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Dear Sir/Madam,

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The Poultry Federation of India (PFI), the apex body representing poultry farmers, breeders, feed millers, equipment manufacturers, pharmaceutical companies, and all allied sectors of the poultry industry, is pleased to announce its 37th Annual General Meeting (AGM) to be held on 23-24 September 2026 at Grand Hyatt, Kochi, Kerala.

The AGM serves as a premier platform bringing together industry leaders, entrepreneurs, policymakers, researchers, and stakeholders to discuss emerging opportunities, key challenges, technological advancements, and future growth strategies for the poultry sector.



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We cordially invite your esteemed organization to participate as a Sponsor for this prestigious event. Your valuable support will contribute significantly to the success of the AGM while providing exceptional visibility and networking opportunities with key decision-makers and industry leaders from across the country.

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We look forward to your enthusiastic participation and generous support. With the collective cooperation of the entire poultry fraternity, we are confident that the 37th AGM of PFI will be a grand success and a memorable gathering for the poultry industry.

With warm regards,

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COMPANY: Sampoorna Feeds FARMER NAME: Mr. Parwinder Singh	JUNE-2026	Top #1
	Farm Type	Open House
	State	PUNJAB
	Chicks Placed	5,022
	Mean Age	33
	Avg Body Wt	2,560
	FCR	1.33
	cFCR	1.20
	Livability%	94.6
	Daily Gain	77.6
	EPEF	551



Eastern Region

COMPANY: IB Group FARM NAME: SBR Farm	JUNE-2026	Top #1
	Farm Type	Closed House
	State	BIHAR
	Chicks Placed	12,544
	Mean Age	39
	Avg Body Wt	2,803
	FCR	1.50
	cFCR	1.32
	Livability%	97.9
	Daily Gain	71.9
	EPEF	468



Central Region

COMPANY: IB Group FARMER NAME: Mr. Balveer Singh	JUNE-2026	Top #1
	Farm Type	Closed House
	State	MADHYA PRADESH
	Chicks Placed	9,700
	Mean Age	40
	Avg Body Wt	2,829
	FCR	1.46
	cFCR	1.28
	Livability%	97.2
	Daily Gain	70.7
	EPEF	469



South Region

COMPANY: IB Group FARMER NAME: Mr. Manjunatha K	JUNE-2026	Top #1
	Farm Type	Closed Shed
	State	KARNATAKA
	Chicks Placed	18,290
	Mean Age	36
	Avg Body Wt	2,636
	FCR	1.36
	cFCR	1.22
	Livability%	95.3
	Daily Gain	73.2
	EPEF	512



June 2026 -Top PERFORMANCE BY AREA

Area	Chicks Placed	Mean Age(Days)	BW	FCR	cFCR(2Kg)	Livability%	Daygain	EPEF
North EC House	9,095	36	2,399	1.41	1.32	92.6	66.4	436
North Open House	5,022	33	2,560	1.33	1.21	94.6	77.6	552
East EC House	12,544	39	2,803	1.50	1.33	97.9	71.9	468
East Open House	1,015	40	2,663	1.55	1.40	95.9	66.6	411
Central EC House	9,700	40	2,829	1.47	1.28	97.2	70.7	469
Central Open House	5,389	35	2,367	1.44	1.36	95.6	68.6	455
South EC House	18,290	36	2,636	1.36	1.22	95.3	73.2	512
South Open House	2,998	35	2,273	1.49	1.43	96.5	64.9	420

June 2026 -Top 10 FIELD PERFORMANCE

Flock	Farm Type	State	Chicks Placed	Mean Age	BW	FCR	cFCR	Livability%	Day Gain	EPEF
Flock 1	OPEN HOUSE	PUNJAB	5,022	33	2,560	1.33	1.21	94.6	77.6	552
Flock 2	OPEN HOUSE	PUNJAB	9,856	36	2,653	1.36	1.21	93.3	73.4	504
Flock 3	CLOSED HOUSE	KARNATAKA	18,290	36	2,636	1.36	1.22	95.3	73.2	512
Flock 4	OPEN HOUSE	SOUTH BENGAL	810	35	2,311	1.30	1.23	95.8	66.0	488
Flock 5	OPEN HOUSE	PUNJAB	8,624	32	2,163	1.27	1.23	95.2	67.2	503
Flock 6	OPEN HOUSE	PUNJAB	4,972	33	2,292	1.30	1.24	93.2	70.2	503
Flock 7	OPEN HOUSE	PUNJAB	2,213	36	2,140	1.28	1.25	95.1	59.4	442
Flock 8	OPEN HOUSE	PUNJAB	6,865	34	2,407	1.34	1.25	95.3	70.7	503
Flock 9	OPEN HOUSE	RAJASTHAN	2,920	45	2,802	1.44	1.26	84.7	62.3	367
Flock 10	OPEN HOUSE	PUNJAB	8,497	35	2,510	1.38	1.27	91.4	72.1	477



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Sustainability in the Poultry Industry

The poultry industry plays a vital role in meeting the world's growing demand for affordable, high-quality protein. However, increasing production has also raised concerns about environmental sustainability, resource utilization, and waste management. To ensure long-term growth, the industry must adopt practices that balance productivity with environmental responsibility.

A major contributor to the industry's environmental footprint is feed production, particularly the use of soybean meal and fishmeal. Alternative protein sources such as insect meal and microalgae offer sustainable solutions by requiring less land and water while providing valuable nutrients for poultry. These innovative feed ingredients can help reduce dependence on conventional resources and lower greenhouse gas emissions.

Effective waste management is another key component of sustainable poultry farming. Poultry litter and manure can be transformed into organic fertilizers and bioenergy through composting and anaerobic digestion. This approach not only minimizes environmental pollution but also creates additional value from farm by-products.

Climate change presents new challenges for poultry producers, including heat stress and reduced productivity. Energy-efficient housing, automated ventilation systems, and renewable energy sources such as solar power can improve climate resilience while reducing operating costs. Furthermore, welfare-oriented housing systems contribute to better bird health and overall farm performance.

The future of poultry farming depends on embracing sustainable technologies and management practices. By adopting alternative feed sources, implementing circular waste management, improving energy efficiency, and prioritizing animal welfare, the poultry industry can reduce its environmental impact while maintaining profitability. Sustainable poultry production is not only essential for protecting natural resources but also for ensuring food security and meeting the expectations of increasingly environmentally conscious consumers.

Bhavana Gupta

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Alternative Protein Sources For Sustainable Poultry Feed

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Biosecurity Measures In Poultry Farm Dr. Deepandita Barman¹ and Dr. Arunoday Das²

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Sustainable Poultry Farming: Smart Solutions For A Healthy And Profitable Future

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Abstract

The poultry sector has faced significant challenges in recent years due to the rising cost and limited availability of feed ingredients, particularly protein sources. Feed accounts for more than 50% of total poultry production cost, with protein ingredients being the most expensive component. Conventional protein sources such as soybean meal and fishmeal are becoming increasingly costly and environmentally unsustainable. As a result, the industry is exploring alternative protein sources derived from plants, insects, and microorganisms. These alternatives offer potential solutions to reduce feed costs while maintaining productivity and sustainability in poultry production. This article discusses various alternative protein sources and

their potential use in poultry nutrition.

Introduction

The global population is expected to reach nearly 10 billion by 2050, increasing the demand for animal protein. In poultry production, conventional protein sources such as Soybean meal and Fish meal are widely used due to their high protein quality and balanced amino acid profile. However, their increasing prices and environmental concerns associated with soybean cultivation have created challenges for sustainable poultry production. Soybean production is associated with issues such as deforestation, soil degradation, biodiversity loss, and increased carbon emissions. Additionally, restrictions on the use of animal-derived proteins in feed have further limited the availability of traditional protein sources. Therefore, identifying alternative and sustainable protein sources has become essential for maintaining economic viability and ensuring continuous poultry production.

Alternative protein sources derived from plants, insects, and other unconventional feed ingredients have gained attention due to their nutritional value and potential to partially replace conventional protein sources.

Plant-Based Alternative Protein Sources

Duckweed (Water Lentils)

Duckweed is a free-floating aquatic plant with a protein content ranging from 20–40%. It contains essential amino acids such as lysine and methionine and closely resembles animal protein in amino acid composition. Studies suggest that duckweed can be included in broiler diets at around 6% of dry matter without affecting performance.

Moringaoleifera Leaves

Moringa leaves are rich in protein, vitamins, minerals, and antioxidants. They possess antimicrobial and immune-enhancing properties. Inclusion of moringa leaf meal up to 10% in broiler and layer diets has been reported to improve growth performance and overall bird health.

Rapeseed / Canola Meal

Rapeseed meal contains approximately 34–38% protein and a well-balanced amino acid profile. However, its use is limited by the presence of glucosinolates, which may cause metabolic disorders if used excessively.

Mustard Cake

Mustard cake is widely used as livestock feed in many parts of

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India. It contains moderate protein levels and can be included up to 10% in poultry diets. The main limitation is the presence of goitrogenic compounds such as glucosinolates.

Linseed Meal

Linseed meal contains about 40% crude protein and is rich in vitamins such as riboflavin and choline. However, it contains small amounts of cyanogenic glycosides and mucilage that may limit its use. It can be included up to 10% in poultry diets.

Coconut Meal (Copra Meal)

Copra meal contains 20–26% crude protein but is deficient in lysine and histidine. Due to its high fibre content, its inclusion level in poultry diets should be limited and supplemented with essential amino acids.

Cottonseed Meal

Cottonseed meal contains approximately 35% protein but also contains **gossypol**, a toxic compound that limits its use in poultry diets. Detoxification methods and supplementation with iron salts can reduce gossypol toxicity.

Sunflower Meal

Sunflower meal is another alternative protein source but contains low lysine levels and high fibre. However, with enzyme supplementation and proper processing, it can partially replace soybean meal in poultry diets.

Sesame Seed Meal

Sesame seed meal contains

about 40% protein and is rich in methionine but low in lysine. It is widely used in livestock feeding and can be incorporated into poultry diets as a supplementary protein source.

Rice Distillers Dried Grains with Solubles (DDGS)

Rice DDGS is a by-product of ethanol production and can be included in broiler diets at levels of around 10–12%. It improves feed efficiency and egg production when used with enzyme supplementation.

Insect-Based Protein Sources

Silkworm Pupae Meal

Silkworm pupae meal is a highly nutritious feed ingredient containing 52–72% crude protein. It can replace up to 50% of fishmeal in poultry diets without affecting growth performance.

Black Soldier Fly Larvae Meal

Larvae of Black soldier fly contain around 40–44% crude protein and essential fatty acids. Studies show that this ingredient can partially or completely replace fishmeal in poultry diets while maintaining growth performance.

Earthworm Meal

Earthworm meal is a natural protein source rich in essential amino acids such as lysine. Inclusion levels up to 10–15% in broiler diets have shown improved body weight gain and feed conversion ratio.

Animal-Based Protein Sources

Fish Meal

Fish meal is a high-quality

protein source rich in essential amino acids such as lysine, methionine, and tryptophan. It also contains important minerals and vitamins, making it a valuable ingredient in poultry diets.

Meat Meal

Meat meal is produced from processed animal carcasses and contains around 60–70% protein. However, its protein quality may be limited by low methionine levels.

Blood Meal

Blood meal contains approximately 80% protein and is rich in lysine. However, due to poor palatability, it is usually included at low levels in poultry diets.

Hatchery Waste Meal

Hatchery by-product meal is produced from eggshells and unhatched eggs. It can replace a portion of fishmeal in poultry diets when processed properly.

Hydrolysed Feather Meal

Feather meal is produced from processed poultry feathers and contains high levels of protein. However, its digestibility is lower compared to other protein sources and therefore inclusion levels are limited.

Conclusion

The use of alternative protein sources in poultry feed is essential to reduce dependency on conventional ingredients such as soybean meal and fishmeal. Plant-based, insect-based, and animal-based alternative protein sources offer promising solutions for

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sustainable poultry production. However, challenges such as anti-nutritional factors, lower digestibility, and variability in nutrient composition must be carefully managed.

The use of feed enzymes such as NSP enzymes, proteases, and phytases can improve nutrient digestibility and enhance the utilization of these alternative ingredients. With proper processing and formulation strategies, alternative protein

sources can contribute significantly to reducing feed costs and improving sustainability in poultry production.

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AVIAN MYCOPLASMOSIS



**Dr. Sharvaree Ingle &
Dr. Himani Ravi**

Division of Bacteriology &
Mycology, Indian Veterinary
Research Institute, Bareilly

Introduction

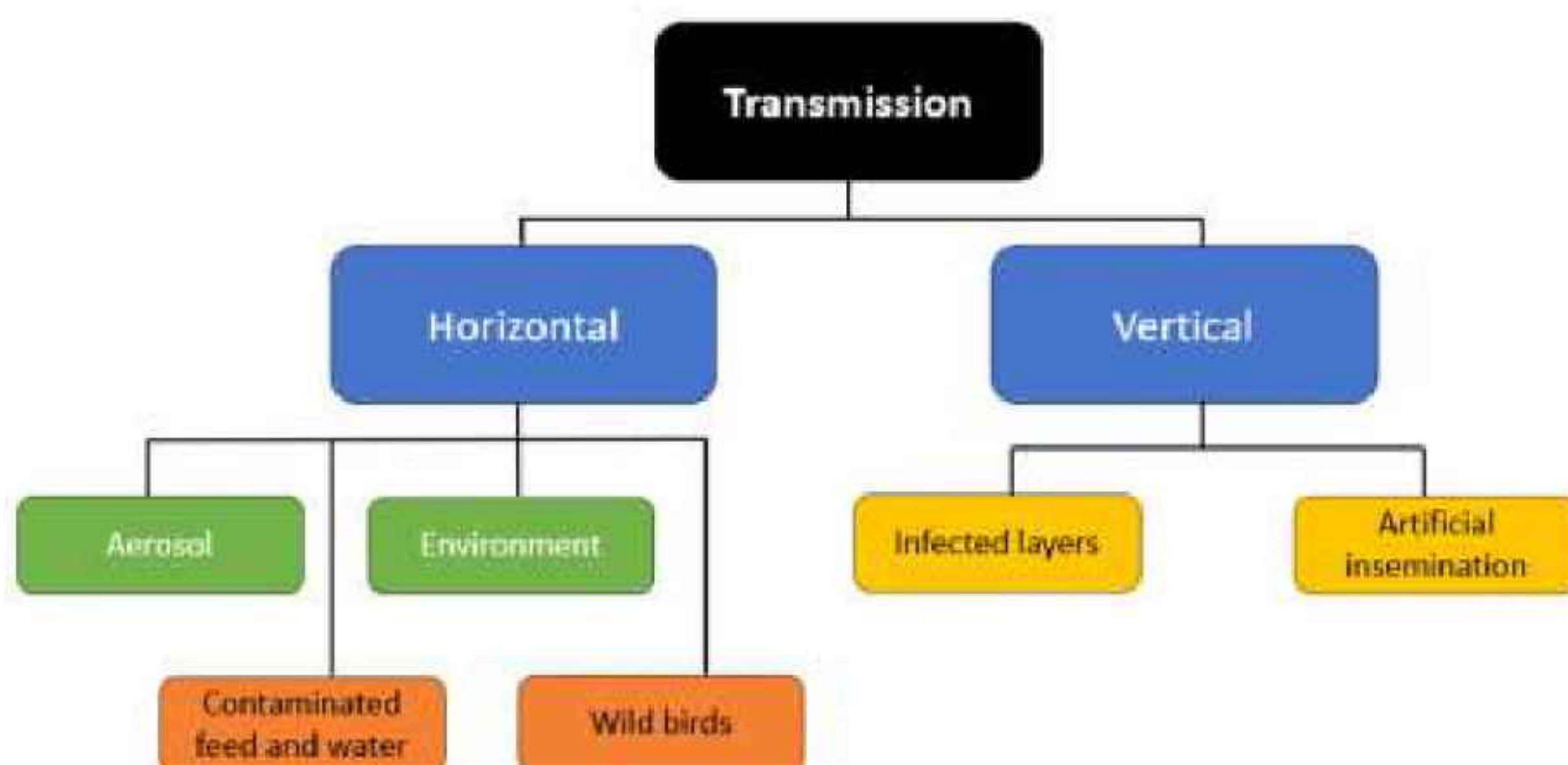
Avian mycoplasmosis is an economically important disease of poultry and turkeys, and is distributed worldwide. It causes tremendous loss to the poultry industry by decreasing egg production, reducing growth and feed conversion efficiency, downgrading carcass quality, and increasing vaccination and treatment costs. More than 20 *Mycoplasma* species have been isolated from avian hosts; however, only 4 species are considered pathogenic in poultry. *M. gallisepticum* (MG) and *M. synoviae* (MS) are pathogenic for chickens,



turkeys, and other species, and *M. meleagridis* and *M. iowae* are pathogenic primarily in turkeys.

Transmission

All pathogenic species of avian mycoplasma are transmitted both vertically (transovarian) from infected breeders to progeny, and horizontally via infectious aerosols, contaminated feed, water, and environment. Once infected, birds remain carriers or reservoirs of infection for life. Wild birds (racing pigeons, house sparrows, Japanese quails and geese) may play an important role as potential reservoir and vectors of MG and MS infection probably due to their close contact with domestic poultry.



In some infected turkeys, *M. meleagridis* can localize in the reproductive tract; in toms, the phallus and adjacent tissues (cloaca) become infected and contaminate the semen. Thus, artificial insemination of turkey hens with infected semen is an additional important method of transmission. *M. iowae* is a relatively uncommon infection and has been reported in chickens and geese.

Clinical symptoms and lesions

M. gallisepticum is the most pathogenic species of avian mycoplasma. There is a marked interaction (polymicrobial disease) between respiratory viruses, *E. coli*, and MG in the pathogenesis and severity of chronic respiratory disease (CRD). In chickens, MG infections can result in varying degrees of respiratory distress, with slight to marked rales, difficulty breathing, coughing, and sneezing along with swelling of infraorbital sinuses. Morbidity is high and mortality is low in uncomplicated cases.

