphoid organs. Furthermore, the transmission of aflatoxin B1(AFB1) and its metabolites from feed to animal edible tissues and products, such as the liver and eggs, becomes particularly important as a potential hazard for human health. Given the global economic importance of Aflatoxin, many strategies have been tried to minimise their negative impact. A successful prevention strategy must be economical and capable of eliminating all traces of toxin without leaving harmful residues and should not impair the nutritional quality of the commodities. Extensive research has been carried out using adsorbent (binder) materials that adsorbs to Aflatoxin molecule by means of ion exchange and thereby preventing their absorption into blood circulation. Among various binding agents, clays and yeast cell wall materials are the most tested. Silicates are the main group of clays that are studied extensively in terms of Aflatoxin binding. These include tectosilicates (zeolites), 1:1 phyllosilicates (kaolinite), 2:1 phyllosilicates (smectites, vermiculites, chlorites, micas) and sepiolite. All silicates, however, are not the same in terms of their ability to bind Aflatoxin and among the above, smectites have shown greater binding efficacy against Aflatoxin. The ability of smectite clays to bind mycotoxins depends on pH in the gut, molecular arrangements, and its geographic region of origin. Smectite clays possess high Aflatoxin adsorption capacity due to its high surface area, ion exchange capacity, and ability to swell in the presence of water, and the efficacy has been proven in vivo inbroiler chickens. The leading hypothesis on the bonding mechanism between adsorbed aflatoxins and smectites is the electron donor–acceptor (EDA) model. Other models such as selective chemisorption, H-bonding, and bonding through furan rings were proposed. The supplementation of smectite clay in feed to aflatoxin challenged broilers considerably reduced the magnitude of toxic effects of aflatoxin and improved growth and immune response. Hence, smectite clay could be successively used in feed to ameliorate the toxic effects of aflatoxins in broiler chickens.

Aflatoxin B1 (AFB1), deoxynivalenol (DON) and ochratoxin A (OTA) are ones of the most common and dangerous mycotoxins. AFB1, produced mainly by Aspergillus, is one of the most poisonous toxins, which is classified as Group Icarcinogen by the World Health Organization due to its hepatoxicity, immunotoxicity, mutagenicity, genotoxicity, and carcinogenicity on variety of animals. DON, produced by many Fusarium moulds, contamination in feeds induces anorexia, emesis, and damage to intestinal barrier and immune function in animals through suppressing the synthesis of nucleic and proteins. OTA, a toxic metabolite from Aspergillus and Penicillium moulds, possesses hepatoxic, nephrotoxic, neurotoxic, immunotoxic, and teratogenic effects on liver and kidney. Long-term epidemiological investigations have shown that most of the global feed is exposed to more than one mycotoxin, and mycotoxin contamination of food and animal feed is a worldwide problem. Meanwhile, when three mycotoxins co-existed in the poultry feeds, their interaction



have been further associated with significant alterations in the productivity and profitability of animals. Therefore, development of remediation strategies to prevent or mitigate the mycotoxicosis is imperative.

Trouw Nutrition's TOXO range offers a suite of mycotoxin binders designed to mitigate the negative effects of mycotoxin contamination in animal feed. These products are formulated to support animal health and performance by reducing the bioavailability of harmful mycotoxins. These products are part of Trouw Nutrition's comprehensive approach to mycotoxin risk management, aiming to ensure feed safety and optimise animal health and performance.

TOXO-MX: Precision for Aflatoxins

TOXO-MX is a specialised binder formulated to combat aflatoxins, particularly Aflatoxin B1, which can adversely affect dairy cows and other livestock. By incorporating purified smectite clays, TOXO-MX effectively reduces the bioavailability of aflatoxins in the gastrointestinal tract. This reduction leads to a significant decrease in the excretion of Aflatoxin M1 in milk, ensuring compliance with regulatory standards and safeguarding consumer health. Additionally, TOXO-MX enhances feed efficiency, as evidenced by improved milk production per kilogram of dry matter ingested in dairy cows.

TOXO-XL: Comprehensive Protection Against Fusarium Mycotoxins

TOXO-XL is an advanced binder designed to address the challenges posed by Fusarium-related mycotoxins, such as trichothecenes and fumonisins. This product combines smectite clays with specifically selected glucose biopolymers and purified β-glucans, which work synergistically to reinforce intestinal barrier function and modulate the immune response. The result is a comprehensive solution that not only binds and eliminates mycotoxins but also mitigates performance impairments caused by their exposure.

TOXO: Broad-Spectrum Mycotoxin Binder

TOXO serves as a versatile, broad-spectrum mycotoxin binder suitable for various animal species. It utilises smectite clays to effectively reduce the bioavailability of a wide range of mycotoxins, including aflatoxins, ochratoxins, and zearalenone. By preventing the absorption of these toxins, TOXO helps maintain animal health and performance, making it an essential component of comprehensive mycotoxin risk management strategies.

Collectively, the TOXO product range represents a holistic approach to mycotoxin risk management, integrating advanced scientific formulations to protect animal health and ensure the safety of the food chain.

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Article

Sustaining Efficacy in Coccidiosis Control

Dr. Priyanka Kamble
Sr. Marketing Manager
Huvepharma SEA
(Pune) Pvt. Ltd

Coccidiosis remains one of the most economically damaging diseases in poultry farming, globally affecting bird health, growth rates, feed conversion, and ultimately, profitability. Caused by protozoan parasites of the Eimeria genus, this disease targets the gut health and is nearly impossible to eradicate completely. The key to effective management lies in long-term control, with the primary goal being to maintain low coccidial pressure throughout the production cycle.

At Huvepharma, we emphasise the importance of rotating coccidiostats as a cornerstone strategy in the battle against coccidiosis. The practice of rotation is not just about maintaining performance; it's about preserving efficacy and delaying resistance development—especially in an era where no new coccidiostat molecules are expected in the near future.

Understanding the Need for Rotation

Coccidiostats have been used in commercial poultry production for decades. While they are indispensable tools, their overuse or misuse can lead to resistance. Eimeria parasites can adapt to the same anticoccidial product if it's used repeatedly without rotation, rendering it less effective over time.

By alternating between ionophores and synthetic molecules or using different combinations strategically across and within production cycles, producers can reduce the selective pressure on parasites and preserve product efficacy.

Field Evidence: Resistance Is Real

A compelling example comes from a large European poultry integrator that used the same combination product (nicarbazin/narasin) for over four consecutive years. Although the inophore used post-combination was rotated between narasin, salinomycin, and monensin three times a year, the producers did not see the need to switch to a newer combination like Monicox (nicarbazin/monensin), as field performance appeared acceptable.

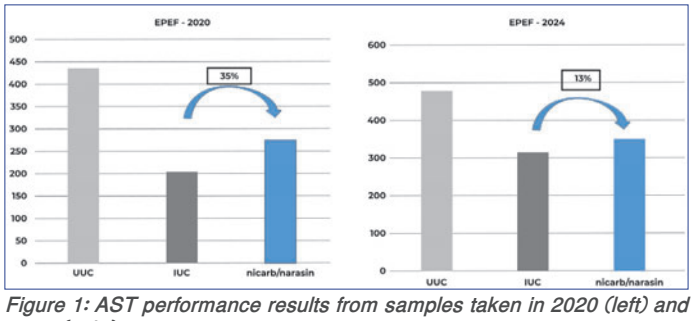

Figure 1: AST performance results from samples taken in 2020 (left) and 2024 (right)

To evaluate this practice, Huvepharma conducted field sampling and anticoccidial sensitivity trials (AST) in 2020 and again in 2024. In 2020, the performance improvement of the existing combination product versus an infected, untreated control (IUC) was 35%, indicating good efficacy.

However, by 2024, the same product only showed a 13% improvement, a level considered to provide minimal benefit. In just four years, the efficacy had dropped by more than half.

A second example of the benefit of rotation comes from field data generated by another European poultry producer. Prior to the trial there were not many rotations. In the summer of 2022, the producer decided to do a chemical break with Stenorol. Figure 2 shows the evolution of the European production efficiency factor (EPEF) before, during and after the chemical break. Before the break, the nicarbazin/narasin combination product was used in the starter diet. After the break, Monicox (nicarbazin/monensin) was used in the starter diet. The graph clearly shows the benefit this chemical break brought to the company. For the first time they were able to reach an EPEF of more than 400.

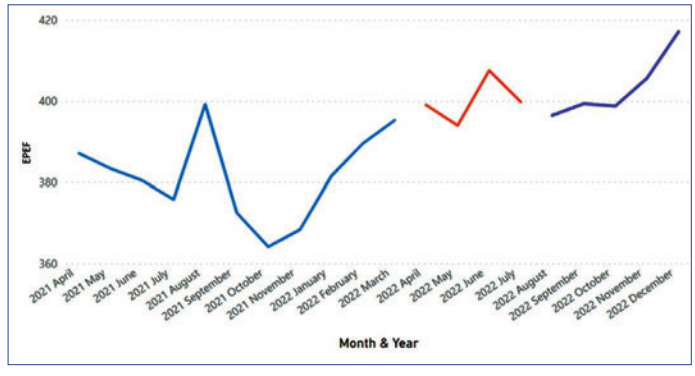

Figure 2: Evolution of the European production efficiency factor (EPEF) from early 2021 to the end of 2022

Figure 3 and 4 show the improvement in EPEF was mainly driven by a lower feed conversion rate (FCR), although the growth was positively influenced by the chemical break and rotation to Monicox.

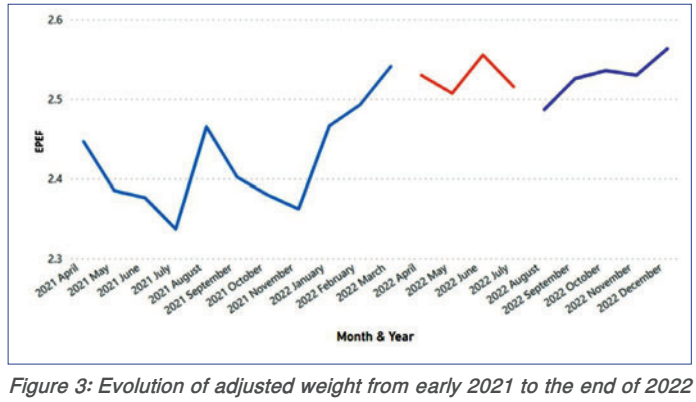

Figure 3: Evolution of adjusted weight from early 2021 to the end of 2022

Figure 4: Evolution of adjusted FCR from early 2021 to the end of 2022

Following this clear evidence of reduced sensitivity, the integrator revised their anticoccidial strategy, adopting Monicox and implementing a rotation with another effective combination product, resulting in significant field performance improvements.

The Iceberg Effect: What You Don't See Can Hurt Performance

Even when problems in the field are not obvious, failure to rotate coccidiostats inevitably impacts performance. This is why the visual of an iceberg is often used when discussing coccidiosis—the visible symptoms are only a fraction of the problem. Much of the damage occurs subclinically, hidden beneath the surface and often unnoticed by producers.

This makes timely and science-based decisions all the more challenging. But the principle is simple: overusing any single product will reduce its effectiveness over time. This principle applies not only to anticoccidials, but to all disease control tools across veterinary medicine.

All data shown in this article was gathered using Aviapp, the poultry performance platform from Huvepharma that enables precision monitoring and evidence-based decision-making in commercial production environments.

Huvepharma's Science-Driven Approch

We advocate for structured anticoccidial programs that involve:

Shuttle Programs: Using different products in the starter and grower phases within a single cycle

Full Rotation Programs: Changing molecules or combination products across successive cycles

Resistance Monitoring: Regular AST and field surveillance to guide decision-making

Integrated Solutions: Combining coccidiostats with good management, biosecurity, and vaccination where appropriate

Conclusion

The case of the European integrator illustrates a broader truth: perceived short-term stability can mask underlying resistance development. Coccidiosis control is a long game, and rotation is not optional—it's essential. With no new molecules in the pipeline, the poultry industry must act responsibly to safeguard the tools we have. At Huvepharma, we provide producers with scientific, field-proven solutions to manage coccidiosis more effectively—ensuring healthier flocks and sustainable performance.

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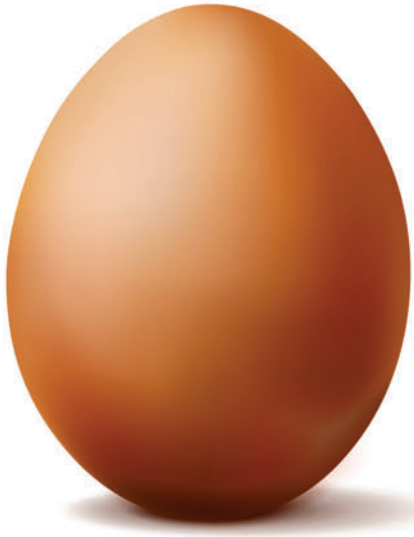
Best Quality Symbol GROUP



