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# INDIAN POULTRY REVIEW

THE MAGAZINE OF INDIAN POULTRY INDUSTRY | DECEMBER 2025

COVER

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ARTICLE

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# TRUST IN INDIA'S POULTRY SECTOR: FROM CONTROVERSY TO CONFIDENCE

**G. N. Ghosh**
**Managing Editor**

Recent controversies surrounding poultry products have once again brought trust and transparency to the forefront of public discourse in modern India. In an age of heightened awareness about food safety, nutrition and sustainability, consumers are asking more questions, and rightly so.

Poultry remains one of India's most affordable, efficient and nutritious sources of animal protein. Yet, gaps in communication, fragmented messaging and the spread of unverified information, especially through social media, have occasionally eroded consumer confidence. Addressing this challenge requires proactive storytelling backed by science, transparency and direct engagement.

One of the industry's strongest assets lies in its powerful expos, trade fairs and networking platforms. These fora must become bridges between producers, policymakers, scientists, retailers and consumers. Open demonstrations of best practices in biosecurity, animal welfare, processing, cold chains and quality certification can demystify the poultry value chain. When consumers see how their food is produced, handled and tested, trust naturally follows.

Equally important is consistent, unified communication. Regular interaction with nutritionists, veterinarians, chefs, food writers and digital influencers can help translate technical facts into relatable narratives for the general public. School outreach programmes, public seminars and interactive digital campaigns can further anchor poultry as a safe, wholesome and responsible food choice.

Indian poultry has already made significant strides in modern processing, traceability, value-added products and regulatory compliance. What is needed now is visibility and dialogue. By opening its doors, listening to concerns and communicating with confidence and humility, the industry can convert controversy into constructive conversation.

Trust is not built overnight, but through sustained engagement and transparency. With its robust platforms, progressive leadership and deep-rooted commitment to nutrition security, the Indian poultry sector is well placed to not only retain consumer confidence, but to set new benchmarks for responsible food production in modern India.

# Fat Replacers in Value Added Meat Products

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## Abstract
Rising cases of obesity, cardiovascular disorders and diabetes have increased the need for healthier alternatives to traditional high-fat meat products. Since meat is a major source of saturated fats, reformulating it with fat mimetics offers a practical solution to reduce calories without compromising sensory qualities. Fat mimetics are mainly carbohydrate-based, protein-based or lipid-based. Carbohydrate mimetics like inulin and starch enhance texture and water-holding capacity. Protein-based ones, such as whey and soy proteins, improve emulsification and stability, while lipid-based substitutes like olestra, salatrim and structured lipids closely mimic the sensory feel of animal fats with lower caloric impact. This outlines the roles, applications, regulatory aspects and consumer acceptance of fat mimetics, highlighting their potential to create healthier meat products that align with dietary guidelines.

## Introduction
Chronic diseases linked to poor diets have increased global interest in healthier food systems. Red and processed meats, rich in saturated fats are strongly associated with cardiovascular and metabolic disorders. While fats provide flavour, juiciness and texture, excessive intake raises cholesterol and disease risks. A practical approach is incorporating fat mimetics- ingredients that imitate fat functions while lowering calorie density. Introduced in the late 1980s, they are now widely used in processed meats, helping balance consumer expectations with public health goals.

## Dietary Fats in Meat Products
Meat fats vary in composition. Saturated fatty acids like palmitic and stearic dominate, contributing to firmness, while monounsaturated (oleic acid) and polyunsaturated fats (omega-3, omega-6) offer health benefits but are present in lower amounts. Composition depends on genetics, diet and processing. Grass-fed meat typically contains more omega-3 and conjugated linoleic acid, while grain-fed animals yield higher omega-6 content, which in excess may promote inflammation. These differences reinforce the need to reduce saturated fats and improve fatty acid profiles in meat products.

## Health Concerns of Excessive Fat Intake
High saturated fat intake elevates LDL cholesterol, increasing cardiovascular risks. Replacing it with unsaturated fats improves heart health. Beyond heart disease, processed meat consumption is associated with type 2 diabetes, largely due to negative effects of saturated fats on insulin sensitivity. International health bodies classify processed meats as carcinogenic and red meats as potentially carcinogenic. Together, these findings emphasise reformulation of meat products with healthier alternatives.

## Need for Fat Reduction in Meat Products
Public health recommendations advise limiting saturated fats to prevent obesity, diabetes and cardiovascular diseases. Since meat is a major contributor, reformulating it with reduced-fat profiles is necessary. The challenge lies in maintaining sensory qualities; taste, juiciness and texture which are heavily influenced by fat. Fat mimetics address this by replicating fat properties without excessive calories.

## Types and Functions of Fat Mimetics
### Carbohydrate-Based
Examples: inulin, pectin and modified starches.
- Absorb water and form gels, improving cooking yield and creaminess
- Inulin, from chicory root, not only mimics fat but also provides prebiotic benefits

### Protein-Based
Sources: whey, soy and casein.
- Form stable gels and emulsions
- Whey protein enhances juiciness and texture; soy improves emulsion stability and is cholesterol-free

### Lipid-Based
Examples: olestra, salatrim and structured lipids.
- Closely replicate mouthfeel and lubricity
- Olestra passes undigested, adding no calories
- Salatrim provides fewer calories per gram
- Structured lipids can be engineered for specific melting points

### Strengths & Limitations
- Carbohydrate mimetics improve water retention but lack lubricity
- Protein mimetics strengthen texture but may affect flavour
- Lipid mimetics mimic fat well but face regulatory and cost barriers

## Applications in Meat Products
Fat mimetics are applied in sausages, nuggets, patties and frankfurters.
- Carbohydrate mimetics enhance cooking yield and prevent dryness
- Protein mimetics support emulsified structures and juiciness
- Lipid mimetics provide authentic fat mouthfeel, useful for premium products

Combination approaches—like inulin with whey protein—offer balanced improvements in structure, taste, and juiciness, aligning with clean-label demands.

## Functional Properties
Mimetics must replicate fat's diverse functions:
- Moisture retention: hydrocolloids trap water, reducing cooking loss
- Emulsification: proteins stabilise fat-water systems
- Texture formation: carbohydrates and proteins form gel networks

- Mouthfeel: lipid substitutes recreate creaminess and smoothness

Together, these ensure reduced-fat meats remain appealing.

## Regulatory Considerations

Fat mimetics require safety approval and labelling transparency. Agencies such as the FDA (US) and EFSA (EU) regulate their use. Some mimetics, like olestra, faced restrictions due to digestive issues, stressing the need for safe formulation and compliance.

## Consumer Acceptance and Market Trends

Consumers value taste and texture above health claims. Products using natural mimetics (e.g., inulin, soy) gain higher acceptance, particularly under the clean-label trend. Plant-based proteins and dietary fibers are preferred. Hybrid products blending meat with plant-forward ingredients are growing, where mimetics improve nutrition and sensory quality simultaneously.

## Future Perspectives

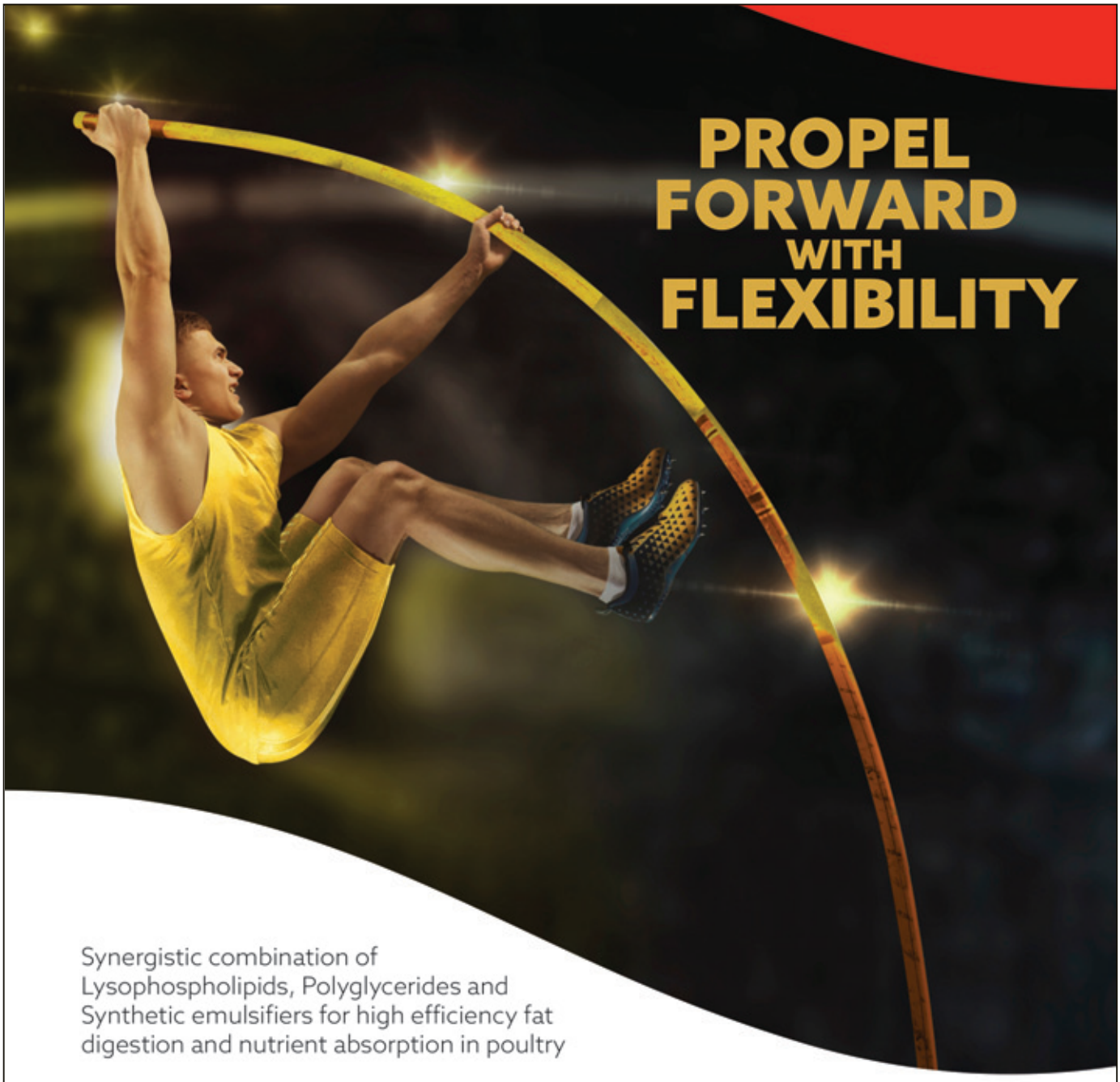
Advances in fat mimetics include nanoemulsions, encapsulated oils, and biopolymer gels. These systems may also deliver added nutrients like omega-3s, antioxidants or prebiotics. With rising demand for natural and sustainable foods, future mimetics will rely more on plant fibers and proteins. Such innovations will balance sensory quality with health benefits, making low-fat meat products more acceptable to consumers.

## Conclusion

Fat mimetics are key tools in reformulating meat products for modern health demands. By lowering calorie content and saturated fats while preserving juiciness, tenderness and mouthfeel, they allow healthier eating without loss of satisfaction. Carbohydrate, protein and lipid-based mimetics each offer unique benefits and combinations often perform best. Regulatory approval and consumer trust remain central to their success. Ongoing research into natural and multifunctional mimetics promises a future of healthier, sustainable meat products that meet both dietary guidelines and consumer expectations.

## References


1. *Akoh, C. C and E. A. Decker, 1995. Structured lipids: A new class of fat substitutes. Food Technology, 49(4), 56-63.*
2. *Dominguez, R., M. Pateiro, M. Gagaoua, F. J. Barba, W. Zhang and J. M. Lorenzo, 2023. A comprehensive review on lipid content and composition in meat and meat products. Critical Reviews in Food Science and Nutrition, 63(3), 389-405.*
3. *Mallika, S., R. R. Kumarand B. D. Sharma, 2009. Functional properties of fat replacers in meat products. Food Research International, 42(3), 287-293.*
4. *Morr, C. V., and E. Y. Ha,(1993). Whey proteins: Their functional properties in food systems. Food Technology, 47(4), 85-89.*
5. *Osborn, H. TandC. C. Akoh, 2002. Structured lipids: A new class of fat substitutes. Food Technology, 56(4), 56-62.*
6. *Pan, A., Q. Sun, A. M. Bernstein, M. B. Schulze, J. E. Manson, M. J. Stampfer,W. C. Willettand F. B. Hu, 2011. Red meat consumption and risk of type 2 diabetes: 3 cohorts of US adults and an updated meta-analysis. The American Journal of Clinical Nutrition, 94(4), 1088-1096.*

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Article

# Aviagen Brief: Green Muscle Disease– Reducing the Incidence in Broiler Flocks

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## Executive Summary

Green Muscle Disease (or Deep Pectoral Myopathy, DPM) is a degenerative disease of the minor pectoral muscles (i.e. the tenders), which is characterised by atrophy and necrosis. The condition arises when the muscle fibres become deficient in oxygen and is associated with sudden and excessive wing flap. The development of the disease can be split into three categories. Category 1 is the acute inflammatory lesion in which the deep pectoral muscle is very red and hemorrhagic. Category 2 describes the stage at which the lesion in the inner fillet becomes well defined and is sometimes circumscribed by a hemorrhagic ring. Category 3 describes the progressive degeneration and greening of damaged tissue. Although the incidence of DPM is increased in heavy broilers, it can occur at any age or weight and is dependent upon the management and husbandry systems employed. Identifying and eliminating the management issues which contribute to wing flapping and the development of the condition is key to reducing the incidence of DPM.

## Introduction

Green Muscle Disease is a hidden problem in modern-day broiler chickens. Green Muscle Disease (or Oregon Disease) is a common name given to a degenerative muscle disease known as Deep Pectoral Myopathy (DPM). The condition is characterised by necrosis and atrophy of the tenders (i.e. supracoracoideus or minor pectoral muscles). The lesions often affect both tenders and vary in colour, progressing from a pinkish hemorrhagic appearance to a gray-greenish discoloration as illustrated in Figure 1.

*Fig.1: Deep Pectoral Myopathy*

DPM was first described in mature breeder turkeys and broiler breeders but is being seen more in meat-type chickens, especially those selected for breast muscle development. The affected muscles are discarded during de-boning, resulting in saleable yield losses. However, the major issue with DPM is that if the birds are marketed as whole carcasses or parts, the problem is rarely detected during processing, resulting in consumer complaints and making the cause of the problem difficult to identify.

The condition is not associated with any infectious agent and, therefore, has no public health significance other than by affecting the aesthetic appearance of the meat.

**DPM is rarely detectable during processing if the birds are marketed as whole carcasses or parts.**

## Why Does DPM Target Broiler Breast Muscles?

- The pectoral muscles in avian species are associated with flight and the deep and superficial pectorals work in synergy, one to raise the wing and the other to lower it
- The anatomy of these muscles is, however, intrinsically different in that the inner fillet has a tough outer sheath which is made up of dense fibrous tissue and is inelastic
- The outer or major muscle is simply surrounded by loose connective tissue that moves easily over the muscle surface as the muscle profile changes

Contraction of the major pectoral muscles (the breast fillet) and the minor pectoral muscles (the tender) are responsible for the up- and down-strokes of the wings. During contraction, these muscles expand with increased blood supply (i.e. muscle pumping). The expansion of the minor pectoral muscle, by as much as 25% in volume, is problematic because this muscle is confined in a 'tight compartment', sandwiched between bone (the sternum) and the large breast fillet. The minor pectoral muscle is also encased in a rigid fibrous sheath which restricts increases in muscle volume. Therefore, when intramuscular pressure increases to levels above circulating blood pressure, the blood supply flowing into the muscle stops and, with continued muscle activity, oxygen deficiency rapidly develops and lack of oxygen (ischaemic necrosis) of the muscle fibers occurs. There is also an additive effect as the muscle pH falls. Typically the middle third of the muscle is involved. In experimental studies, relatively short periods of wing flap are enough to induce these degenerative changes.

## Recognition and Identification of the Development Stages in DPM

In response to complaints of DPM from the processing plant and/or customers, an investigation should be organised. This should include the identification of the category of DPM (fresh or old) at the processing plant. This information can then be correlated to husbandry management practices.