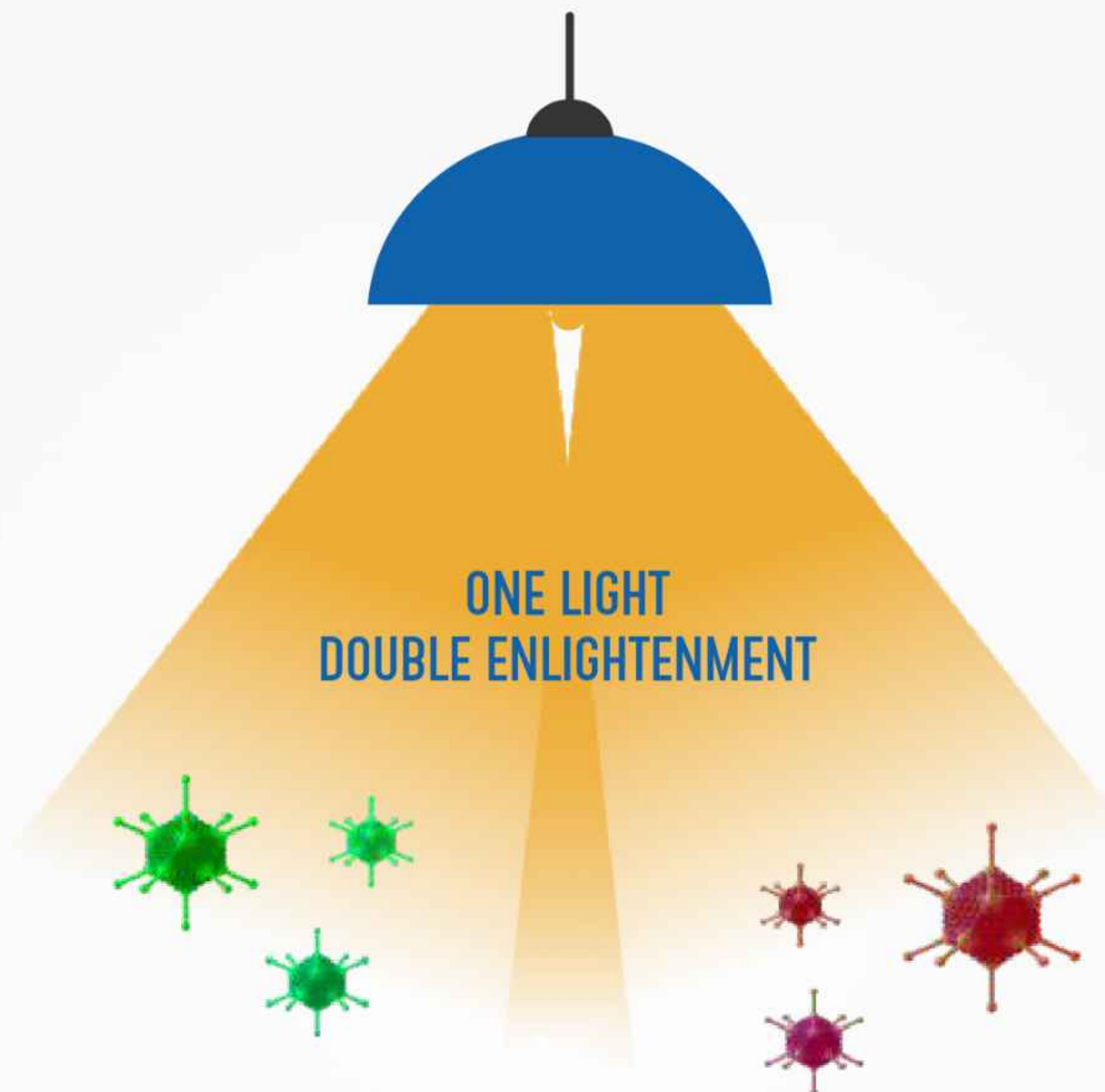
Birds infected with *M. synoviae* are more likely to be clinically affected under stress or with concurrent infections. The first signs include infectious synovitis with pale-bluish head parts and lameness. Swollen hocks and footpads are common. Morbidity is usually low to moderate with mortality of 1%–10%.

Egg transmission and embryo infection with *M. meleagridis* reduces hatchability (due to late embryo mortality), poult quality, and growth rate. Only mild respiratory signs seen.

Turkey breeder flocks with *M. iowae* infection show no clinical



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signs other than reduced hatchability (usually 2%–5%) due to embryo mortality in the last 10 days of incubation.

Diagnosis

Diagnosis of avian mycoplasmosis is usually based upon different serological, cultural and molecular tests. Serological tests such as serum plate agglutination test (SPAT) and ELISA are used for initial screening of the flocks, followed by confirmation of reactors with the HI test. SPAT is rapid, inexpensive, and sensitive but ELISA is still more sensitive and specific.

Culture of the pathogen is considered gold standard but it is laborious, time consuming, expensive. It requires 1-3 weeks for their growth and identification in Frey's, PPLO broth and agar media. Growth in broth medium is depicted by change in colour from pink to yellow without any turbidity. On solid medium, minute-sized, fried-egg colonies are typically observed.

For molecular detection, conventional PCR and real-time PCR are increasingly being used. PCR techniques allow rapid, sensitive, and specific detection of

Mycoplasma DNA that can be directly performed on clinical samples taken from infected sites. Other molecular methods involve PCR with restriction fragment length polymorphism (PCR-RFLP) and loop-mediated isothermal amplification (LAMP).

Sequencing methods, including multi-locus sequence typing (MLST), single-locus sequence typing (SLST) and whole genome sequencing do not require isolation of pathogens in pure culture i.e., mixed infection of pathogenic and saprophytic mycoplasmas does not interfere in the sequencing of desired pathogen.

Treatment

Due to the lack of cell wall, Mycoplasmas are resistant to beta-lactam antibiotics such as penicillin and cephalosporins. However, they are sensitive to tetracyclines, macrolides, tiamulin, and lincomycin-spectinomycin. Fluoroquinolone antibiotics are highly effective but its resistance in Mycoplasma species is of great concern since enrofloxacin is often the drug of choice to treat infections in poultry.

Prevention and control

These mainly include biosecurity and management practices, treatment and vaccination. The first step to prevent entry of pathogen and maintaining poultry flocks free from infection includes acquisition



of fertile eggs and chicks from Mycoplasma-free source and then rearing the birds with adequate hygiene and biosecurity measures. Fertile eggs should be either treated with suitable antibiotics and/or heated at 46 C for 12 to 14 hours. Frequent sero-testing according to the surveillance program facilitates early detection of infection, and prevents horizontal and vertical transmission of the disease. Vaccination should be as a long-term intervention to reduce morbidity, mortality, production losses and pathogen transmission.

Conclusion

Avian mycoplasmosis, a respiratory poultry disease, is distributed worldwide and causes significant economic losses in the poultry industry. *M. gallisepticum* (MG), *M. synoviae* (MS), *M. meleagridis*, and *M. iowae* are 4 species considered pathogenic for poultry. Infection of all species is transmitted both horizontally and vertically. Serological tests viz., SPAT, ELISA and HI are used for the initial screening of flocks, which are later confirmed by culture and PCR assays. The three main strategies for the control of Mycoplasma infections include biosecurity and management practices, treatment, and vaccination. Due to the lack of cell wall, beta-lactam antibiotics are ineffective but those inhibiting metabolic processes of microorganisms like tetracyclines, macrolides, fluoroquinolones, tiamulin, and tylosin are commonly used. Acquisition of fertile eggs and chicks from Mycoplasma-free sources, regular surveillance and monitoring of the flocks, and strict biosecurity measures are needed to prevent infection in poultry flocks.



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Global poultry industry produces over 140 million tones of poultry meat and more than 1.6 trillion eggs annually. Rapid expansion of the poultry industry has greatly increased hatchery waste generation, including infertile eggs, unhatched embryos, eggshells, culled chicks, fluff, blood and waste water.

Traditionally, these materials were disposed of through landfilling, burial, rendering or incineration. However, modern poultry production is shifting from a linear "take-make-dispose" model towards a circular economy in which wastes are converted into valuable resources while maintaining strict biosecurity.

Biosecurity remains the foundation of hatchery management. Conceptual, structural and operational biosecurity reduce pathogen entry, improve hatchability, protect chick quality and minimize economic losses. Clean-to-dirty workflow, controlled

access, sanitation, disinfection, pest control, airflow management and waste segregation are essential components of modern hatchery design. Biosecurity and waste management should function together because poorly handled hatchery waste can become a reservoir of *Salmonella*, *Escherichia coli*, *Aspergillus*, *Mycoplasma* and other pathogens. Modern hatcheries therefore integrate strict biosecurity measures with sustainability principles and convert biological waste into valuable resources such as protein meal, compost, biogas, biofertilizers and recycled calcium. This article reviews current biosecurity practices, hatchery waste management technologies, industrial applications and future opportunities for sustainable poultry production.

Recent studies have depicted that hatchery residues possess significant nutritional value. Hatchery residues contain high protein (21–49%), lipid (15–29%) and energy (2498–5911 cal/g), though they also possess high microbial load and variable eggshell-derived mineral content. These characteristics make hatchery waste unsuitable for direct reuse but highly suitable for stabilization and valorization through circular technologies.

The circular economy emphasizes reducing waste generation, recovering nutrients, recycling

biological resources and creating value-added products. Instead of viewing hatchery waste as a disposal problem, modern systems regard it as feedstock for resource recovery. Current circular approaches include rendering, composting, anaerobic digestion, fermentation, insect bioconversion and production of organic fertilizers.

Rendering remains widely used in commercial hatcheries to convert waste into protein meal and poultry fat after thermal processing. Composting transforms hatchery residues into pathogen-safe organic fertilizer when proper carbon:nitrogen ratio, aeration, moisture and thermophilic temperatures are maintained. Anaerobic digestion converts organic waste into renewable biogas while producing nutrient-rich digestate.

Among the most promising innovations is black soldier fly (*Hermetia illucens*) bioconversion. Recent studies indicate that hatchery waste provides an excellent protein-rich substrate for larvae after suitable stabilization. The larvae convert organic residues into high-quality insect protein for animal feed, insect oil for biofuel applications and frass that functions as an organic biofertilizer. This approach simultaneously reduces waste volume, greenhouse gas emissions and disposal costs while producing marketable products.



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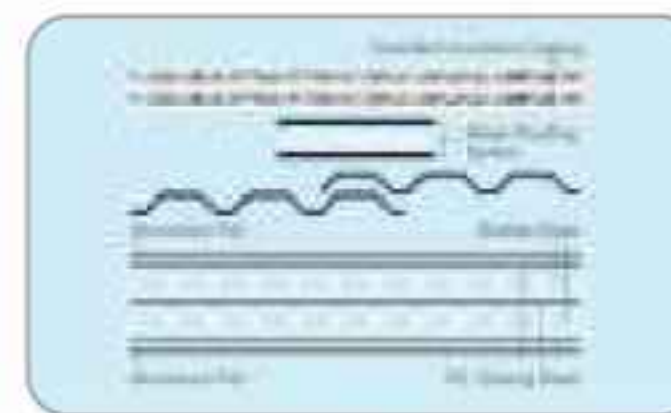
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Fermentation has also emerged as an important pretreatment strategy. Lactic acid fermentation lowers pH, suppresses pathogenic microorganisms, extends storage life and improves the safety of hatchery residues before further utilization. Combining fermentation with insect bioconversion represents one of the most promising future integrated systems.

Modern hatcheries increasingly integrate waste water treatment, nutrient recycling, renewable energy generation and carbon footprint reduction into sustainability programs. Circular bioeconomy models connect hatcheries with feed manufacturers, insect production facilities, composting plants, biogas units and crop production, thereby creating closed nutrient loops with minimal environmental losses.

Future studies are needed to optimize microbial stabilization, evaluate life-cycle environmental impacts, improve economic feasibility, develop regulatory standards for insect-derived products and integrate artificial intelligence for real-time monitoring of biosecurity and waste processing. Adoption of circular economy principles can transform hatcheries from waste generators into sustainable bio resource recovery centers.

Circular economy concept

The circular economy replaces the linear model of take-make-dispose with Reduce, Reuse, Recycle, Recover and Regenerate. Nutrients and energy are recovered from hatchery waste through rendering, composting, anaerobic digestion,

biochar production and recycling. This approach improves sustainability while generating additional income.

Reduce, Reuse, Recycle, and Recover (4R Principles)

The 4R principles provide the foundation for sustainable hatchery waste management.

- **Reduce:** Minimize waste generation by improving breeder flock management, egg handling, incubation efficiency, and hatchability.
- **Reuse:** Reuse non-contaminated materials such as trays, packaging, and treated process water where appropriate.
- **Recycle:** Convert eggshells, hatchery fluff, and organic residues into useful products

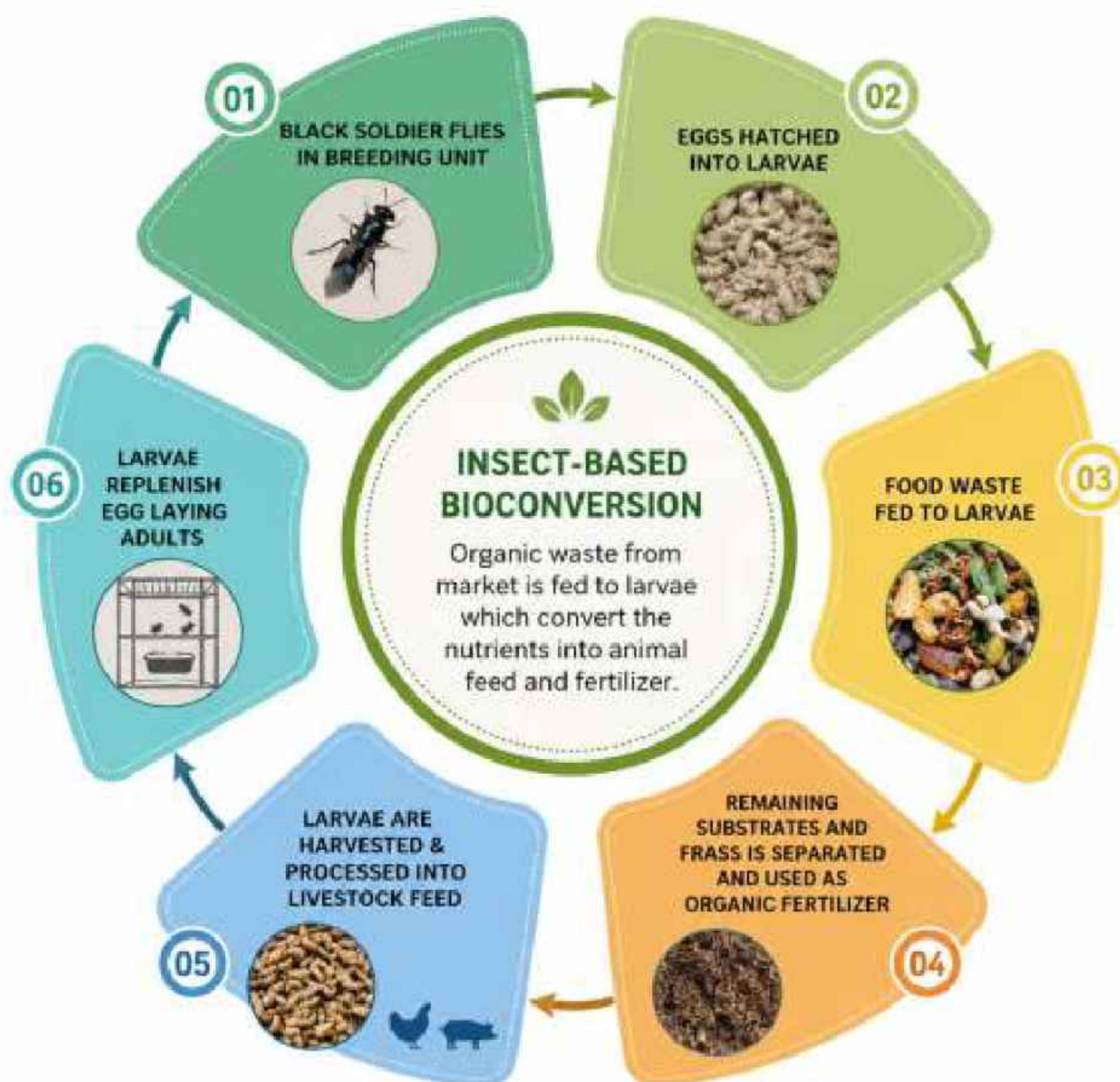
such as calcium supplements, compost, or industrial raw materials.

- **Recover:** Recover nutrients, proteins, fats, and renewable energy from hatchery waste through rendering, anaerobic digestion, and other biological processes.

Applying the 4R strategy significantly reduces landfill disposal, lowers production costs and improves environmental sustainability.

Resource recovery instead of waste disposal

Modern hatcheries increasingly consider waste as a resource rather than a disposal problem. Organic residues such as infertile eggs, dead embryos, culled chicks, and hatchery fluff contain





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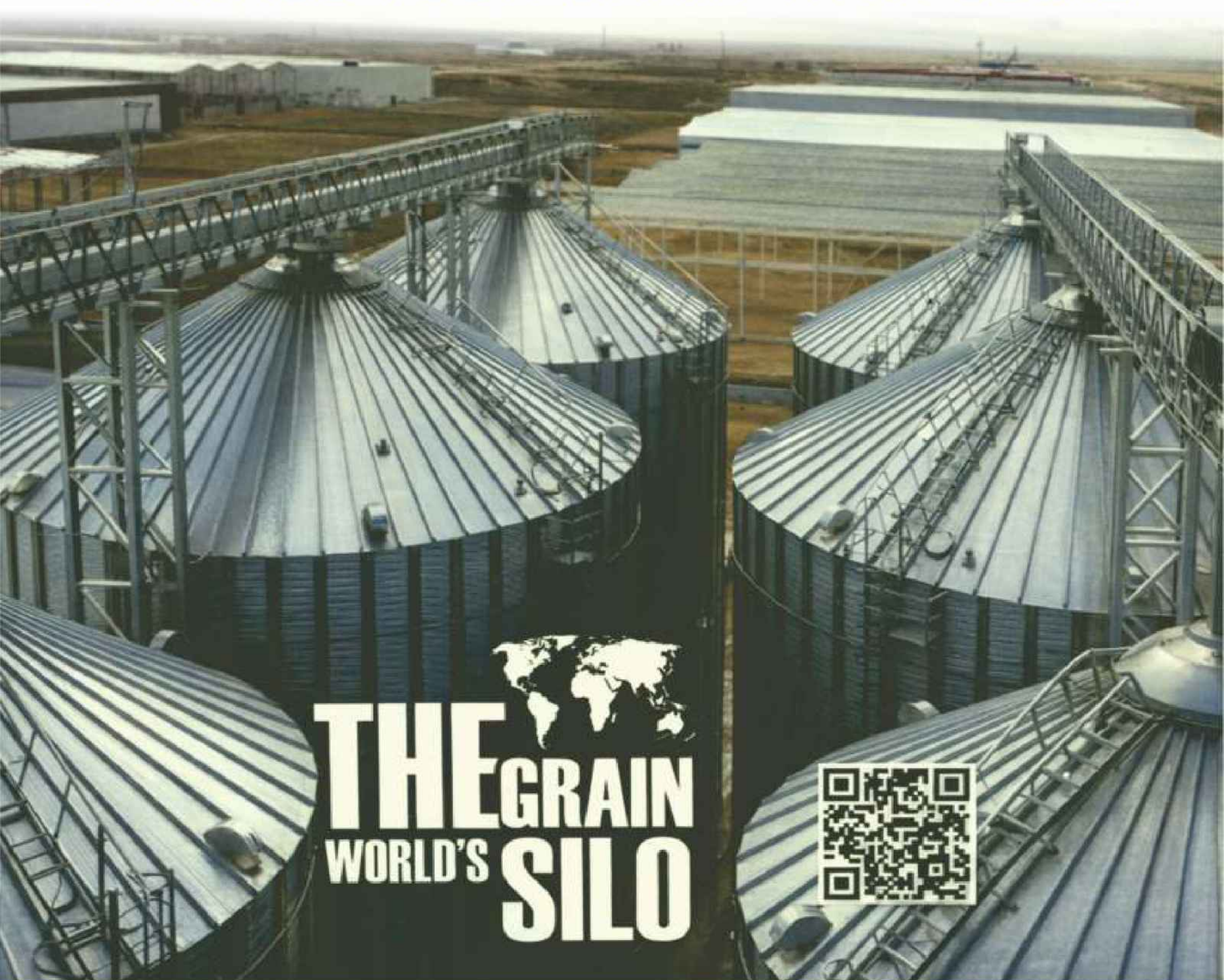


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proteins, lipids, minerals, and organic matter that can be recovered through suitable technologies. Instead of paying for disposal, hatcheries can produce valuable by-products including poultry protein meal, organic fertilizers, renewable energy, and industrial biomaterials. This approach improves both economic returns and environmental performance.