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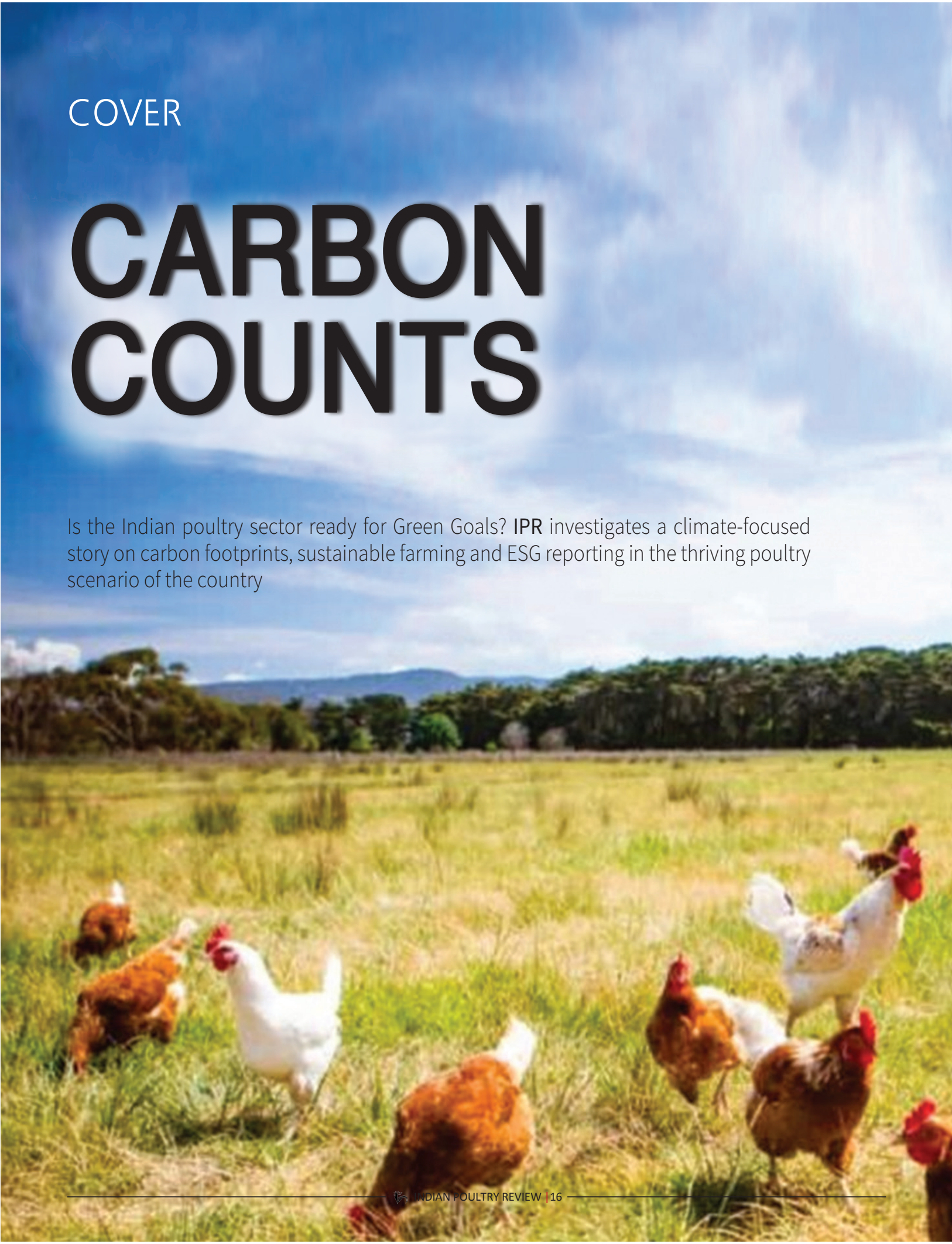
COVER

CARBON COUNTS

Is the Indian poultry sector ready for Green Goals? **IPR** investigates a climate-focused story on carbon footprints, sustainable farming and ESG reporting in the thriving poultry scenario of the country



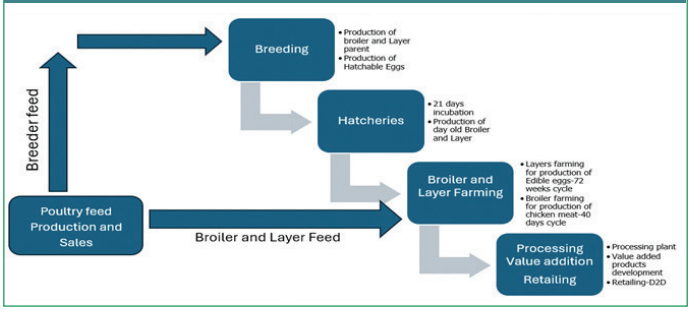
The CareEdge Ratings report on Indian poultry industry predicts a positive outlook, with revenue growth of 8-10% in FY2025, driven by rising demand for protein-rich foods, supported by urbanisation and a shift towards healthier diets. Poultry, being an affordable protein source, is increasingly consumed across households and food services.

The Indian poultry sector is a fast-growing part of the agriculture industry, providing affordable, high-quality protein to the nation. The country is a leading producer of eggs and broiler chicken, with significant growth driven by urbanisation and rising incomes. In 2024 itself, India ranked among the top producers of eggs and broiler chicken globally, with an annual production of over 140 billion eggs and approximately 4.5 million tonnes of broiler meat.

The poultry value chain begins with breeding and genetic selection to produce birds optimised for egg or meat production. Parent stocks produce fertilised eggs, which hatch into day-old chicks at hatcheries. These chicks are raised on farms with nutritionally

balanced feed, reaching market weight for broilers or maturity for layers. Broilers are processed into meat products, while eggs are cleaned, graded and packaged. Distribution is managed through wholesalers, retailers and direct channels, with cold storage preserving quality.

TABLE 1 – Poultry Value Chain



While growth factors are racing towards a major goal, compliance has also taken significant root in poultry farming. ESG or Environmental, Social and Governance, is a set of criteria that investors and other stakeholders use to assess the sustainability and ethical performance in the context of the whole animal husbandry and rearing activities. ESG factors are becoming increasingly important in industry specific business today, as investors and consumers delve more and more to support projects committed to responsible practices.

The poultry industry in India has consistently grown in both egg and meat production over the past decade, highlighting its increased role in meeting the country's protein needs. Historically, the food and beverage sector has driven protein demand, with meat, poultry and seafood making up 31-34% of this demand. Egg production is expected to grow by 7-8% in this term, reflecting the rising demand for affordable protein. Similarly, meat production is projected to increase by 5-6%, indicating a recovery from previous disruptions. Improved feed availability, a demand for protein-rich diets and shift in consumer preferences during festive seasons contribute to this demand, aligning with historical growth trends and suggested continued expansion.

TABLE 2 – Meat Production and Annual Growth Rate

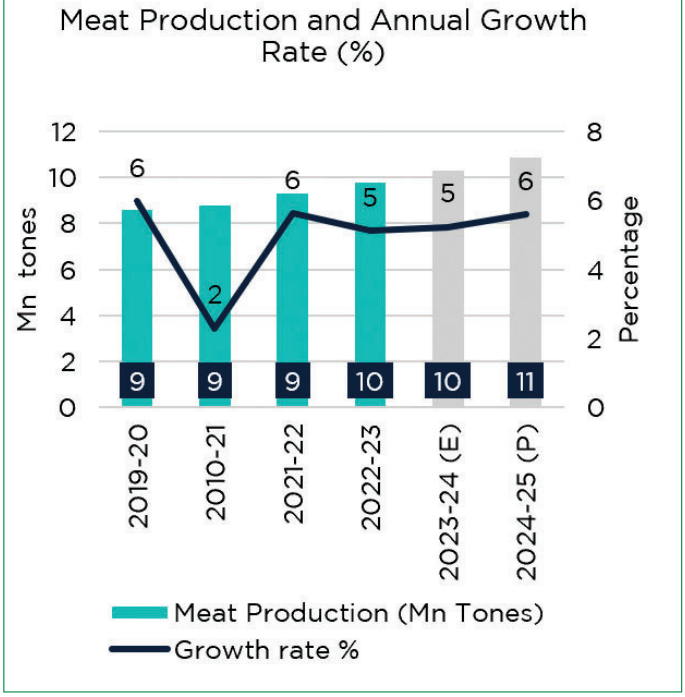
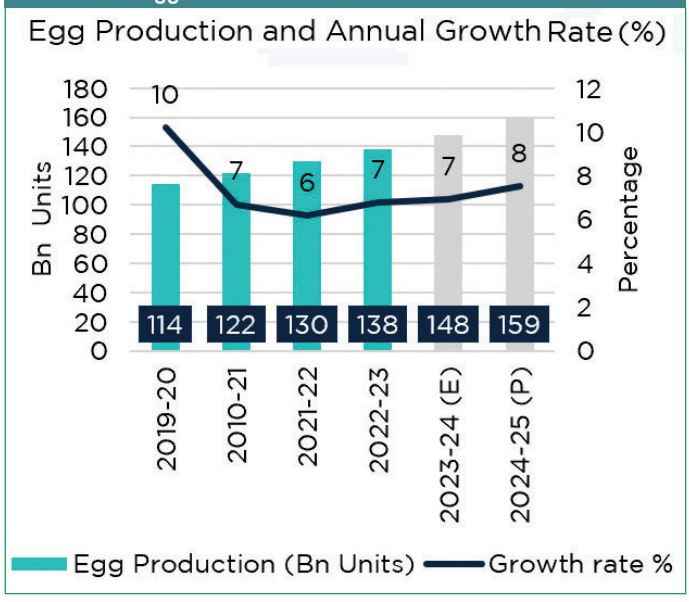


TABLE 3 – Egg Production and Annual Growth Rate

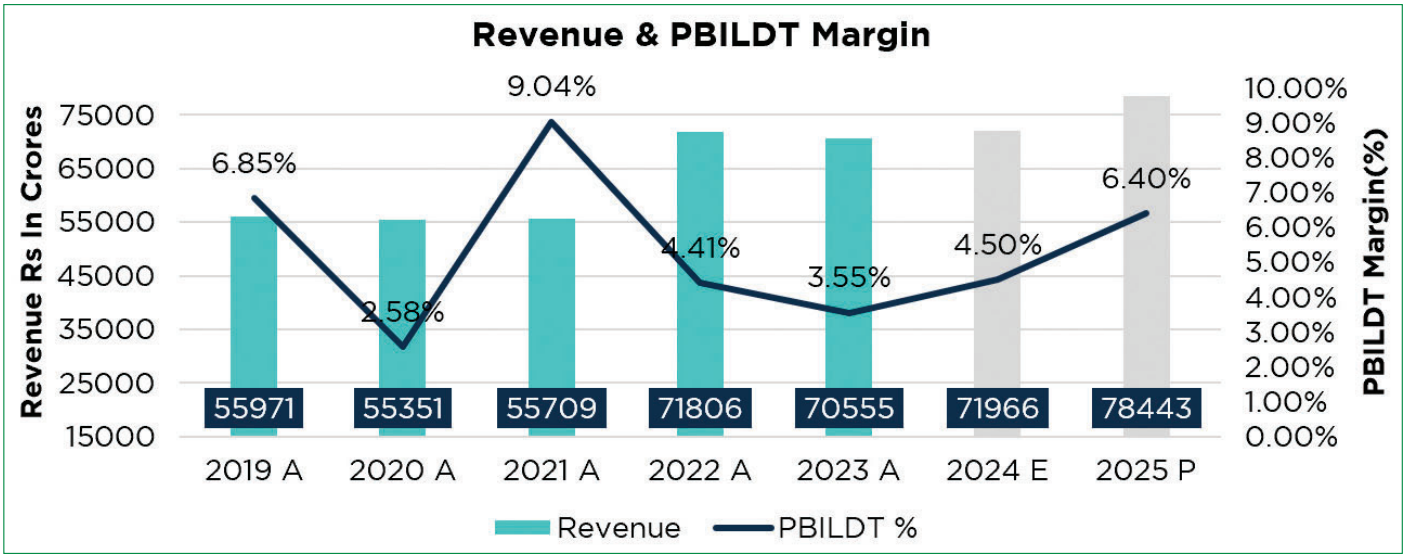


Source: Department of Animal Husbandry Annual Report FY 23-24 and CareEdge Ratings; (E) – Estimates; (P) – Projected
Note: Meat production includes poultry, buffalo, goat, sheep, pig and cattle meat with poultry having over 50% share in total meat production.

The poultry industry's revenue trend has shown significant fluctuations over the years, reflecting changes in market dynamics and input costs. Revenues of key players peaked in 2022, but declined in 2023 and 2024 due to market conditions and rising input costs. Maize and soybean are the key feed inputs whose prices surged due to supply issues; however, these have stabilised in 2024 with improved harvests and government interventions. Broiler meat prices peaked in early FY2024, but fell later due to oversupply. Prices are expected to stabilise with expected seasonal demand boosts.

Though, CareEdge Ratings anticipate healthy growth in FY2025, with recovery of 180-220 bps in operating profit margins driven by growing population with changing dietary preferences towards protein-rich foods and softening of input prices, the poultry industry remains susceptible to feed prices and disease outbreaks wherein industry players continue to focus on developing breed with lower FCR and higher disease resistance and innovations in poultry vaccines. Additionally, stabilising input costs, improved feed management and government support further enhance growth prospects. Post the COVID disruption in FY2020, which impacted scale and profitability, the industry saw a strong demand recovery with better realisations. However, this moderated in 2023 and 2024 due to oversupply and increased input costs. Meat and egg prices are volatile due to commodity and perishable nature of these products and they are influenced by local supply-demand dynamics, which limit pricing flexibility. The poultry industry experienced volatility in broiler meat prices during FY2024. Strong demand boosted prices in H1 (April to October) last year, but an oversupply from November 2023 led to a decline.

TABLE 4 – Revenue & PBILDT Mar.gin



Source: CMIE and CareEdge Ratings estimates.

In the current situation, the industry faces many challenges and opportunities. Among them the biggest challenge is posed by the fluctuations in input costs. The poultry industry is heavily dependent on feed cost. Feed prices, driven by factors like weather and global demand for maize and soybean, significantly impact profitability of players operating in the industry. In FY2024, the industry witnessed a stabilisation in feed prices that had a direct impact on profitability. To reduce the impact of the same, key players focus on developing better breed which has lower Feed Conversion Ratio (FCR).

