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Northern Region

COMPANY: Sampoorna Feeds FARMER NAME: Mr. Kulwinder Singh	JULY-2026	Top #1
	Farm Type	Open House
	State	PUNJAB
	Chicks Placed	9,951
	Mean Age	36
	Avg Body Wt	2,818
	FCR	1.37
	cFCR	1.18
	Livability%	97.1
	Daily Gain	76.3
	EPEF	541

Eastern Region

COMPANY: IB Group FARM NAME: Mr. Manjurul Sarkar	JULY-2026	Top #1
	Farm Type	Open House
	State	BENGAL
	Chicks Placed	1289
	Mean Age	31
	Avg Body Wt	2,034
	FCR	1.24
	cFCR	1.23
	Livability%	98.1
	Daily Gain	65.6
	EPEF	518

Central Region

COMPANY: Japfa FARMER NAME: Mr. Tanaji Kisan Shelar	JULY-2026	Top #1
	Farm Type	Closed House
	State	MAHARASHTRA
	Chicks Placed	16,990
	Mean Age	32
	Avg Body Wt	2,345
	FCR	1.34
	cFCR	1.26
	Livability%	97.1
	Daily Gain	73
	EPEF	527

South Region

COMPANY: IB Group FARMER NAME: Mr. Bolisetti Sreera	JULY-2026	Top #1
	Farm Type	Closed House
	State	ANDHRA PRADESH
	Chicks Placed	18,500
	Mean Age	37
	Avg Body Wt	2,571
	FCR	1.51
	cFCR	1.38
	Livability%	97.6
	Daily Gain	69.5
	EPEF	449

July 2026 -Top PERFORMANCE BY AREA

Area	Chicks Placed	Mean Age(Days)	BW	FCR	cFCR(2Kg)	Livability%	Daygain	EPEF
North EC House	12,030	32	2,156	1.38	1.35	95.9	67.2	467
North Open House	9,951	37	2,818	1.37	1.19	97.1	76.3	541
East EC House	7,161	35	2,555	1.47	1.35	97.3	73.0	483
East Open House	1,289	31	2,034	1.24	1.24	98.1	65.6	518
Central EC House	16,990	32	2,345	1.34	1.27	97.1	73.0	527
Central Open House	9,900	32	2,214	1.39	1.35	96.2	67.4	465
South EC House	18,500	37	2,571	1.51	1.38	97.6	69.5	449
South Open House	3,510	37	2,410	1.47	1.38	96.5	65.1	428

July 2026 -Top 10 FIELD PERFORMANCE

Flock	Farm Type	State	Chicks Placed	Mean Age	BW	FCR	cFCR	Livability%	Day Gain	EPEF
Flock 1	OPEN HOUSE	PUNJAB	9,951	37	2,818	1.37	1.19	97.1	76.3	541
Flock 2	CLOSED HOUSE	MAHARASHTRA	16,990	32	2,345	1.34	1.27	97.1	73.0	527
Flock 3	OPEN HOUSE	PUNJAB	9,996	34	2,510	1.36	1.25	96.2	73.2	518
Flock 4	OPEN HOUSE	NORTH BENGAL	1,289	31	2,034	1.24	1.24	98.1	65.6	518
Flock 5	CLOSED HOUSE	MAHARASHTRA	7,885	33	2,536	1.40	1.28	94.8	76.4	516
Flock 6	OPEN HOUSE	PUNJAB	14,360	34	2,425	1.34	1.25	97.0	70.3	509
Flock 7	OPEN HOUSE	PUNJAB	5,675	32	2,366	1.36	1.28	93.6	73.9	509
Flock 8	OPEN HOUSE	PUNJAB	8,375	33	2,367	1.35	1.27	95.8	70.9	503
Flock 9	OPEN HOUSE	PUNJAB	10,117	35	2,535	1.36	1.24	95.5	71.6	503
Flock 10	OPEN HOUSE	PUNJAB	5,085	32	2,325	1.37	1.30	95.3	72.2	502



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Sustainability in the Poultry Industry

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

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

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

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

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

Bhavana Gupta

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Abstract

- Feed accounts for **65–70%** of the total cost of poultry production, making nutrition the most important factor affecting farm profitability.
- A scientifically balanced ration supplies birds with adequate energy, protein, vitamins, minerals, and water required for optimum growth and production.
- Proper feeding improves growth rate, egg production, feed conversion ratio (FCR), immunity, and overall flock health while reducing production losses.

Keywords: Poultry ration, balanced feed, broilers, layers, poultry nutrition, feed efficiency.

Why is a Balanced Poultry Ration Important?

A balanced poultry ration provides all essential nutrients according to the bird's age and production stage. Since poultry have a simple digestive system,

they require nutrient-rich and highly digestible feed.

Benefits of Balanced Feeding

- Ensures rapid growth and better body weight gain.
- Improves feed conversion efficiency (FCR).
- Increases egg production and eggshell quality.
- Enhances immunity and disease resistance.
- Promotes better feather development and skeletal growth.
- Reduces feed wastage and production costs.
- Improves overall farm profitability.

Essential Nutrients in Poultry Feed**1. Energy**

Energy is required for maintenance, growth, egg production, and normal body functions.

Major sources

- Maize, Wheat, Sorghum, Pearl millet, Rice broken, Vegetable oils and fats

Importance

- Improves growth and production.
- Maintains body temperature.
- Supports efficient feed utilization.

2. Protein and Amino Acids

Protein is the building block of muscles, feathers, tissues, and eggs.

Common protein sources

- Soybean meal
- Groundnut cake
- Sunflower meal
- Fish meal
- Rapeseed meal

Important amino acids

- Lysine
- Methionine
- Threonine
- Tryptophan

Adequate amino acid supplementation improves growth rate, egg production, and feed efficiency while reducing unnecessary nitrogen excretion.

3. Minerals

Minerals are essential for skeletal development, eggshell formation, enzyme activity, and reproduction.

Major minerals

- Calcium, Phosphorus

Trace minerals

- Zinc, Copper, Iron, Manganese, Selenium, Iodine

Layers require higher calcium levels than broilers for producing strong eggshells.

4. Vitamins

Vitamins regulate various metabolic activities and improve bird health.

Important vitamins

- Vitamin A – Vision and immunity
- Vitamin D₃ – Calcium



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absorption and bone health

- Vitamin E – Antioxidant and reproductive performance
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- Vitamin-mineral premixes help prevent nutritional deficiencies under commercial farming conditions.

5. Water – The Most Important Nutrient

Water is often overlooked but is the most essential nutrient.

- Birds consume approximately **1.8–2.5 times** more water than feed.
- Water intake increases during hot weather.
- Clean, cool, and fresh drinking water should be available at all times.
- Poor-quality water reduces feed intake, growth, and egg production.

Feeding According to Age

Different stages of growth require different nutrient levels.

Starter Diet (0–3 weeks)

- High protein and energy.
- Supports rapid chick growth.
- Promotes better immunity.

Grower Diet (4–8 weeks)

- Balanced nutrients for steady body development.
- Prevents excessive fat deposition.

Layer Diet

- Higher calcium and balanced amino acids.
- Improves egg production and shell quality.

Broiler Finisher Diet

- Maximizes body weight gain.
- Improves feed conversion before marketing.

Modern Feed Additives

Several feed additives are now routinely used to improve poultry performance.

- **Probiotics:** Improve beneficial gut bacteria.
- **Prebiotics:** Support intestinal health.
- **Enzymes:** Increase nutrient digestibility.
- **Organic acids:** Improve gut environment.
- **Phytogenic additives:** Enhance digestion and immunity.
- **Toxin binders:** Reduce the harmful effects of mycotoxins.

These additives improve bird health while reducing dependence on antibiotic growth promoters.

Common Feeding Mistakes

Avoid the following common mistakes:

- Feeding mouldy or poor-quality ingredients.
- Improper storage of feed.
- Sudden changes in feed formulation.
- Overcrowded feeders and drinkers.
- Insufficient drinking water.
- Ignoring bird body weight and feed intake.

These mistakes reduce production efficiency and



increase disease risk.

Practical Tips for Poultry Farmers

- Purchase feed ingredients from reliable suppliers.
- Store feed in a cool, dry, and well-ventilated place.
- Always provide clean drinking water.
- Feed birds according to age and production stage.
- Maintain feeder and drinker hygiene.
- Monitor body weight and feed consumption regularly.
- Protect feed from moisture, rodents, and fungal contamination.
- Use quality vitamin-mineral premixes when required.

Conclusion

Balanced poultry nutrition is the foundation of successful poultry farming. A scientifically formulated ration containing adequate energy, protein, amino acids, vitamins, minerals, and clean water helps birds achieve their full genetic potential. Along with proper management and biosecurity, balanced feeding improves growth, egg production, feed conversion ratio, bird health, and farm profitability. Investing in quality nutrition is one of the most effective ways to ensure sustainable and profitable poultry production.

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Abstract

Feed accounts for nearly 60–70% of the total expenditure in commercial poultry production, making feed cost one of the major challenges faced by poultry farmers. Rising prices and increasing competition for conventional feed ingredients such as maize and soybean meal have encouraged researchers and nutritionists to explore alternative feed resources. Non-conventional feedstuffs include agro-industrial by-products, leaf meals, aquatic plants, insects, microalgae, oilseed cakes, kitchen waste, and several other locally available materials that are not commonly included in standard poultry diets. Many of these feed resources possess considerable nutritional value and can partially replace costly conventional ingredients without adversely affecting

Utilization Of Different Non-conventional Feedstuffs In Commercial Poultry Production

poultry performance when used at appropriate levels. Studies have demonstrated that ingredients such as rice bran, cassava meal, moringa leaf meal, sunflower meal, DDGS, insect meal, and microalgae can improve sustainability while reducing feed costs. However, factors such as high fiber content, anti-nutritional substances, poor palatability, and variation in nutrient composition may limit their wider utilization. Appropriate processing methods, enzyme supplementation, and balanced feed formulation can help overcome these limitations. Therefore, the utilization of non-conventional feed resources offers significant potential for achieving economical and sustainable commercial poultry production.

Introduction

Commercial poultry farming is one of the fastest-growing sectors of animal agriculture worldwide. Poultry birds require nutritionally balanced feed for optimum growth, egg production, immunity, and feed efficiency. Traditionally, maize and soybean meal are the principal energy and protein sources used in poultry feed formulation. However, increasing demand for these ingredients for human

consumption and industrial use has resulted in rising feed costs and reduced profitability in poultry farming.

To address this challenge, nutritionists and researchers have focused on utilizing non-conventional feed resources (NCFRs). These are feed ingredients that are not commonly utilized in poultry diets but are locally available at comparatively lower cost. They include agricultural by-products, unconventional plant materials, animal-origin proteins, and industrial waste products. Proper utilization of these resources can reduce dependence on conventional feeds, minimize environmental pollution, and enhance sustainable poultry production.

The successful incorporation of non-conventional feedstuffs into poultry diets depends on their nutrient composition, digestibility, processing methods, and inclusion levels. Modern technologies such as enzyme supplementation, fermentation, and heat treatment have improved the nutritional quality and utilization efficiency of many alternative feed ingredients.

1. Definition of Non-Conventional Feedstuff

Non-conventional feedstuffs are feed ingredients that are not



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traditionally used in poultry rations but possess nutritional potential for partial replacement of conventional ingredients. They are usually locally available, inexpensive, and derived from agricultural, industrial, or animal waste products.

2. Importance of Non-Conventional Feed Resources in Poultry Production

a) Reduction of Feed Cost

Feed cost is the major expense in poultry farming. Non-conventional feed ingredients are generally cheaper and can significantly reduce production cost.

b) Sustainable Poultry Production

Utilization of agricultural and industrial by-products minimizes environmental waste and promotes sustainable livestock production systems.

c) Reduction of Competition Between Humans and Animals

Alternative feed ingredients reduce dependence on maize and soybean meal, which are also important human food resources.

d) Availability of Local Resources

Many non-conventional feed resources are readily available in rural areas and can be utilized effectively after proper processing.

3. Types of Non-Conventional Feedstuff Used in Poultry

A. Agro-Industrial By-Products

i) Rice Bran - Rice bran is rich in energy, fat, vitamins, and

minerals that can partially replace maize in poultry diets. However, its high fiber content and rancidity limit its use.

ii) Wheat Bran - Wheat bran contains moderate protein and fiber which is commonly used in layer diets.

iii) Distillers Dried Grains with Solubles (DDGS) - DDGS is a by-product of ethanol production and contains high protein and digestible phosphorus. Studies have shown that DDGS can successfully replace part of soybean meal in broiler diets.

iv) Brewery Waste - Brewery by-products contain protein and vitamins but require drying before use.

B. Oilseed By-Products

i) Sunflower Meal - Sunflower meal is rich in protein and can replace soybean meal partially in poultry rations. Excess fiber is the major limitation.

ii) Cottonseed Meal - It is a good protein source but contains gossypol, which can be toxic if used excessively.

iii) Coconut Cake - Coconut cake is rich in oil and energy but deficient in lysine and methionine.

C. Root and Tuber Products

i) Cassava Meal - Cassava root meal is an excellent energy source and can partially replace maize. Cyanogenic glycosides present in cassava require proper processing before feeding.

ii) Sweet Potato Meal - Sweet potato meal contains carbohydrates and carotenoids and can improve yolk pigmentation.

D. Leaf Meals

i) Moringa Leaf Meal - Moringa leaves are rich in protein, vitamins, minerals, and antioxidants. They improve growth performance and immunity in poultry.

ii) Azolla - Azolla is an aquatic fern rich in protein and minerals. It is suitable for backyard and semi-commercial poultry production.

iii) Leucaena Leaf Meal - Leucaena contains good-quality protein but also contains mimosine, an anti-nutritional factor.

E. Animal-Origin Non-Conventional Protein Sources

i) Insect Meal - Insects such as black soldier fly larvae and maggots are rich in protein and essential amino acids. They are increasingly used as sustainable poultry protein sources.

ii) Hatchery Waste Meal - Hatchery waste can be processed into poultry feed ingredients rich in protein and minerals.

iii) Fish Processing Waste - Fish waste meal provides high-quality protein and omega-3 fatty acids.

F. Aquatic and Microbial Feed Resources

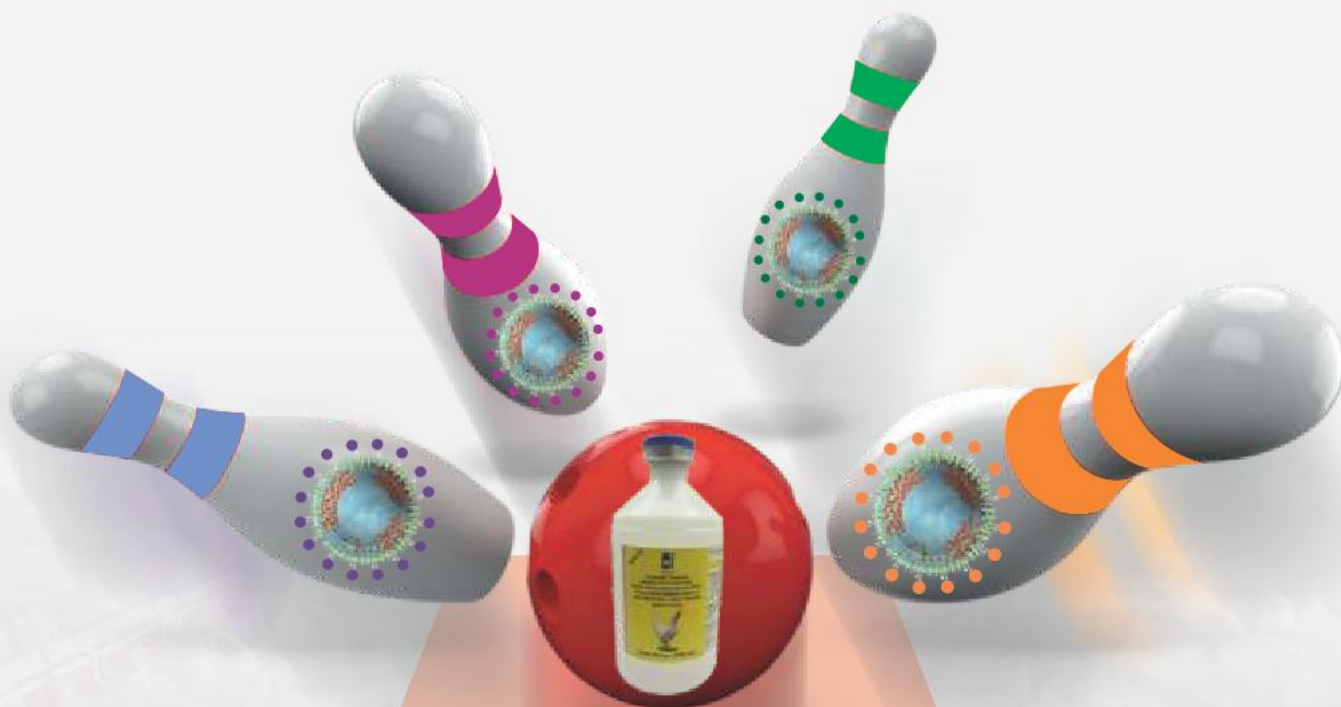
i) Microalgae - Microalgae such as Spirulina and Chlorella are rich in protein, pigments, vitamins, and antioxidants. They improve egg yolk color, immunity, and productivity.

ii) Yeast-Based Products - Yeast products improve gut health and nutrient digestibility in poultry.



