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Vol. 27 | No. 11 | November - 2025

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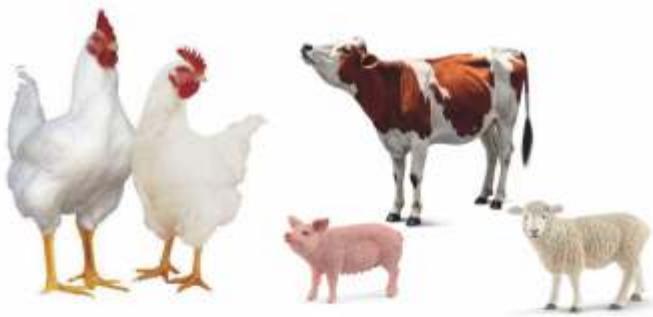
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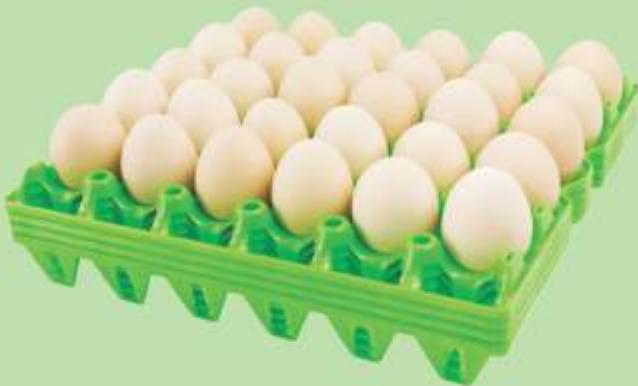
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**Northern Region**

<b>COMPANY:</b> Sampoorna feeds  <b>FARMER NAME:</b> Mr. Mandeep Singh Maan  	<b>SEPTEMBER-2025</b>	<b>Top #1</b>
	Farm Type	Closed Shed
	State	PUNJAB
	Chicks Placed	12073
	Mean Age	35.3
	Avg Body Wt	2566
	FCR	1.391
	cFCR	1.265
	Livability%	96.8
	Daily Gain	72.7
	EPEF	505.7

**Eastern Region**

<b>COMPANY:</b> IB Group  <b>FARMER NAME:</b> Mr. Brajesh Patel  	<b>SEPTEMBER-2025</b>	<b>Top #1</b>
	Farm Type	Closed Shed
	State	BIHAR
	Chicks Placed	12113
	Mean Age	38.0
	Avg Body Wt	2686
	FCR	1.429
	cFCR	1.277
	Livability%	97.8
	Daily Gain	70.7
	EPEF	483.9

**Central Region**

<b>COMPANY:</b> Jafpa  <b>FARMER NAME:</b> Mr. Prasad Ashokrao Fhalke  	<b>SEPTEMBER-2025</b>	<b>Top #1</b>
	Farm Type	Closed Shed
	State	MAHARASHTRA
	Chicks Placed	15770
	Mean Age	34.9
	Avg Body Wt	2631
	FCR	1.363
	cFCR	1.223
	Livability%	97.1
	Daily Gain	75.4
	EPEF	537.1

**South Region**

<b>COMPANY:</b> IB Group  <b>FARMER NAME:</b> Mr. Avinash Reddy  	<b>SEPTEMBER-2025</b>	<b>Top #1</b>
	Farm Type	Closed Shed
	State	ANDHRA PRADESH
	Chicks Placed	22465
	Mean Age	35.0
	Avg Body Wt	2511.0
	FCR	1.444
	cFCR	1.330
	Livability%	96.2
	Daily Gain	71.7
	EPEF	477.9

**SEPTEMBER-Top PERFORMANCE BY AREA**

Area	Chicks Placed	Mean Age	BW	FCR	cFCR(2Kg)	Livability%	Daygain	EPEF
North EC House	12073	35.3	2566	1.391	1.265	96.8	72.7	505.7
North Open House	2328	34.0	2393	1.342	1.255	96.3	70.4	505.1
East EC House	12113	38.0	2686	1.429	1.277	97.8	70.7	483.9
East Open House	2035	38.0	2565	1.324	1.198	93.8	67.5	478.0
Central EC House	15770	34.9	2631	1.363	1.223	97.1	75.4	537.1
Central Open House	3495	31.2	2271	1.383	1.323	97.5	72.8	512.5
South EC House	22465	35.0	2511	1.444	1.330	96.2	71.7	477.9
South Open House	5685	32.2	2160	1.390	1.354	96.7	67.1	466.4

**SEPTEMBER-Top 10 FIELD PERFORMANCE**

Flock	Farm Type	State	Chicks Placed	Mean Age	BW	FCR	cFCR	Livability%	Day Gain	EPEF
Flock 1	CLOSED SHED	MAHARASHTRA	15770	34.9	2631	1.363	1.223	97.1	75.4	537.1
Flock 2	CLOSED SHED	MAHARASHTRA	14256	34.0	2474	1.345	1.239	95.7	72.8	518.2
Flock 3	CLOSED SHED	MAHARASHTRA	7794	32.8	2300	1.330	1.264	97.9	70.2	516.7
Flock 4	CLOSED SHED	MAHARASHTRA	10384	36.2	2700	1.364	1.209	94.4	74.7	516.5
Flock 5	CLOSED SHED	MAHARASHTRA	11785	31.8	2229	1.335	1.284	97.6	70.1	512.8
Flock 6	OPEN SHED	MAHARASHTRA	3495	31.2	2271	1.383	1.323	97.5	72.8	512.5
Flock 7	CLOSED SHED	MAHARASHTRA	14978	34.7	2572	1.369	1.242	94.6	74.0	511.5
Flock 8	OPEN SHED	MAHARASHTRA	5995	36.3	2684	1.400	1.247	96.6	74.0	510.4
Flock 9	CLOSED SHED	MAHARASHTRA	14078	32.6	2326	1.359	1.287	97.3	71.3	510.2
Flock 10	CLOSED SHED	MAHARASHTRA	11580	32.7	2293	1.341	1.276	97.5	70.2	510.0



# From the Editor's Desk



## Editorial: Managing Winter Stress for Better Flock Health

As the temperatures drop and winter sets in, poultry farmers across the country face one of the most challenging periods of the year—winter stress. Cold weather, fluctuating humidity, and reduced daylight hours not only affect the comfort of the birds but can significantly impact their growth, immunity, and productivity. Understanding and managing these stress factors is essential to maintain flock performance during the season.

In winter, birds expend extra energy to maintain body temperature. If housing conditions are not adequately managed, this can lead to poor feed conversion and reduced egg or meat production. Proper insulation, draft-free ventilation, and maintaining an optimal temperature range are key to minimizing heat loss while ensuring adequate air exchange to prevent ammonia buildup.

Equally important is nutrition. Feed formulations should be adjusted to provide higher energy levels, along with essential vitamins and minerals that support immunity, such as vitamins A, D, E, and selenium. Access to clean, unfrozen water is often overlooked but is vital to digestion and metabolic function.

Lighting management also plays a role in minimizing stress. With shorter days, artificial lighting can help maintain consistent laying patterns and bird activity. However, overexposure should be avoided to prevent fatigue and behavioral issues.

Biosecurity must remain a top priority during winter, as closed housing and moisture can promote the spread of respiratory infections. Regular cleaning, litter management, and vaccination schedules should be strictly followed.

Ultimately, preventive care and observation are the best tools for combating winter stress. Farmers who monitor their flocks closely and respond promptly to behavioral or production changes can prevent minor issues from turning into major losses.

With careful attention to housing, nutrition, and health management, poultry producers can ensure their birds not only survive the winter but continue to thrive—proving that a well-prepared farmer is the best defense against seasonal stress.

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- Publication of news, views of information is in the interest of positive poultry industrial development in India. It does not imply publisher's endorsement.
- Unpublished material of industrial interest, not submitted elsewhere, is invited.
- The submitted material will not be returned.
- Publisher, Printer Mr. Vishal Rai Gupta on behalf of Pixie Publication. Printed at Jaiswal Printing Press, Chaura Bazar, Karnal-132001 (Haryana).
- Published at : Anand Vihar, near gogripur railway crossing, hansi road, karnal-132001 (Haryana)
- Editor-in-Chief : Mrs. Bhavana Gupta
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# 10 Common Mistakes in Poultry Farming

- Inadequate housing and ventilation
- Poor biosecurity measures
- Poor Nutrition management
- Ignoring hygiene practices
- Failure to monitor health regularly
- Improper handling and management
- Lack of pest and predator control
- Inadequate record keeping
- Ignoring environmental factors
- Overlooking biosecurity training for staff

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# Fit Layers, Even After Disease

## Plant power gets hens back on track

By

**Dr. Iris Wortmann**

Technical Sales Manager, Anne Möddel,  
Team Lead Technical Sales

**Dr Bernhard Eckel**

Vice President

**Dr. Eckel**

Animal Nutrition

Even on well-managed farms, illness can knock laying hens off track. Productivity drops – sometimes permanently. So how can we help layers quickly return to peak performance after an outbreak? The answer: With a phytogenic all-rounder that supports layers in every aspect.

Viral infections such as infectious bronchitis (IB) pose a serious threat to laying flocks. The coronavirus responsible for IB is highly contagious, constantly mutating and therefore difficult to control through vaccination alone. In acutely affected flocks, symptoms include respiratory distress, feed refusal and reduced performance. Severe cases are often complicated by bacterial secondary infections and a significant rise in mortality.

Even after the acute phase, productivity and egg quality frequently fall short of expectations – with long-term impacts on farm profitability. This is why targeted nutritional management is key after disease outbreaks. Supporting the digestive system, metabolism and immune function not only accelerates recovery, but also improves performance and animal welfare.

### Success is no coincidence

A proven way to support hens during recovery is the plant-based feed additive Anta® Phyt. Its unique blend of ingredients,

including hops and liquorice, promotes gut health, resilience and overall performance. Hops offer antimicrobial effects and help fend off gram-positive pathogens such as clostridia.

At the same time, Anta® Phyt improves the availability of essential nutrients – a crucial factor for egg production and shell stability. Fewer pathogens and better digestion also mean improved faecal consistency and fewer dirty eggs.

In addition, the immunomodulating compounds in liquorice help regulate inflammation and enhance immune response. Anta® Phyt thus contributes naturally to restoring health balance in the barn – and getting birds back on track.

### Anta® Phyt delivers consistent results

The benefits of Anta® Phyt in layers were recently confirmed in a German field trial.

Conducted on an organic farm with approximately 26,000 hens, the trial ran from laying week 93 to 101 after an IB outbreak. One barn was fed standard feed with 400 g/t of Anta® Phyt (Anta® Phyt group); the other received standard feed without phytogenic additives (control group).

Results were striking: laying performance in the Anta® Phyt group was 2% higher than in the

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01

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03

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04

Enhances overall growth performance in broiler &amp; egg production in layer

05

Improves hatchability in breeders

06

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control. The proportion of marketable eggs rose by 1%, while cracked and dirty eggs were reduced by a remarkable 20%. Feed structure was adjusted in both groups in week 100, boosting production further – yet again, Anta® Phyt outperformed by 2%.

Practical takeaways:

- Anta® Phyt improves laying performance following disease
- Anta® Phyt enhances egg quality and raises the share of marketable eggs

This makes Anta® Phyt a strong foundation for profitable and

sustainable egg production.

A healthier flock, stronger performance and more marketable eggs – all naturally. Discover how Anta® Phyt can help you shape the future of sustainable poultry farming. Talk to our team today.

Figure 1: Anta® Phyt increases laying performance in hens

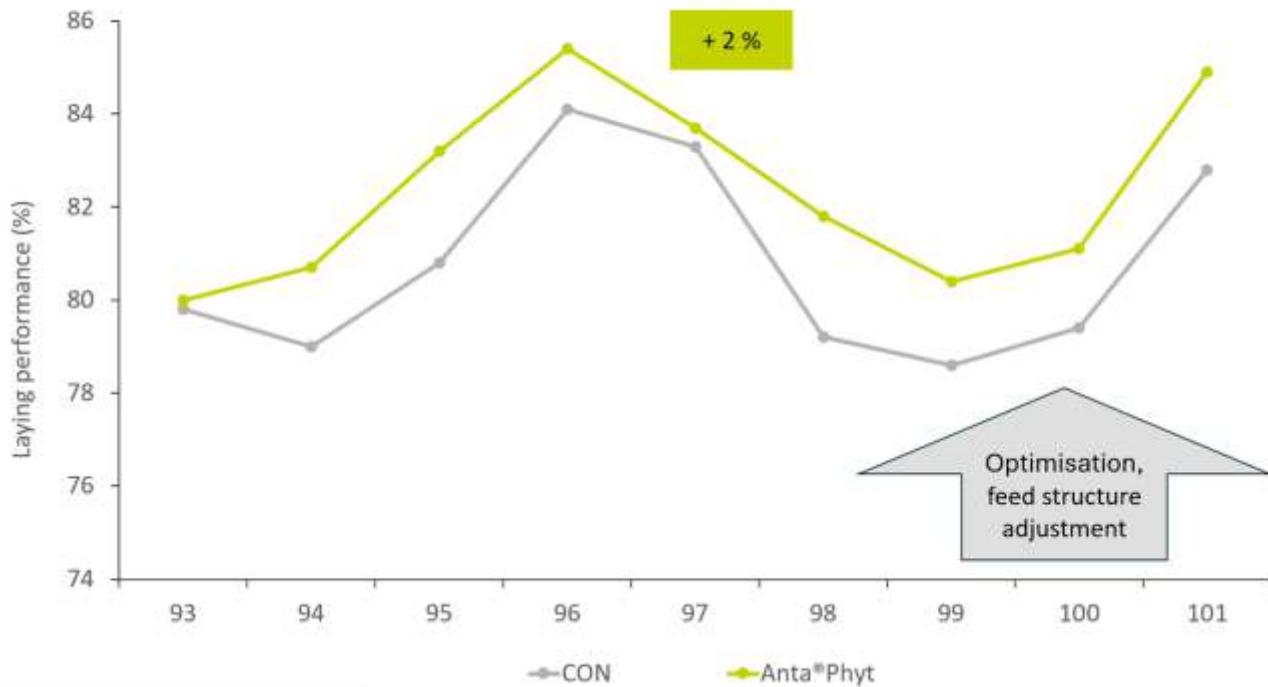
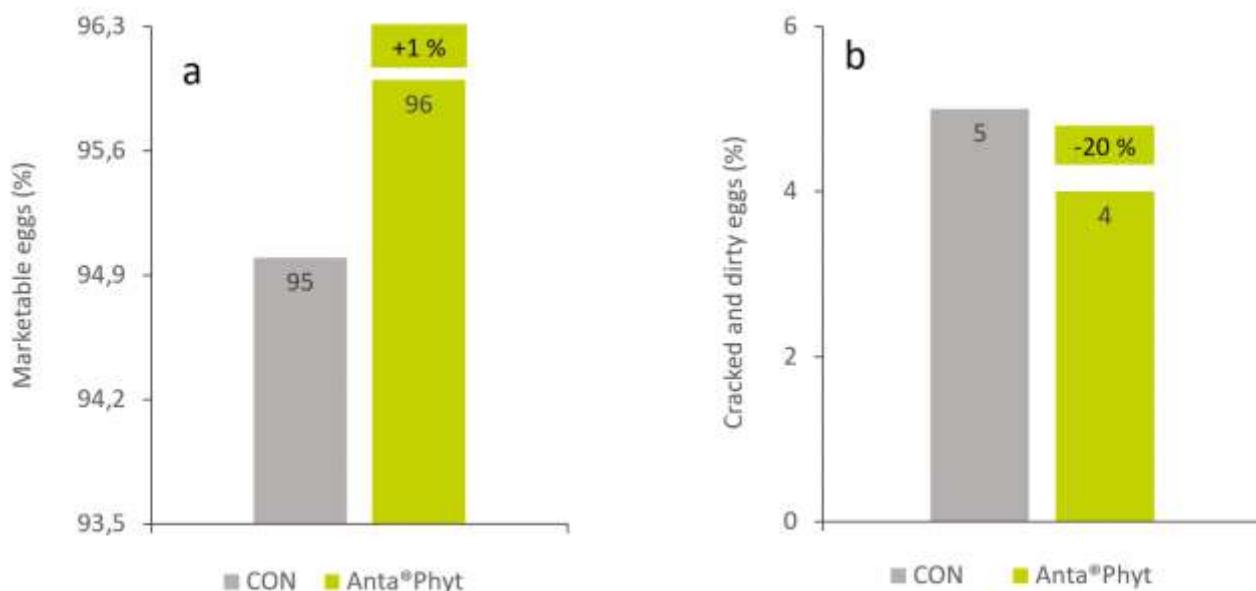


Figure 2: Impact of Anta® Phyt on marketable eggs (a) and cracked/ dirty eggs (b)



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# Integrative Approaches to Optimizing Safe and Efficient Poultry Production in Winter

**Manoj Kumar Singh, Jinu Manoj, Ahmad Fahim, Amit Kumar, D.K. Singh, Alka, Atul Kumar, Shivam Chaudhary and Vivek Choudhary**

Assistant Professor, Professor, M.V.Sc. Scholar, Department of Livestock Production Management, COVAS, SVPUAT, Meerut, U.P

DIO, Department of VPHE, LUVAS, Hisar, Haryana

## Introduction

Poultry rearing is an art as well as a science and management plays most crucial role in deciding profitability of this business. It has been observed in past several years that high market rates of broiler meat and eggs are observed only in those times when rearing is very difficult due to harsh climate and thus, demand is more than supply. Therefore, it is very important to understand and implement the best management practices in such harsh climate.

India has a remarkable diversity of climate zones, from tropical in the south to alpine and moderate in the Himalayan north, where highlands see heavy snowfall in the winter. Such diverse climatic challenges and extremes lead to variations in managerial practices across different parts of the country. Winter poses formidable temperature challenges, making it challenging to sustain both livability and production without additional measures. Managing winter conditions is often said to be like a double-edged sword,

requiring a delicate balance between climate and ventilation management.

During the winter season, when temperatures fall below 55°F, poultry faces various challenges such as a decline in egg production, reduced water consumption, lower fertility and hatchability rates, inefficient feed conversion in broilers, diminished weight gain, lower fertility, increased bird mortality, and more. These climate-related changes can have direct or indirect impacts on both egg and meat production. Consequently, poultry farmers need to be prepared to address these challenges by implementing cold stress-relieving measures to mitigate potential economic losses. Thus, poultry farmers need to implement various measures to enhance poultry production during the winter season.