TABLE 5 – Maize (Corn) Price

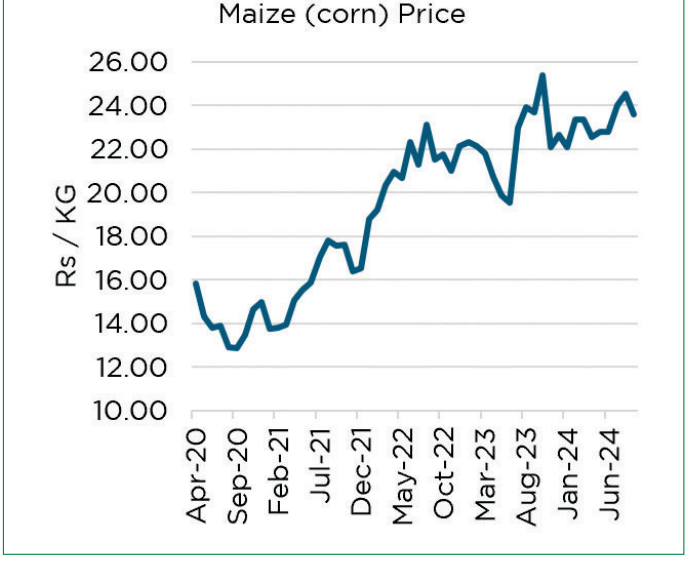
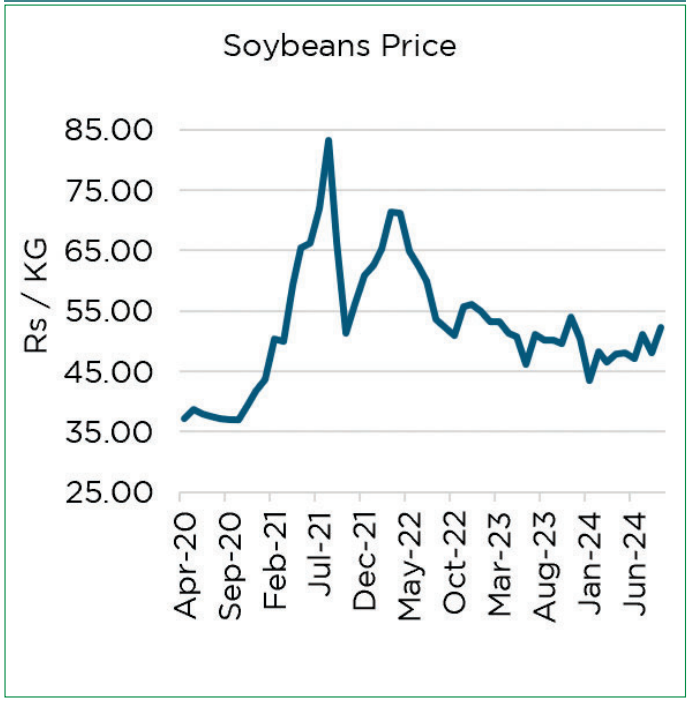


TABLE 6 – Soybean Price

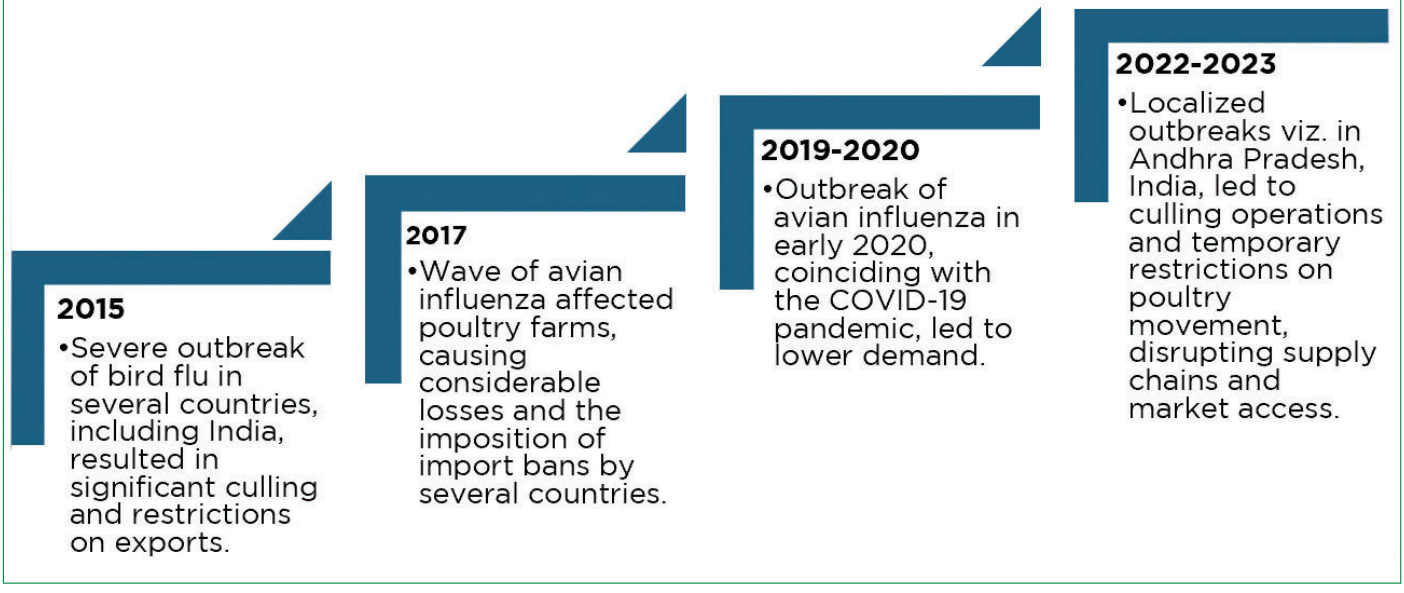


Source: Agmarknet.gov.in and CareEdge Ratings

The other challenge of the industry is disease outbreaks, particularly avian influenza (bird flu), that significantly impacts the profitability of the sector by causing both direct and indirect losses.

Year-wise, the poultry industry has witnessed several outbreaks that have impacted its players as follows

TABLE 7 – Avian Influenza Outbreaks 2015-2023



This results in lower sales volumes and prices, negatively affecting revenue and margins. Additionally, disease outbreaks lead to increased expenditure on biosecurity measures, vaccinations and other preventive actions, further squeezing profitability and the same continue to weigh down on the industry players. To tackle this issue, key players focus on developing vaccines as well as disease resistant breeds. However, considering the commodity nature of the product, cost and effectiveness remain a key challenge.

Feed Conversion Ratio (FCR) is crucial for profitability in the poultry industry, reflecting how efficiently birds convert feed into body mass. Over the last decades, there has been a noticeable improvement in the FCR across all bird sizes, with larger birds demonstrating the most efficient feed conversion. The FCR for breeds that dominate the Indian poultry market typically ranges from 1.50 to 1.80. This efficiency can be further optimised through improvements in breed selection, feed quality and management practices. Analysis reveals that larger poultry groups achieve better feed efficiency, with management strategies and seasonal variations playing key roles in maintaining optimal FCR values.

Looking ahead, revenue and margins are expected to recover in 2025. For 2025 CareEdge Ratings anticipates a gradual recovery in prices as the demand-supply balance improves, with seasonal demand during festive periods and colder months supporting stabilisation.

Sustainability is the key for any industry to grow and survive, and today, ESG provides an excellent pathway to build systems and processes to get there. Some of the relevant factors for ESG in poultry industry include i. Climate change and greenhouse gas emissions ii. Pollution and waste management iii. Resource conservation and biodiversity protection. There are further social and governance factors like labour practices and working conditions, human rights and community relations, diversity and inclusion, product safety and consumer protection to board composition and independence, risk management and internal controls, transparency and accountability and anti-corruption and bribery prevention.

Many companies worldwide have initiated the ESG compliance annual reports into their progressive work culture.

In the leading international agri-business company, Cargill's 2023 ESG Report, Brian Sikes, President and CEO in his message says, "When it comes to urgent challenges facing people and the planet, Cargill's connections across the food system give us the opportunity – and responsibility – to deliver meaningful solutions. That's why, throughout our global supply chains, Cargill is driving industry-leading change that's creating value for our customers, farmers and communities. And agriculture is how we're getting it done."

The Cargill report shares how the company is delivering impact with purpose and partnership. It elaborates delivering innovative, sustainable solutions for their customers that together drive collective action; engaging with farmers around the world to transform agriculture supply chains to be more sustainable; and partnering to build resilient, inclusive communities where they do business.

"Our sustainability strategy is focused on three areas: Climate, Land and Water and People. Within each of these areas, we have a clearly defined approach with commitments and programs to drive positive change and maximise our impact within our operations, supply chains and communities," the report highlights.

The company's sustainability strategy is specifically focused in three areas – Climate, Land and Water and People. Within these areas, they have specific commitments and targets that provide clarity on the most important issues they seek to address through their solutions, supply chains, external partnerships and management of the group's operations and businesses.

Climate: Food insecurity and climate change are inextricably linked. We must mitigate and adapt across the food system – particularly helping farmers, who are on the front lines of climate change. That's why our climate action includes aggressive measures to expand farmer-led adoption of regenerative agriculture and decarbonise how to grow, process and move the world's food.

Land and Water: Effectively managing our planet's natural resources, including preserving critical ecosystems and water resources, is essential to ensuring we can continue to produce food for a growing population. It's also essential to enabling climate mitigation and adaptation. Our work is grounded in nature-based solutions and accelerated through partnerships with farmers, customers, industry groups, non-governmental organizations (NGOs), and governments.

People: Our food and agriculture system must nourish the world. But to do that, we need to support the people who make it possible. Working alongside our employees, farmers, customers and communities, we seek to improve livelihoods and build a more equitable, inclusive and resilient food system.

On another spectrum, the Government of India has issued practical environmental guidelines for poultry farms to help in addressing the main issues for poultry farming.

Environmental nuisance arising from poultry farms is due to the generation of NH_3 and H_2S gases causing odour, dust from feed mill, storage and management of Solid Waste (manure, dead birds and hatchery waste) also causing odour and water from cleaning operations. Breeding of flies and rodents etc. are the other issues from poultry farms.

The gaseous emission viz. Ammonia (NH_3) and Hydrogen Sulphide (H_2S) emanate from the excreta generated from the birds causing odour. The odour is produced due to anaerobic conditions in the litter occurs due to its storage at one place for longer period. The general practice followed by poultry farms to control odour is by maintaining good ventilation and free flow of air.

For the minimisation of odour/gaseous pollution, the government guidelines prescribe:

- Proper ventilation and free flow of air over manure collection points to keep it dry shall be ensured
- Manure should be protected from run-off water and from unwanted pests/insects
- Well-designed storage facilities should be provided to contain manure/litter
- Carcasses of dead birds shall be promptly collected on regular basis and disposed appropriately without damaging the environment as per the prescribed methods under section 7.2.3 of the guidelines

Dust is generated from the feed mill operation during mixing and grinding of various ingredients of feed. The feed mill operations are typically located inside the mill buildings. Dust extraction systems are generally used to collect the dust and to improve the shop floor environment.

For dust accumulation prevention in feed mills, the government suggests:

- Feed mill and godown should be located on a well elevated ground preferably near the entrance of the farm and isolated from other poultry sheds
- Dust collector system should be installed to control emissions from mixing and grinding section of the feed mill
- Workers in the feed mill shall be provided with dust masks to protect them from dust
- Provision for vehicle tyre dip shall be made at the entrance to remove impurities/dust carried by vehicle tyres
- Floor of the feed mill and godown shall be concrete and raised above the ground level by a minimum of 2 feet

Some sources of solid waste in farming are poultry droppings/manure/litter, dead birds and hatchery waste.

In case of cage system, excreta are collected just below the bird cages directly on ground, made of stone slabs or concrete or impermeable compacted clay. Litter is collected and kept dry by maintaining good ventilation and free air flow to undergo aerobic composting. The manure is removed once in four to six months and sold to the farmers. In deep litter system, excreta are collected in bed made up of agro residue (rice husk, saw dust, groundnut hulls, wood shavings and dried leaves) itself. Once in a day or two days the bed is scratched for mixing litter. Once the chicken is sold for meat, the bed (rice husk, saw dust, groundnut hulls, wood shavings and dried leaves) is removed once the cycle of 42 to 45 days gets over along with the excreta and sold as manure. The shed is washed and lime is applied as disinfectant and allows the area for quarantine period.

For management of solid wastes like manure/litter, hatchery debris and dead birds, the government has issued stringent guidelines as well.

For manure handling and disposal

- Proper ventilation and free flow of air over manure collection points to keep it dry (by blowing dry air over it or by conveying ventilation air through the manure pit) shall be ensured to prevent obnoxious odour in the area
- Poultry housing shall be ventilated allowing sufficient supply

of fresh air to remove humidity, dissipate heat and prevent build-up of gases such as methane, carbon dioxide, ammonia etc.

- Excreta shall be scratched at least once in two days as needed for mixing of litter and to keep bedding material (rice husk, saw dust, wood shavings etc.) dry. In case of deep litter houses the waste material shall be utilised for composting after completion of the cycle.

Table 8

Sl. No.	Poultry Farms	Methods for Disposal/Utilization of Manure
1.	Small Poultry Farms	Composting
2.	Medium & Large Poultry Farms	Composting or Biogas production for disposal/ utilisation of manure/litter Combination of any of the methods for disposal/utilisation of manure/litter
3.	Poultry Farms in Cluster	Common facilities for Biogas production or Composting or their combination

- Manure collected under cages on high raised platforms shall be stored for further processing and utilised by using the following options:
- Land application of manure to the nutritional requirements of soil and crop shall be balanced
- The litter/ manure storage facilities shall be minimum 2 metres above the water table and of adequate size based on type and number of birds handled. Its base should be constructed with stone slabs or concrete or impermeable compacted clay
- Manure should be protected from run-off water and cover it to avoid dust and odours in storage pits. The dry manure dump shall be covered with permanent roof or with plastic/ similar material to prevent air emissions and the precipitation falling on it
- Mortalities on farm by proper animal care and diseases prevention program shall be reduced
- Proper facilities (burial pit/composting/incineration) shall be provided for collection, storage, transport and disposal of dead birds
- Domestic hazardous wastes (vaccines, vails, medicines, syringes etc.) shall be disposed as per provisions of "Solid Waste Management Rules, 2016"

For the composting of manure, government guidelines say:

- Proper mixing the waste with a carbon rich material (e.g. paddy straw/ husk, wood shavings) should be done in the pits. Carbon to nitrogen ratios of 20-25:1 is usually recommended. Pure manure can also be composted following the procedure and monitoring all parameters. The composting facilities may be designed through expert institutions in the field as per the size of poultry farms
- Periodic stirring of compost material should be done for its proper mixing
- Moisture levels should be maintained between 35 to 50%
- Temperature monitoring should be done to determine composting conditions

And for hatchery waste, the norms say:

- Efforts shall be made in converting the shells to animal feed to supply as a source of calcium, especially of poultry feeds
- Extrusion with soybean meal can be used to make a shell/ hatchery meal
- Un-hatched eggs shall be disposed of by composting or rendering

Death of the birds in poultry farms is a common phenomenon and their disposal is an issue. Dead birds cause nuisance, odour and aesthetic problems like disease, insect, rodent and predator problems if the birds are not disposed immediately. Dead birds are either burnt at relatively high temperatures using different fuels which cause atmospheric pollution and also odour nuisance or buried in the burial pit in the premises.

During hatching operation, large quantity of solid waste comprising of egg shells, unhatched eggs, dead embryos and chickens and a viscous liquid from eggs etc. is generated. This waste is disposed through open burning or through rendering plant.