**Category 1:** The acute inflammatory lesion in which the deep pectoral muscle is very red and hemorrhagic. Hemorrhages also appear on the fibrous sheath (see Figure 2). There is an obvious suffusion of serous fluid in the area of the damage making it appear wet. This stage is likely to be associated with a handling event (e.g. catching) and will be present for about 48 hours.

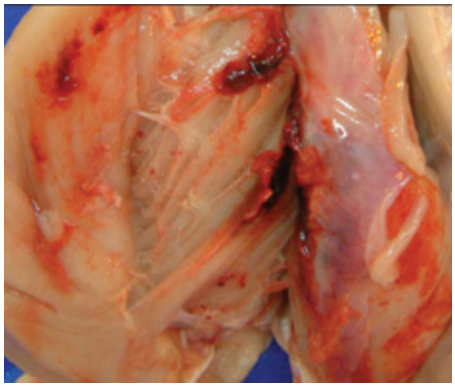

*Fig. 2: Early Acute Pectoral Myopathy*

**Category 2:** At this stage the lesion in the inner fillet has become well defined and is sometimes circumscribed by a hemorrhagic ring (see Figure 3). The affected areas are pale pink to plum coloured and there are clear changes consistent with early coagulative necrosis of the muscle, when the tissue texture becomes fibrous. This is sometimes described as 'fish flesh'. This stage will continue for a few days after the initial event or incident.

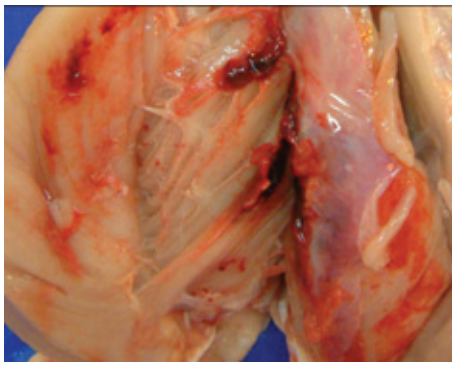

*Fig. 3: Pectoral Myopathy-developing lesions*

**Category 3:** This stage reveals the progressive degeneration and greening of the damaged tissue (see Figure 4). Often, only the middle part of the fillet is involved and the progressive greening is in parallel with the loss of cellular structure, so that a 'putty like' consistency develops within the lesion. This green, necrotic area will persist and through time will gradually reduce in size as it is reabsorbed so that the symmetry of the breast is lost in some older birds. The green colour is produced by the breakdown of haemoglobin and myoglobin to bile salts.

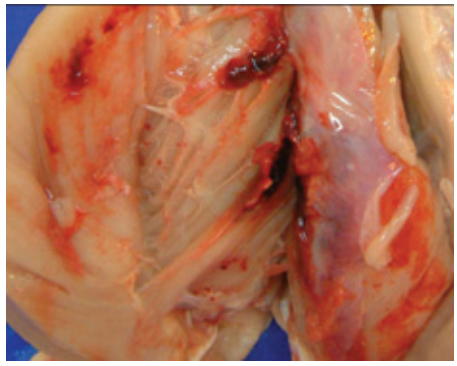

*Fig. 4: Aged Pectoral Myopathy*

## Factors affecting the occurrence of DPM

The pectoral muscles make up nearly a quarter of the total liveweight in current-day meat chickens. Rearing broiler chickens to heavy market weights can increase the probability for occurrence of DPM. Incidence is dependent on management and husbandry systems and not simply bodyweight as birds at any age or weight can be affected.

**DPM is associated with the following factors:**

- Excessive wing flapping
- Heavy market bodyweight
- Sex: incidence can be higher in males compared to females
- High white meat yield
- Rapid growth rate

**The desirable efficiency in growth and anatomy of today's broiler brings with it the possibility of DPM development.**

Commercially raised broiler chickens are kept relatively comfortable and inactive during the growing period. Consequently, the pectoral muscles are not exercised enough to increase efficiency of the circulatory supply to the muscles and to allow the expansion of the surrounding fibrous sheath. It is doubtful that even a subtle amount of wing activity would help improve circulation or develop the sheath adequately.

Few, if any, processing plants actually track or document the incidence of DPM on a regular basis. Detection of DPM on whole carcasses and parts is extremely difficult as lesions are not visible during carcass inspection or sorting. As birds also exhibit no symptoms, finding affected live birds in a flock and treating them is not possible.

The key to avoiding the DPM lies with preventative management. Controlling the incidence of DPM hinges upon identifying and eliminating certain flock management issues that contribute to the development of the condition.

**The key to reducing the incidence of DPM lies in management of the broiler flock and minimising wing flapping.**

To avoid the occurrence of DPM, the following flock management guidelines (Table 1) are suggested as starting points to investigate and minimise any unnecessary wing activity.

## Conclusion

Reducing DPM is a broiler management responsibility.

**Table 1: Flock Management Guidelines to Minimise Unnecessary Wing Activity**

| Do Not Stress or Frighten Birds | Limit Sudden and Excessive Wing Exercise | Control Overall Flock Flightiness |
|---|---|---|
| Do not allow other animals in or around the house | Avoid excessive human activity in the house, especially if the birds are flighty | Bird activity and flightiness increases with increasing natural day length |
| Eliminate novel sounds (buzzing security lights, sudden use of noisy ventilation fans, tractor/ generator operation in/ near houses) | Avoid walking birds too fast, especially when migration barriers (nets, pipes or fences) are used; this may cause the birds to pile up | Birds respond to increased light intensity with increased activity. Blue curtains may help calm the flocks in curtain-sided facilities |
| Limit weighing or penning birds<br>Weigh birds in a bucket (or similar) instead of by legs | Train personnel for gentle bird handling techniques during catching<br>Do not catch birds by their wings | In environmentally controlled houses, avoid sudden and excessive increases in light intensity with dimmers - especially under low light intensity (<3 lux) conditions |
| Avoid excitement induced by frequent thinning of flocks | Keep birds comfortable during transport to the processing plant. Low crate stocking densities can cause problems. Prevent any unnecessary bird movements when crated<br>Automatic catching systems can exacerbate wing flapping depending on the system used | Avoid extended periods (>3-4 hours) of feed and/or water withdrawal |
| In tunnel ventilated houses use migration fences approximately 100 ft (30 m) apart | | Intermittent lighting programs can be a potential problem due to frequent bird stimulation |
| | | Ensure that stocking density, feeder and drinker space are adequate |
| | Minimise birds perching on swinging equipment such as feed tracks which allow birds to flap | A dawn to dusk type dimmer offers a gradual increase in lux |

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# Impact of Winter on Poultry Health and Production

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## Introduction

This winter (Dec. 2025 – Feb. 2026) in India, expect a harsher-than-usual cold in North and Central India with more cold wave days (especially Punjab, Rajasthan, UP, MP, Maharashtra), driven by weak La Niña conditions. While minimums are low, the Western Himalayas, Northeast, and parts of East/West India might see above-normal maximums. Overall, prepare for intense cold spells in central/north regions, with lingering mildness in some maximum temperatures elsewhere.

## Seasonal Changes in Indian Sub-Continent

India experiences four main seasons—Winter (Dec-Feb), Summer (Mar-May), Monsoon (Jun-Sep), and Post-Monsoon/ Autumn (Oct-Nov)—with variations across the vast country due to geography, influenced heavily by the Himalayan range and monsoons, leading to distinct tropical to subtropical climates with significant regional differences in temperature and rainfall.

Climate change is causing a complex impact on India's winters, leading to less predictable patterns, with recent years seeing warmer-than-average winters despite some La Niña phases. However, a potential La Niña event is predicted for the 2025-2026 winter, which may bring colder conditions with more cold waves to northern and central India. Climate change also exacerbates winter air pollution and affects rainfall and snowfall patterns exposes poultry to various stress due to which mortality in poultry farm also increases.

## Impacts of Climate Change on Indian Winters

- **Warmer Average Temperatures**
  Despite natural year-to-year variations, the long-term trend indicates warmer winters. February 2023 was the hottest since 1901, and December 2022 was the warmest in 122 years in terms of mean temperature
- **Shrinking Winter Season**
  The duration of the cold season is shortening, with an earlier onset of summer-like conditions and heatwaves starting as early as February in some regions
- **Altered Precipitation Patterns**
  Climate change has affected the frequency and intensity of Western Disturbances (extratropical storms that bring winter rain and snow). This has led to a decrease in the number of snowless winters in some high-altitude areas, which can disrupt agriculture and water supply in the Himalayan river systems
- **Intensified Cold Waves (During La Niña)**
  While the general trend is warming, La Niña events (the cooling phase of the ENSO cycle) can still trigger more frequent and prolonged severe cold waves, especially in North and Central India, due to the channeling of icy winds from higher latitudes
- **Increased Air Pollution**
  Colder, calmer winter conditions lead to atmospheric stability and thermal inversions, trapping pollutants closer to the ground and exacerbating severe air pollution episodes in the Indo-Gangetic plains, posing significant health risks
- **Impact on Agriculture and Health**
  Altered temperature and precipitation patterns affect winter crops like wheat and mustard. Prolonged cold waves and severe pollution increase public health risks, including respiratory infections and cardiovascular strain, especially for vulnerable populations
- **Glacial Melt and Landslides**
  The overall rise in global temperatures is accelerating the melting of Himalayan glaciers, increasing the size of glacial lakes and the risk of Glacial Lake Outburst Floods (GLOFs) and landslides in the hilly regions.

This article explain how cold stress, alters the physiological changes and the emergence of pathogen presence during winter due to increase in poultry's susceptibility to various diseases.

## Effect on Poultry

Winter in India brings cold stress to poultry, reducing feed efficiency, egg/weight gain, fertility, and increasing mortality due to birds using energy for warmth, leading to poor FCRs and higher costs, especially with inadequate housing; farmers must use high-energy feeds, ensure warm water, control drafts, manage litter, and provide supplements like vitamins to combat cold, dampness, and ammonia buildup for better production and health.

## Physiological Changes in Chicken During Winter

In the winter season, poultry birds undergo several physiological and behavioural changes to maintain their core body temperature of around 105-107°F (40.5-41.7°C). These responses are primarily driven by the need to balance heat production with heat loss, which becomes more challenging in cold weather.

### The Key Changes Are

- **Increased Metabolic Rate:** The most significant physiological change is an increased basal metabolic rate to generate more internal heat (thermogenesis). This requires more energy and oxygen consumption
- **Higher Feed Intake:** To meet the increased energy demands for maintaining body temperature, birds significantly increase their feed consumption, sometimes by as much as 25%. The body prioritises nutrient use for warmth over growth or egg production
- **Altered Lipid Metabolism:** Cold exposure can lead to changes in lipid metabolism, including increased levels of total cholesterol and triglycerides in the serum, as the body mobilises fat stores for energy
- **Circulatory Adjustments:** The circulatory system adapts to minimise heat loss from extremities. A counter-current heat exchange system in the legs warms returning blood, and blood flow to bare areas like combs and wattles is reduced, which can make these appendages appear pale or bluish (cyanotic)
- **Hormonal Responses:** The hypothalamic-pituitary-adrenal (HPA) axis is activated during cold stress, potentially leading to increased levels of stress hormones like corticosterone, which helps regulate energy metabolism
- **Immune System Modulation:** Cold stress can compromise immune function, potentially by diverting energy away from immune responses towards thermoregulation. This makes the birds more susceptible to diseases like Avian Influenza, Aspergillosis, and Coccidiosis
- **Changes in Gut Health:** The integrity of the intestinal barrier might be impaired, and bacterial translocation can occur under cold stress conditions
- **Reduced Water Intake:** Birds tend to drink less water in winter, which can affect overall hydration and nutrient digestion. This also presents challenges for administering water-based medications or vaccines

## Behavioural Adaptations

- **Feather fluffing:** Birds puff up their feathers to trap a layer of warm air close to their skin, enhancing insulation
- **Huddling:** Chickens huddle together tightly on roosts or the floor to share body heat
- **Reduced activity:** To conserve energy, chickens may become more sedentary, spending less time walking and foraging
- **Tucking extremities:** They may stand on one leg at a time or tuck their beak under their wing feathers to protect bare areas from the cold

## Effects on Production and Health

- **Energy Drain:** Birds expend more energy to stay warm, reducing energy for growth or egg laying, causing poor weight gain in broilers and fewer/smaller eggs in layers
- **Reduced Intake:** Lower water intake, especially if water is icy, affecting hydration and medication/vaccine absorption
- **Poor Feed Efficiency:** Higher feed intake (10-15% more) for less output (poor FCR)
- **Immunity & Disease:** Cold stress weakens immunity; damp litter increases ammonia, causing respiratory issues; rodents/pests thrive in sheds
- **Reproduction:** Decreased fertility and hatchability

Poultry are more prone to respiratory diseases during winter due to a combination of environmental factors within poultry housing and the physiological effects of cold stress on the birds, both of which compromise their immune system and respiratory health.

## Contributing Factors Include

- **Poor Ventilation and Air Quality:** To conserve heat, poultry houses are often sealed tightly during winter, leading to inadequate airflow. This causes a buildup of harmful gases like ammonia from manure, as well as dust and carbon dioxide. High levels of ammonia (above 25 ppm) irritate and damage the lining of the respiratory tract, impairing the natural defense mechanisms and making birds more susceptible to airborne pathogens
- **Cold Stress and Weakened Immunity:** Exposure to temperatures below their comfort zone (cold stress) forces birds to use more energy to maintain body temperature, which compromises their immune system function and general health. A weakened immune system makes them less resistant to infections.
- **Favourable Conditions for Pathogens:** Many common respiratory pathogens, including viruses like Avian Influenza and Newcastle disease, and bacteria like Mycoplasma gallisepticum, can survive longer and thrive in cool and damp conditions
- **High Humidity and Wet Litter:** Inadequate ventilation also leads to the accumulation of moisture and high humidity levels inside the coop. Damp environments encourage the growth of mold and bacteria in the litter, such as Aspergillus fungi (which causes Aspergillosis or "brooder pneumonia")
- **Overcrowding:** Birds often huddle together in cold weather to share warmth, and if houses are overcrowded, this closer proximity facilitates the rapid spread of infectious diseases throughout the flock
- **Complex Respiratory System:** Birds have a highly efficient, complex respiratory system with nine air sacs in addition to their lungs. While this system is efficient, its extended surface area also provides a high contact surface for pathogens to enter and cause infection

## Common Winter Diseases

Winter weather can stress poultry, weakening their immune systems and making them more vulnerable to diseases. Common winter diseases of poultry primarily include respiratory infections, as well as other conditions like Fowl Cholera, Coccidiosis, and Inclusion Body Hepatitis.

- **Avian Influenza (Bird Flu):** This viral disease mainly affects the respiratory system and is a major concern as the virus survives better in cool temperatures. Highly pathogenic forms can cause sudden death, facial swelling, bluish combs and wattles, and severe respiratory distress
- **Newcastle Disease (ND) / Ranikhet:** A highly contagious and often fatal viral disease that affects birds of all ages,

causing high mortality rates. Symptoms include respiratory distress, hoarse chirps, nasal discharge, nervous signs like paralysis or twisted necks, and a sharp drop in egg production

- **Mycoplasmosis (Chronic Respiratory Disease-CRD):** Caused by Mycoplasma gallisepticum bacteria, this condition causes sneezing, coughing, nasal and eye discharge, and general respiratory distress. It can lead to a significant drop in egg production
- **Aspergillosis (Brooder Pneumonia):** A fungal disease caused by inhaling Aspergillus spores, often found in wet and mouldy litter or feed. It primarily affects the lungs and causes difficulty breathing, gasping for air, lethargy, and potentially high mortality in young chicks
- **Fowl Cholera:** A bacterial disease transmitted through nasal exudates, faeces, and contaminated equipment. In its acute form, it can cause high mortality with few prior symptoms. Chronic cases may involve swollen wattles, joints, and tendon sheaths
- **Infectious Bursal Disease (IBD) / Gumboro Disease:** This highly contagious viral disease causes severe immunosuppression, especially in young birds. Symptoms include depression, watery diarrhea, vent picking, and an unsteady gait
- **Coccidiosis:** Caused by protozoa, this parasitic disease is favored by cold, damp conditions. It leads to diarrhea (sometimes bloody), lethargy, and stunted growth. Keeping the coop dry is a key prevention measure

## Adverse Effects of Cold Stress in Birds

Clinical signs of disease in poultry during the winter season often relate to respiratory distress and general signs of illness, frequently exacerbated by environmental stressors such as poor ventilation and cold temperatures.