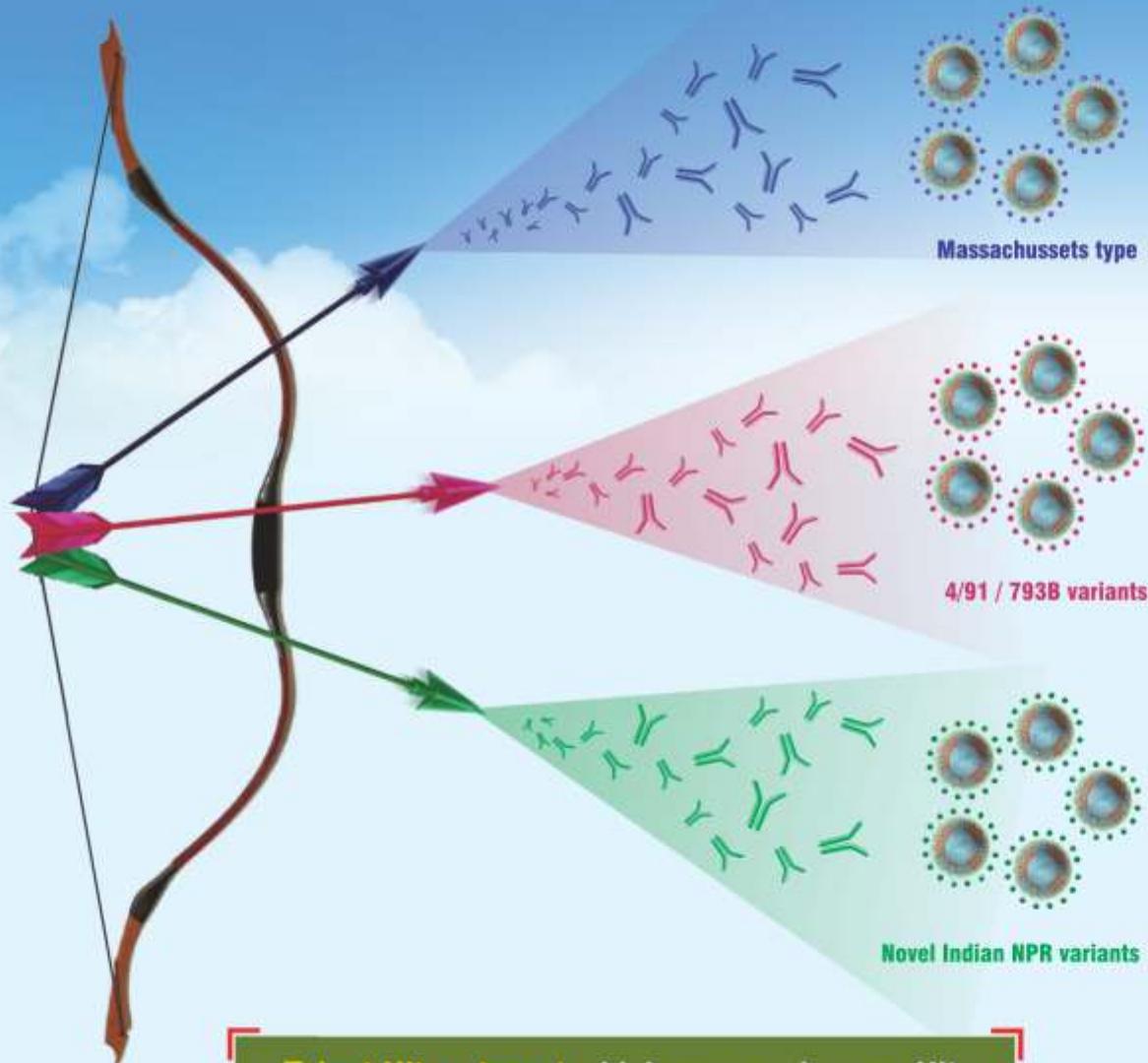
Although ways of practicing the management in harsh climate may differ slightly across region, the basic principles remain same. Below listed are few basic principles which may guide proper decision making.

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- Proper temperature and humidity suitable for the age is always required
- Proper ventilation to provide fresh air and removing gases inside house is always required
- The rearing surface and bedding material should be always warm and dry
- The drinking water should be maintained at suitable temperature to promote water intake
- The feed & feeding practice should help bird to maintain their body temperature, metabolism, and osmo-regulation

### Proper orientation of the poultry house

The poultry house should be meticulously designed to ensure optimal comfort for the birds during the winter season. The orientation of the building in

relation to wind and sunlight significantly impacts the temperature and light exposure on various external surfaces. In winter, when the sun's visible path is shortened, aligning a rectangular house in the east-west orientation maximizes solar energy absorption. The design should prioritize the allowance of maximum sunlight into the shed during the daytime. To shield the birds from chilling winds, precautionary measures can be taken by hanging gunny bags at points where cold air enters. These bags should be lowered in the evening after sunlight diminishes and raised again in the morning before the sunlight reappears, creating a barrier against cold drafts.

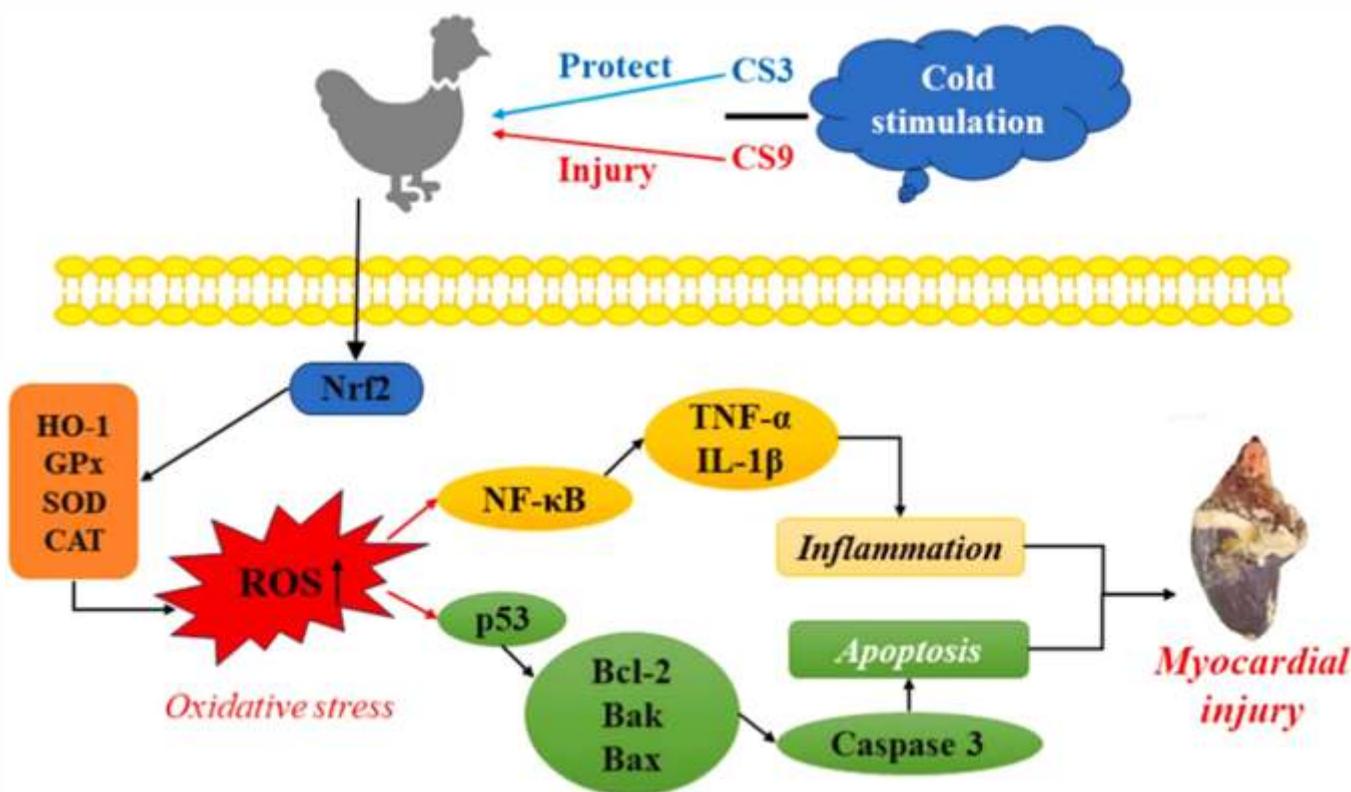
### Effective management of ventilation

Birds naturally release a significant amount of moisture through their breath and

droppings, which can have adverse effects on their health. Inadequate ventilation contributes to the accumulation of ammonia in the air, posing respiratory threats. Therefore, it is crucial to ensure sufficient fresh air circulation within the poultry shed. Sliding the windows open during the day serve this purpose by allowing ventilation and the windows should be closed at night. Installing exhaust fans in poultry sheds is another effective measure to expel impure air. To maintain warmth in the poultry shed, traditional BUKHARIS or heaters can be installed. In smaller-scale poultry farming, the use of multiple 200W bulbs can also generate heat and contribute to maintaining a comfortable temperature for the birds.

### Adequate poultry litter management

Before introducing chicks to the



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shed, it is essential to establish a stable floor surface by using a bedding material known as litter. This not only provides comfort to the birds but also serves various important functions. A sufficient quantity of high-quality bedding material contributes to insulation by maintaining a consistent temperature. Additionally, it absorbs excess moisture, preventing dampness, and promotes drying. The litter helps in breakdown of fecal matter, thus reducing the likelihood of contact between the birds and their waste. Furthermore, it acts as a barrier between the birds and the cold ground, serving as a cushion. An optimal depth of around 6 inches of bedding material or litter is recommended during the winter season, as it provides ample warmth to the birds. The moisture content in the litter should ideally be maintained within the range of 25-35%. However, proper management is crucial to prevent the litter from becoming excessively wet due to water from various sources. Wet litter can lead to the formation of cakes, providing an ideal environment for bacterial growth and ammonia production. If the litter becomes excessively wet and cakes are formed, it is advisable to replace it. During the winter season, it is generally not recommended to completely empty the shed, as the built-up litter helps retain heat. If litter removal is necessary, only a portion should be removed to maintain a suitable environment for the birds.

### **Strategic poultry feeding management**

Poultry utilizes nutrients from food for two primary purposes: as an energy source to maintain normal body temperature and support physiological functions, and as building materials for the development of bones, feathers, flesh, eggs, etc. Therefore, it is essential to provide poultry with an adequate, well-balanced, and nutritious diet to meet these needs. In colder temperatures, there is an increased demand for feed consumption and oxygen. Hence, it is necessary to supply birds with an ample amount of food, as they require extra energy to maintain their body temperature during the winter season. Caloric intake per bird per day fluctuates with variations in environmental temperature. When poultry consumes more feed for energy, it also ingests excess nutrients that become wasteful. To prevent such wastage during winter, it is advisable to include energy-rich feed sources like oil or fat in the diet. Increasing the number of feeders in winter compared to summer is recommended, and feed should be made available to the birds throughout the day. In terms of nutritional content, a winter diet should consist of 3400 kcal/kg ME and 23% protein, as compared to a summer diet requiring 3100 kcal/kg ME and 23% protein. Providing poultry with high-calorie feed in the winter helps keep them warm. It is crucial to store the feed in dry places to prevent moisture contact and maintain its quality.

### **Efficient poultry water management**

During the winter season, poultry may require less water, but it is crucial to ensure a continuous supply of fresh and clean water for proper hydration. If the water is very cold, it should be provided to the birds after adding hot water to bring it to a normal temperature. Regions experiencing snowfall often encounter issues with pipe blockages due to water freezing in the winter when temperatures drop below 0°C. To prevent such problems, regular inspections of pipelines should be conducted to avoid water blockages. Water serves as a carrier for various vaccines, medicines, and anti-stress vitamins for poultry. Since water intake decreases during the winter season, it is important to remove waterers a few hours before water medication. Medicines or vaccines should be administered in a smaller amount of water, ensuring that each bird consumes the total water and receives the full benefits of the medication, vaccine, or other supplements.

Addition of good organic acids such as formic acid, propionic acid in water to keep water acidification at par is key to improve water quality. Water intake is always a concern in winter. Thus, Effective use of organic acids along with water sanitizers to improve water quality and intake should always be considered in winter season. Careful attention to water



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management is essential to maintain the health and well-being of poultry during winter.

### Implementation of supplementary management

The poultry environment is conducive to pests and rodents that are also seeking warmer places for habitation, thus making their control extremely crucial. Poultry farmers must be vigilant about winter illnesses, as neglecting them can pose a serious threat to the flock. Maintaining gut health is essential for optimal performance and preventing business losses. Various feed additives play a critical role in supporting and enhancing gut health, including protease, NSPase enzyme, probiotics, essential oils, organic acids

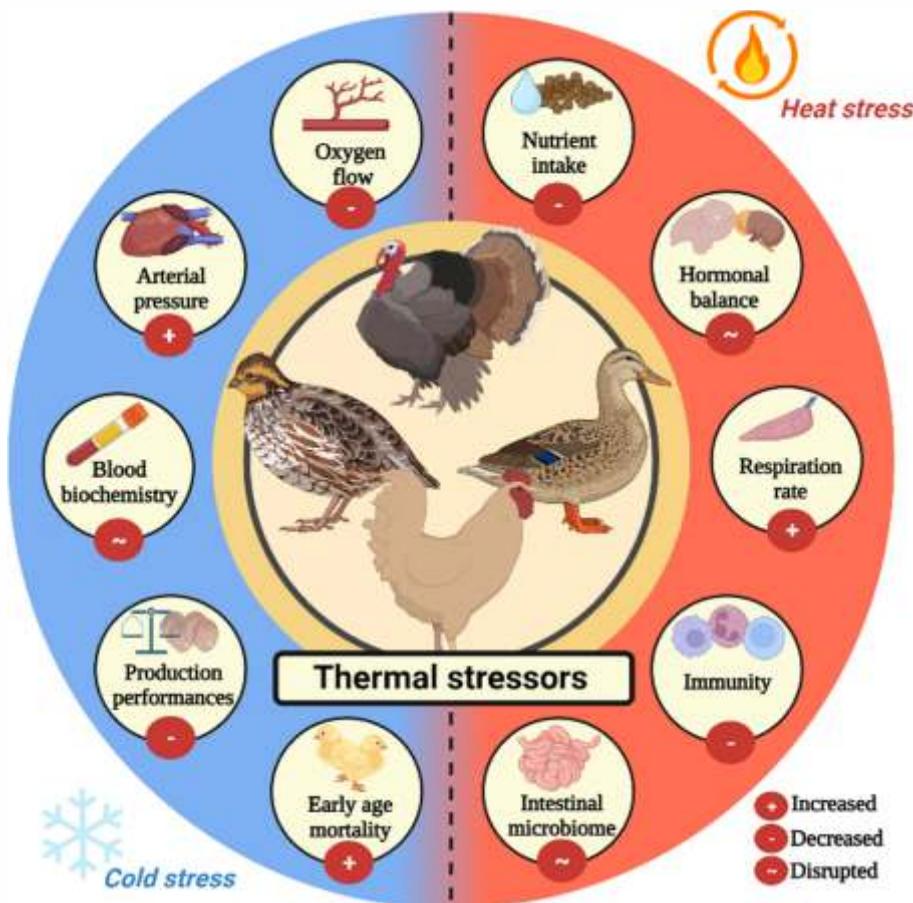
etc. Organic acids like coated benzoic acids not only reduce pathogenic bacteria such as Clostridium and Salmonella but also enhance the inhabitation of Lactobacillus in the gut.

Essential oils primarily function as digestive enhancers and also have immune-boosting properties. They aid in the effective digestion of nutrients in the early stages where endogenous enzymes may not be fully active. Additionally, essential oils impede quorum sensing acting as natural antibacterials. In case of illness, following the standard protocols is crucial. This includes isolating sick birds through quarantine,

administering various broad-spectrum antibiotics via feed or water (depending on availability) and ensuring proper vaccination. Poultry farmers should regularly check the vaccination status and promptly consult a local veterinarian when birds are found to be unwell. This proactive approach is vital for maintaining the health and well-being of the poultry flock.

### Conclusion

Poultry farmers should adopt correct managerial practices of poultry birds during winter season to maintain the productivity of farm. Managing poultry during winter is a tedious task, but if managed with proper scientific methods, the losses to the farmer can be minimized. Winter management in poultry farming requires careful attention to various factors including house orientation, ventilation, feed and water management, litter management and brooding practices. Ensuring consistent temperatures during brooding and afterward, offering tepid water, properly sealing poultry houses for warmth while facilitating adequate ventilation and managing litter quality are key practices. These measures not only prevent decreased productivity and diseases but also contribute significantly to the overall well-being and performance of the birds throughout the winter season.



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# The Ultimate Detoxifier Kidney & Liver Protector

Authors: Dr. C. S. Bedi, Dr. Himali Kishor Gotarane, Dr. Nithin Reddy, Dr. Arun Kumar

Guybro Animal Health Pvt. Ltd.

Modern poultry farming has undergone a remarkable transformation over the past few decades. Fast-growing broilers and high-yielding layers allow farmers to achieve unprecedented productivity, but this intense production system also places tremendous stress on the birds' internal organs. The liver and kidneys, which are responsible for detoxification, nutrient metabolism, bile production, and maintaining fluid balance, are particularly vulnerable. Continuous exposure to high-energy diets, environmental stress, toxins, and medications will overburden these vital organs, leading to a cascade of health issues that affect growth, immunity, and overall flock performance. Fatty liver, impaired bile secretion, and reduced metabolic efficiency are common consequences of

liver stress, while kidney overload often results in the accumulation of urates and other wastes, fluid imbalance, and conditions such as ascites. These challenges compromise feed efficiency, slow growth, and increase susceptibility to disease, ultimately affecting farm profitability.

Kalix has been specifically developed to address these challenges and provide comprehensive support for liver and kidney health. It works on multiple levels to maintain organ function, enhance detoxification, and support overall metabolic efficiency. By supporting bile secretion and fat metabolism, Kalix ensures that the liver can process nutrients efficiently and remove harmful metabolic by-products, preventing fatty liver and other liver-related disorders. At the same time, it supports

kidney function by aiding in the elimination of toxins and metabolic wastes, maintaining proper fluid and electrolyte balance, and reducing the risk of ascites. This dual action helps birds remain resilient, even under stressful conditions such as high-density housing, seasonal stress, or periods of rapid growth.

One of the key benefits of Kalix is its ability to assist in the removal of environmental and metabolic toxins. Poultry are often exposed to feed contaminants, mycotoxins, and chemical residues from medications or other additives, which can accumulate in the body over time. Kalix helps mobilize and flush out these harmful substances through natural detoxification pathways, ensuring that the liver and kidneys can function efficiently. By supporting the



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body's internal cleansing mechanisms, Kalix reduces the toxic load on vital organs, promoting healthier metabolism and overall well-being of the flock.

Beyond organ support, Kalix improves overall metabolic health and vitality. Birds receiving Kalix show better feed conversion, enhanced growth, and improved uniformity across the flock. Healthy liver and kidney function ensures that nutrients are absorbed efficiently and utilized for growth, energy, and immunity. Birds exhibit stronger vitality, improved resistance to environmental stressors, and higher livability, which translates directly into improved productivity for the farm. Regular supplementation helps maintain organ health while supporting natural detoxification pathways, allowing birds to perform at their full potential without compromising long-term wellbeing.

The benefits of Kalix extend

throughout the flock, ensuring stronger immunity, higher energy levels, and improved overall flock performance. By addressing the underlying causes of liver and kidney stress, it helps prevent metabolic disorders, supports organ regeneration, and maintains fluid balance. Farmers can see tangible improvements in growth rates, feed efficiency, and livability, while birds remain active, healthy, and productive. Kalix provides a holistic approach to poultry health, combining detoxification, organ support, and metabolic enhancement in a single, scientifically formulated solution.

Incorporating Kalix into daily flock management is simple and effective. Regular use ensures that birds receive continuous support for their vital organs, particularly during periods of stress or recovery. Its balanced formulation makes it suitable for all types of poultry, including broilers,

layers, and breeders, providing consistent protection and performance benefits across the flock. By helping to maintain clean, healthy organs and a well-regulated metabolism, Kalix allows birds to thrive and farmers to achieve sustainable productivity.