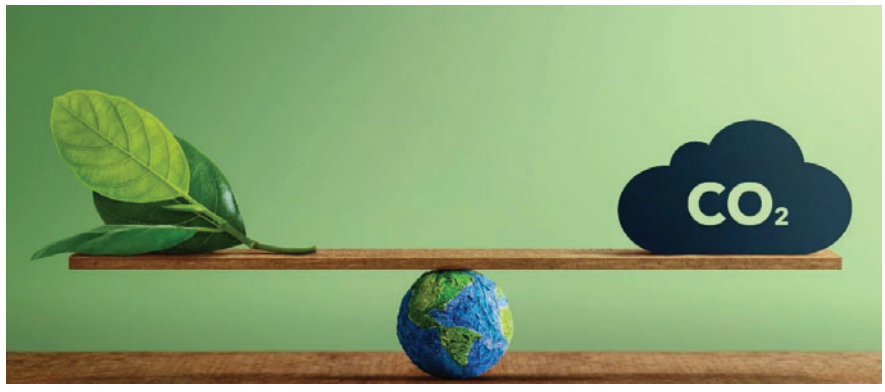
The dead birds arising from day to day farm activity shall be separated from other live birds promptly and stored in closed containers and disposed off within 24 hours by following any of the disposal methods.

The Burial Method:

- The dead birds arising from day to day farm activity should be separated from other live birds promptly and should be stored in closed containers /disposed off within 24 hours
- The dead bird burial pit shall be of minimum 3 to 4 m in depth and 0.8 to 1.2 m diameter and this size may vary as per the capacity of poultry farm and shall be located above minimum 3 m from the ground water table
- The dead bird burial pit shall be provided with a vermin/fly proof cover made up of wooden/metal/ concrete having a central operable lid of proper size for day to day dropping of carcasses
- Carcasses shall be covered by a thin layer of soil (at least 40cm deep) along with calcium hydroxide
- When the pit is full, a compacted soil cover of 0.5 m shall be provided with the top of the covered soil well above the ground level
- The distance between any two burial pits should not be less than 1 meter

For composting, the government guidelines suggest:

- The composting facility shall not be located within 300 m from the nearest dwelling and 100 m from a well or water course
- The capacity of the composting facility shall be sufficient to handle the average mortalities on the farm
- The roof of the composting facility shall be permanent with concrete bottom
- The composting facility shall be secured with link mesh all around raised to a height of 1.5 m above the ground level to avoid the predation by stray dogs etc
- A proper mixture of smaller and larger particle sizes to obtain an optimum air exchange within the mixture and build-up of temperature
- Moisture content of the composting pile shall be approximately 60%. More than this may result in odour problems and less than this will reduce the efficiency of the composting process
- Carbon and nitrogen are vital nutrients for the growth and reproduction of bacteria and fungi. The carbon-to-nitrogen ratio shall be in the range of 20:1 and 25:1 for proper composting. This is obtained by carefully balancing the dead bird and carbon sources
- The optimum temperature for composting is 54 to 66°C which pasteurises the compost. If temperature falls below 49°C after a week or so, the material should be moved to the secondary stage unit. To facilitate the easy transfer of the first stage material to the secondary stage, the proper designing of the primary stage (first stage) facility is desirable. Failure to do sowill result into poor compost. The temperature in the secondary stage unit will begin to raise as beneficial bacterial activity begins and will peak in 5 to 10 days.



Waste water generation from cleaning operation can be a source of waste. Water in poultry farms is used for drinking of birds, sprinkling during the summer and for cleaning sheds and equipment in between batch replacement. As such there is no process waste water generation from the poultry farming. However, waste water is generated during cleaning operations. The waste water is collected in holding tank and utilised in gardening in the premises. Breeding of flies and rodents etc. are the other issues in poultry farms.

- The waste water generated from the cleaning operations (after each batch removal) shall be collected in appropriate holding tank and put to use in the green belt. Efforts may be made for dry cleaning of the sheds with use of disinfectant so as to avoid use of water
- Water use and spills from drinking devices shall be reduced by preventing overflow or leakages and using calibrated , well-maintained self-watering devices
- Improve drainage, reduce standing water and water ditches to control mosquitoes and flies
- Use of pressure pumps, hot water or steam in cleaning activities instead of cold water and plain water scrubs may be encouraged to improve sanitation and reduce the quantities of wash water

The government also derived at guidelines for other issues at the poultry farm, like control of flies: Proper treatment and disposal of manure, ventilation of sheds, control of temperature, good sanitation, swift repairs of leaks, avoidance of feed spills, prompt removal of broken eggs and dead birds shall be ensured for control of flies in the poultry farms. The farm should have provisions of wire nettings, traps, fly-repellents, insecticides etc.

Control of rodents: Methods for the control of rodents may include i. Exclusion ii. Trapping glue boards iii. Tracking powder iv. Rodent proof doors and windows to eliminate rodents/pest infestation.

As per Bureau of Indian Standards 1374:2007, on poultry feed specifies that antibiotics should not be mixed with feed or administered for non-therapeutic purposes without prescription for diseased birds. Regulation for use of antibiotics shall be regulated as per the advisory/directions issued by Department of Animal Husbandry, Dairying and Fisheries and Ministry of Health and the Drug Controller General of India.

For new poultry farm sites, the ones set up after issuance of guidelines, the government says this new set of should preferably be established:

- 500 m from residential zone in order to avoid nuisance caused due to odour and flies
- 100 m from major water course like river, lakes, canals and drinking water source like wells, summer storage tanks, in order to avoid contamination due to leakages/spillages, if any
- 100 m from National Highway (NH) and 50 m from State Highway (SH) order to avoid nuisance caused due to odour & flies
- 10-15 m from rural roads/ internal roads/ village pagdandis
- The poultry sheds should not be located within 10 m from farm boundary for cross ventilation and odour dispersion

There are also set regulatory and monitoring mechanism for the poultry farms by the government authority which states:

- SPCBs/PCCS shall upload Environmental Guidelines on their website
- Guidelines shall be applicable to all the category of poultry farms
- Poultry farms handling birds above 25,000 at single location will have to obtain consent to establish (CTE) and consent for operate (CTO) under the Water Act, 1974 & Air Act 1981 from State Pollution Control Board/ Pollution Control Committee
- The poultry farms are categorised under "Green" category, therefore validity of the consent will be for 15 years
- Animal Husbandry Department of the state/districts to assist the poultry farms for implementation of guidelines

In India, ABIS Exports (India) Pvt. Ltd. published their first Environment, Social and Governance (ESG) report in 2023 titled "Nourishing, Nurturing and Evolving" that narrates the company's forward journey in the space of sustainable development. The report summarises ABIS's business interventions to empower the future and their wide range of requirements of nourishment. It helps nurture an amicable and robust relationship with the company stakeholders and strive to improve their stance with respect to materiality issues relevant to their business unit. It also enables to be prepared to foresee and mitigate pertinent issues while adapting to new scenarios and circumstances. "Our ESG contribute to the UN SDGs in three ways – through our work in our operations, through strengthening and empowering our workforce and through building social and human capital," the report says.

The report specifies that ABIS has quintessentially been nurturing its relationship with the environment over the years. "We are making continuous efforts to optimise efficiency across the environmental, social and governance framework of the company. We work through a true integration framework linking our forward and backward supply chains. Sustainability is critical in every step of our business strategy," the report states.

"We give equal attention to all the three pillars of ESG, wherein our 'E' journey and strategy is reflected in our commitment towards net zero emission, zero waste disposal, water conservation and response to climate change, 'S' gets reflected in our commitment towards community health, safety and wellbeing. Applying good governance practices that confirms to the letter and spirit of regulatory authorities reflect the 'G'," sums up Zoya Afreen Alam, Director of ABIS.

As stated in the report the focus areas of the ESG compliance are interconnected and form the basis of the company's plan for a sustainable development. Their sustainability strategy is focused on three principles:

- Protecting Environment: "We are focusing on climate change and effective and sustainable management of water and waste"
- Safeguarding and Enhancing life and livelihoods: "We collaborate with our employees, farmers, customers and communities to enhance livelihoods and create a more secure, equitable, inclusive and resilient food system"
- Enabling Good Governance: "Our governance reflects policies, structures, practices, culture and ethics moored in transparency and integrity"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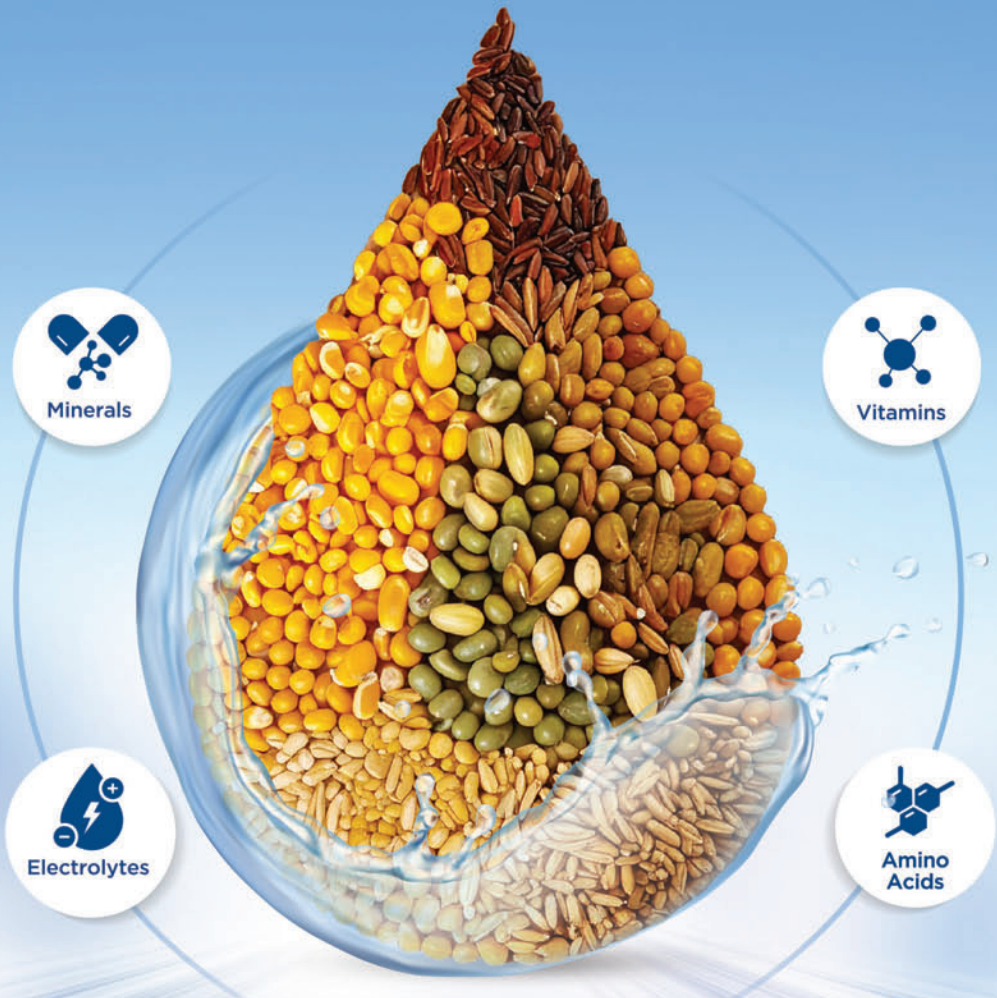

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Article

Decoding the State of the World's Animal Health

SHRIDHAR speaks

Tarun Shridhar
Director General,
Indian Chamber of Food and Agriculture, and former Secretary, Ministry of Fisheries, Animal Husbandry and Dairying, Govt.of India

The World Organisation for Animal Health (WOAH) has released the inaugural edition of the *State of the World's Animal Health*. This key publication is on the analogy of the annual and biennial publications of the Food and Agriculture Organisation (FAO) which capture, in depth, the global resources and status of diverse subjects such as Food and Agriculture, Fisheries and Aquaculture, Food and Nutrition, Agriculture Commodities etc. These are classified as the flagship publications of the FAO that are rich in data and information and provide a global overview and perspective of critical issues, backed up with real life case studies. The WOAH has followed lead and taken a good initiative, even though a bit late, to capture and analyse the state of animal health in the world. The multiple animal diseases spread in our shared ecosystems have been extensively documented and an effort made to offer solutions, though they appear more didactic than tangible. However, the strong focus and advocacy on the power of vaccination in tackling the challenging threats of animal diseases and zoonoses deserves serious thought and appropriate interventions.

Infectious animal diseases pose an ongoing and continuing threat all across the world like never before. There are multiple instances, in diverse parts of the world, of the spread of Avian Influenza beyond poultry. If this is not alarming enough, we are seeing the resurfacing of foot-and-mouth disease in Europe for the first time in decades. To further compound matters, new and emerging diseases continue to disrupt our environs in the fast changing world. To what could we attribute this disturbance? Climate change? Rapidly increasing global trade? Compromised bio-security? Whatever be the speculation, the fact is that the newly emerging and ever shifting pathogens, in fact by the day, are creating a mayhem. Today, diseases are spreading faster and hitting harder than ever before; therefore, we need eternal vigil and quick response, and this response has to be necessarily collaborative and institutional since the challenge is trans-boundary. No pathogen has ever been deterred by a political or a geographical border.

It would be a worthwhile and productive exercise to dissect and summarise the first edition of the State of World's Animal Health which is poised to be WOAH's flagship publication. To begin with, it acknowledges, strongly and outrightly, the criticality of One Health. "Animal health is inextricably linked to human health, the stability of ecosystems and the strength of economies. In a world facing increasingly complex global challenges – emerging infectious diseases, climate change, antimicrobial resistance and food insecurity – ensuring the health of animals is crucial", thus begins the foreword. It goes on to emphasise that "Animal diseases know no borders. Whether affecting livestock, wildlife or aquatic species, their impact can be devastating – threatening livelihoods, public health, food supply chains, international trade and biodiversity. Our ability to prevent, detect and respond to these threats depends on robust surveillance, strong Veterinary Services, and the effective implementation of science-based policies." The publication attempts to reinforce the message that proactive investment in animal health is an investment in global health security "because animal health is our health. It's everyone's health."