## Clinical Signs of Illness

Regardless of the specific disease, sick birds in winter commonly exhibit:

- **Behavioral Changes:** Depression, listlessness, huddling together for warmth, reluctance to move, and closed eyes
- **Reduced Feed and Water Intake:** Leading to weight loss and emaciation
- **Appearance:** Ruffled feathers, pale or cyanotic (bluish/purple) combs and wattles
- **Diarrhea:** Often with white, green, or bloody droppings, which can lead to soiled feathers around the vent (pasted vent)

- **Neurological Signs (less common):** Tremors, lack of coordination, paralysis, and twisted necks, which may be seen with severe cases of Newcastle disease or Avian Influenza

## Respiratory Clinical Signs

The most common signs are related to the respiratory system:

- **Breathing Difficulties:** Gasping for air with an open beak, labored breathing, or "pump handle" breathing (stretching the neck outward)
- **Abnormal Sounds:** Sneezing, coughing, wheezing, gurgling, or rattling noises (rales) in the trachea, often more noticeable at night
- **Nasal and Ocular Discharge:** Runny or sticky discharge from the nostrils and eyes, sometimes foul-smelling
- **Facial Swelling:** Edema of the face, eyelids, and/or wattles is a prominent sign in diseases like Infectious Coryza or Swollen Head Syndrome
- **Coughing up Exudate:** In severe cases like Infectious Laryngotracheitis (ILT), birds may cough up bloody mucus or cheesy plugs that can obstruct the airway and cause death by asphyxiation

## Production-Related Signs

In laying birds, winter diseases often manifest as:

- **Marked Drop in Egg Production:** Production can fall rapidly and significantly, sometimes by 50-70%
- **Poor Egg Quality:** Eggs may be misshapen, soft-shelled, thin-shelled, rough, or have watery albumen

Observing these signs requires prompt action, including consulting a veterinarian or a poultry health expert for proper diagnosis and treatment to prevent the rapid spread of infection throughout the flock.

## Management Strategies

Proper management during winter is crucial to maintaining flock health. Key strategies include:

- **Housing:** Insulate sheds, block drafts but ensure ventilation (e.g., side windows), use deep litter (partially removed) to retain heat
- **Proper Ventilation:** Ensure adequate airflow to prevent the build-up of moisture and ammonia, which contribute to respiratory issues
- **Dry Litter:** Use clean, dry bedding materials and replace wet litter immediately to stop the spread of fungal and bacterial diseases
- **Water:** Offer warm, fresh water; remove waterer several hours before water medication for full consumption
- **Nutrition:** Increase the energy content of the feed by adding oil or fat to help birds generate heat and maintain body temperature, as they eat more in cold weather
- **Warm Water:** Provide warm drinking water periodically to encourage consumption and help birds stay warm without depleting energy reserves
- **Lighting:** Provide 16+ hours of light for layers.
- **Vaccination:** Follow a proper vaccination schedule for diseases like Newcastle Disease, Avian Influenza, and IBD to build immunity within the flock
- **Pest Control:** Manage rodents and pests seeking warmth
- **Biosecurity:** Maintain strict biosecurity measures, such as disinfecting equipment, avoiding contact with wild birds, and quarantining new birds, to prevent the introduction of pathogens
- **Deworming:** Regularly deworm layer birds to manage parasitic infections, which can be more common from stagnant water sources
- **Chicks:** Critical to keep day-old chicks warm (around 95°F) as they can't regulate heat

Consult a veterinarian for proper diagnosis and treatment if diseases occur, as early intervention is vital to prevent economic loss.

## Conclusion

Winter season has a great effect on poultry production. During winter, when temperature goes down it leads to various problems like reduction in fertility, hatchability, egg production and water intake. All these effects of low temperaturealter the bird physiology.

Winter management is crucial to avoid economic losses from cold stress, focusing on nutrition, housing, and water management to keep birds healthy and productive despite the cold.

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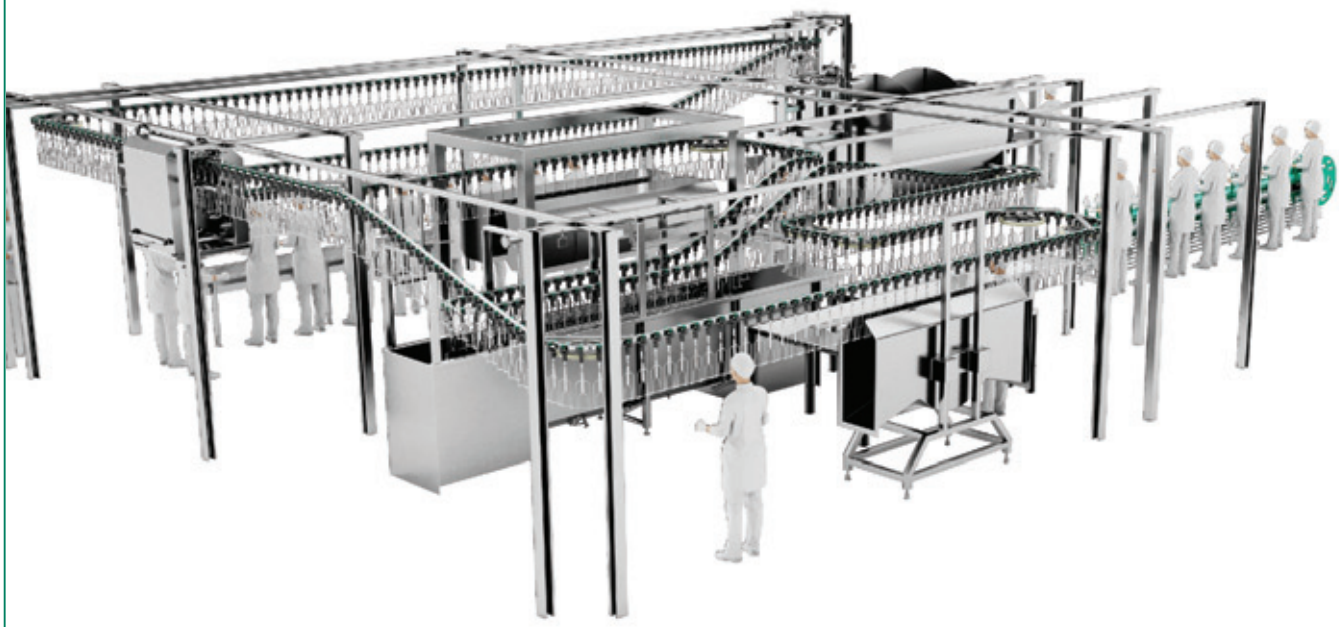

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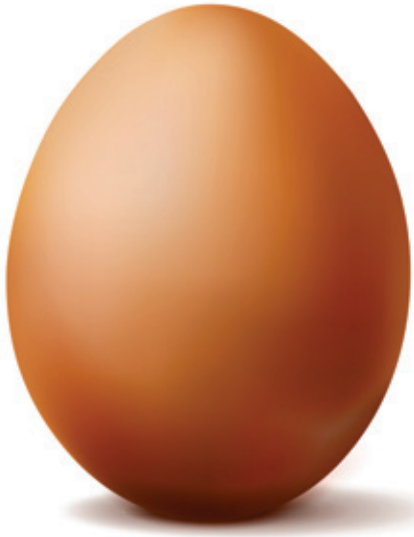

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# COVER

# FROM CULLING TO COMPASSION

As consumer consciousness reshapes global food ethics, the poultry industry faces renewed scrutiny over chick culling. **Prof. (Dr.) P.K. Shukla** and **Dr. Amitav Bhattacharyya** Department of Poultry Science, College of Veterinary Science and Animal Husbandry, Mathura, explore how in-ovo sexing offers a transformative, humane alternative—aligning technological innovation with animal welfare and the future sustainability of egg production

## The Ethical Dilemma in Poultry Farming

The global poultry industry stands at the crossroads of efficiency, ethics, and sustainability. Over the past five decades, poultry has transformed into one of the fastest-growing segments of animal agriculture, providing affordable protein to billions. Yet, beneath this narrative of success lies one of the most pressing ethical dilemmas in modern livestock farming—the mass culling of day-old male chicks. Each year, billions of male chicks are killed worldwide immediately after hatching because they are deemed unprofitable for the egg industry. Unlike female chicks, which grow into layers capable of producing eggs, male chicks of egg-laying breeds cannot lay eggs and are also unsuitable for meat production, as they grow more slowly and inefficiently compared to specialised broiler breeds. This mismatch between biology and economics has created a practice that many animal welfare advocates, consumers, and policymakers increasingly view as unacceptable.

The methods used for culling further compound the controversy. Standard industry practices involve maceration, where chicks are ground alive by high-speed macerators, or gassing, where carbon dioxide or inert gases are used to asphyxiate them. While these methods are approved under various animal welfare guidelines for being rapid and minimising suffering, the sheer scale at which they are carried out—estimated at 6 to 7 billion male chicks annually—creates an unsettling image that undermines public trust in the poultry sector. For a long time, this practice was shielded from consumer scrutiny, hidden behind the efficiency-driven supply chains that focus primarily on affordability and productivity. However, the rise of social media, investigative journalism, and animal welfare activism has made chick culling a symbol of the ethical contradictions in industrial farming.

Consumer consciousness is playing a crucial role in reshaping this debate. As societies increasingly demand food that is not only safe and affordable but also ethical and sustainable, practices that were once considered "necessary evils" are coming under heavy criticism. Chick culling, with its stark imagery and moral undertones, has become a rallying point for campaigns urging transparency and change in the egg industry. Animal welfare organisations in Europe, North America, and Asia have amplified the issue, framing it as both an ethical failure and an area where technological solutions are possible. In response, governments, researchers, and companies are actively exploring alternatives that can eliminate the need for mass chick culling without undermining the viability of egg production systems.

Among the most promising solutions is in-ovo sexing—a technology that allows the sex of a chick embryo to be determined inside the egg, before hatching. By identifying and removing male eggs early in the incubation process, poultry producers can prevent the birth of billions of unwanted male chicks, thus avoiding the moral and practical challenges of culling. This innovation represents more than a technical breakthrough; it signals a paradigm shift in the way the poultry sector can align productivity with compassion. Countries like Germany, France, and the Netherlands have already banned chick culling and are actively investing in scaling up in-ovo sexing technologies. Similar debates are emerging in the United States, Israel, and parts of Asia, reflecting a global momentum toward a more humane approach.

The significance of this transition extends beyond animal welfare. In-ovo sexing embodies a broader shift toward

ethical market transformation, where consumer expectations, technological innovation, and regulatory frameworks converge to redefine the standards of production. Just as cage-free eggs have become a marker of welfare-conscious consumption, eggs labelled as "no-chick-culling" or "humanely hatched" are carving out new premium segments in global markets. For the poultry industry, this trend represents both a challenge and an opportunity: a challenge because it requires investments, regulatory adjustments, and consumer education; and an opportunity because it enhances trust, creates value-added products, and strengthens the industry's social license to operate.

As the poultry sector enters this era of heightened scrutiny and innovation, the debate around chick culling and in-ovo sexing will likely shape its ethical trajectory for years to come. The issue forces us to confront fundamental questions: Can efficiency and compassion coexist in industrial farming? Can technological innovation bridge the gap between profitability and morality? And most importantly, will consumers be willing to support and reward these ethical transformations through their choices in the marketplace? This article explores these questions in depth, tracing the roots of chick culling, the science of in-ovo sexing, global policy responses, economic implications, and the broader market transformation it heralds.

## Scale of the Problem

To understand the urgency behind the debate on chick culling, one must first grasp the staggering scale of the practice and its implications for global poultry production. The poultry industry is vast, highly industrialised, and operates on efficiency metrics that depend on specialised breeding. Modern poultry production divides birds into two distinct genetic lines: layer breeds for egg production and broiler breeds for meat production. The layer breeds have been selectively bred over decades for high egg-laying capacity, with hens producing up to 330 eggs per year. However, these specialised birds are inefficient at producing meat, growing slowly with poor feed conversion ratios compared to broilers. Male chicks born from egg-laying breeds, therefore, serve no economic purpose—they neither lay eggs nor grow into profitable meat producers. This biological-economic mismatch explains why culling has become an entrenched practice.

The numbers are daunting. Globally, an estimated 6 to 7 billion male chicks are culled every year—a figure that roughly equals the human population of the entire planet. In Europe alone, about 330 million male chicks are culled annually, while the United States accounts for another 260 million. Countries like India, China, and Brazil, major players in the poultry sector, add hundreds of millions more to this grim tally, though reliable statistics are harder to obtain due to less transparency and informal sector dominance. These figures are not abstract estimates; they translate into daily operations where hatcheries across the world cull thousands of chicks within hours of hatching, ensuring that only female chicks are reared for laying.

The process begins immediately after chicks hatch in large commercial hatcheries. Automated sorting lines determine sex, often through trained workers who separate male from female chicks at high speed, sometimes processing over 1,000 chicks per hour. Female chicks are transferred to rearing facilities, while males are diverted for disposal. The most common method is maceration, where chicks are instantly killed in high-speed grinders—a method considered humane by regulatory standards because of its rapidity. Another method is gassing with carbon dioxide or nitrogen, which suffocates the chicks. Despite technical justifications, the optics of these practices—piles of dead chicks, images of macerators, or suffocation chambers—have sparked outrage among the public whenever exposed by activists or the media.

From an economic standpoint, chick culling is treated as a cost-avoidance strategy. Feeding and rearing male chicks of layer breeds would mean diverting feed resources toward birds that generate little to no return. Studies suggest that raising male layer chicks for meat is highly inefficient, requiring nearly twice as much feed to produce the same amount of meat as broilers. This translates into higher feed costs, greater land use, and a larger carbon footprint—outcomes that are unsustainable both economically and environmentally. Thus, the industry has historically justified culling as a pragmatic solution, even though it creates ethical and reputational risks.

The sheer scale of the practice also raises sustainability concerns in terms of resource wastage. Consider the indirect costs: every male chick culled represents an investment of energy, incubation, and hatchery infrastructure that ultimately results in waste. While each egg incubated has the potential to produce a productive female chick, half of them statistically become males, meaning nearly 50% of the incubation effort ends in culling. This inefficiency has prompted researchers and innovators to argue that technological solutions like in-ovo sexing are not just ethical but also resource-efficient, preventing unnecessary use of energy, hatchery capacity, and labour.

Public awareness around the scale of chick culling has been rising steadily, particularly in Europe. Animal welfare campaigns often emphasise the "one chick killed per egg" equation to underline the moral cost of egg production. This framing has resonated with consumers, especially in high-income countries where animal welfare concerns often translate into purchasing decisions. Supermarkets in Germany and France, for instance, have already pledged to sell only "no-cull" eggs sourced from farms using in-ovo sexing or dual-purpose breeds. This consumer-driven demand is forcing producers to reckon with the magnitude of the issue and explore scalable alternatives.

In developing countries like India, Brazil, and Indonesia, the scale of chick culling is equally massive but less visible in public debates. Here, the dominance of smallholder systems, weaker regulatory oversight, and price-sensitive consumers mean that chick culling continues largely unquestioned. Nevertheless, as globalisation spreads both awareness and ethical standards, even these markets may soon face pressure to acknowledge and address the practice. Moreover, with India being the second-largest egg producer in the world, changes in its approach to chick culling could have significant global ripple effects.

Ultimately, the scale of chick culling is not just a statistic—it is a reflection of the structural design of modern poultry production systems. By quantifying and exposing the magnitude of the practice, advocates, scientists, and policymakers highlight the urgent need for transformative solutions like in-ovo sexing. The billions of chicks culled annually are a powerful reminder that ethical concerns are not isolated incidents but systemic outcomes of a production model that prioritises efficiency over compassion. Confronting these numbers is the first step in understanding why replacing chick culling is not merely desirable but imperative for the future of poultry farming.