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4. Advantages of Non-Conventional Feedstuff

1. Reduces feed cost.
2. Improves sustainability in poultry production.
3. Minimizes environmental pollution.
4. Encourages utilization of local resources.
5. Reduces dependence on imported soybean meal and maize.
6. Some feed resources improve immunity and gut health.

5. Limitations of Non-Conventional Feedstuff

1. Presence of anti-nutritional factors.
2. High fiber content reduces digestibility.
3. Variability in nutrient composition.
4. Poor palatability in some feed ingredients.
5. Risk of contamination by toxins or pathogens.
6. Need for processing before utilization.

6. Methods to Improve Utilization

- a) **Heat Treatment:** Destroys harmful anti-nutritional factors.
- b) **Fermentation:** Improves digestibility and nutrient availability.
- c) **Enzyme Supplementation:** Enzymes help break down fiber and improve nutrient absorption.
- d) **Proper Feed Formulation:** Balancing amino acids, vitamins and minerals ensures better performance.

Conclusion

Non-conventional feedstuffs have great potential in commercial poultry production due to their low cost, local availability, and sustainability benefits. Different alternative feed resources such as agro-industrial by-products, leaf meals, insect protein, oilseed cakes, and microalgae can partially replace conventional feed ingredients without significantly affecting poultry productivity when used appropriately. Their utilization can help reduce feed cost, environmental pollution, and dependence on imported feed ingredients. However, successful incorporation depends on proper processing, balanced diet formulation, and control of anti-nutritional factors. Future research and technological advancements will further enhance the efficient utilization of non-conventional feed resources in commercial poultry farming. Therefore, non-conventional feed resources can play a vital role in achieving economical and sustainable commercial poultry production.

Recommendations

1. More research should be conducted on locally available feed resources.
2. Farmers should adopt enzyme supplementation and fermentation technologies.
3. Proper quality control measures should be maintained to avoid contamination.
4. Government and research institutions should promote awareness regarding alternative feed resources.

5. Poultry nutritionists should formulate balanced diets using optimum inclusion levels of non-conventional feed ingredients.

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Prof. Dr. ARM Ziaul Hasan, Ph.D.
*Agricultural Economist
Animal Science Expert*

Introduction

Egg production is no longer simply a matter of keeping laying hens and collecting eggs. Modern poultry enterprises must manage the entire value chain—from genetics, nutrition and housing to flock health, egg collection, grading, packaging, cold-chain management and, increasingly, processing into higher-value products.

Eggs remain one of the most

Egg Production & Processing From High-performance Layer Farms To Safe, Value-added Egg Products

accessible animal-source foods because they provide high-quality protein and important nutrients at a relatively affordable cost. Global egg production has expanded dramatically, with Asia accounting for more than 64% of global output. FAO reports that world egg production increased from approximately 15 million tonnes in 1961 to 93 million tonnes in 2020.

For producers in Sri Lanka and other Asian markets, this creates an important opportunity. The future is not only in producing more eggs. It is in producing **better-quality eggs more efficiently and converting part of that production into safe, convenient and higher-value egg products.**

1. The Foundation: Efficient Layer Production

A successful egg-processing business begins with a successful layer farm. Processing cannot compensate for poor-quality raw material.

The principal production factors are:

- High-performing commercial layer genetics
- Balanced feed and precision nutrition
- Adequate water supply
- Proper housing and ventilation
- Temperature and environmental control
- Lighting programmes
- Vaccination and disease prevention
- Biosecurity
- Flock monitoring
- Effective manure and waste management
- Consistent egg collection

FAO notes that poultry production systems range from small family operations to highly automated, environmentally controlled commercial systems, with industrial systems accounting for most poultry meat and egg production globally.





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The commercial layer farm should therefore be managed as a **precision production unit**, not simply as a livestock facility.

Feed is usually the largest operating cost. Consequently, feed conversion, feed intake, egg mass, mortality, uniformity and production percentage must be monitored continuously. The objective is not merely to maximize the number of eggs but to maximize **saleable egg output per bird while controlling the cost per egg**.

2. Flock Health and Biosecurity

The profitability of a layer operation can collapse quickly when disease enters the farm.

Biosecurity must cover people, vehicles, feed, equipment, water, visitors, wild birds, rodents and movement between poultry houses. Vaccination programmes should be designed according to local disease risks and veterinary advice.

Food safety is equally important. FAO identifies Salmonella and Campylobacter among the important bacterial hazards associated with contaminated poultry products, including eggs.

This means that food safety begins **before the egg is laid**.

Responsible veterinary medicine use, withdrawal-period compliance and accurate treatment records are also essential. A modern egg company must be able to demonstrate what happened to the flock, when it happened and what controls were applied.

3. Egg Collection: The First Processing Operation

Once an egg is laid, quality begins to decline unless it is handled correctly.

Eggs should be collected frequently, particularly in intensive commercial systems. Collection equipment, belts, trays and storage areas should be kept clean and maintained properly.

The objective is to minimize:

- Cracked eggs
- Dirty eggs
- Contamination
- Mechanical damage
- Temperature abuse
- Excessive handling
- Delays between laying and packing

The egg has a natural protective cuticle on its shell. FAO explains that this coating contributes to protection against microbial penetration and moisture loss. Excessive or inappropriate washing can remove this protection.

Therefore, egg-cleaning procedures must be designed around the applicable food-safety regulations and the intended market rather than adopting a one-size-fits-all approach.

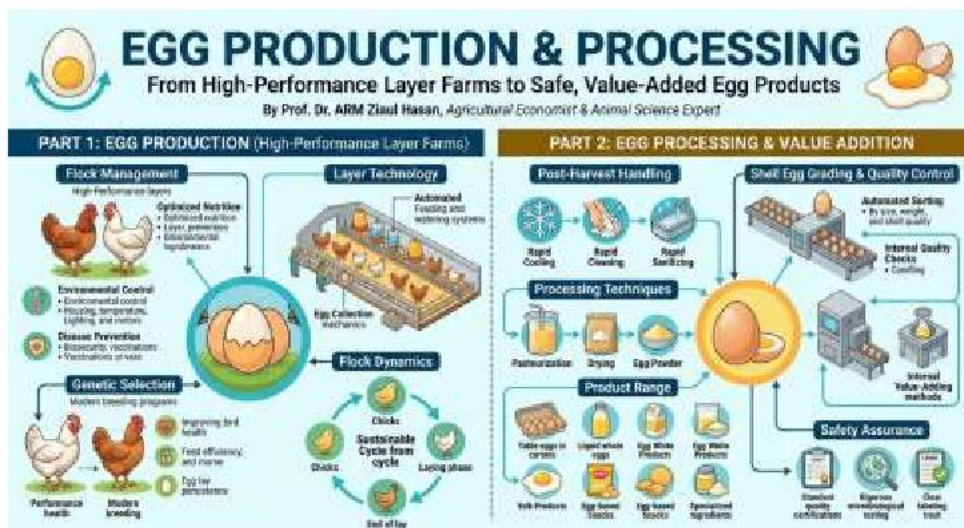
4. Grading and Quality Classification

A modern packing centre should separate eggs according to measurable quality characteristics.

Typical grading parameters include:

- Egg weight
- Shell integrity
- Shell cleanliness
- Shape
- Internal quality
- Air-cell condition
- Cracks
- Abnormalities

Candling systems can help identify internal defects, while automated weighing and grading equipment can increase consistency and reduce labour requirements.





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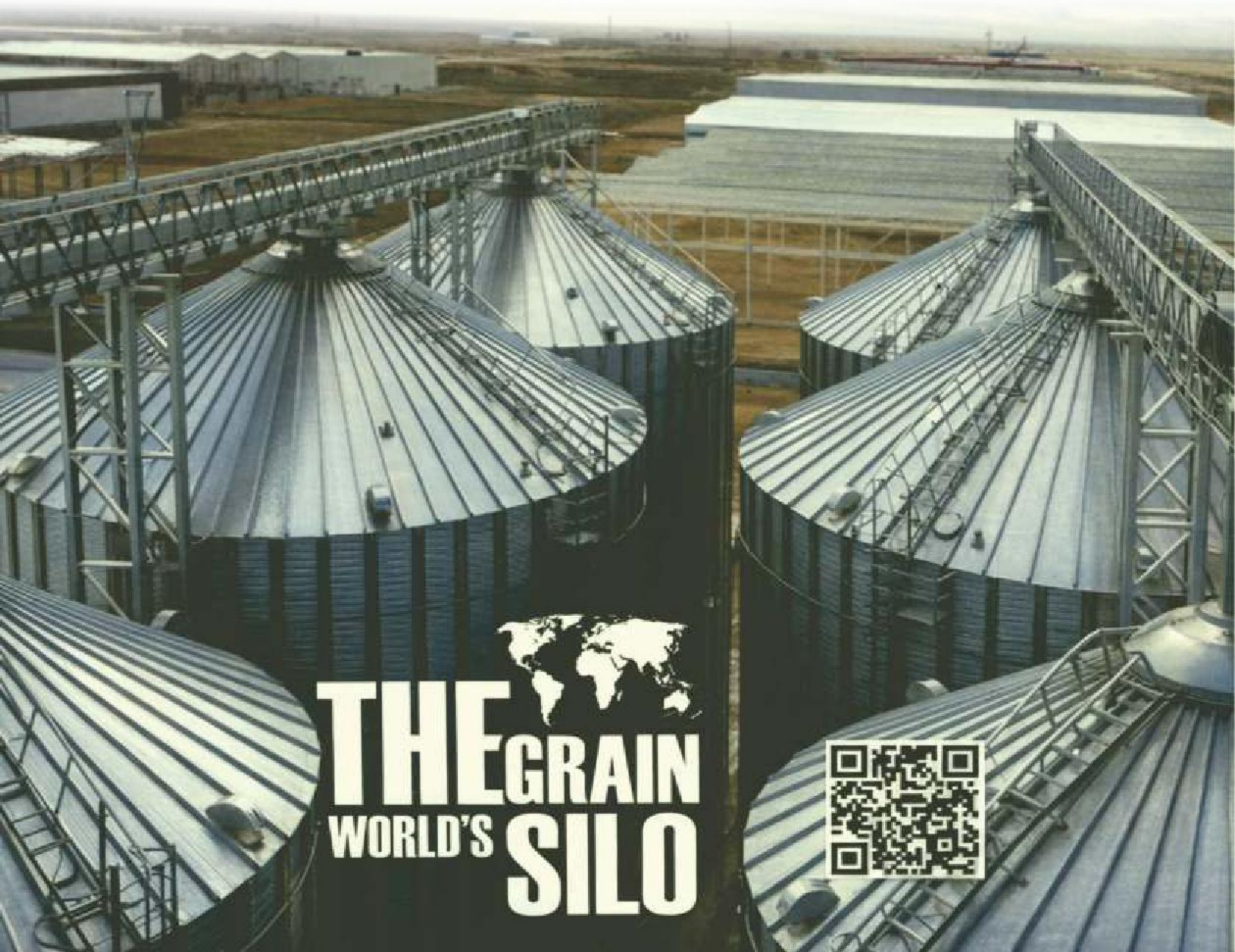
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The commercial objective is simple: **send the right egg to the right market.**

Premium table eggs can be marketed in attractive consumer packaging, while eggs that do not meet the requirements for premium retail presentation—but remain suitable for processing under applicable regulations—may potentially be directed to an approved processing stream.

This creates an important economic principle: **not every egg needs to be sold in the same form.**

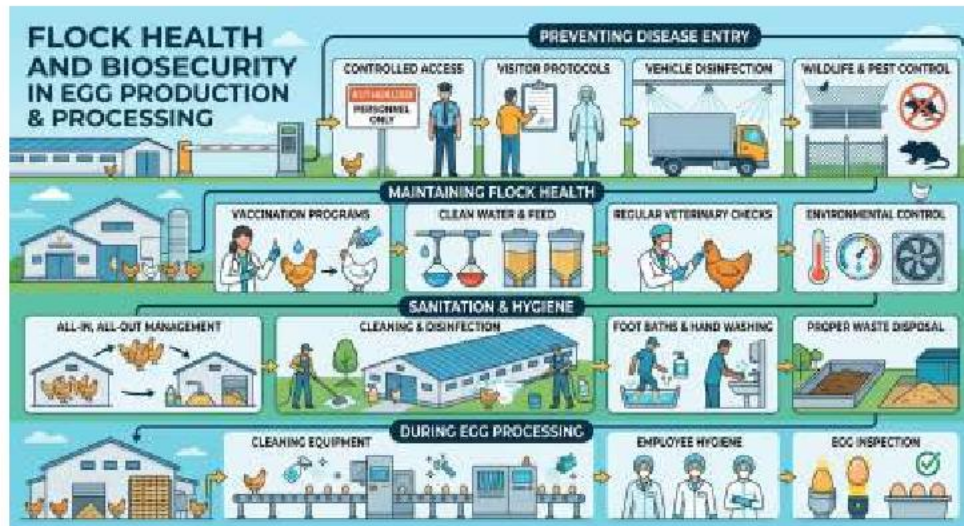
5. The Egg Processing Plant

Egg processing transforms a perishable agricultural commodity into standardized food ingredients.

The basic industrial process may include:

Egg reception → inspection → cleaning where applicable → breaking → separation → filtration → pasteurization → cooling → packaging → cold storage → distribution

Egg-processing facilities should



be physically and operationally designed to minimize cross-contamination.

International food-safety guidance emphasizes the importance of separating operations such as washing, breaking and subsequent processing activities.

The Codex Code of Hygienic Practice for Eggs and Egg Products covers the entire chain, including primary production, sorting, grading, storage, transport, processing and distribution.

This approach is critical because the processing plant is not

simply a mechanical facility. It is a **food-safety system.**

6. Value-Added Egg Products

The greatest commercial opportunity may lie beyond shell eggs.

Depending on market demand and regulatory approval, a modern processing facility can produce:

Liquid Whole Egg

Used by bakeries, hotels, restaurants, food manufacturers and institutional kitchens.

Liquid Egg White

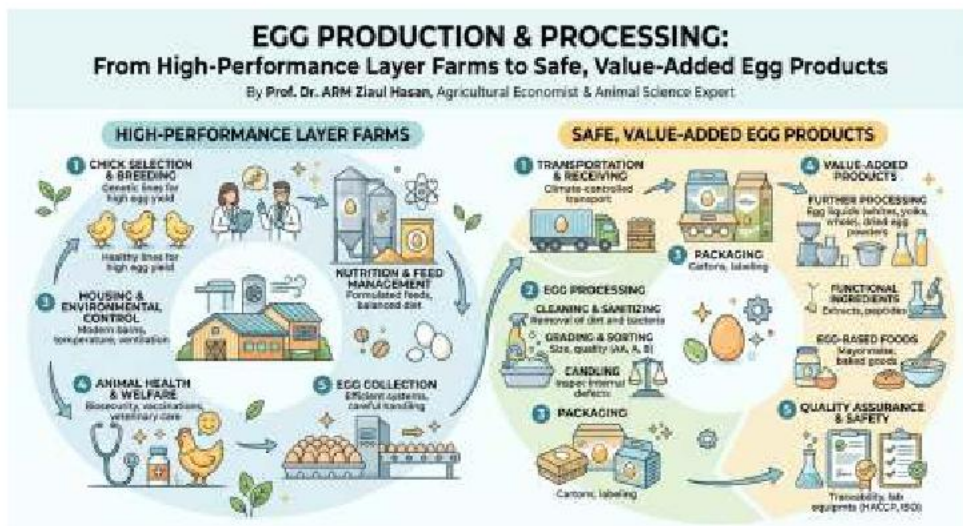
Particularly useful for bakery, confectionery, sports nutrition and food-manufacturing applications.

Liquid Egg Yolk

Used in mayonnaise, sauces, dressings, bakery products and other food applications.

Frozen Egg Products

Freezing can extend usability and support industrial customers requiring larger-volume supply.





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Dried Egg Powder

Spray-dried egg products can provide long shelf life and easier transportation while serving food manufacturers that require standardized ingredients.

Specialty Products

Further opportunities can include pre-cooked egg products, ready-to-use food ingredients and specialized formulations, subject to appropriate technology, food-safety requirements and market demand.

The strategic advantage is that processed egg products can shift the business from a purely commodity-based model toward a **B2B ingredient-supply business**.

7. Cold Chain and Distribution

Egg quality depends heavily on storage and transportation conditions.

Temperature requirements must be established according to the applicable Sri Lankan regulations and the requirements of the destination market. Storage areas should be

clean, dry, protected from direct sunlight and managed to minimize damaging temperature fluctuations.

The same principle applies to processed egg products. Once eggs are converted into liquid or other processed forms, temperature control and hygienic handling become even more important.

A commercial processing company therefore needs:

- Hygienic receiving areas
- Controlled processing rooms
- Chilled storage
- Appropriate frozen storage where required
- Temperature monitoring
- Insulated transportation
- Batch identification
- Traceability records

8. Traceability: The Invisible Asset

Traceability is often underestimated by small and medium-scale poultry businesses.

Every commercial batch should

ideally be connected to identifiable production information, including:

Farm → flock → production date → collection → grading → processing batch → packaging → customer

This allows the company to identify problems quickly and conduct targeted recalls if necessary.