In modern poultry farming, where high performance often comes at the cost of internal organ stress, Kalix emerges as a vital tool. By supporting liver and kidney function, enhancing detoxification, and promoting metabolic efficiency, it ensures healthier birds, better growth, and improved flock resilience. With **Kalix, poultry farmers can safeguard their flocks from the hidden burdens of intensive production, achieving healthier, more productive, and more profitable operations while maintaining long-term flock wellbeing.**



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## VITAMIN D: SUNSHINE VITAMIN

Vitamins are chemical entities which are essential in small quantities for maintaining the proper metabolic process in animals and birds. These essential nutrients can't be synthesised at all or not in sufficient quantities. So, there is need to give these vitamins to animal and bird in feed as daily allowance.

Vitamins are two types as Fat soluble and Water soluble, fat soluble are A, D, E and K and water soluble are B complex and Vit C.

Vitamin D is fat soluble vitamin which regulates calcium haemostasis, which is vital for normal growth, bone development, egg shell formation and routine metabolic processes in birds. Vitamin D<sub>3</sub> production process can be activated when sunshine spreads on bird skin. But due to present extensive farming and managemental practices and housing method, it is difficult to get sunlight to form the Vit. D process naturally in birds. So, there is need to supply proper Vit D sufficient levels of Vit D through feed or water.

Two major forms of Vit D are available i.e., Ergocalciferol or Vit D<sub>2</sub> and Cholecalciferol or Vit D<sub>3</sub>. Ergocalciferol is derived from plant steroid, ergosterol and Cholecalciferol is product from the precursor 7 dehydrocholesterol which further form absorbable Vit D conversion in animals and birds. In birds pre-vitamin 7 dehydrocholesterol is derived from cholesterol or squalene, and they present in large quantity in skin of the animals & birds.

The provitamin 7-dehydrocholesterol which is present in epidermis of skin get converted to cholecalciferol with UV irradiation from sunlight, then it get absorb in blood circulatory system after binding it with Vit D blood transport protein (DBP).

As of this Vit D form is not biologically active and must be converted to biologically active form which takes place in liver and kidney before it absorbs in system.

Once Vit D reaches to liver for transformation, in which a microsomal system of hydrolylate to produce 25-hydroxy-vit D[25-(OH)D].

This metabolite is major circulating form of Vit D in blood, which is transported to kidney with Vit D transport globulin. In kidney it is converted into various compounds including 1,25-(OH)<sub>2</sub>D<sub>3</sub> which is also known as Calcitriol.

Then this compound is transported to the intestine, bones or other organs where it is involved in metabolism of calcium and phosphorous.

In maintaining the normal blood calcium levels, Vit D acts along with Parathyroid hormone. Vit D facilitates absorption of calcium through intestine.

Vit D plays important role in regulating Calcium haemostasis which is also required for skeletal development, embryo development, immunity and basic metabolism processes. It becomes a vital nutrient in breeders, layers, broilers and chicks.

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In animal nutritional supplement market Huvepharma's Bio D product outperform due to its uniqueness. The product Bio D is 25-hydroxy vitamin D<sub>3</sub> (Calcidol) which is manufactured by bacterial fermentation process with use of natural ingredients. As it is manufactured by natural process its bioavailability is TWO times more than its synthetic form products available in the market. It is very stable during long storage and pelleting temperature with 98.6%

recovery at temperature 120° C for 30 min.

In market various products of active Vit D<sub>3</sub> are available as feed additives. Active Vit D<sub>3</sub> can be destroyed with over treatment with UV light and by peroxidation in presence of various fatty acids in feed.

Vit D<sub>3</sub> is fat soluble vitamin and it is mainly absorbed in ilium part of intestine, where the feed remains for long duration. The fat absorption is depended on presence of bile salts for lipid absorption. If there is stress on liver due to mycotoxicosis, fatty liver, IBH where liver function gets stressed, bile production and secretion may not be normal, then the Vit D metabolism in liver may get hampered and so the deficiency symptoms may be seen.



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As Huvepharma's product Bio D which is 25-hydroxy vitamin D<sub>3</sub> is directly get absorbed and activated in kidney and it bypasses liver metabolism and conversion. Vit D<sub>3</sub> is also important in broiler breeder nutrition which are high performing birds, needs vitamins for proper skeletal development.

Bio D absorption is good as it is natural fermented product. In eggs Vit D<sub>3</sub> absorbed & get accumulated in egg yolk, which gets utilised by newly hatched chicks in first week. As the lipid digestion mechanism is not well developed in early life in chick, chick can use Vit D<sub>3</sub> from yolk. So, in breeder Bio D is essential not only for own skeletal development but also for early chick nutrition. It is also important for egg quality, hatchability, immunity etc. making it necessary. So proper supplementation of the Vitamin is important for optimizing broiler breeder operations.

Vit D plays important role in regulating Calcium haemostasis which is also required for skeletal development, embryo development, immunity and basic metabolism processes. It becomes a vital nutrient in breeders, layers, broilers and chicks.

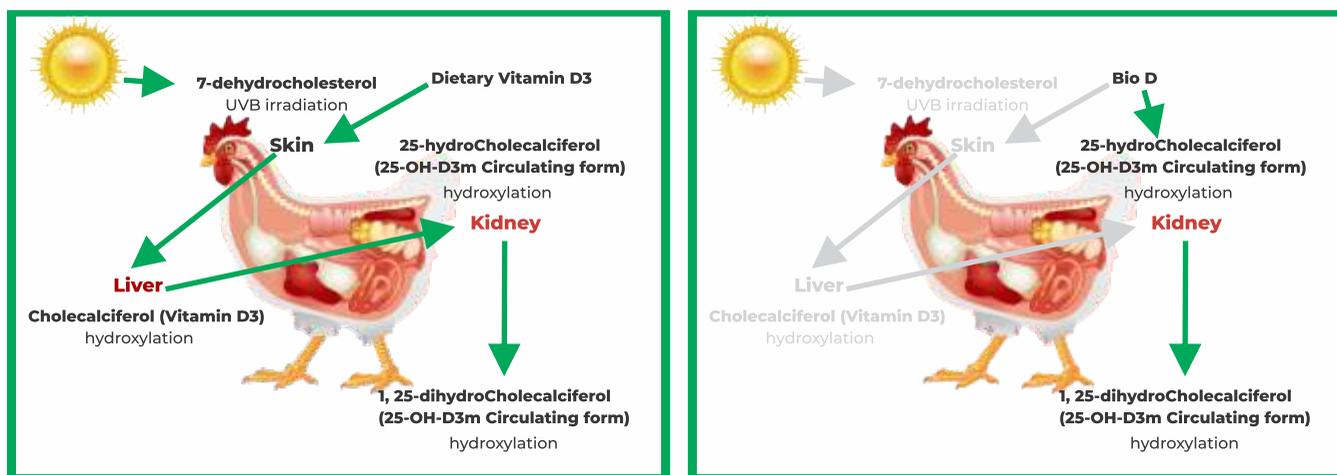
In present commercial broiler operations fast growth rate is obtained in muscle and skeletal development, which calls for fast bone mineralisation without any porosity.

Otherwise, bird may show lesions of lameness, femur head necrosis (osteomyelitis), tibial dyschondroplasia. Bio D<sup>®</sup> helps in Ca and P haemostasis to maintain proper growth of broiler.

Bio D<sup>®</sup> can support immunity system to have better defence mechanism for bacterial and viral diseases in poultry.

In laying hens, if the laying period get extended, where egg quality and egg shell may be a problem in later stages of lay. In this mechanism Vitamin D<sub>3</sub> plays an important role for regulation of intestinal calcium absorption. Bio D<sup>®</sup> acts as metabolite which can bypass liver hydrolysis, so the action of Bio D<sup>®</sup> is not dependable on liver function which may affected due to mycotoxins, fatty liver syndrome, IBH etc.

In conclusion Vitamin D is essential for birds and as standard diet ingredients do not contain enough of this vitamin, it should be supplemented to make sure the animals vitamin D needs are met throughout production as efficiency is key in diet formulation, opting for a highly effective vitamin D metabolite makes sense. This is where Bio D<sup>®</sup> which contains 25-hydroxy vitamin D<sub>3</sub> with unique properties due to its fermentation origin.



- 25-hydroxyvitamin D<sub>3</sub> undergoes conversion in the kidney hence follow negative feedback mechanism and avoiding the toxicity and Ca /P imbalance in the body.
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- Bio D<sup>®</sup> helps to increase in bone mineralization versus the synthetic derivate.
- Bio D<sup>®</sup> helps to increase in bone mineralization versus the synthetic derivate.

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**Prof. Dr. ARM Ziaul Hasan**

Senior Consultant –Industrial  
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Management Specialist

# Management of Winter Stress in Poultry Farming

## Abstract

*Winter stress is one of the most significant environmental challenges in poultry farming, affecting both broiler and layer production systems. Cold temperatures lead to physiological, metabolic, and behavioral changes in birds that can reduce growth performance, feed efficiency, egg production, and overall flock health. Managing winter stress is critical to sustaining productivity, minimizing economic losses, and ensuring poultry welfare.*

*This article provides a comprehensive review of the causes, effects, and management strategies for winter stress in poultry. It examines the physiological and behavioral responses of birds to low temperatures, the impact on immunity, reproduction, and growth, and highlights best practices in housing, nutrition, health, and welfare management.*

*Key strategies discussed include environmental modifications such as insulated housing, controlled ventilation, heating systems, and litter management; nutritional adjustments to meet increased energy demands, vitamin and mineral supplementation, and water management; and health interventions including vaccination timing, disease monitoring, and biosecurity measures. The article also emphasizes the importance of layer and broiler-specific strategies, stocking density adjustments, behavioral enrichment, and welfare measures during winter months.*

*Additionally, economic considerations are addressed, providing a cost-benefit analysis of investments in winter management practices versus losses due to mortality, reduced productivity, and poor feed conversion. Case studies from the Middle East, Europe, and Asia illustrate practical applications of these strategies across different farm sizes and climatic conditions.*

*The integration of environmental, nutritional, and health management practices is essential for effective winter stress mitigation. By adopting these strategies, poultry producers can achieve enhanced productivity, improved bird welfare, and sustainable economic outcomes even under challenging winter conditions.*

## Introduction

Poultry farming is a cornerstone of global food security, providing high-quality protein in the form of meat and eggs. Globally, the poultry sector has experienced significant growth due to increasing demand for affordable and nutritious protein sources. However, production efficiency is influenced by numerous environmental factors, including temperature, humidity, ventilation, and lighting. Among these, cold stress during winter months poses a critical challenge, especially in regions with temperate climates or cold winter seasons.

Winter stress in poultry is primarily caused by exposure to low ambient temperatures that exceed the bird's thermoregulatory capacity. Birds maintain their body temperature through a combination of behavioral, physiological, and metabolic

adaptations. When environmental temperatures drop below the thermoneutral zone — typically 18–24°C for broilers and 20–24°C for layers — birds must expend additional energy to maintain core body temperature. This energy diversion can negatively affect growth rates, egg production, feed conversion ratios, and overall flock performance.

Physiologically, cold stress increases metabolic rates, elevates oxygen consumption, and alters endocrine function, including the secretion of thyroid hormones and corticosterone. These hormonal changes are associated with reduced immune function, making birds more susceptible to respiratory infections and other winter-related diseases. Behaviorally, cold-stressed birds exhibit huddling, decreased activity, and reduced feed intake, which further exacerbate production losses.

The economic impact of winter stress is substantial. In broiler production, decreased weight gain and feed efficiency translate into higher production costs per kilogram of meat. In layer operations, cold stress reduces egg production, shell quality, and egg mass, affecting profitability. Mortality rates can increase significantly if stress is severe and management practices are inadequate. For smallholders and commercial farms alike, failure to address winter stress can result in considerable financial losses and compromised flock welfare.

Effective management of winter stress requires a multi-faceted approach, integrating environmental modifications, nutritional adjustments, health monitoring, and welfare practices. Housing designs must minimize heat loss, provide adequate ventilation without drafts, and include heating systems where necessary. Nutritional strategies involve increasing energy density in feed, balancing macronutrients, and providing vitamin and mineral supplements to support immunity and metabolism. Health interventions focus on vaccination schedules, biosecurity, and disease monitoring. Additionally, behavioral enrichment and welfare measures are critical to reducing stress-related aggression and ensuring birds maintain normal activity and feed consumption.

Over the past decade, research and practical experiences have demonstrated that a combination of these strategies leads to significant improvements in winter performance. Poultry producers who adopt a holistic winter management plan not only protect flock health but also enhance economic efficiency, sustainability, and animal welfare.

This article aims to provide a comprehensive review and practical guide for managing winter stress in poultry farming. By discussing physiological effects, environmental modifications, nutritional strategies, health management, and economic

considerations, the article seeks to equip producers, extension specialists, and researchers with the knowledge required to mitigate winter stress effectively. Case studies and examples from diverse regions illustrate how these strategies can be implemented in both small-scale and commercial operations, ensuring resilience and productivity under challenging winter conditions.

### **Physiological and behavioral effects of winter stress**

Winter stress significantly impacts both the physiology and behavior of poultry, affecting productivity, health, and welfare. Understanding these effects is critical for implementing effective management strategies.

#### **1. Thermoregulation and Hypothermia**

Poultry are homeothermic animals, maintaining a stable body temperature within a narrow range. The thermoneutral zone (TNZ) is the range of ambient temperatures where birds maintain their body temperature with minimal energy expenditure. For broilers, the TNZ is typically 18–24°C, whereas layers require slightly warmer conditions of 20–24°C.

When environmental temperatures fall below the lower critical temperature (LCT), birds experience cold stress. To compensate, they increase metabolic heat production, primarily through shivering thermogenesis and elevated basal metabolism. Prolonged exposure to cold may lead to hypothermia, characterized by reduced core temperature, lethargy, and, in severe cases, mortality.

Metabolically, birds under cold stress redirect energy from growth or egg production toward maintaining body heat. In broilers, this manifests as slower weight gain, poor feed conversion, and reduced carcass quality. In layers, energy diverted to thermoregulation can result in lower egg production, decreased egg weight, and thinner shells.

#### **2. Hormonal and Metabolic Changes**

Cold stress triggers endocrine responses that affect metabolism and immunity. Key hormonal changes include:

##### **Thyroid Hormones (T3 and T4):**

Cold exposure increases thyroid activity, enhancing basal metabolic rate to generate heat. However, chronic stimulation can lead to catabolism of body protein, affecting growth and muscle development.

**Corticosterone:** Elevated stress hormone levels suppress immunity, making birds more susceptible to respiratory and systemic infections.

**Catecholamines:** Epinephrine and norepinephrine rise during acute cold stress, mobilizing energy reserves but also increasing oxidative stress.

Metabolically, birds increase feed intake to meet higher energy demands, but extreme cold can reduce appetite, compounding nutrient deficits. Fat stores are mobilized for thermogenesis, while protein catabolism may affect growth and egg formation.

#### **3. Behavioral Adaptations**

Poultry exhibit several behavioral responses to cold environments, aimed at reducing heat loss and maintaining body temperature:

**Huddling:** Birds cluster together to share body heat, which can lead to uneven distribution and overcrowding in parts of the house. This behavior may also increase the risk of ammonia accumulation, footpad lesions, and disease transmission.

**Reduced Activity:** Cold-stressed birds decrease movement to conserve energy, which reduces foraging, feeding, and social interactions.

**Increased Feather Ruffling:** Birds fluff feathers to trap insulating air, a natural thermoregulatory mechanism.

##### **Altered Feed and Water Intake:**

Birds may either eat more to meet energy demands or eat less due to reduced comfort, depending on the severity of the cold and feed accessibility.

#### 4. Effects on Immune Function

Winter stress suppresses immune competence, increasing susceptibility to respiratory and systemic diseases. Mechanisms include:

Elevated corticosterone levels inhibit lymphocyte proliferation and antibody production.

Reduced feed intake limits essential nutrients needed for immune function, including vitamins A, D, E, selenium, and zinc.

Cold-induced oxidative stress damages cellular components, weakening innate immunity.

Common outcomes include increased incidence of avian influenza, infectious bronchitis, Newcastle disease, and colibacillosis during cold months. Maintaining proper vaccination and biosecurity protocols is therefore critical during winter.

#### 5. Impact on Growth and Reproduction

##### Broilers:

Slower weight gain due to energy diversion toward thermoregulation.

Poor feed conversion efficiency, increasing production costs.

Higher susceptibility to ascites and cold-induced metabolic disorders.

##### Layers:

Reduced egg production and egg mass.

Poor eggshell quality due to nutrient and calcium redistribution toward thermogenesis.

Delayed onset of lay in pullets exposed to cold during early development.

Studies have shown that even a 5–7°C drop below the TNZ can reduce growth rates by 10–15% in broilers and egg production by 5–8% in layers over a 2–4 week period.

#### 6. Interaction with Environmental and Nutritional Factors

The severity of winter stress is influenced by several environmental and management factors:

**Housing design:** Poor insulation,

drafts, or inadequate heating exacerbates cold stress.

**Stocking density:** Overcrowded houses may create microclimates that reduce airflow but can also increase disease risk.

**Feed and water availability:** Frozen water lines or limited feed accessibility intensify stress.

**Health status:** Birds already compromised by disease or poor nutrition are more vulnerable to cold stress.

#### 7. Case Examples

**Case 1** – Broiler Farm in Northern Europe:

During a winter with prolonged temperatures of –5°C, broilers housed in poorly insulated barns experienced 15% higher mortality compared to insulated houses. Implementation of side-wall curtains, draft control, and supplemental heating reduced mortality by 10% and improved feed conversion.

**Case 2** – Layer Operation in Central Asia:

Layers in unheated houses showed a 20% decline in egg production during extreme winter months. Nutritional adjustments including increased energy density and vitamin supplementation, combined with heated perches and insulation, restored production levels within three weeks.

#### Summary of Physiological and Behavioral Effects

Winter stress in poultry causes a cascade of physiological and behavioral responses:

#### Effect Type Observed Impact Implications

Thermoregulation Increased metabolic rate, hypothermia risk  
Reduced growth and egg production

**Hormonal Elevated T3/T4, corticosterone Catabolism, immune suppression**

Behavior Huddling, decreased activity  
Overcrowding, uneven feed intake

Immunity Reduced lymphocyte activity  
Higher disease susceptibility  
Production Lower weight gain, egg quality  
Economic losses

Understanding these effects is essential for designing environmental, nutritional, and health interventions to mitigate winter stress and maintain productivity.

#### Environmental management of winter stress in poultry farming

Effective environmental management is the cornerstone of mitigating winter stress in poultry. Proper housing, heating, ventilation, and lighting not only maintain bird comfort but also improve productivity, reduce mortality, and enhance welfare. This section discusses best practices for designing and managing poultry environments during winter.

##### 1. Housing Design for Winter

Housing plays a pivotal role in minimizing cold stress. A well-designed poultry house ensures adequate insulation, draft control, and temperature stability. Key considerations include:

###### a. Insulation

**Walls and Roof:** Insulation materials such as polyurethane panels, polystyrene, or mineral wool reduce heat loss through conduction. In regions with extreme winter temperatures, double-layered roofing with air gaps significantly improves thermal retention.