## Ethical Concerns and Consumer Awareness

While the poultry industry has long justified chick culling as an unavoidable by-product of egg production, the ethical dimensions of the practice are now firmly at the forefront of public discourse. At its core, the controversy is not merely about numbers or efficiency but about the morality of killing billions of healthy sentient beings simply because they lack economic value. Critics argue that this practice undermines the industry's claims of humane treatment and exposes a contradiction between consumer expectations and industrial realities. In societies where animal welfare is gaining increasing importance, the culling of

day-old chicks has become emblematic of the ethical blind spots of modern agriculture.

Animal welfare organisations have been instrumental in raising awareness. Groups such as Compassion in World Farming, PETA, and local advocacy networks in Europe and North America have conducted undercover investigations that reveal the conditions under which male chicks are culled. Images of conveyor belts feeding live chicks into macerators or gas chambers have circulated widely on social media, sparking outrage among consumers who had previously been unaware of these practices. The emotional power of such imagery has galvanised public sentiment, reframing chick culling as not just an industry-specific issue but as a broader moral failing in food production systems.

Philosophically, the issue raises questions about the instrumentalisation of animals. Are animals merely commodities to be optimised for human needs, or do they possess intrinsic value that demands ethical consideration? The culling of male chicks exemplifies the logic of industrial farming that views animals primarily through an economic lens. Ethical theorists and animal rights advocates argue that such utilitarian approaches fail to respect the basic moral worth of animals, especially when alternatives are technologically feasible. Even among those who accept animal farming as necessary for food security, the culling of male chicks is increasingly seen as an unnecessary cruelty that conflicts with evolving social values.

Consumer awareness is rapidly reshaping market dynamics. In the past, the details of poultry production remained hidden from consumers, with food systems designed to deliver low-cost protein while shielding the public from ethically controversial practices. Today, however, consumers are more informed, thanks to digital transparency, investigative journalism, and advocacy campaigns. Terms such as "cage-free," "free-range," and "organic" have become part of the everyday vocabulary of food shoppers. Now, "no-chick-culling" or "humanely hatched" labels are emerging as the next frontier in ethical consumption. Supermarket chains in Germany, France, and Switzerland already market eggs explicitly labelled as free from chick culling, signalling a direct response to consumer demand for greater transparency and humane practices.

The ethical debate is also intertwined with broader consumer trends around sustainability, health, and food justice. Consumers who are willing to pay a premium for cage-free or organic eggs are often the same demographic that demands alternatives to chick culling. For these consumers, buying eggs is not merely a dietary choice but a statement of values—support for systems that prioritise animal welfare, ecological responsibility, and corporate accountability. Surveys in Europe show that a majority of consumers express willingness to pay slightly higher prices for eggs if it means that male chick culling is avoided. This trend indicates that the market is evolving from one solely driven by cost toward one increasingly influenced by ethical considerations.

Religious and cultural values further complicate the debate. In some societies, the unnecessary killing of animals is viewed through moral or spiritual lenses, adding another layer of objection to chick culling. For instance, in countries with strong traditions of non-violence or respect for life, such as India, the revelation of large-scale chick culling could provoke significant backlash if consumer awareness continues to grow. Conversely, in regions where price sensitivity dominates, ethical objections may remain muted, though global consumer trends could gradually influence perceptions.

The role of youth and younger consumers is particularly noteworthy. Younger generations, especially in urban centres, are more conscious of ethical consumption and more engaged with social justice movements, including those related to animal rights. For them, food is not only about nutrition but about aligning lifestyle with values. Social media platforms amplify this voice, creating viral campaigns that pressure corporations and policymakers to adopt more humane practices. This generational shift suggests that ethical concerns about chick culling are unlikely to fade but will instead intensify in the coming decades.

Importantly, the ethical pressure is not just external to the industry. Within the poultry sector itself, some producers and entrepreneurs recognise that ignoring consumer sentiment poses long-term reputational and economic risks. By investing in alternatives such as in-ovo sexing or dual-purpose breeds, these innovators position themselves not only as market leaders but also as ethical pioneers. This strategic alignment with consumer expectations demonstrates that animal welfare is no longer a fringe concern but a mainstream driver of innovation and competitiveness.

Overall, the ethical concerns around chick culling are a powerful catalyst for change. What was once an obscure practice known only to insiders has become a symbol of the moral contradictions of industrial farming. As consumer awareness grows, supported by activism, cultural values, and generational shifts, the poultry industry faces mounting pressure to abandon culling in favour of humane alternatives. In-ovo sexing, therefore, is not merely a technical solution—it is an ethical imperative that allows the industry to reconcile its practices with the values of a more informed and conscientious public.

## The Science Behind In-Ovo Sexing

The breakthrough that offers a humane alternative to chick culling lies in in-ovo sexing, a set of scientific methods that enable the determination of a chick's sex while it is still developing inside the egg. Instead of waiting until chicks hatch and then sorting and culling males, in-ovo sexing allows producers to identify and remove male eggs early in incubation. This innovation not only prevents the ethical dilemma of killing day-old chicks but also improves efficiency by avoiding wasted incubation space, energy, and labour. To appreciate its transformative potential, it is important to understand the science behind these technologies and how they have evolved over the past decade.

At the heart of in-ovo sexing is the principle of detecting biological markers that distinguish male from female embryos. Since sex in birds is determined genetically—females have ZW chromosomes while males have ZZ—there are measurable differences that can be identified through chemical, physical, or molecular signals. Researchers have developed a variety of approaches, each with its own strengths, limitations, and commercial readiness. The most widely used methods include spectroscopy, hormone analysis, genetic techniques, and AI-assisted imaging.

One of the earliest and most promising approaches is optical spectroscopy, in which a small laser or light beam penetrates the eggshell to analyse embryonic fluids or tissues. By studying the way light interacts with biological material, scientists can detect sex-specific markers. For example, differences in blood oxygenation or the presence of specific pigments can reveal the embryo's sex as early as day 9 of incubation. This method is considered minimally invasive, as it requires only a tiny puncture in the eggshell that is resealed afterward, ensuring normal development for female chicks.

Another technique involves hormonal analysis. During incubation, male and female embryos secrete different levels of sex hormones, such as estradiol and testosterone, into the egg. By extracting a minute sample of fluid from the egg's allantois (a fluid-filled sac), laboratories can measure these hormone levels using rapid biochemical assays. This method is highly accurate, though slightly more invasive than optical

spectroscopy. Companies in Germany and the Netherlands have pioneered commercial systems based on this approach, capable of screening tens of thousands of eggs per day.

Genetic and molecular methods represent another frontier. By targeting DNA or RNA markers that differ between male and female embryos, scientists can determine sex with near-perfect accuracy. Techniques such as PCR (polymerase chain reaction) are commonly used in laboratories, though their application in high-throughput commercial settings remains technically challenging due to costs and processing time. However, advances in microfluidics and lab-on-chip technologies are rapidly closing this gap, suggesting that genetic screening may become commercially viable in the near future.

More recently, AI and computer vision have entered the field of in-ovo sexing. Using hyperspectral imaging and machine learning algorithms, researchers can analyse subtle differences in embryonic development patterns visible through the shell. These AI systems can process large datasets quickly, improving both accuracy and speed. By reducing the need for invasive sampling, AI-assisted imaging holds promise as a scalable and welfare-friendly solution.

A key scientific challenge in in-ovo sexing is the timing of detection. Ethical guidelines emphasise that sex determination should occur as early as possible in incubation, ideally before day 7, to ensure embryos do not develop into sentient organisms capable of experiencing pain. Earlier detection also maximises resource efficiency, as male eggs can be removed before significant energy is invested in incubation. Many current commercial systems achieve sexing around days 9–10, which is acceptable but still later than the ideal benchmark. Ongoing research is focused on pushing detection earlier, with breakthroughs in spectroscopy and molecular biology showing promising results.

The science of in-ovo sexing is also deeply intertwined with commercial scalability. It is not enough for a method to be accurate; it must also be rapid, automated, and cost-effective for hatcheries handling millions of eggs annually. Innovations in robotics, fluid handling, and data processing are, therefore, integral to making in-ovo sexing practical at industrial scale. Companies such as Seleggt (Germany), In Ovo (Netherlands), and Orbem (Germany) have developed technologies that are already in commercial use, demonstrating that scientific theory can be translated into operational reality.

Ultimately, the science behind in-ovo sexing illustrates the potential for biotechnology and data-driven tools to transform ethical challenges into technical solutions. By enabling early, non-lethal sex determination, these methods align animal welfare with economic viability. They also reflect a broader trend in agriculture: the fusion of biology, engineering, and artificial intelligence to create systems that are more precise, sustainable, and humane. While challenges remain in terms of accuracy, cost, and early-stage detection, the steady progress of in-ovo sexing science offers a powerful example of how innovation can reconcile productivity with compassion.

## Global Developments in In-Ovo Sexing

The rapid evolution of in-ovo sexing technologies is not occurring in isolation; it is being shaped and accelerated by global policy shifts, consumer expectations, and the competitive dynamics of the poultry industry. Across Europe, North America, Asia, and beyond, governments, startups, and large agribusinesses are investing in different approaches, each aiming to establish scalable, accurate, and economically viable alternatives to chick culling. These global developments reveal a landscape of both innovation and disparity, as adoption rates vary significantly across regions depending on regulatory frameworks, market maturity, and socio-economic conditions.

Europe is widely recognised as the global leader in the adoption of in-ovo sexing. Germany became the first country to legislate against chick culling, announcing a ban that took effect in 2022. This move was driven by strong public demand for animal welfare reforms and supported by the government through funding for research and innovation. Companies such as Seleggt GmbH and Orbem pioneered commercial in-ovo sexing technologies that are now used by hatcheries supplying major German supermarket chains. Seleggt, for instance, developed a hormone-based testing method that identifies sex at around day 9 of incubation, while Orbem employs advanced MRI and AI imaging technologies. France soon followed Germany's example, introducing its own ban in 2022 and investing in scaling up similar technologies. These legislative shifts set a precedent for other European nations, and by 2024, several countries—including the Netherlands and Austria—were in active stages of implementing comparable bans.

Outside of Europe, the momentum is slower but steadily building. In the United States, chick culling has not yet been banned at the federal level, but industry players are increasingly recognising that consumer expectations and potential trade restrictions may make adoption inevitable. Companies like Agri Advanced Technologies (AAT) have been piloting sexing systems, while American retailers are beginning to show interest in sourcing "no-cull" eggs as part of their corporate social responsibility commitments. In parallel, advocacy groups are pressuring lawmakers to follow the European model, arguing that the U.S., as a global poultry powerhouse, should not lag behind in ethical innovation.

In Israel, another hub of agricultural innovation, startups such as EggXYt have made significant progress. Their approach combines CRISPR-based biotechnology with AI imaging to identify male embryos at very early stages of incubation, promising both precision and scalability. Israel's reputation for fostering agricultural biotech has made it an incubator for high-tech solutions that could potentially leapfrog existing European models. Similarly, the Netherlands, home to In Ovo, has invested heavily in research to push the boundaries of speed and accuracy in sex determination, positioning itself as a pioneer in merging science with commercialisation.

Asia presents a more complex picture. China, the world's largest poultry producer, has not yet implemented large-scale in-ovo sexing initiatives, although research collaborations between universities and private companies are beginning to emerge. The focus in China remains on scaling efficiency and affordability, meaning welfare-driven innovations may take longer to gain traction unless government policy intervenes. In India, which ranks second in global egg production, public discourse around chick culling remains limited, but as the country integrates more deeply into global markets, the demand for ethical certifications and compliance with international welfare standards may drive adoption. Pilot projects supported by international NGOs and partnerships with European technology providers could play a catalytic role in introducing in-ovo sexing in the Indian context.

South America, particularly Brazil, is another major poultry-producing region where adoption remains limited. The region's competitive advantage in poultry exports is built on cost efficiency, and thus, welfare-driven innovations face resistance due to concerns about higher production costs. However, as importing countries like Germany or France begin requiring "no-cull" certifications for egg imports, Brazilian producers may eventually be compelled to adopt in-ovo sexing to retain access to lucrative export markets.

These global developments underscore that in-ovo sexing is not simply a technological innovation but a marker of global

ethical convergence in animal agriculture. While Europe leads in regulatory mandates, the United States, Israel, and the Netherlands are pushing scientific and commercial frontiers, and Asia and South America are cautiously observing before committing. This uneven adoption trajectory suggests that the spread of in-ovo sexing will follow both top-down regulatory enforcement and bottom-up market incentives.

What unites these global efforts is the recognition that chick culling is increasingly incompatible with the values of modern consumers. Whether driven by legislation, activism, or corporate social responsibility, the global poultry industry is entering a new era where technological innovation and ethical imperatives are intertwined. The challenge now is to ensure that these innovations are not confined to wealthy markets but are adapted to the economic realities of developing regions, thereby making the end of chick culling a truly global achievement.

## Economic and Commercial Dimensions

The debate over in-ovo sexing is not solely an ethical or technological issue; it is also deeply embedded in the economic and commercial realities of the global poultry sector. For hatcheries and egg producers, the decision to adopt new technologies hinges on cost, efficiency, and market competitiveness. While animal welfare is becoming a significant driver of consumer choice, profitability remains central to industry decision-making.

Thus, the success of in-ovo sexing technologies depends on whether they can align humane practices with economic viability.

Historically, chick culling has been justified as the most cost-effective option. Male chicks from layer breeds represent a financial liability because they consume feed without producing either eggs or sufficient meat to justify the input. Culling them immediately after hatching has been seen as the least expensive solution, even if it carries reputational and ethical risks. In contrast, raising male layer chicks for meat is highly inefficient, with feed conversion ratios nearly double those of specialised broilers, resulting in prohibitive costs. This economic logic explains why alternatives like dual-purpose breeds—birds that produce both reasonable quantities of eggs and acceptable meat yields—have gained little traction commercially. While appealing in theory, dual-purpose breeds cannot match the efficiency of specialised lines, making them less attractive for large-scale operations.

In-ovo sexing disrupts this paradigm by introducing a method that prevents the hatching of unwanted males altogether. However, the technology itself involves significant upfront investment. Hatcheries must install sophisticated equipment—ranging from spectroscopy systems and hormone analysers to AI-driven imaging platforms—which can cost millions of dollars. Additional costs include staff training, maintenance, and adaptation of existing hatchery infrastructure. For small and medium-sized producers, these costs may seem daunting, creating a risk of market concentration where only large-scale, well-capitalised operations can afford to implement the technology.

On the other hand, proponents argue that in-ovo sexing offers substantial long-term economic benefits. By eliminating the need for culling, hatcheries save labour costs associated with sexing and disposal, reduce energy waste from incubating unviable eggs, and improve overall operational efficiency. Studies suggest that removing male eggs as early as day 7 of incubation can cut hatchery energy consumption by as much as 20 percent, while also freeing up space and resources for female eggs. These operational gains can partially offset the high initial investment. Furthermore, the ability to market "no-chick-culling" eggs as a premium product opens new revenue streams. In markets like Germany and France, such eggs already command higher retail prices, with consumers demonstrating willingness to pay more for ethically produced food.

From a broader commercial perspective, in-ovo sexing also enhances brand reputation and consumer trust. Food companies and retailers are increasingly judged not just on the quality of their products but also on the values they embody. Supermarkets in Europe that introduced "no-cull" eggs have benefited from positive publicity, differentiating themselves in competitive markets. For multinational food corporations, adopting in-ovo sexing aligns with corporate social responsibility (CSR) commitments and sustainability goals, making it a valuable tool for strengthening brand image and mitigating reputational risks. In this sense, the technology is not just a cost but also a strategic investment in long-term consumer loyalty and market positioning.

Export markets are another commercial dimension to consider. Countries that adopt in-ovo sexing early may gain preferential access to markets with strict animal welfare standards, while those that delay risk being excluded. For instance, if the European Union mandates imports of only "no-cull" eggs in the future, exporters from Asia or South America will need to comply or risk losing valuable trade opportunities. This creates a powerful incentive for adoption, even in cost-sensitive regions, as access to international markets often outweighs the costs of technological transition.