International egg-processing standards emphasize traceability at both the primary-production and processing stages.

For a company targeting supermarkets, hotels, institutional buyers or export markets, traceability is not an optional administrative exercise. It is part of the product's commercial credibility.

9. Economics: Produce for the Market, Not Just for the Farm

The financial performance of an egg enterprise should be measured using more than the farm-gate egg price.

Key indicators should include:

- Cost per bird
- Feed cost per dozen eggs
- Egg production percentage
- Average egg weight
- Mortality
- Cracked and rejected eggs
- Labour cost per thousand eggs
- Packaging cost
- Energy cost
- Processing recovery rate
- Cost per kilogram of processed product





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

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



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Rooms will be allotted strictly on a first-come, first-served basis and confirmed only upon receipt of full payment. Once the rooms reserved by PFI are fully booked, PFI will not be able to arrange or guarantee accommodation at the venue hotel.



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

With warm regards,

Poultry Federation of India (PFI)



- Selling price
- Gross margin
- Working-capital requirement

The critical question is:

How much profit does the enterprise generate from every kilogram of feed, every bird housed and every egg produced?

A processing plant should not be constructed merely because processing sounds more sophisticated. It must be supported by sufficient raw-egg volume, reliable customers, appropriate technology and a realistic financial model.

10. The Integrated Future

The strongest poultry businesses will increasingly operate as integrated systems.

A possible structure is:

Breeding → Pullets → Layer Farm → Egg Collection → Grading & Packing → Processing → Distribution → Retail/B2B → By-product Utilization

Waste should also be treated as a resource wherever economically and

environmentally appropriate.

Manure can have agricultural value, while eggshells may potentially be recovered for suitable applications. FAO recognizes manure and other poultry by-products as potentially valuable components of integrated production systems.

This creates the possibility of a circular poultry economy in which fewer resources are wasted and more value is extracted from each production cycle.

Conclusion

*The future of egg production belongs to enterprises that combine **animal science, economics, food technology and disciplined management.***

A profitable modern egg business should not stop at producing shell eggs. It should build a controlled value chain in which flock performance, egg quality, food safety, processing efficiency, traceability and market development operate as one system.

For Sri Lanka, this presents a significant opportunity. Domestic

egg production can supply consumers directly, while professionally managed grading and processing facilities can supply hotels, bakeries, restaurants, institutional buyers and food manufacturers with standardized egg ingredients.

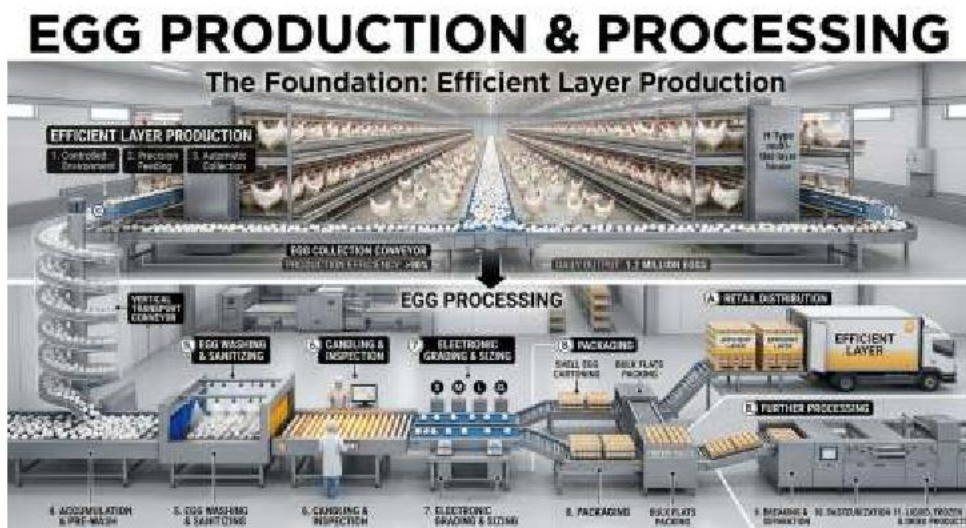
The central lesson is straightforward:

Produce efficiently. Handle carefully. Process safely. Add value. Control every stage.

That is how an egg farm becomes a modern food enterprise rather than simply a poultry operation.

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Egg Production and Processing



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Egg production and processing are important components of the poultry industry and contribute significantly to the availability of high-quality animal protein for human consumption. Eggs are considered a highly nutritious food because they contain high-quality proteins, essential amino acids, fats, vitamins, minerals and other biologically active substances. Commercial egg production mainly involves the rearing of specialized layer breeds under suitable environmental, nutritional and management conditions, followed by systematic collection, grading, cleaning, storage, packaging and processing of eggs into various value-added products.

The production of table eggs begins with the selection of

suitable layer strains. Commercial layers are generally selected for high egg production, good feed efficiency, disease resistance, proper egg size and desirable shell quality. Common commercial layer strains include White Leg horn-type birds and various brown-egg layer hybrids. Newly hatched female chicks, known as pullets, spend their first seventeen weeks of life in dedicated brooding and rearing facilities. During this rearing phase, proper nutrition, vaccination, environmental management and appropriate lighting are used to control growth and development. The objective is to develop birds with strong skeletal structures, uniform body weights and good reproductive potential before they enter the laying phase.

At approximately eighteen weeks of age, pullets are transferred to specialized production laying houses, coinciding with the onset of sexual maturity. The lighting programme is gradually adjusted to stimulate and maintain reproductive activity. Increasing the duration of artificial light helps stimulate the hormonal mechanisms responsible for ovulation and egg production. Commercial laying hens generally reach peak production during the early laying period, commonly between approximately 25 and

39 weeks of age. Under good management, a highly productive flock may achieve very high laying rates, with a large proportion of hens producing an egg each day. As hens become older, egg production gradually declines and shell quality may deteriorate. By approximately 72–80 weeks of age, the reduction in laying performance and deterioration in egg quality may lead to planned flock replacement.

The formation of an egg is a continuous and highly coordinated physiological process that generally takes about 23–27 hours. The process begins in the ovary, where a mature yolk, or ovum, is released during ovulation and enters the oviduct through the infundibulum. The yolk remains in the infundibulum for a short period, after which it enters the magnum, the longest section of the oviduct. During approximately three hours in the magnum, layers of albumen, commonly known as egg white, are deposited around the yolk. The developing egg then passes into the isthmus, where the inner and outer shell membranes are formed around the albumen over approximately one hour. The egg subsequently enters the uterus, also known as the shell gland, where it remains for approximately 18–20 hours. During this stage, calcium



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carbonate is deposited over the shell membranes to form and strengthen the hard eggshell. Calcium is supplied through the diet and mobilized from the hen's body reserves when necessary. In the final stage, shortly before oviposition, a thin protective cuticle is deposited over the shell surface. This cuticle helps reduce the penetration of microorganisms through the shell pores. Finally, muscular contractions of the uterus and vagina result in oviposition, or laying of the completed egg.

Nutrition plays a major role in egg production. Layer diets must provide adequate energy, protein, essential amino acids, calcium, phosphorus, vitamins and trace minerals. Calcium is particularly important because a large amount is required for eggshell formation. An inadequate supply of calcium or an imbalance between calcium and phosphorus can result in thin, weak or cracked shells. Adequate drinking water is equally important because water is essential for feed intake, digestion, metabolism and egg formation. Feed and water should be clean, fresh and readily available. Proper lighting programmes are also used to stimulate and maintain egg production. Environmental conditions such as temperature, humidity, ventilation, stocking density and cleanliness influence both production and egg quality.

Egg collection is an important stage in maintaining egg quality. Eggs should be collected

frequently, particularly on commercial farms, to reduce breakage, contamination, and exposure to extreme environmental conditions. Clean eggs should be handled carefully to prevent cracks and contamination. Eggs may be collected manually or through automated conveyor systems in modern poultry farms. After collection, eggs are inspected for visible cracks, dirt, abnormal shape, and other defects. Dirty, cracked, or otherwise unsuitable eggs are separated from good-quality eggs. Prompt collection and proper handling help reduce microbial contamination and maintain the internal quality of eggs.

After collection, eggs undergo grading and quality evaluation. Grading may be based on weight, shell quality, cleanliness, shape and internal characteristics. In the United States, standard egg sizes include Peewee, Small, Medium, Large, Extra Large and Jumbo, and these categories are determined according to minimum weight requirements for a dozen eggs. Egg size categories may vary according to national or commercial standards. Internal quality can be assessed by techniques such as candling, in which eggs are exposed to a light source to identify cracks, blood spots, abnormal contents and other defects. Candling also helps determine the condition of the air cell and yolk. The freshness of an egg can be evaluated by examining characteristics such as albumen quality, yolk condition and air-cell size. High-

quality eggs generally have a firm albumen and a well-defined, centrally positioned yolk when broken onto a flat surface.

Egg washing and sanitation are important processing operations, particularly in systems where washing is permitted or required. Washing removes dirt and some microorganisms from the shell surface. However, inappropriate washing, especially with unsuitable water temperature or contaminated washing equipment, can increase the risk of microorganisms entering the egg through the shell pores. Therefore, washing procedures must be carefully controlled. After cleaning, eggs may be dried and treated according to applicable food-safety regulations. Proper sanitation of equipment, workers and processing areas is essential to minimize contamination.

Storage conditions have a major effect on egg quality. Eggs gradually lose quality during storage because carbon dioxide and moisture escape through the shell. As storage time increases, the albumen becomes thinner, the yolk becomes less firm and the air cell becomes larger. Refrigeration slows these changes and helps maintain freshness. Eggs should therefore be stored under appropriate temperature and humidity conditions and protected from strong odors because eggshells are porous and can absorb odors from their



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surroundings. Maintaining a continuous cold chain is particularly important for processed and refrigerated egg products.

Egg processing converts shell eggs into convenient and value-added products. The major processed egg products include liquid whole egg, liquid egg white, liquid egg yolk, dried egg powder, frozen egg products and cooked egg products. Processing begins with breaking and separating the shell from the edible contents. Depending on the product, the whole egg may be retained or separated into albumen and yolk. The liquid egg is then filtered to remove shell fragments and other foreign material. It may undergo pasteurization to reduce pathogenic microorganisms while maintaining desirable functional properties. Pasteurization is particularly important because raw eggs can potentially carry microorganisms such as *Salmonella*. Properly valid at edpasteurization improves food safety without causing excessive changes in egg proteins.

Liquid egg products can be packaged and refrigerated or frozen depending on their intended use. They are widely used by bakeries, restaurants, hotels, food-processing industries and institutional kitchens because they reduce the labour involved in shell removal and provide consistent quantities. Egg white is especially valuable in products

requiring foaming properties, while egg yolk is widely used because of its emulsifying properties. Whole egg products are commonly used in bakery products, confectionery, sauces and ready-to-eat foods.

Another important method of egg processing is drying. Liquid whole egg, egg white or egg yolk can be converted into powder by controlled drying processes. Egg powders have a longer shelf life, are easier to transport and require less storage space than liquid egg products. They can be reconstituted with water before use. Spray drying is commonly used for producing powdered egg products. During processing, strict control of temperature and hygiene is required to preserve nutritional and functional qualities.

Eggs can also be processed into several value-added products such as boiled eggs, peeled eggs, egg-based snacks, omelettes and ready-to-eat preparations. These products provide convenience to consumers and increase the economic value of eggs. Modern egg-processing plants use automated systems for washing, candling, grading, breaking, separation, pasteurization, drying and packaging. Automation improves efficiency, reduces manual handling and helps maintain uniform quality.

Food safety is a major concern throughout egg production and processing. Poultry farms should follow good farming

practices, appropriate vaccination programmes, biosecurity measures and hygienic manure and waste management. Processing plants should follow good manufacturing practices and Hazard Analysis and Critical Control Point (HACCP) principles. Workers should maintain personal hygiene, use appropriate protective clothing and prevent cross-contamination between raw and processed products. Equipment and processing surfaces must be regularly cleaned and disinfected.

Conclusion

Egg production and processing involve a series of interconnected operations beginning with efficient layer management and continuing through egg formation, collection, grading, cleaning, storage and conversion into value-added products. Proper nutrition, environmental management, disease prevention and hygienic handling are essential for obtaining high-quality eggs. Modern processing techniques improve safety, shelf life, convenience and utilization of eggs. With increasing demand for affordable, nutritious and convenient food products, efficient egg production and processing will continue to play an important role in poultry farming, food security and the agricultural economy.



ASSOCIATION OF LIVESTOCK SECTOR

Announcement

CLFMA 59th AGM & 67th NATIONAL SYMPOSIUM 2026

Dear Sir / Madam,

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

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

With warm regards,

Divya Kumar Gulati
Chairman



Kiril Domuschiev



President of Huvepharma drive is an example of a modern business determined to leave a positive legacy. He is interested not only in operating a profitable business but also in reinvesting earnings into better, more modern technologies to improve production methods. These investments will also promote a healthier and more sustainable environment, benefiting employees and local residents alike.



Solidifying the Vanguard: Huvepharma Group Secures Landmark Acquisition of Euroapi Italy to Propel Global Biotech Leadership



O. P. Singh



Managing Director, Huvepharma SEA (Pune) Pvt. Ltd., which is a fast-growing global pharmaceutical company with a focus on developing, manufacturing & marketing human & animal health products.

On the 29th of July, 2026, Huvepharma EOOD consummated a definitive Share Purchase Agreement with Euroapi S.A. to acquire a 100% equity stake in Euroapi Italy S.r.l. This transaction remains subject to customary closing conditions, including the requisite Golden Power regulatory clearance. The perimeter of this strategic acquisition encompasses the premier manufacturing facility in Brindisi, Italy, an asset boasting a venerable industrial heritage in microbiological fermentation dating back to 1966.

"A profound synergy exists between the cutting-edge biotechnological profile of Huvepharma and the deep institutional knowledge and expertise of the Brindisi workforce," remarked Kiril Domuschiev, President and CEO of Huvepharma. He further articulated, "Huvepharma intends to fully leverage these symbiotic capabilities to introduce novel products and advanced formulations to the global marketplace. Our strategic focus remains steadfastly anchored in the development, manufacture, and commercialisation of animal health, human health, and nutraceutical solutions. This acquisition serves as a testament to that enduring commitment to our global clientele."

To ensure unparalleled quality assurance, the entirety of Huvepharma portfolio is manufactured exclusively in-house across proprietary facilities owned by the Huvepharma Group. This vertical integration grants the corporation absolute governance over its production methodologies, guaranteeing adherence to the most stringent quality standards. Furthermore, this operational autonomy fosters exceptional organizational agility, empowering the Huvepharma Group to dynamically recalibrate and optimize product formulations in alignment with evolving market demands.

This landmark acquisition expands Huvepharma aggregate fermentation capacity by 25%, elevating its total volume past the 12,000m³ threshold. Consequently, this expansion solidifies the company's position as a preeminent vanguard of the European biotechnology sector while catalysing the broader expansion of its global footprint. Ultimately, this transaction reinforces client confidence in Huvepharma sustainable, resilient, and long-term manufacturing architecture.

This landmark acquisition marks a monumental leap forward in our global manufacturing paradigm says Mr. O. P. Singh – Managing Director, Huvepharma SEA (Pune) Pvt. Ltd. He further added; by expanding our aggregate fermentation capacity to unprecedented heights, the Huvepharma Group drastically fortifies its global supply chain. For our discerning clientele here in India and the wider South Asian region, this translates to unparalleled product reliability, robust operational continuity, and enhanced access to world-class biotechnological solutions. We are exceptionally proud to synergise our regional operations with this newly augmented global infrastructure.

"Huvepharma a Premier Global Titan in the Biotechnology Sector."



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CYANOSIS (PURPLE HEAD) IN BROILER BREEDER MALES

INTRODUCTION

Transient cyanosis in broiler breeder males is a well-recognized issue in commercial poultry production, manifesting as a purple discoloration of the comb and skin due to deoxygenated blood. This condition is closely linked to cardiac function, feeding management, and environmental stressors. Recent collaborative studies and morphometric research have provided deeper insights into its prevalence, causes, and management strategies.

CYANOSIS IN BROILER BREEDER MALES

Cyanosis (purple head) is observed in breeder males, typically around 35–40 weeks of age, and is sometimes used as a management indicator (**Figure 1**). The condition is not limited to one breed or line and may be transient, with color changes throughout the day; cyanosis appears after feeding, then disappears during the day. Affected birds show no respiratory distress, and necropsy reveals few gross lesions except occasional flaccid hearts. Echocardiography has detected aortic insufficiency (AOI) in a significant proportion of affected males, and laboratory findings show elevated hematocrit and hemoglobin concentrations, suggesting increased blood viscosity and potential compensatory polycythemia, a condition where an overproduction of red blood cells compensates for a lack of oxygen. This information is intended to provide physiological context and support practical management decisions, rather than to imply differences between breeds or genetic lines. There is no evidence of a genetic basis for this condition; therefore, management should be the focus to reduce field incidence.

FIGURE 1: An example of affected (left) and unaffected (right) broiler breeder males.