**Floors:** Raised floors or deep litter bedding help reduce heat loss from the ground, especially in broiler houses.

**Doors and Windows:** Minimize openings and seal gaps to prevent cold air entry. Transparent polycarbonate panels can allow sunlight in while reducing heat loss.

###### b. House Orientation

Position poultry houses to receive maximum sunlight during winter. In northern hemispheres, a south-facing orientation reduces the reliance on artificial heating.

Minimize exposure to prevailing winds by planting windbreaks or using solid fencing.

### c. Draft Control

Drafts increase cold stress dramatically. Install sidewall curtains, baffles, or plastic flaps to control air movement.

Ensure ventilation systems prevent accumulation of ammonia and moisture without creating cold drafts on the birds.

### d. Stocking Density Considerations

Huddling is a natural response to cold. Adjust stocking density to allow birds to cluster without overcrowding.

Overcrowding can lead to increased humidity, poor litter quality, and disease outbreaks, while understocking may reduce heat retention in smaller flocks.

## 2. Heating Systems

Supplemental heating is often necessary in regions where ambient temperatures fall below the lower critical temperature (LCT) for prolonged periods.

### a. Types of Heating Systems

**Brooders:** Typically used for chicks to maintain temperatures of 32–34°C during the first week.

**Space Heaters:** Electric or gas heaters provide targeted heating in cold zones.

**Underfloor Heating:** Embedded heating systems in deep litter houses maintain warmth without creating hot spots.

**Infrared Lamps:** Effective for small groups or chicks; they provide radiant heat directly to the birds.

### b. Efficiency and Safety

Position heaters to avoid drafts and maintain even heat distribution.

Use thermostats or automated temperature control systems to maintain optimal house temperature.

Monitor fuel or electricity usage to optimize cost-effectiveness.

### c. Case Study

In a broiler farm in Northern Europe, installation of infrared space heaters combined with insulated walls reduced winter mortality from 8% to 2% and improved feed conversion by 6%.

## 3. Ventilation Management

Proper ventilation is essential to remove moisture, ammonia, and CO<sub>2</sub> while conserving heat.

**Tunnel Ventilation:** Suitable for large commercial houses; allows uniform air movement without creating drafts if airflow is regulated.

**Natural Ventilation:** Use controlled sidewall curtains and roof vents to balance fresh air entry and heat retention.

**Humidity Control:** High humidity in winter can increase wet litter problems, promoting bacterial growth and footpad lesions. Target 50–60% relative humidity.

**Key Tip:** Avoid excessive ventilation that increases cold stress; inadequate ventilation, however, can lead to respiratory problems. Automation systems with temperature and humidity sensors are highly effective in winter management.

## 4. Lighting and Photoperiod Management

**Extended Photoperiods:** Winter days are shorter, which may reduce feed intake and egg production. Artificial lighting can maintain a 14–16 hour light period for layers to sustain production.

**Light Intensity:** Maintain 10–20 lux for broilers to encourage feeding and activity. Avoid excessive light intensity that may increase stress.

**Spectral Quality:** Warm white or red light has calming effects and can improve feeding behavior and weight gain during cold months.

## 5. Litter Management

Proper litter management enhances warmth and prevents disease:

**Deep Litter Method:** Provides natural insulation and retains heat generated by microbial activity. Use materials like

wood shavings, rice hulls, or straw.

**Litter Depth:** Maintain 8–12 cm depth in broiler houses; deeper litter improves insulation and reduces cold stress.

**Moisture Control:** Remove wet patches promptly to prevent ammonia accumulation and fungal growth.

**Bedding Supplements:** Adding lime or sand can reduce moisture and maintain a dry, warm environment.

**Example:** A layer farm in Central Asia reported improved egg production during winter by increasing litter depth and adding straw bedding, maintaining house temperature at 18°C without heavy heating.

## 6. Water Management

Cold temperatures can reduce water intake due to freezing or reduced palatability:

**Heated Water Lines:** Use insulated or electrically heated pipes to ensure constant water availability.

**Water Trough Placement:** Avoid drafts and direct cold airflow on water lines.

**Monitoring Consumption:** Track daily water intake to ensure birds meet energy requirements; reduced water intake can reduce feed consumption and increase stress.

## 7. Monitoring Environmental Parameters

**Temperature Sensors:** Install digital thermometers at bird level in multiple locations to monitor house temperature accurately.

**Humidity Sensors:** Track relative humidity to maintain optimal levels (50–60%).

**Airflow Indicators:** Ensure proper ventilation without cold drafts; adjust fans and curtains accordingly.

**Practical Tip:** Recording environmental data daily allows early identification of potential cold stress issues, enabling timely intervention.

## 8. Integration with Other Management Practices

Environmental management should

not operate in isolation. To maximize winter productivity:

Combine housing insulation and heating with nutritional adjustments, ensuring birds receive adequate energy for thermoregulation.

Implement health management protocols to prevent disease outbreaks exacerbated by cold stress.

Adjust stocking densities and lighting programs to balance behavior, welfare, and production goals.

### Summary of Environmental Strategies

#### Strategy Key Measures Benefits

Housing Design Insulation, orientation, draft control Reduced heat loss, improved comfort

Heating Systems Brooders, space heaters, underfloor heating Maintains optimal temperature, reduces mortality

Ventilation Controlled airflow, humidity management Prevents respiratory issues, maintains dry litter

Lighting Extended photoperiod, light intensity control Sustains feed intake and egg production

Litter Management Deep litter, moisture control Conserves warmth, reduces disease risk

Water Management Heated lines, monitor intake Maintains hydration and feed consumption

#### Conclusion for this Section:

Environmental management is the first line of defense against winter stress. Properly designed housing, effective heating, controlled ventilation, optimized lighting, and well-maintained litter collectively create a stable, comfortable microclimate. When integrated with nutrition and health strategies, environmental management significantly improves poultry productivity, welfare, and economic outcomes during winter.

#### Nutritional management of winter stress in poultry farming

Nutrition is a critical component in mitigating winter stress in poultry.

Cold temperatures increase birds' energy requirements, alter metabolic processes, and impact feed intake, making careful nutritional management essential for maintaining growth, production, and health.

#### 1. Increased Energy Requirements

During winter, birds expend additional energy to maintain body temperature through thermogenesis. Energy demand can increase by 10–20% in broilers and 5–15% in layers during cold conditions.

**Broilers:** Additional energy supports thermoregulation, preventing weight loss and poor feed conversion. Failure to adjust energy levels results in slower growth and increased mortality.

**Layers:** Energy requirements rise to sustain egg production. Insufficient energy leads to decreased egg mass and poor shell quality.

#### Practical Recommendation:

Increase metabolizable energy (ME) in feed formulations by 100–150 kcal/kg for cold-stressed flocks.

Incorporate high-energy ingredients such as vegetable oils, animal fats, or supplemental cereals.

#### 2. Macronutrient Management

##### a. Carbohydrates

Carbohydrates provide the primary energy source for thermogenesis.

Easily digestible grains such as corn, wheat, and barley are suitable during winter.

Slowly digestible carbohydrates can provide sustained energy release to maintain stable body temperature.

##### b. Fats and Oils

Dietary fat is an efficient energy source, producing more heat per unit than carbohydrates.

Inclusion of 3–5% animal fat or vegetable oil in broiler diets during winter improves weight gain and feed efficiency.

In layers, fat supplementation supports egg production and maintains body condition.

#### c. Proteins

Proteins are necessary for growth, egg formation, and immune function.

Cold stress increases protein catabolism, so adequate protein levels must be maintained.

#### Recommended protein levels during winter:

**Broilers:** 21–23% CP (starter/grower phases may require slightly higher levels)

**Layers:** 16–18% CP for maintenance and egg production

Amino acid balance (lysine, methionine, threonine) is critical for optimal performance.

#### 3. Micronutrient Supplementation

Winter stress can impair immune function and increase susceptibility to diseases.

Targeted vitamin and mineral supplementation helps maintain health and productivity:

**Vitamin A:** Supports mucosal immunity; prevents respiratory infections.

**Vitamin D3:** Enhances calcium absorption; critical for eggshell quality.

**Vitamin E:** Acts as an antioxidant; reduces oxidative stress caused by cold temperatures.

**Selenium:** Works synergistically with Vitamin E; enhances immunity and antioxidant defense.

**Zinc and Copper:** Support growth, feathering, and immune function.

**Electrolytes (Na, K, Cl):** Maintain acid-base balance; prevent dehydration during fluctuating temperatures.

**Example:** A layer farm in Eastern Europe observed a 7% improvement in egg production and better shell quality by supplementing feed with Vitamin D3, E, and selenium during cold months.

#### 4. Feed Formulation Adjustments

Winter feed formulations must balance energy, protein, and micronutrients to meet elevated

metabolic demands. Strategies include:

**Higher energy density:** Incorporate fat sources and reduce fiber content.

**Smaller, frequent meals:** Prevent reduced feed intake due to cold-induced lethargy.

**Pelleted feed:** Enhances palatability and feed intake during winter.

**Additives:** Enzymes, probiotics, and prebiotics can improve digestion and nutrient absorption under stress.

**Broiler Example:** Adding 2–3% vegetable oil to winter feed increased weight gain by 5–7% over a 6-week period in cold climates.

**Layer Example:** Providing a high-energy mash with supplemental vitamins improved average egg weight and reduced the drop in production caused by cold stress.

## 5. Water Management and Hydration

Water intake is critical for maintaining feed consumption and metabolism.

Cold temperatures can reduce water intake due to freezing or discomfort:

Use insulated or heated water lines to ensure continuous access.

Position waterers away from drafty areas.

Monitor consumption daily; reduced water intake directly affects feed intake and performance.

Consider electrolyte supplementation during extreme cold to support hydration and metabolic balance.

## 6. Feed Additives for Winter Stress

Several feed additives can enhance cold tolerance and immune function:

**Antioxidants:** Vitamin E, selenium, and natural plant extracts reduce oxidative stress caused by cold temperatures.

**Probiotics:** Support gut health and nutrient absorption; improve resistance to respiratory and enteric diseases.

**Prebiotics and Synbiotics:** Enhance immune function and nutrient

utilization.

### Fatty Acid Supplementation:

Omega-3 fatty acids support immune health and reduce inflammation caused by cold stress.

## 7. Nutritional Management for Layers vs. Broilers

### Broilers:

Focus on energy and protein balance to maintain weight gain.

Increase fat content to meet elevated thermogenic demands.

Monitor growth and feed conversion closely during prolonged cold spells.

### Layers:

Maintain calcium and phosphorus balance for eggshell quality.

Adjust energy density to prevent weight loss and sustain egg production.

Provide vitamin and mineral supplementation to support immunity during cold stress.

## 8. Case Studies of Nutritional Strategies

**Case 1** – Broiler Farm in Northern Asia:

**Problem:** Reduced weight gain during prolonged  $-3^{\circ}\text{C}$  temperatures.

**Strategy:** Increased dietary ME by 120 kcal/kg and supplemented 3% animal fat.

**Outcome:** Weight gain increased by 6%, feed conversion improved by 5%, mortality reduced from 6% to 2%.

**Case 2** – Layer Farm in Central Europe:

**Problem:** Drop in egg production and poor shell quality during cold months.

**Strategy:** Added vitamin D3, E, selenium, and increased energy density by 100 kcal/kg.

**Outcome:** Egg production recovered within three weeks; eggshell thickness improved by 15%.

## 9. Key Recommendations

Calculate energy requirements based on ambient temperature and flock age.

Adjust feed formulation before the

onset of winter to prevent production loss.

Monitor feed intake daily and modify feed form, particle size, and frequency to maintain consumption.

Combine nutritional strategies with environmental and health management for holistic winter stress mitigation.

Summary of Nutritional Strategies

Nutritional Component Winter Requirement Benefit

Energy +10–20% ME Supports thermoregulation, maintains growth/egg production

Protein Maintain or slightly increase Prevents catabolism, supports growth/egg formation

Fats 3–5% supplemental Efficient energy source, improves feed efficiency

Vitamins (A, D3, E) Increased Supports immunity, shell quality, antioxidant defense

Minerals (Se, Zn, Cu) Adequate levels Enhances growth, immunity, feathering

Water & Electrolytes Continuous, warm access Maintains hydration, feed intake, metabolic balance

Feed Form Pellets, smaller frequent meals Increases intake and nutrient utilization

### Conclusion for this Section:

Nutritional management is a critical defense against winter stress. By adjusting energy, protein, fat, vitamins, and minerals, and ensuring water availability, poultry can maintain growth, egg production, and immunity during cold months. Integrating nutrition with environmental management maximizes winter performance and economic returns.

### Health and biosecurity considerations for winter stress in poultry

Winter presents unique challenges for poultry health and biosecurity. Cold stress compromises immunity,

increases susceptibility to disease, and can exacerbate the spread of infections if biosecurity measures are inadequate. Proper health management is therefore essential for maintaining flock performance during the winter months.

### 1. Impact of Winter Stress on Poultry Health

Cold temperatures can lead to multiple physiological and immune challenges:

**Immune Suppression:** Elevated corticosterone levels during cold stress reduce lymphocyte proliferation and antibody production, making birds more prone to respiratory and systemic infections.

#### Increased Susceptibility to

**Respiratory Diseases:** Poor ventilation, high humidity, and ammonia accumulation in winter increase the risk of infectious bronchitis, Newcastle disease, avian influenza, and chronic respiratory disease.

**Digestive Disorders:** Reduced feed and water intake can affect gut health, leading to dysbiosis, decreased nutrient absorption, and higher vulnerability to enteric pathogens.

**Metabolic Disorders:** Cold stress increases energy demands; insufficient nutrition may lead to fatty liver, ascites, or hypothermia-related mortality.

**Example:** A broiler farm in Northern Europe reported a 10% rise in respiratory infections during prolonged cold periods due to drafty housing and poor ventilation. Intervention with improved airflow and winter-specific vaccination reduced disease incidence by 60%.

### 2. Vaccination and Immunization Strategies

Vaccination programs must be adjusted for winter conditions:

**Timing:** Administer vaccines before the onset of severe cold to ensure birds have optimal immunity during winter.

**Cold-Tolerant Handling:** Store and transport vaccines carefully; extreme cold can reduce vaccine efficacy.

**Targeted Diseases:** Prioritize immunization against respiratory diseases (IB, ND, AI), infectious bursal disease (IBD), and Marek's disease.

**Layer Flocks:** Ensure booster vaccines are aligned with the peak egg production season, which may be affected by cold stress.

**Practical Tip:** Monitor antibody titers to confirm vaccine efficacy, especially when environmental conditions are stressful.

### 3. Monitoring and Early Detection of Disease

Continuous health monitoring is critical during winter:

**Daily Observations:** Check for lethargy, abnormal posture, ruffled feathers, coughing, sneezing, or reduced feed intake.

**Mortality Records:** Track daily mortality; spikes may indicate disease or environmental issues.

**Flock Uniformity:** Uneven growth or production may signal cold stress or underlying illness.

**Environmental Checks:** Monitor ammonia levels, humidity, and temperature to prevent respiratory stress.

#### Technology Integration:

Use smart sensors and cameras for real-time monitoring of activity, feed intake, and temperature fluctuations, allowing early intervention before significant losses occur.

### 4. Biosecurity Measures in Winter

Biosecurity during cold months must account for changes in bird behavior and housing conditions:

**Restricted Access:** Minimize human traffic in poultry houses to reduce pathogen introduction.

**Protective Clothing:** Use winter-specific gear that does not carry pathogens from outside.

**Rodent and Pest Control:** Cold months may drive rodents and wild

birds indoors, increasing disease risk. Maintain traps, bait stations, and physical barriers.

**Sanitation:** Regular cleaning and disinfection of feeders, waterers, and litter prevent disease buildup.

**Quarantine:** Isolate new or sick birds to prevent transmission within the flock.

### 5. Environmental Hygiene and Disease Prevention

Winter conditions can worsen litter quality, ventilation, and moisture accumulation, creating favorable conditions for pathogens:

Maintain dry litter to prevent fungal growth and footpad lesions.

Ensure balanced ventilation to reduce ammonia accumulation without creating drafts.

Use air quality monitoring tools to track ammonia, CO<sub>2</sub>, and humidity levels.

Disinfect water lines to prevent bacterial contamination when heated water systems are used.

#### Case Study:

A layer farm in Central Asia implemented a winter-specific biosecurity protocol, including draft prevention, litter management, and enhanced sanitation. As a result, respiratory disease incidence decreased by 50%, and egg production remained stable during the cold season.

### 6. Common Winter-Related Diseases

#### a. Respiratory Diseases

**Infectious Bronchitis (IB):** Cold and humidity favor viral spread; symptoms include coughing, nasal discharge, and reduced egg production.

**Newcastle Disease (ND):** Cold stress can exacerbate clinical signs and mortality.

**Avian Influenza (AI):** Winter migration of wild birds increases AI risk; strict biosecurity is essential.

#### b. Enteric Diseases

**Coccidiosis:** Poor litter management

and reduced immunity may increase susceptibility.

**Necrotic Enteritis:** Cold stress and poor gut health can trigger outbreaks.

### c. Metabolic Disorders

**Ascites:** Broilers in cold environments increase oxygen demand; inadequate ventilation and nutrition can cause fluid accumulation in the abdomen.

**Fatty Liver Syndrome:** Layers with high-energy diets and cold stress may mobilize fat inefficiently, leading to liver issues.

## 7. Health Management Best Practices

**Proactive Vaccination:** Align vaccination schedules with winter stress periods.

**Nutritional Support:** Increase vitamins (A, D, E), minerals (selenium, zinc), and antioxidants in feed.

**Environmental Optimization:** Maintain temperature, ventilation, and humidity within optimal ranges.

**Early Intervention:** Treat minor disease outbreaks promptly to prevent mortality and economic loss.

**Record Keeping:** Maintain comprehensive health, mortality, and environmental logs to detect trends and implement corrective measures.

## 8. Summary of Winter Health and Biosecurity Measures

### Aspect Key Measures Benefits

Vaccination Timing, cold-tolerant handling, targeted diseases Maintains immunity, reduces infection risk

Disease Monitoring Daily checks, mortality records, environmental monitoring Early detection, reduced losses

Biosecurity Restricted access, pest control, quarantine Prevents pathogen introduction and spread

Environmental Hygiene Litter, ventilation, air quality Reduces respiratory and enteric diseases

Nutritional Support Vitamins, minerals, antioxidants Enhances immunity and stress resistance

### Conclusion for this Section:

Winter stress not only affects growth

and production but also compromises immunity, increasing the risk of disease outbreaks. Implementing comprehensive health and biosecurity measures, integrated with environmental and nutritional management, is critical for maintaining flock health, productivity, and economic viability during cold seasons.

### Conclusion: integrated management of winter stress in poultry farming

Winter stress poses a significant challenge for poultry production worldwide, affecting both broiler and layer flocks. Exposure to cold temperatures triggers physiological, metabolic, and behavioral responses in birds, leading to reduced growth, lower egg production, compromised immunity, and increased mortality. Without proper management, these impacts can result in substantial economic losses, decreased animal welfare, and long-term production inefficiencies.

Effective mitigation of winter stress requires an integrated approach combining environmental, nutritional, health, and management strategies.

#### 1. Environmental Management:

Properly designed housing with insulation, draft control, and efficient heating systems is essential to maintain a stable and comfortable microclimate. Ventilation, humidity control, lighting, litter management, and heated water systems ensure that birds remain warm, hydrated, and productive.