Nutrient recycling

Hatchery waste is naturally rich in nitrogen, phosphorus, calcium, proteins, and lipids. Nutrient recycling captures these valuable components and returns them to agricultural production systems. Composting and rendering allow nutrients to be converted into organic fertilizers and feed ingredients, reducing dependence on synthetic fertilizers while improving soil fertility and crop productivity. Eggshells, composed primarily of calcium carbonate, can be processed into poultry feed supplements, soil amendments, biomedical materials, and industrial fillers.

Black Soldier Fly (BSF) bioconversion

One of the most innovative circular economy technologies is the use of Black Soldier Fly (*Hermetia illucens*) larvae to convert hatchery waste into high-value insect biomass. The larvae efficiently consume organic waste and transform it into:

- High-protein insect meal for poultry and aquaculture feeds
- Insect oil for animal nutrition and biofuel production
- Frass, a nutrient-rich organic fertilizer

BSF bioconversion reduces waste

volume, destroys many pathogens during processing and offers an environmentally friendly alternative to conventional waste disposal. It is increasingly being explored as a sustainable option for hatchery residue management.

Rendering and protein recovery

Rendering is one of the most widely adopted technologies for managing hatchery waste. Through controlled heating, drying, and fat separation, hatchery residues are converted into:

- Poultry by-product meal
- Protein concentrate
- Poultry fat
- Organic fertilizer ingredients

Rendering effectively destroys pathogens while recovering nutrients that would otherwise be lost. Modern rendering plants therefore contribute to both biosecurity and resource recovery.

Composting and biofertilizer production

Aerobic composting converts hatchery residues into stable

organic fertilizer. During composting, microorganisms decompose organic matter under controlled temperature, moisture, and aeration conditions. Proper composting destroys many disease-causing organisms, reduces odours, stabilizes nutrients and produces compost rich in nitrogen, phosphorus, calcium and organic carbon.

Research has shown that incorporating hatchery waste into compost mixtures increases nitrogen and calcium content while producing high-quality organic fertilizers suitable for agricultural use.

Anaerobic digestion and biogas production

Anaerobic digestion is another important circular economy technology. Organic hatchery waste is decomposed by anaerobic microorganisms in oxygen-free digesters to produce:

- Methane-rich biogas
- Renewable electricity
- Thermal energy
- Nutrient-rich digestate fertilizer





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Biogas systems reduce greenhouse gas emissions, lower dependence on fossil fuels and provide renewable energy for hatchery operations, contributing to sustainable poultry production.

Lactic acid fermentation for waste stabilization

Fresh hatchery residues deteriorate rapidly because of their high moisture content and microbial activity. Lactic acid fermentation provides an effective stabilization method by encouraging beneficial lactic acid bacteria to produce organic acids that lower pH and suppress spoilage organisms. Stabilized residues can then be stored safely before composting, insect bioconversion or other valorisation processes, reducing odours and nutrient losses.

Carbon footprint reduction

Circular economy practices help reduce the environmental footprint of hatchery operations by:

- Diverting waste from landfills
- Lowering methane emissions from uncontrolled decomposition
- Reducing transportation requirements through on-farm waste treatment
- Producing renewable energy from biogas
- Recycling nutrients into agriculture
- Replacing synthetic fertilizers and some conventional feed ingredients

Together, these measures support climate change mitigation and improve the sustainability of poultry production.

Closed-loop poultry production

A closed-loop production system integrates biosecurity with resource recovery so that wastes generated within the hatchery are safely converted into useful products and returned to the production system. Examples include:

- Eggshells → Calcium supplement or fertilizer
- Dead embryos → Rendering or biogas
- Hatchery fluff → Compost or bioenergy
- Wastewater → Treatment and reuse
- Organic residues → Black Soldier Fly larvae → Insect protein for animal feed

This integrated model minimizes waste generation while maximizing economic value and environmental protection.

Bio economy and sustainable hatchery management

The circular bio economy combines biological resources, biotechnology, renewable energy and sustainable production systems to create value from agricultural by-products. In poultry hatcheries, adopting circular economy principles strengthens biosecurity, improves resource efficiency, reduces environmental pollution, generates additional revenue and supports long-term sustainability. Future hatcheries are expected to operate as zero-waste bioresource facilities, where every waste stream is converted into valuable products while maintaining high standards of animal health, food safety, and environmental stewardship.

Current industrial practices

Leading poultry companies are

increasingly adopting integrated waste management systems. These include rendering facilities, composting units, renewable energy generation, automated hatchery sanitation, hydrogen peroxide vapour disinfection, AI-based monitoring systems and IoT sensors for environmental control.

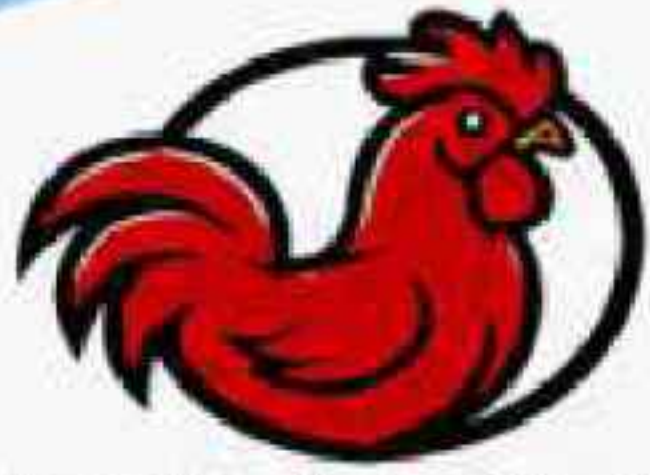
Challenges and future prospects

Major constraints include high investment costs, limited infrastructure, lack of technical expertise and regulatory compliance. Future hatcheries will increasingly use artificial intelligence, robotics, renewable energy, carbon footprint assessment and zero-waste strategies to achieve sustainable poultry production.

Conclusion

The future of poultry hatchery management lies in integrating rigorous biosecurity with circular economy technologies. Such integration improves disease prevention, reduces environmental pollution, lowers greenhouse gas emissions, enhances resource efficiency and generates additional income from materials that were previously treated as waste.

Biosecurity and circular economy are complementary strategies for modern hatchery management. By preventing disease and converting waste into valuable products, commercial hatcheries can simultaneously improve productivity, profitability and environmental sustainability. Adoption of innovative waste-to-wealth technologies will play a key role in the future development of the poultry industry.



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**Ankit Bansal, CA & CS | Author**

Director – Business Development,
Rudrapur Solvents Private Limited
Author of De-Oiled Rice Bran:
A Boon for Livestock

Poultry-feed decisions are often made under pressure: a supplier quote looks attractive, crude protein appears acceptable, and the ingredient is cleared for use. Yet crude protein alone cannot tell a feed buyer whether a rice-bran-based ingredient will support a consistent formula. For de-oiled rice bran (DORB), the more useful question is whether the batch is clean, stable and predictable enough to fit the intended diet.

DORB is the material left after oil is extracted from rice bran. It is used in animal feed because it can contribute nutrients and help manage formulation cost. But its value depends heavily on quality. Two batches carrying a similar protein number can behave very differently if their fibre, mineral contamination, moisture and storage condition are not alike.

Why protein is only the starting point

Protein is an important screening figure, but it is not a complete

Beyond Crude Protein : A Practical Quality Checklist For Dorb In Poultry Feed

quality verdict. In poultry diets, excess fibre can dilute usable energy. Indigestible mineral matter can displace nutritive material. Excess moisture can reduce storage stability. These factors may not be visible in a single headline number, yet they affect how reliably an ingredient fits a formula.

A better approach is to read a batch report as a pattern. Protein should be considered alongside crude fibre, total ash, acid-insoluble ash or sand-silica indicators, moisture, physical appearance and odour. When the pattern is consistent, the buyer can have a more informed discussion with the nutritionist. When it is inconsistent, the buyer has a reason to pause before committing the material to a large production run.

Four checks that deserve attention

1. Fibre: ask what the number represents

Some fibre is naturally present in rice bran. The concern is excessive or poorly digestible fibre, particularly when it may reflect husk, sawdust or other non-nutritive material. Poultry diets are energy-sensitive, so high fibre can lower the effective energy density of the ration and make feed conversion less predictable. Fibre should therefore be treated as both a nutrition parameter and a procurement question: is it the expected fibre of the ingredient,

or is it a signal to investigate the batch more closely?

2. Ash, sand and silica: distinguish minerals from contamination

Total ash measures the inorganic residue left after a sample is burned. It does not by itself prove poor quality, because feed ingredients contain minerals. However, high ash together with high acid-insoluble ash or sand-silica values deserves attention. This combination may point to soil, sand, silica-rich husk or other material that adds weight without adding useful nutrition. For poultry buyers, that means paying feed price for matter that contributes little to the intended ration.

3. Moisture: protect the batch after purchase

DORB is an organic, moisture-absorbing material. A sound batch can lose quality if it is stored directly on a damp floor, pressed against a wall, stacked without air movement or left uninspected during humid weather. Clumping, a musty smell, local heating or visibly uneven bags are practical warning signs. Moisture should be checked at receipt, but storage discipline is equally important: use pallets, keep airflow around stacks, separate damaged bags and follow a first-in, first-out system.

4. Sampling: make the laboratory report representative

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useful as the sample sent for testing. A sample taken from one convenient bag may not represent the entire lot. For a meaningful decision, take small portions from multiple bags and different stack positions, mix them cleanly and retain a sealed reference sample. The retained sample is valuable if a later quality question arises. It also encourages a more disciplined conversation between procurement, the feed mill and the supplier.

What to do before approving a new lot

A practical receiving routine does not need to be complicated. First, compare the batch report with the purchase specification rather than looking only at crude protein. Second, inspect the material for flow, uniformity, odour, clumps and visible

contamination. Third, confirm that the delivery is stored in a dry, ventilated area before it is fed. Finally, make any inclusion decision with the nutritionist responsible for the overall energy, amino-acid, mineral and enzyme balance of the diet.

The aim is not to reject DORB as an ingredient. The aim is to use it with the same quality discipline applied to every other raw material. DORB may be useful in a poultry formula when the batch is properly assessed and the formulation is balanced for the birds, production stage and local ingredient context. It is not a one-for-one substitute for every protein or energy ingredient, and it should not be judged by one lab value alone.

A procurement habit that builds confidence

The most reliable poultry-feed programmes turn raw-material quality into a routine rather than a reaction. They define specifications, sample systematically, keep batch records, inspect storage and review results with the nutrition team. This reduces the chance that a low invoice price becomes a costly formulation problem later.

For DORB, the takeaway is simple: look beyond crude protein. Read the full quality pattern, protect the material in storage and keep the final diet under qualified nutritional supervision. That is how a feed ingredient becomes a dependable part of a poultry programme rather than a variable that has to be explained after performance moves.

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Prof. Dr. ARM Ziaul Hasan, Ph.D.

*Agricultural Economist
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Introduction

Sustainability has become a strategic priority for the global poultry industry as demand for affordable, safe, and nutritious animal protein continues to rise. With the world's population projected to approach 10 billion by 2050, poultry meat and eggs will remain among the most efficient sources of high-quality protein, making the sector essential to global food security. Modern poultry production must balance economic profitability with environmental stewardship and social responsibility. Sustainable farming is not defined by a single technology or certification but by an integrated management approach that improves productivity while conserving natural resources, protecting animal welfare, ensuring food safety, and strengthening resilience against

climate change. Farms that adopt sustainable practices often achieve lower production costs, healthier flocks, and greater long-term competitiveness.

The Three Pillars of Sustainability

Sustainability in poultry production is built on three interconnected pillars.

Environmental sustainability focuses on reducing greenhouse gas emissions, conserving water and energy, minimizing waste, and protecting biodiversity.

Economic sustainability emphasizes profitable production, efficient resource use, lower production costs, increased productivity, and stronger farm resilience.

Social sustainability promotes food safety, animal welfare, safe working conditions, rural livelihoods, and consumer confidence.

Long-term success depends on balancing these three dimensions throughout the poultry value chain.

Feed Efficiency and Sustainable Feed Resources

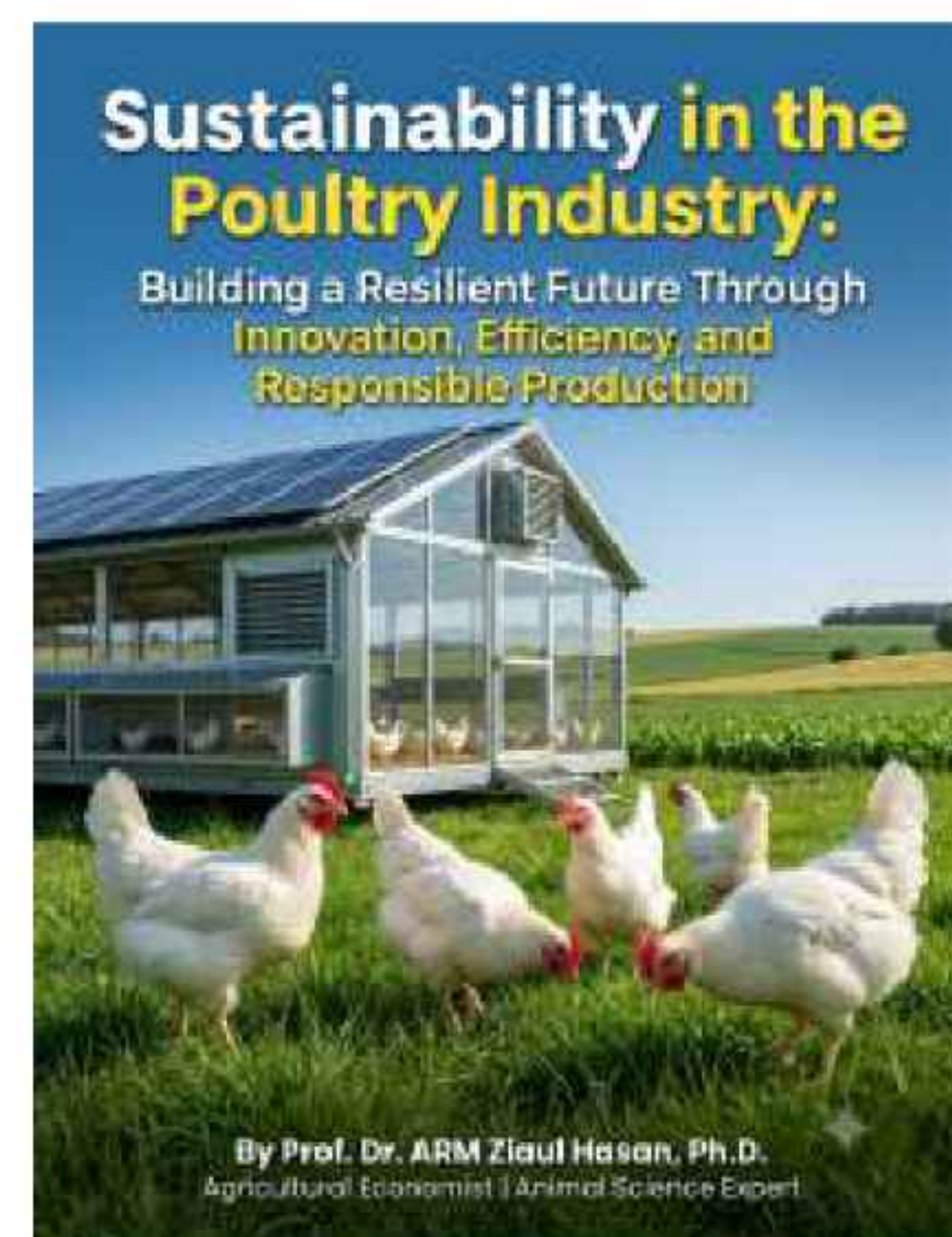
Feed represents approximately 60–70% of poultry production costs and is the largest contributor to the

environmental footprint of poultry farming. Improving feed conversion ratio (FCR) enables birds to produce more meat or eggs with less feed, reducing grain consumption, land use, water demand, greenhouse gas emissions, and production costs.

Advances in genetics, precision nutrition, enzyme technology, amino acid balancing, and feed processing have significantly improved feed efficiency.

Precision nutrition supplies birds with nutrients according to their age and production stage, reducing nutrient losses while improving performance.

Sustainable feed sourcing is equally important. Greater use of locally produced maize, soybean, sorghum, cassava, agricultural by-products, fermented feed ingredients,



insect protein, and algae can reduce dependence on imported raw materials while strengthening national food security. Climate-resilient feed crops and responsible ingredient sourcing also contribute to long-term sustainability.

Water, Energy, and Resource Management

Water is essential for bird health, cooling, sanitation, and feed processing. Efficient water management begins with maintaining high water quality and minimizing wastage through leak detection, automated drinker systems, routine monitoring, and rainwater harvesting where feasible. Clean water supports bird health, vaccine effectiveness, and overall productivity.

Energy efficiency is another key component of sustainable poultry farming. Modern poultry houses require electricity for ventilation, heating, cooling, lighting, and automated feeding systems. Technologies such as LED lighting, high-efficiency

motors, variable-speed fans, automated environmental controls, and rooftop solar systems reduce operating costs while lowering greenhouse gas emissions.

Effective waste management transforms poultry by-products into valuable resources. Poultry litter, manure, feathers, hatchery waste, and processing by-products can be composted, converted into organic fertilizer, or used for biogas production. These circular economy practices reduce environmental pollution, improve soil fertility, generate renewable energy, and decrease dependence on chemical fertilizers.

Integrating efficient feed management, responsible resource use, and waste recycling enables poultry farms to improve profitability while reducing their environmental impact, forming the foundation of a resilient and sustainable poultry industry.