PRACTICAL MANAGEMENT OF MALE CYANOSIS

FEEDING AND PHYSICAL STRESS

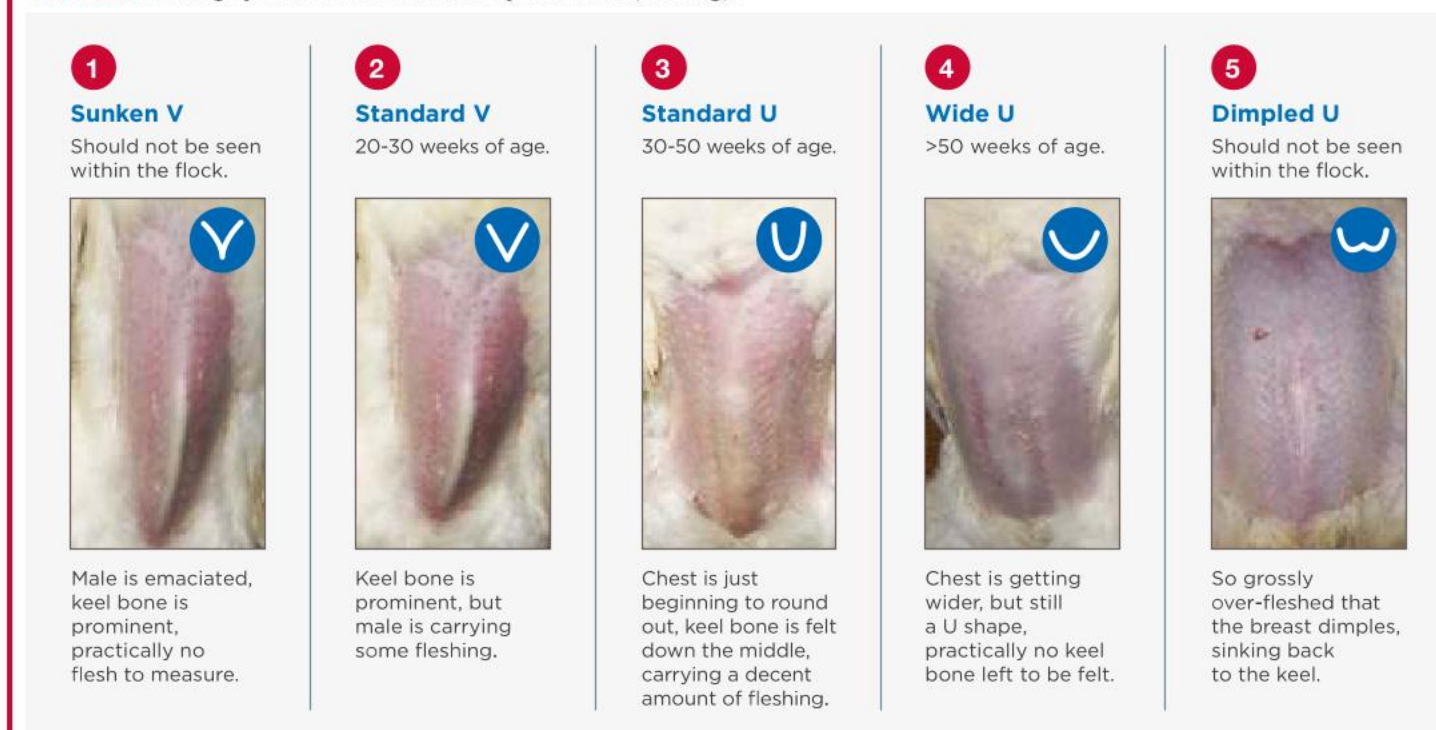
Cyanosis typically occurs during periods of peak physical stress, such as feeding or mating, when oxygen demand spikes and the heart may struggle to keep pace. For this reason, feed distribution should be completed within three minutes to prevent uneven gorging and panic. Male exclusion grills must be intact to prevent males from stealing hen feed, which increases their body mass and oxygen demand while physically restricting their air sacs. In addition, verify water quality, drinker space, and water line flow rates to ensure they meet the requirements for broiler breeder males.

Field observations have also suggested that behaviors such as litter consumption may contribute to transient episodes in some flocks, although the underlying mechanism remains unclear.

BODY WEIGHT AND CONDITION CONTROL

Rear males to a body weight profile that meets or slightly exceeds current breed standards, as these higher profiles help prevent conditions such as Valgus-Varus Deformity (VVD), also known as ‘X-legs’. Achieving and maintaining good body weight and uniformity in male populations is as critical as it is in females, because cyanosis occurs less frequently in well-managed, well-fed males. Over-fleshed males (with a Dimpled U-shaped breast; score 5) are at higher risk since muscle tissue is oxygen-expensive. Therefore, target a fleshing score of 2.5–3 (a Standard V or Standard U-shaped breast; score 2-3) to minimize risk (**Figure 2**).

FIGURE 2: Scoring system to assess bird body condition (fleshing).



VENTILATION

Oxygen demand peaks during feeding, regardless of temperature. Increase ventilation 10 minutes before and during feeding to maximize oxygen availability. Maintaining good air quality and effective air exchange is important, as suboptimal ventilation, elevated ammonia or carbon dioxide levels, and reduced oxygen availability may add to physiological stress and contribute to symptom expression, even in open-sided housing systems.

TRIAGE AND CULLING

If cyanosis is observed, monitor the bird's recovery post-feeding. Persistent cyanosis indicates heart failure and warrants culling.

MORPHOMETRIC DOCUMENTATION OF CARDIAC ABNORMALITIES

STUDY OVERVIEW

Research by Floyd D. Wilson et al (2016) documented a high prevalence of left ventricular dilated cardiomyopathy in mature broiler breeder males, both cyanotic and clinically normal. To better contextualize these findings within commercial production, the study also incorporated comparisons to market-age broilers.

KEY FINDINGS

Both cyanotic and normal broiler breeder males showed extensive left ventricular chamber dilation, with no significant difference between groups. Older males (average 42 weeks of age) had significantly higher left and right ventricular weight-to-total heart weight ratios compared with market-age broilers (average 7 weeks of age).

Morphometric data indicated that the left ventricle chamber area-to-total ventricle area ratio increased from 3.2% in broilers to 10% in broiler breeder males; 33% of males had left ventricular volume ratios above 10%, with 13% above 20%. The right ventricle-to-total ventricle weight ratio (RV/TV) increased from 0.18 in broilers to 0.25 in males, and 36% of males exceeded the threshold for right ventricular hypertrophy, although ascites was not observed. Left ventricle wall area-to-body weight ratios were similar between age groups.

Histopathology revealed only minimal endocardiosis, with no substantial changes suggestive of dilated cardiomyopathy. Collectively, these findings suggest that left ventricular enlargement in broiler breeder males is primarily due to dilation rather than hypertrophy, possibly linked to systemic hypertension and aortic insufficiency, and they highlight the need for further research into the relationship between cyanosis, cardiac dilation, and breeding performance.

CONCLUSIONS AND RECOMMENDATIONS

The combined evidence from pathological and morphometric studies underscores the complexity of health challenges in broiler breeder males. Cyanosis and cardiac dilation are prevalent and multifactorial, impacting both flock management and productivity. Management strategies should prioritize rapid feed distribution, strict control of body weight and uniformity, sufficient drinker space and flow rates, and enhanced ventilation during feeding. Continued research and vigilant health monitoring are essential for optimizing breeder welfare and performance.

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Introduction

The global poultry industry has become a major contributor to the supply of affordable, high-quality animal protein. Among poultry products, table eggs occupy a unique position because they provide highly digestible protein, essential amino acids, lipids, vitamins, minerals and several biologically active compounds. A chicken egg contains approximately 75% water, while the remaining fraction comprises proteins, lipids, minerals, vitamins and other organic components. Beyond their conventional nutritional value, eggs contain compounds with antioxidant, anti-inflammatory and immunomodulatory properties and

Advanced Strategies for Sustainable Table Egg Production: Integrating Genetics, Nutrition, Welfare and Egg Biofortification

are increasingly considered a component of functional-food systems.

Contemporary egg production, however, is confronted with multiple constraints, including increasing feed costs, feed-resource limitations, climate change, thermal stress, emerging diseases, environmental concerns and growing societal expectations regarding animal welfare. Consequently, the future of the layer industry depends not merely on increasing egg number but on simultaneously improving laying persistency, feed efficiency, egg quality, hen health, welfare, food safety and environmental sustainability.

A multidisciplinary approach integrating genetic selection, precision nutrition, housing enrichment, health management and nutritional manipulation of egg composition offers considerable potential for achieving these objectives.

1. Transition from Conventional Production to Long-Cycle Layer Production

Genetic selection over several decades has markedly improved the productive potential of commercial laying hens. Modern layers possess high rates of egg production and efficient conversion of dietary nutrients into egg mass. However, conventional depletion of flocks before their biological

production potential is fully expressed may result in underutilization of genetic improvement.

Consequently, the concept of the long-life laying hen has gained increasing attention. The supplied review indicates that appropriately managed modern layers can potentially be maintained up to approximately 100 weeks of age while retaining economically relevant egg production and quality. Some long-life layer programs target approximately 500 eggs per hen over a 100-week production cycle.

Extending the production cycle can reduce the requirement for replacement pullets and distribute rearing costs over a greater number of eggs. It can also reduce flock replacement frequency and potentially improve resource-use efficiency.

Nevertheless, extended laying cycles create important biological challenges. With advancing age,

Precision Management and Monitoring



Future of Egg Production



deterioration of eggshell quality, changes in calcium metabolism, skeletal depletion, oxidative stress and increased variability in production may compromise both productivity and welfare. Therefore, productive longevity should be defined as the ability of a hen to maintain acceptable egg production and egg quality without compromising health and welfare, rather than simply extending chronological age.

2. Genetic Improvement of Laying Persistency and Egg Quality

Egg production is a complex quantitative trait controlled by multiple genes and influenced by environmental and management factors. Major selection criteria in modern layer breeding include egg number, age at sexual maturity, egg weight, laying persistency, feed efficiency and eggshell quality.

The application of molecular genetics has expanded the capacity for genetic improvement. Single nucleotide polymorphism (SNP) markers, quantitative trait loci (QTL) mapping and genome-wide association studies (GWAS) have been used to identify genetic variants associated with egg production and related traits. Such approaches can contribute to genomic selection and more accurate prediction of breeding values.

However, selection exclusively for

high egg number may be insufficient for long-cycle production. Breeding programs should incorporate a balanced selection index involving: Egg production and laying persistency, Egg mass, Eggshell strength and quality, Feed efficiency, Disease resistance, Robustness and adaptability, Skeletal integrity, Reproductive fitness, Livability and welfare. This approach is particularly relevant because eggshell deterioration is one of the important limitations to maintaining older laying hens.

3. Role of Indigenous Genetic Resources and Crossbreeding

Although advanced molecular breeding is increasingly important, conventional genetic approaches continue to have practical relevance, particularly under tropical and low-input production conditions.

Indigenous chickens possess valuable adaptive traits, including tolerance to local climatic conditions, robustness, disease resistance and survival under relatively challenging production environments. Crossbreeding adapted indigenous genetic resources with high-producing exotic or commercial strains can potentially combine adaptability and robustness with enhanced productive performance.

The supplied review identifies crossbreeding as a comparatively accessible strategy for improving quantitative traits such as body weight and egg production while exploiting heterosis.

Therefore, future breeding strategies should consider both advanced genomic technologies and locally adapted genetic resources, particularly for production systems operating under environmental and resource constraints.

4. Eggshell Quality: A Critical Constraint in Long-Life Layers

Eggshell quality is an important determinant of egg safety, marketability and economic efficiency. The eggshell consists predominantly of calcium carbonate and acts as a physical barrier against mechanical damage and microbial penetration. The source material indicates that approximately 10% of eggs may be lost through cracking associated with inadequate shell quality, highlighting the economic significance of shell integrity.

In ageing hens, maintaining calcium homeostasis becomes increasingly important because calcium is simultaneously required for eggshell mineralization and skeletal maintenance. Consequently, long-cycle production requires careful attention to: Calcium and phosphorus nutrition, Vitamin D status, Mineral availability, Feed particle characteristics, Body-weight management, Eggshell thickness and strength, Skeletal integrity

Genetic improvement of eggshell quality should complement nutritional and management interventions rather than being considered independently.

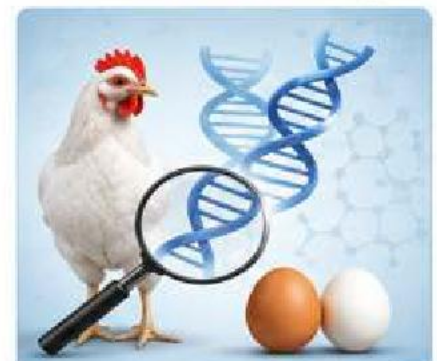
5. Housing Environment, Enrichment and Hen Welfare

Housing represents one of the major environmental determinants

Functional / Designer Eggs



Genetics and Breeding



of layer performance. Stocking density, temperature, ventilation, lighting, feeder and drinker availability, nesting facilities and opportunities for locomotion can influence production, health and behavioural expression.

Growing consumer concern regarding animal welfare has accelerated the development of enriched cages, aviaries, cage-free and free-range production systems. Environmental enrichment can provide opportunities for perching, nesting, walking, dust bathing and other natural behaviours.

However, housing systems should not be evaluated solely on the basis of behavioural freedom. They should be assessed using a multidimensional framework incorporating: Animal welfare, productivity, egg safety, microbial contamination, environmental impact, economic feasibility. The available studies indicate that alternative housing systems may improve opportunities for natural behaviour but can also be associated with increased dirty eggs, environmental exposure and certain skeletal or foot-health problems. Differences in egg production, feed efficiency and microbial contamination have also been reported among housing systems.

Thus, the optimal production system should be determined

Heat Stress Management



according to the genotype, climatic conditions, management capacity and welfare and food-safety objectives of the production unit.

6. Precision Nutrition for Sustained Layer Performance

Nutrition is a central determinant of laying persistency and egg quality. The nutrient requirements of hens change with age, production rate, body weight and environmental conditions. Consequently, phase-specific feeding programs are essential. A scientifically formulated layer diet should provide adequate: Metabolizable energy, Crude protein, Essential amino acids, Calcium and available phosphorus, Vitamins, Trace minerals, Essential fatty acids and Antioxidants. Particular emphasis should be given to mineral nutrition during late lay because of the simultaneous requirement for eggshell formation and maintenance of skeletal calcium reserves.

Nutritional management should therefore shift from a simple maximum-production approach toward a precision-nutrition approach, in which nutrient supply is matched to physiological requirements and production stage.

7. Nutritional Modulation of Egg Composition

One of the most promising applications of layer nutrition is the production of designer or biofortified eggs. Because the egg is consumed frequently and its composition is influenced by the hen's diet, dietary manipulation can be used to increase the deposition of selected nutrients and bioactive compounds in the egg. Potential targets include: Omega-3 polyunsaturated fatty acids, Vitamin E, Selenium, Carotenoids, Lutein, Zeaxanthin,

Choline, Folate, Antioxidant compounds. Eggs enriched with omega-3 fatty acids, vitamin E, carotenoids and minerals as examples of designer foods. This approach creates a potential value chain extending from feed formulation to functional-food production.

8. Omega-3 Enrichment of Eggs

Omega-3 polyunsaturated fatty acids are essential components of human nutrition and cannot be synthesized adequately by humans. Dietary sources include flaxseed, fish oil, rapeseed/canola oil and marine algae. Laying hens can incorporate dietary fatty acids into egg yolk lipids. Feeding diets rich in appropriate omega-3 sources can therefore increase the concentration of α -linolenic acid and longer-chain omega-3 fatty acids in eggs. However, increasing polyunsaturated fatty acid concentration may increase susceptibility to lipid oxidation. Therefore, omega-3 enrichment should preferably be accompanied by adequate antioxidant protection. Vitamin E, selenium and carotenoids have been investigated for this purpose. Thus, successful egg biofortification requires consideration of both nutrient deposition and oxidative stability.

9. Carotenoid-Enriched Eggs and Yolk Pigmentation

Carotenoids are lipid-soluble

Antioxidants and Immune Support



pigments that can be transferred from feed to the egg yolk. Important carotenoids include lutein, zeaxanthin and capsanthin. In addition to influencing yolk pigmentation, these compounds possess antioxidant properties. The supplied review describes the use of marigold, spinach, corn, red pepper and other natural sources for modifying yolk pigmentation and increasing carotenoid deposition. Tomato powder has also been investigated as a dietary source for egg lycopene enrichment. Therefore, yolk pigmentation can serve as both a consumer-oriented quality attribute and a nutritional enrichment strategy.

10. Antioxidant Nutrition in High-Producing and Ageing Hens

Modern high-producing hens have elevated metabolic activity, which can increase the generation of reactive oxygen species. When the generation of reactive species exceeds antioxidant defence capacity, oxidative stress may occur. Oxidative stress can influence cellular integrity, inflammatory processes, immune function and productive performance. Several nutritional antioxidants and plant-derived bioactive compounds, including vitamin E, carotenoids, flavonoids and other phytochemicals, as potential tools for supporting antioxidant defence. This is particularly relevant in ageing layers because maintaining antioxidant capacity may contribute to sustaining physiological function during prolonged production.