Still, challenges remain in ensuring that the technology is affordable and scalable for producers worldwide. Without subsidies, partnerships, or shared innovation platforms, there is a risk of creating a two-tiered system in which wealthy countries adopt humane practices while developing regions continue chick culling due to cost constraints. Policymakers, therefore, have a role to play in facilitating adoption by offering financial incentives, grants, or cooperative models that make in-ovo sexing accessible across the industry.

In short, the economic and commercial dimensions of in-ovo sexing highlight a delicate balance. On one hand, the technology entails significant costs and operational changes; on the other, it offers efficiency gains, premium product opportunities, reputational benefits, and improved market access. The key question for the poultry industry is not whether it can afford to adopt in-ovo sexing, but whether it can afford not to—given the mounting consumer, regulatory, and ethical pressures that are reshaping the global marketplace.

## Regulatory and Policy Perspectives

The trajectory of in-ovo sexing technologies cannot be understood without examining the regulatory and policy frameworks that either accelerate or hinder their adoption. In the poultry sector, government regulations and policy directives often serve as

catalysts for systemic change, especially in areas where market forces alone are insufficient to drive rapid transformation. In-ovo sexing has emerged as a prominent example of how public policy, consumer sentiment, and scientific innovation intersect to reshape industry practices.

Europe has taken the strongest regulatory stance against chick culling. Germany became the first country to officially ban the practice, implementing legislation in 2022 that prohibited the culling of male layer chicks. This landmark policy was the result of sustained public pressure, animal welfare advocacy, and a political commitment to align agriculture with ethical values. The German government not only introduced the ban but also allocated significant funding to accelerate the development of in-ovo sexing technologies. This dual approach—combining prohibition with research support—ensured that the industry had both a clear mandate and the tools to comply. France quickly followed with its own ban, while other European nations, such as Austria and the Netherlands, are actively moving in the same direction. At the EU level, discussions are underway about harmonising welfare standards, which could make in-ovo sexing a continent-wide requirement in the near future.

In the United States, the policy environment is more fragmented. While there is no federal ban on chick culling, growing public awareness and lobbying from animal welfare groups are pressuring regulators to act. Some states are considering individual measures, while at the federal level, the USDA has provided grants for research into animal-friendly alternatives. However, the U.S. poultry industry's size and diversity make nationwide regulation more complex compared to Europe. Instead, market-led initiatives—such as commitments by major retailers to source "no-cull" eggs—are gradually creating de facto standards that may eventually pave the way for formal legislation.

In Asia, the policy environment is evolving more slowly. China, the world's largest egg producer, has not introduced specific regulations targeting chick culling, largely due to the country's emphasis on cost efficiency and food security. However, as China increasingly positions itself as a global agricultural leader, it may adopt higher welfare standards to enhance export credibility. India, the second-largest producer, also lacks explicit policy measures addressing chick culling, although its poultry sector faces growing international pressure to align with global welfare expectations. For both China and India, regulatory change is likely to be driven by external trade dynamics rather than domestic consumer activism, at least in the short term.

In the Middle East, Israel has emerged as a policy innovator by fostering a supportive ecosystem for agri-tech startups like EggXYt. While formal bans on chick culling have not yet been enacted, government-backed research funding and incubators for biotech innovation have positioned Israel as a hub for in-ovo sexing research. This policy model—prioritising innovation ecosystems over regulation—demonstrates an alternative pathway for countries seeking to balance welfare concerns with industry competitiveness.

In South America, Brazil is a critical case. As one of the world's largest poultry exporters, Brazil faces significant external pressure from trading partners with stringent welfare standards. While domestic regulation is limited, export-oriented producers are beginning to consider in-ovo sexing adoption as a way to future-proof market access. This illustrates how global trade dynamics can serve as a regulatory mechanism, shaping practices in the absence of local legislation.

Importantly, regulatory perspectives also raise ethical questions about the timing of intervention. Some European policymakers argue that sex determination must occur at the earliest possible embryonic stage (before day 7), based on scientific evidence suggesting embryos develop pain sensitivity thereafter. Others have allowed technologies operating at later stages (day 9–14), arguing that what matters most is eliminating post-hatch culling, even if embryonic welfare considerations remain unresolved. This divergence in policy frameworks underscores the complexities of balancing science, ethics, and practicality.

Looking ahead, the future of regulation in this field is likely to move toward convergence. International bodies such as the World Organisation for Animal Health (WOAH) and the Food and Agriculture Organization (FAO) may play a coordinating role in setting minimum global standards. Harmonised policies would not only reduce competitive disparities between countries but also ensure that animal welfare is upheld consistently across borders. At the same time, governments will need to provide financial and infrastructural support to ensure smaller producers are not excluded from compliance due to cost barriers.

In a nutshell, regulatory and policy perspectives demonstrate how state intervention, trade dynamics, and global governance structures are all shaping the adoption of in-ovo sexing. While Europe leads through legislative bans, other regions are following more cautiously, often guided by market forces and international pressures. Ultimately, the regulatory landscape will determine whether in-ovo sexing becomes a universal standard or remains confined to select markets.

## Ethical and Consumer Dimensions

At the heart of the move toward in-ovo sexing lies a profound ethical transformation within the poultry sector. For decades, chick culling was viewed as an unfortunate but necessary practice to maintain economic efficiency. However, as society has become more aware of animal welfare, the moral justification for this practice has weakened. Consumers, advocacy groups, and policymakers increasingly argue that economic convenience should not override ethical responsibility. This cultural and ethical shift has been one of the strongest driving forces behind the development and adoption of in-ovo sexing technologies.

From an ethical standpoint, chick culling raises two fundamental concerns: the intrinsic value of animal life and the methods used for disposal. Every year, billions of newly hatched male chicks are euthanised, most commonly through maceration or suffocation. While these methods are considered efficient and technically compliant with animal welfare guidelines, they evoke strong emotional responses among the public. In-ovo sexing provides a solution that not only eliminates the act of killing day-old chicks but also aligns poultry production with the principle of reducing unnecessary suffering. By preventing male embryos from developing to the hatching stage, the technology represents

a shift toward more humane and ethically defensible practices.

Religious and cultural values also intersect with the ethical debate. In many traditions, the sanctity of life is emphasised, and killing healthy chicks, even if economically rational, is seen as morally troubling. Countries with strong cultural or religious commitments to compassion for animals—such as India, where ahimsa (non-violence) is a guiding principle—may find in-ovo sexing particularly appealing as it offers a way to modernise agriculture without violating deeply held ethical beliefs. Ethical alignment with local values can therefore act as an important driver of consumer acceptance and regulatory support.

Consumers themselves play a pivotal role in shaping the ethical landscape. Surveys in Europe and North America reveal that a growing majority of consumers are uncomfortable with chick culling and are willing to pay more for eggs produced without this practice. The marketing of "Respeggt" eggs in Germany, which proudly display labels certifying "no chick culling," illustrates how ethical values can be transformed into tangible market choices. Consumer willingness to pay a premium creates financial incentives for producers to adopt in-ovo sexing, making ethics and economics mutually reinforcing rather than contradictory.

However, consumer expectations are not always uniform across regions. In wealthier markets, where animal welfare is a prominent concern, demand for ethically produced eggs is stronger. In contrast, in low- and middle-income countries, affordability often outweighs welfare considerations, with consumers prioritising price over production methods. This disparity raises ethical questions about global equity: should welfare improvements be a privilege of affluent consumers, or should they be made universal through international standards and supportive policies? Addressing this issue requires balancing ethical aspirations with economic realities, ensuring that humane practices are not restricted to niche markets but become mainstream across all regions.

Another layer of ethical debate concerns the embryos themselves. While in-ovo sexing prevents the suffering of hatched male chicks, questions remain about whether embryos at later stages of incubation can feel pain. Scientific studies suggest that embryonic neural pathways begin forming around day 7 of incubation, raising concerns about whether sex determination conducted later (day 9–14) is ethically sufficient. This has led some ethicists and policymakers to argue that only early-stage sexing (before day 7) truly resolves the ethical problem. The debate reflects a broader tension in animal ethics: the challenge of reconciling technological feasibility with philosophical ideals.

Transparency also plays a crucial role in ethical acceptance. For consumers to trust in-ovo sexing, they must believe that labels such as "no chick culling" genuinely reflect production practices. Clear certification systems, third-party audits, and honest communication are essential to prevent greenwashing or "welfare-washing." If consumers perceive ethical labelling as misleading, it could undermine both trust in the poultry industry and the broader movement toward responsible food systems.

Ultimately, the ethical and consumer dimensions of in-ovo sexing demonstrate that the poultry sector is no longer judged solely on productivity and cost efficiency but also on its moral compass. In-ovo sexing is not just a technological innovation but a symbol of a broader shift toward food production systems that prioritise compassion, transparency, and responsibility. As consumer awareness continues to grow, ethical legitimacy will become as important as economic efficiency in determining the future success of poultry enterprises.

## Global Adoption Trends and Future Prospects

The adoption of in-ovo sexing technologies is not unfolding evenly across the globe; rather, it reflects the interplay of cultural values, regulatory frameworks, economic realities, and technological readiness in different regions. Examining global adoption trends provides insight into both the current state of implementation and the trajectory toward a more widespread future.

Europe stands at the forefront of adoption. Germany and France have already banned chick culling, forcing producers to embrace in-ovo sexing or other alternatives. Retailers have played a decisive role in accelerating this transition, with supermarket chains only stocking "no-cull" eggs. Certification systems, such as the "Respeggt" label, have given consumers a transparent way to support ethical production, further embedding these technologies into the market. Other European nations, such as Austria, Switzerland, and the Netherlands, are actively moving toward similar models. The EU is now considering bloc-wide regulation, which, if enacted, would create the largest single unified market for in-ovo sexing globally.

North America presents a more gradual adoption pattern. In the U.S., while there is no federal legislation banning chick culling, consumer awareness campaigns and advocacy by groups such as the Humane League are putting increasing pressure on egg producers. Several major food companies and retailers have made voluntary commitments to source from "no-cull" supply chains, and the USDA has funded research into viable alternatives. Canada is following a similar path, with industry groups actively evaluating the feasibility of in-ovo sexing. Adoption here is likely to be market-driven rather than regulation-driven, with early adopters leveraging ethical branding as a competitive advantage.

In Asia, adoption remains limited but holds massive future potential due to the scale of egg production. China, the world's largest egg producer, has not yet embraced in-ovo sexing on a wide scale, as cost efficiency and production volume remain paramount. However, Chinese biotechnology firms are increasingly collaborating with European partners, signalling that the technology could find a foothold once it becomes more cost-effective. India, the second-largest egg producer, faces similar dynamics: consumer demand for welfare-certified eggs is low, but international trade pressures and domestic ethical movements could spur gradual adoption. Japan, by contrast, is more welfare-conscious and is already experimenting with in-ovo sexing technologies through collaborations with European innovators.

The Middle East and Israel have carved out a unique niche in the adoption landscape. Israel, through startups such as EggXYt, has positioned itself as a leader in genetic and molecular approaches to in-ovo sexing. While local demand is modest, government-supported innovation ecosystems have enabled Israeli technologies to influence global markets. Neighbouring Middle Eastern countries, where poultry production is central to food security, are monitoring these developments closely.

South America is also an important player. Brazil, one of the largest poultry exporters in the world, is beginning to explore in-ovo sexing as a way to meet the animal welfare standards of importing countries, particularly in Europe. While domestic regulation is limited, export competitiveness could act as a de facto driver of adoption. Argentina and Chile are showing similar interest, although resource constraints may slow progress.

Looking ahead, global prospects for in-ovo sexing are promising but dependent on several key factors. First, cost reduction will be critical. The current high investment required for equipment and training remains a barrier, especially in low- and middle-income countries. As technologies mature and economies of scale are achieved, costs are expected to fall, making adoption more feasible across diverse production systems.

Second, global standardisation will likely accelerate adoption.

If international organisations such as the World Organisation for Animal Health (WOAH) or the Food and Agriculture Organization (FAO) establish guidelines or minimum standards, countries will be incentivised to adopt in-ovo sexing not only for ethical reasons but also to maintain trade competitiveness.

Third, the future of in-ovo sexing may be shaped by technological convergence. Current approaches—ranging from spectroscopy to genetic markers—could evolve into hybrid models that offer earlier, faster, and more cost-efficient sex determination. Integration with digital poultry management systems may further streamline adoption by embedding sexing technologies into broader farm automation processes.

In general, global adoption trends highlight a world moving in the same direction but at different speeds. Europe is leading with regulatory mandates, North America is advancing through market-driven initiatives, Asia holds untapped potential, and South America is motivated by trade competitiveness. The future prospects of in-ovo sexing will be defined by cost reduction, regulatory harmonisation, and technological innovation. Together, these factors point toward a future where the elimination of chick culling is not just a regional development but a universal standard in poultry production.

## Way Forward

The transition from traditional chick culling to in-ovo sexing marks a watershed moment in the evolution of the poultry sector. It represents not merely the introduction of a new technology but the redefinition of ethical, economic, and social norms that have governed egg production for decades. By addressing one of the most controversial practices in modern animal agriculture, in-ovo sexing aligns the industry with contemporary values of compassion, sustainability, and consumer responsibility. Its significance therefore extends far beyond hatcheries—it has become a symbol of how innovation can transform agriculture into a more humane enterprise.

One of the most important conclusions that emerges from this global shift is that ethical progress and economic viability can reinforce one another. While chick culling was historically tolerated for its cost efficiency, the growing societal demand for humane practices has created a market for ethically certified products such as "no-cull" eggs. This consumer-driven shift has not only encouraged producers to adopt in-ovo sexing but has also spurred governments and retailers to support the transformation through policy and certification. The poultry sector, often criticised for prioritising profits, is now presented with a unique opportunity to demonstrate that profitability and responsibility can go hand in hand.

At the same time, the path forward is not without obstacles. High initial costs, technological complexity, and uneven adoption across regions risk creating disparities in welfare standards between developed and developing countries. If not addressed, these gaps could reinforce existing inequalities in global food systems, where only affluent consumers have access to ethically produced eggs. Ensuring inclusivity in this transformation will require international collaboration, financial support mechanisms, and knowledge-sharing platforms that help low- and middle-income countries access and implement in-ovo sexing technologies.

Policymakers have a particularly vital role to play in the way forward. Regulatory bans on chick culling, as seen in Germany and France, have been powerful catalysts for change. However, legislation must be complemented by financial incentives, subsidies, or public–private partnerships that make technology adoption feasible for smaller producers. Additionally, the establishment of global welfare standards by organisations such as the WOAH or FAO could ensure that ethical improvements are not confined to a handful of wealthy nations but become universal benchmarks for responsible poultry farming.

The future of in-ovo sexing will also be shaped by ongoing technological innovation. Current methods, while effective, still face challenges in cost, speed, and early-stage accuracy. Next-generation solutions—whether through advanced spectroscopy, gene-editing approaches, or AI-driven imaging—are likely to deliver faster, more precise, and more affordable outcomes. Integration of in-ovo sexing into digital poultry management systems could create efficiencies that make adoption seamless, further embedding welfare improvements into the broader framework of smart and sustainable agriculture.

Beyond the technological and regulatory dimensions, the way forward must also prioritise transparency and consumer engagement. Labels such as "no chick culling" have proven powerful in shifting consumer behaviour, but their credibility depends on rigorous certification and third-party verification. Clear communication, public education, and honesty about both the benefits and limitations of in-ovo sexing will be essential to maintaining consumer trust. If managed well, this transparency can strengthen the bond between producers and consumers, fostering a food system grounded in mutual accountability.

The long-term vision for the poultry sector must be guided by the principle that ethical responsibility is not optional but intrinsic to sustainability. In-ovo sexing is not the final destination but the first step in a broader movement toward more humane and climate-smart livestock systems. The lessons learned here—about the power of consumer choice, the role of regulation, and the potential of technology to reconcile ethics and economics—can serve as a blueprint for addressing other welfare challenges in animal agriculture.

In conclusion, the replacement of chick culling with in-ovo sexing is more than a technological fix; it is a societal milestone. It demonstrates that when science, ethics, and economics converge, entrenched practices can be reimagined for the better. The way forward lies in expanding global access, accelerating innovation, strengthening regulatory frameworks, and engaging consumers as partners in transformation. By doing so, the poultry sector can not only resolve one of its most contentious ethical dilemmas but also pave the way for a future in which food production is defined by compassion, sustainability, and shared responsibility.