Climate Change and Precision Poultry Farming

Climate change presents significant challenges to poultry

production through rising temperatures, water scarcity, extreme weather events, and changing disease patterns. Heat stress can reduce feed intake, growth, egg production, fertility, and immune function, affecting both productivity and profitability.

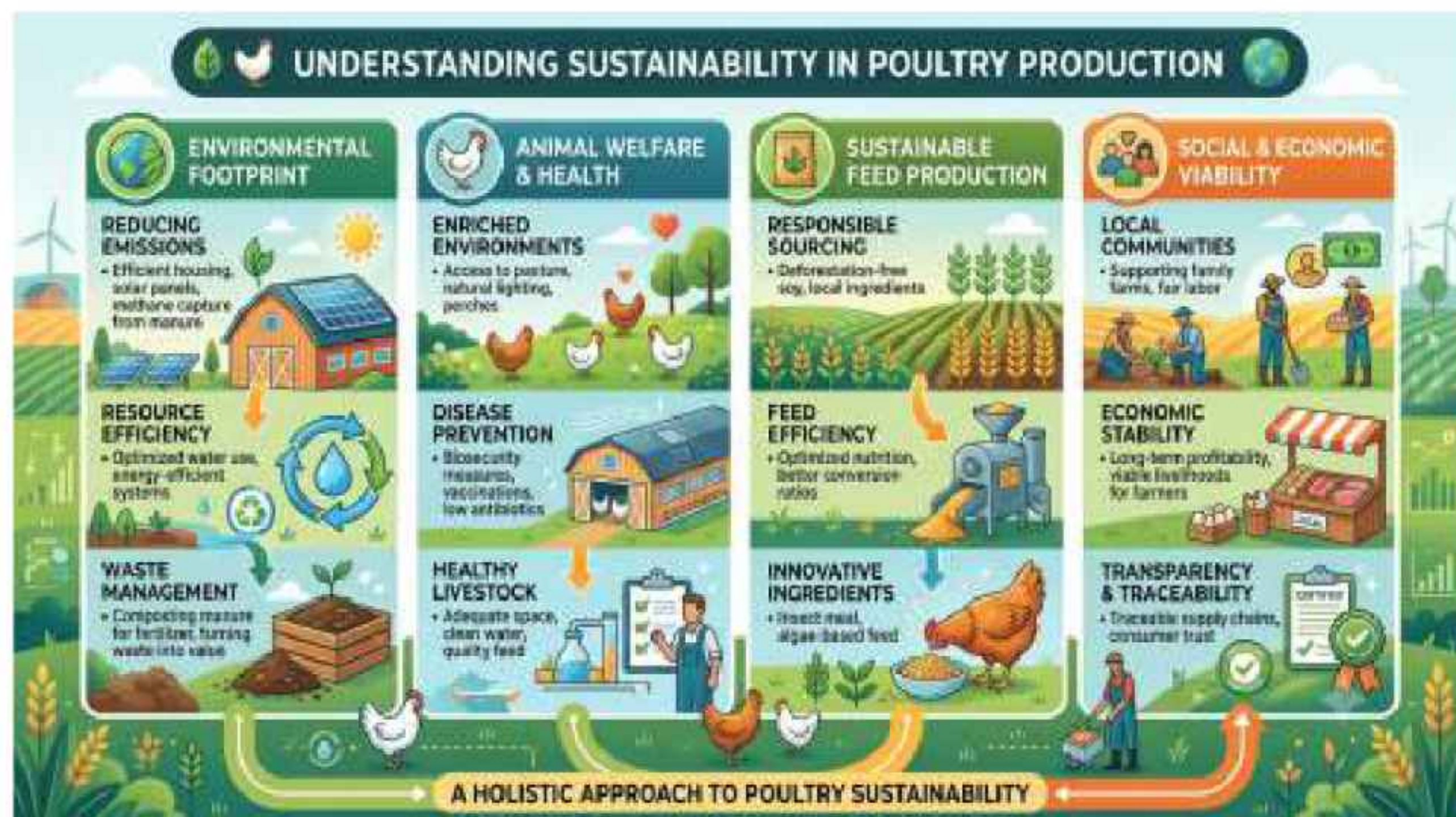
Climate-smart poultry farming incorporates improved housing design, efficient ventilation, evaporative cooling systems, heat-tolerant breeds, shade management, and emergency preparedness to reduce climate-related risks.

Digital innovation is also transforming poultry production. Precision poultry farming uses sensors, automation, artificial intelligence, and real-time data to monitor environmental conditions, bird health, feed intake, and water consumption. These technologies enable early disease detection, improve management decisions, reduce mortality, strengthen traceability, and enhance production efficiency while lowering resource use.

Animal Welfare, Biosecurity, and Food Safety

Animal welfare is an essential component of sustainable poultry production. Appropriate stocking densities, proper nutrition, clean litter, adequate ventilation, and humane handling reduce stress and improve bird health, productivity, and product quality.

Strong biosecurity remains the most effective strategy for



preventing disease outbreaks. Controlled farm access, vehicle disinfection, vaccination, rodent control, routine cleaning, and continuous health monitoring minimize disease risks while reducing reliance on antibiotics. Responsible antimicrobial use under veterinary supervision is critical in addressing the global challenge of antimicrobial resistance.

Food safety begins at the farm through quality feed and water, accurate record keeping, effective vaccination programs, hygienic processing, and reliable cold-chain management. Modern traceability systems further strengthen consumer confidence and facilitate rapid responses to food safety concerns.

Circular Economy and Sustainable Genetics

The circular economy encourages efficient use of resources by converting poultry

waste into valuable products such as organic fertilizers, renewable energy, and recycled nutrients. Integrated farming systems that combine poultry production with crop cultivation, aquaculture, and renewable energy improve both environmental and economic sustainability.

Advances in poultry genetics continue to improve feed efficiency, disease resistance, heat tolerance, productivity, and animal welfare. Future breeding programs supported by genomic technologies will play an increasingly important role in developing resilient poultry populations capable of adapting to changing environmental conditions.

Opportunities for Sri Lanka

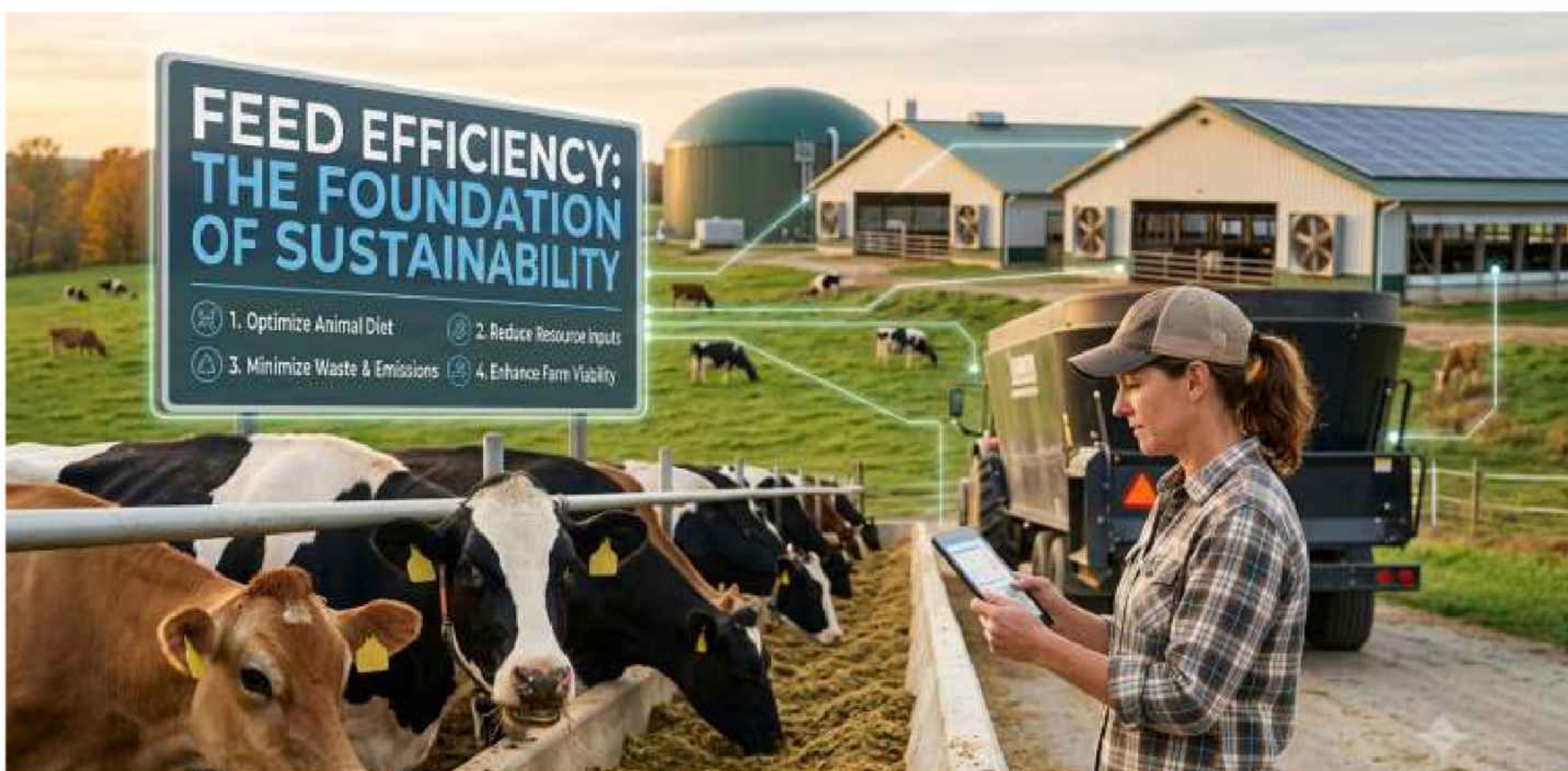
Sri Lanka has considerable potential to strengthen sustainable poultry production through greater investment in local maize and soybean

cultivation, alternative feed resources, renewable energy, manure-based organic fertilizer industries, improved hatchery infrastructure, precision farming technologies, and enhanced biosecurity.

Farmer education, research, innovation, and strong public-private partnerships will be essential for improving productivity, reducing import dependence, creating rural employment, and increasing the competitiveness of the national poultry sector. Integrating sustainability into agricultural policy will support long-term food security and economic growth.

Future Outlook and Conclusion

The future of poultry production will be shaped by digital technologies, artificial intelligence, biotechnology, renewable energy, precision nutrition, and climate-smart



farming practices. Farms that embrace innovation while using natural resources responsibly will be better positioned to meet growing consumer demand and environmental expectations.

Sustainability is no longer an optional objective but a strategic necessity for the poultry industry. By improving feed efficiency, conserving water and energy, strengthening biosecurity, promoting animal welfare, adopting circular economy principles, and investing in research and technology, the poultry sector can produce safe, affordable, and nutritious food while reducing its environmental footprint

For Sri Lanka, sustainable poultry production represents an opportunity to enhance food security, strengthen rural livelihoods, improve environmental stewardship, and expand market competitiveness. Collaboration among farmers, researchers, policymakers,

industry leaders, and investors will be essential to building a resilient poultry industry capable of supporting future generations.

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Intrinsic heat stability of a phytase

An additional criterion for a good phytase

TECHNICAL TEAM, HUVEPHARMA SEA

SUMMARY

The biochemical characterisation of a phytase such as pH profile, pepsin resistance, speed and affinity, can provide information on the potential efficacy of the phytase *in vivo*. The focus on improvement of the intrinsic heat stability has been driven by the market and forms part of the selection criteria.

INTRODUCTION

Exogenous added phytase in feed is already in practice for more than 25 years. It is used to liberate phosphorous (P), bound to phytate present in raw materials, lowering the feed cost by reducing the amount of added inorganic P and to degrade the concentration of phytate, a well-known anti-nutritional factor. At the same time, environmental sustainability is improved, as P excretion in the environment is reduced. Also, the awareness grows that the sources of inorganic P are not inexhaustible. As different phytases are commercially available, it is important to understand which criteria are important to make a good choice.

pH PROFILE AND PEPSIN RESISTANCE OF THE PHYTASE

These criteria have already been used for a long time as a first quick screening of phytases. It is common knowledge that phytate must be in solution to allow the exogenous phytase to hydrolyse its phosphate groups. Phytate is largely soluble at pH levels below 4.0 (gizzard) while at higher pH levels it forms complexes with positively charged ions and amino acids, making it insoluble and unavailable for hydrolysis by phytase. Therefore a phytase with a high activity throughout the complete acid pH range from pH 2 to 4 has shown to be superior. As phytases work in the gizzard, screening for a phytase which is not prone to degradation by pepsin is also an important parameter to consider.



SPEED OF PHYTATE HYDROLYSIS AND AFFINITY FOR PHYTATE

A key criterion for selection is speed of phytate hydrolysis. The aim is to have a maximal speed so that quick degradation of phytate is achieved. This is not only providing a high P release in short time, but the destruction of phytate also leads to the release of micro-minerals and proteins (amino acids) complexed by it, enhancing their digestibility. This maximal speed (V_{max}) is determined in so-called Michaelis-Menten kinetic studies, in which *in vitro* the speed of phytate degradation is measured with increasing levels of phytate (Fig. 1). However, as indicated in Fig. 1, two phytases having a similar V_{max} , can have lower speed of action when phytate levels decrease due to phytase action. This is due to a difference in affinity (K_m) of the phytase for phytate. The affinity, defined as the concentration of phytate at which the speed of its degradation equals half of its maximal speed, indicates how long this high speed can be maintained when the phytate concentration is decreasing. A low K_m (so a high affinity) gives a benefit to a phytase as it will lead to a prolonged high speed of phytate degradation, and thus to a higher P matrix value as from *in vivo* measurement can be expected. Translating this into a practical situation: when birds consume feed, the initial phytate level will drop during hydrolysis in the gizzard, and so will also the speed of phytate degradation. A phytase with higher affinity (lower K_m) will be able to keep the high speed of phytate degradation up for a longer time, and will thereby give a higher P matrix value.

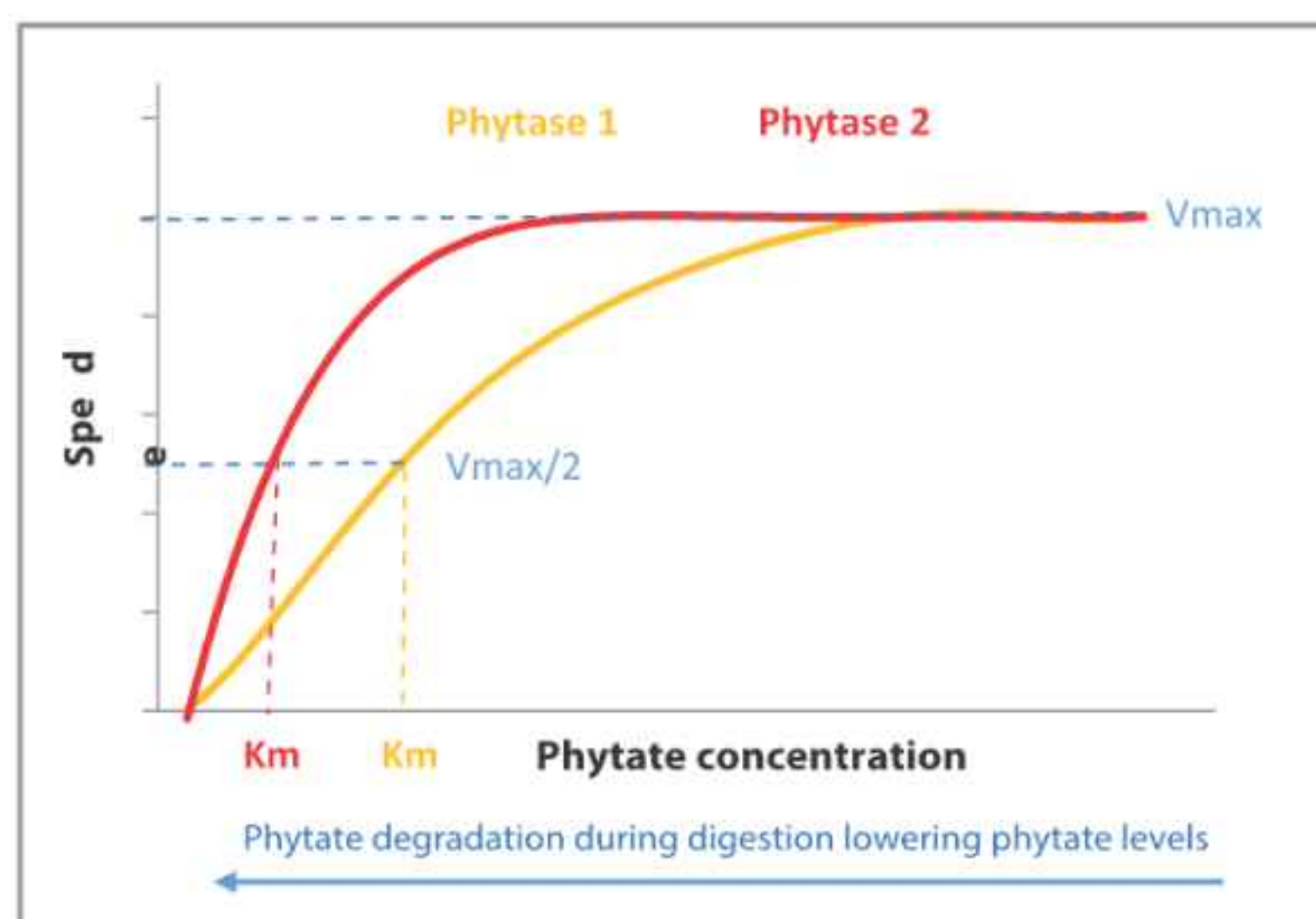


Fig. 1: The speed of phytate degradation by 2 phytases showing equal maximal speed (V_{max}) but a different affinity (K_m) for phytate

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STRIVING FOR AN INTRINSIC HEAT STABLE PHYTASE

The first phytases commercialised 20-30 years ago were rather heat sensitive during pelleting, even when coated, requiring the post pellet liquid application (PPLA) of phytases. Next to the cost of installation, the risk of malfunctioning lurked around the corner requiring a high level of maintenance and quality control, which is a burden to the feed mill manager and technician.

In that perspective, the intrinsic heat stability of a phytase has gained interest. An increase in intrinsic heat stability that allows pelleting to at least up to 85 °C was reassuring thermostability under normal pelleting conditions. When, by a coating technique, the thermostability could be increased to 90 °C (or even 95 °C), an alternative to the application of liquid phytases through PPLA is realised.