11. Phytogetic Feed Additives: A Natural Approach

The poultry industry has increasingly investigated phytogetic feed additives as

alternatives or complements to conventional feed additives. Plants contain numerous biologically active compounds, including essential oils, phenolics, flavonoids and tannins. These compounds may exhibit: Antioxidant activity, Antimicrobial activity, Anti-inflammatory effects, Digestive stimulation, Immunomodulatory activity, Potential effects on gut microbial balance. These botanical products have potential to influence intestinal microbiota, metabolism, immunity and productivity.

Thyme

Thyme contains thymol and other phenolic compounds with antioxidant and biological activities. Dietary thyme has been associated in the reviewed studies with improvements in physiological and productive responses, antioxidant status and selected egg-quality characteristics.

Turmeric and curcumin

Curcumin, the principal bioactive compound of turmeric, has been investigated for antioxidant and metabolic effects. Studies reported their effects on oxidative responses, lipid metabolism and egg cholesterol in experimental nutritional studies.

Fenugreek

Fenugreek contains bioactive compounds, including galactomannan, and has been investigated as a functional feed ingredient. Studies reported effects on feed intake, yolk pigmentation and egg production under specific experimental conditions.

Ginger

Ginger contains gingerols and other biologically active compounds. The studies indicate potential effects on laying performance and serum

antioxidant status. Importantly, plant-based does not automatically mean universally safe or efficacious. Botanical products must be evaluated for standardization, active-compound concentration, inclusion level, toxicity, interactions and economic feasibility.

12. Gut Microbiota and the Gut-Production Axis

The gastrointestinal tract is not merely a digestive organ; it is an important metabolic and immunological interface. Intestinal microorganisms contribute to nutrient utilization, epithelial development, vitamin metabolism and immune regulation. Consequently, disruption of intestinal microbial balance may adversely influence nutrient absorption and bird performance. Several investigations identify the ability of natural feed additives to influence intestinal microbiota and associated metabolic and physiological processes. This provides a scientific basis for developing nutritional strategies directed toward the gut-immune-metabolic axis of the laying hen. Future research should increasingly integrate gut microbiome profiling with production performance, immune status, antioxidant biomarkers and

Omega-3 Enriched Eggs



egg-quality traits to understand the biological mechanisms underlying nutritional responses.

13. Functional Eggs and Immunologically Active Components

Eggs can also serve as carriers of biologically active compounds. Immunoglobulin Y (IgY) is the predominant immunoglobulin found in egg yolk. The source document describes the potential use of eggs as a source of antigen-specific antibodies and discusses dietary and immunological approaches for influencing IgY deposition. This expands the concept of the egg beyond conventional nutrition toward functional and potentially nutraceutical applications. Similarly, egg folate content and other micronutrient concentrations can potentially be influenced through nutritional manipulation.

14. Integrating Genetics, Nutrition and Welfare

The most important lesson emerging from modern layer science is that no single intervention can independently solve the challenges of extended egg production. A genetically superior hen cannot achieve her potential under poor nutrition or inadequate environmental conditions. Similarly, an excellent feeding program cannot compensate for poor genetics, disease, chronic heat stress or inadequate welfare. The production system should therefore be viewed as an integrated biological model: Genotype × Nutrition × Environment × Health × Welfare → Production and Egg Quality. This interaction becomes increasingly important during extended laying cycles.

15. Implications for Sustainable Egg Production

Sustainability in egg production

involves more than reducing feed costs. It encompasses efficient resource utilization, animal health, welfare, environmental impact, food safety and economic viability. Extending productive life can potentially reduce replacement requirements and improve resource efficiency. The earlier studies emphasize that longer production cycles can contribute to economic and sustainability benefits when hens remain healthy and productive. However, sustainability should be assessed across the entire production system. A housing system that improves welfare but substantially increases disease risk, feed consumption or egg contamination may require additional management interventions. Therefore, future sustainability assessments should consider: Production efficiency, animal welfare, egg safety, environmental footprint and economic return.

Conclusion

The future of table egg production lies in the integration of genetic improvement, precision nutrition, welfare-oriented housing, health management and functional egg production. Modern breeding has created hens with remarkable laying potential, and the development of long-life layers provides an opportunity to extend productive cycles toward approximately 100 weeks. However, productive longevity can be achieved sustainably only when extended production is accompanied by maintenance of eggshell quality, skeletal integrity, metabolic health, immunity and welfare.

Nutritional manipulation represents another major opportunity. Dietary strategies can modify the fatty-acid profile, antioxidant content, pigmentation and other nutritional characteristics of eggs. Omega-3

fatty acids, carotenoids, vitamin E, selenium and selected phytochemical compounds have demonstrated potential for producing value-added eggs and supporting physiological functions of laying hens.

At the same time, botanical feed additives such as thyme, turmeric, ginger and fenugreek provide promising avenues for nutritional modulation of antioxidant status, immunity, gut health and egg quality. Nevertheless, their application should be based on scientifically validated inclusion levels, standardized products, safety evaluation and economic assessment rather than on the assumption that all natural products are automatically beneficial.

Ultimately, the next generation of table egg production should move from a single-trait production model to an integrated biological and sustainability model which focuses on Superior Genetics, Precision Nutrition, Healthy Gut, Appropriate Housing, Welfare, Biosecurity, Productive Longevity and High-Quality Eggs. This integrated approach represents a scientifically sound pathway for the future development of the table-egg industry.

**Ankit Bansal**

Director
Business Development,
Rudrapur Solvents Private Limited

Why the protein number can mislead

Poultry-feed decisions are often made quickly. A supplier quote looks attractive, the crude-protein value appears acceptable and the material is cleared for use. Yet crude protein alone cannot tell a buyer whether a DORB batch will support a consistent formula. The more useful question is whether the protein is available, stable and supported by the rest of the quality pattern.

Crude protein is calculated from nitrogen. It is therefore a screening figure, not a complete verdict on digestible nutrition. Two batches can show a similar protein percentage and still behave differently if their processing history, fibre, moisture, ash or contamination are not alike.

1. Live protein: useful nutrition in a balanced batch

For buyer awareness, live protein means protein that remains nutritionally useful after processing and can contribute to the diet as intended. It should be considered with a fresh smell, uniform colour, free-flowing texture, controlled moisture and a sensible fibre value. The word is an educational description, not a separate laboratory test or a promise of a

Live, Dead Or False? Understanding Protein Quality In Dorb For Poultry Feed

A protein percentage is a starting point. The poultry buyer must still ask whether that protein is usable, stable and honestly represented.

particular performance result.

A good report should therefore be read as a pattern. Protein above 15 percent is only one part of the review; fibre, sand silica, total ash, acid-insoluble ash (AIA), moisture and, where relevant, aflatoxin complete the discussion.

2. Dead protein: when processing and storage reduce confidence

Protein can lose practical value when raw material, heating, moisture or storage conditions are poorly controlled. Poultry diets are energy-sensitive, so a batch that carries excess fibre or has suffered deterioration may dilute usable nutrition even when the headline protein number still looks acceptable. Local heating, clumps, musty odour or uneven bags are reasons to pause and investigate.

This is why a receiving check should continue after the laboratory report arrives. Compare the report with the actual lot, inspect multiple bags, verify storage conditions and retain a sealed reference sample. A batch should not be judged by a number disconnected from its physical condition.

3. False protein: a nitrogen number without the right nutrition

False protein is the most important warning in this discussion. Because crude protein is estimated through nitrogen, non-protein nitrogen or other adulteration can make the percentage appear stronger than the usable nutrition really is. Urea is a serious example: it can inflate a protein reading, but it is not a substitute for the protein and

energy balance required in poultry diets and can create safety concerns.

A buyer who sees an unusually high protein result should ask whether fibre, ash, AIA, moisture, smell and animal response support it. If the numbers do not tell a consistent story, the right response is further testing and qualified review—not automatic approval.

A poultry-safe decision routine

Before approving a DORB lot, compare the batch-specific report with the purchase specification. Take small portions from multiple bags and stack positions, mix them properly and retain a sealed counter-sample. Check that bags are stored on pallets, away from walls, with airflow around the stack and a first-in, first-out system.

Finally, let the qualified nutritionist decide how the ingredient fits the complete ration. DORB is not a one-for-one replacement for every protein or energy ingredient. Its value appears when quality is controlled, the formula is balanced for the birds and the result is tracked through feed conversion, growth, egg production or other agreed measures.

The practical takeaway

A poultry buyer does not need to reject DORB because one number raises a question. The buyer needs a disciplined method for answering that question. Read protein with fibre, sand silica, AIA, moisture, ash, physical signs and records. Good suppliers should welcome this level of attention. Quality awareness protects the farmer first and helps the feed programme remain predictable.



Managing *Mycoplasma gallisepticum* in Poultry: The Continuing Case for Tiamulin



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Product Manager,
Concept Pharmaceutical Ltd.

Introduction

Mycoplasma gallisepticum (MG), the agent behind chronic respiratory disease (CRD), remains one of the most economically damaging infections in poultry production worldwide. Its impact rarely stops at a cough or nasal discharge growth retardation, poor feed conversion, higher condemnation rates at processing, and depressed egg production all follow, often worsened by secondary invaders such as *E. coli* and viral co-infections like infectious bronchitis. Control relies on a combination of biosecurity, vaccination, and medication, but each tool has limits: vaccination does not guarantee protection, and eradication of positive flocks is not always feasible. This leaves antimicrobial therapy as an indispensable part of practical MG management.

For over three decades, tiamulin a semisynthetic pleuromutilin antibiotic has been a cornerstone of that therapy. As product manager at Concept Pharmaceutical Ltd., I'm often asked about dosing, expected efficacy, and how tiamulin compares with combination therapy involving tetracyclines. This

article draws on three peer-reviewed sources a controlled dose-titration challenge study, a drug-compatibility review, and a pharmacokinetic/pharmacodynamic (PK/PD) study to summarize the evidence and translate it into practical guidance.

The Scale of the Problem

MG infection can reduce egg production by 10–20%, raise embryo and chick mortality by 5–10%, and depress weight gain and feed conversion by a similar margin. Because MG rarely operates in isolation, secondary bacterial invaders frequently complicate the clinical picture, transforming a manageable respiratory infection into more severe systemic disease. Because complete eradication through medication alone is unrealistic elimination of MG from all birds in an infected flock is generally not achievable treatment is best understood as a way to control clinical disease and limit economic losses, not to eliminate the organism from the flock entirely.

How Tiamulin Works

Tiamulin binds the 50S ribosomal subunit of the bacterial ribosome at the peptidyl transferase center, blocking correct positioning of tRNA and halting bacterial protein synthesis. This mechanism gives it strong activity against *Mycoplasma* species, including *M. gallisepticum*, *M. synoviae*, *M. meleagridis*, and *M. iowae*, as well as *Brachyspira spirochaetes* and various gram-positive organisms. Notably, MG has shown almost no meaningful resistance development to tiamulin over 25 years of surveillance data, making it one of the more resistance-stable options in the poultry antimicrobial toolkit a track record few other antimicrobial classes can match. It is available in multiple formulations, including soluble powders, drinking-water solutions, and medicated feed premixes, giving flexibility across different flock sizes and infrastructure.

Dose-Titration Evidence

A two-trial challenge study at Ghent University tested tiamulin against a wild-type MG field strain in broilers, comparing monotherapy doses (Trial 1) and a tiamulin–chlortetracycline combination (Trial 2). **Trial 1** compared 10 mg/kg and 25 mg/kg body weight tiamulin, given via drinking water for five days, against an untreated control. **Trial 2** compared two combination doses 6.25 mg tiamulin/18.75 mg chlortetracycline per kg, and 12.5 mg tiamulin/37.5 mg chlortetracycline per kg again against an untreated control.

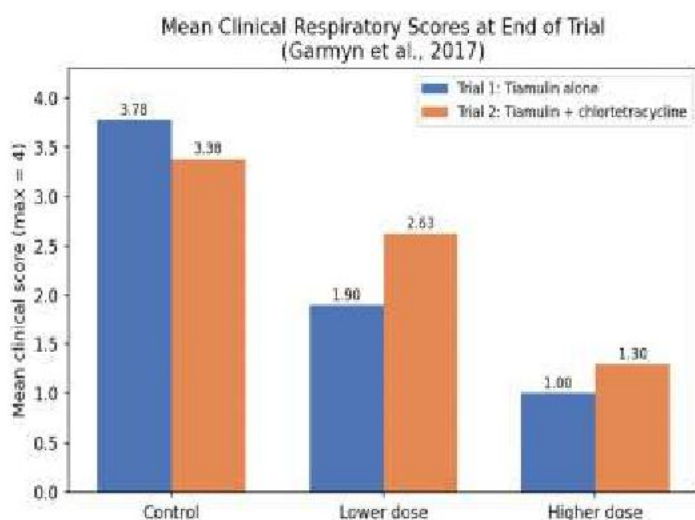
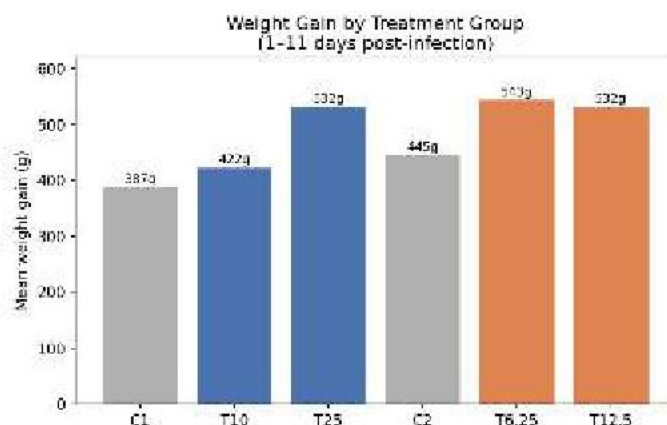


Figure 1. Mean clinical respiratory scores at the end of each trial (max score = 4). Higher tiamulin doses, alone or combined with chlortetracycline, produced consistently lower scores. Source: Garmyn et al., 2017.

As Figure 1 shows, untreated birds in both trials developed severe, sustained respiratory disease, with mean clinical scores approaching the maximum possible score of 4. Tiamulin treatment reduced these scores substantially in every group, but the effect was clearly dose-dependent: the higher tiamulin dose (25 mg/kg alone, or 12.5/37.5 mg/kg in combination) consistently outperformed the lower dose. The 25 mg/kg group also achieved significantly greater reductions in tracheal MG genomic equivalents a 4 log₁₀ reduction relative to controls at six days post-infection along with lower lesion incidence at necropsy (37% vs. 96% in controls at 11 days post-infection).

Weight gain followed the same pattern, as shown in Figure 2 below.

Figure 2. Mean weight gain (grams) by treatment group, 1–11 days post-infection. Every treated group outgained its untreated control. Source: Garmyn et al., 2017.



Every treated group outgained its respective untreated control, with the higher-dose groups (T25 and T12.5) showing the largest, most consistent gains. Based on these combined clinical, microbiological, and performance outcomes, the study's authors recommended the 25 mg/kg, five-day tiamulin regimen for clinical MG infections or, where a tiamulin-sparing approach is preferred, the 12.5/37.5 mg/kg tiamulin–chlortetracycline combination, which achieved comparable control using less than half the tiamulin dose. This dose-sparing effect reflects the synergistic activity previously reported when chlortetracycline (acting at the 30S ribosomal subunit) is combined with tiamulin.

Pharmacokinetic/Pharmacodynamic Insights

A separate PK/PD study used a neutropenic chicken model to characterize tiamulin's exposure–response relationship more precisely. Following intramuscular dosing at 5, 40, and 80 mg/kg, tiamulin was rapidly absorbed, reaching peak serum concentrations within about 10 minutes, with an elimination half-life of roughly 1.15–1.39 hours. The area under the concentration–time curve (AUC_{24h}) rose in a tightly dose-dependent, linear fashion, allowing researchers to model the AUC_{24h}/MIC ratio the standard PK/PD index for this drug class against observed bacterial reduction.

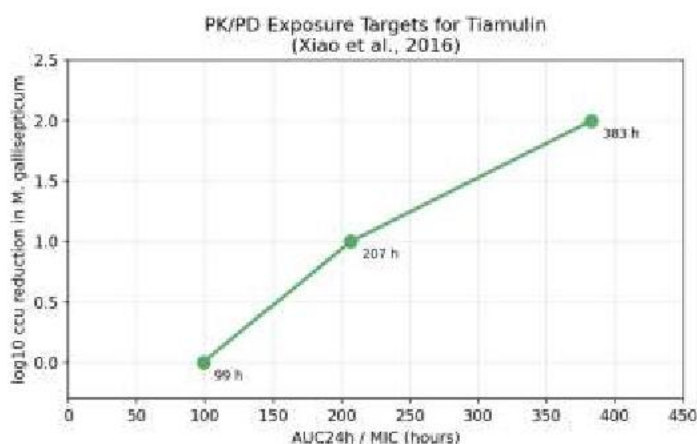


Figure 3. AUC24h/MIC exposure needed for increasing reductions in *M. gallisepticum* load. Higher exposure produced progressively greater bacterial kill. Source: Xiao et al., 2016.