**2. Nutritional Management:** Cold stress increases birds' energy and nutrient requirements. Adjusting feed formulations by increasing energy density, balancing protein and amino acids, supplementing vitamins and minerals, and ensuring water availability are crucial for supporting thermoregulation, growth, and egg production.

#### 3. Health and Biosecurity:

Cold stress suppresses immunity and predisposes birds to respiratory, enteric, and metabolic diseases. Implementing winter-specific vaccination schedules, maintaining strict biosecurity, monitoring flock health, and optimizing sanitation are essential for disease prevention.

#### 4. Layer and Broiler Flock

**Management:** Tailoring management practices to the specific needs of layers and broilers—including adjusting stocking density, monitoring feed and water intake, and observing behavior—ensures optimal performance and welfare during winter months.

#### 5. Economic and Welfare

**Considerations:** Investments in winter management—such as housing insulation, feed adjustments, and vaccination—provide substantial returns by reducing mortality, maintaining production, and improving bird welfare. The holistic approach enhances both profitability and sustainability of poultry operations.

**Key Takeaway:** Winter stress is not merely an environmental challenge; it is a multidimensional production constraint that can be successfully managed through proactive planning, integrated strategies, and continuous monitoring. Poultry producers who adopt a comprehensive approach will ensure resilient, healthy, and productive flocks throughout the winter season.

In conclusion, effective winter stress management is a vital component of modern poultry farming, contributing to higher productivity, better animal welfare, and sustainable economic outcomes. By combining environmental optimization, tailored nutrition, vigilant health practices, and careful flock management, poultry producers can successfully navigate the challenges of winter and maintain high performance and profitability in their operations.



# Glycerine: A Novel and Alternate Energy Source for Poultry

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## Introduction

The poultry industry is widely recognised as a comprehensive food production chain that produces both meat and eggs. About 60–70% of the total production costs are related to poultry feed. Further, maize accounts for 60% to 70% of primary source of energy in the diet. Poultry feed is made using a few pure ingredients and by-products from numerous organisations to optimise the nutrition and cost per unit. It is well known that energy plays a major role in determining feed intake and accounts for a large portion of diet expenses (Classen, 2017).

However, use of maize in manufacture of ethanol, off-season time, drought and its usage in human food has caused significant price fluctuations with adverse effects in livestock profitability (Min et al., 2010; Ferreira et al., 2014). In order to lower production costs and increase the supply of these cereals to other industry sectors, there is a rising search for substitute ingredients for those typically included in diets that can be utilised for animal production. A by-product of the manufacturing of biodiesel, crude glycerin (CG), is one of

these potential alternatives.

Many of the biodiesel industry's byproducts might be utilised to make poultry feed. Among these by-products, glycerine is a novel and economical ingredient for animal feed that meets the seasonal maize scarcity in particular regions while also serving as a substitute for some expensive ingredients.

Biodiesel is a product resulting from trans-esterification reactions of triglycerides, both of animal and vegetable origin. Trans-esterification is a series of three-step reactions that create monoglycerides and diglycerides as intermediates. Alkaline catalysts are utilised in this process. Three molecules of methyl or ethyl esters of fatty acids (biodiesel) and one molecule of glycerol or glycerine are the end products of the trans-esterification process, and this is an alcoholysis reaction (Mota et al. 2009).

Glycerol (1,2,3-propanetriol), also known as glycerine (Niu et al. 2011), is a polyalcohol that has an almost sweet flavour and is present as fatty esters in all natural fats and oils. One of the most useful and adaptable chemical substances is glycerine, also known as glycerol ( $C_3H_5(OH)_3$ ). In general, the term

"glycerine" refers to a commercial glycerol in water solution where glycerol is the primary ingredient.

Poultry has a special digestive mechanism that allows food to pass through without being ground in the mouth. The early stages of a chicken's life are crucial for growth and require a system that can provide energy quickly and efficiently as the digestive and other metabolic processes are still developing. Glycerine appears as a viable option to assist the body's development during this stage of life (Wang et al. 2018).

### **Properties and importance of glycerine**

Chemically, glycerine has three carbon atoms in its skeleton and has the formula  $\text{CH}_2\text{OH}-\text{CHOH}-\text{CH}_2\text{OH}$ . It is a by product during manufacturing of biodiesel (Ayoub and Abdullah, 2012). It is transparent, nearly colourless, odourless, water soluble, thick, and has a sweet flavour. Glycerine is an amazing energy substance because it's an original molecule of glyceraldehyde 3-phosphate, an intermediate for gluconeogenic and lipogenic processes (Rodrigues et al. 2017). Glycerol serves as a precursor for the synthesis of triglycerides when energy is abundant, and can be used to supply carbon skeletons for gluconeogenesis or to generate energy through the Krebs cycle and glycolysis when energy is scarce (Arif et al. 2017; Verussa et al. 2017).

### **Digestibility and metabolism**

The digestibility and metabolism

of crude glycerine in poultry might fluctuate based on various factors, including glycerol concentration in the crude glycerine, dietary inclusion level, and the age and health status of the birds. With metabolisable energy (ME) values ranging from 3,069 to 4,839 kcal/kg, crude glycerine is an easily digestible in birds (Batista 2010). The degree of inclusion in the diet might affect the digestibility of crude glycerine; higher degrees of inclusion result in lower digestibility because of the high glycerol concentration (Tavernari et al., 2022). It has been noted that laying hens absorb about 97% of their glycerine through their digestive tracts (Bartelt and Schneider, 2002).

In terms of metabolism, chickens quickly break down crude glycerine, with the liver converting the majority of the glycerol to glucose. Even though it helps to connect two processes called glycolysis and gluconeogenesis and makes fats, glycerol is very important for the body's energy production through gluconeogenesis and lipogenesis. It is generally known that glyceraldehyde 3-phosphate dehydrogenase, a glycerol-dependent enzyme, participates in catabolic actions in the tricarboxylic-acid cycle and glycolysis of living organisms (Lammers, Kerr, Honeyman et al. 2008). According to Doppenberg and Van Der Aar (2007), glycerine can oxidise to produce 22 moles of ATP/mol.

### **Energy value of glycerine**

Poultry nutritionists have different points of view regarding

energy value of glycerine. According to Min et al. (2010), its gross energy (GE) is 4,100 kcal/kg. However, Abd-Elsamee et al. (2010) reported GE 3445 kcal/kg. Bartlett and Schneider (2002) found that the metabolisable energy (ME) of pure glycerine is 3,929 kcal/kg for laying hens and 3,993 kcal/kg for broilers. Apparent metabolisable energy of crude glycerine has been reported as 3312 kcal/kg (Abd-Elsamee et al. 2010). Dasari (2007) measured the digestible energy of crude glycerine as 14.9–14.3 MJ/kg, while metabolisable energy ranged from 13.9–14.7 MJ/kg. The variation of energy between samples occurs due to its degree of purity, which varies as stated to the techniques and equipment used in biodiesel production (Lammers et al., 2008).

### **Use of glycerine in poultry diet**

Besides usage in pharmaceutical and cosmetics, glycerine can also be used in poultry diets (Zavarize et al. 2014; Vancov et al., 2012) as glycerol has been declared GRAS (Generally Recognized as Safe) status as food additive in US even for human beings (FDA 2003). Its use in animal diet has been reported since 1970s (Fisher et al. 1973). Glycerine is used in pellet production for its benefits to control dust and prolonged feed preservation (Best 2006). Pellet durability index can be improved by 2–6% using 9% glycerol in feed formulation (Grosbeck et al. 2008). In feed manufacturing, maintaining a proper texture of feed particles and prolong shelf life of feed are the prime criteria

which can be seemingly controlled by using glycerine in poultry ration because it deters the growth of moulds (Doppenberg and Van Der Aar, 2007; Raja et al., 2018). This novel ingredient can be used in poultry diets in combination with probiotics to enhance the protection against harmful bacteria (Delgado et al., 2014). However, its nutrient availability differs greatly in avian species, depending upon source and the host digestive physiology. Naitam et al. (2020) concluded that 3% glycerol in diet with probiotic significantly improved dressed breast weight, lowered LDL and increased litter moisture with increase in glycerol level.

### **Glycerine and growth performance of meat type poultry**

#### **Broiler**

In broilers, earlier studies recommended glycerine inclusion up to 5% in diet (Cerrate et al. 2006). However, Mandalawi et al. (2014) also established same result and recommended 10% glycerine inclusion in broiler diets. Topal and Ozdogan (2013) recommended 4 and 8% of glycerine for use in broiler production system from 0 to 21 days with improved body weight gain and FCR. According to Henz et al. (2014), crude glycerine may be added as diet ingredient up to 6.06% for broilers until 21 days of age without detrimental effect on performance. However, recent findings from Freitas et al. (2017) contradicted the higher inclusion rates in broiler diets and declared 5% inclusion as safe in diet up to 42 days of age.

#### **Feed intake**

In a recent study, feed intake was changed quadratically, resulting in higher feed intake in broilers with 70 g/kg of crude glycerine (Tavernari et al., 2022). Significantly higher feed intake was observed in meat type quails fed 12% glycerol than birds subjected to other lower glycerol inclusion in diet (Silva et al., 2016). Similarly, in another experiment, it was noted that for each 1% glycerine added, the consumption of feed by quails was increased by 4.15 g (Farrapo et al. 2017).

#### **Body weight gain**

It has been confirmed in several studies that the lower level of crude glycerine can be efficiently used in broiler diets without any hazardous effects. Recently, Tavernari et al. (2022) reported an increase in body weight and decrease in fat deposition in broiler deposition when crude glycerine was added up to 4.6% in initial diets. However, higher inclusion rate of crude glycerine is still under investigation for recommendations. In a previous study, body weight improved 13.22% in females and 12.12% in males upon glycerine addition in diet (Kroupa et al., 2011).

#### **FCR**

Crude glycerine @ 8% in diet has been found to be safe in broilers showing better FCR as compared to glucose and sucrose (Wang et al. 2018). Abd-Elsamee et al. (2010) reported better feed conversion ratio when broilers were fed with 6% crude glycerine in diet throughout the experimental period of 42 days.

#### **Carcass characteristics**

Carcass characteristics including thigh, drumstick and breast yield remained unchanged when crude glycerine was added up to 5% (Cerrate et al. 2006). However, in another experiment it was noted that glycerine was negatively associated with carcass yield when added up to 10% glycerine in broiler diet. Bernardino et al. (2015) reported that glycerine @ 7% in diet adversely did affect breast yield. However, 5.2% inclusion of glycerine in diet may improve it.

#### **Meat quality**

A higher inclusion rate of crude glycerine (9%) in diet of broilers was recommended by de Souza et al. (2020) who observed a significant impact on protein deposition and water holding capacity of meat. Wattanachant et al. (2018) reported that 10% inclusion of crude glycerine in broiler diet had no effect on meat quality parameters including pH, lightness, redness, yellowness, drip loss, cooking loss and shear force of meat at 45 minutes and 24 hours post mortem intervals. In another report, yellowness of thigh meat was also linearly decreased when broilers were fed different glycerine treated diets (Garcia et al. 2018).

#### **Gut microbiome**

Diets containing glycerol reduced the intestinal microbial inhabitants and increased surface area capable of higher absorption of available nutrients from intestine. Studies in broilers (Liu et al., 2020) and laying hens (Cui et al., 2023) demonstrated increased villus length and thickness in the intestine.

## Glycerol

monolaurate/Monolaurin supplementation yielded enhanced villus height-to-crypt depth ratio (V/C ratio) in both experiments.

In addition, enriching feed with 5% glycerin in females from one to 21 days of age and in males up to 35 days of age increased total bacterial count, microbial activity, enterobacteria and coliform bacterial populations. From a microbiological and biotechnological view, it was assumed that there was a positive relationship between glycerin and microorganisms as reported by Silva et al. (2009).

### Litter moisture

Increase in litter moisture might be due to low molecular weight hydrophilic glycerol compound which is easily excreted through the kidneys (Freitas et al., 2017). Henz et al. (2014) observed a linear increase in litter moisture corresponding with higher levels of crude glycerine in the diet at 10 days of age.

### Economics

Apart from benefits as energy source, glycerine is also an economical feed ingredient relative to the conventional ingredients (Zavarize et al. 2014). Abd-Elsamee et al. (2010) reported that cost/kg live weight was reduced at 6% inclusion of glycerine while highest value was for control group. Sehu et al. (2013) calculated the economic efficiency of broiler birds fed glycerine supplemented diet and concluded that birds fed with 5% glycerine diet showed 20% more economic efficiency compared with those fed basal diet.

## Quail

Batista et al. (2013) recommended 16% level of glycerine in feed of meat type Japanese quails, where as Pasquetti et al. (2014) indicated that crude glycerine in diet of meat type quail may be used up to 15%. Glycerine supplementation in Japanese quail showed better female body weight in birds fed with 10% glycerine diet in rearing period (Ghayas 2016). Abd El-Hack et al. (2017) found a quadratic response in broiler quails fed with glycerine supplemented diet and recommended that glycerol dosage of 2.5 and 5% in diet may favour to approach better feed conversion ratio. In contrast to the above results, Arif et al. (2017) observed that breast and thigh yield along with some internal organs in Japanese quail remained unaffected when birds were offered 0 to 10% glycerine supplemented diets. Ghayas et al. (2017) reported that productive performance, egg quality, and hatching traits did not differ significantly throughout the experimental period. It was concluded that glycerine may be used as a replacement energy source, having no effect on productive and reproductive performance in Japanese quail.

### Limitations

- Excess glycerol in broiler diets increases triglyceride release and fat deposition in the liver, causing fatty liver syndrome and reduced performance (Emami et al., 2020).
- High levels of crude glycerine lower protein digestibility and

increase nitrogen excretion, reducing growth and contributing to pollution (Mc Lea et al., 2011).

- Negative effects depend on processing quality, methanol content, and salt levels, with methanol being toxic and slowly eliminated (Luo et al., 2016; Skrzydlewska, 2003).
- Methanol toxicity may cause narcosis and metabolic acidosis, while excess salt leads to water imbalance, wet litter, higher ammonia, and respiratory problems (Kerr et al., 2009; Silva et al., 2012).
- Despite this, glycerine can be safely included up to 10% in monogastric diets without major adverse effects (EFSA, 2010).

### Conclusion

- Crude glycerine is a low-cost, non-conventional energy source that can be safely used in poultry diets, providing an instant source of energy for metabolism.
- Its nutritional value depends on source (animal or vegetable), purity (crude, semi-purified, purified), and processing technique (single or bi-distilled).
- Inclusion levels up to 7.5% for layers, 10% for broilers, and 15% for quails can be used without impairing growth, egg production, or product quality.
- While several studies confirm positive effects up to 10% inclusion, variability in results suggests the need for careful source selection and monitoring.



# Poultry Parasites and Their Control



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Assistant Professor, Department of Poultry Technology  
Suguna Institute of Poultry Management, Udumalpet.

## Introduction

Controlling of parasites in poultry is essential for maintaining flock health and productivity. Effective management involves identifying parasite types, implementing preventive measures like sanitation and biosecurity, and providing appropriate treatments required. Their presence can lead to a range of problems, including reduced growth rate, decreased egg production, increased mortality, and heightened susceptibility to other diseases,

ultimately impacting the economic viability of poultry production.

## Types of Parasites

1. Internal Parasite – lives inside the body
2. External Parasite – live outside the body

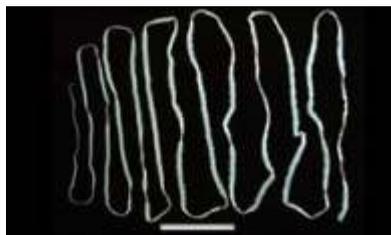
## Internal Parasites

Removal of internal parasites is called deworming. The medicine given for deworming is called an anthelmintic medicine (dewormer). It includes single cell protozoa and worms. The common worms in poultry are

Worm name	Scientific name	Affected area	Prepatent period
Roundworm	<i>Ascaridia gali</i>	Small intestine	35-42 days for young birds, 50-56 days for older birds
Tapeworm	Eucestoda	Intestinal tract	12 – 28 days
Hairworm	<i>Capillaria species</i>	Esophagus, Crop, and Small intestine	20-26 days
Gapeworm	<i>Syngamus trachea</i>	Wind pipe, Bronchi	17-20 days
Caecal worm	<i>Heterakis gallinarum</i>	Intestinal caeca	24-30 days



Roundworm



Tapeworm



Hairworm



Gapeworm



Caecal worm



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EXPERIENCE**

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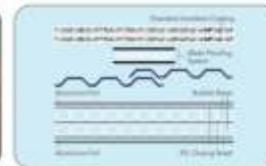
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Mak Flash Seal



Tiri Gold Class



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We are an international brand with the Best Manufacturing Technology & High-Speed Production Facility here in India. TIRI Systems, The Indian Reflective Insulation Systems, manufactures world-class thermal reflective insulation technology which is eco-friendly, saves energy, and is widely trusted in Green Buildings. TIRI Systems Bubble Thermal Insulation acts like a thermos, providing superior performance in both summer and winter conditions. In addition, our advanced insulation systems are increasingly preferred in the poultry industry, ensuring a controlled environment, enhancing bird comfort, and supporting better farm productivity.

**Protozoa:**

Protozoa name	Scientific name	Affected area	Prepatent period
Coccidiosis	Eimeria species	Intestinal tract	4 - 7 days
Black head disease	Histomonas meleagridis	Intestinal tract and Liver	7 - 12 days

Worms are common on deep-litter system and rarely encountered in cage rearing. Growing birds are dewormed one week before vaccinating R2B vaccine at 7-8 weeks and at 16-17 weeks while giving booster. There is common practice to deworm adults once in a month on deep-litter and once in three months in cage rearing. Deworming will be done every month or once in 6 weeks in deep litter system and once in two months in case of cage and slat reared layers. For young chickens, deworming should occur every 4 weeks. After 12

weeks of age, deworming should happen every 5 to 6 weeks to break the life cycle of parasites. LaSota vaccination will be invariably followed after deworming.

**Control and treatment:**

- **Dewormers** – Anthelmintic drugs - Piperazines, Albendazoles, Mebendazoles, Levamisole, Tetramisole, Vermix, Helmacid, etc.
- **Cocciostat** – Anticoccidial drugs – Amprolium, Sulfa drugs, Sulfonamides, etc.
- **Black head disease** – No approved medication.

- **Natural remedies** – Papaya leaves, Guava laves, Ivy gourd, etc.