In the period 2017-2020, plural pelleting trials in Europe (at 5 different trial locations) and in the USA (at 5 different trial locations) were conducted to assess the heat stability of a newly developed intrinsic heat stable phytase, either uncoated (granular) as well as the coated version. It was chosen to run these trials in different trial locations, so that the phytase were tested under a wide variety of different pelleting conditions (including impacting factors like equipment, feed composition, speed of cooling and others). As the universal definition of stability states that “stability is achieved when recovery of the active substance is > 80 % of the original value”, it can be seen that the newly developed phytase can claim an intrinsic heat stability at 85 °C (Fig. 2) when applied in the granular form (G), while its coated version (CT) can stand pelleting temperatures up to 90 °C, and even 95 °C with acceptable (25 %) losses of activity (Fig. 2).

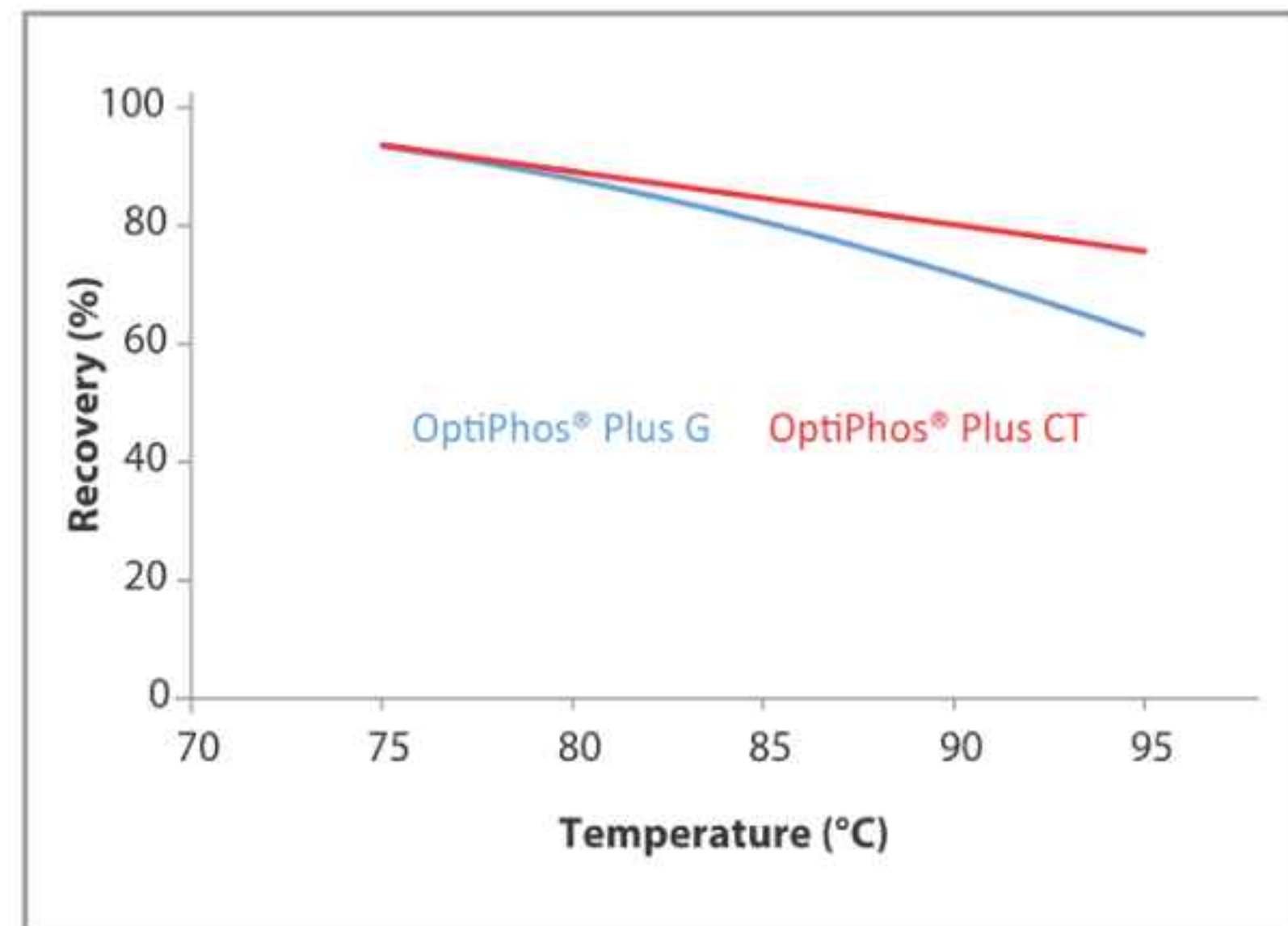


Fig. 2: Average recovery of pelleting studies ran with a granular and coated intrinsic heat stable phytase (2017 to 2020, EU and the USA data)

CONCLUSION

Next to the screening for optimal biochemical characteristics of a phytase like pH profile, pepsin resistance and speed/affinity, the intrinsic heat stability has become a prerequisite for a phytase, allowing it to reach a heat stability till 85°C, and even up to 95°C when appropriately coated.

To know more, please contact Huvepharma technical team



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The Future of Eggs Is Functional

Eggs are one of the most complete and affordable sources of high-quality protein and essential nutrients. Today, with increasing consumer awareness about preventive healthcare, the demand is rapidly shifting from conventional foods to **functional foods** that provide additional health benefits beyond basic nutrition.

Enriched eggs are produced by supplementing the diet of laying hens with highly bioavailable nutrients that are naturally transferred into the egg. Among the most important nutrients are **organic selenium, organic zinc, vitamin E, and vitamin D₃**, which not only enhance the nutritional value of eggs but also improve bird health, immunity, and productivity.

Considering that deficiencies of selenium, zinc, and vitamin D

FUNCTIONAL ENRICHED EGGS: A SMART NUTRITIONAL INNOVATION FOR IMPROVED POULTRY PERFORMANCE AND HUMAN HEALTH

The Role of Organic Selenium, Organic Zinc, Vitamin E and Vitamin D₃ in Producing Premium Value-Added Eggs

remain common worldwide, enriched eggs provide a simple, natural, and cost-effective solution to improve daily nutrient intake without changing eating habits.

Why Are Enriched Eggs Needed?

Micronutrient deficiencies continue to be a major global public health challenge.

- Nearly **2 billion people** suffer from micronutrient deficiencies.
- Selenium deficiency affects approximately **0.5–1 billion** people worldwide.
- Global zinc deficiency is estimated at **17–31%**.
- In India, vitamin D deficiency has been reported in **70–100%** of certain population groups despite abundant sunshine.

A conventional egg contains only modest quantities of these nutrients. By improving hen nutrition with highly bioavailable organic minerals and vitamins, eggs can naturally become an excellent vehicle for delivering these essential micronutrients to consumers.

How Egg Enrichment Works

The enrichment process is completely natural.

After ingestion, nutrients are absorbed through the intestine, transported via the bloodstream to the liver, and subsequently deposited into the developing egg yolk during egg formation.

Organic mineral sources such as **Hydroxy-Selenomethionine** and **Zinc Glycinate** possess superior bioavailability compared with conventional inorganic mineral sources, resulting in greater nutrient deposition while reducing mineral excretion into the environment.

Laboratory Confirmation of Enriched Eggs

Egg samples collected from hens receiving **UT- Selway Gold supplemented program**, enriched nutrition were analysed by **four independent NABL-recognized laboratories**.

Nutrient Enrichment Compared with Ordinary Eggs

Nutrient	Ordinary Egg (per 100 g)	Enriched Egg (Average)	Improvement
Vitamin D ₃	2.0 µg	9.13 µg	4.6×
Vitamin E	1.08 mg	3.75 mg	3.5×
Selenium	25–30 µg	84.0 µg	~3×
Zinc	~1.0 mg	1.99 mg	~2×

The laboratory results clearly demonstrate that nutritional enrichment

Nutrient	Ordinary Egg (per 100 g)	Enriched Egg (Average)	Improvement
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Zinc	~1.0 mg	1.99 mg	~2×

significantly increases the concentration of all four key micronutrients in eggs, creating a premium functional food with enhanced nutritional value.

Benefits for Poultry

Supplementation with organic selenium, organic zinc, vitamin E and vitamin D₃ provides multiple benefits to laying hens.

- ✓ Improved antioxidant protection and reduced oxidative stress
 - ✓ Enhanced immune response and better vaccine performance
 - ✓ Stronger eggshell quality and improved shell strength
 - ✓ Better reproductive performance and hatchability
 - ✓ Improved flock uniformity and persistency of lay
 - ✓ Reduced environmental mineral excretion through improved mineral utilization
- Scientific studies have consistently shown that the synergistic action of selenium

and vitamin E enhances antioxidant defence, while zinc and vitamin D₃ support skeletal health, eggshell formation, immunity and overall productivity.

Benefits for Consumers

Enriched eggs offer a convenient way to increase the intake of essential micronutrients through a commonly consumed food.

A single enriched egg can provide approximately:

- **37%** of the daily vitamin D requirement
- **22%** of the daily vitamin E requirement
- **Over 90%** of the daily selenium requirement
- **11–15%** of the daily zinc requirement

Regular consumption of enriched eggs may help support:

- Healthy immune function
- Antioxidant defence against oxidative stress
- Normal thyroid hormone metabolism

- Bone and muscle health
- Healthy ageing
- Reproductive health

Unlike dietary supplements, enriched eggs deliver these nutrients through a natural food matrix with excellent consumer acceptance.

Economics for Poultry Producers

Producing enriched eggs requires only a modest investment in feed supplementation.

Supplementing layer feed with a special program of **UT- Selway Gold** at design dose size per tonne of feed increases feed cost by only ₹0.15–0.22 per egg, depending on flock performance.

Enriched eggs typically command a retail premium over conventional eggs in the Indian market. Even a modest premium of ₹1–3 per egg can yield farmers an additional gross return. Offering producers an attractive opportunity to improve profitability while delivering additional nutritional value to consumers.

A Growing Opportunity for the Poultry Industry

The global market for functional and fortified eggs is estimated to be about **USD 4.0 billion in 2026** and is expected to grow to **USD 8.6 billion by 2036**, with an annual growth rate of about **7.9% (CAGR)**. Feed-based fortification is expected to remain the most widely used method for producing enriched eggs (Future Market Insights, 2026). In the future, eggs

enriched for specific nutrient deficiencies may become important products alongside staple-food fortification programs. However, their use should be supported by population-level safety evaluations, especially for **vitamin D₃**, because of regulatory limits on feed additives. India's large organized egg industry, along with the high prevalence of **zinc and vitamin D deficiencies**, provides a strong opportunity for the growth of enriched eggs. More human clinical studies and harmonized regulations will be important to support their wider adoption (Kamboj et al., 2018; Wessells & Brown, 2012). The use of highly bioavailable organic minerals together with antioxidant vitamins, enables poultry producers to produce premium eggs without changing existing management practices. As awareness of preventive

nutrition grows, enriched eggs are expected to become an important premium category within the Indian egg industry.

Conclusion

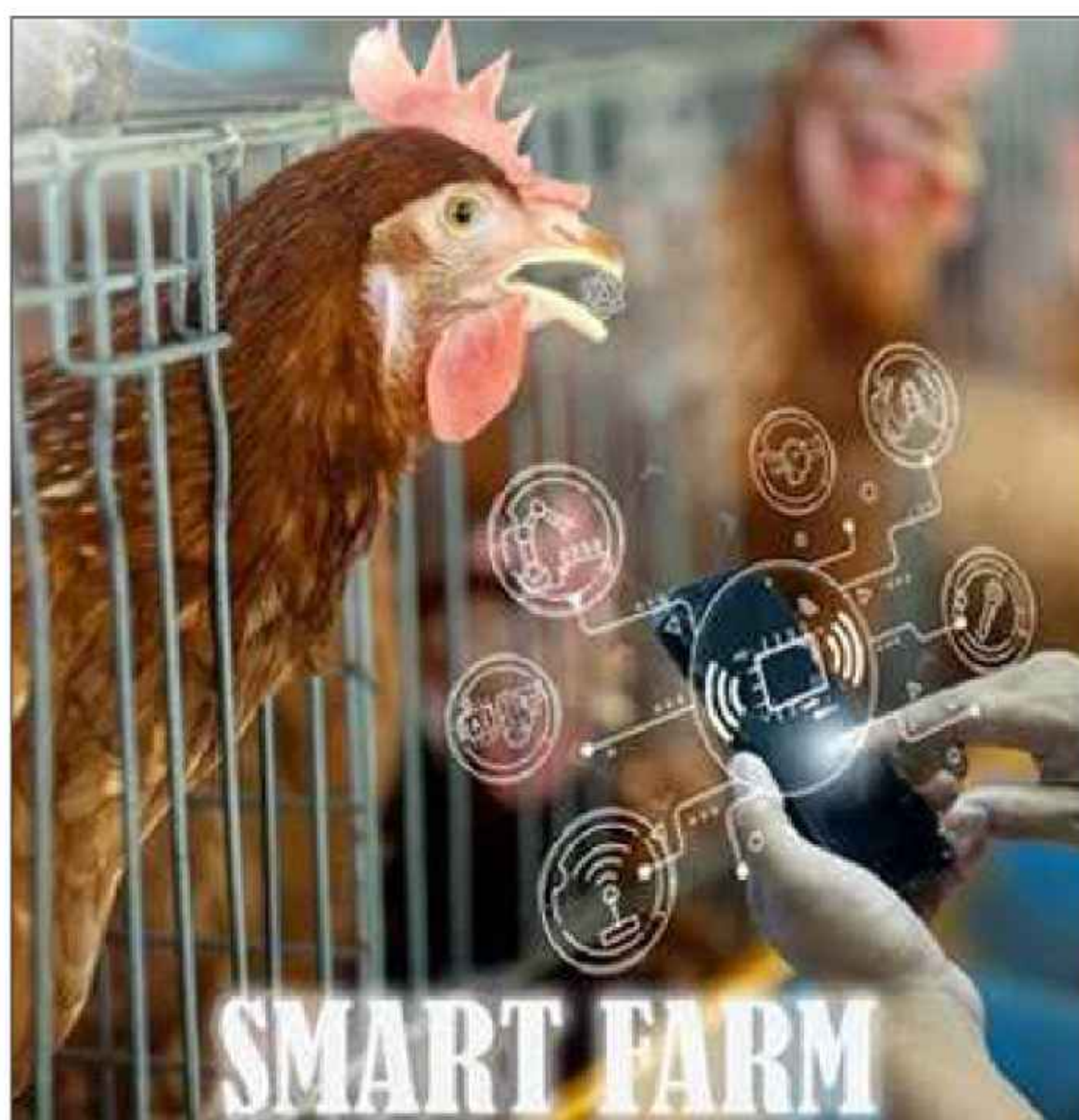
Enriched eggs represent the next generation of value-added poultry products. Scientific evidence demonstrates that dietary supplementation with organic selenium, organic zinc, vitamin E and vitamin D₃ can substantially increase the concentration of these essential nutrients in eggs while simultaneously supporting bird health, immunity and egg quality.

Laboratory analyses confirmed enrichment levels of **4.6-fold for vitamin D, 3.5-fold for vitamin E, approximately 3-fold for selenium and nearly 2-fold for zinc** compared with conventional eggs. Enriched eggs provide a practical and economically viable opportunity for poultry producers to

differentiate their products while contributing to improved consumer nutrition.

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Biosecurity Measures In Poultry Farm



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Introduction:

Poultry diseases are associated with severe economic losses. With the new and re-emerging diseases evaluating their economic impact is essential to determine whether new control measures and especially new vaccines are needed. Biosecurity at a poultry farm includes all measures taken to minimize the risk of introduction and spread of disease agents and thus, includes all actions for keeping poultry and the farm healthy.

Poultry sector provides livelihood to millions of farmers in developing countries. The recent years have witnessed a huge demand for poultry products (meat and egg) and this has resulted in a production boom in this sector. On the basis of flock size, poultry holders are classified as small-scale poultry holders (300 - 3000 birds),

medium-scale poultry holders (10000 - 50000 birds) and large-scale poultry holders (50000 - 400000 birds).

Implementing biosecurity on a poultry operation can prevent the introduction and spread of infectious diseases, including Avian Influenza.

1. Conceptual Biosecurity

This is the foundational phase of farm planning. It focuses on the geographical location and general isolation of the farm to minimize exposure to wild birds, rodents, and other commercial flocks.

- (a) **Site Selection:** Building farms in remote areas, far from other poultry facilities, slaughterhouses, or migratory bird flyways.
- (b) **Layout Design:** Planning the spatial distance between different poultry houses to prevent airborne (aerosol) transmission.
- (c) **Multi-Age Restriction:** Deciding to avoid raising multiple species or varying age groups of poultry on the same site.

2. Structural Biosecurity

This involves the physical barriers and facilities built on the farm to enforce isolation and sanitation.

- (a) **Fencing & Gates:** Perimeter fencing to keep out stray animals, unauthorized

visitors, and potential biological vectors.

- (b) **Facilities:** Specific structures for biosecurity compliance, such as sanitation rooms (sluice rooms) for workers to shower and change, and specialized dead bird disposal pits.
- (c) **Vehicle Sanitation:** Installation of wheel washes and disinfectant dips at the farm entrance to sanitize trucks.
- (d) **Pest Proofing:** Using wire mesh to prevent wild birds and rodents from accessing the poultry houses and feeders.

3. Operational Biosecurity

These are the daily management practices, Standard Operating Procedures (SOPs), and hygiene protocols that staff must follow to prevent disease transmission.

- (a) **Visitor Controls:** Implementing strict visitor logs and requiring guests to wear dedicated farm clothing and footwear.
- (b) **Sanitation & Hygiene:** Daily use of footbaths, regular hand washing, and the "all-in-all-out" system to empty, clean, and disinfect entire houses between flocks.

© **Vector Control:** Managing biological and mechanical vectors (insects, beetles, and non-living objects like mobile phones).

(d) Feed & Water Quality: Ensuring that feed supplies are uncontaminated and testing the water source for microbial/chemical quality.

(e) Waste & Mortality Management: Hygienic and immediate disposal of manure and dead birds to eliminate breeding grounds for pathogens.

Management Strategies:

1. Isolation and quarantine of new birds for 21 days:
Isolation and quarantine of new birds is necessary in a separate place and enclosure so that infectious agents which may be there in the newly introduced birds may be detected before introduction of these birds with other flocks.

2. Hygiene, Cleaning and Sanitation:

Cleaning and disinfection is an essential component of good hygiene and thus one of the key biosecurity measures for disease control. This should be carried out from time to time to reduce the build-up of pathogenic organisms and a disinfectant known to be effective against a large range of pathogens should be used regularly for prevention of ingress of the infection. It should address the cleaning and disinfection of materials, feeding pans and drinking equipment. Cages should be disinfected at regular basis.

3. Disinfecting Poultry shed:
The sheds should be fumigated and subjected to an effective disinfection. Keeping the shed empty for a minimum period of 10 days before arrival of new

flock will enhance the biosecurity in more systemic way.

4. Disposal of manure or waste:

The manures can be disposed carefully for healthy and sick birds in separate way to decrease the further contamination. The healthy manures can be either used as organic fertilizer for agricultural purpose and the unhealthy manures should be burnt off away from the shed in a pit with a layered soil disinfected with chemicals.