As Figure 3 illustrates, increasing AUC24h/MIC exposure produced progressively greater reductions in MG counts: roughly 99 hours to simply halt bacterial growth (mycoplasmaemia), about 207 hours for a 1 log₁₀ reduction, and about 383 hours for a 2 log₁₀ reduction. Translating this into a dosing recommendation, the researchers calculated that approximately 45 mg/kg body weight for three days would be needed to achieve near-maximal antibacterial effect against a strain with an MIC₉₀ of 0.03 µg/mL — notably, tiamulin never achieved a full mycoplasmaicidal (3 log₁₀) effect even at higher exposures, reinforcing that treatment goals should center on disease control rather than complete pathogen clearance. The study also flagged a safety ceiling: doses above 60 mg/kg triggered transient neuro-toxic signs, though no deaths occurred even at 80 mg/kg.

Drug Compatibility: A Critical Field Consideration

No discussion of tiamulin in poultry is complete without addressing ionophore anticoccidial interactions, since most broiler feed programs include one. Tiamulin has a well-documented, dose-dependent, and sometimes lethal interaction with monensin, narasin, and salinomycin thought to arise from tiamulin's inhibition of hepatic cytochrome P-450 3A enzymes, which causes ionophore levels to build up to toxic concentrations even at normal use rates. Signs range from loss of appetite and ataxia to

fatal myopathies and cardiomyopathies.

The interaction is considerably milder with maduramicin and semduramicin, typically causing only temporary, reversible dips in weight gain and feed intake. Tiamulin is, by contrast, compatible with lasalocid, confirmed in both laboratory and field studies making it the safer ionophore pairing where tiamulin therapy is anticipated. On the positive side, tiamulin's synergy with tetracyclines such as chlortetracycline and doxycycline is well established, forming the pharmacological basis of the dose-sparing combination therapy discussed above.

From a residue standpoint, tiamulin is rapidly metabolized and cleared, generally requiring a withdrawal period of around 72 hours for meat, with a zero-withdrawal period for eggs granted in several EU states.

Practical Recommendations

Pulling this evidence together, for confirmed or strongly suspected clinical MG infection, a five-day, 25 mg/kg body weight tiamulin regimen via drinking water offers the most reliably effective monotherapy option, and is preferable to lower doses that control clinical signs but leave pathogen loads only partially reduced. In flocks already receiving ionophore anticoccidials the majority of commercial broiler operations monensin, narasin, and salinomycin should generally be avoided alongside therapeutic tiamulin dosing given the well-documented risk of toxic interaction; lasalocid is the safer pairing, and maduramicin or semduramicin carry only mild, reversible risk. Where minimizing tiamulin exposure is a priority for cost reasons, stewardship, or ionophore compatibility the 12.5/37.5 mg/kg tiamulin–chlortetracycline combination offers a well-supported, dose-sparing alternative that achieves comparable clinical control. Finally, treatment should be initiated as promptly as possible once infection is suspected, and expectations should be set accordingly, tiamulin controls and ameliorates MG disease effectively, but it does not eliminate the organism from the flock, so biosecurity and vaccination remain essential complements.

Conclusion

Mycoplasma gallisepticum remains a formidable, costly challenge for poultry producers, but the evidence supporting tiamulin as a frontline treatment continues to strengthen. Dose-titration trials confirm that higher, well-targeted dosing alone or in combination with chlortetracycline delivers meaningfully better clinical and production outcomes, while PK/PD modeling helps fine-tune exposure targets. Used as part of a broader strategy that also accounts for anticoccidial compatibility and sound biosecurity, tiamulin remains one of the most reliable tools available for managing this persistent pathogen.

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EVENT CALENDER

OCTOBER 2026



WVPA Asia Meeting
9-10 October 2026 New Delhi, India
Contact: Dr B Barmandr.barman@gmail.com
www.wvpaasiameeting2026.com



Aghena Middle East
15-17 October 2026 | Cairo, Egypt
E: maarcservices@gmail.com
M: +91 8295733669



October 15-17
An international poultry and livestock management and production exhibition.



Vietstock Expo & Forum
21-23 October 2026 Ho Chi Minh City, Vietnam
www.vietstock.org

SEPTEMBER 2026



AgriLivestock & Feed Taiwan
8-10 September 2026
TaiNEX 1, Taipei, Taiwan
TAIWAN SMART AGRIWEEK
info@taiwanagriweek.com
W: taiwanagriweek.com/en/about/agrilivestock/



CLFMA of India
59th AGM and 67th National Symposium 2026
11-12 September 2026
The Leela, Mumbai
admin@clfma.org



PFI 37th AGM
23-24 September 2026
Hotel Grand Hyatt, Kochi (Kerala)
www.poultryfederation.org
M: 85752 22224



Mediterranean Poultry Summit 2026
September 27-30, 2026.
Held at the University of Split, Croatia, featuring scientific updates on poultry production in the region. Aghena Middle East 2026:

NOVEMBER 2026



EuroTier
10-13 November 2026
Hanover, Germany | W: <https://www.eurotier.com/en/>



25-27 NOVEMBER-POULTRY EXHIBITION
Poultry India Expo 2026 | Knowledge Day-24 Nov. 2026
Venue: HITEX Exhibition Complex, Hyderabad
Phone: 7997994338/1/2 Email: office3@poultryindia.co.in, president@poultryindia.co.in web: www.poultryindia.co.in



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Introduction

The poultry sector in India has emerged as a vital component of agriculture, reflecting significant growth and productivity (Pant et al., 2025). India ranks second in global egg production and fourth in broiler meat output, underscoring its role in food security and nutrition (Narayan Murigeppa et al., 2024). This growth is driven by favorable climate, rising domestic demand, and technological advancements (Kunal et al., 2017).

Between 2018–19 and 2024–25, egg production increased by 44% (103.8 to 149.11 billion eggs), while per capita availability rose by 34% (79 to 106 eggs/person/year) (BAHS, 2025). However, annual growth rates have slowed—from 10.19% in 2019–20 to 4.44% in 2024–25—indicating possible market saturation and rising production challenges (BAHS, 2025).

Improved poultry breeds

Import and Export of Poultry Products in India : An Overview

dominate production, contributing 86.35% of total eggs, while commercial systems account for 84.49%, reflecting the shift toward organized farming (BAHS, 2025). Egg production is concentrated in southern states, with Andhra Pradesh, Tamil Nadu, and Telangana contributing ~47% of total output (BAHS, 2025).

Poultry also plays a dominant role in the meat sector, contributing 49.47% of total meat production, with total meat output reaching 10.50 million tonnes in 2024–25 (BAHS, 2025). Exports of meat, dairy, and poultry products increased by 12.57% to USD 5.09 billion, highlighting growing trade potential (BAHS, 2025).

Feed costs, accounting for ~67% of production expenses, remain a major constraint, especially due to competition with biofuel policies affecting maize availability (Katu et al., 2025). Growth in the sector is further supported by improved breeding, feed management, and expansion of commercial farming in major states (Liverpool-Tasie et al., 2019).

The industry comprises broiler (meat) and layer (egg) systems, supported by government initiatives such as the Rural Backyard Poultry Development Programme (RBPDP) and National Livestock Mission

(NLM), which promote organized production. Strengthening of cold-chain infrastructure, processing facilities, and adherence to international standards like ISO, HACCP, and FSSC-22000 has improved India's global competitiveness (Annoff & Reddy, 2023; Liverpool-Tasie et al., 2019).

As domestic and international demand in the poultry commodities is burgeoning, the poultry sector in India is creating vast opportunities to farmers and entrepreneurs and other investors alike to produce commodities and export them (Deshmanya & Jainuddin, 2023). However, despite the fact that the country stands at a forefront position among the world poultry producers, its international trade is still disproportionately poor with regard to its domestic production.

1. Export Dynamics of Indian Poultry Recent Export Performance (2024-2025)

The Ministry of Commerce and Industry released data that India exported US\$ 607.84 million worth of meat, dairy and poultry products in January 2026, which was 17.92 per cent higher than the US export of US 515.47 million (approximately US 0.52 billion) in January 2025. Export in terms of Indian rupee was 5,519.15 crore in January, 2026

which indicates a strong increase in dollar value as well as rupee value. The total exports over the accumulative period between April 2025 and January 2026 stood at US\$ 5,193,01 million exports and this is a significant growth of 24.78 percent compared to the same period immediately preceding the current fiscal year and is hence an indication of a healthy and growing export performance by the meat, dairy and poultry industry in India.

According to Ministry of Commerce and Industry, United States became the main destination, with the export volume of USD 6,596.11 (million) followed by the United Arab Emirates with USD 3,971.01 (million). The exports to China were USD 1,637.89 million USD, the Netherlands USD 1,224.58 million USD, and the United Kingdom USD 1,075.33 million USD. Other interesting markets were Germany (USD 1,011.99 million) and Saudi Arabia (USD 1,036.66 million). All these numbers serve to reiterate the fact that the export trade in India is highly concentrated in North America, the Middle East, Europe, and East Asia with the United States and the United Arab Emirates reigning supreme in the export market in January 2026.

Destination Market Analysis

In a comparative analysis of poultry products especially the eggs and processed meat. There is an evident form of dominance of Indian poultry products in the markets that cover the Middle East and Southeast Asia and

their immediate areas. Major destinations include Oman, the United Arab Emirates, Saudi Arabia and other members of the Gulf Cooperation Council. Southeast Asian emerging markets, especially Indonesia and the Philippines, are expressing increased demand on Indian poultry commodities. At the same time, the United States has become a potential market, and recent trade talks have opened up new possibilities of participation.

Product-Wise Export Composition

India's poultry exports comprise several categories:

- Eggs and egg products: Including shell eggs, egg powder, and liquid eggs
- Poultry meat: Frozen chicken and processed poultry products
- Value-added products: Ready-to-cook and marinated items

According to the Directorate General of Commercial Intelligence and Statistics (DGCIS), the export of albumin that included eggs and milk to India was worth US\$ 18.34million in recent trade statistics; the value of poultry products was US\$ 168.77million.

Strategic Market Opportunities

India stands in an ideal position to achieve a higher market share in the given global poultry trade landscape. The recently established India-United States trade structure has triggered discussions on the market

access issue, in which India will protect its sensitive industries and at the same time explore opportunities to increase the poultry product exports. In addition, active participation in the multilateral forums and bilateral trade negotiations by India keeps opening new markets.

Indian Egg Exports Trade Problems

a) Hong Kong Suspensions (2025)

Due to recent outbreaks of H5N1 avian influenza that have been reported in some districts in India, Hong Kong has undertaken selective importation suspensions against poultry eggs coming out of these affected areas. Key suspensions include:

- Uttarakhand (Udham Singh Nagar) Banned on December 4, 2025, after the outbreak of avian flu had been announced.
- West Godavari and other districts in Andhra Pradesh: Suspended in March 2025
- Rampur and Gorakhpur districts, Uttar Pradesh Suspended in October 2025.

These measures are implemented under a bilateral protocol with India that requires immediate shipment halts upon World Organisation for Animal Health (WOAH) notifications and health certificates for compliance. The Centre for Food Safety in Hong Kong actively monitors outbreaks for potential resumption of trade, minimizing broader trade impacts unlike quota-based systems elsewhere. As a result of these restrictions

and broader market access challenges, no overall egg imports from India were recorded in 2024-2025.

b) Nigeria Import Restrictions

In this report, the implications of the Nigeria importation restrictions on eggs and live or dead poultry to Indian exporters is outlined, illustrating that such policy interventions have a direct negative effect on the access of a key African market. The text explains the motive to protect local producers, through a stringent examination of protectionist practices by the Nigerian government, which increases the competition pressure on Indian products. This market uncertainty is then placed in the context of the overall dynamics of international trade where it is clear that strategic adjustment by exporters in these regulatory changes is necessary.

c) Oman Import Restrictions

The move by Oman to stop the issue of granting new import authorizations to calls of Indian table eggs is a collateral blow to the poultry industry in Namakkal, Tamil Nadu, which is one of the renowned poultry export centers in India. This ban is largely an answer to bio-security concerns, most prominently the dangers of avian flu, due to the recent outbreaks of bird-flu in India. This limitation has thus significantly reduced the availability of the Gulf market to India which has long been a major market destination of Indian eggs.

Opportunities in African Markets

The growth of imports of eggs and poultry products in 2020 to 2024 in various African countries has been impressive as indicated by the following compound annual growth rates:

- Ivory Coast: 14 % CAGR
- Senegal: 13 % CAGR
- Uganda: 57 % CAGR
- Nigeria: 63 % CAGR (despite restrictions)

These countries pose considerable emerging opportunities to the Indian exporters despite their relatively small market sizes in comparison with the traditional markets. The high urbanisation rates, population growth and rising disposable income in the areas are potential drivers of the demand of cheap sources of protein especially the eggs.

India's Cost Advantage

India has a very strong cost advantage in the production of hen eggs, and this might provide it with an easy time to extend its export business operations to African markets.

Indian egg price: Approx. \$0.08/kg.

Import prices in African market:

- Belgium: \$8.3/kg
- Brazil: \$4.59/kg
- Turkey: \$2.7/kg

A sharp price gap makes India a very competitive supplier and it can afford to offer eggs at considerably low prices without compromising on quality.

India's Opportunity in Egg Exports to Uzbekistan

Recently Uzbekistan has liberalized its market to foreign poultry suppliers. The national production is only short by 6.7 billion eggs which drives greater imports. This forms a major opportunity to the Indian exporters to reach the Central Asian market.

Source: CRISIL Monthly Dashboard – Eggs, November 2025

2. Import Regime and Input Supply Chain

Import Policy for Poultry Products (Protected Status)

India has a protective importation regime on poultry produce, which is allegedly to protect the local producers, rural population, and the general food security domain. Therefore, commodities that can be considered especially delicate, i.e. poultry, dairy, cereals, and large fruit and vegetable groups, have been explicitly excluded in the nascent India-United States trade agreement a step that will prevent the negative effects on the local agriculture.

Limited Animal Feed Imports (DDGS from USA)

India has established a restricted import policy on dried distillers grains with solubles (DDGS) produced in the United States and has placed a limit of about 1 percent of the total feed intake in the country, which is approximately 50 million tonnes annually. The policy will aim at balancing the interests of domestic farmers and the

increasing demand of animal-feed sector since DDGS is a high-protein nutritionally valuable feed commodity that can be used to nourish both poultry and livestock production.

Feed Costs, Policy Impacts, and Trade Issues

In poultry production, feed represents about 60% to 70% of the total cost and the major parts of the feed include maize (about 20 million tonnes), wheat (about 6.5 million tonnes) and soybean meal (about 6.2 million tonnes) which are the largest proportion of the national consumption of 50 different types of feed (about 50 million-tonnes of daily feed consumption in India). An increased price pressure and the shift of maize to cattle-fed generation is afflicting the domestic feed supply chain, increasing competition between the feed and biofuel industries and forcing the importation of feedstuffs and corn. In spite of the use of importation of distillers dried grains with solubles (DDGS) as a buffer to relieve feed deficit, some farmer organisations have expressed concerns that these imports could lower native oilseeds, especially the soybean and mustard. More so, the agricultural trade matters pose a relevant point of friction in Indo-US relations, which is demonstrated by the sharp differences in tariffs on alcohol, dairy, meat, and processed food products (Takshashila Discussion Document, 2025).

3. Regulatory bodies governing poultry trade in India

The official Export -certification body of the Indian country is the **Export Inspection Council (EIC)** that ensures the quality and safety of goods exported to India. EIC was established by the Government of India under the Section 3 of the Export (Quality Control and Inspection) Act, 1963 with the aim of proper development of export trade of India by way of quality control and inspection and other related issues. EIC is supposed to make sure the products reported under the Export (Quality Control and Inspection) Act 1963 are satisfying the needs of the countries they are sold to in terms of their quality and safety. EIC offers compulsory certification to egg products, meat and meat products and poultry meat products. EIC is the the only Indian organization that has international acceptability.

The Agricultural and Processed Food Products Export Development

Authority (APEDA) was established by the Government of India under the Agricultural and Processed Food Products Export Development Authority Act passed by the Parliament in December, 1985. APEDA has been serving the agri-export community for the last 37 years. APEDA has been entrusted with the responsibility of export promotion and development of Poultry and Poultry Products.

Sanitary Import Permit (SIP - issued on high-risk products)

High risk livestock products are also issued a Sanitary Import Permit (SIP) under the management of the Animal Quarantine and Certification Services (AQCS), which is under the department of Animal Husbandry and Dairying (DAHD) of the Ministry of Fisheries, Animal Husbandry and Dairying. In particular, these items include all types of meat and meat items, egg-based items, as well as fish-based items, thus allowing these products to be of high sanitary and animal health quality before entering the domestic market.

DAHD is the nodal agency of animal-health regulation in India and the National Enquiry Point of Sanitary and Phytosanitary (SPS) measures in the framework of the World Trade Organization. It controls the conditions of importation of live poultry, hatching eggs, egg product and poultry meat by issuing Sanitary Import Permits (SIP) and prescribing Veterinary Health Certificate. The latest draft veterinary health certificates, which are dated August 2025, require disease-free status of Avian Influenza and Newcastle Disease Virus (NDV), compliance with WOA, high standards of biosecurity and post-importation inspection shall be conducted by the Association of Quarantine and Control Services (AQCS).

FSSAI offers broad guidelines and food standard parameters of poultry meat, poultry products, and egg products- including definitions, microbiological limits, hygienic, and labelling

specifications- that are obligatory concerning domestic food safety as well as those that are relevant to imports in order to meet the Indian food safety standards.