The first and the strongest of the messages is that vaccines are among the most powerful and unmatched tools for preventing and controlling diseases. They minimise livestock losses, prevent the spread of zoonotic diseases and thus reduce the global need for antibiotics. In short, vaccines save lives. But alas! Not everyone can have unhindered access to them. Vaccination has been a game changer in the fight against and eradication of many debilitating diseases such as Rinderpest, FMD, PPR etc. Even though the WOAH vaccine banks have provided a lifeline for communities affected by animal disease outbreaks by offering high quality vaccines in compliance with WOAH International Standards at an affordable price, yet access to vaccines is grossly discriminatory around the world. There are ongoing challenges when it comes to research, production, distribution and uptake. Political uncertainty and lack of consistent funding add to this already complex picture. As highlighted by COVID-19, vaccination hesitancy is also a serious condition which can't be brushed aside; it must be addressed on multiple fronts, including societal awareness campaigns. Besides highlighting the critical importance of vaccines and calling for a multi-disciplinary One Health approach, the report does not offer a workable solution to the challenge of access, availability and affordability of vaccines.

Animal diseases are not only on the move, the pace of this movement is

olympian too; so, a matching swiftness is expected from us. Further, infectious animal diseases are migrating to previously unaffected areas, places that are often unprepared to deal with them. One of the underlying factors behind this trend is climate change. Rising temperatures and changing weather patterns are dramatically altering today's landscape, making it easier for pathogens and diseases to find new grounds in more favourable conditions. Most of them have zoonotic potential i.e., transit from animal to human; recognition of the critical interconnection between the two ecosystems should be the key to our policy and strategy to meet the situation. The arrival or re-emergence of diseases in new regions is a telling sign of an ever-changing world. It is a warning, too. Is our ability to respond keeping pace? Investing in stronger surveillance systems, quicker response capacities and cross-border collaboration to prevent frequent and unpredictable disease outbreaks should form one of the cores of policy.

Outbreaks of bird flu are more worrying than ever before. The world is grappling with a deadly wave of high pathogenic avian influenza (HPAI). Over the last 20 years, more than 633 million birds have been lost to the disease. However, birds are not the only species which has been affected. What is startling is that the virus has also been detected in mammals such as foxes, dolphins, bears and even domestic pets. According to this report, outbreaks in mammals more than doubled last year compared to 2023, jumping from 459 to 1,022. Whilst the risk of human infection remains low, the more the mammalian species get affected, the higher the potential of it spilling over into humans.

Global antibiotic use in animals is dropping, so says the report. A very healthy development and good news indeed. The misuse and/or overuse of antimicrobials tends to the development of antimicrobial resistance (AMR), reducing the effectiveness of antimicrobials. The indirect, but serious, impacts of this phenomenon could be disquieting, ranging from higher food production costs on account of higher animal mortality, reduced productivity and compromised food security. The use of antimicrobials in animals has decreased by 5% between 2020 and 2022, and expanding livestock vaccination globally would further reduce the risk of antibiotic resistance. According to a 2024 report co-published by WOAH and the World Bank, if farmers worldwide reduce antibiotic use by 30% through improved hygiene, vaccination and biosecurity, the global GDP could gain up to US$120 billion between 2025 and 2050. Innovative approaches such as encouraging probiotics and genetic improvement could contribute substantially. However, WOAH assesses that due to continued investment in research and the adoption of innovative technologies, vaccination is poised to become the most effective tool in the global fight against AMR.

If one were to summarise the report, the crux would be that investment in animal health means protection of everyone's health. So, it is important to strengthen the resilience of animal and public health systems. To reiterate, investment in animal health creates a resilient, sustainable and secure future for animals and humans alike.

Rising temperatures and changing weather patterns are dramatically altering today's landscape, making it easier for pathogens and diseases to find new grounds in more favourable conditions. Most of them have zoonotic potential i.e., transit from animal to human; recognition of the critical interconnection between the two ecosystems should be the key to our policy and strategy to meet the situation

Article

Sudden Death Syndrome in Broilers: Pathogenesis, Risk Factors, and Current Mitigation Approaches

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Kemin Industries South Asia Pvt Ltd

Introduction

Sudden Death Syndrome (SDS) in poultry, primarily affecting fast-growing broiler chickens, is a metabolic disorder characterised by the sudden and unexplained death of healthy birds. It predominantly occurs in male chickens, particularly those raised in intensive production systems, and is most common between 2 and 4 weeks of age, with an incidence ranging from 0.5% to 5% of affected flocks[1]. Sudden Death Syndrome (SDS), also known as Mortesubita, Acute Death Syndrome, Dead in good condition, Heart attack, or Lung Edema, is a condition commonly observed in fast-growing broiler chickens[2]. SDS is sometimes referred to as "flip-over disease" because affected birds often flip onto their backs, dying with their wings outstretched and legs extended[2]. Affected chickens experience a rapid onset of imbalance, intense flapping, and muscular contractions lasting around 53 seconds before death[3].

Sudden Death Syndrome (SDS) in modern broiler chicken production represents a significant concern due to its impact on mortality rates and overall economic losses, particularly at the end of the fattening period[4]. SDS results in direct financial losses through bird fatalities and induces indirect costs, including uneven flock growth, higher feed conversion ratios, and increased labour and veterinary expenses. The industry's focus on achieving rapid growth, and feed efficiency to meet rising global poultry demand inadvertently intensifies the risk of SDS. Addressing this issue is crucial for both animal welfare and production efficiency, as well as for the sustainability and profitability of poultry operations. Mitigating SDS is vital for maintaining economic returns and meeting global food security needs. A comprehensive understanding of its etiology, pathogenesis, pathophysiological symptoms, and diagnostic strategies is necessary. Implementing targeted prevention measures and best management practices will help reduce SDS prevalence, safeguard flock health, and ensure long-term sustainability in poultry production.

Etiology and Pathogenesis of SDS

Sudden death syndrome in broilers is influenced by various factors like nutrition, genetics, and environment. However, the primary trigger is acute cardiac arrhythmia, which causes fatal reactions in birds[1].

Genetic and Metabolic Influences

Rapid growth rates in genetically selected broilers significantly heighten the risk of ascites and sudden death syndrome (SDS) due to disproportionate metabolic oxygen demand[1]. This outpaces the development of cardiac and pulmonary systems, leading to functional insufficiency and increased SDS susceptibility[1].

SDS is recognised as a metabolic disorder wherein disturbances in metabolite or electrolyte homeostasis precipitate ventricular fibrillation, ultimately resulting in mortality[1]. Contemporary perspectives emphasise that SDS is primarily driven by metabolic dysregulation, not necessarily due to accelerated weight gain, but rather due to elevated systemic oxygen demands. This heightened demand induces disruptions in electrolyte equilibrium and systemic acid-base balance. Consequently, acute alterations in electrolyte concentrations and blood pH are considered critical triggers for the onset of SDS[1].

Figure 1: Symbolic image of dead birds on a farm representing sudden death syndrome[29]

SDS causes sudden mortality in broiler chickens, primarily due to the acute cardiac stress that leads to pulmonary edema and respiratory failure[1].

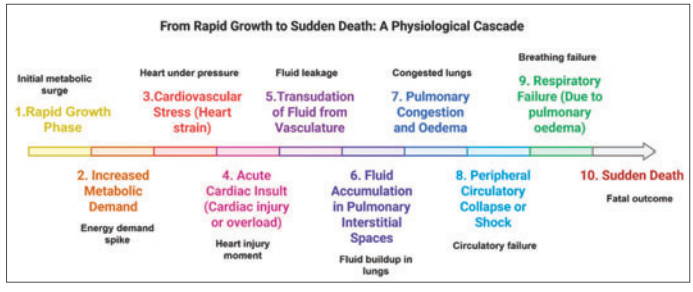


Figure 2: Schematic diagram of the physiological cascade for rapid growth to sudden death[1]

Modern, fast-growing broiler strains are increasingly prone to cardiovascular anomalies, contributing to higher mortality rates linked to cardiac dysfunction[21]. Sudden Death Syndrome (SDS), primarily attributed to cardiac arrhythmias, is common in these genetically selected birds[2]. The condition is exacerbated by accelerated muscle growth, heightening the risk of arrhythmic events[2]. Heritability studies suggest a strong correlation between SDS, body weight, and ascites incidence, highlighting genetic predisposition as a key factor[28].

Occurrence Patterns and Incidence Rates

The occurrence and incidence of SDS in broilers vary, typically affecting birds from 2-3 days of age to market age, with peak mortality occurring between 21-28 days [2,5]. Males are more susceptible, accounting for 60-80% of deaths, likely due to their higher growth rates and hormonal factors[7]. Mortality rates range from 0.5 to 5% in affected flocks[5].

Diet Texture and Composition

The form of diet affects feed intake, metabolic rate, and the risk of metabolic diseases like SDS. While mash diets reduce SDS incidence, they also slow growth, which is not ideal. Pelleted feeds increase feed intake and growth rate, raising SDS risk[9]. Some studies suggest that pelleting protein supplements, especially soybean meal, may produce toxins linked to SDS, but including meat meals may offer some protection against it[5]. However, this remains unclear.

Diet composition plays a crucial role in the incidence of SDS in poultry. Studies suggest that replacing carbohydrates with lipids, such as glucose, lipids, and corn starch, may influence SDS mortality[5]. Additionally, low-density diets have been found to reduce SDS mortality compared to high-density diets[10]. Furthermore, feed formulations with more wheat and less corn are associated with higher SDS incidence[5]. These findings indicate that diet composition, including energy sources, can impact SDS occurrence and body weight in poultry.

Nutritional Factors

Protein & Amino Acid

Dietary protein appears to have a limited direct effect on Sudden Death Syndrome (SDS), with protein-deficient diets potentially reducing SDS incidence, though at the cost of growth and increased fat deposition[5]. High-protein diets with excess sulphur may promote acid secretion and lactic acid buildup, contributing to SDS. Taurine, an amino acid, influences heart health, and its deficiency could lead to heart failure and SDS, although its precise role remains uncertain[11]. Additionally, the use of meat meals in diets has been associated with a reduced SDS incidence, suggesting the presence of unidentified factors in meat meals that help mitigate SDS[5].

Lipids

The type and level of dietary lipids, particularly the balance between saturated and unsaturated fats, may influence the incidence of Sudden Death Syndrome (SDS) in broilers[12]. Studies show that broilers fed saturated oils have lower SDS occurrence, and those fed sunflower oil experience less mortality than those fed tallow[13].

Maternal intake of n-3 polyunsaturated fatty acids (PUFAs) influences offspring myocardial tissue composition, reducing Eicosanoid production and SDS risk[14]. High metabolic rates in broilers increase free radical formation, contributing to SDS[5]. Melatonin supplementation may reduce SDS by counteracting high-intensity light's inhibitory effect on melatonin production[5]. Additionally, low Linoleic and Arachidonic acid levels in heart tissue impair prostaglandin synthesis, increasing SDS susceptibility[5].

Carbohydrates and Lactate

The pathogenesis of SDS is significantly influenced by the type and availability of carbohydrates, rather than by proteins or fats[8]. Research shows that different carbohydrate sources, such as glucose and corn starch, impact mortality rates, likely due to their effect on lactic acid metabolism[5]. Elevated levels of Lactate Dehydrogenase (LDH), Glutamic Oxaloacetic Transaminase, and Creatine Phosphokinase are indicators of circulatory disturbances and are often associated with SDS[15].Inadequate oxygen due to poor organ growth (heart and lungs) exacerbates lactate production, resulting in muscular contractions, imbalance, and ultimately, violent flapping, contributing to SDS onset.

Minerals

Stress conditions, such as lighting and stocking density, are proposed to increase Catecholamine secretion from the adrenal gland, elevating catecholamine and calcium ion levels in cardiac muscle, potentially leading to cardiac arrhythmias[6]. Selenium deficiency is also considered a cause of Sudden Death Syndrome (SDS) in broilers, likely due to its antioxidant properties[5]. Additionally, high dietary saturated fatty acids can bind with minerals like magnesium, calcium, and zinc, reducing their bioavailability, affecting the nervous system, and possibly causing SDS-like conditions[8].

Vitamins

There is limited evidence suggesting that vitamin deficiencies, particularly B vitamins like biotin, may influence the incidence of Sudden Death Syndrome (SDS) in broilers[5]. Higher SDS rates have been observed in flocks fed wheat, potentially due to biotin deficiency in wheat. Supplementing biotin through corn or wheat may reduce mortality, although the required amount is typically met with the diet's premix[5].

Excessive supplementation of vitamin D_3 in broiler diets, often aimed at preventing leg disorders, may paradoxically increase the risk of Sudden Death Syndrome (SDS)[1]. High vitamin D_3 levels disrupt cardiac morphology and electrophysiology, promoting arrhythmias[1]. Coupled with rapid growth and mineral imbalances, this significantly elevates the susceptibility of broilers to SDS.

Stress

Recent studies suggest that stress is a major contributor to Sudden Death Syndrome (SDS) in broiler chickens, with arrhythmia-inducing stress playing a key role[1]. Stress can exacerbate SDS symptoms, and mortality may occur days after the stressor.

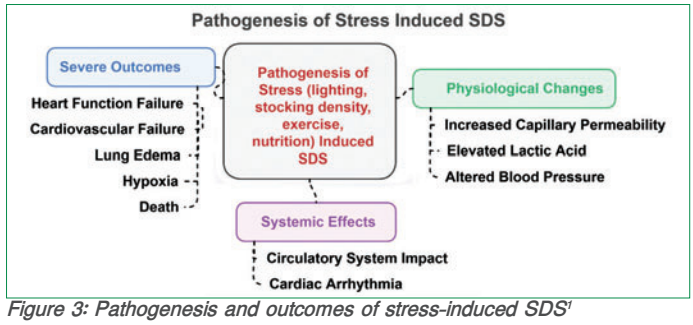
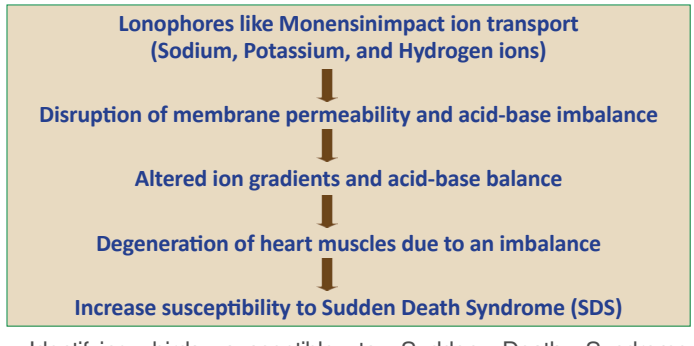


Figure 3: Pathogenesis and outcomes of stress-induced SDS[1]

Drugs

The pathogenesis of Sudden Death Syndrome (SDS) in broiler chickens related to anti-coccidiosis drugs, particularly Ionophores, involves several steps[16,17,5].