5. Rodent and Insect control measures:

Rodent catcher or traps and rodenticides should be used during night times. Ensure proper drainage to decrease the load of flies in the cages and shed system



(Source: The Indian Express)

HONORARY EDITORIAL BOARD MEMBERS



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DUVASU, Mathura-281001 (UP)
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Executive Member,
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Educational qualification

Examination/ Degree	School/ College/ Institute	Board/ University	Subjects/ Specialization	Year of passing	Division	Percent/ OGPA
A.I.S.S.E. (10th Std.)	V.S.Vidyalaya, Sunabeda, Odisha, India	C.B.S.E.	English Medium	1991	1st	71%
A.I.S.S.C.E. (12th Std.)	V.S.Vidyalaya, Sunabeda, Odisha, India	C.B.S.E.	English Medium	1993	1st	72.6%
B.V.Sc. and A.H.	College of Veterinary Science and Animal Husbandry, Bhubaneswar, India	O.U.A.T, Bhubaneswar, India	All subjects under V.C.I. syllabus	2001	1st	7.19/10
M.V.Sc.	C.A.R.I	I.V.R.I., India	Poultry Science	2003	1st	8.503/10
Ph.D.	C.A.R.I	I.V.R.I., India	Poultry Science	2008	1st	8.585/10
Visiting Professor	Gyeongsang National University, Republic of Korea			25th March, 2023 to 22nd June, 2023		

Additional qualification : Diploma in Export Management with specialization in Agriculture Exports 2006 (Indian Institute of Export Management, Bangalore), NET-2004 (Poultry Science), (ICAR), India

Participation in Workshop/ Training : 11

Organization of Webinars/ Conference : 7

Research Experience : 24 years

Teaching Experience : Teaching Associate in the Department of Poultry Science, College of Veterinary Science and Animal Husbandry, DUVASU, Mathura, India from 30th October, 2007 to 1st July, 2009. Assistant Professor in the Department of Poultry Science, College of Veterinary Science and Animal Husbandry, DUVASU, India from 2nd July, 2009 till 1st July, 2021 Associate Professor in the Department of Poultry Science, College of Veterinary Science and Animal Husbandry, DUVASU, India from 2nd July, 2021 till 1st July, 2024. Professor, Department of Poultry Science, College of Veterinary Science and Animal Husbandry, DUVASU, India from 2nd July, 2021 till date

Students guided : Guided successfully 11 Masters students and 1 doctoral student.

Projects Handled : 6

Awards & Honors : 32

Countries visited : Italy, Bangladesh, South Korea, Spain, Russia

Membership of Professional Societies:

1. Life Member of Indian Poultry Science Association (IPSA).
2. Life Member of Indian Association of Veterinary Public Health Specialists (IAVPHS).
3. Annual Member of World Poultry Science Association
4. Life Member of Indian Association for Advancement of Veterinary Research
5. Life Member of Indian Science Congress
6. Life Member of Association of Public Health Veterinarians

Publications

Number of papers in Journals	Number of conference Papers/Books/Chapters/Popular articles/ Lead Papers
Research: 52	Conference Papers: 106 Books/ Manuals/ Compendium: 10
Review Articles: 6	Book Chapters: 23, Popular articles/ Lead papers: 51

I hereby affirm that the information furnished above is true to the best of my knowledge.

Date: 31/07/2026

(AMITAV BHATTACHARYYA)



Uma Kant Verma¹, Swarup Debroy², Shalini Pandey³ and Hansmeet Kour³

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Introduction

Sustainability in poultry farming relies on efficient resource use, waste recycling, and renewable energy to lower environmental impacts. Key practices include optimizing feed efficiency, managing manure safely, and using green energy. Poultry farming has become one of the fastest-growing agricultural enterprises worldwide. Chicken meat and eggs provide affordable, high-quality protein to millions of people every day, making poultry an essential part of global food security. As the world's population continues to grow, farmers are expected to

Sustainable Poultry Farming: Smart Solutions For A Healthy And Profitable Future

produce more food while using fewer natural resources. This challenge has encouraged the poultry industry to adopt modern technologies, improved management practices, and environmentally friendly production systems. Today's poultry farming is very different from traditional backyard production. Modern farms use scientifically balanced feeds, climate-controlled housing, vaccination programs, automated feeding systems, and digital monitoring tools to improve bird health and productivity. These innovations help farmers reduce production costs while producing safe and nutritious food.

Different Poultry Production Systems

Poultry can be raised under intensive, semi-intensive, or free-range production systems. Intensive farming is the most common commercial system because it allows large numbers of birds to be raised efficiently in controlled environments. Semi-intensive systems combine indoor housing with outdoor access, providing a balance between productivity and bird welfare. Free-range systems allow bird's greater freedom of movement and natural behavior, although production levels are generally lower and disease risks may be higher. Each production system has



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Qualifications:

- **B.V.Sc. & A.H. (2014)** – DUVASU, Mathura, Uttar Pradesh, India.
- **M.V.Sc. (2016)** – Animal Genetics & Breeding, Govind Ballabh Pant University of Agriculture and Technology, Pantnagar-263145, Uttarakhand, India.
- **Ph.D. (2019)** – Animal Genetics & Breeding, ICAR-National Dairy Research Institute (NDRI), Karnal-132001, Haryana, India.
- ASRB NET Qualified (2017)

Life Memberships:

1. Society for Conservation of Domestic Animal Biodiversity.

2. The Indian Society for Study of Animal Reproduction.
3. Indian Society for Buffalo Development.
4. Indian Society for Advancement of Canine Practice.

Prior Job Experience:

Worked for **5 years and 3 months** as a **Veterinary Medical Officer** under the Department of Animal Husbandry, Government of Uttar Pradesh.

Publications:

- **Research Papers:** 12
- **Review Papers:** 04
- **Book Chapters:** 10
- **Popular Articles:** 36
- **Conference Abstracts:** 06

Awards:

- **03 Awards**



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College of Veterinary and Animal Sciences,
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Email: swarup.vetroy@gmail.com

Qualifications:

Master of Veterinary Sciences (M.V.Sc.) in *Veterinary Anatomy & Histology* (2017) from the College of Veterinary Sciences & Animal Husbandry, Selesih, Aizawl, Mizoram, under Central Agricultural University. **Doctor of Philosophy (Ph.D.)** in *Forensic Anatomy* (2022), with a dissertation titled "*Trichological Analysis of the Local Cattle Breed of Mizoram and Meghalaya*", from the College of Veterinary Sciences & Animal Husbandry, Selesih, Aizawl, Mizoram, under Central Agricultural University. **Qualified ICAR-NET** in the years **2017 and 2019**.

Job Experiences:

Working as Assistant professor in the **Department of Veterinary Anatomy, Banda**

University of Agriculture & Technology since 28.10.2024.

Served as an Assistant Professor for **2 years and 6 months** in the **Section of Veterinary Anatomy** at the **ICAR-Indian Veterinary Research Institute**, Izatnagar, Bareilly, Uttar Pradesh, India. Additionally, worked for **8 months** as a **Senior Research Fellow** at the **ICAR Research Complex for NEH Region, Tripura Centre**, Lembucherra, Tripura.

Publications & Achievements:

Research articles: 29
(International journal-15, National journal-14), Book chapter: 9,
Popular articles-16, Review articles: 3, Awards: 2 (1 Young Scientist Award), Abstracts: 11, Training: 2.

Life Member: Tripura Veterinary Council (TVC), Indian Association of Veterinary Anatomy (IAVA).

advantages and limitations, and farmers should select the system that best suits their available resources, climate, and market demand.

Balanced Nutrition: The Foundation of Success

Feed accounts for the largest portion of poultry production costs. Providing birds with balanced diets containing energy, protein, vitamins, minerals, and clean water is essential for healthy growth, efficient feed conversion, and high egg or meat production. Modern poultry nutrition is moving toward precision feeding, where nutrients are supplied according to the bird's age and production stage. This approach reduces feed wastage and improves profitability. Researchers are also exploring

sustainable feed ingredients such as insect meal, algae, and agricultural by-products to reduce dependence on conventional feed resources.

Use of probiotics and alternatives to antibiotics

For many years, antibiotics were widely used to promote growth and prevent diseases in poultry. However, excessive use has contributed to the global problem of antimicrobial resistance, making some bacterial infections more difficult to treat. To overcome this challenge, poultry producers are increasingly using probiotics, prebiotics, enzymes, organic acids and herbal feed additives. These natural alternatives improve gut health, strengthen immunity and support better growth without

relying heavily on antibiotics.

Comfortable Housing Improves Performance

A well-designed poultry house provides birds with a clean, comfortable, and stress-free environment. Proper ventilation, suitable temperature, adequate lighting, and correct stocking density help maintain bird health and productivity. Poor housing conditions can reduce feed intake, weaken immunity, increase disease outbreaks, and lower production efficiency. Therefore, maintaining an optimal environment throughout the production cycle is essential.

Managing Heat Stress

Heat stress is one of the biggest challenges facing poultry farmers, especially in tropical and subtropical regions. High



temperatures reduce feed consumption, slow growth, decrease egg production, and weaken the immune system. Severe heat stress can even lead to increased mortality. Farmers can reduce heat stress by improving ventilation, providing cool and clean drinking water, using cooling systems, reducing stocking density during hot weather, and adjusting feeding schedules. Long-term breeding programs are also focusing on developing heat-tolerant poultry strains.

Preventing Diseases through Biosecurity

Disease prevention is always more effective and less expensive than disease treatment. Poultry diseases such as avian influenza, Newcastle disease and coccidiosis can spread rapidly and cause significant economic losses. Strong biosecurity measures include restricting visitor access, disinfecting equipment, maintaining farm cleanliness, vaccinating birds according to schedule, isolating sick birds and controlling rodents and wild birds. Good biosecurity reduces disease outbreaks and minimizes the need for antibiotics.

Animal Welfare Matters

Consumers today are increasingly interested in how poultry are raised. Good animal welfare means providing birds with sufficient space, clean water, balanced nutrition, proper ventilation, and protection from unnecessary stress. Healthy and comfortable birds generally grow better, produce more efficiently, and are less susceptible to disease. Therefore, improving animal welfare benefits both farmers and consumers.

Sustainable Poultry Farming

Sustainability has become a major goal in modern poultry production. Farmers are adopting practices that reduce environmental pollution while maintaining productivity. These include efficient manure management, recycling agricultural waste, reducing greenhouse gas emissions, conserving water and improving feed efficiency. Innovative technologies can also convert poultry waste into useful products such as biogas and organic fertilizers, creating additional income while protecting the environment.

Technology is Transforming Poultry Farming

Digital technologies are changing poultry production. Sensors, automated feeders, climate-control systems, artificial intelligence, and precision livestock farming enable farmers to monitor bird health, behavior, feed intake and environmental conditions in real time. These technologies help farmers detect problems early, reduce labor requirements, improve decision-making, and increase overall farm efficiency.

Challenges in poultry management

Although poultry farming has achieved remarkable progress, several challenges remain. Rising feed costs, climate change, disease outbreaks, antimicrobial resistance, and increasing consumer expectations continue to affect the industry. Meeting these challenges will require continued research, improved management practices, adoption of sustainable technologies, and greater awareness among farmers.

Conclusion

Poultry farming plays a vital role in feeding the growing global population while supporting rural livelihoods and national economies. Future success will depend on combining good nutrition, disease prevention, animal welfare, environmental sustainability, and modern technology. By adopting innovative and responsible management practices, poultry producers can improve productivity, protect natural resources, and build a resilient and sustainable poultry industry for future generations.





59th AGM & 67th National Symposium 2026

Theme: "Animal Agriculture-The Backbone of Sustainable Development"

Date: 11th and 12th September, 2026 at The Leela Mumbai, Sahar, Near International Airport, Andheri East, Mumbai

Day-1: Friday, September 11, 2026	
Time	Session
10:00 hrs	Registration of Delegates
12:00 hrs - 13:30 hrs	Lunch
13:30 hrs - 14:30 hrs	59 th Annual General Meeting
Inaugural Session	
16:00 hrs. - 18:30 hrs	Inaugural Session
19:00 hrs	Networking Dinner & Live Performance Felicitation of Sponsors, Media, Guests, and Invitees

67th National Symposium 2026

Theme: "Animal Agriculture-The Backbone of Sustainable Development"

Day-2: Saturday, 12 th September, 2026	
09:00 hrs	Registration
09:15 hrs	Welcome Address by Mr. Divya Kumar Gulati, Chairman, CLFMA OF INDIA
09:30 hrs	Introduction of Symposium – (Technical Committee Member)
10:00 hrs	Mr. Sunil Kataria, CEO & MD, Godrej Agrovvet Ltd.

11:00 hrs	Interactive Policy – Roundtable / Government and sector partnership for animal agriculture Moderator: Ms. Manisha Gupta, Editor – Commodities & Currencies, CNBC ❖ Ms. Varsha Joshi, Additional Secretary (CDD), Department of Animal Husbandry and Dairying, GOI ❖ Dr. Muthukumarasamy B., Joint Secretary (NLM/SD), Department of Animal Husbandry & Dairying, GOI ❖ Dr. Gagan Garg, Joint Commissioner (Trade), Department of Animal Husbandry and Dairying, GOI ❖ Mr. B. S. Yadav, Ex-Managing Director, Godrej Agrovets Ltd. ❖ Shri. Suresh Rayudu Chitturi, Vice Chairman and MD, Srinivasa Farms ❖ Shri. Daljeet Singh, President, Progressive Dairy Farmers Association (PDFA) ❖ Mr. Sameer Agarwal, MD of Shalimar Group of Companies
12:00 - 13:00 hrs	Presentation on AI in animal agriculture (Mr. Bhaskar)
13:00 - 14:00 hrs	Lunch Break
14:00 - 14:15 hrs	Kevin Roepke, Executive Director MENASA, U.S. Soybean Export Council
14:15 hrs	Panel Discussions with National Associations - One Nation One Voice
	Moderator: Mr. Mrityunjay Jha, Commodity Editor and Anchor, Zee Business ❖ Mr. Divya Kumar Gulati, Chairman, CLFMA OF INDIA ❖ Mr. Ranpal Dhanda, President, Poultry Federation of India (PFI) ❖ Mr. Uday Singh Bayas, President, Indian Poultry Equipment Manufacturers Association (IPEMA) ❖ Mr. Madan Mohan Maity, General Secretary, West Bengal Poultry Federation Association (WBPFA) ❖ Mr. Saji Chako, President, Society of Aquaculture Professionals (SAP) ❖ Mr. R. Ramkutty, Broiler Co-ordination Committee (BCC)
15:45 hrs-16:00hrs	Presentation on Pet Food - Dr. Saurabh Shekhar, Managing Partner – Pet Care, Pet Care Business
16:00 hrs	Panel discussions: Animal Agriculture and Global Food Security Moderator: Dr. O. P. Chaudhary (Retd. JS NLM/PC) ❖ Dr. S. K. Dutta, Joint Commissioner (NLM), Dept of AH&D, GOI ❖ Dr. P. S. Mahesh, Joint Commissioner and Director, CEAH-Bengaluru ❖ Prof. (Dr.) Pankaj Kumar Shukla, President, Indian Poultry Science Association ❖ Mr. Naveen Pasupathy, President, Karnataka Poultry Farmers & Breeders Association (KPFBA) ❖ Dr. Ajay Deshpande, President, Vets In Poultry (VIP) ❖ Mr. Valsan Parameswaran, Secretary, All India Poultry Products Exporters Association (AIPPEA)- Egg
17:00 hrs	Valedictory Session: Mr. Abhay Shah, Dy. Chairman CLFMA OF INDIA
17:15 hrs	Vote of Thanks by – Mr. R. Ramkutty, Treasurer, CLFMA OF INDIA
19:00 hrs	Networking Dinner



CLFMA Of India Partners With Gadvasu In Ludhiana To Undertake Scientific Study On Moisture Content In Chicken Sausages Research Collaboration To Generate India-specific Scientific Evidence Supporting Product Quality, Food Safety And Evidence-based Industry Standards - Ludhiana, 10th July 2026



The Compound Livestock Feed Manufacturers Association (CLFMA) of India has signed a Memorandum of Understanding (MoU) with Guru Angad Dev Veterinary and Animal Sciences University (GADVASU), Ludhiana, to undertake a comprehensive scientific research project titled "Comprehensive Evaluation of Moisture Content on the Technical Stability and Sensory Acceptability of Chicken Sausages in India." The research initiative aims to generate scientific evidence on the impact of moisture content on the quality, safety, nutritional integrity, technical stability and consumer

acceptability of chicken sausages, supporting evidence-based recommendations for the processed poultry industry in India.

As part of the collaboration, CLFMA of India will provide a research grant of ₹5 lakh to GADVASU for the execution of the six-month project. The study will be carried out under the leadership of Dr Nitin Mehta, Professor-cum-Head, Department of Livestock Products Technology, GADVASU, with technical oversight from the university's research team.

Speaking on the collaboration,

Divya Kumar Gulati, Chairman, CLFMA of India, said, "The Indian poultry processing industry is witnessing rapid growth, driven by changing consumer preferences and increasing demand for safe, nutritious, and convenient protein products. As the industry evolves, standards and regulations must be backed by robust scientific evidence. Through this partnership with GADVASU, CLFMA aims to support research that will generate credible data on moisture content in chicken sausages, helping to strengthen technical understanding while ensuring product quality, consumer

confidence, and industry competitiveness.”

Rakesh Swami, Group President-Corporate Affairs, Godrej Industries Group and Management Committee Member, CLFMA of India says, “At Godrej Industries Group, we believe lasting progress is driven by collaboration between industry, government and academia. This partnership reflects both CLFMA's commitment to science-based standards and Godrej Agrovet's focus on strengthening India's animal protein value chain. Research-led frameworks such as these will help enhance quality, safety and consumer confidence, while reinforcing chicken's role as a nutritious and affordable source of protein for millions of Indians”.