**Route of administration:**

- Mixed with feed
- Adding to water
- Direct administration

**External parasites:**

Removal of external parasites is called dipping. Parasites are live on or in the skin and feathers of birds, feeding on their blood, skin, or feathers. The medicine used for dipping is called dip solution or dip concentrate. The common external parasites are

Parasite name	Scientific name	Location	Lifespan
Mites	Dermanyssus gallinae	Vent area, hiding in cracks and crevices	2 weeks
Lices	Menacanthus stramineus	Vent, under the wings, breast, feather and shaft	3 weeks and can live for several months
Ticks	Argas persicus	Head, neck, vent	30 days
Fleas	Echidnophaga gallinacea	Head area, comb, wattles, face	1 to 2 months



**Mites**



**Lices**



**Ticks**



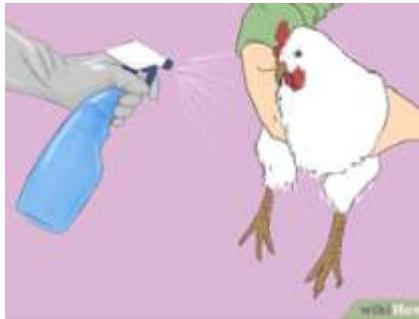
**Fleas**

## Control and treatment:

- **Dusting** - For direct dusting, part the feathers and apply the powder to the skin. For dust bath application, place the dust in a container (e.g., a shallow box) for the birds to access and self-treat - Sevin, Malathion.
- **Spraying** - Spray the birds, paying attention to areas like the vent, head, and under the wings. Spray the poultry house, paying attention to cracks, crevices, and areas where parasites may hide - Permethrin, Carbaryl, or Coumaphos, Organophosphates.
- **Dipping** - Dip the bird's legs or affected areas in the solution, ensuring the insecticide reaches the skin. Avoid dipping on rainy days and avoid dipping the head - Paraffin, Cypermethrin, Amitrax.



Dusting



Spraying



Dipping

## Prevention of Parasites

- **Good Manufacturing Practices** - Maintaining clean, dry housing environments, ensuring proper ventilation and lighting, and implementing a regular cleaning and disinfection schedule are essential for preventing infestations.
- **Biosecurity** - Implementing strict access controls, disinfecting equipment and vehicles, and quarantining new birds help prevent the introduction of parasites into the flock.
- **Poor nutrition and hygiene** - Providing a balanced and nutritious diet can help birds develop strong immunity and better withstand parasitic challenges.
- **Integrated Parasite Management (IPM)** - This holistic approach combines cultural/physical, biological, and chemical control methods to minimize losses and optimize resource use.

## Conclusion

Poultry parasite control is a complex and ongoing process. By understanding the common types of parasites, their life cycles, and transmission methods, you can develop effective prevention and control strategies. Good management practices, biosecurity measures, and proper nutrition and hygiene are all crucial for maintaining a healthy and productive flock. When parasite infestations occur, antiparasitic treatment and strategic medication use can help minimize the impact. Regular monitoring and evaluation are essential for ensuring the effectiveness of parasite control programs.



# Integrated Cold Chain and Value Addition Infrastructure (ICCVAI)

## India's Post-Harvest Supply Chain from Farm Gate to Consumer

### Introduction

Post-harvest losses remain a significant challenge in India, particularly for perishable commodities such as fruits, vegetables, dairy, meat, poultry, and fish. Research indicates that considerable losses occur throughout the supply chain, from harvesting and handling to transport, storage, and processing, reducing farmers' incomes, increasing consumer prices, and undermining food security. To tackle these challenges, the Ministry of Food Processing Industries (MoFPI) runs the Integrated Cold Chain and Value Addition Infrastructure Scheme, commonly referred to as the Cold Chain scheme as part of the Pradhan Mantri Kisan Sampada Yojana (PMKSY). The main goal is to build a seamless cold chain from farm gate to retail outlet, to reduce post-harvest losses and help farmers secure better returns for their produce. Although the scheme was launched earlier, it was restructured and included under PMKSY in 2016-17. PMKSY is an umbrella scheme of the Ministry of Food Processing Industries which aims to create modern infrastructure with efficient linkages and supply chain management from farm gate to retail outlet. The Cold Chain Scheme was brought under the umbrella of PMKSY for creating

complete cold chain solutions that connect farmers, processors, and markets, and for cutting wastage, boosting employment, and strengthening the competitiveness of the perishable goods sector.

Moreover, the significance of cold chain infrastructure extends beyond mere storage. It includes pre-cooling facilities at farms, modern processing centers, efficient distribution hubs, and temperature-controlled transport systems that work together in sync. The scheme encompasses multiple sectors, including horticulture (excluding fruits and vegetables since 2022 which get covered under a separate scheme), dairy, meat, poultry, and marine or fish products (excluding shrimp), thereby addressing a broad spectrum of



perishable commodities crucial to agriculture and allied industries. This restructuring aimed to streamline assistance and prevent duplication. It also transferred fruits, vegetables, and shrimp under the Operation Greens scheme, another component of PMKSY focused on stabilizing supply chains.

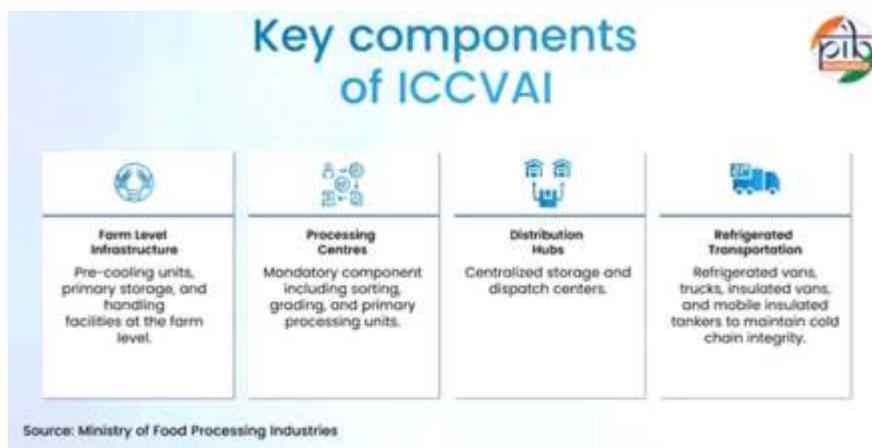
An evaluation study conducted by NABARD Consultancy Services Pvt. Ltd. (NABCONS) in 2020 highlighted that interventions under the ICCVAI scheme resulted in a significant reduction in wastages, particularly in the Fruits & Vegetables, Dairy, and Fisheries sectors.

### Objectives of the ICCVAI

The founding objectives of the scheme were clearly defined to ensure the holistic development of cold chain infrastructure:

### Key components of ICCVAI

The scheme supports the creation of facilities across the supply chain, often emphasizing infrastructure at the farm level. For an applicant to receive financial assistance under the general cold chain scheme (as per 22.05.2025 guidelines), they must set up Farm Level Infrastructure (FLI) and connect it with either a Distribution Hub (DH) and/or refrigerated/insulated transport. Its key components include:



### Eligibility of PIA to establish Food Processing Unit

ICCVAI is a demand driven scheme. Various eligible entities (Project Implementing Agencies – PIAs) can establish the food processing units. PIA can be anyone from the following:

- Individuals (including farmers).
- Entity/Organization such as Farmer

Producer Organizations (FPOs), Farmer Producer Companies (FPCs), Non-Governmental Organizations (NGOs), Public Sector Undertakings (PSUs), Firms, Companies, Corporations, Cooperatives, and Self-Help Groups (SHGs).

Ministry invites applications/proposals from eligible entities through floating Expressions of Interest (EOIs) based on the availability of funds. Obtaining consent from the States for the storage of food commodities is not mandatory; however, their assistance is required in establishing the food processing units.

### Key Government Initiatives Complementing the ICCVAI Scheme

Mission for Integrated Development of Horticulture (MIDH), National Horticulture Board (NHB), and Agriculture Infrastructure Fund (AIF) are some key government initiatives that complement the ICCVAI Scheme.

#### 1. Mission for Integrated Development of Horticulture (MIDH)

Under the MIDH, financial assistance is provided for a range of horticulture activities, including the construction, expansion, and modernization of cold storages with a capacity of up to 5,000 MT across the country. These projects

respective State Horticulture Missions.

#### 2. Operation Greens Scheme

This is another Central Sector Scheme being implemented by MoFPI under Pradhan Mantri Kisan SAMPADA Yojana since 2018-19, with the objective of enhancing the value realisation of farmers and minimizing post-harvest losses. The scheme was initially intended for the integrated development of Tomato, Onion and Potato (TOP) value chain, but was later extended to cover a variety of other vegetables and fruits, and also shrimp.

#### 3. National Horticulture Board (NHB)'s Initiative

NHB is implementing a scheme namely "Capital Investment Subsidy for Construction/Expansion/Modernization of Cold Storages and Storages for Horticulture Products". The scheme provides a credit-linked back-ended subsidy of 35% of the project's capital cost in general areas and 50% in the case of North Eastern, hilly, and scheduled areas. It supports the construction, expansion, and modernization of cold storage and Controlled Atmosphere (CA) storage facilities with capacities ranging from 5,000 MT to 20,000 MT, thereby promoting scientific storage and reducing post-harvest losses in the horticulture sector.

#### 4. Agriculture Infrastructure Funds (AIF)

To further strengthen agricultural infrastructure across the country, the Government has launched the AIF with a corpus of ₹1 lakh crore. The Fund aims to facilitate the creation of post-harvest management and community farming assets, including cold storages, warehouses and processing units. All the eligible beneficiaries can avail collateral-free term loans of up to ₹2 crore along with an interest subvention of 3% per annum on the term loan.

#### Financial Assistance

#### Enhanced Budgetary Allocation under PMKSY (2025)

The Union Cabinet in July 2025 approved an additional outlay of ₹1,920 crore for the PMKSY, raising the total allocation to ₹6,520 crore for the 15th Finance Commission cycle (up to March

31, 2026). This approval includes Rs. 1000 crore to support the setting up of 50 Multi-Product Food Irradiation Units under the component scheme- Integrated Cold Chain and Value Addition Infrastructure (ICCVAI). This significant increase reflects the government's strong commitment to expand the impact of cold chain infrastructure.

The scheme provides grants or subsidies to set up integrated cold chain projects covering 35% of the eligible project cost in general areas and 50% in difficult areas, as well as for proposals from SC/ST groups, FPOs, and SHGs. Difficult Areas include North-Eastern States (including Sikkim), Uttarakhand, Himachal Pradesh, Jammu & Kashmir, Ladakh, Integrated Tribal Development Programme (ITDP) areas, and Islands. Each project can receive up to ₹10 crore in financial assistance.

#### Achievements and Progress

As of June 2025, a total of 395 integrated cold chain projects have been approved under the Cold Chain Scheme since its launch in 2008. Out of these, 291 projects have been completed and are operational, creating a preservation capacity of 25.52 lakh metric tonnes (LMT) per year

and a processing capacity of 114.66 LMT per year. The completed and operationalised projects have contributed to the generation of 1,74,600 jobs across the country.

Substantial progress became evident after 2016–17. Since 2016-17, an amount of ₹1535.63 crore has been released against approved grants-in-aid / subsidy of ₹2066.33 crore for implementing 269 approved projects with 169 cold chain projects have been completed and operationalised across the country.

#### Major Revision and Policy Updates

The scheme has undergone several revisions to enhance its effectiveness and align with emerging needs:

June 2022 Revision: A significant policy change was implemented on June 08, 2022 when the scheme discontinued support for cold chain projects in the fruits and vegetables sector. Moreover, the sector was shifted to the Operation Greens Scheme which is another component of PMKSY specifically designed to address price stabilization measures in the horticulture sector. Therefore, this strategic reallocation allowed for specialized focus and optimized resource utilization.

August 2024 Guidelines: Operational scheme guidelines were issued on August 06, 2024 for setting up multi-product food irradiation units (use of ionizing radiation to preserve food, extend shelf life, and reduce post-harvest losses for various products) under the cold chain scheme.

Therefore, this addition reflects the incorporation of modern preservation technologies that extend shelf life and ensure food safety without compromising nutritional quality.

May 2025 Revision: The latest operational guidelines, released on May 22, 2025, focus on strengthening preservation and value-addition infrastructure across the entire supply chain, from the farm gate to the consumer. These measures aim to minimize post-harvest losses of non-horticulture produce, while also ensuring farmers receive fair and remunerative prices and consumers benefit from the year-round availability of food products.

#### Conclusion

The evolution of the scheme demonstrates adaptive governance. The 2022 sectoral realignment, transferring fruits and vegetables to Operation Greens, reflects strategic specialization. The 2025 budget increase to ₹6,520 crore underscores the government's focus on strengthening and expanding the impact of cold chain infrastructure. The introduction of irradiation facilities and regular guideline revisions shows responsiveness to technological advancements and ground-level requirements.

The scheme's financial framework ensures that cold chain development remains economically feasible for a wide range of stakeholders, from individual farmers to large corporate entities. It aims to ensure that projects are implemented in response to actual market needs. Furthermore, the scheme holds significant potential. Integrating modern technologies such as IoT-based monitoring, energy-efficient systems, and AI-driven logistics optimization can greatly enhance operational efficiency. Strengthening linkages with agricultural marketing reforms can further amplify benefits for farmers.



# BAADER Showcases Innovative Protein Processing Solutions at World Food India 2025



**Lübeck / New Delhi, 25. Sept. 2025** – BAADER, a global leader in food processing technology, will participate in World Food India 2025 at Bharat Mandapam, India's flagship event for the food and agribusiness sector, held from 25 - 28th September in New Delhi.

With more than a century of innovation, BAADER partners with processors worldwide to serve the growing demand for safe, sustainable, and efficient protein supply. At World Food India, BAADER will highlight its comprehensive portfolio in poultry, refining, fish, and digitalisation – underscoring its commitment to supporting India's dynamic food industry.

## Trusted partnerships in India

BAADER has established long-standing relationships with Indian food producers such as Venky's and the Allana Group. Most recently, BAADER and Allana are shaping the future of poultry processing with a greenfield facility in Kishanganj, North

India. Fully automated and scalable, the plant delivers maximum efficiency and hygiene, setting new industry standards and inspiring the next generation of food production in the region.

## End-to-end processing expertise

BAADER offers machines and complete processing solutions across the entire processing value chain:

- **Poultry:** Complete solutions from live bird handling, slaughtering, deboning, to grading and batching, with strong emphasis on automation, flexibility, hygiene, and quality.
- **Refiner:** Mechanical separation technology that maximizes protein recovery from poultry, fish, and meat, contributing to resource efficiency and sustainability.
- **Fish:** Advanced solutions across species, including pelagic processing and surimi production using the BAADER Refiner.
- **Digitalisation:** Intelligent data capture, powered by

AI, combined with real-time monitoring of processing performance, to support ongoing optimization of yield and product quality.

## Sustainable innovation for the future

"India's food industry is at an exciting stage of growth. With our experience in greenfield projects and focus on long-term customer partnerships, we see strong opportunities to contribute to the country's sustainable protein supply," said BAADER CEO Petra Baader, who will be at the **BAADER booth D19 in Hall 11**.

World Food India, organized by the Ministry of Food Processing Industries, brings together global industry leaders, policymakers, and innovators to accelerate India's position as a global food hub.

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# CLFMA of India Delegation Strengthens U.S.-India Agricultural & Livestock Collaboration Through In-Depth Knowledge Exchange



- The CLFMA of India delegation visited the United States to study sorghum, corn, and dairy farming practices and engage with top agricultural stakeholders.
- Meetings included live farm demonstrations, industry interactions, and discussions with senior U.S. officials, including the Governor and Agriculture Secretary of Iowa.
- The visit reinforces ongoing MoUs between CLFMA, the State of Iowa, and Maharashtra, promoting knowledge exchange and bilateral cooperation.

The Compound Livestock Feed Manufacturers Association (CLFMA) of India successfully concluded a week-long delegation visit to the United States, marking a significant step in advancing international cooperation in agriculture and livestock feed. Invited by the U.S. Grains Council, the delegation, led by Chairman Mr Divya Kumar Gulati, engaged with policymakers, industry leaders, and farmers to

explore best practices in sorghum (jowar), corn, and dairy production. The visit commenced in San Antonio, Texas, where the delegation participated in a series of technical sessions led by experts from the United Sorghum Checkoff Program, Kansas State University, Clemson University, and the U.S. Grains Council. Discussions spanned global sorghum markets,

grain standards, sustainable farming practices, and the role of sorghum in poultry, swine, and pet food diets. Sessions also highlighted efficiencies within the U.S. grain supply chain and emerging trends in global demand. Next, the delegation travelled to Amarillo, Texas, to witness sorghum cultivation and processing firsthand. Visits included Will

Braack and Kathy Broman Farms, Joe Rohrbach Farms, and the Richardson Seed Company in Vega. The program also featured a tour of Myles Frische Farms and an engagement with Bunge in Etter, Texas, offering an in-depth look at planting, harvesting, and supply chain operations. The Texas leg concluded with a debrief session hosted by the United Sorghum Checkoff Program in Amarillo.

In Iowa, the delegation explored the integrated grain-to-feed ecosystem through visits to POET Bioprocessing facilities in Jewell and Shell Rock, as well as Mark Mueller's farm in Waverly, where the team was hosted for a farmer-organized cookout. Additional stops included Stuart Swanson Farms in Galt, the Gold Eagle Feed Mill in Eagle Grove, and Dutchland Dairy in Rolfe, providing insights into ethanol production, feed manufacturing, and large-scale dairy operations.

The Iowa program culminated in strategic engagements, featuring a high-level meeting with the Governor of Iowa at the State Capitol, followed by discussions with the Iowa Agriculture Secretary and members of the Iowa Corn Growers Association. These

interactions focused on agricultural policy, trade, and technology adoption, underscoring opportunities for long-term collaboration in livestock feed and dairy sectors.

This visit reinforces ongoing efforts under the MoU signed between CLFMA and the State of Iowa (September 2024), and the sister-state agreement between Maharashtra and Iowa (August 2025). Both frameworks aim to facilitate joint research, knowledge sharing, and adoption of sustainable practices in the livestock feed and broader agricultural sector.

Commenting on the visit, Mr Divya Kumar Gulati, Chairman, CLFMA of India, said, "This visit provided invaluable insights into advanced agricultural practices, particularly in sorghum, corn, and dairy production. With India's animal feed market valued at approximately USD 14.34 billion in 2024 and projected to reach USD 21.02 billion by 2034,<sup>1</sup> the need for sustainable and efficient feed solutions is paramount. Engaging with U.S. counterparts has highlighted the importance of knowledge exchange in addressing challenges such as feed shortages

and productivity gaps. By adopting proven practices and fostering international collaboration, we aim to enhance the sustainability and competitiveness of India's livestock sector."

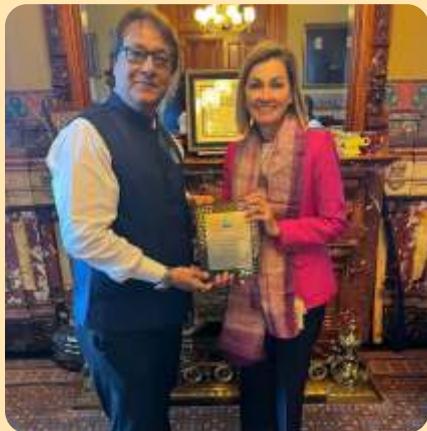
The CLFMA delegation included:

- Mr. Divya Kumar Gulati, Chairman
- Mr. Abhay Shah, Deputy Chairman
- Mr. Abhay Parnekar, Deputy Chairman
- Mr. Nissar F. Mohammed, Honorary Secretary
- Mr. R. Ramkutty, Treasurer
- Mr. Sameer Chotai, President – East Zone
- Mr. Sumeet Surekha, Deputy Chairman
- Mr. Suresh Deora, Immediate Past Chairman
- Mr. Naveen Pasuparthi, Deputy Chairman

Through direct engagement with U.S. farmers, industry representatives, and policymakers, the CLFMA delegation reinforced India's commitment to sustainable agricultural practices, livestock feed innovation, and international collaboration.