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# ROSS 308 AP BEST ACHIEVERS OCTOBER-2025

Aviagen INDIA

## Northern Region

**COMPANY:** Sampoorna Feeds
**FARMER NAME:** Ms.Tripta Rani

| OCTOBER-2025 | Top #1 |
|---|---|
| Farm Type | Open House |
| State | PUNJAB |
| Chicks Placed | 7958 |
| Mean Age | 32.6 |
| Avg Body Wt | 2335 |
| FCR | 1.300 |
| cFCR | 1.226 |
| Livability% | 96.3 |
| Daily Gain | 71.6 |
| EPEF | 530.5 |

## Eastern Region

**COMPANY:** IB Group
**FARMER NAME:** Mr. Brajesh Patel

| OCTOBER-2025 | Top #1 |
|---|---|
| Farm Type | EC House |
| State | BIHAR |
| Chicks Placed | 11979 |
| Mean Age | 35.0 |
| Avg Body Wt | 2500 |
| FCR | 1.424 |
| cFCR | 1.313 |
| Livability% | 98.1 |
| Daily Gain | 71.4 |
| EPEF | 491.8 |

## Central Region

**COMPANY:** Japfa
**FARMER NAME:** Mr. Avinash Choudhary

| OCTOBER-2025 | Top #1 |
|---|---|
| Farm Type | EC House |
| State | MAHARASHTRA |
| Chicks Placed | 15617 |
| Mean Age | 32.9 |
| Avg Body Wt | 2451 |
| FCR | 1.355 |
| cFCR | 1.255 |
| Livability% | 96.1 |
| Daily Gain | 74.6 |
| EPEF | 529.0 |

## South Region

**COMPANY:** SKM
**FARMER NAME:** Mr. Subash Chandra Bose

| OCTOBER-2025 | Top #1 |
|---|---|
| Farm Type | Open House |
| State | TAMILNADU |
| Chicks Placed | 5272 |
| Mean Age | 33.2 |
| Avg Body Wt | 2310.0 |
| FCR | 1.420 |
| cFCR | 1.351 |
| Livability% | 96.9 |
| Daily Gain | 69.7 |
| EPEF | 475.5 |

## OCTOBER-Top PERFORMANCE BY AREA

| Area | Chicks Placed | Mean Age | BW | FCR | cFCR(2Kg) | Livability% | Daygain | EPEF |
|---|---|---|---|---|---|---|---|---|
| North EC House | 6460 | 35.2 | 2554 | 1.390 | 1.267 | 96.0 | 72.5 | 500.6 |
| North Open House | 7958 | 32.6 | 2335 | 1.300 | 1.226 | 96.3 | 71.6 | 530.5 |
| East EC House | 11979 | 35.0 | 2500 | 1.424 | 1.313 | 98.1 | 71.4 | 491.8 |
| East Open House | 2720 | 41.0 | 2909 | 1.434 | 1.232 | 95.7 | 71.0 | 473.5 |
| Central EC House | 15617 | 32.9 | 2451 | 1.355 | 1.255 | 96.1 | 74.6 | 529.0 |
| Central Open House | 8329 | 32.6 | 2349 | 1.398 | 1.321 | 97.6 | 72.2 | 503.7 |
| South EC House | 7798 | 31.2 | 2050 | 1.350 | 1.339 | 97.5 | 65.8 | 475.1 |
| South Open House | 5272 | 33.2 | 2310 | 1.420 | 1.351 | 96.9 | 69.7 | 475.5 |

## OCTOBER-Top 10 FIELD PERFORMANCE

| Flock | Farm Type | State | Chicks Placed | Mean Age | BW | FCR | cFCR | Livability% | Day Gain | EPEF |
|---|---|---|---|---|---|---|---|---|---|---|
| Flock 1 | OPEN HOUSE | PUNJAB | 7958 | 32.6 | 2335 | 1.300 | 1.226 | 96.3 | 71.6 | 530.5 |
| Flock 2 | EC HOUSE | MAHARASHTRA | 15617 | 32.9 | 2451 | 1.355 | 1.255 | 96.1 | 74.6 | 529.0 |
| Flock 3 | EC HOUSE | MAHARASHTRA | 10580 | 33.0 | 2454 | 1.373 | 1.272 | 96.7 | 74.4 | 524.4 |
| Flock 4 | OPEN HOUSE | PUNJAB | 18967 | 33.0 | 2453 | 1.330 | 1.229 | 93.6 | 74.3 | 522.9 |
| Flock 5 | EC HOUSE | MAHARASHTRA | 9480 | 31.7 | 2310 | 1.351 | 1.283 | 96.8 | 72.8 | 521.3 |
| Flock 6 | EC HOUSE | MAHARASHTRA | 7272 | 31.4 | 2302 | 1.352 | 1.285 | 95.8 | 73.3 | 519.6 |
| Flock 7 | OPEN HOUSE | HARYANA | 15689 | 34.0 | 2618 | 1.420 | 1.283 | 94.9 | 76.9 | 514.0 |
| Flock 8 | OPEN HOUSE | PUNJAB | 11860 | 30.8 | 2120 | 1.300 | 1.273 | 97.2 | 68.7 | 513.9 |
| Flock 9 | OPEN HOUSE | PUNJAB | 10544 | 34.5 | 2484 | 1.360 | 1.252 | 97.0 | 71.9 | 513.2 |
| Flock 10 | OPEN HOUSE | PUNJAB | 11494 | 34.9 | 2514 | 1.370 | 1.256 | 97.2 | 72.1 | 511.6 |

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Article

# Poultry for Protein Security in Viksit Bharat

**SHRIDHAR speaks**

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

Let me state a simple fact: Protein is the foundation of progress. Sounds like a sweeping, non-scientific statement? Fiction rather than fact? An undeniable truth is: protein has played an indispensable role in the biological existence of humans, and the cultural, economic and physical development of human societies. Historically, meat and other protein-rich foods have been associated with health and wealth. High protein consumption is a marker of social status and linked to national or racial superiority. Protein provides healthy nutrition to pregnant mothers, fuels learning in children, productivity in adults, and hence resilience in communities and nations. And poultry represents the most accessible, affordable, and scalable source of animal protein for our people. Therefore, Poultry Scientists are the custodians of essential nutrition, as also the creators of health, wealth and prosperity of communities.

Viksit Bharat (Developed India) by 2047 represents India's transformative ambition to achieve developed nation status by the 100th anniversary of its independence, a national aspiration to foster a self-reliant and prosperous economy, characterised by comprehensive advancements across multiple societal and economic dimensions. The foundational framework for this vision rests upon four strategic sets of people: Yuva (Youth), Garib (Poor), Mahila (Women), and Kisan (Farmers), emphasising inclusive growth as a core principle. The overarching goals of Viksit Bharat 2047 extend beyond mere economic expansion to encompass social equity, global competitiveness, environmental sustainability, technology, and transparent governance.

As India marches confidently toward its grand vision of Viksit Bharat by 2047, the pursuit of nutritional security is not merely a policy goal, it is a moral and national imperative. Protein malnutrition is a pervasive and silent crisis across India, affecting millions. Over 80% of the population fails to meet their daily protein requirements, with a staggering 73% identified as protein deficient. The average Indian consumes only 0.6 grams of protein per kilogram of body weight daily, significantly below the Indian Council of Medical Research (ICMR) recommendation of 0.8 to 1 gram per kilogram. This deficiency has adverse consequences, including stunted growth and impaired cognitive development in children, and reduced muscle mass, weakened immunity, and decreased productivity in adults. With over 35% children stunted and over 18% wasted, could Viksit Bharat be truly termed Viksit amidst such chronic malnutrition?

Poultry is a solution to this nutritional challenge. Poultry products are among the most affordable and readily available sources of high-quality protein containing all essential amino acids not found in many plant-based foods, along with vital vitamins, minerals, and beneficial fats. Their versatility and ease of preparation make them suitable for diverse dietary preferences across various income groups. The critical role of poultry in improving public health and human capital is evident. Increasing the per capita consumption of poultry products, which currently lags significantly behind recommended levels, can directly address widespread protein deficiency. Per capita egg availability has risen to 106 eggs per year; though impressive it is still below the recommendation of the National Institution of Nutrition which advises a consumption of 180 eggs per person per year. The per capita annual consumption of poultry meat stands at about 3.4 kg which is considerably below the recommended 11 kg. Promoting poultry consumption through targeted awareness campaigns and integrating eggs and chicken into nutrition programs can significantly improve nutritional outcomes, especially for vulnerable populations like children.

Investment in a healthier, more productive citizenry is foundational to achieving the broader economic and social development goals of Viksit Bharat. India's policy, industry, and innovation ecosystem should come together to transform poultry into a pillar of our protein-secure, Viksit Bharat. Poultry science is way ahead of other disciplines: focusing on efficiency, health, and genetics etc. ensures a consistent supply of safe, affordable, and nutrient-dense foods, making it an indispensable tool for achieving global nutrition security.

Poultry stands out in the agriculture sector as it stands on its own feet. Being low on the political and governance agenda has been a blessing as it has spurred entrepreneurship and the resultant competitive spirit. The Indian poultry market, consisting mainly of broilers and eggs was worth approximately Rs. 3,00,000 crore in the year gone by. The growth rates during the last few years for eggs and poultry meat are averaging between 6% to 9% annually. The largely organised and integrated structure of the industry has given it an inherent resilience. The sector's dependence upon the government to bail it out is much less compared to many other sectors


of the economy. Innovativeness and entrepreneurship of the industry rather than any hand holding by the government has been its identity.

From the year 2000 onwards till the current year, food grains production, the primary focus of our agriculture and the resultant infusion of government investment, has registered a growth of 56%, whereas during the same period poultry has grown nearly 500%. India has also emerged as one of the fastest growing poultry markets in the world. This surely is a pointer that the support of subsidies may not necessarily spur growth or even long term financial security. More important is the effectiveness of the policy framework, the operational eco-system and space for the sector to grow. Poultry has organised and integrated itself into an industry; and hence has grown from a primary farming activity into a business enterprise.

Our unorganised and backyard poultry sector too is a potent tool for subsidiary income generation for landless/ marginal farmers besides providing nutritional security to the rural poor. More importantly, it has managed to integrate into the larger production and supply chain; even the relatively sophisticated transition from live birds to chilled and frozen products. In quite a few standalone models, backyard poultry is the source of high value free range eggs and organically produced chicken. This transition has propelled India into a prominent position on the global stage: 2nd largest egg producer globally, with an impressive 149.11 billion eggs produced during 2024-25 at the annual growth rate of 4.4%. About 85% of these eggs are the output of commercial poultry, a progressive evolution of a traditional backyard activity to an industrial one. In meat production, India holds the 5th position worldwide, with an output of over 10.50 million tonnes in 2024-25, poultry at 5.18 million tonnes contributing nearly half of the total meat production. Over the past decade, the sector has demonstrated robust expansion, growing at a healthy rate of 8-10% annually, contributing 1% to GDP, 14% to Livestock GDP and employing about 4 million persons. Such robust growth positions India not just as a major producer but as a potential global leader in poultry, directly supporting Viksit Bharat's overarching goal of enhancing global competitiveness and establishing India as a key global economic player by 2047.

A worrying trend I witness these days is science succumbing, with alarming frequency, to sentiments, beliefs, ideologies, pressures, politics etc. Why doesn't science encourage informed choices and decisions? Why can't science and traditional knowledge go hand in hand? Science should guide politics and policy not vice-versa. Please introspect.

I wish to quote from my article published in the November edition of Indian Poultry Review titled Poultry: Powerhouse of Protein, Provider of Nutritional Security, "A vast multitude of women and children in the low, and even middle, income countries are severely impacted adversely by abysmally low consumption of Animal Source Foods (ASF). A perspective inclusive of these concerns is either missing or under-represented in scientific analyses. The discussions on the relationship between ASF production systems and climate change generally tend to degenerate into ideology driven heated slugfest. What is also missing is an understanding of how low the consumption of ASF is among the poor, particularly in low and middle income countries, where the typical diets are starch dominant. For example, mean annual per capita meat consumption in the bottom four meat-consuming countries Sudan, India, Bangladesh, and Ethiopia is less than one-thirtieth of that in the top four Brazil, Uruguay, Australia, and USA. Considering the global power that we are emerging as, this is one club we would not like to be a member of."

Viksit Bharat, besides being wealthy, should be truly healthy; a Human Resource we could be proud of.

From the year 2000 onwards till the current year, food grains production, the primary focus of our agriculture and the resultant infusion of government investment, has registered a growth of 56%, whereas during the same period poultry has grown nearly 500%

*This article is adapted from the keynote address delivered by the author at IPSACON 2025, Hyderabad*

Article

# From Water Use to Air Efficiency: Why Poultry Processors are Moving to Air Chilling?

**Kate Jørgensen**
Head of Marketing, Poultry
BAADER

Still using water chill systems in your poultry plant? You are not alone - it is a long-standing industry standard.
However, as market demands evolve, many processors are exploring new options to meet modern challenges: Higher water cost, tighter regulations, labour shortages, sustainability goals, and rising customer expectations.

## Rethinking Poultry Chilling: Why More Processors Are Exploring Air Over Water

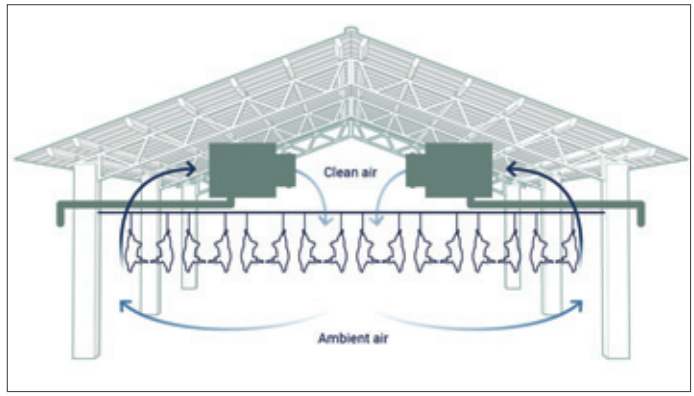
While water chilling has served the industry well, a growing number of operations are evaluating air chilling as a way to enhance efficiency, hygiene, and long-term performance.

Let's look at the core issues with traditional water chilling:

- Excessive water usage, adding cost and failing sustainability benchmarks
- Cross-contamination risks, as birds share immersion tanks
- Product inconsistency, with water absorption skewing yields
- Manual labour, including re-hanging between lines

## Clean Air Chill – One of the BAADER Solution to Your Water Usage

The BAADER Clean Air Chill offers a modern alternative - cooling birds with filtered, recirculated cold air instead of immersion in shared water.

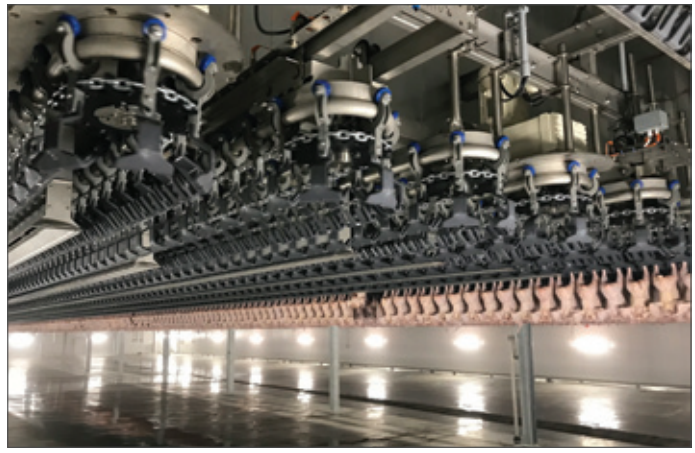



But what about one common concern processors still have? "Won't air chilling dry out the meat and affect tenderness?"
Not with Clean Air Chilling.

Our system includes a precisely timed water spray directly on the birds. This step prevents the skin from drying out during chilling, ensuring moist, tender meat while still avoiding the problems of full water immersion.

## High Cleanability of the Clean Air Chill Room

Colony Forming Units (CFU) - a measure of potential bacterial or fungal presence - remain exceptionally low in the area above the plenum. This zone is considered a clean, controlled environment and does not require daily cleaning like the main air chill room.
Additionally, the single-layer design of the Clean Air Chilling system offers a major hygiene advantage: With no dripping onto overhead structures, only the floor requires routine washing, making sanitation faster, easier, and more effective.