Identifying birds susceptible to Sudden Death Syndrome (SDS) remains challenging, as current methods, including electrocardiograms, temperature monitoring, and behavioural

observations, are insufficient. Histopathological changes in the heart may help identify structural traits that predispose broilers to lethal arrhythmia[2], but further research is needed for a conclusive diagnosis.

Clinical Signs

- Birds initially exhibited normal feeding, drinking, and walking behavior before death, followed by neck extension, squawking, and wing beating, with death occurring within minutes[6]
- All affected birds experienced a sudden onset of symptoms, including loss of balance, violent wing flapping, and strong muscular contractions, with seizures lasting less than one minute. Most birds emitted high-pitched cries or squawks during these episodes[18]

Post-mortem Findings

Upon necropsy, a structure was found within the heart's blood, which was histologically identified as "Jelly clots" or "chicken fat clots," both of which are characteristic of post-mortem formation[6].

- Lungs: Exhibiting edema
- Kidneys and Liver: Slight congestion and subcapsular petechial hemorrhage. The liver appears enlarged with fatty infiltration
- Heart: Firm and contracted, with enlargement. The ventricles are empty, and the atria are filled with blood clots, which are deemed to have a post-mortem origin
- Crop and Gizzard: Containing recently ingested food
- Gall Bladder: Empty, suggesting the bird had eaten before death

Microscopic Lesions

- Lungs: Exhibiting varying degrees of vascular engorgement, with the presence of red blood cells (RBCs) and edema in both intestinal and interlobar connective tissues[6]
- Liver: At the portal triad, there is leucocyte infiltration, causing distortion and reduction in the lumen of the bile duct[6]
- Heart: Degeneration of myofibrils accompanied by leukocyte infiltration (primarily lymphocytes and heterophils). Edema is present, leading to the separation of myofibrils[6]

Biochemical Studies

- Elevated blood lactic acid levels may contribute to Sudden Death Syndrome (SDS) in broiler chickens by damaging the cardiovascular system, increasing the risk of mortality[1,19]
- High calcium ion levels, along with increased catecholamine and adrenaline, have been observed in heart muscles of birds with sudden death syndrome, along with thyroid hormone changes[20,21]
- Elevated creatine kinase levels in broiler chickens, often seen under stress, serve as an indicator of cardiac disturbances and an increased risk of Sudden Death Syndrome (SDS), reflecting potential myocardial damage[21]
- Elevated levels of lactate, lactate dehydrogenase (LDH), glutamic oxaloacetic transaminase (GOT) and creatine phosphokinase in the cardiac muscle are key metabolic and molecular indicators of Sudden Death Syndrome (SDS) in broiler chickens, which can aid in identifying affected birds[15]

Molecular Studies

- Caspase enzymes, particularly caspase-3, play a key role in regulating apoptosis and inflammation, with increased caspase activity observed in heart tissue damage, suggesting that measuring caspase-3 expression could help identify animals at high risk for Sudden Death Syndrome due to cardiac defects[2]
- Mutations in the RYR2 (Ryanodine Receptor 2) gene, which regulates calcium release in heart cells, have been linked to increased susceptibility to cardiac arrhythmia and Sudden Death Syndrome (SDS) in broiler chickens, suggesting that identifying these mutations could help reduce SDS mortality in poultry[22]

Prevention of SDS

- The form of feed, nutrient content, and feed additives may play a role in reducing Sudden Death Syndrome (SDS) mortality in broiler chickens, with some studies suggesting that mash feeding can slow growth and reduce cardiac defects, although other research found no impact of feed type on SDS incidence[1,10]
- Feed restriction has been shown to reduce the incidence of Sudden Death Syndrome (SDS) in broiler chickens, with studies indicating lower SDS mortality in restricted-fed birds compared to ad libitum feeding; however, the negative impact on growth performance and other factors limits its recommendation for commercial production[2]
- Limiting the energy level and nutrient concentration in feed can improve broiler welfare and reduce Sudden Death Syndrome (SDS) mortality, especially in older birds, though some studies suggest that diet type may have little effect on SDS incidence[1,10]
- Plant extracts, such as thyme oil and Echinacea purpurea juice, show potential in improving cardiovascular function and reducing mortality in poultry, including lowering cholesterol and triglyceride levels, and decreasing the risk of Sudden Death Syndrome, though further research is needed for practical application in poultry breeding[23,24]
- Supplementing broiler chicken diets with vitamins such as E, selenium, B-complex, or multivitamin electrolytes has been found effective in reducing the incidence of Sudden Death Syndrome[25]
- Probiotics have been shown to reduce blood lipid metabolites, potentially decreasing metabolic disorders and indirectly lowering the incidence of Sudden Death Syndrome in broiler chickens[26]
- Adding rapeseed oil or fish oil to broiler chicken diets, both rich in omega-3 fatty acids, can reduce the risk of Sudden Death Syndrome by preventing cardiac arrhythmia. A 3% rapeseed oil supplement significantly boosts EPA (Eicosapentaenoic acid) and DHA (Docosahexaenoic acid) levels in heart phospholipids, providing protection against SDS, with rapeseed oil being a more affordable option that doesn't impact meat aroma[1]
- Supplementing broiler chicken diets with Guanidinoacetic acid (GAA) may help reduce the incidence of Sudden Death Syndrome by protecting against lactic acidosis, though it also negatively impacts growth, indicating that more effective SDS prevention methods are still needed[19]
- To reduce Sudden Death Syndrome (SDS) in broiler chickens, it is crucial to manage stocking density and ambient temperature[1]
- The photoperiod length significantly affects Sudden Death Syndrome (SDS) in broiler chickens, with longer periods beyond 10 hours increasing mortality, while appropriate lighting programs and increased melatonin secretion may help mitigate stress-related cardiac arrhythmia, reducing the risk of SDS[27]

Conclusion

Sudden Death Syndrome (SDS) in broiler chickens remains a complex issue influenced by a variety of nutritional, environmental, and genetic factors. While nutritional strategies, such as adjusting energy intake and providing appropriate vitamins and minerals, may help reduce SDS incidence, the overall impact is limited. Stress, particularly related to genetics, nutrition, and management, plays a central role in SDS development. Although current prevention methods can reduce SDS mortality, they often result in decreased production efficiency. Further research is needed to better understand SDS's underlying causes and develop effective prevention strategies that balance animal welfare and production profitability.

(References are available upon request)

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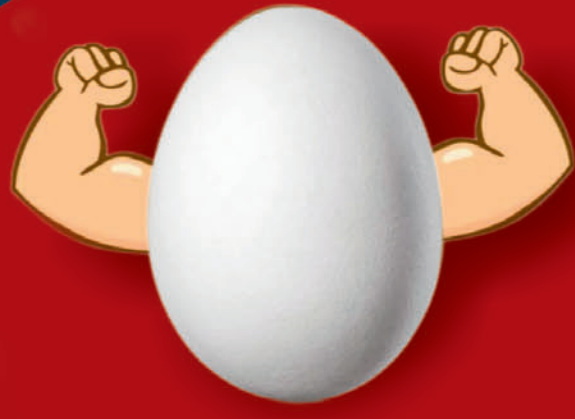

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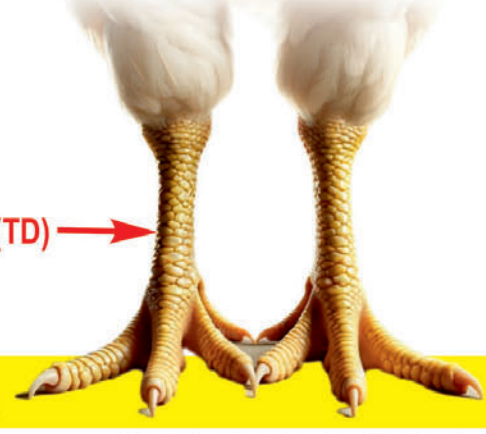

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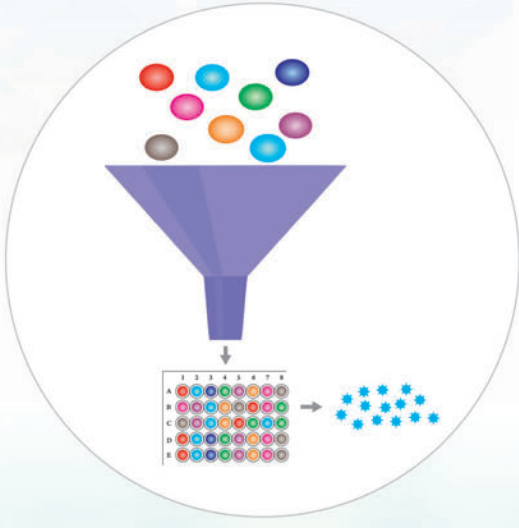

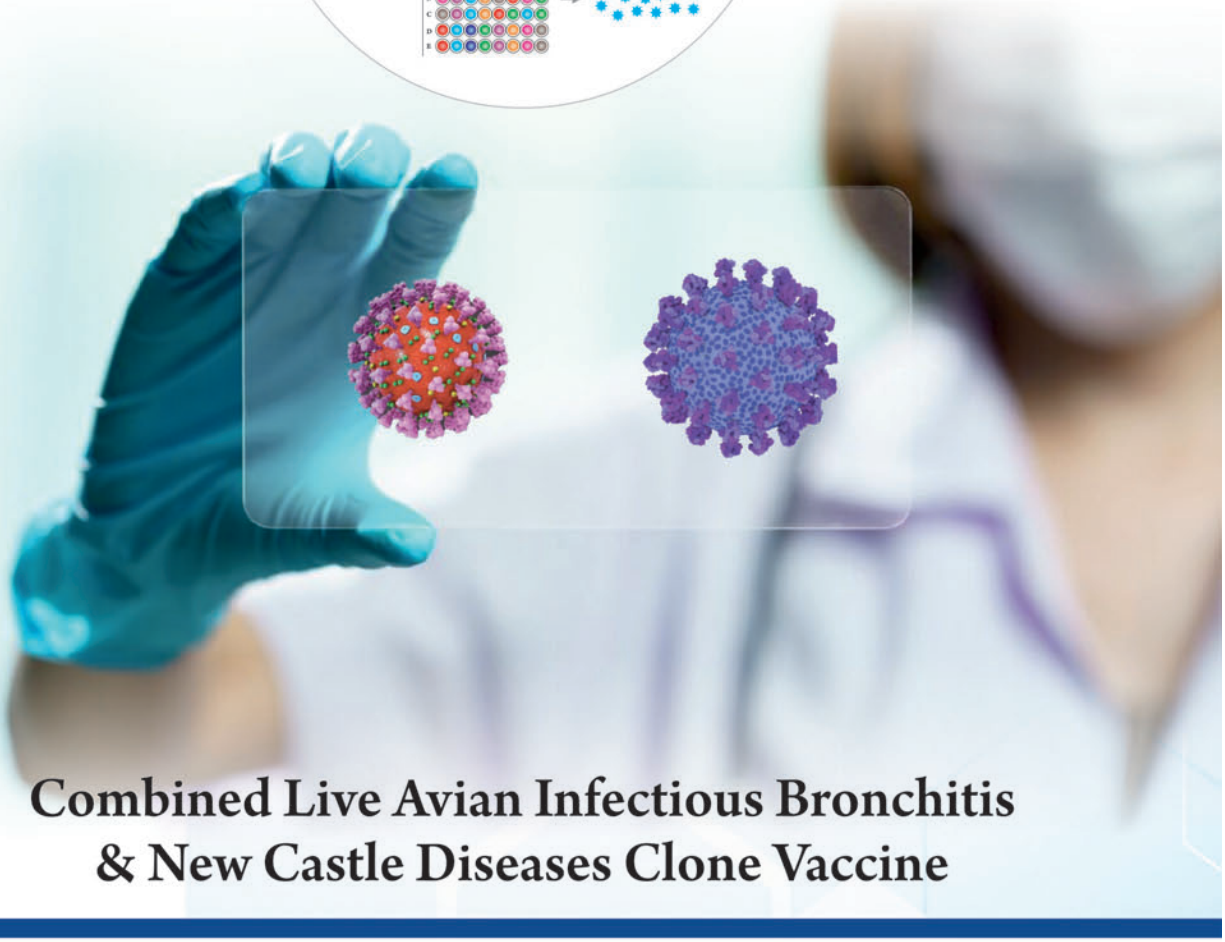

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2025 Alltech Agri-Food Outlook

Alltech recently published its 2025 Agri-Food Outlook, based on findings from its 14th annual global feed production survey. The report reveals that global feed production rose by 1.2% in 2024, reaching 1.396 billion metric tons, recovering from a flat 2023. This growth occurred despite challenges like avian influenza, climate shifts, and economic instability, showcasing the resilience of the agri-food sector.

The survey compiled data from 142 countries and over 28,000 feed mills, offering a detailed view of compound feed production and pricing. This information provides a key indicator of livestock industry health — highlighting species-specific trends, regional hurdles, and emerging opportunities.

Top 10 Countries

The top 10 feed-producing countries in 2024 were China (which produced 315.030 million mt of feed, down 2.03% from 2023), the U.S. (269.620 million mt; +0.68%), Brazil (86.636 million mt; +2.43%), India (55.243 million mt; +4.56%), Mexico (41.401 million mt; +1.38%), Russia (38.481 million mt; +8.53%), Spain (35.972 million mt; +1.46%), Vietnam (25.850 million mt; +3.41%), Türkiye (24.502 million mt; +4.83%) and Japan (24.297 million mt; +0.14%). Together, the top 10 countries produced 65.6% of the world's feed — and 52% of all global feed production was concentrated in just four countries: China, the U.S., Brazil and India.