The study has been designed in three phases. The first phase will establish baseline compositional data of broiler chicken meat collected from different geographical regions

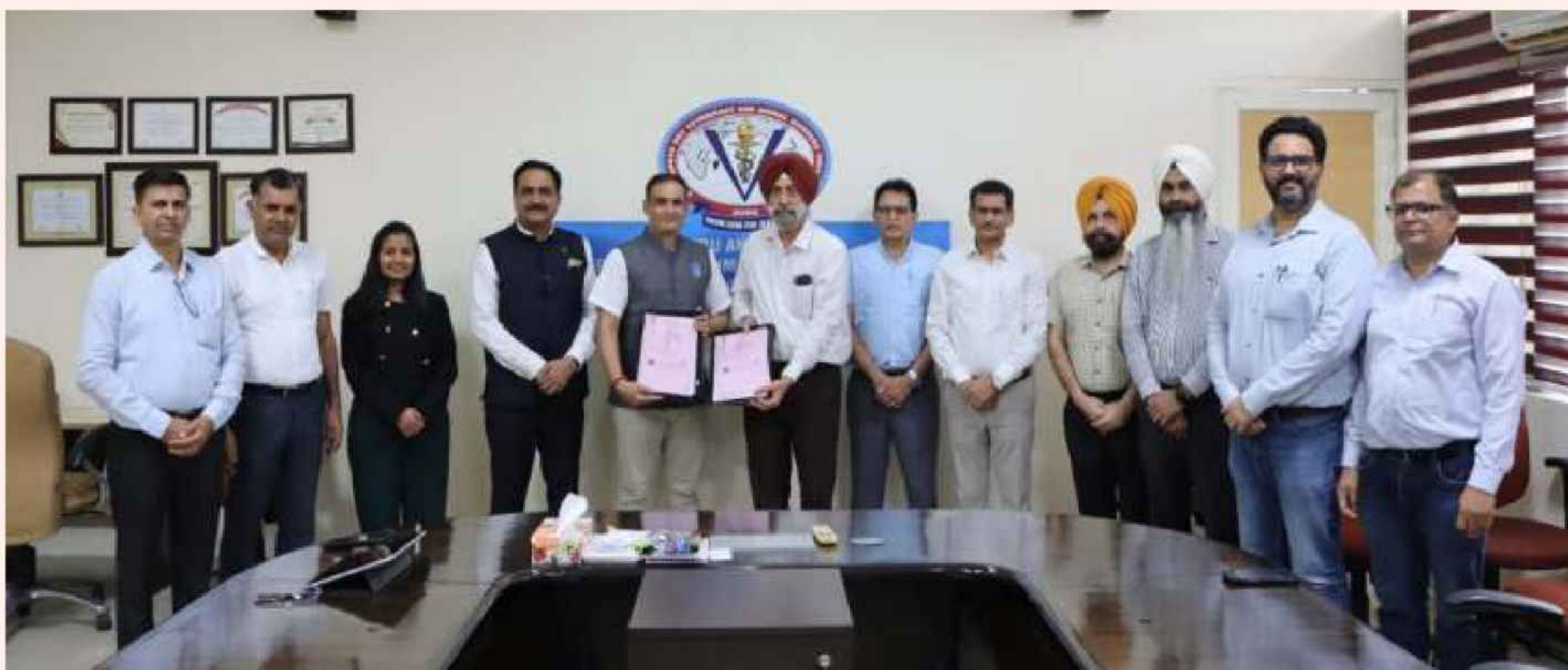
across India. The second phase will compare chicken sausage formulations prepared at different moisture levels by evaluating parameters such as moisture, protein, fat, texture, colour, microbial safety, cooking characteristics, and sensory attributes. The final phase will integrate these findings to develop evidence-based recommendations on the optimal moisture content that balances nutritional quality, processing efficiency, product stability, and consumer acceptance. A consumer survey will also be undertaken to evaluate the market acceptability of the different product formulations.

Dr. Swarn Singh Randhawa, Director Research of GADVASU, Ludhiana added that industrial collaboration with university is paving new ways to address challenges in scientific manner which will help the consumer at large.

Commenting on the

collaboration, Dr. J.P.S. Gill, Vice-Chancellor, GADVASU, Ludhiana said, “Scientific research plays a vital role in supporting evidence-based food standards and strengthening consumer trust. Through this collaboration with CLFMA of India, GADVASU will undertake a comprehensive evaluation using advanced techniques to generate reliable scientific data. The outcomes of this study will contribute to strengthening the knowledge base for India's poultry processing sector while supporting innovation, quality assurance, and informed policy decisions”.

The collaboration reflects the shared commitment of CLFMA of India and GADVASU to advancing scientific research that promotes innovation, supports sustainable growth in the poultry processing sector and contributes to the continued development of India's animal agriculture ecosystem.





CLFMA Of India Delegation Concludes U.s. Learning Tour Focused On The Animal Agriculture Value Chain

- CLFMA of India delegation undertook a U.S. learning tour focused on the animal agriculture and feed value chain.
- The programme included visits to leading industry facilities and interactions with industry stakeholders across New Orleans and Iowa.
- The delegation gained insights into global agri supply chains, grain movement, quality assurance, soy processing, oilseed processing, and sustainable farming practices. The Compound Livestock Feed Manufacturers Association (CLFMA) of India successfully



concluded its **U.S. delegation visit**, bringing together industry representatives to gain insights into **global best practices across the animal agriculture and feed value chain**. The learning tour provided exposure to international approaches in **trade, logistics, grain movement, processing technologies, feed manufacturing, quality assurance and sustainable farming** through a series of industry interactions, academic engagements and site visits. **The delegation comprised:**

- **Divya Kumar Gulati** – Chairman, CLFMA of India

- **Sumit Surekha** – Deputy Chairman
- **Naveen Pasupathy** – Deputy Chairman
- **Abhay Shah** – Deputy Chairman
- **Suresh Deora** – Immediate Past Chairman
- **Nissar F. Mohammed** – Honorary Secretary

- **R. Ramkutty** – Treasurer
- **Sameer Chotai** – President – East Zone

The programme commenced in **New Orleans**, where the delegation visited the **Cargill Reserve Export Terminal** to gain exposure to trade, logistics and global agri supply chains. A



Mississippi River tour, along with interactions with **Russell Marine Group and Eurofins**, provided insights into the systems supporting **international grain movement, inspection and quality assurance**.



The delegation then travelled to **Iowa**, where members interacted with the **Secretary of Agriculture, Iowa**, reinforcing CLFMA of India's focus on global dialogue and strengthening collaboration across the animal agriculture



value chain through **industry and policy-level exchanges**. The Iowa programme also included a visit to the **Iowa Soybean Association Office**, where delegates participated in sessions featuring introductions, insights into



Iowa Soy, and discussions with **Mid-Co Commodities**. The sessions facilitated knowledge sharing, collaboration and stronger industry connections. As part of the Iowa programme, the delegation also visited the Iowa State University Feed Mill



attended expert lectures and technical sessions, further strengthening their understanding of advancements in animal nutrition, feed technology and global industry best practices. The learning tour concluded



learning tour provided valuable exposure to different aspects of the animal agriculture value chain. The interactions and site visits offered important insights into trade, logistics, grain movement, quality assurance, soy processing,



and Grain Science Complex, where members gained first-hand exposure to modern feed manufacturing processes, grain handling systems and researched innovations supporting the feed industry. On the final day of the learning tour, delegates

with visits to **Insta-Pro International**, where delegates explored advanced soy processing technologies and value-added protein solutions, and the **Cargill Crush Plant**, which provided insights into large-scale oilseed processing and its role in supporting the feed industry. The programme also included a **farm visit**, where delegates witnessed farming practices, management and sustainable production at the ground level. Commenting on the visit, **Divya Kumar Gulati, Chairman, CLFMA of India**, said, "The U.S.



oilseed processing and farming practices, while creating opportunities for knowledge sharing and industry engagement." The learning tour highlighted different aspects of the **global animal agriculture**



ecosystem, providing exposure to practices across supply chains, processing, quality assurance and on-farm production. Through interactions with industry stakeholders and visits to key facilities, the programme supported continued knowledge exchange across the **animal agriculture and feed value chain**.



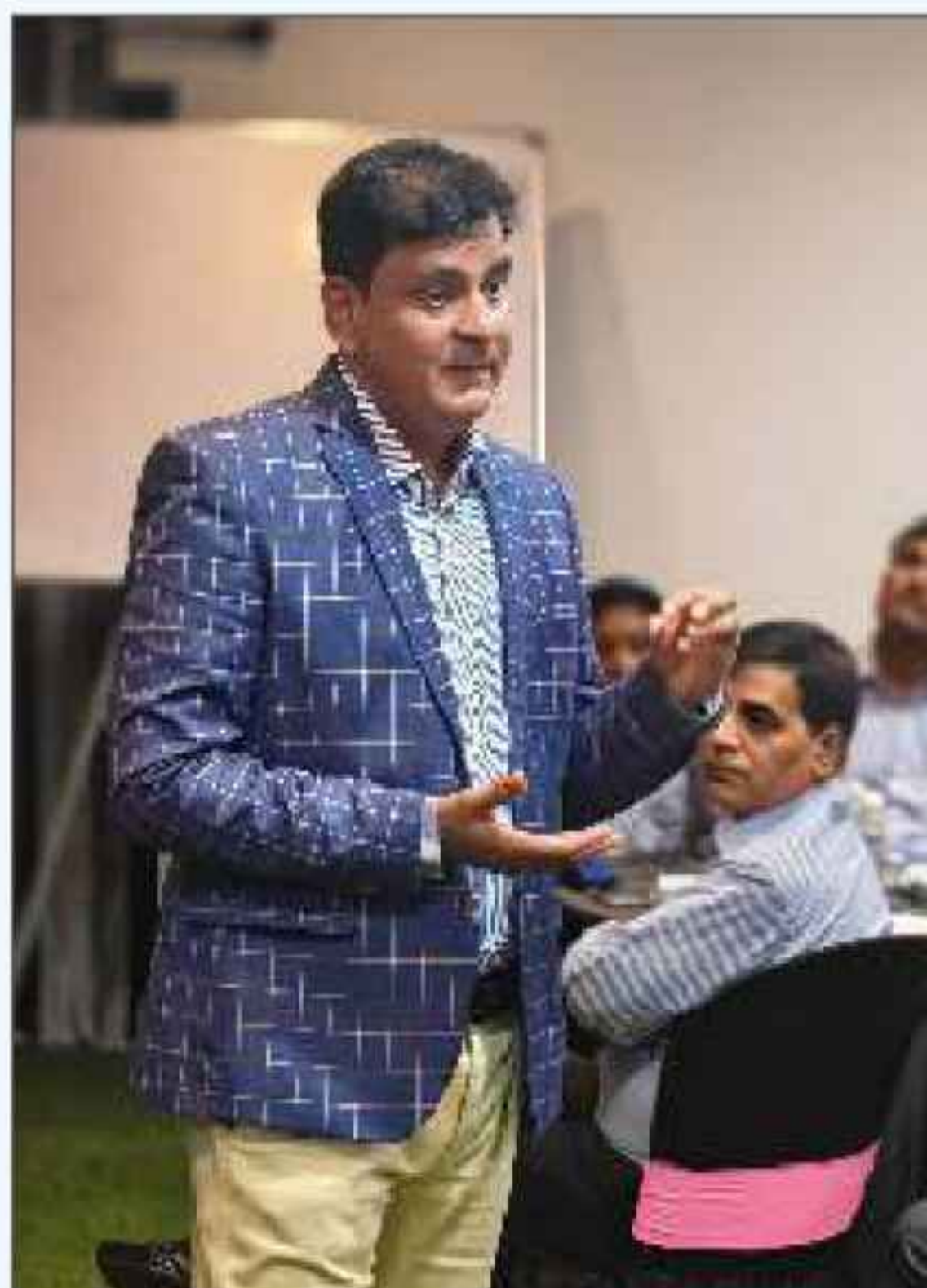


Building the Future of Poultry Health: Inside Concept Pharmaceuticals Ltd's Annual General Meeting - 2026

A Gathering of Minds in the Hills of Goa



For four packed days, the coastal serenity of Goa played host to a very different kind of energy one driven by strategy, science, and a shared passion for animal health. The Divan Clark Inn Hotel became the temporary headquarters for Concept Pharmaceuticals Ltd's Animal Health Poultry division, as sales personnel, technical experts, and leadership from across India converged for the company's Annual General Meeting (AGM). What unfolded was not just a routine corporate gathering, but a deeply engaging exchange of ideas, strategies, and field experiences that will likely shape the company's



direction in the poultry health space for the year ahead.

Concept Pharmaceuticals Ltd has, over the years, built a reputation for its focused approach to animal health, particularly within the poultry segment a sector that continues to evolve rapidly amid shifting consumer demands, regulatory changes, and technological innovation. This year's AGM was designed with a clear purpose: to align the organization's national sales force around a common vision, deepen technical expertise, and foster the kind of camaraderie that turns a scattered team into a cohesive unit capable of tackling



an increasingly complex market.

A Legacy of Trust: 47 Years of Concept Pharmaceuticals

To fully appreciate the significance of this year's AGM, it helps to understand the organization behind it. Concept Pharmaceuticals Ltd is not a recent entrant to the animal health space it is a 47-year-old institution with deep roots in India's pharmaceutical landscape. The company was founded by **Mr. A.B. Gupta**, a name that carries considerable weight in the industry, given that he was also instrumental in the

early stages of building Lupin Pharmaceuticals, now one of India's pharmaceutical giants. Yet it was Concept Pharmaceuticals that became the vehicle for a very particular vision close to his heart making quality medicine genuinely accessible to farmers.

That founding philosophy remains central to the company's identity today. Mr. Gupta recognized early on that farmers, often operating on thin margins and facing unpredictable market conditions, are perpetually concerned with two things above all else the price and the quality of the products they depend on. Concept Pharmaceuticals was built around the idea that these two concerns need not be at odds, and that a company could deliver rigorously tested, high-quality animal health products without pricing farmers out of the very solutions designed to protect their livelihoods.

Today, that legacy is carried forward by **Mr. Yugin Gupta**, the company's Chairman and Managing Director, and son of the founder. Under his leadership, Concept Pharmaceuticals has continued to expand its capabilities while staying anchored to its original mission. The company operates in-house manufacturing facilities located in Aurangabad and Roorkee, both equipped with advanced technology designed to meet the exacting standards the industry now demands. These facilities are not

merely production units they represent the company's substantial investment in ensuring that every product leaving its doors meets consistent, verifiable quality benchmarks.

Central to this commitment is the company's approach to quality control. Every molecule produced at Concept Pharmaceuticals undergoes rigorous testing, and every single batch must pass through the scrutiny of the Quality Management team before it is cleared for distribution. This is not a token gesture toward compliance it reflects a company-wide understanding that end-user satisfaction, whether that end user is an individual farmer or a large-scale integrator, depends entirely on the reliability of what they receive. In an industry where a compromised product can have cascading consequences for animal health and farmer livelihoods alike, this uncompromising stance on quality has become one of Concept Pharmaceuticals' defining characteristics.

The company's role extends beyond private commercial channels as well. Concept Pharmaceuticals also plays a pivotal role in supplying government institutions, underscoring the trust that has been placed in its manufacturing standards and product efficacy at an institutional level. This dual presence serving both the open market and public sector needs speaks to the breadth of

the company's credibility and its standing as a dependable name within India's animal health ecosystem.

It is against this backdrop of nearly five decades of experience, family-driven vision, and manufacturing excellence that the recent AGM in Goa takes on added significance. The technical and commercial discussions that unfolded over those four days were not happening in a vacuum they were an extension of a long-standing organizational commitment to combining scientific rigor with genuine accessibility the very principle upon which **Mr. A.B. Gupta** built the company nearly half a century ago.

The Poultry Industry at a Crossroads

Before diving into the specifics of the AGM, it's worth pausing to consider the broader context in which this meeting took place. The poultry industry in India, and indeed globally, is undergoing a period of significant transformation. Rising input costs, particularly for feed, have squeezed margins across the value chain, pushing farmers and integrators to seek greater efficiency at every stage of production. Simultaneously, there is a growing consumer awareness around food safety and antibiotic use, prompting the industry to explore alternatives to conventional antibiotic growth promoters and



chain, and use product differentiation as a genuine competitive advantage rather than just a talking point. His pragmatic, numbers-informed style resonated well with the sales personnel, many of whom appreciated the direct applicability of his insights to their daily fieldwork.

Adding further weight to the commercial conversation was **Dr. Subhash Sharma, President**, whose sessions tied together the technical and commercial threads with a broader organizational perspective. **Dr. Sharma's** contribution centered on how individual sales efforts fit into the company's larger strategic goals reinforcing that every client interaction, every technical recommendation, and every closed deal is part of a bigger picture involving market share, brand reputation, and long-term customer relationships. His sessions encouraged attendees to think beyond immediate transactions

and consider the cumulative impact of consistent, trust-based engagement with clients across India's diverse poultry markets.

A Vision from the Top: Technocommercial Perspectives

Perhaps one of the most anticipated segments of the AGM was the address by **Dr. Pawan Sood, President**, who offered attendees a sweeping technocommercial view of the poultry industry's current state and future trajectory. **Dr. Sood's** session stood out for its ability to connect macro-level industry trends with the micro-level realities that sales personnel encounter every day in the field.

He spoke at length about the growth opportunities emerging within the poultry sector, noting how shifts in farming practices, increasing formalization of the supply chain, and evolving disease pressures are

collectively reshaping the demand for animal health products. Rather than presenting these as abstract trends, **Dr. Sood** contextualized them within the company's own product portfolio, helping attendees understand where the greatest opportunities for growth lie and how the sales team could position itself to capture them.

Central to his message was the idea that success in today's poultry health market requires more than just selling products it requires becoming a trusted technical partner to customers. This meant reinforcing product knowledge not as a rote exercise but as a genuine tool for building credibility with farmers and integrators who are increasingly discerning about the solutions they adopt. **Dr. Sood's** emphasis on combining deep product understanding with commercial acumen echoed themes raised throughout the AGM, but his vantage point as President lent

the discussion an added sense of strategic importance, helping attendees see how their individual roles contribute to the company's broader ambitions in the sector.

The Energy of a National Team United

Beyond the structured sessions and formal presentations, much of the AGM's value lay in something less tangible but equally important: the atmosphere of connection and collective problem-solving that emerged when sales personnel from across India came together under one roof. For many attendees, the four days in Goa represented a rare opportunity to step away from the isolation of individual territories and engage directly with colleagues who understood, firsthand, the unique pressures of selling in different regional markets.

Discussions during breakout sessions and informal gatherings alike touched on the practical challenges that sales teams face from navigating price-sensitive customers in certain regions to managing relationships with integrators who demand highly customized technical support. These conversations were not merely cathartic they were genuinely productive, as colleagues exchanged strategies that had worked in their own territories, offering fresh perspectives on problems that might have felt intractable when tackled alone.

This kind of peer-to-peer learning, often undervalued in formal training environments, proved to be one of the AGM's quiet strengths.

The setting itself, a coastal retreat in Goa, seemed to encourage a more relaxed and open exchange of ideas than might have been possible in a purely office-bound environment. Attendees noted that the change of scenery helped foster a sense of camaraderie that extended well beyond the conference rooms, with informal conversations over meals and during breaks often proving just as valuable as the scheduled sessions. This blend of structured learning and organic relationship-building is increasingly recognized as essential for sales organizations operating across geographically and culturally diverse markets like India's.

Looking Ahead: A Stronger, More Aligned Team

As the four-day AGM drew to a close, there was a palpable sense among attendees that the time invested had been well spent. The combination of technical training from **Dr. Rajesh Kalkar**, commercial strategy insights from **Dr. Pratyush Singh**, organizational perspective from **Dr. Subhash Sharma**, and the broader technocommercial vision articulated by **Dr. Pawan Sood** created a comprehensive framework that sales personnel

could carry back to their respective territories.

