English monthly from Hyderabad, India

Poultry Fortune

Estd. 1991

Health • Nutrition • Technology • Marketing

November 2025

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Inside ...

ROSS 308 AP

BEST ACHIEVERS
SEPTEMBER-2025

Aviagen® INDIA

Northern Region

COMPANY: Sampoorna feeds
FARMER NAME: Mr. Mandeep Singh Maan

SEPTEMBER-2025	Top #1
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

COMPANY: IB Group
FARMER NAME: Mr. Brajesh Patel

SEPTEMBER-2025	Top #1
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

COMPANY: Jafpa
FARMER NAME: Mr. Prasad Ashokrao Fhalke

SEPTEMBER-2025	Top #1
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

COMPANY: IB Group
FARMER NAME: Mr. Avinash Reddy

SEPTEMBER-2025	Top #1
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

Poultry Fortune

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M. A. Nazeer

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Union Minister Prof. S.P. Singh Baghel advised poultry sector to come out with representation for 'National Poultry Development Board'.

When there is a national development board for Aquaculture and Dairy sectors, why not for Poultry sector

Hatcheries employ trained workers to quickly distinguish between male (cockerels) and female (pullets) chicks, while also checking for signs of illness or defects among the flock. Removing weak or unviable chicks helps maintain overall flock health and reduces the risk of disease. This practice, however, has sparked major ethical and welfare concerns worldwide. In response, researchers are developing alternatives like in-ovo sexing, a technique that determines an embryo's sex before it hatches, thereby avoiding mass culling.

Dear Readers,
The November 2025 issue of Poultry Fortune is in your hands. In the news section you may find news about...

The Mighty Egg: A Daily Source of Strength. Food is more than fuel. It carries comfort, tradition and nourishment. Among the many items on our plates, one humble hero stands out the Egg. From a quick Omelet before work, a boiled egg in a Lunchbox, to a flavorful curry at Dinner, the egg has quietly become a part of daily life. This year **World Egg Day** is marked with the theme "The Mighty Egg Packed with Natural Nutrition. The message is simple: in a world where good nutrition is vital, the egg delivers strength in the simplest form. Affordable, accessible, and versatile, it nourishes people across all ages and backgrounds. A Quiet Hero in Daily Meals: Picture a busy morning: children rushing to school, parents juggling responsibilities, all needing something quick yet wholesome. A boiled egg or masala omelet saves the day, offering protein and energy to keep life moving. Beyond homes, the egg's journey continues in food stalls and restaurants from spicy curries to rolls, dosas or bhurji, it adapts itself to countless flavors and traditions.

Nutrition doesn't need to be dull, the egg proves it can be delicious, familiar, and comforting. **Nature's Multivitamin:** Eggs are often called nature's multivitamin, inside their smooth shells, they hold nutrients the body needs to thrive. Protein for muscle strength and repair Vitamin B12 for energy and brain health. Vitamin D for bone Strength and immunity. Choline for memory and development. Lutein and zeaxanthin to protect the eyes. Few foods provide such nutrition at such an affordable cost. In one serving, the egg offer balance, strength, and nourishment unmatched by most alternatives.

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 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.

Venkateshwara BV Bio Corp Pvt Ltd, India and Nature Care Manufacturing Industry Ltd, Bangladesh organized Technical seminars for commercial layer farmers on 7 October 2025 at Chattogram, Bangladesh. The technical seminar was attended by layer farmers of Chattogram and surrounding area. Dr Sanjay Deshpande, Venkateshwara BV Bio Corp Pvt Ltd spoke and explained about the "Commercial Layers Management" in all aspects and the importance of balanced nutrition to improve productivity in commercial layers with optimization of production cost. He explained how Venkys 5% Eggxtra

Contd on next page

NRS GROUP

Poultry Fortune

Our Mission

Poultry Fortune will strive to be the reliable source of information to poultry industry in India.

PF will give its opinion and suggest the industry what is needed in the interest of the stakeholders of the industry.

PF will strive to be The Forum to the Stakeholders of the industry for development and self-regulation.

PF will recognize the efforts and contribution of individuals, institutions and organizations for the development of poultry industry in the country through annual Awards presentation.

PF will strive to maintain quality and standards at all times.