# A successful experience at Bhubaneswar's Bharat Poultry Expo 2025!



It was a truly rewarding experience being part of the Bharat Poultry Expo 2025 held in Bhubaneswar. The event brought together leading poultry professionals, innovators, and entrepreneurs from across the country, creating an excellent platform for networking, collaboration, and knowledge sharing. A big thank you to everyone who visited our booth —

your presence and participation made the event even more memorable! We had the opportunity to engage in insightful discussions, exchange innovative ideas, and connect with passionate individuals who are driving the growth and transformation of the poultry industry. The expo showcased the latest technologies, products, and solutions shaping the

future of poultry farming. It was inspiring to witness the enthusiasm, dedication, and forward-thinking mindset of all participants working together for a more sustainable and progressive poultry sector. Here are some glimpses from the event that capture the spirit of innovation, collaboration, and shared commitment to excellence in the poultry industry.





# PROUD MOMENT FOR CLFMA OF INDIA!

**Our Chairman,  
Mr. Divya Kumar Gulati**

has been appointed to the Board of Directors of the  
International Feed Industry Federation (IFIF)

## **IFIF Board of Directors - Mr. Divya Kumar Gulati**

CLFMA of India is honoured to represent India on the global stage. Our Chairman, Mr. Divya Kumar Gulati, joins the IFIF Board of Directors (2026–2027) — strengthening India’s voice in advancing sustainable growth, innovation, and collaboration in the global feed and livestock sector.

# Venkateshwara B V Bio-Corp Private Limited organised Technical Seminar on “Layer Management & Nutrition with Eggxtra 5% Composite Premix” in Bangladesh



Venkateshwara BV Bio-Corp Pvt Ltd India and Nature Care Manufacturing Industry Ltd Bangladesh organized Technical seminars for commercial Layer Farmers on Tuesday 07th October, 2025 at Chattogram, Bangladesh. This technical seminar was attended by layer farmers of Chattogram and surrounding area.

**Dr Sanjay Deshpande**, Venkateshwara BV Bio-Corp Pvt Ltd was spoken for the seminar and explained in detail about the “**Commercial Layers Management**” in all aspects and Importance of balanced nutrition to improve productivity in commercial layers with optimization of production cost. He explained how **Venkys 5% Eggxtra Composite Premix** provide very easy solution to produce the balanced feed for commercial layers as

per the requirement of birds. During his presentation, he advised to be watchful about quality parameters to be considered while selecting the different feed ingredients. The excerpts from his presentation can be summarized as below.

- Importance of brooding management as a foundation for preparing better pullets.
- Importance of body weight monitoring in rearing period and its impact on laying productivity.
- Benefits of good uniformity for good egg production and consistency as well.
- Early Laying Nutrition to maximize peak production.
- Benefits of Phase feeding – to reduce the overall egg production cost and

to provide the nutrients as per requirement of the birds age, egg production, egg weight, egg shell quality etc.

- Importance of Water Management and its impact on gut health.
- Maintaining the egg shell quality during post peak production period.
- **5% Eggxtra Composite Premix** is an innovative Premix helping to produce balanced feed in an easy and simple way. It also helps to avoid the errors occurring during weighing, batching and mixing processes of feed production.
- **5% Eggxtra Composite Premix** is capable of optimizing the cost with highest efficiency at farm level.

**Dr Sanjay Deshpande** answered the queries of the attendees related to the subject and other technical queries regarding Farm Management and Vaccination Program.

The Technical Seminar was attended by around **25** Layer farmers surrounding the Chattogram Bangladesh area.

**Mr Md Mahabub Alam**, Sales Manager, Nature Care proposed vote of thanks to all. The local Nature Care and Venkys Team, **Dr Faiz Khan Rakib**, Technical Manager (sales) Venkys India Ltd, Bangladesh organised this technical seminar.



# The 36th Annual General Body Meeting (AGM) of the Poultry Federation of India

The 36th Annual General Body Meeting (AGM) of the Poultry Federation of India commenced today at Hotel Ramada by Wyndham in Lucknow (UP) marking the start of a two-day national convention (October 8–9, 2025) under the theme “Survive & Thrive in Difficult Times.” The event witnessed the presence of over 950 participants from across India and 99 sponsoring companies, reflecting the strength and unity of India’s poultry community.

**Inaugural Ceremony** - The AGM began with the lighting of the ceremonial lamp, symbolizing growth, progress, and prosperity in the poultry sector. Mr. Ranpal Dhanda, President, welcomed all participants, expressing heartfelt gratitude to all sponsoring companies for their valuable support in making the AGM a grand success. He also extended special thanks to all office bearers, technical speakers, media partners,

and the entire management team for their dedicated efforts and teamwork. The inaugural address was followed by the Annual Report presented by Mr. Ravinder Singh Sandhu, Secretary, and the Financial Report by Mr. Rahul Khatri, Treasurer.

**Technical & Business Sessions** - The day featured insightful presentations by leading industry experts and companies: Uday Singh Bayas (IPEMA (Indian Poultry Equipment Manufacturers Association) Poultry India– Global Exhibitions and Their Role in Uniting the Poultry Industry. Harish Dharme & Dr. Rahul Sawarkar (BERG & SCHMIDT NUTRITION SDN. BHD. ) – Oil Quality for Better Profitability & Bergaboost Innovation in Egg Production. Mr. Shailendra Garg (RPS Biotech Pvt. Ltd.) – Raw Material Procurement and Product Quality: Our Vision and Values. Dr. Rahul Kulkarni & Mr. Charuhas Gogate (Hargun

Agro Company) – Company Introduction and Product Portfolio Dr. Anup Kalra (Saife Vetmed India) – Biosecurity: The Cornerstone of AMR Control and Cost-Effective Production

**Panel Discussion** - A high-level panel discussion moderated by Dr. O.P. Chaudhary, Retd. Joint Secretary, DAHD, Government of India, included Ricky Thaper, Dr. Ajay Deshpande, Divya Kumar Gulati, Dr. Ajit Ranade, Mr. Mohan Reddy Kasarla, and Dr. Sharad Singh, who discussed key challenges and future opportunities for sustainable poultry farming.

**Further Technical Highlights**- Mr. Saurabh Saboo (Saboo Protein) – Importance of Protein in Poultry Sector. Dr. Rakesh Gupta – Metabolic Syndromes Impacting Broiler Breeders. Mr. Pardeep Kumar Yadav (Sampoorna Feeds Pvt. Ltd.) – Business Overview of Sampoorna. Joginder S. Uppal (nu.ance Biotechnology) – Innovating for a Better Tomorrow. Dr. Shailaja Rajyam (Zamira Australia) – For Better Animal Health. Dr. Bohra (Makams) – Glucose Oxidase: Bridging Nutrition, Immunity & Performance in Poultry.

Sponsors were felicitated for their continuous support. The Vote of Thanks was delivered by Mr. Sanjeev Gupta, Vice President (HQ). The evening concluded with a musical program and cocktail dinner, offering networking opportunities and celebrating unity within the poultry fraternity.





## ₹1,166 Crore Projects Launched to Boost Dairy and Livestock Sector in India; 125 Crore Animal Vaccinations Announced under PM Dhan-Dhanya Krishi Yojana



**14 October 2025, New Delhi:** Giving a major push to India's livestock and dairy sector, Prime Minister Narendra Modi inaugurated and laid the foundation stone for projects worth a total of ₹1,166 crore in New Delhi. The initiatives, forming a crucial part of the government's investment in agriculture and allied sectors, were launched alongside two key national programmes — the Pradhan Mantri Dhan-Dhanya Krishi Yojana (PM-DDKY) and the Mission for Aatmanirbharta in Pulses. These efforts underline the government's commitment to strengthening rural livelihoods, improving farmers' income, and advancing India's self-reliance in

agriculture and allied activities.

In his address, Prime Minister Modi highlighted the central role of livestock, fisheries, and allied sectors in rural prosperity under PM-DDKY. He noted that more than 125 crore vaccines have already been administered free of cost to protect animals from diseases such as Foot and Mouth Disease, significantly improving animal health and reducing farmers' concerns. The Prime Minister announced that local-level campaigns on animal health will soon be launched under PM-DDKY to ensure disease-free livestock and

better productivity. He emphasized that animal husbandry, fisheries, and beekeeping are vital income sources for small and landless farmers, especially in regions where crop cultivation is limited.

A major highlight of the event was the inauguration of the first IVF Laboratory in the North-Eastern Region, established in Guwahati, Assam under the Rashtriya Gokul Mission (RGM) at an investment of ₹28.93 crore. This state-of-the-art facility will enhance dairy development and breed improvement in the northeastern states, giving a strong boost to the region's livestock productivity.

Under the National Programme for

Dairy Development (NPDD), several large-scale infrastructure projects were inaugurated. These include the Mehsana Milk Union project in Gujarat, which comprises a 120 metric tonnes per day milk powder plant and a 3.5 lakh litres per day UHT plant developed at a cost of ₹460 crore. The Indore Milk Union in Madhya Pradesh inaugurated a 30 tonnes per day milk powder plant worth ₹76.50 crore, while the Bhilwara Milk Union in Rajasthan launched a 25,000 litres per day UHT plant built at a cost of ₹46.82 crore. Additionally, a new Greenfield Dairy Plant was established at Nustulapur, Karimnagar in Telangana with an investment of ₹25.45 crore. Further strengthening the dairy network, the foundation stone was laid for an integrated dairy plant and a 200 tonnes per day cattle feed plant in Kuppam Mandal, Chittoor District, Andhra Pradesh, with a combined investment of ₹219 crore.

Under the Animal Husbandry Infrastructure Development Fund (AHIDF), ten projects worth ₹303.81 crore were inaugurated across multiple states to enhance the nation's capacity for feed, milk, and animal product processing. To strengthen breeding and reproductive services at the grassroots level, 2,000 newly trained and equipped MAITRIs — Multipurpose Artificial Insemination Technicians in Rural India — from all districts of Uttar Pradesh were awarded certificates by the Prime Minister under the Rashtriya Gokul Mission. In addition, over 38,000 MAITRIs have been inducted across India, marking a significant step toward improving artificial insemination coverage and accelerating genetic upgradation of livestock.

## An innovative approach to shield poultry against foodborne illness, including Salmonella



Like a silent saboteur, foodborne pathogens can sneak up and ruin your next meal. One of the biggest culprits is Salmonella, a type of bacteria found in many foods that causes more than 1.3 million cases of foodborne illnesses annually according to the Centers for Disease Control and Prevention.

Despite nationwide efforts, Salmonella's infection rates have remained nearly unchanged for the past 30 years. Now, MU is part of an interdisciplinary effort determined to change that after recently receiving a three-year, \$5 million grant from the National Science Foundation's Convergence Accelerator program.

The 19-member team of investigators — with expertise in engineering, poultry and food science, public health and supply chain management — is developing new technology to rapidly detect and mitigate salmonella and other foodborne pathogens throughout the entire poultry supply chain.

### Rapid results

One in every 25 packages of chicken found on store shelves is contaminated with Salmonella, according to the US Food and Drug Administration. Because chicken is a major source of illnesses from Salmonella, the researchers decided to begin their efforts by focusing on helping the poultry industry.

The team's goal is to significantly reduce the risk of foodborne illness in people, said Mahmoud Almasri, lead principal investigator (PI) and an associate professor of electrical engineering and computer science in the MU College of Engineering.

"Real-time data collected from multiple portable sensors will be added to a transformative sensor-enabled decision support system (SENS-D), allowing us to produce results in one hour or less," Almasri said. "Our rapid results will enable both the supply chain and health partners to make data-driven decisions to enhance food safety, equity and security by providing evidence-based solutions."

While the current gold standard of testing for foodborne pathogens takes at least 24 hours to produce results, the researchers' forward-thinking approach could one day revolutionize the poultry industry and influence policy, said Kate Trout, co-PI and an assistant professor of health sciences in the MU College of Health Sciences.

"These pathogens grow very quickly, so a lot can happen to a food product in just 24 hours," Trout said. "We think our sensors, combined with our decision support system, could change the way that the entire poultry industry and health stakeholders make decisions to ensure a safer food supply for everyone."

For instance, this research is vital for helping ensure food safety between the packing plant and a store shelf.

"Our project could help increase the understanding of the impact of time and temperature during distribution and transit," said Tim Safranski, co-PI and a professor of animal sciences in the MU College of Agriculture, Food and Natural Resources and a state swine extension specialist with MU Extension.

The team will also use advanced statistical and machine learning techniques to improve risk mitigation.

"One strength of our project is using advanced analytics and artificial intelligence (AI) to develop innovative descriptive, predictive and prescriptive capabilities for a safe, efficient, equitable and resilient food supply chain," said Haitao Li, co-PI and a professor and chair of supply chain and analytics department at the University of Missouri-St. Louis.

While the sensors are currently in prototype development, the team is already exploring how the new technology might work for detecting other foodborne pathogens besides salmonella.

"We hope our technology can go beyond poultry and be adapted to detect and reduce the risk of other foodborne pathogens to benefit society as a whole," said Amit Morey, co-PI and an associate

professor of poultry science at Auburn University.

When the technology is ready for real-world use, the team will work with MU Extension to help industry partners in Missouri and beyond understand how to use the new tools through various workforce education and training initiatives.

“We know that just developing a new technology and putting it out in the world doesn't make a large impact unless we teach people in the industry how to use these new AI and detection technologies,” Trout said. “We're fortunate to have such a strong state extension program to be able to implement that component of the program.”

## Asia Pacific poultry meat preparations market poised for steady growth



Asia Pacific's poultry meat preparations market is set to reach USD 39.1 billion by 2035, with China and Thailand leading growth.

Asia Pacific's poultry meat preparations market is set for steady expansion over the next decade, according to a newly published report by IndexBox.

- Regional consumption is projected to reach 9.4 million tons by 2035, up from 7.9 million tons in 2024.
- Market value is expected to hit USD 39.1 billion, up from USD 31.1 billion in 2024.
- Growth is driven by rising demand and sustained trade.

### China leads in consumption and production

China continues to lead the region, accounting for nearly half of both consumption and production.

In 2024, China consumed 3.8 million tons of poultry meat preparations and produced 4.1 million tons—50% of the region's total output. India and Pakistan follow, consuming 1.5 million tons and 582,000 tons, respectively.

Per capita consumption is highest in Japan at 4.1kg, followed by Thailand (3.2kg), and China (2.7kg). From 2013 to 2024, China's

consumption volume grew at an annual rate of 2.6%, while Pakistan posted the fastest growth at 3.9%.

Production hits record highs

Regional production reached 8.2 million tons in 2024, marking a 3.7% increase from the previous year. The market has grown at an

average annual rate of 2.7% since 2013, with notable acceleration in 2019 when production rose by 5%.

In value terms, production rose to USD 33 billion in 2024, reflecting a 3% CAGR over the past decade.

After China, India and Thailand ranked second and third in production, with 1.5 million tons and 901,000 tons, respectively. Thailand showed the fastest growth among major producers at 3.63% annually.

### Imports rise, driven by Japan and China

Imports of poultry meat preparations climbed to 711,000 tons in 2024, up 12% year-on-year. Japan accounted for 71% of total imports, followed by Hong Kong SAR and China. China's import volume surged at compound annual rate of 104.5% from 2013 to 2024, making it the fastest-growing importer in the region.

Imports in 2024:

- **Japan:** 504,000 tons (71% of total imports), USD 2.3 billion in value.
- **Hong Kong SAR and China:** combined for 94,000 tons
- **South Korea:** 32,000 tons
- **Philippines:** 31,000 tons, strong growth at 63.1% CAGR
- **Singapore:** 27,000 tons

Import prices in Asia Pacific averaged USD 4374 per ton in 2024, down 4.6% year-on-year. Of the importing countries, Singapore had the highest price at USD 5097 per ton, while the Philippines had the lowest at USD 2258 per ton.

### Thailand dominates export landscape

Asia Pacific exported 1.1 million tons of poultry meat preparations in 2024, up 15% year-on-year. Export volume grew at 3.8% CAGR over the past 10 years. Export value

reached USD 4.4 billion.

Thailand led the region in exports with 677,000 tons, followed by China with 354,000 tons. Thailand also commanded the highest export price at USD 4432 per ton.

Export shares in 2024:

- **Thailand:** 64% of export volume, 68% of export value
- **China:** 34% of export volume, 30% of export value

Export prices declined slightly to USD 4190 per ton in 2024, continuing a flat trajectory since 2014.

With China and Thailand anchoring production and trade, and Japan driving import demand, Asia Pacific's poultry preparations market is positioned for sustained growth through 2035.

## Global poultry production to grow 2.8% in 2025



Global poultry production is projected to grow by 2.8% in 2025, according to a recent report by RaboResearch, marking a slight acceleration from the 2.6% growth recorded in 2024.

Global poultry production is

projected to grow by 2.8% in 2025, according to a recent report by RaboResearch, marking a slight acceleration from the 2.6% growth recorded in 2024. This increase reflects the continued strength of the poultry market, which remains resilient amid rising prices for other animal proteins such as beef and pork.

- Poultry's affordability continues to make it a preferred choice for consumers worldwide, especially in regions facing economic pressures.
- Lower feed prices are also contributing to improved profitability across the industry, with positive impacts seen in Asia, Europe, Africa, and the Americas.
- Nan-Dirk Mulder, senior analyst in animal protein at RaboResearch, emphasized that feed cost reductions are helping producers maintain margins despite global uncertainties.

**However, supply growth remains uneven. Europe, Africa, and Latin America are experiencing slower expansion due to tight parent stock availability—a constraint expected to persist until early 2026.** In contrast, Asia is leading

the growth, with China's poultry sector expanding by 7% in the first half of 2025. Other countries such as Turkey, Indonesia, Saudi Arabia, the Philippines, and Vietnam are also seeing robust increases in production.

- **To address oversupply, governments in China and Indonesia have implemented market-balancing programs.**
- Meanwhile, global poultry trade continues to expand, although Brazil—the world's largest poultry exporter—suffered a significant setback in May 2025 due to bird flu-related restrictions.
- This disruption opened opportunities for other exporters like Thailand, Russia, Ukraine, and Turkey, which increased their market share during Brazil's temporary absence.

**Trade tensions, particularly involving the United States, have yet to yield benefits for American poultry exports.** However, future negotiations may prioritize access to international chicken markets. As Brazil regains its disease-free status and U.S. trade access improves, global export dynamics are expected to shift again.

**Bird flu remains a critical concern for the industry, especially in the Northern Hemisphere as winter approaches.** Biosecurity measures and vaccination programs are being increasingly adopted in regions such as Asia, Latin America, France, and South Africa to mitigate risks. Nonetheless, new outbreaks are anticipated, potentially adding volatility to already tight market conditions.

**Despite these challenges, the outlook for global poultry production in 2025 remains optimistic, driven by strong demand, cost-effective protein**

options, and strategic market adjustments.

## India Poultry: Focus on Domestic Market, Not Exports



New Delhi, Oct 6 (PTI) India's poultry industry is prioritising domestic consumption over exports, citing high production costs and a vast untapped local market, senior industry officials said on Monday.

Despite ranking second globally in egg production, India ranks 25th or 26th in egg exports, said Tarun Sridhar, former secretary in the Union Ministry of Animal Husbandry, Dairying and Poultry, at a curtain raiser for the 17th Poultry India Expo to be held November 25-28 in Hyderabad.

"Export is not an end in itself," the former secretary told reporters. "If my product is giving me more value in the domestic market, then why should I go for exports?," he questioned.