What made this year's AGM particularly noteworthy was its recognition that success in the poultry health sector cannot be achieved through technical excellence or commercial savvy alone it requires both, seamlessly integrated and consistently applied. As the poultry industry continues to navigate rising costs, biosecurity concerns, and shifting consumer expectations, companies like Concept Pharmaceuticals Ltd are betting that a well-trained, well-aligned sales force will be the difference between merely participating in the market and genuinely leading it.

For the sales personnel who gathered at the Divan Clark Inn Hotel, the AGM offered more than just information it offered renewed clarity of purpose and a strengthened sense of belonging to a team working toward shared goals. As they dispersed back to their respective corners of the country, they carried with them not only updated technical knowledge and sharpened commercial strategies, but also the reassurance that they were part of a collective effort, backed by leadership committed to their continued growth. In an industry as dynamic and demanding as poultry health, that combination of knowledge, strategy, and unity may well prove to be Concept Pharmaceuticals Ltd's most valuable asset in the year ahead.



to invest more heavily in preventive health strategies.

Biosecurity has also emerged as a non-negotiable priority, especially following recurring concerns around avian influenza and other infectious diseases that can devastate flocks and disrupt supply chains almost overnight. Add to this the increasing adoption of data-driven farm management where sensors, analytics, and precision nutrition are becoming part of everyday poultry operations and it becomes clear why companies like Concept Pharmaceuticals Ltd see continuous training and knowledge-sharing as essential, not optional. The poultry sector's growth trajectory remains strong, driven by rising protein consumption and expanding organized farming, but capturing that growth requires a workforce that is technically sharp, commercially astute, and responsive to change. This was precisely the spirit that animated the discussions in Goa.

Technical Depth Meets Commercial Strategy

One of the defining features of this year's AGM was the balance struck between technical rigor and commercial pragmatism. Rather than treating these as separate tracks, the sessions wove them together, reflecting a growing industry consensus that product knowledge alone is insufficient without a clear understanding of how that knowledge translates into value on the ground.

Dr. Rajesh Kalkar led several sessions that grounded attendees in the scientific fundamentals underpinning the company's poultry health portfolio. His approach emphasized not just what the products do, but why they work the way they do a distinction that matters enormously when sales personnel are expected to have credible, informed conversations with farmers,

veterinarians, and integrators who are themselves becoming more sophisticated in their expectations. By walking through mechanisms of action, application protocols, and real-world case studies, **Dr. Kalkar** helped bridge the gap between laboratory research and field application, a gap that often determines whether a product's potential is fully realized or left on the table.

Complementing this technical foundation, **Dr. Pratyush Singh**, the company's Product Manager, brought a distinctly commercial lens to the proceedings. His sessions focused on how technical superiority needs to be paired with the right positioning, pricing conversations, and customer engagement strategies to actually move the needle in a competitive marketplace. **Dr. Singh's** discussions touched on how sales teams could better identify customer pain points, tailor their pitches to different segments of the poultry value



A Remarkable Conclusion To The 27th World Poultry Congress 2026 – Inspiring Innovation And Collaboration Of Global Poultry – *Ricky Thaper*



The 27th edition of World Poultry Congress (WPC) 2026 organised by the World's Poultry Science Association (WPSA) at the Metro Toronto Convention Centre, Toronto, Canada, from July 13–17, 2026 was recognised as the world's premier gathering for poultry science and technology, WPC 2026 had brought together a good delegates comprising poultry scientists, researchers, academicians, veterinarians, industry leaders, production specialists, policymakers and

students from more than 55 countries. The congress served as an exceptional platform for exchanging knowledge, showcasing cutting-edge innovations and strengthening international collaborations that will shape the future of the poultry industry.

The scientific and technical program covered a wide spectrum of critical topics including genetics and breeding, poultry nutrition, health and disease prevention, animal welfare, sustainability, precision

production technologies, processing innovations and global food security. At a time when the poultry sector is addressing evolving challenges related to disease management, climate resilience, sustainability and feeding a growing global population, forums like WPC continue to play a pivotal role in driving science-based solutions and technological advancement. Held once every four years under the auspices of the World's Poultry Science Association (WPSA), the World



Poultry Congress remains one of the most influential international platforms dedicated to advancing poultry science and industry worldwide. The exhibitors displayed their promotional material in Exhibit

Hall and the seminars / presentations were in various session rooms. The poster and oral presentation sessions represented the cutting edge of global poultry research.

During World Poultry Congress 2026, it was my privilege to meet distinguished poultry leaders, scientists, researchers, innovators and industry colleagues from around the world and explored new opportunities for collaboration that will contribute to the sustainable growth and future of the global poultry sector. My sincere congratulations to the World's Poultry Science Association (WPSA) organising committee, sponsors, exhibitors, and everyone who worked tirelessly to make WPC 2026 an



outstanding success. As one memorable chapter comes to an end, we now look forward to the 28th World Poultry Congress, which will be held in Tokyo, Japan from July 21-25, 2030.





From Farmer Empowerment To Food Security: De Heus Animal Nutrition India's Sustainable Vision

Sustainability begins with empowering the people who make food production possible. Discover how De Heus Animal Nutrition India is supporting farmers through knowledge, innovation, and partnership to strengthen food security and create lasting impact across the agricultural value chain.

How De Heus Animal Nutrition India is Empowering Farmers and Strengthening Food Security

As the global population continues to grow, the challenge of producing safe, affordable,

and nutritious food becomes increasingly complex. Farmers are expected to produce more with fewer resources while navigating climate uncertainty, rising costs, and evolving consumer expectations.

At De Heus Animal Nutrition India, we believe that sustainable food production begins with empowered farmers. By combining nutritional expertise, on-farm support, and knowledge sharing, we help farmers improve productivity, strengthen their businesses, and contribute to a more resilient food system.

Supporting Farmers Beyond Feed

Animal feed plays a critical role in food production, but sustainable farming requires much more than quality nutrition.

Across India, De Heus works directly with farmers to provide practical guidance on animal health, farm management, feeding strategies, productivity improvement, and animal welfare. Through our on-farm approach, technical specialists work alongside farmers to identify challenges and



implement solutions tailored to local conditions.

This hands-on support enables farmers to make informed decisions, improve farm performance, and adopt responsible farming practices that deliver long-term value.

Turning Knowledge into Impact

Knowledge transfer is one of the most powerful tools for creating sustainable change.

In 2025, we met more than 29,200 farmer and provided training sessions focused on nutrition, animal welfare, farm management, and productivity enhancement. The company also delivered specialized technical programs for poultry, swine and dairy farmers helping them improve aspects like animal health, animal well-being, and overall farm performance and productivity.

By sharing practical expertise and proven solutions, De Heus enables farmers to become more efficient, profitable, and resilient.

Strengthening Rural Communities

Many livestock farmers in India operate as family-run businesses and form the backbone of rural economies.

De Heus Animal NutritionIndia is committed to supporting these farmers not only as producers but also as entrepreneurs. Through training initiatives, partnerships, and access to quality feed solutions, farmers gain the confidence and

capabilities needed to grow their operations sustainably.

The company is also encouraging greater participation of women in agriculture through dedicated engagement programs that promote knowledge sharing, leadership, and community development.

These efforts create a positive ripple effect, supporting livelihoods, local employment, and long-term rural prosperity.

Building a Sustainable Food Value Chain

Sustainability requires collaboration across the entire food value chain.

De HeusAnimal Nutrition India works closely with farmers, channel partners, breeders, processors, and suppliers to improve efficiency and create long-term value. By combining global expertise with local understanding, we develop

solutions that address regional challenges while contributing to broader sustainability goals.

This collaborative approach strengthens food security, improves resource efficiency, and supports the responsible production of safe and nutritious animal protein for a growing population.

Looking Ahead

Creating a sustainable food system is a long-term commitment.

At De Heus Animal NutritionIndia, every farmer met, every farm visited, and every partnership established contributes to a larger vision: a future where farming is more productive, communities are more resilient, and nutritious food remains accessible to all.

By empowering farmers today, we aim towards helping nourish future generations.





New Clinical Directors and Veterinary Clinical Board at St David's Poultry Team



St David's Poultry Team blends deep clinical understanding with cutting-edge technology and science led innovation to provide the highest level of care for our clients and their flocks.

As part of our ongoing commitment to invest in the future of poultry veterinary medicine, we have created a new, Veterinary Clinical Board to further support our growing number of clients, veterinary surgeons and field technicians. It means we will be even better placed to support our customers achieve long-term and sustainable success.

As Managing Director Richard Turner explains, "St David's has grown significantly over the years, both in terms of the number of birds under our care and the size of team we have in place. The creation of a Veterinary Clinical Board and additional Clinical Director roles further strengthens our clinical and technical leadership.

We have welcomed vets Matt Balfour and Ben Crisp to this team, which means there is now a Clinical Director aligned to each of the major parts of the industry we work with. There is also a role dedicated to innovation and technical support. This reaffirms our commitment to outstanding veterinary care and advancing poultry health."

Chairing the veterinary board is Aonghus Lane, Richard Jackson is Broiler Lead, and Kenny Stokes-Nutting is Game Lead. Joining them are our new Clinical Directors. Matt Balfour is Layer Lead, and Ben Crisp the lead for Innovation and Technical.

Matt Balfour joined St David's 10 years ago and has led the Scotland and North of England regional team for the last 5 years. He is one of just 6 UK vets with EBVS® European Specialist in Poultry Veterinary Science status.

Matt says, "I'm delighted to be leading our veterinary approach for our layer flocks. Together with my colleagues, we've evolved our veterinary and management approach that has improved bird health, welfare and performance. One of our biggest achievements has been to extend the productive life of the birds, which is key to a long-term, sustainable and profitable industry. I'm looking forward to continuing to drive this approach."

Ben Crisp has been with the team for 12 years, leading the regional team in the South. He has long championed our focus on innovation, not least helping drive our approach to antibiotic reduction.

Ben says, "Innovation is a fundamental part of our approach to bird health. We are at the forefront in introducing and developing the latest technology, veterinary approaches and products, continuously running trials to find the best solutions to today's and tomorrow's challenges. I'm looking forward to leading this area and working with the wider team to keep us at the forefront of the industry, so our clients continue to benefit from the latest scientific developments and industry insights."



ASSOCIATION OF LIVESTOCK SECTOR

Announcement

CLFMA 59th AGM & 67th NATIONAL SYMPOSIUM 2026

Dear Sir / Madam,

We are pleased to inform you that, the 59th Annual General Meeting (AGM) and 67th National Symposium 2026 will be held on **September 11 & 12, 2026** at **"The Leela Mumbai"**, Sahar, Near Mumbai International Airport, Andheri East, Mumbai.

You are requested to kindly block your dates for 59th Annual General Meeting and 67th National Symposium 2026.

With warm regards,

Divya Kumar Gulati
Chairman



Editorial Calendar 2026

Publishing Month: January Article Deadline : 18th, Dec. 2025 Advertising Deadline: 20th, Dec.2025 Focus : Opportunities and Challenges	Publishing Month: February Article Deadline : 18th, Jan. 2026 Advertising Deadline: 20th, Jan.2026 Focus : Budget	Publishing Month: March Article Deadline : 18th, Feb. 2026 Advertising Deadline: 20th, Feb.2026 Focus : Disease Prevention	Publishing Month: April Article Deadline : 18th, March 2026 Advertising Deadline: 20th, March 2026 Focus : Summer Stress Management
Publishing Month: May Article Deadline : 18th, April 2026 Advertising Deadline: 20th, April 2026 Focus : Cold Chain	Publishing Month: June Article Deadline : 18th, May 2026 Advertising Deadline: 20th, May 2026 Focus : Nutrition	Publishing Month: July Article Deadline : 18th, June 2026 Advertising Deadline: 20th, June 2026 Focus : Biosecurity	Publishing Month: August Article Deadline : 18th, July 2026 Advertising Deadline: 20th, July 2026 Focus : Sustainability
Publishing Month: September Article Deadline : 18th, August 2026 Advertising Deadline: 20th, August 2026 Focus : Egg Production & Processing	Publishing Month: October Article Deadline : 18th, September 2026 Advertising Deadline: 20th, September 2026 Focus : Processing & Packaging	Publishing Month: November Article Deadline : 18th, October 2026 Advertising Deadline: 20th, October 2026 Focus : Winter Stress	Publishing Month: December Article Deadline : 18th, November 2026 Advertising Deadline: 20th, November 2026 Focus : Food Safety

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Front Opening	20,000	300	☐	Back Opening	18,000	275	☐				



EGG DAILY AND MONTHLY PRICES OF JULY 2026



Egg Rate

Name Of Zone / Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Average	
NECC SUGGESTED EGG PRICES																																	
Ahmedabad	675	675	675	675	680	685	690	695	700	715	730	740	750	755	760	765	765	765	765	765	765	730	700	680	680	680	680	665	610	600	575	702.90	
Ajmer	635	635	635	645	650	655	655	660	665	701	706	710	710	710	710	695	701	701	690	680	670	640	620	570	600	600	600	550	530	515	490	643.03	
Barwala	614	614	617	625	632	632	635	640	652	680	696	699	699	701	701	701	701	701	701	665	660	640	580	570	570	570	540	530	500	490	488	627.23	
Bengaluru (CC)	710	710	710	710	710	710	710	710	710	710	715	720	725	730	735	740	740	740	740	740	740	720	720	700	700	700	680	680	650	650	650	710.16	
Brahmapur (OD)	655	655	655	665	670	670	670	670	680	690	700	700	705	710	720	720	725	725	725	725	725	695	680	660	640	640	610	590	590	560	560	670.48	
Chennai (CC)	720	720	720	720	720	720	720	720	720	720	720	730	735	745	745	750	750	750	750	750	750	750	740	730	710	710	680	680	650	650	650	720.16	
Chittoor	713	713	713	713	713	713	713	713	713	713	713	723	728	738	738	743	743	743	743	743	743	743	733	723	703	703	673	673	643	643	643	713.16	
Delhi (CC)	640	640	640	650	665	665	665	670	700	710	720	725	725	725	730	730	730	730	725	725	725	700	670	660	620	620	620	590	570	550	550	670.48	
E.Godavari	625	625	625	630	635	635	635	635	645	655	665	670	675	685	690	695	695	695	695	695	695	665	665	635	635	635	605	605	565	565	535	645.48	
Hospet	650	650	650	650	650	650	650	650	650	650	655	660	665	670	675	680	680	680	680	680	680	660	660	640	640	640	620	620	590	590	590	650.16	
Hyderabad	650	650	650	650	650	650	650	650	650	650	665	680	700	705	710	710	710	710	710	710	710	680	660	640	640	640	610	590	570	570	550	657.10	
Jabalpur	660	660	660	660	670	680	680	680	680	710	725	735	735	740	740	740	740	740	740	740	720	705	690	670	650	635	620	620	605	590	575	683.71	
Kolkata (WB)	695	695	695	705	710	710	710	710	720	730	740	745	750	760	765	770	770	770	770	770	770	740	710	710	680	680	680	660	640	640	610	610	711.29
Ludhiana	616	616	616	619	629	631	631	636	643	677	701	701	701	701	701	701	701	701	701	701	674	660	635	635	570	570	570	570	530	530	500	637.41	
Mumbai (CC)	720	710	705	705	705	710	710	710	715	720	730	740	750	760	770	780	780	780	780	770	765	750	740	730	710	700	680	665	650	640	630	722.90	
Mysuru	725	725	725	725	725	725	725	725	725	725	730	735	740	745	750	750	750	750	750	750	750	725	725	710	710	710	680	680	650	650	650	720.65	
Namakkal	650	650	650	650	650	650	650	650	650	650	655	660	665	670	675	680	680	680	680	680	680	680	680	680	650	650	630	630	600	600	600	655.00	
Pune	725	720	715	715	715	720	720	720	725	730	740	750	760	770	775	780	780	780	780	780	775	760	750	730	710	700	680	670	650	640	630	728.87	
Raipur	640	640	640	645	650	650	655	655	660	675	675	700	700	720	725	725	725	725	725	725	725	685	665	640	625	625	625	625	600	575	555	664.52	
Surat	700	700	700	700	700	700	700	700	705	715	730	740	750	750	750	760	760	760	765	765	765	750	730	700	700	700	680	665	635	610	580	711.77	
Vijayawada	660	650	650	650	660	665	665	665	680	700	710	715	725	730	730	730	730	730	730	730	730	710	700	675	660	650	630	620	600	575	550	677.58	
Vizag	640	640	640	640	640	640	640	640	650	660	670	675	680	690	695	700	700	700	700	700	700	680	665	635	635	635	605	605	585	565	535	651.13	
W.Godavari	625	625	625	630	635	635	635	635	645	655	665	670	675	685	690	695	695	695	695	695	695	665	665	635	635	635	605	605	565	565	535	650.43	
Warangal	652	652	652	652	652	652	652	652	652	667	682	702	707	712	712	712	712	712	712	712	712	682	662	642	642	642	612	592	572	572	552	659.10	
Prevailing Prices																																	
Allahabad (CC)	671	671	671	686	695	700	700	714	724	752	762	762	771	771	771	762	762	762	762	752	743	733	714	695	676	671	652	633	619	610	595	708.45	
Bhopal	660	660	660	670	670	680	680	680	690	710	725	730	730	730	725	730	730	730	730	730	720	690	670	660	650	635	630	630	600	580	685.32		
Indore (CC)	660	660	660	665	670	670	670	670	675	700	710	730	740	740	740	730	730	730	720	715	700	680	660	620	620	620	620	600	570	560	530	669.84	
Kanpur (CC)	648	648	648	657	671	671	671	671	690	710	719	719	729	729	738	738	738	738	738	738	714	714	667	667	643	643	643	610	581	548	548	677.00	
Luknow (CC)	657	657	657	667	683	683	683	683	706	717	757	767	767	783	783	783	767	759	750	750	740	733	700	680	667	643	633	623	617	593	577	698.87	
Muzaffarpur (CC)	675	675	678	685	690	690	695	700	710	750	760	760	760	760	760	760	760	760	760	750	730	700	680	640	630	630	630	600	600	600	560	694.77	
Nagpur	700	690	670	670	690	690	690	700	700	710	730	745	745	760	745	735	735	735	735	735	720	710	690	675	650	625	625	605	595	595	570	689.35	
Patna	675	675	678	685	690	690	695	700	710	750	760	760	760	760	760	760	760	760	760	750	730	700	680	640	630	630	630	600	600	600	560	694.77	
Ranchi (CC)	676	676	676	676	690	690	690	690	695	700	728	740	745	750	756	760	762	762	762	762	762	738	725	715	690	690	676	666	643	619	619	707.39	
Varanasi (CC)	667	667	667	683	693	700	700	700	717	750	750	750	750	750	750	750	750	750	750	733	727	717	690	683	650	633	623	617	600	583	567	694.10	

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