TALK TO US

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Send a letter: *Letters to the Editor must include writer's full name, address and personal telephone and mobile numbers. Letters may be edited for purposes of clarity and space. Letters should be addressed to the Editor:*

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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.

PFI conducted its 36th Annual General Meeting in Lucknow, Uttar Pradesh, on 8 & 9 October 2025. Chief Guest of the occasion, Prof. S.P. Singh Baghel, Union Minister of state for Animal Husbandry, Fisheries & Dairying, Govt of India remarked, "A healthy mind resides in a healthy body, and a healthy nation is built upon both — which cannot be achieved without eggs and chicken." He reaffirmed that eggs are vegetarian, and one of the best sources of affordable protein. The minister expressed strong support for the formation of a National Poultry Development Board, assuring that such an institution could propel the sector far beyond its current valuation of ₹1.2 lakh crore, strengthening livelihoods for over 1.6 million people engaged in poultry farming. When there is a national development board for aquaculture and dairy sectors, why not for poultry sector. He advised stakeholders of poultry sector to come out with an effective representation requesting for 'National Poultry Development Board' for sustainable development of poultry sector.

Mr Batchu Rajender, Promoter & CEO of Sun Foods Group based in Hyderabad received Poultry Industry Excellence Award for the services he is rendering in the Indian poultry sector from NLC India and ACT NOW on the occasion of Dr A.P.J. Abdul Kalam birth anniversary celebrations on 26 October 2025. Rajender entered into poultry farming in 2001 with 120,000 layers on the name of Sun Foods and Feeds. By 2021 he developed it to 18 lakh layers farm and he is producing 50 crore eggs annually. Rajender is also doing egg trading and supplying eggs to consumer centers in the country. About 700 people are working in his group.

In the Articles section, **Role of Artificial Intelligence and Machine Learning in Poultry production and Health management** by Dr Sophia Inbaraj, says that, Indian poultry industry keeps on emerging from backyard to industrial mode recording an annual growth rate ranging from 8 - 13% by 2033. Major private players adopted a business model of supply of freshly hatched chicken to farmers followed by collection at their broiler stage or eggs under the integrator system. During the rearing period, poultry farmers are faced with severe challenges like increased feed cost of corn and soybean meal, feed import policy regulations, lack of government subsidiaries to poultry farmers, sporadic outbreaks of avian influenza and chronic respiratory diseases, rising labour cost, lack of infrastructure and cold storage facilities.

Another Article titled, **From Waste to Wonder: How Poultry By-products are turned into Collagen, Pet Food, and More** by Mr G. Karthikeyan and Ms Kowsalya, discussed that, how poultry by-products such as feathers, blood, bones, skin and fat, once considered waste, are now being transformed into high-value products like collagen supplements, pet food, biofuels, and biodegradable plastics. It highlights how these innovations contribute to a circular economy by reducing waste, lowering environmental impacts, and creating new revenue streams. The message to readers and stakeholders in poultry industry is clear: by embracing technology and innovation, by-products can be turned into co-products that support sustainability, profitability and long term industry growth. When you think of chicken, you probably imagine juicy drumsticks, grilled breasts or golden nuggets. But have you ever wondered what happens to the rest of the bird, the feathers, bones, skin, blood, and internal organs?

Another Article titled, **Feed Passage Syndrome in Poultry** by Dr Chandramohan, said in this article, feed passage syndrome, also known as "undigested feed passage," occurs when partially or fully undigested feed appears in the droppings of poultry. This condition is often a symptom of underlying gut health issues that disrupt digestion and nutrient absorption, and it can lead to reduced feed efficiency, slower growth, and other economic losses in poultry production. Causes of Feed Passage Syndrome: Several factors can contribute to feed passage in poultry, including: **Dysbacteriosis**: An imbalance in the gut microbiota disrupts normal digestion as enzymes produced by the bacteria also aid in digestion of the nutrients in the gut. Hence, dysbacteriosis often leads to poor feed breakdown and undigested feed in droppings. Coccidiosis: This intestinal parasite damages the gut lining, alters the structure of the gut, erodes the intestinal epithelium leading to reduced nutrient absorption and bloody diarrhoea with undigested feed particles. **Feed Quality:** Diets with low nutrient density lacking in digestible nutrients or improperly formulated feed can overwhelm the digestive system, causing incomplete digestion. A balanced feed is required as over supply of nutrients is also detrimental to gut health and proper digestion.