Directorate General of Foreign Trade (DGFT) has been constituted as an agency of the Ministry of Commerce and Industry of India to regulate and facilitate the importation and export of poultry products as provided by the Foreign Trade Policy (FTP). It acts as the leading body in the issuance of licences, harmonisation of quality levels, and in the provision of fiscal and non-fiscal incentives to facilitate the whole range of the poultry trade- live fowl, eggs and processed meats.

4. Trade Barriers Tariff Differentials on Agricultural Products

The Global Trade Research Initiative (GTRI) data cited in the Takshashila document provides detailed tariff differentials for agricultural products: Sector Tariffs faced by US Exporters in India (%) Tariffs faced by Indian Exporters in the US (%) Tariff Differential (%) Alcohol, wines 124.582.49122.1 Dairy Products 39.781.5438.23 Fish, Meat, Frozen, Processed 28.420.5927.83 Live Animals, Products 28.40.6627.75 Processed food, sugar, cocoa, preparations 29.664.6724.99 Source: GTRI, cited in Takshashila Discussion Document 2025-06, p. 13*

These figures demonstrate that meat, fish, frozen and processed

poultry products face a tariff differential of nearly 28 per cent, making them a key area of interest for US exporters seeking market access to India.

Non-Tariff Barriers Affecting Poultry Trade

India's poultry trade with the US is influenced by key non-tariff barriers, including mandatory import licensing for livestock products, religious and cultural restrictions (such as bans on products from animals fed blood meal or organ-based feed), and strict Quality Control Orders (QCOs) that require compliance with Indian standards and allow factory inspections, making market access more complex for US exporters.

5. RECENT POLICY DEVELOPMENTS AND TRADE AGREEMENTS

India-US Interim Trade Agreement (February 2026)

The United States and India released an interim framework for a trade deal in February 2026, paving the way for an agreement that would lower tariffs and deepen economic co-operation. The joint statement indicated that New Delhi pushed back against Washington's efforts to broadly open its agricultural market, with all sensitive commodities, including spices, grains, dairy, poultry, and major fruits and vegetables, excluded from the proposed deal.

DDGS Import Liberalization: A Calibrated Approach

Under the trade framework, India agreed to provide quota-based duty concessions on DDGS

to the US, as the animal husbandry and poultry industry specifically requested this product due to its high nutritional value. The quota is limited to 5 lakh tonnes (500,000 tonnes), representing only 1% of India's total feed consumption of 500 lakh tonnes.

New Veterinary Health Certificate Requirements (October 2025)

In October 2025, India notified the World Trade Organization of a draft veterinary health certificate for the import of live poultry, day-old poultry, and hatching eggs into India (Notification **G/SPS/N/IND/335**). This document, based on World Organization for Animal Health (OIE) guidelines, establishes the sanitary requirements for such imports and reflects India's commitment to disease prevention while maintaining regulatory transparency.

Changing Landscape of India-US Trade under Trump Administrations

India-US trade relations under Trump Administration 2.0 (2025 onwards) reflect a sharper continuation of earlier trends, with comparison to Trump 1.0 (2017-2021) showing how tensions have evolved. During Trump 1.0, the US imposed tariffs on steel (25%) and aluminium (10%) and withdrew India's GSP benefits affecting \$6 billion in exports, yet India's exports to the US still grew by 22% even as the US trade deficit rose from \$22 billion to \$33.1 billion. Building on this backdrop, Trump 2.0 has

adopted a more aggressive “America First” tariff approach focused on reducing trade imbalances, with the US trade deficit with India further expanding by ~117% to \$45.6 billion (2018–2024). In response, both countries are now moving towards a broader, macro-level Bilateral Trade Agreement (BTA), expected to include multiple sectors such as agriculture, marking a shift from reactive measures to structured trade negotiations.

6. STRATEGIC IMPERATIVES FOR EXPORT GROWTH

Market Diversification Strategies

The trade restrictions experienced in 2025 underscore the critical importance of market diversification for Indian poultry exporters. Key strategies include:

i. African Market Penetration

With several African nations witnessing robust import growth (Ivory Coast 14% CAGR, Senegal 13%, Uganda 57%, Nigeria 63%), Indian exporters should prioritize these emerging markets. India's significant cost advantage — with egg prices as low as **\$0.08/kg** compared to import prices of \$8.3/kg from Belgium, \$4.59/kg from Brazil, and \$2.7/kg from Turkey — positions the country as a highly competitive supplier.

ii. Central Asian Opportunities

Uzbekistan's market opening, with a production shortfall of 6.7 billion eggs, presents a major

opportunity for Indian exporters. By pricing eggs competitively at \$1,100–1,300 per ton FOB Chennai (Grade A, 55g+ clean shells), Indian exporters can undercut European suppliers while building long-term trade relationships through joint ventures and partnerships.

iii. Risk Mitigation Through Geographic Diversification

The concentration of export production in regions like Namakkal, Tamil Nadu, creates vulnerability to region-specific trade restrictions. Developing export capacity across multiple states — Andhra Pradesh, Telangana, Karnataka, and others — can help mitigate the impact of targeted suspensions such as those imposed by Hong Kong on specific districts.

CONCLUSION

India's poultry trade landscape is characterized by a robust regulatory framework, growing export performance, and strategic policy interventions that balance domestic farmer protection with international market engagement. The Export Inspection Council, APEDA, and Animal Quarantine Services provide the institutional backbone for quality assurance and certification.

Recent production statistics demonstrate the sector's strength, with egg production reaching 149.11 billion eggs and meat production hitting 10.50 million tonnes in 2024–25. Poultry contributes nearly half of India's total meat production, underscoring its critical

importance in national protein supply.

The February 2026 India-US interim trade agreement represents a calibrated approach: no duty concessions on poultry and dairy products, ensuring protection for millions of farmers, while limited imports of feed ingredients like DDGS address domestic supply constraints without threatening local production. The DDGS import quota of 500,000 tonnes (1% of total feed consumption) is designed to reduce feed cost volatility and support the poultry industry's competitiveness.

With agricultural exports showing strong growth — meat, dairy, and poultry products exports increasing by 12.57% to \$5.09 billion in 2024–25 — the poultry sector is poised for continued expansion. States like Andhra Pradesh, Tamil Nadu, Telangana, West Bengal, and Karnataka remain at the forefront of production, together contributing over 64% of national egg output.

The message from policymakers is clear: India's poultry sector will engage with global markets on its own terms, protecting domestic livelihoods while strategically positioning itself as a reliable supplier in the international protein trade. The calibrated approach to input liberalization, coupled with protection of sensitive finished products, provides a sustainable pathway for growth.



Soy Connex 2026 Strengthens Global Collaboration for Sustainable Food & Feed Security - *Ricky Thaper*

Chicago, Illinois & Des Moines, Iowa, USA | August 04-10, 2026

The U.S. Soybean Export Council (USSEC) organised Soy Connex 2026 at the Hyatt Regency, Chicago, bringing together more than 800 participants from 60 plus countries around the globe from animal nutrition, feed, food and agribusiness sectors. The flagship summit provided an important platform for international collaboration, market intelligence, sustainability, innovation and discussions on strengthening global food, feed and nutritional security.

The program also included interactions with U.S. soybean growers, farm visits in Illinois and States, USA, the Soy Excellence Center (SEC) 2026 Top Achiever Recognition Award Ceremony, a Risk Management and Market Awareness Workshop and a technical visit to Kent Feed Mills, Iowa State University.

As part of the program, the delegation visited Jeff O'Conner Farm in Illinois State and interacted with Mr. Jeff O'Conner, a sixth-generation soybean grower and Board Director of the Illinois Soybean Association.

Photo 1

The visit provided valuable insights into sustainable soybean production, advanced genetics, precision agriculture, technology adoption and environmental stewardship. Interactions with members of the Illinois Soybean Association during the Illinois Soy Reception



further highlighted the importance of farmer-led institutions, strategic planning and public-private partnerships in developing a resilient soybean value chain.

The Soy Excellence Center (SEC) 2026 Top Achiever Recognition Award Ceremony was another important highlight. Ms. Anne Meis, Chair, SEC Global Advisory Panel (GAP) welcomed participants, followed by remarks from Mr. Brent Swart, SEC GAP Secretary, and Mr. Mike McCranie, USSEC Chair.

Photo 2

A proud moment for India came when Dr. Vijay



Anand E. Pilli, Center Lead, Soy Excellence Center-India, highlighted the achievements of the SEC -India. The STAR Award was presented to Dr. Pragati Salutgi in recognition of her outstanding contribution. Mr. Jim Sutter, CEO, USSEC appreciated the contributions of SEC Global Advisory Panel and Regional Advisory Council Members.

Photo 3

During a special media interaction attended by more than 20 international journalists, Mr. Mike McCranie, Chair, USSEC Board of Directors shared the perspective of U.S. soybean farmers and while

reflecting on life as a soybean farmer, he shared a powerful thought “We love to produce crops and watch them grow. But what we really love is seeing



our crops feed people around the world. That is, without question, the most gratifying part of being a farmer.” His words beautifully captured the true purpose of agriculture—feeding the world.

Photo 4

Mr. Jim Sutter, CEO, USSEC, emphasized that Soy Connex 2026 with 800 plus registrations is more than a conference—it is a global platform for collaboration, innovation and sharing scientific insights. Mr. Sutter highlighted that U.S. Soy combines superior feed performance, verified sustainability and a highly reliable supply chain, positioning it to meet the world’s growing demand for protein. With global soybean import demand projected to rise significantly and a record U.S. soybean crop expected this year, the outlook for U.S. Soy remains exceptionally strong. Mr. Jim Sutter added U.S. Soy supply chain is backed by highway, rail, river and barge logistics that buffer supply when a buyer needs it, we deliver it. The world needs more protein and more oil for decades to come and U.S. Soy delivers both reliably, sustainably and at a value buyers can trust.



Photo 5

Post Media interaction, I had insightful discussions with Mr. Kevin Roepke, Executive Director, USSEC -



Middle East, North Africa & South Asia (MENASA), highlighted that SoyConnex2026 once again demonstrated U.S. Soy leadership in enabling sustainable food and feed systems worldwide. Mr. Kevin Roepke added Soy Connex has established itself as the world’s premier globally recognized soy event. Every year, it gets bigger and better and we are proud to see that this year we had over 800 participants join us from across the world. Apart from the stellar agenda and amazing speaker lineup, this conference also gives us the opportunity to network with the industry veterans, customers, U.S. soybean farmers, USSEC members and more. It represents what USSEC stands for: strengthening partnerships, fostering relations and building a preference for U.S. Soy across the world. These in person engagements build trust, emphasize the importance of supply chain resilience. Insatiable demand for both protein and oil is setting an exciting stage for the conversations and discussions being held. To that end, U.S. Soy plays a pivotal role in improving nutrition security across the world, while doing so in an environmentally sustainable and responsible manner.

Mr. Franklin Manuel, Country Lead-India, USSEC described the engagement as a truly rewarding experience, emphasizing that the high-level interactions strengthened understanding and relationships across the U.S.–India soy value chain. The discussions opened new avenues for trade, innovation, sustainability and market development, while creating a stronger foundation for future soy cooperation and advocacy.

During networking reception my discussions with

farmer leaders from American Soybean Association (ASA), United Soybean Board (USB) and U.S. Soybean Export Council (USSEC), reinforced one key message: international collaboration is essential to building resilient, sustainable and nutrition-focused food systems.

Global Leaders Share Perspectives on the Future of Soy during Soy Connex 2026 Conference

Soy Connex 2026 - Where Bright Minds Connect, commenced with welcome and opening remarks by Mr. Mike McCranie, Chair, USSEC Board of Directors.

Photo 6

Ms. Colby P., Executive Director, International Strategy, USSEC, introduced Ms. Michelle Caruso-



Cabrera, CEO, MCC Global Enterprises, CNBC Contributor, who spoke on “Global Forces at Play: Geopolitics, Trade & the Future of Soy.” Mr. Tanner Ehmke, Lead Economist, CoBank, presented “The Global Soy Outlook: Supply, Demand & Market Signals.” A panel on “How It’s Growing: Inside the 2026 U.S. Soy Crop” featured Mr. Mike McCranie; Mr. Randy Miller, Director, USSEC; Mr. J. L. Scott Metzger, President, American Soybean Association; and Mr. Brent Gatton, Chair, United Soybean Board.

Photo 7 and Photo 8

On the last day of Soy Connex 2026, Mr. Daniel Whitley, Administrator, Foreign Agricultural Service, USDA, addressed the delegates, followed by Mr. Juan Luciano, CEO, ADM, who highlighted the importance of an integrated soy value chain covering origination, processing, logistics and merchandising. This was followed by break-out session and there were insightful presentations from other distinguished leaders across the global soy value chain.

Photo 9 and Photo 10

The summit concluded with remarks by Mr. Jim Sutter, CEO, USSEC, who emphasised the value of bringing U.S. soybean farmers, processors, traders,



agribusinesses and international trade teams together to exchange knowledge and explore new opportunities.

Photo 11

Mr. Sutter said attendees will depart with a clear perspective on the opportunities ahead and a look forward to what's next. Mr. Sutter announced that Soy Connex 2027 will be held in New York, USA, from August 16–18, 2027.





Photo 12

Post conference, the delegation visited Grubbs Lands & Cattle Farm in Iowa State, and had good interaction with Mr. Brock Grubbs, a sixth-



generation farmer producing soybean and corn across approximately 4,200 acres. The visit provided insights into precision agriculture, advanced genetics, technology and sustainable farming. Ms. Karen Long, Project Coordinator, Iowa Soybean Association, briefed the delegation on farming and sustainability practices.

Photo 13



Later the Trade Team visited the Kent Feed Mill and Grain Science Complex at Iowa State University, a modern facility integrating education, research, analytical laboratories and pilot-scale



feed manufacturing. Dr. Dirk Maier, Professor and Director, Kent Feed Mill and Grain Science Complex, Dr. Camille Schroeder, Associate Director and Mr. A S M Younus Bhuiyan Sabbir, Assistant Manager of Grain Center, briefed the delegation on advancements in feed technology, grain science, research and industry-academia collaboration.

Thanks to Mr. Kevin Roepke, Executive Director (MENASA), U.S. Soybean Export Council, Mr. Franklin Manuel, Country Team Lead – India, USSEC Ms. Deebea Giannoulis, Regional Food and Nutritional Security & Trade Strategy Leader–MENASA, USSEC, Ms. Hibah Ameer, Regional Communications Lead–MENASA, USSEC, Dr. Vijay Anand E. Pilli, Center Lead, Soy Excellence Center - SEC India, Dr. Ashesh Bhattarai, Market Lead–Nepal, Mr. Saram Bokhari, Country Market Lead–Pakistan, Mr. KhaBiBur RahMan, Country Market Lead–Bangladesh, Dr. Khurram Shahbaz, Regional Special Projects Facilitator, South Asia, Ms. Nikita Sharma, PMP, Ms. Dhanu Basavraj, Mr. Tara Singh Rawat and all other members of the USSEC team for organizing this highly educational and informative program and for providing members of the MENASA Trade Team with this valuable learning opportunity. Initiatives like these play a vital role in enhancing industry knowledge, strengthening international partnerships and fostering sustainable growth across the global food and feed sectors.



TCHS Edition 5: Advancing Poultry Towards a Future Without Antibiotics

Knowledge, Innovation and Industry Collaboration for the Next Generation of Poultry Farming



The Techno-Commercial Hybrid Seminar (TCHS) – Edition 5, organised by SS Agrow Tech, has further strengthened its position as a significant knowledge-sharing platform for India's poultry industry, bringing together leading academicians, industry experts, farmers, students, associations and technology providers from across the country.

With more than four decades of experience in the poultry industry, SS Agrow Tech has consistently looked beyond the present to anticipate the technological and operational needs of the industry. With a vision of taking Indian poultry farming towards globally accepted standards, the TCHS initiative was conceived as a platform

where pressing industry challenges could be openly discussed and practical solutions explored.

From Industry Challenges to Practical Solutions

The first four editions of TCHS addressed several critical issues confronting poultry farmers, including fly management, biosecurity, litter management and environmentally controlled (EC) houses. Each edition focused on an emerging challenge and brought together experts capable of offering practical, technology-driven approaches.

Continuing this journey, TCHS Edition 5 focused

on one of the most important subjects shaping the future of poultry farming — antibiotic-free farming and the advancements required to make it commercially and practically sustainable.

The seminar highlighted the importance of adopting improved management practices, nutrition, biosecurity, farm technology and scientific approaches to reduce dependence on antibiotics while maintaining bird health, productivity and profitability.

Eminent Poultry Experts Share Their Knowledge

The seminar was moderated by Dr. D. Chandrasekaran, MVSc, PhD, an icon of the Indian poultry industry, whose experience and expertise added tremendous value to the technical deliberations.

The distinguished gathering included eminent personalities such as:

- Dr. M. Selvaraju, MVSc, PhD, Dean, VCRI, Namakkal
- Dr. A. Natarajan, MVSc, PhD, Former Head, AFAQAL, Namakkal
- Dr. S. Ramamoorthy, MD, Krishi Nutrition Company Private Limited
- Prof. A. Thiruvankadan, MVSc, PhD, Dean, CPPM, Hosur
- Mr. K. Singaraj, Zonal Chairman, NECC
- Mr. Sridevi P. S. Mohan, Executive Committee Member, PFI
- Mr. K. Sundararaju, Secretary, TNPFA



- Mr. C. Panneerselvam, President, EPPEA
- Dr. C. Meganathan, DGM, VHPL
- Mr. M. Eswaramoorthy, Honorary President, BFOA

Their valuable contributions, observations and suggestions provided participants with a broader understanding of the challenges and opportunities ahead for the poultry sector.