## Clean Air Chill: A Constant Flow of Advantages

Clean Air Chilling isn't just air over birds – it is a fully engineered solution tailored for modern poultry processors:

- **Significantly Reduced Water Usage**
  Eliminate the need for immersion tanks and drastically cut water consumption - ideal for sustainability targets and cost savings
- **Ultra-Clean Air Environment**
  With extremely low CFU counts above the plenum, the system maintains a clean zone that minimises bacterial load - reducing the need for constant cleaning and enhancing overall hygiene
- **No Cross-Contamination**
  Single-layer design and air chilling eliminate risks associated with shared water or dripping - promoting superior food safety
- **Moist, High-Quality Product**
  A strategic water mist prevents surface drying while avoiding water absorption - keeping the yield high without waterlogging
- **Fast, Even Cooling**
  Cold airflow is directed both inside the cavity and across the surface, rapidly bringing down core temperature without freezing extremities. Birds remain pliable and ready for efficient cut-up or pack-out
- **Simplified Sanitation**
  The single-layer layout means no overhead beam washdowns - only the floor requires cleaning. Lesswater, less time, more uptime
- **Built for Automation**
  No need for manual re-hanging between lines. Clean Air Chilling supports automated, in-line transitions for higher throughput and reduced labour strain

## Not One-Size-Fits-All: BAADER Offers Flexible Air Chilling Solutions for Every Facility

While Clean Air Chilling delivers high-performing results in hygiene and product quality, we understand that not every facility has the space for a full single-layer chilling tunnel.

That is why BAADER also offers Multi-Tier Air Chilling Solutions - designed specifically for processors who want the benefits of air chilling but need to optimise space. These systems utilise the height of your building rather than its floor space, making them ideal for retrofits or footprint-constrained plants.

Need even more flexibility? Our hybrid configuration combines the advantages of both immersion and air chilling: birds can first pass through a short inline water bath for initial cooling and then continue into the air chill tunnel. The result is fast chilling and a light water pickup followed by efficient air chilling - all in a compact, efficient footprint.

If you are still using simple water chill, you are absorbing more cost than necessary.

BAADER

From Water Use to Air Efficiency

# Using Too Much Water?

You're not alone. Water chilling has been the industry standard for decades, but evolving market demands are pushing processors to rethink their approach. Rising water costs, stricter regulations, labour shortages, and sustainability targets are driving change.

More poultry operations are turning to air chilling to boost efficiency, improve hygiene, and meet modern production challenges.

**The BAADER Air-Chilling Solution:**

- / No immersion tanks - reduces water use and costs
- / Maintains clean air – keeps microbial levels low
- / Prevents cross-contamination – safer, more hygienic processing
- / Optimized humidity – protects yield and product quality
- / Fast and even cooling – efficient, uniform chilling
- / Easy sanitation – simple floor-only cleaning
- / Automation-ready – supports in-line chilling, eliminating manual handling

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## YOU ARE CORDIALLY INVITED

# Feed-Based Solution to Enhance Mucosal Defence in Poultry Against Viral Challenges

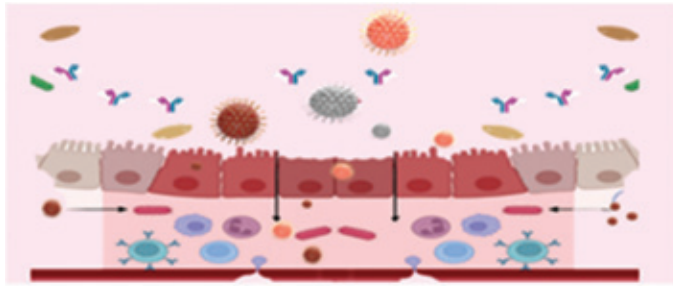
**Dr. Sumon Nag Chowdhury**
AGM - Technical & Marketing
Glamac International Pvt. Ltd.

Environmental changes cause immunosuppression and make the birds more prone to viral infections. These viral challenges namely Newcastle disease (ND), avian influenza (AI), infectious bronchitis (IB), and others continue to impose a significant threat to the poultry industry worldwide, resulting in substantial economic losses through high mortality rates, reduced productivity, increased operational costs, and market disruptions.


While vaccination remains a cornerstone of prevention programs, the industry increasingly recognises that vaccines alone cannot guarantee full protection, especially when antigenic drift, immunosuppressive stressors, and variability in field exposure undermine immunisation efficacy. Hence, the poultry sector is steadily integrating nutritional strategies that strengthen birds' natural defence systems. Among these, feed-based solutions aimed at enhancing mucosal defence have emerged as a powerful, sustainable, and cost-effective approach.

## Understanding the Role of Mucosal Immunity

Nearly all kinds of viruses invade the animal's body through the mucous membrane. The mucosal surfaces of poultry—including the gut, respiratory tract, and reproductive system—serve as the first line of defence against pathogens. To reinforce the mucous immunity system means to effectively inhibit viral invasion and infection.



Mucosal immunity- Defence at the entry point of the virus

Unlike humoral immunity, which becomes active only after an antigen enters the bird's body through vaccination or when pathogens reach the bloodstream, mucosal immunity works at the point of entry. By neutralising pathogens before they cross epithelial barriers, mucosal immunity significantly reduces both the incidence and severity of infections.

**Key components of mucosal immunity include:**

- Mucus layer: Forms the first protective barrier at mucosal surfaces. Mucin, a structural protein (lubricant) in the mucus layer secreted by goblet cells entraps viral particles and inhibit epithelial adhesion and penetration
- 


  Secretory IgA (sIgA): The most important antiviral antibody at mucosal sites. sIgA binds to viral antigens, neutralises them extracellularly and intracellularly, and prevents attachment and entry into epithelial cells
- Tight junction proteins: Tight junction proteins (claudins, occludin, ZO-1) function as selective permeability regulators that prevent paracellular leakage. Viral pathogens frequently disrupt TJ integrity to facilitate epithelial invasion. Enhanced TJ expression strengthens the mucosal barrier, limiting viral penetration and subsequent viremia

Collectively, these components ensure rapid, localised immune responses, thereby enhancing disease resistance and overall flock resilience.

## Importance of Feed-Based Mucosal Defence Approaches

Vaccination remains vital, but it mainly stimulates systemic (humoral) immunity. For pathogens that enter through mucosal sites—such as Newcastle disease virus, avian influenza, IBV, and enteric viruses like rotaviruses, reoviruses —vaccine response alone may not be enough to prevent initial infection or viral shedding. Compounding factors such as heat stress, mycotoxins, poor gut health, high stocking density, and poor litter conditions further compromise mucosal barrier function.

**Feed-based mucosal defence solutions offer several advantages:**

- Sustained immunological support throughout the production cycle
- Modulation of mucosal cytokine expression and lymphocyte activation
- Non-invasive and stress-free administration
- Synergy with vaccination, improving both mucosal and systemic responses
- Reduced viral replication and shedding, lowering infection pressure in flocks
- Improved gut health, supporting nutrient absorption and performance

These attributes justify the integration of functional feed additives in comprehensive disease prevention programs.

## VAP Premix-The Next-Gen Feed-Based Mucosal Defence Strategy

VAP (Versatile Adhesion Polypeptide) is a scientifically designed natural non-toxic functional feed additive that enhances mucosal immunity through multiple pathways:

- Activates B-cells (IgA production) and T-cells (memory & phagocyte response) for early protection, synergises with M-cells for stronger defense
- Assists the immune system in targeting environmental viruses, making it less susceptible to viral mutations
- Activates the immune system early, before the virus replicates extensively within the body, effectively reducing the damage to the bird

## Research Evidence and Field Validation

A recent broiler trial at Agrivet Research & Advisory, Kolkata (ARAPL Trial ID: 290-GLB-1/June-25) revealed that supplementation with VAP Premix at 250 mg/kg feed effectively enhanced broiler growth performance with upregulation of local mucosal defence mechanisms (sigA and MUC-2), coupled with maintained or improved vaccine responses, significantly higher livability, and lesser COP per kg. live wt.

Several other trials in Taiwan showed VAP intake improved T-cell count and reduced intestinal inflammation in Zebrafish and significantly increased IgA response in mice.

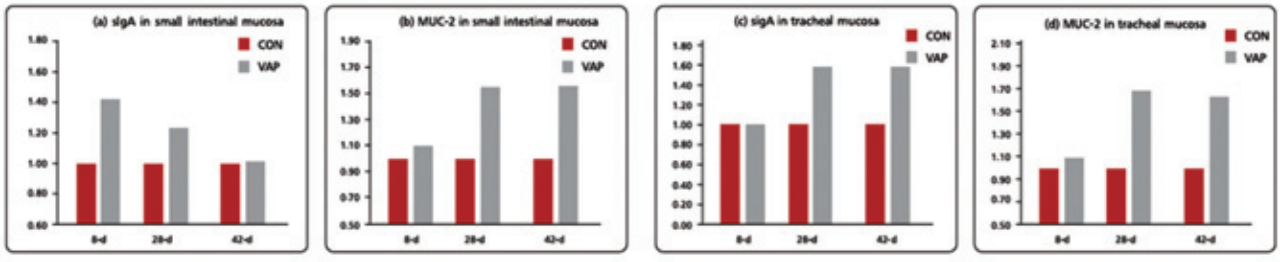
Another very interesting study conducted at National Laboratory Animal Centre, Taiwan showed VAP supplemented mice, experimentally challenged with AI viruses (H5N1 and H7N9, a 1:1 virus mixture with a viral load of about 50,000 viruses per ml. of liquid)) did not develop any respiratory symptoms even after 96 hours, indicating strong antiviral mucosal protection.

These collective findings highlight VAP Premix as a promising nutritional intervention to work as a shield against virus with strengthened immunity and ensure support health and productivity.

## Way Forward

In the face of escalating viral challenges and the growing emphasis on welfare-focused poultry production, strengthening mucosal immunity through precision nutrition is no longer optional—it is essential. Feed-based mucosal defence solutions such as VAP Premix offer a vital bridge between nutrition and immunology, enabling proactive protection rather than reactive interventions. By reinforcing mucosal immunity—the bird's first line of defence—producers can safeguard flock health, enhance productivity, and build resilience against emerging viral threats. Ultimately, this approach supports a more sustainable, responsible, and profitable poultry production system for the future.

**Transcriptomic analysis of mucosal tissues - Pure Science, 100% confirmatory test**




Relative mRNA expression (2-ΔCt) of sIgA and MUC-2 genes in the mucosa of broiler chickens

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# Charting the Future of Indian Poultry: Highlights from Poultry Knowledge Day and Poultry India Expo 2025


The Indian poultry industry stands at a defining crossroads, where scale must now be matched by sustainability, technology, and consumer trust. This transition was clearly reflected at Poultry Knowledge Day 2025 and the 17th Poultry India Expo, held in Hyderabad from 25th to 28th November.

Poultry Knowledge Day on 25th November opened with the theme "Outlook of Sustainable & Profitable Poultry for Viksit Bharat," framing poultry as a critical pillar of India's food security and rural economy.






In his introductory address, Uday Singh Bayas, President IPEMA/Poultry India expressed heartfelt gratitude to all those who made the event possible, especially the Government of Telangana, the Hon'ble Chief Minister, the Hon'ble Minister for Animal Husbandry, and key industry leaders. Special thanks were extended to the Telangana Poultry Federation, its President, the NECC Chairman, and the entire Poultry India team. Mr. Bayas also acknowledged the presence of distinguished international dignitaries who travelled from across the world to attend Poultry India, expressing confidence that they would take away valuable insights from the exhibition. Further, he emphasised the importance of knowledge sharing. Looking ahead, he expressed a strong belief that Poultry India is on track to be recognised as the world's largest exhibition in the poultry sector.

Setting the agenda for the day, Prof. (Dr). P. K. Shukla, Chairman, Knowledge Day, outlined a power-packed programme featuring eight speakers, two technical sessions, over 1,500 delegates, and discussions spanning sustainable farming, avian influenza control, rural market expansion, nutrition, environmental housing, genetically modified feed ingredients, and leadership perspectives for a future-ready poultry sector.

The Thematic Address by Dr. Tarun Shridhar, Director General ICFA and Former Secretary, Department of Fisheries, Animal Husbandry and Dairying, Government of India situates the Indian poultry sector at the heart of the nation's long-term development vision as India approaches the centenary of its Independence. Anchored in the principles of inclusive growth,





the vision of Viksit Bharat rests on four strategic pillars— Yuva (youth), Garib (the poor), Mahila (women), and Kisan (farmers)— and seeks not only economic expansion, but also social equity, environmental sustainability, technological advancement, transparent governance, and enhanced human capital. In the address Dr. Shridhar underscored that structural transformation in a developing economy naturally reduces agriculture's share in GDP; however, this transition must be accompanied by higher productivity, value addition, diversification of rural incomes, and improved farmer profitability. Within this context, poultry emerges as the most dynamic and resilient segment of Indian agriculture. Its superior production efficiency, rapid growth cycles, affordability, and adaptability position poultry as the most reliable and accessible source of animal protein, capable of supporting both economic growth and nutritional security. He further stated that poultry can become a cornerstone of Viksit Bharat 2047— advancing food security, rural prosperity, women's empowerment, and India's global competitiveness, he concluded.

Delivering the Keynote Address, Sunil Kataria, CEO and Managing Director, Godrej Agrovet Ltd. brought a fresh outsider's lens from consumer and FMCG sectors to reflect on the future of India's poultry industry. Acknowledging limited time in the sector, he positioned his talk as insight drawn from his experience in building value-added consumer businesses. Anchoring the discussion in Viksit Bharat 2047, he highlighted India's ambition to grow from a $4 trillion economy to nearly $35 trillion, with agri and food exports expected to rise dramatically. Beyond economic scale, he underscored a softer yet critical national goal: improving India's life expectancy from ~70 to 84–85 years. Nutrition, especially protein intake, emerges as central to this aspiration. Despite food

globally and domestically, the poultry sector has demonstrated a unique ability to withstand shocks—from pandemics to disease outbreaks, while maintaining growth momentum. In India, its evolution from a backyard activity to a highly integrated enterprise has generated millions of rural livelihoods, strengthened entrepreneurship, and enhanced value chain efficiency. Yet, he emphasised that poultry's greatest contribution lies beyond production volumes and market value: it is a critical instrument in addressing India's pervasive protein deficiency and malnutrition, which continue to undermine public health and productivity. Dr. Shridhar also highlighted key challenges confronting the sector, including feed cost volatility, input constraints, disease risks, structural inefficiencies such as dependence on wet markets, and limited global export penetration. The way forward demands greater investment in processing and value addition, aggressive export orientation, deeper technological integration, and stronger collaboration among government, industry, and research institutions. With cohesive action and a unified voice,

sufficiency, India remains protein-deficient, consuming just ~47 grams per person per day, far below global benchmarks. Poultry, Mr. Kataria said, offers the most cost-effective solution, with chicken and eggs delivering high-quality protein at the lowest cost per gram. Yet paradoxically, poultry contributes only ~1% to GDP, has minimal exports, and remains largely unprocessed and unbranded. The core challenge, he asserted, lies not only in structural constraints such as disease outbreaks, cost volatility, and extreme price fluctuations but in mindset. Volatility exists in every commodity sector; value creation depends on how industries respond to it. Drawing from the Parachute coconut oil case study, he demonstrated how a highly volatile commodity was transformed into a premium, trusted brand through unwavering product quality, packaging innovation, consumer-centric problem solving, benefit-led communication, and patient category building. The lesson for poultry is clear: commodities create volume, brands create value. Moving from wet markets to processed, branded offerings is not merely about hygiene or

safety—it is essential for GDP contribution, export growth, and income stability. Consumers pay for benefits, not ingredients; value addition comes from innovation, branding, and relevance. Mr. Kataria concluded with a powerful call to action: if fox nuts (makhana) can be repositioned as a global superfood, poultry which is far more nutritionally powerful, can certainly evolve. To truly transform national health and economic outcomes, India's live birds must become brands.