Another Article titled, **Rising Feed Costs and Maize Supply Challenges** by Dr Pawar Rutik Namdev and Dr Shipra Tiwari, discussed that, India's poultry industry, one of the fastest-growing agribusiness sectors globally, is now confronting a crisis that strikes at its very foundation - feed costs. For decades, the industry's resilience has rested on two essential pillars: maize (corn) and soybean meal. Together, these ingredients form nearly 70% of the total cost of production in poultry farming. Their availability and affordability have enabled India to become one of the largest producers and consumers of chicken and eggs, providing affordable protein to over 1.4 billion people. But in 2025, this balance has been severely disrupted. Surging feed prices, policy-driven shifts in crop usage, and the global scramble for grains have combined to squeeze farmers, disrupt markets, and raise consumer concerns. This crisis is not only about economics - it cuts across the spectrum of food security, farmer livelihoods, and sustainability.

Another Article titled, **CO2-Induced Euthanasia: Scientific Advances and Regulatory Perspectives for Hatchery Cull Birds** by Dr Sayyed Mushtaque and Dr Akash Wadal, said that, Chick culling is a common practice in poultry hatcheries, carried out mainly for economic and biological reasons. It involves separating and killing chicks that are considered unprofitable or unsuitable for production most often male chicks, since they cannot lay eggs and are not efficient for meat production, as well as weak or unhealthy female chicks that would not survive or contribute productively. Because egg-laying breeds and meat producing breeds are selectively bred for different purposes, raising surplus males would add unnecessary costs, so they are usually culled shortly after hatching or being sexed.

M.A.Nazeer
Editor & Publisher
Poultry Fortune

The Mighty Egg: A Daily Source of Strength

Food is more than fuel- it carries comfort, tradition, and nourishment. Among the many items on our plates, one humble hero stands out the egg. From a quick omelette before work, a boiled egg in a lunchbox, to a flavorful curry at dinner, the egg has quietly become a part of daily life. This year, World Egg Day is marked with the theme "The Mighty Egg Packed with Natural Nutrition. The message is simple: in a world where good nutrition is vital, the egg delivers strength in the simplest form. Affordable, accessible, and versatile, it nourishes people across all ages and backgrounds.

A Quiet Hero in Daily Meals:

Picture a busy morning: children rushing to school, parents juggling responsibilities, all needing something quick yet wholesome. A boiled egg or masala omelette saves the day, offering protein and energy to keep life moving.

Beyond homes, the egg's journey continues in food stalls and restaurants from spicy curries to rolls, dosas or bhurji, it adapts itself to countless flavors and traditions. Nutrition doesn't need to be dull the egg proves it can be delicious, familiar, and comforting.

Nature's Multivitamin: Eggs are often called nature's multivitamin

Inside their smooth shells, they hold nutrients the body needs to thrive

- Protein for muscle strength and repair
- Vitamin B12 for energy and brain health
- Vitamin D for bone Strength and immunity
- Choline for memory and development
- Lutein and zeaxanthin to protect the eyes

Few foods provide such nutrition at such an affordable cost. In one serving, the egg offer balance, strength, and nourishment unmatched by most alternatives.

Breaking Old Myths:

For years, eggs were clouded by myths about cholesterol, But modern research shows that for most people, an egg a day is not only safe but highly beneficial.

- For children, eggs support growth and concentration
- For adults, they sustain energy and build immunity
- For the elderly, they help preserve strength and support healthy aging

Few foods touch every stage of life so meaningfully.

A Global Day, A Shared Purpose:

World Egg Day is more than a tribute to food it highlights the egg's role in fighting malnutrition reducing hunger, and supporting sustainable diets. Schools include them in children's meals. fitness enthusiasts trust them for protein, and households rely on them daily.

The egg also supports millions of livelihoods

through poultry farming creating jobs and inco for families worldwide. Choosing an egg means nourishing both people and communities.

The Mighty Egg Every Day:

World Egg Day 2025 reminds us to look at the egg with fresh appreciation. It is not just a of breakfast item but a p warehouse natural nutrition and a bridge between taste and health.