Poulbrary — Taking Knowledge to the Poultry Industry

A special highlight of the event was the launch of “POULBRARY” — the Poultry Mobile Library, a unique initiative designed to take knowledge and technical information closer to poultry professionals and farmers.

The initiative was released by Dr. S. Ramamoorthy, MD, Krishi Nutrition Company Private Limited, adding another meaningful dimension to TCHS's objective of making knowledge accessible across the poultry industry.

Nationwide Participation

TCHS Edition 5 witnessed participation from different parts of India, reflecting the growing acceptance of the seminar as a platform for meaningful industry dialogue.

Students from CPPM Hosur, Kavitha College of Arts and Science, and Paavai College of Arts and Science for Women also participated, giving the younger generation an opportunity to interact with industry leaders and understand the rapidly evolving poultry sector.



The participation of students alongside farmers, consultants, academicians, associations and industry representatives demonstrated the importance of connecting knowledge, experience and the next generation.

Regen Biocorp Supports the Knowledge Movement

Regen Biocorp, as the Platinum Sponsor, played an important role in supporting TCHS Edition 5 and its mission of strengthening knowledge dissemination within the poultry industry. The organisers expressed their appreciation to all sponsors, speakers, associations, participants, students and supporters whose contributions helped make the event a memorable and meaningful industry gathering.

Towards a Global Standard for Indian Poultry

The strong response and feedback received from participants reaffirmed the relevance of TCHS as a knowledge-driven platform.

The various presentations in Edition 5 reinforced the need for the Indian poultry industry to continuously adopt scientific knowledge, modern technology, improved farm management and sustainable production practices to meet evolving domestic and international expectations.

Antibiotic-free poultry production is not merely

a future concept; it is an evolving journey requiring coordinated efforts from farmers, nutritionists, veterinarians, academicians, technology providers, industry associations and other stakeholders.

TCHS aims to contribute to this journey by creating a platform where problems are discussed, knowledge is shared and practical solutions are explored.

The encouraging response to Edition 5 has strengthened the commitment of SS Agrow Tech to continue the TCHS journey and empower poultry farmers with knowledge that can help them face future challenges, improve farm efficiency and move towards globally competitive standards.

"TCHS is not just a seminar. It is a continuing knowledge movement for the future of Indian poultry."

Mr. S. Rex Christi Raj, Owner

SS Agrow Tech

Organiser – Techno-Commercial Hybrid Seminar (TCHS)





Venkateshwara B.V. Biocorp Pvt. Ltd. (East Zone) Organizes Technical Seminar on Modern Feed Premix Solutions for Layer Nutrition in Berhampur

Venkateshwara B.V. Biocorp Pvt. Ltd. (East Zone) organized a technical seminar on "**Modern Feed Premix Solutions for Layer Nutrition**" on **17th June 2026** at **Berhampur, Odisha**. The programme brought together layer farmers from Berhampur and nearby districts, providing an excellent platform for technical knowledge sharing, scientific discussions, and interaction with industry experts.

The programme commenced with a warm welcome address by **Mr. Satyajeet Mohanty, Zonal Manager (East Zone)**, who welcomed the participating farmers and emphasized Venworld's commitment to strengthening the poultry industry through scientific knowledge-sharing initiatives. **Mr. C. Sahoo, AGM (East Zone)**, further elaborated on Venworld's farmer-centric approach, highlighting the company's focus on delivering innovative nutritional solutions, customized feed formulations and continuous technical support to help poultry farmers improve productivity, profitability and overall flock performance.

The technical session was delivered by **Dr. Sanjay Deshpande, AGM (Technical)**, on "**Modern Feed Premix Solutions for Layer Nutrition**." He explained that developing healthy, uniform pullets is the foundation of a successful laying flock and emphasized the importance of precision nutrition in maximizing feed efficiency, sustaining egg production, improving egg quality, and maintaining flock health. The session covered practical aspects of phase-wise feeding, gut health management, efficient nutrient utilization and strategic feed formulation to achieve optimum production performance.

A major highlight of the seminar was the detailed presentation on **Mixiblend Layer Premix**, Venworld's advanced nutritional solution developed for modern commercial layer flocks. Dr. Deshpande explained that the premix is scientifically formulated to meet the changing nutritional requirements of birds throughout different stages of the laying cycle, ensuring an optimum balance of nutrients for sustained production and superior flock performance. He highlighted its

role in improving feed efficiency, maintaining persistency of lay, enhancing eggshell strength, yolk pigmentation, albumen quality, egg uniformity, and overall bird health, ultimately leading to improved farm profitability.

The session also demonstrated how **Mixiblend Layer Premix** supports precision nutrition through phase-feeding programmes by providing balanced levels of essential vitamins, minerals, amino acids, and trace elements required for optimum egg production. Farmers were informed about the flexibility of utilizing locally available raw materials for customized feed formulations, enabling them to optimize feed costs while maintaining nutritional consistency and production efficiency. This farmer-centric approach allows producers to achieve higher productivity and better economic returns under diverse field conditions.

The programme concluded with an interactive discussion, during which farmers actively shared field-level challenges and received practical, experience-based recommendations from

the technical experts. The vote of thanks was delivered by **Mr. Rajat Pattnayak, Senior KCM**, who expressed his sincere appreciation to all participants for their enthusiastic involvement and reaffirmed the company's commitment to empowering poultry farmers through continuous technical

education, innovative nutritional solutions, and farmer-focused extension programmes.

The seminar concluded on a highly positive note, reinforcing Venworld's strong partnership with the poultry farming community and reaffirming **Venkateshwara B.V.**

Biocorp Pvt. Ltd.'s commitment to delivering innovative nutritional solutions, technical excellence, and sustainable practices that enhance productivity, profitability, and the long-term growth of the poultry industry across Eastern India.



INFAH's 15th AGM Outlines Vision for an Innovative and Healthier Animal Health Ecosystem

Key stakeholders call for an AI-enabled, prevention-first strategy to safeguard food security, elevate farmer incomes, and drive rural growth under Viksit Bharat.



MUMBAI, INDIA — August 21, 2026 — India's next major surge in livestock productivity will be driven by proactive animal wellness and tech-driven care rather than merely expanding herd sizes. This strategic pivot formed the central theme of the 15th AGM of the Indian Federation of Animal Health Companies (INFAH), held at the Taj Lands End, Mumbai.

Bringing together policymakers, regulatory officials, veterinary

scientists, and corporate leaders, the assembly charted a roadmap to transform India's reactive animal healthcare model into a predictive, science-led ecosystem. INFAH, which represents approximately 85% of India's veterinary biologics, pharmaceuticals, and feed supplements market, positioned preventive healthcare as a vital driver for national nutritional security and rural economic resilience.

Shifting from Reaction to Prediction

Delivering the keynote address, Burjis Godrej, Chairperson of Godrej Agrovet, emphasized that sustainable livestock growth hinges on optimizing animal health, nutrition, and welfare. He urged industry leaders and institutions to accelerate investments in diagnostics, vaccination, and biosecurity infrastructure.

Complementing this focus,





regulatory and public health officials outlined steps toward proactive disease defense:

- **Streamlined Regulation:** Dr. Rubina Bose, Deputy Drugs Controller (India) at CDSCO, advocated for agile regulatory structures that maintain safety and quality standards while encouraging sectoral innovation.

- **Enhanced Biosecurity:** Dr. Naveen Kumar, Director of ICMR-National Institute of Virology (NIV), Pune, underscored the critical need for advanced surveillance, biotechnology, and vaccine development to mitigate emerging zoonotic threats.

Artificial Intelligence

Transforms Farm Management

The integration of digital advisory systems and predictive technology emerged as a key operational disrupter during the proceedings.

Amit Vyas, Managing Director of Amul Dairy, demonstrated how technology-enabled veterinary services directly enhance milk yield and farmer profitability. Additionally, Hareesh Tibrewala, Founder and CEO of Manabu AI Solutions, showcased practical applications of computer vision, predictive analytics, and digital traceability across the dairy, poultry, aquaculture, and companion animal segments.

15 Years of Sectoral Advocacy and Leadership

Marking 15 years since its inception, INFAH reaffirmed its evolution from a trade association into a proactive platform for national policy advocacy. Organization leadership highlighted a refreshed commitment to member-centric outcomes, aiming to turn shared industry challenges into structured policy engagements.

To celebrate the milestone, INFAH presented its annual industry awards to two distinguished veterans for their lifelong contributions to animal healthcare:





- **Dr. Ramesh C. Sikka**
- **Dr. Raghuvir Krishnarao Trifale**

Six Core Priorities for Sectoral Growth

To guide its mission of *"Healthy Animals, Healthier India,"* INFAH formally outlined six key strategic objectives:

- 1. Preventive Healthcare & Biosecurity:** Strengthening early defense systems against critical animal diseases.
- 2. Predictable Regulation:** Collaborating with regulatory bodies to foster innovation-friendly frameworks.
- 3. AI & Digital Integration:**

Accelerating farm-level adoption of predictive analytics and automated diagnostic tools.

4. Farmer Prosperity: Boosting livestock yields and farm profitability through precision nutrition and disease management.

5. Nutritional Security: Linking improved animal wellness directly to national food safety and nutrition.

6. Ecosystem Collaboration: Deepening institutional partnerships among government entities, private industry, and academic researchers.

About INFAH

The Indian Federation of Animal Health Companies (INFAH) is the apex body representing India's animal health industry. Encompassing producers of veterinary pharmaceuticals, biologics, and feed supplements, INFAH collaborates with regulatory agencies, government authorities, and research institutions to drive science-based policies, sustainable growth, and animal welfare across India.

For More Information, Contact:

Indian Federation of Animal Health Companies (INFAH)

Email: admin@infah.org

Website: www.infah.org



Editorial Calendar 2026

Publishing Month:
January
Article Deadline :
18th, Dec. 2025
Advertising Deadline:
20th, Dec.2025
Focus :
Opportunities and Challenges

Publishing Month:
February
Article Deadline :
18th, Jan. 2026
Advertising Deadline:
20th, Jan.2026
Focus :
Budget

Publishing Month:
March
Article Deadline :
18th, Feb. 2026
Advertising Deadline:
20th, Feb.2026
Focus :
Disease Prevention

Publishing Month:
April
Article Deadline :
18th, March 2026
Advertising Deadline:
20th, March 2026
Focus :
Summer Stress Management

Publishing Month:
May
Article Deadline :
18th, April 2026
Advertising Deadline:
20th, April 2026
Focus :
Cold Chain

Publishing Month:
June
Article Deadline :
18th, May 2026
Advertising Deadline:
20th, May 2026
Focus :
Nutrition

Publishing Month:
July
Article Deadline :
18th, June 2026
Advertising Deadline:
20th, June 2026
Focus :
Biosecurity

Publishing Month:
August
Article Deadline :
18th, July 2026
Advertising Deadline:
20th, July 2026
Focus :
Sustainability

Publishing Month:
September
Article Deadline :
18th, August 2026
Advertising Deadline:
20th, August 2026
Focus :
Egg Production & Processing

Publishing Month:
October
Article Deadline :
18th, September 2026
Advertising Deadline:
20th, September 2026
Focus :
Processing & Packaging

Publishing Month:
November
Article Deadline :
18th, October 2026
Advertising Deadline:
20th, October 2026
Focus :
Winter Stress

Publishing Month:
December
Article Deadline :
18th, November 2026
Advertising Deadline:
20th, November 2026
Focus :
Food Safety

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



EGG DAILY AND MONTHLY PRICES OF AUGUST 2026



Name Of Zone / Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Average				
NECC SUGGESTED EGG PRICES																																				
Ahmedabad	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	555	560	565	570	580	590	590	555.16			
Ajmer	500	515	515	505	510	515	525	525	515	500	510	510	510	500	505	511	511	511	511	516	516	516	516	525	540	540	545	555	570	570	560	521.71				
Barwala	488	495	500	500	503	508	511	511	511	511	511	511	511	511	511	511	511	511	511	500	500	500	504	512	530	530	538	546	561	561	561	515.48				
Bengaluru (CC)	620	620	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	580.48				
Brahmapur (OD)	560	560	560	540	540	550	550	550	550	530	530	525	525	525	530	530	530	530	530	530	530	530	530	535	550	550	550	570	580	580	585	544.03				
Chennai (CC)	620	620	590	590	590	590	590	590	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	592.90				
Chittoor	613	613	583	583	583	583	583	583	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	585.90				
Delhi (CC)	530	530	530	530	530	535	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	547.32				
E.Godavari	535	535	540	525	525	525	525	525	525	525	525	525	502	505	505	505	505	505	505	505	505	505	505	505	510	520	525	530	540	550	555	555	521.68			
Hospet	560	560	530	530	530	530	530	530	530	530	530	530	530	530	530	530	530	530	530	530	530	530	530	510	490	490	490	490	490	500	505	510	510	520.48		
Hyderabad	530	530	530	500	505	510	515	520	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	500	500	500	500	500	505	515	525	530	530	517.58		
Jabalpur	560	545	545	525	525	525	525	525	525	510	510	510	510	510	510	510	510	510	510	510	510	510	510	510	510	510	510	525	540	540	555	560	560	525.48		
Kolkata (WB)	610	610	610	590	590	600	600	600	600	580	585	575	575	575	580	580	580	580	580	580	580	580	580	580	590	600	605	610	620	630	630	635	594.84			
Ludhiana	500	500	500	507	507	515	518	519	519	519	519	519	519	519	519	519	519	519	519	519	519	519	519	519	519	519	519	519	519	519	519	519	521.77			
Mumbai (CC)	610	600	590	580	580	580	580	580	580	580	580	580	570	570	565	565	565	565	565	565	565	565	565	555	555	545	545	550	555	560	565	575	585	590	571.94	
Mysuru	620	620	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	590	575	555	555	555	555	555	555	570	570	575	575	582.42
Namakkal	570	570	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	520	520	520	520	520	520	520	520	520	535.48		
Pune	610	600	590	580	580	580	580	580	580	580	580	580	570	560	555	555	555	555	555	555	555	555	545	535	525	525	530	535	540	545	555	565	570	562.90		
Raipur	510	510	510	510	510	510	515	510	510	510	510	510	480	480	480	480	480	480	480	480	485	485	485	485	495	495	510	595	535	535	535	535	500.32			
Surat	570	550	550	550	550	550	550	550	550	550	550	550	540	540	540	540	540	540	540	550	550	550	550	550	550	550	560	560	565	575	585	585	552.90			
Vijayawada	550	550	555	555	555	555	555	555	555	555	555	555	525	525	525	525	525	525	525	525	525	525	525	515	510	510	510	530	535	550	560	565	575	575	541.45	
Vizag	535	535	540	525	525	525	525	525	525	525	525	525	525	505	505	505	505	505	505	505	505	505	505	505	505	510	520	525	530	540	550	555	555	522.42		
W.Godavari	535	535	540	525	525	525	525	525	525	525	525	525	502	505	505	505	505	505	505	505	505	505	505	505	510	520	525	530	540	550	555	555	521.68			
Warangal	532	532	532	502	507	512	517	522	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527	502	502	502	502	502	507	517	527	532	532	519.58		
Prevailing Prices																																				
Allahabad (CC)	581	557	562	552	552	552	552	552	552	548	543	538	538	533	533	533	543	543	543	543	543	538	538	538	538	552	562	567	571	595	600	605	553.35			
Bhopal	550	545	545	545	545	545	545	530	530	510	510	510	510	510	510	510	510	510	510	510	510	510	510	510	510	525	535	545	560	570	570	570	529.84			
Indore (CC)	530	530	530	530	530	530	535	535	535	535	535	535	530	530	530	530	530	530	530	530	530	530	530	520	520	520	520	525	530	535	545	555	560	532.90		
Kanpur (CC)	548	548	548	548	548	548	548	548	548	548	548	548	548	548	548	548	548	548	548	548	548	548	548	548	548	567	567	567	586	600	600	600	556.10			
Luknow (CC)	567	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	560	570	560	560	560	560	560	560	560	560	573	573	573	583	607	600	566.65			
Muzaffurpur (CC)	550	555	560	560	560	565	568	568	568	558	556	556	556	550	550	550	550	550	550	550	550	550	550	550	550	550	560	580	580	580	590	590	615	564.19		
Nagpur	540	540	540	540	520	520	530	530	530	530	510	510	510	510	510	510	510	510	510	510	510	510	510	510	510	510	535	535	540	550	560	560	524.19			
Patna	550	555	560	560	560	565	568	568	568	558	556	556	556	550	550	550	550	550	550	550	550	550	550	550	550	550	560	580	580	580	590	590	615	564.19		
Ranchi (CC)	619	619	595	590	590	590	590	590	590	590	562	562	562	562	562	562	562	562	562	562	562	562	562	562	562	567	557	571	571	571	525	609	609	576.39		
Varanasi (CC)	550	562	557	557	557	557	563	563	563	550	550	550	550	550	550	557	557	557	557	557	557	557	557	557	557	560	560	573	581	583	593	600	600	563.81		



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