Notable Results and Future Outlook by Species

- Poultry feed experienced an increase in production, both for broilers (385.415 million mt; +1.8%) and layers (173.038 million mt; +1.4%).
  - Broiler feed remains the largest species segment, accounting for 27.6% of the total feed tonnage in the world. As a "budget-friendly" protein option, the broiler industry benefits from surges in red meat prices. Affordability drove demand in Asia-Pacific and Latin America, while rising incomes boosted growth in Africa. While HPAI was a persistent issue for poultry production, broiler feed volumes are positioned to continue on a path toward moderate growth this year because of broiler meat's affordability and export opportunities.
  - For layers, the slow 1.4% growth rate reflected the challenges facing the industry, including the disruptions by avian influenza and oversupply in some regions. Disease challenges led to North America experiencing the steepest decline in production due to flock reductions. Layer production was able to maintain a positive global growth rate, however, due to volume gains in Asia-Pacific — where consumers are favouring eggs as a cheaper protein option — and healthy demand in Latin America and Africa. While the threat of HPAI continues to loom in various regions, the development of vaccines and improved biosecurity measures could help mitigate losses and keep the global layer sector on an upward trajectory.
- Global pig feed production experienced a loss in 2024 of 0.6%, leading to a decreased total of 369.293 million mt. Growth in the European, Latin American and North American pork segments was counterbalanced by downturns in Africa and the Middle East, Asia-Pacific and Oceania. These trends were partly dictated by how well producers in each region continued to recover from outbreaks of African swine fever (ASF), with export demand allowing Europe and Latin America to reclaim lost ground. Survey respondents were divided in their outlook for pig feed production, which recorded the highest amount of pessimism among all feed segments. Proper disease management and stabilised feed costs will be critical for the pig feed sector to achieve growth worldwide.
- Dairy feed tonnage increased by 3.2%, to 165.500 million mt, due to robust consumer demand, favorable milk prices and a shift toward more intensive farming practices, with Asia-Pacific, Europe, Africa and Latin America all displaying growth. While dairy feed production remained stable in North America, Oceania's reliance on abundant pasture led to a slight dip in its feed tonnage. Despite challenges that ranged from disease pressures to volatile weather conditions, the global dairy sector continues to exhibit strong resilience and growth potential. The modernisation and intensification of production and higher milk yields are expected to foster further increases — but lower farmgate prices in China could limit global gains overall.
- Beef feed tonnage rose from 131.6 million mt in 2023 to 134.1 million mt in 2024, reflecting a global increase of 1.8%.

North America, Latin America, Africa, Europe and Oceania all recorded gains thanks to a rise in demand for beef exports due to tight supply elsewhere around the world. Additionally, scarce forages in parts of North America, Latin America and Australia drove cattle producers to rely more heavily on commercial feeds. The decline in beef feed tonnage seen in Asia-Pacific and the Middle East was attributed to oversupply and lower prices.

- Global feed production for the aquaculture sector declined slightly, by 1.1%, in 2024 to 52.966 million mt, continuing a downward trend for the sector that first emerged in 2023. This statistic, however, conceals considerable regional divergence, including gains in Latin America, Africa and Europe. Unfortunately, the considerable decreases in Asia-Pacific and North America due to disease challenges, extreme weather events, cost pressures and low market prices weighed down the entire sector. Looking ahead, aquaculture is positioned to strengthen slowly, but this recovery will likely remain uneven across regions. Potential rebounds in shrimp and finfish production in Asia-Pacific will depend on stabilised prices and biosecurity improvements. Latin America and Africa could continue their upward trajectories, and momentum around alternative feed ingredients in Europe is expected to pick up steam as regulatory frameworks and consumer demand increasingly emphasise sustainability.

- Pet feed tonnage increased by 4.5% to 37.692 million mt in 2024, fueled by continued trends toward premiumisation (including functional diets and the "humanisation" of pets), expanded pet ownership and continued innovation in the sector's product offerings. While the increase in pet food production appears to have slowed somewhat last year, it still remains one of the fastest-growing sectors in the world. Africa saw the largest percentage jump (of 60%), albeit from a low baseline, and Asia-Pacific's double-digit gains underscore the surge in pet adoption and premium diets in developing regions.

- Equine feed tonnage increased by 2.3% to 9.630 million mt. This growth was driven by premiumisation trends and rising interest in nutrition-focused care among horse owners, as well as growing participation in equestrian activities and the widely improving availability of specialised feeds. Looking forward, however, the sector faces declining populations and high feed costs.

Notable Regional Results

- Asia-Pacific (533.1 million mt): Feed production was down slightly in the region (by 0.8%), but Asia-Pacific remained the largest producer of feed overall. This decrease was largely due to headwinds in China as well as ongoing weather extremes, oversupply and cheap feed alternatives that hampered expansion.

- North America (290.7 million mt): The second-largest feed producing region saw a modest increase (0.6%) across beef, poultry and pork that was offset by the impacts of HPAI (in layers and turkeys) and stagnant aquaculture production.

- Latin America (198.4 million mt): This region experienced solid gains driven by robust demand for poultry, pork and beef, as well as favourable export markets. Overall, feed production in Latin America increased by 3.6%.

- Europe (267.8 million mt): Rebounds in pig, beef and aquaculture feed led to a 2.7% increase in Europe's total feed production, but structural constraints — including sustainability policies and diminishing herds — will temper future expansion.

- Africa and the Middle East (95.5 million mt): This region had the strongest percentage growth (of 5.4%) around the world in 2024, but it was also starting from a smaller base than other regions. This growth reflects expanding commercial feeds in the poultry, ruminant and pet sectors. Stable growth in poultry and beef in the Middle East, however, has been tempered by water scarcity and import costs.

- Oceania (11.0 million mt): Gains in beef and aquaculture from low baselines led to an increase of 2.5% in Oceania's overall feed production. Feedlot usage is high in Australia, but New Zealand's herd declines constrain further growth.

The compound feed production totals and prices reported in the 2025 Alltech Agri-Food Outlook were collected in the first quarter of 2025 with assistance from feed mills and industry and government entities around the world. These figures are estimates and are intended to serve as an informative resource for industry stakeholders.

IPR Espresso

IPEMA/Poultry India Honoured at EEA 2025

Recognising its outstanding contribution to the Indian poultry and agri-exhibition sector, IPEMA / Poultry India received the prestigious "Top Industry Catalyst" award at the Exhibition Excellence Awards & Summit 2025, held on 31st May at CIDCO Exhibition & Convention Centre, Navi Mumbai.

Organised by Exhibition Showcase and backed by key MICE bodies including the Ministry of Tourism, IEIA, UFI, and ICCA, the 9th edition of the EEA brought together over 980 global industry leaders in a landmark celebration of excellence in exhibitions and trade fairs.

Speaking on the award, Uday Singh Bayas, President – IPEMA / Poultry India said, "this national honour reflects the collective dedication of the entire IPEMA community. The 'Top Industry Catalyst' award underscores IPEMA's influential role in fuelling knowledge exchange, empowering stakeholders, and reinforcing India's growing global leadership in the exhibitions domain".

West Bengal Poultry Federation Elects New Committee

On 4th June, West Bengal Poultry Federation conducted its election to form the committee for the period 2025-28.

NATIONAL

Key office bearers of the new committee are:

West Bengal Poultry Federation Committee (2025-28)	
Samarendra Narayan Sen	President
Radheshyam Roy	Senior Vice President
Sameer Agarwal	Senior Vice President
Sumit Kumar Ghosh	Vice President
Sumit Sureka	Vice President
Amit Saraogi	Vice President
Partha Sur	Vice President
Sanat Sarkar	Vice President
Madan Mohan Maity	General Secretary
Shantanu Paul	Assistant Secretary (Layer Operation)
Debasish Sen	Assistant Secretary (Feed Operation)
Amitava Maity	Assistant Secretary (Breeder Operation)
Tanmoy Saha	Assistant Secretary (Broiler Operation)
Balai Sanki	Assistant Secretary (Accounts & Infrastructure)
Palas Kr. De	Treasurer

Avitech Nutrition Launches New Trading Division

Avitech Nutrition has launched a new trading vivision as part of its strategic growth. The division will initially focus on trading essential feed ingredients like vitamin blends and straight vitamins used in animal feed formulations, with plans to expand the product range over time.

This new unit will serve both distributors and end-users by ensuring consistent access to high-quality inputs. Leading the division is Amal Kumar Datta, a seasoned professional with over 30 years of experience in the Indian feed additive industry. His expertise and industry network are expected to play a key role in the division's success.

With this initiative, Avitech aims to strengthen its position in the animal nutrition sector, streamline its supply chain, and deliver greater value to its customers.

Namakkal Forays into the US Egg Market

In an extremely significant development, a consignment of one crore eggs from Namakkal, Tamil Nadu has been shipped to the US following formal approval from Washington. The temperature controlled consignment of 21 containers with approximately 4.75 lakh eggs each left India in end May. This is a major breakthrough for the Indian poultry industry which already exports around 200 million eggs monthly to the Middle East and Africa.

"The US approval is a massive endorsement of our production standards and disease-control protocols," said V. Subramaniam, former member of the Tamil Nadu Livestock Development Agency and President of the Tamil Nadu Muttai Kochi Pannaiyalargal Marketing Society. "Export opportunities like this help stabilise domestic prices, especially during times of surplus. Without a robust external market, farmers suffer due to price crashes. That's why diversifying export destinations is critical," he added.

The US, which is traditionally reliant on North American and domestic suppliers, has turned to India to meet the burgeoning demand. The US decision was influenced by a mix of demand pressure and limited supply from traditional exporters battling avian flu outbreaks," said Dr. M. Balaji, coordinator of the Tamil Nadu Veterinary Graduate Federation.

Poultry farmers voiced optimism that this inaugural shipment will pave the way for regular egg exports to the US.

IPJA Conducts AGM

The Indian Poultry Journalists' Association (IPJA) conducted its AGM and elections on 3rd May at Hyderabad.

The newly constituted committee

- M.K Vyas – President
- M. N. Rao – Vice President
- Amit Rana – Secretary
- NSN Murthy – Treasurer
- Shashank Purohit – Joint Secretary
- Vishal Gupta – Executive Committee Member
- Baljinder Aghi – Executive Committee Member

Activities planned for the year were also announced including technical seminars at Tanuku, Hyderabad and Nashik.

IPJA Technical Seminar in Tanuku, Andhra Pradesh

Indian Poultry Journalists' Association organised a technical seminar at Tanuku on 10th June.

NATIONAL

Speakers at the seminar were:

- Uday Singh Bayas, President IPEMA & Poultry India: Keynote Address
- Dr. K. Somi Reddy: Challenges & Opportunities in Poultry in Andhra Pradesh
- K. Subba Rao: Overview of Poultry Industry in Andhra Pradesh
- Dr. Parag Mahadik: Role of Enzymes in Poultry Nutrition
- Dr. Dhirendra Kumar: Bird Flu & its Prevention
- Dr. Pavan Kumar: New Way of Premixing in Poultry – Mixiblend uses
- Dr. Srinivasa Rao Ramaraju: Managing Gut Health in Poultry
- Ramesh Yadlapati: Litter Management in Poultry
- Dr. K. Balaswamy: Cholesterol is not Responsible for Heart Diseases

ANNOUNCEMENT

Avitech Nutrition Onboards Dr. Ashish Sachdeva

Dr. Ashish Sachdeva has joined Avitech Nutrition as Assistant General Manager – International Sales. He will operate from the company's corporate headquarters in Gurugram.

Dr. Sachdeva holds a Master's degree in Veterinary Science (MVSc), specialising in Veterinary Bacteriology, from the Indian Veterinary Research Institute (IVRI), Bareilly, Uttar Pradesh and brings with him over 15 years of rich experience in international business development, sales, and product management within the animal nutrition sector.

His professional journey includes key roles at leading organisations such as Jubilant Ingrevia, EW Nutrition, Ayurvet, and Natural Remedies.Pvt.

Dr. Sachdeva will lead the company's international sales strategy, focusing on driving growth and expanding Avitech's global market presence.

Second IPR Knowledge Review, Nepal Unfolds in Bharatpur, Chitwan

The 2nd Nepal edition of IPR Knowledge Review was organised at Bharatpur, Chitwan on 29th May. Following the tremendous success of the inaugural edition in Kathmandu last year, the current edition was organised in the heartland of Nepal's poultry sector. The seminar brought together key stakeholders to focus on the theme, "Resilient Poultry Industry: Adapting for Sustainability & Economic Success."

As the poultry industry continues to navigate complex challenges, ranging from climate change and disease outbreaks to shifting market dynamics and increasing consumer demands, resilience has become a strategic imperative. This edition of IPR Knowledge Review sought to explore how the sector can not only withstand these pressures but evolve into a more sustainable, technology-driven, and economically robust ecosystem. Industry leaders, veterinarians, entrepreneurs, policymakers, and researchers came together for a day of dialogue, insight, and collaboration.

Mr. Uday Singh Bayas, President IPEMA & Poultry India and Prof. (Dr.) I. P. Dhakal, Former Vice Chancellor, Agriculture and Forestry University, Nepal were the Guests of Honour for the seminar.

Prof. (Dr.) P. K. Shukla, President, Indian Poultry Science Association and Head, Department of Poultry Science, DUVASU, Mathura delivered the Keynote Address.

Other speakers at the seminar were:

- Dr. Dinesh Gautam, Senior Poultry Consultant and Nutritionist, Kanchanjanga Trading, Kathmandu
- Prof. (Dr.) Subir Singh, Professor of Veterinary Medicine, Agriculture and Forestry University, Nepal
- Prof. (Dr.) A. S. Ranade, Former Dean, Mumbai Veterinary College
- Dr. Bijaya Kumar Shrestha, Chief of National Avian Disease Investigation Laboratory, Chitwan
- Prof. (Dr.) Rebanta Kumar Bhattarai, Professor of Veterinary Microbiology, Agriculture and Forestry University, Nepal
- Dr. Santosh Ire, Director, Bhuvana NBS & Secretary, Vets in Poultry
- Dr. Pawan Kumar, President, Bihar Poultry Farmers Association

In his Keynote Address, Prof. Shukla, highlighted that, while the poultry industry serves as a cornerstone of global food security and economic development, the ever-increasing challenges from disease outbreaks, environmental pressures, and shifting consumer preferences demand strategic adaptation for long-term viability. He added that resilience essentially means the ability to recover from disruptions while maintaining productivity, integrating sustainable practices to reduce vulnerability and

maintaining profitability while addressing challenges. Prof. Shukla further said that efficient resource management systems hinged upon automated systems that reduce waste as well as ensure healthier, more productive birds and renewable energy that reduces operational cost and carbon footprint. He went on to explaining the concept of circular economy and spotlighted that one chicken can, 1) convert 10 lbs of food scraps into eggs 2) de-bug 120 sq. ft. area in a week 3) fertilise a 50 sq. ft. garden in a month 4) level a pile of mulch in 2 days 5) break pest cycles on a fruit tree in I hour 6) help turn compost 7) till 50 sq. ft. of sod in 4-6 weeks 8) produce enough manure to make 1 yard of compost a month. Prof. Shukla spoke at length on precision farming technology integration using IoT devices, data analytics and smart decisions; animal welfare and ethical practices; reducing antibiotics dependency through use of probiotics, herbal supplements and enhanced biosecurity. Additionally, he spoke about the financial resilience drivers. Prof. Shukla quoted a case study from a Nigerian broiler farm to highlight how they had adopted the concept of resilience. He further said that eggs are the friends of the planet from the perspective of low environmental impact and sustainable growth. Prof. Shukla showcased how innovation, collaboration, resilience and growth must come together to build a resilient poultry industry of tomorrow. He concluded by quoting Henry Ford, "Coming together is a beginning, staying together is progress, and working together is success."