As this year's theme says, "The Mighty Egg: Packed with Natural Nutrition, it's time to give this everyday hero the recognition it deserves.

So, the next time you crack one open, remember that simple egg is more than food it's a promise of strength, wellness, and nourishment wrapped in nature's perfect shell.

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 feature detour of **Myles Frische Farms and an engagement with Bungein 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

PROUD MOMENT FOR CLFMA OF INIDA

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.

VITAMINS

- SWISS VITAMIN - A
- SWISS VITAMIN - E
- SWISS VITAMIN - C
- SWISS VITAMIN - K
- SWISS VITAMIN - D2
- SWISS VITAMIN - B2
- SWISS VITAMIN - B9
- SWISS VITAMIN - D3
- SWISS VITAMIN - B5
- SWISS VITAMIN - B1

AMINO ACIDS

- DL-Methionine
- L-Lysine Hcl
- L-Threonine
- L-Tryptophan
- L-Valine
- L-Isoleucine

SWISS GLYCERINE

ANIMAL FEED SUPPLEMENT

SWISS CHEMIE

SWISS
ANTIBIOTICS

- Chlortetracycline 15% (CTC) (BEST SELLER)
- Tiamulin 10/45/80
- Amoxicillin
- Ciprofloxacin
- Doxycycline
- Albendazole
- Fenbendazole
- Lincomycin Hcl
- Azithromycin
- Oxytetracycline
- Enrofloxacin
- Tetracycline Hcl
- Levofloxacin
- Virginiamycin 11%
- Anticoccidials

I N V I T A T I O N

17th EDITION POULTRY INDIA
OUR INDUSTRY SHOW

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NOVEMBER 2025
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email : sales@swisschemie.co
Website : www.swisschemie.com

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,[1] 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, DeputyChairman
- Mr Abhay Parnekar, Deputy Chairman
- Mr Nissar F.Mohammed, HonorarySecretary
- Mr R.Ramkutty, Treasurer
- Mr Sameer Chotai, President – EastZone
- Mr Sumeet Surekha, DeputyChairman
- Mr Suresh Deora, Immediate Past Chairman
- Mr Naveen Pasuparthy, 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.

Batchu Rajender receives Poultry Industry Excellence Award

Batchu Rajender, Promoter & CEO of Sun Foods Group, Hyderabad receiving Poultry Industry Excellence Award from M. Prasanna Kumar, CMD, NLC India and Murthy of ACT NOW on the occasion of Dr A.P.J. Abdul Kalam birth anniversary celebrations on 26 October 2025 at Hyderabad. Rajender's wife Mrs Batchu Surekha is seen beside him receiving the award.

Hyderabad: Mr Batchu Rajender, Promoter & CEO of Sun Foods Group based in Hyderabad received Poultry Industry Excellence Award for the services he is rendering in the Indian poultry sector from NLC India and ACT NOW on the occasion of Dr A.P.J. Abdul Kalam birth anniversary celebrations on 26 October 2025. Mr M Prasanna Kumar, CMD, NLC India and Mr Murthy of ACT NOW presented the award to Mr Rajender.

While studying mechanical engineering course during 1983-87, Mr Rajender did a project work for Sangam Dairy for optimization of feed cost by using Operations research technics of Simplex method for which developed a complex software in Fortron77 language. Then became consultant for preparing a optimized feed formula and worked for a decade. Rajender entered into poultry farming in 2001 with 120,000 layers on the name of Sun Foods and Feeds. By 2021 he developed it to 18 lakh layers farm and he is producing 50 crore eggs annually. Rajender is also doing egg trading since long and supplying eggs to consumer centers in the country. About 700 people are working in his group.

Venkateshwara B V Bio-Corp organises 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 7 October 2025 at Chattogram, Bangladesh. This seminar was attended by layer farmers of Chattogram and surrounding area.

Dr Sanjay Deshpande, Venkateshwara BV Bio-Corp Pvt Ltd was a speaker for the seminar and explained in about the **"Commercial Layers Management"** in all aspects and the 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.