India ranks fourth or fifth globally in meat production. Still, it has the world's lowest per capita

consumption at 3 kg annually, which is lower than that of Bangladesh and other developing nations.

Per capita chicken consumption in India stands at 6-7 kg per person per year, while egg consumption stood at 103 eggs annually, according to Naveen Pasuparthi,

President of Karnataka Poultry Farmers & Breeders Association (KPFBA).

"The country has protein-deficient citizens," Pasuparthi said, noting that 71 per cent of Indians consume chicken and eggs. "We have 1.43 billion people. Why will I want to export?," he questioned.

Indian poultry producers face significant cost disadvantages compared to major exporters.

Corn costs Rs 23-25 per kg in India, compared to Rs 14 per kg in exporting countries, while soybean meal is 30 per cent more expensive domestically, industry officials said.

"Our cost of production is Rs 90. Their cost of production is Rs 25-30 less than ours," said Divya Kumar Gulati, chairman of the Compound Livestock Feed Manufacturers Association (CLFMA), noting that feed accounts for 80-85 per cent of production costs.

The cost gap stems partly from India's restrictions on genetically modified crops, which lower feed costs in competing nations.

"We will not be able to compete in international markets," Pasuparthi said.

Industry officials said export opportunities remain limited without significant infrastructure improvements. "Unless we have good processing facilities, good frozen and processed products, we will not be able to enter the export markets," Sridhar said, citing strict international hygiene standards.

Gulati suggested Export Processing Zones with duty-free imports as a potential solution, though viability remains uncertain.

The United States and other countries view India as a potential market for their poultry products due to competitive pricing advantages, officials said.

## India's poultry sector eyes domestic consumption over exports amid cost pressures

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## More HPAI reported in Minnesota, Utah, British Columbia

New cases of highly pathogenic avian influenza (HPAI) in commercial poultry have been reported in the United States and Canada. Those include three flocks in Minnesota, two in Utah and one in British Columbia.

### Avian influenza in Minnesota

The United States Department of Agriculture (USDA) Animal and Plant Health Inspection Service reported that the presence of HPAI was confirmed in three commercial flocks in Minnesota on October 14.

The largest of the three flocks was in Meeker County, where 92,000 commercial meat turkeys were affected. In Stearns County, another flock of commercial meat turkeys was struck by the virus, with 61,000 turkeys involved in that situation.

The third flock affected involved commercial turkey breeder hens in Kandiyohi County. There were 30,400 birds in that flock.

So far in 2025, 18 commercial poultry flocks have been lost to HPAI.

### Avian influenza in Utah

APHIS reported that two more commercial meat turkey flocks in Sanpete County, Utah, have been hit by HPAI. On October 8, the presence of HPAI was confirmed in a flock of 13,000 turkeys and another flock that included 30,900 turkeys.

All of Utah's commercial poultry flocks to be affected by HPAI in 2025 have been commercial turkey flocks in Sanpete County. The previous two were confirmed cases on September 29 and October 1, respectively involving 34,800 and 8,700 turkeys.

### Avian influenza in British Columbia



British Columbia has had its first HPAI situation involving commercial poultry since January. The Canadian Food Inspection Agency reported that the presence of HPAI was confirmed in a commercial flock in Abbotsford on October 14. The size of the flock or the species of poultry involved have not been disclosed.

No municipality in Canada has had more instances of HPAI during the 2022-25 outbreak than Abbotsford. All four of British Columbia's flocks to be affected in January were in Abbotsford, while 47 flocks there were affected in 2024.

## Revenue of Poultry Industry Expected to Increase by 10% in FY 2025: CareEdge Report



The revenue of the Indian poultry industry could increase by 8-10% in the current financial year. According to a report by rating agency CARE Edge Ratings, the operating profit margin of the domestic poultry industry may rise by 180-220 basis points in the 2024-25 fiscal year.

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to a report by rating agency CARE Edge Ratings, the operating profit margin of the domestic poultry industry may rise by 180-220 basis points in the 2024-25 fiscal year. The agency anticipates that the coming year will also be favorable for the poultry industry.

The report states that by 2024, India has made significant progress in egg and broiler meat production, producing over 140 billion eggs and approximately 4.5 million tons of chicken meat annually. The demand for eggs and chicken has surged due to urbanisation and rising incomes, which has fueled the industry's rapid growth. The industry is also benefiting from stable input costs, improved feed management, and government support. Additionally, the demand for meat and eggs increases during festivals and winter, which further boosts the industry.

The report further mentions that

egg and meat production in India has consistently grown over the past decade, playing a key role in meeting the country's protein needs. In the food sector, meat, fish, and seafood fulfill about 31-34% of the total protein demand. In the coming years, egg production is expected to grow by 7-8% and meat production by 5-6%.

During the COVID-19 pandemic in 2020, the poultry industry suffered

significant losses, reducing income and revenue. In 2022, however, earnings for major poultry companies improved, although rising maize and soybean prices increased production costs in 2023 and 2024. Maize and soybean are primary components of poultry feed, and their prices surged due to supply issues. Nevertheless, with a good harvest and government support, prices have now stabilized.

### Key Challenges for the Industry

**Fluctuating Input Costs:** The poultry industry relies heavily on maize and soybean, which make up approximately 65-70% of the total feed cost. In the 2024 fiscal year, the stabilization of feed prices has improved industry profits. Large companies are addressing this challenge by focusing on better breeds and feed conversion ratios (FCR).

**Impact of Diseases:** Diseases like avian influenza negatively impact industry profits by reducing sales and increasing costs for preventive measures. Major companies in the industry are working to develop vaccines and disease-resistant breeds.

**Feed Conversion Ratio (FCR):** FCR is crucial for profitability in the poultry industry. Enhancing FCR through improved breeds and feed quality can increase profitability.

## Ricky Thaper Shares Insights on India's Poultry Industry Growth, Challenges, and Future Prospects

Ricky Thaper highlighted the growing potential of India's poultry sector, the importance of



government support, integration with allied activities to boost farmers' income, youth participation in modern poultry farming, and the need for awareness and vaccination to manage bird flu.

Ricky Thaper, Joint Secretary of Poultry Federation of India, visited Krishi Jagran's office in New Delhi on October 04, 2025. During an engaging session at KJ Chaupal, Thaper shared his extensive experience and valuable insights on the growth, challenges, and future prospects of India's poultry sector.

Speaking at the session, Thaper shared his long-standing association with the poultry industry since 1986 and noted that he was a founding member of the Poultry Federation of India, established in 1988. He has held key roles over the years, including Vice President, Zonal Convener, and Executive Committee Member. Emphasizing the sector's significance, he highlighted that India's poultry industry is worth nearly Rs 2 lakh crore and supports the livelihoods of lakhs of people. India ranks as the second-largest egg producer and the

fourth-largest chicken producer globally.

He praised the Government of India's initiatives, particularly the Animal Husbandry Infrastructure Development Fund (AHIDF), which offers a 3% interest subsidy and financial assistance for establishing cold storage facilities, feed plants, and processing units. Thaper emphasized that more such schemes are needed to strengthen the poultry processing infrastructure and ensure inclusive sectoral growth.

Discussing consumer trends, he noted that 73% of India's population consumes chicken, and demand continues to rise due to its affordability compared to mutton and fish. He described poultry as the 'cheapest and best source of

protein,' accessible to both rural and urban populations.

Thaper also underlined the integration of poultry farming with agriculture and allied activities such as dairy, piggery, aquaculture, and beekeeping as a key pathway to doubling farmers' income, in alignment with the vision of the Hon'ble Prime Minister of India. He encouraged the youth to view poultry as a profitable, scalable, and technology-driven enterprise, supported by innovations in cooling systems, water management, and energy-efficient farming practices.

Addressing public concerns about avian influenza (bird flu), he clarified that the strains detected in India are generally low-pathogenic avian influenza and not a major threat. He stressed that awareness, vaccination, and responsible media reporting play a crucial role in preventing panic and safeguarding the livelihood of farmers.

The interactive session concluded with a group photograph, capturing a moment of collaboration and shared commitment towards empowering India's poultry farmers and promoting sustainable growth in the livestock sector.



# Editorial Calendar 2025

Publishing Month: <b>January</b> Article Deadline : <b>28<sup>th</sup>, Dec. 2024</b> Advertising Deadline : <b>30<sup>th</sup>, Dec. 2024</b> Focus : <b>Opportunities and Challenges</b>	Publishing Month: <b>February</b> Article Deadline : <b>28<sup>th</sup>, Jan. 2025</b> Advertising Deadline : <b>30<sup>th</sup>, Jan. 2025</b> Focus : <b>Budget</b>	Publishing Month: <b>March</b> Article Deadline : <b>26<sup>th</sup>, Feb. 2025</b> Advertising Deadline : <b>28<sup>th</sup>, Feb. 2025</b> Focus : <b>Disease Prevention</b>	Publishing Month: <b>April</b> Article Deadline : <b>28<sup>th</sup>, March 2025</b> Advertising Deadline : <b>30<sup>th</sup>, March 2025</b> Focus : <b>Summer Stress Management</b>
Publishing Month: <b>May</b> Article Deadline : <b>28<sup>th</sup>, April 2025</b> Advertising Deadline : <b>30<sup>th</sup>, April 2025</b> Focus : <b>Cold Chain</b>	Publishing Month: <b>June</b> Article Deadline : <b>28<sup>th</sup>, May 2025</b> Advertising Deadline : <b>30<sup>th</sup>, May 2025</b> Focus : <b>Nutrition</b>	Publishing Month: <b>July</b> Article Deadline : <b>28<sup>th</sup>, June 2025</b> Advertising Deadline : <b>30<sup>th</sup>, June 2025</b> Focus : <b>Biosecurity</b>	Publishing Month: <b>August</b> Article Deadline : <b>28<sup>th</sup>, July 2025</b> Advertising Deadline : <b>30<sup>th</sup>, July 2025</b> Focus : <b>Sustainability</b>
Publishing Month: <b>September</b> Article Deadline : <b>28<sup>th</sup>, August 2025</b> Advertising Deadline : <b>30<sup>th</sup>, August 2025</b> Focus : <b>Egg Production &amp; Processing</b>	Publishing Month: <b>October</b> Article Deadline : <b>28<sup>th</sup>, September 2025</b> Advertising Deadline : <b>30<sup>th</sup>, September 2025</b> Focus : <b>Processing &amp; Packaging</b>	Publishing Month: <b>November</b> Article Deadline : <b>28<sup>th</sup>, October 2025</b> Advertising Deadline : <b>30<sup>th</sup>, October 2025</b> Focus : <b>Winter Stress</b>	Publishing Month: <b>December</b> Article Deadline : <b>28<sup>th</sup>, November 2025</b> Advertising Deadline : <b>30<sup>th</sup>, November 2025</b> Focus : <b>Food Safety</b>

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 Bank address: Sector 12; U Estate Karnal  
 Account Type: Current  
 Account Name: Pixie Expomedia Pvt. Ltd.  
 Account Number: 120000991579  
 IFSC Code: CNRB0003264 | Swift Code: CNRBINBBBFD | PAN No. AAMCP6787A

Date: \_\_\_\_\_ Company's Stamp & Signature

By signing this form I acknowledge that I have read and agree to the quoted cost above

### \*5% GST Extra Advertisement Tariffs

Advertisement Type	Single Issue (INR)	Single Issue (USD)		Advertisement Type	Single Issue (INR)	Single Issue (USD)		Advertisement Type	Single Issue (INR)	Single Issue (USD)	
Front Cover	30,000	500	<input type="checkbox"/>	Back Cover	20,000	300	<input type="checkbox"/>	Centre Spread	25,000	400	<input type="checkbox"/>
Front Gate Fold 1A	25,000	400	<input type="checkbox"/>	Back Gate Fold 1A	20,000	300	<input type="checkbox"/>	Full Page Random	10,000	200	<input type="checkbox"/>
Front Gate Fold 2A	25,000	400	<input type="checkbox"/>	Back Gate Fold 2A	20,000	300	<input type="checkbox"/>	Up to Page 9	15,000	250	<input type="checkbox"/>
Front Inside	20,000	300	<input type="checkbox"/>	Back Inside	18,000	275	<input type="checkbox"/>				
Front Opening	20,000	300	<input type="checkbox"/>	Back Opening	18,000	275	<input type="checkbox"/>				



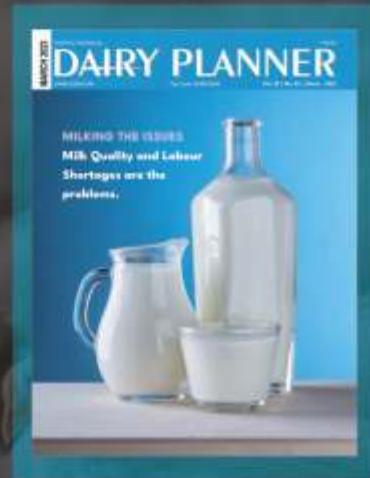
# EGG

## Daily and Monthly

### Prices of October 2025

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		
<b>NECC SUGGESTED EGG PRICES</b>																																		
Ahmedabad	560	560	560	560	560	560	560	560	560	560	560	560	560	560	570	575	585	590	590	590	590	590	590	590	590	595	600	605	605	605	605	605	605	578.06
Ajmer	530	532	532	523	523	523	523	527	527	510	517	517	517	522	525	534	538	538	538	551	551	551	560	562	580	585	590	601	601	603	603	603	546.26	
Barwala	521	523	523	523	523	523	525	527	527	527	517	517	517	521	524	529	533	533	533	537	541	541	547	553	573	580	584	594	594	596	596	596	542.00	
Bengaluru (CC)	560	560	560	560	560	560	560	560	560	560	560	560	560	560	565	570	575	575	580	580	580	580	580	580	580	580	580	585	590	595	595	595	595	571.77
Brahmapur (OD)	545	545	545	535	535	535	540	540	540	540	540	530	540	550	560	575	575	575	575	570	560	560	560	560	585	585	585	590	600	600	600	600	560.48	
Chennai (CC)	550	550	550	535	535	535	535	535	535	545	545	560	560	560	570	580	580	580	590	590	590	590	590	590	590	590	590	600	600	600	600	600	569.35	
Chittoor	543	543	543	528	528	528	528	528	528	538	538	553	553	553	563	573	573	573	583	583	583	583	583	583	583	583	583	583	593	593	593	593	562.35	
Delhi (CC)	541	541	550	560	560	560	560	560	560	560	560	560	560	560	560	560	570	570	570	570	570	570	580	580	600	600	608	623	623	623	623	623	573.94	
E.Godavari	530	530	530	520	520	525	530	535	535	525	525	505	510	520	530	540	550	550	550	553	553	553	553	553	553	560	565	570	575	575	580	580	542.90	
Hospet	500	500	500	500	500	500	500	500	500	500	500	500	500	500	505	510	515	515	520	520	520	520	520	520	520	520	525	530	535	535	535	535	511.77	
Hyderabad	500	500	500	500	505	510	515	520	520	520	520	500	505	510	515	520	525	530	535	540	540	540	540	545	550	555	560	565	570	570	570	570	528.87	
Jabalpur	525	525	525	525	525	530	535	540	540	530	530	530	530	535	545	555	560	565	570	570	570	570	570	570	570	580	585	590	595	595	595	595	554.19	
Kolkata (WB)	600	590	590	590	580	580	585	585	585	570	570	570	585	600	615	625	625	627	627	617	600	600	600	600	630	630	630	630	650	650	650	650	606.00	
Ludhiana	523	523	523	523	523	523	523	525	527	527	517	517	517	520	522	524	533	533	535	535	540	542	542	551	560	580	580	592	598	598	598	598	541.10	
Mumbai (CC)	570	570	570	570	570	570	575	580	580	580	570	570	570	570	580	585	595	600	605	605	605	605	605	605	605	610	615	620	625	630	635	635	592.74	
Mysuru	570	570	570	570	570	570	570	570	570	570	570	570	570	570	570	573	578	578	583	583	583	583	583	583	583	583	583	585	590	595	595	595	577.52	
Namakkal	505	505	505	505	505	505	505	505	505	505	505	505	505	505	510	515	520	520	525	525	525	525	525	525	525	530	535	540	540	540	540	516.77		
Pune	555	555	555	555	555	560	565	570	570	570	570	570	570	575	580	585	590	595	601	601	601	601	601	601	601	605	611	615	621	626	631	631	586.81	
Raipur	535	520	520	520	520	520	530	535	535	535	535	525	525	540	545	550	550	560	565	565	565	565	565	565	565	570	577	580	585	585	585	585	550.23	
Surat	565	565	565	565	565	565	565	565	565	565	565	565	565	565	570	580	590	595	600	600	600	600	600	600	600	600	605	605	605	610	610	610	583.55	
Vijayawada	530	525	525	520	520	525	530	540	540	540	540	515	525	525	550	550	560	560	560	560	560	560	560	560	560	575	575	575	575	575	575	548.06		
Vizag	520	520	520	510	510	515	520	525	525	525	515	500	500	510	520	535	545	545	545	545	545	545	545	545	545	550	555	560	565	565	570	570	534.35	
W.Godavari	530	530	530	520	520	525	530	535	535	525	525	505	510	520	530	540	550	550	550	553	553	553	553	553	553	560	565	570	575	575	580	580	542.90	
Warangal	502	502	502	502	507	512	517	522	522	522	522	502	507	512	517	522	527	532	537	542	542	542	542	547	552	557	562	567	572	572	572	530.87		
<b>Prevailing Prices</b>																																		
Allahabad (CC)	557	557	557	557	557	557	557	562	562	562	552	548	552	557	562	571	581	590	590	590	590	595	595	595	600	605	614	614	624	629	629	629	580.71	
Bhopal	520	525	525	525	525	530	540	540	545	545	525	525	525	540	550	560	560	560	560	575	560	575	575	575	580	590	595	595	605	610	610	557.10		
Indore (CC)	530	530	530	530	520	520	530	530	530	530	530	530	530	535	545	550	555	565	565	565	565	565	566	565	570	575	580	585	590	595	595	551.65		
Kanpur (CC)	557	557	557	557	557	557	557	571	571	571	571	557	557	557	557	571	581	595	595	595	595	595	595	595	595	595	614	614	629	629	629	629	582.81	
Luknow (CC)	595	595	595	595	595	595	595	595	595	595	595	590	590	590	590	600	600	600	600	600	600	600	600	600	600	617	617	617	627	627	643	643	643	605.87
Muzaffarpur (CC)	580	580	580	580	580	580	580	585	585	585	575	575	575	580	580	585	590	590	590	595	600	600	605	610	630	640	640	650	654	654	655	599.61		
Nagpur	540	540	540	540	540	540	560	570	570	555	555	555	555	555	560	570	580	580	580	590	580	590	590	590	590	590	590	605	610	610	610	610	572.58	
Patna	580	580	580	580	580	580	580	585	581	585	575	575	575	580	580	585	590	590	590	595	600	600	605	610	630	640	640	650	654	654	655	599.48		
Ranchi (CC)	585	585	586	586	580	571	581	581	581	575	581	581	586	592	596	615	615	615	614	610	605	595	595	595	610	610	610	619	629	629	633	598.26		
Varanasi (CC)	567	567	567	567	567	573	573	580	580	580	567	567	567	573	577	580	583	593	593	593	600	600	600	600	600	617	627	627	633	633	633	590.87		

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