IPR Knowledge Review

Dr. Dinesh Gautam and Prof. (Dr.) Subir Singh's presentation was titled "Poultry Industry in Nepal: Sustaining Growth amid Uncertainty." Dr. Gautam began the presentation with an overview of Nepal's poultry sector. He highlighted that over the past 7 years, while the consumption of eggs hasn't increased, that of meat has increased 100%. He added that the poultry feed market in Nepal has remained static over the past 5 years. However, 2024-25 is expected to show a positive growth. Dr. Gautam further said that Nepal had achieved self-sufficiency in terms of meat, eggs, chicks, broiler day old chicks and feed (except some floating types and dog food) . It is still dependent on imports for GPs, feed ingredients (65-70%), medicines (almost all imported) and equipment (95% imported). He also spoke at length about how the poultry landscape is changing, both globally and specifically for Nepal. He opined that to be on the global trade map, Nepal needs to create an import and export value chain for poultry products and to uplift its infrastructure and practices. Dr. Gautam enumerated the emerging trends for Nepal, 1) broiler and breeder farms are shifting from small farms to large, integrated EC houses 2) layer farming is witnessing consolidation with the dominance of large farms 3) poultry farming is expanding from the Terai region the mid hills 4) consumers are preferring slow growing / local / cross breeds 5) technology adoption in feed mills 6) technology infusion in slaughtering 7) growing incidence of labelled and branded poultry products 8) introduction of new Ross 308 GPs. He also spoke about the challenges facing the poultry industry in Nepal – health risks, economic pressures, supply chain weaknesses, policy & infrastructure, low insurance adoption and climate change. Dr. Gautam further spoke on the opportunities for the poultry sector – strong consumer demand, protein awareness, affordability, improved and sustainable practices. In conclusion, Dr. Gautam said that despite crises, Nepal's poultry sector has growth potential ; learning from global experiences can drive innovation; collaboration is needed between government, private sector and other stakeholders to help the industry progress.

Dr. Ajit Ranade began his presentation on "Sustainable Feed Innovations: Reducing Cost and Environmental Impact," with a summary of the world poultry scenario with particular reference to the Indian and Nepalese scenarios. For Nepal, he said that the industry is in a growth phase; employs 70,000 + people; generates $ 240 million revenue; has 83M+ birds; produces 1.61 billion eggs and 548,000 tonnes of meat annually, is growing towards self -sufficiency and poultry meat production is projected to grow at 2.6% CAGR. Speaking about feed formulation, Dr. Ranade said that the best feed formulation is one that provides all nutrients at the recommended level, at the least possible cost. He then listed out the requirements of feed formulation and spoke about the evolution of feed formulation. Dr. Ranade spoke in depth about the present scenario of feed formulation and the advantages of modern diets. Discussing about the reasons for feed cost increase, Dr. Ranade listed them out as 1) climate variability & poor yield of crops 2) rising demand from multiple sectors 3) uncontrolled growth in the poultry industry 4) entry of international players 5) processing and diversion of major raw materials 6) storge in bulk 7) shortage driven by speculation and market distortions 8) low government procurement and support 9) raw material export in spite of shortage. As a solution, Dr. Ranade proposed the use of alternate raw materials, use of appropriate feed additives and adopting the concept of Value

Conversion Ratio. He then suggested a list of alternatives to maize and soybean and also discussed about the pros and cons of each alternative. He also discussed about some novel feed sources like spirulina, karanj cake, corn germ meal, sugarcane press residue and DDGS. Dr. Ranade presented a study on alternative feed resources conducted by Mumbai Veterinary College. He further spoke about the anti- nutritional factors in feed ingredients and their detoxification methods. Dr. Ranade then spoke about the carbon footprint of the poultry industry and the mitigation strategies. The final area that Dr. Ranade covered was the use of nanotechnology in poultry nutrition. In conclusion, he said – stick to basics, follow new trends with validation, be vocal for local resources, be happy to be second rather than at the top, use the right biotechnological tools, manage cost effectiveness and not just production efficiency.

Dr. Bijaya Kr. Shrestha and Prof. (Dr.) Rebanta Kr. Bhattarai's presentation dealt with "Combating Infectious Threats in Poultry." They began by talking about the importance of poultry in global food security and then moved onto the economic impact that infectious diseases have. Dr. Shrestha and Prof. Bhattarai then detailed about the common infectious threats in poultry and the transmission routes. They, then spoke about the prevention strategies including biosecurity measures, vaccination programmes and surveillance systems. The presentation then moved on to detection and diagnosis of infections threats. A short case study on outbreak management was also shared. Dr. Shrestha and Prof. Bhattarai then discussed about the future trends and innovations. They concluded their presentation by enumerating the various activities to be undertaken to mitigate the risk of infections diseases.

Dr. Santosh Ire delivered a very interesting presentation titled, "Water Health: A Pillar of Sustainable Poultry Farming." He started his presentation by saying that sustainable poultry farming focuses on producing poultry products in a way that minimises environmental impact, promotes safe potable water, and ensures economic viability for farmers. He then briefly touched on the One Health concept that combines environmental health, human health, and animal health. Speaking on the importance of water, Dr. Ire said that water stands out to be the most essential element in our lives as the animal body constitutes up to 70% water. He added that water is the most essential nutrient yet is least focused upon. 80% of global diseases are water borne and WHO recommends 650+ ORP for 100% disinfection of water to make it potable. He then listed out the challenges faced by poultry farmers in maintaining water quality. He also shared the strategic industry recommendations and the best practices for water management. Dr. Ire added that the commonly used water treatment solutions included sand filters, RO, softener, UV, ozone, chlorine and acidifiers amongst others. He then introduced Boom-Ox, an economical, robust and automated water management system which has unique features like ORP based automatic dosing of patented stabilised chlorine dioxide with IoT facilities, a potent combination of water disinfectant and acidifier to achieve desired goals, automated and senor-based technology, cost effective water treatment and a robust, maintenance free device.

The concluding presentation of the day by Dr. Pawan Kumar titled, "Protein Power" covered the extremely important topic of feeding and eating the right amount of protein. Dr. Kumar illustrated the importance of protein for humans by talking about the functions of protein in the human body. He then spoke about the ideal vs. actual composition of the food plate. The major cause of protein deficiency, according to Dr. Kumar, is our cereal based food culture. He detailed the daily protein requirements of children, teens, and adults while speaking of the consequences of protein deficiency that include muscle atrophy, weakened immune system, edema, hair loss, fatigue & weakness, delayed healing of wounds, mood changes, stunted growth in children, fatty liver, hypoproteinemia, hormonal imbalance, skin problems. He detailed the common animal and plant sources of protein along with their protein percentage and PDCAS. Dr. Kumar further spoke about protein quality of foods which is a function of the amino acid profile and bioavailability. He said that to motivate Nepal to consume more protein, it requires a change in food habits and it needs to spread nutritional awareness about the need for adequate protein consumption for better nutrition and public health. He further said that in the face of the onslaught of processed and ultra-processed foods, it is important to buy fresh, cook fresh and eat fresh to maintain human health. Dr. Kumar concluded by urging the Nepal Veterinary Poultry Association to collaborate with Bihar Poultry Farmers Association to form an information exchange group that will help promote and protect small farmers and help them earn a sustainable income from farming.

Prof. Subir Singh moderated an intensive and engaging panel discussion on the theme, "Strengthening Indo-Nepal Collaboration in Poultry Science, Industry and Sustainability."

The concluding address and vote of thanks were delivered by Prof. Subir Singh.

The seminar reaffirmed the importance of regional collaboration, knowledge sharing, and adaptive strategies to ensure that poultry continues to be a driver of nutrition, livelihoods, and economic growth in Nepal and beyond.

The third edition of IPR Knowledge Review will be organised at Kathmandu in 2026.

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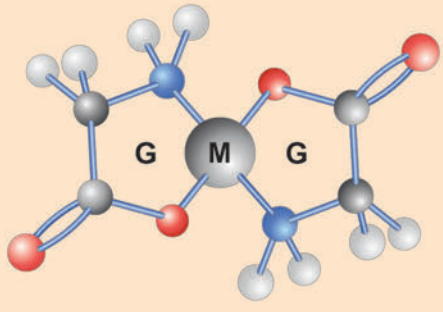

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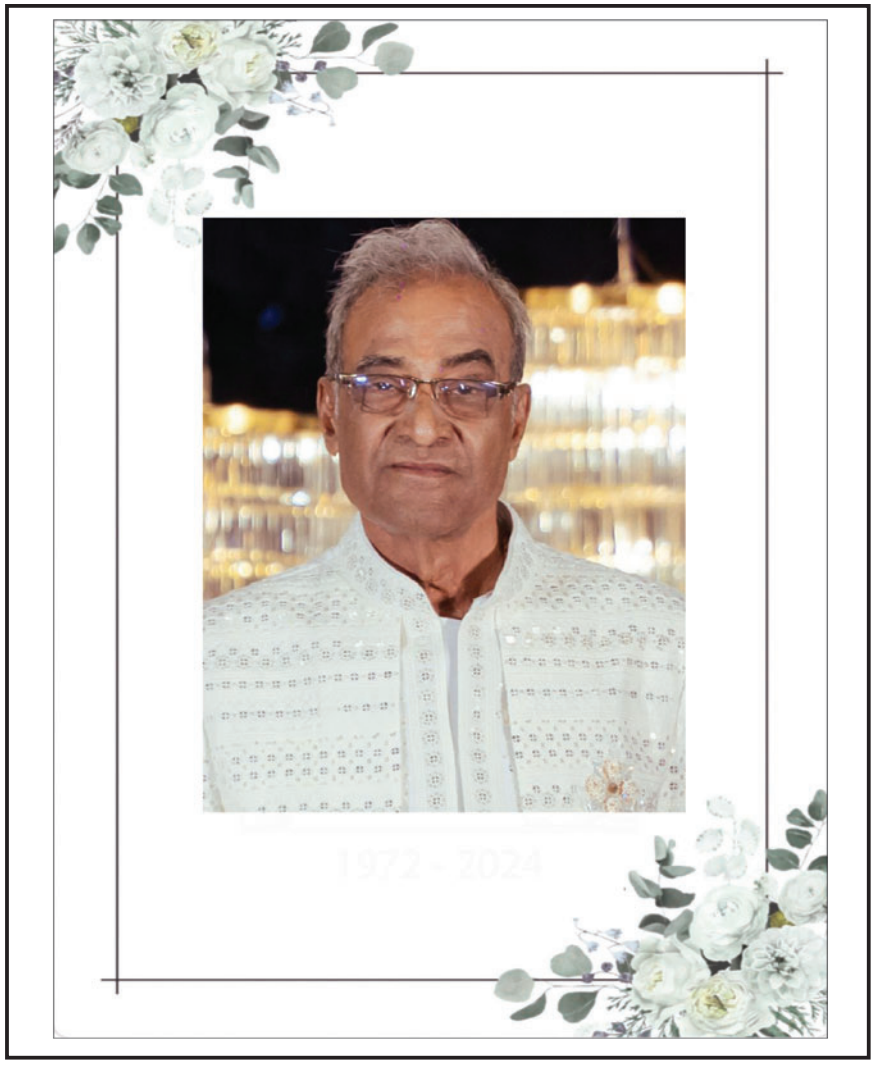
In Memoriam



Vijay Singh Bayas

(1945–2025)

We are deeply saddened by the passing of Mr. Vijay Singh Bayas, a pioneering force in India's poultry industry.

As the Founder and Chairman of Vijay Raj Poultry Equipments Pvt. Ltd., Mr. Bayas dedicated over five decades to transforming poultry farming in India. Since establishing the company in 1972, he championed modernisation through technology and innovation, setting new benchmarks in efficiency, animal welfare, and product quality.

Among his many industry-first contributions were the introduction of water channel systems, nipple drinkers and the revolutionary "Comfort Cage" model, all of which are now standard in poultry farming nationwide. His commitment to R&D and collaboration with agricultural institutions led to the integration of SOPs and GMP across the company's offerings, earning global trust across 25+ countries.

A founding member of IPEMA, he played a key role in launching the Poultry India Expo — now South Asia's largest poultry event, Mr. Bayas leaves behind a legacy of excellence and leadership.

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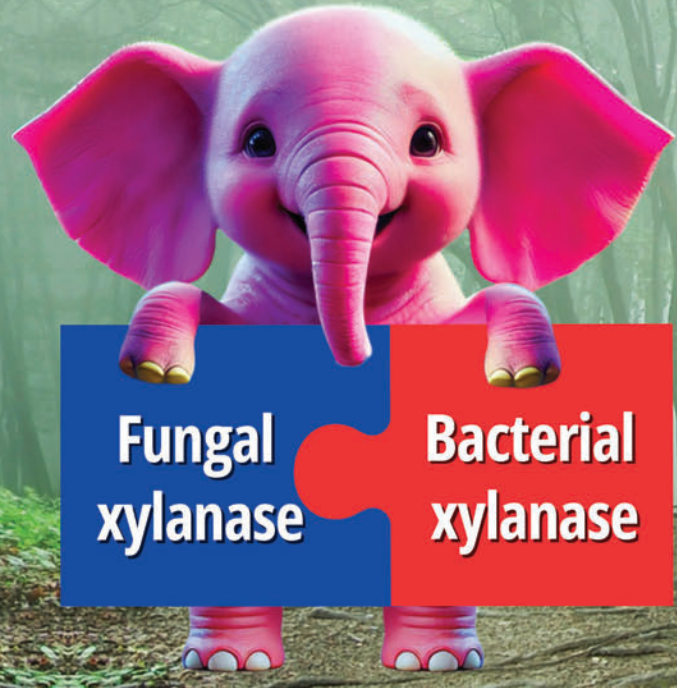

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