Other speakers at Poultry Knowledge Day 2025 were:

| | |
|---|---|
| Prof. (Dr.) Suresh Mittla, Purdue University | Role of Vaccines in Controlling High Pathogenic Avian Influenza |
| Sanjay Panigrahi, Consultant | Unlocking the Potential of Rural Market for Eggs |
| Marisabel Caballero, Category Manager of Monogastrics, Hamlet Proteins, Denmark | Advances in Poultry Early Nutrition - Focus on Protein & Digestive Dynamics |
| O. P. Singh, Managing Director, Huvepharma SEA | Energising the Collective Wisdom & Rescripting Industry's DNA |
| Ricardo R. Guerra, Global Poultry Ventilation Consultant, Cargill | Outlook for Environmental Control (EC) Housing in India |
| Deepak Pareek, Founder - HnyB Tech Incubations Pvt. Ltd. | Outlook of Genetically Modified Corn & Soybean Meal for India |
| Ravi Kumar Banka, Managing Director & Founder of Eggfirst Advertising | Unlocking the Potential of Rural Market for Broiler Chicken |

Adding inspiration to the day, was the motivational speech by Lt. Gen. K.J.S. Dhillon (Retd.) who captivated the audience with an address on leadership, resilience, and nation-building—drawing parallels between discipline in defence forces and excellence in agribusiness.

A major highlight of the event was the Legend in Poultry–Lifetime Achievement Award, which was presented to Dr. D. Chandrasekaran, M.V.Sc., Ph.D., Professor of Animal Nutrition (Retd.), TANUVAS. Dr. Chandrasekaran was honoured for his decades-long contribution to research, education, and innovation in animal nutrition, and for shaping generations of professionals in the poultry industry.

With rich deliberations, global perspectives, and recognition of industry icons, Poultry Knowledge Day 2025 reaffirmed its position as one of the most influential platforms for knowledge exchange and collaboration in India's poultry sector.

The 17th Poultry India Expo held between 26th and 28th November reaffirmed its status as South Asia's most influential poultry industry platform with 550+ exhibitors and more than 50,000 visitors who explored cutting-edge solutions spanning farm automation, hatchery technologies, feed innovation, animal health, packaging, logistics, and digital tools.


Driven by the theme "One Nation, One Expo," the expo successfully accelerated innovation, collaboration, and knowledge exchange across the poultry value chain.

In the words of Uday Singh Bayas, President IPEMA / Poultry India, " "IPEMA's continued ability to inspire innovation and unite global and national stakeholders has shown the true momentum of India's poultry sector. The alliances forged this year reaffirm our industry's future-ready vision."

Lumis Enzymes marked a strong presence at the Poultry India Expo 2025 by presenting its portfolio of next-generation feed enzymes designed to enhance nutrient digestibility, support gut health, and improve overall feed efficiency. The Lumis booth drew considerable attention from poultry integrators, feed manufacturers, veterinarians, nutritionists, and other industry stakeholders from India and abroad, reflecting the growing interest in science-backed nutrition solutions. The expo also enabled Lumis Enzymes' technical team to engage in meaningful

knowledge exchange, address emerging industry challenges, and discuss how enzyme technologies can mitigate the impact of rising feed costs while enhancing farm profitability.




Optima Life Sciences made a strong and impactful presence at Poultry India Expo 2025, reaffirming its commitment to innovation, uncompromising quality, and customer confidence. A key attraction was Optima Life Sciences' manufacturing-facility-themed stall, thoughtfully designed to offer visitors a transparent view of its production excellence, stringent quality protocols, and scientific rigour. This immersive concept reinforced trust by demonstrating the precision, consistency, and global standards that define the company's manufacturing practices.The expo also witnessed the special launch of Optima's proprietary probiotic strain, Bacillus velezensis OLS-1101, unveiled by its inventors, Dr. Sudipto Haldar, Director, Agrivet, and Dr. Amit Pal,


Scientist G, NICED Kolkata. The launch was accompanied by an expert interaction session attended by leading veterinarians, consultants, and key poultry industry stakeholders, providing valuable scientific insights into the strain's development, mode of action, and potential impact on poultry gut health management.

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# Optima Inaugurates Centre for Animal Research & Excellence




Optima Life Sciences Pvt. Ltd. recently inaugurated CARE– the Centre for Animal Research & Excellence at Khor, Pune. This state-of-the-art research facility is purpose-built to advance India's poultry innovation landscape through precision nutrition, enhanced gut-health research, and scientifically validated performance solutions.

Equipped with advanced research pens, controlled-environment units, and real-time data monitoring systems, CARE enables reproducible, industry-aligned studies across broilers, layers, breeders, and specialised nutrition programmes, setting new benchmarks for evidence-based poultry research in the country.

Key Research Focus Areas of CARE are:

- Gut integrity and microbiome modulation
- Feed additive efficacy and mode of action
- Nutrient absorption and energy optimisation
- Stress management and immunity enhancement
- Meat quality, carcass assessment and shelf-life evaluation

Through CARE, Optima is poised to fast-track the development of next-generation poultry innovations from Tri-Biotic technologies and butyrate-based platforms to osmolyte-driven performance enhancers and advanced functional additives engineered for real-world farm conditions.

Rooted in the values of Curiosity, Application, Respect, and Excellence, CARE embodies Optima's long-term commitment to elevating poultry productivity, strengthening bird welfare, and advancing sustainable practices across India's poultry sector.

The inauguration brought together industry leaders, scientists, and global collaborators, marking a major milestone in the push toward evidence-based, application-focused poultry nutrition.

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# Announcement

## Glamac Clinches Top Sustainability Honour for CYNKA HBR 50 at the 2025 GEEF Global Healthcare Awards



Glamac International Pvt. Ltd., was recently honoured with the prestigious 'Best Sustainable Poultry Nutrition Brand of the Year 2025' for its breakthrough gut-health formulation CYNKA HBR 50. The award was conferred at the GEEF Global Sustainable Development Summit 2025, supported by the Department of Science & Technology, Government of India.

This recognition underscores Glamac's steadfast commitment to sustainability, scientific excellence, and next-generation veterinary innovation aimed at strengthening animal health and ensuring a resilient future for the livestock sector. The GEEF (Global Excellence and Eminence Forum) Awards celebrate outstanding contributions across diverse global industries.

The summit convened more than 200 distinguished participants, including government leaders, industry experts, policymakers, academicians, and technocrats, centred on the theme "Sustainable Environment & Healthy Future for All." Discussions highlighted the integral relationship between planetary health and human well-being. The GEEF Foundation organised the event in collaboration with the Department of Science & Technology.

GEEF Global Healthcare Awards in Sustainability & Healthcare were presented to 28 winners across 6 categories who were recognised for their contributions to the Sustainable Development Goals (SDGs).

The awards were presented by a distinguished panel comprising U.P. Singh, Former Secretary to the Government of India; His Excellency Rasmus Abildgaard Kristensen, Ambassador of Denmark to India; Dr. H.R.P. Yadav, Professor & Head, Amity University; and Punit Singh Nagi, Director, The GEEF.

Glamac was represented at the awards ceremony by Abir Mukherjee, Managing Director and Dr. Manish Chaurasia, AGM-Sales & Marketing.

Speaking on the occasion, Mr. Mukherjee said, "This recognition reflects GLAMAC's relentless dedication to innovation and excellence. We are deeply honoured and will remain committed to leveraging our collaboration and technical expertise to deliver more groundbreaking sustainable solutions for Poultry. Our sustainability journey began with CLOSBO – consortium of Probiotics for Poultry Gut Integrity followed by PANBONIS—a Natural Vitamin $D_3$ Metabolite from Herbonis, Switzerland—and has progressed with CYNKA HBR 50 and recently launched another sustainable product VAP- Viral Defence through Poultry Feed which is developed under technical collaboration with Taiwan. Our natures blend CYNKA HBR 50, a unique Natural Antidiarrheal and Antimicrobial – Gut Health Modulator for poultry, is a game changer and has already been recognised as 'Veterinary Pharma Innovation of the Year' by The Economic Times in 2024. CYNKA HBR 50 is an outcome of extensive research and trials and today, its impact resonates globally, addressing antimicrobial resistance (AMR) and supporting the 'One Health Program' promoted worldwide by the FAO."

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**Website:** GrainProteinTech.com

# Announcement

## Driving Livestock Progress: F-DATAL Established to Equip Small Farmers with Technology for a Healthier and Safer Future

Professionals from government, academia, and the private sector have come together to establish the Foundation for Digital & AI Transformation in Livestock (F-DATAL) — a pioneering institution committed to placing technology directly in the hands of India's livestock farmers, particularly small and marginal producers in rural regions.

The Foundation unites some of the country's most respected former bureaucrats, academic experts, practising veterinarians, animal health and nutrition specialists, and livestock entrepreneurs to create a cohesive national platform for digital advancement in animal agriculture.

As India's first dedicated initiative of its kind, F-DATAL aims to democratise AI-driven tools, digital systems, disease-prediction technologies, and precision livestock solutions — ensuring that farmers receive direct, measurable benefits from cutting-edge innovation.

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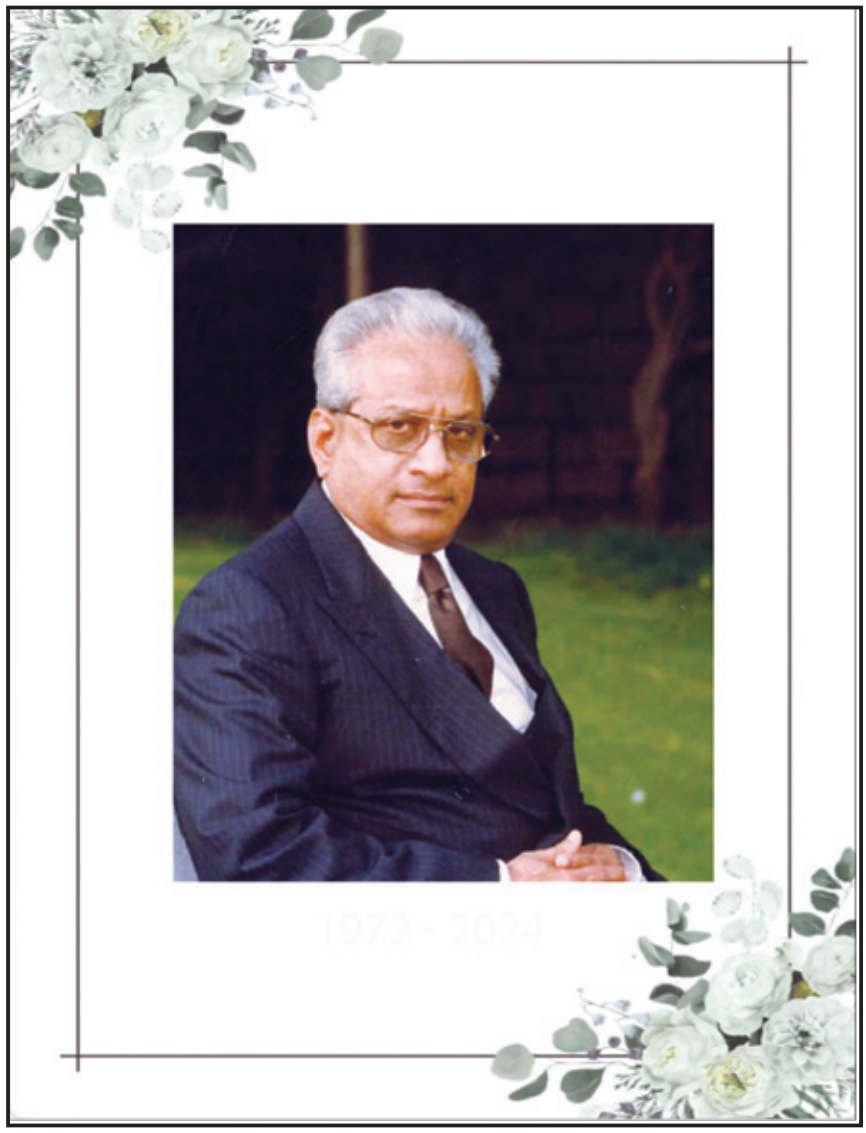
# In Memoriam




## Chitturi Jagapati Rao

(April 1933 - November 2025)

Shri Chitturi Jagapati Rao, Chairman of Srinivasa Farms and a towering figure in India's poultry industry, passed away on 29th November, leaving behind a legacy of entrepreneurship, integrity, and service. A visionary leader, he transformed Srinivasa Farms into one of the country's most respected integrated poultry enterprises, setting benchmarks in quality, biosecurity, and farmer partnerships.

Deeply committed to inclusive growth, he believed in empowering poultry farmers through fair practices, technology adoption, and long-term collaboration. His leadership combined business acumen with humility, earning him admiration across the industry, from grassroots farmers to corporate peers.

Beyond business, he was known for his values, philanthropy, and quiet mentorship of the next generation of entrepreneurs. His contributions played a pivotal role in shaping modern poultry farming in India.

Shri Chitturi Jagapati Rao's passing marks the end of an era, but his principles and impact will continue to guide the sector for years to come.

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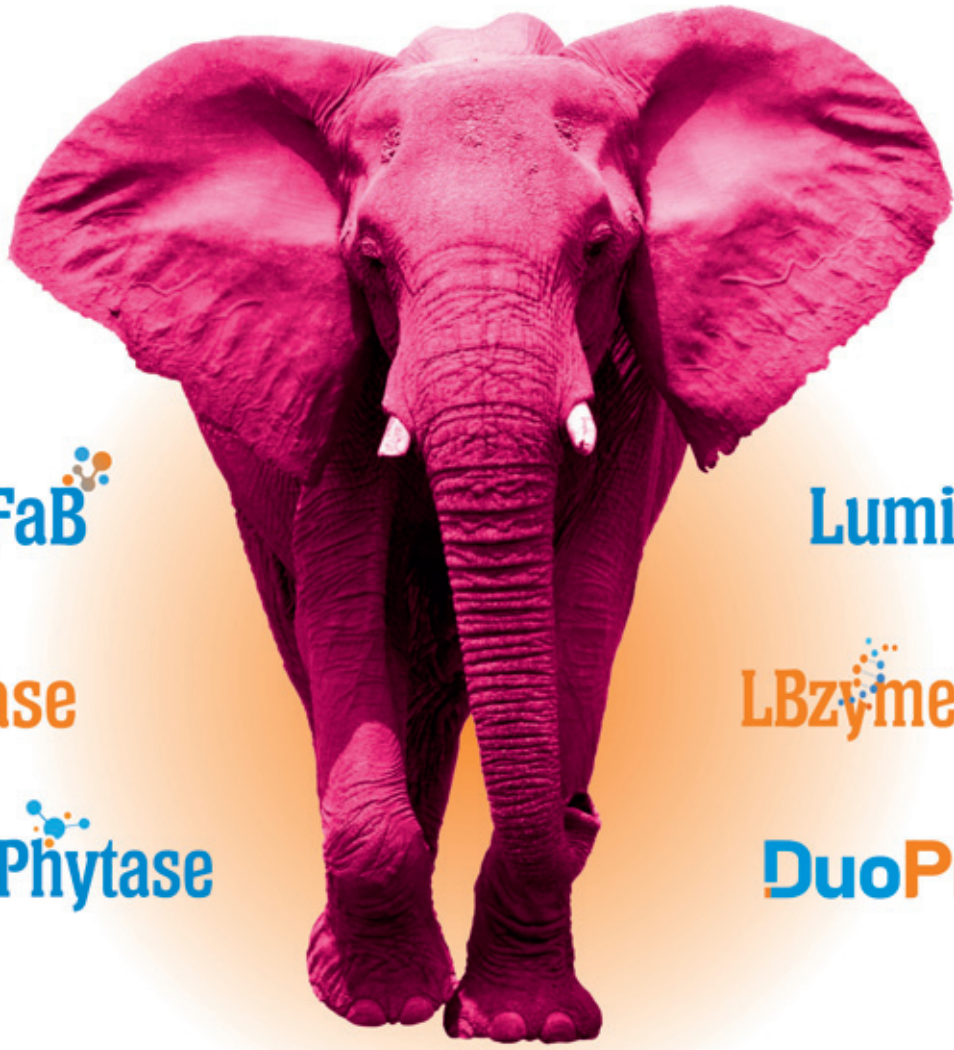

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