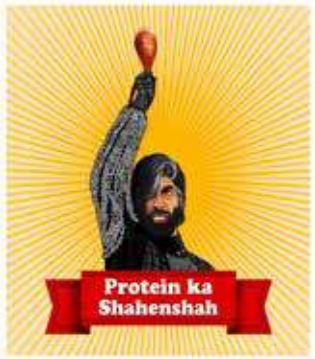
5% Eggxtra Composite Premix is capable of optimizing the cost with highest efficiency at farm level.

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. The local Nature Care and Venkys Team, **Dr Faiz Khan Rakib,** Technical Manager, Sales, Venkys India Ltd, Bangladesh organised this technical seminar.

A section of participants in the Seminar



Hotraco Agri launches Fortica MAX: New poultry control system that automates up to 90%

Cutting daily labor, enhancing farm performance, and ensuring stable barn conditions

Hotraco Agri, a global leader in farm automation, proudly introduces its most advanced all-in-one control system for poultry farm management to date: Fortica MAX. This controller sets a new industry benchmark by combining powerful hardware, intelligent software and full system integration. It helps poultry farmers reduce labor costs, improve consistency, and simplify the management of even the most complex farm setups.

Total control over all barn processes

Fortica MAX offers complete automation and monitoring of all critical barn processes, including climate control, ventilation, feeding, watering, lighting, animal weighing and egg flow management. The system is compatible with every poultry housing type, including broilers, layers, breeders and pullets, across floor housing, cage-free, aviary, or free range systems.

At the heart of Fortica MAX is its next-generation 12-inch intuitive touchscreen, giving farmers clear, real-time insights with an easy-to-use, fully customizable interface. Its advanced processor ensures smooth, fast, and reliable system performance, even in complex farm environments.

Automating up to 90% of daily tasks

With Fortica MAX, up to 90% of daily manual tasks can be automated, significantly reducing labor, minimizing human error, and increasing overall farm consistency. From climate adjustments to feeding schedules and egg flow coordination,

Fortica MAX allows poultry farm managers to focus on strategic decisions while ensuring stable living conditions for their animals.

Real-time farm insights with iHotraco Farm Manager

Fortica MAX fully integrates with iHotraco Farm Manager, offering farmers 24/7 access to live performance data across their entire operation. The system provides real-time monitoring, advanced data analysis and benchmarking between barns or against genetic standards, enabling farmers to quickly identify deviations and respond proactively to changing conditions.

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Fortica MAX features Hotraco's most sophisticated egg flow control system to date. Belt speeds are automatically adjusted to maintain a continuous and stable egg flow, minimizing shell damage and maximizing collection efficiency.

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About Hotraco Agri

Hotraco Agri develops, manufactures, and supplies advanced automation systems for the livestock sector. The company's mission is to improve farm performance through smart, integrated solutions that prioritize efficiency, animal welfare, and ease of use. With a strong global presence and decades of experience, Hotraco Agri is a trusted partner for poultry farmers worldwide

About Munters

Munters, a global leader in climate control and sustainable agricultural solutions, acquired Hotraco Agri in 2024, enhancing Hotraco Agri's ability to deliver advanced automation systems and empowering its customers with more innovative and sustainable solutions. Munters provides advanced hardware and digital solutions to optimize farming operations, improve sustainability, and ensure transparency across the food supply chain. With decades of experience and a commitment to creating a digital ecosystem for farm management, Munters empowers farmers worldwide to achieve superior productivity and animal welfare.

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NOVUS and Kasetsart University Open Dedicated Broiler Research Unit

New facility supports research and talent development in Southeast Asia

Bangkok, Thailand September 29, 2025: Thanks to a cooperative enterprise with the NOVUS team in Thailand, Kasetsart University currently has a new Broiler Research Unit, located at the Animal Science Learning Center at the Department of Animal Science, Faculty of Agriculture at Kamphaeng Saen, Kasetsart University, Kamphaeng Saen Campus. The facility is designed to generate high-impact research and practical insights for broiler producers operating in tropical environments across Southeast Asia.

While the facility is open to research collaborations with any industry partners, NOVUS specifically supported its development to help expand the intelligent nutrition company's capability to validate nutritional technologies in the region. NOVUS has previously partnered with Kasetsart University on research trials for CIBENZA® Enzyme Feed Additives, MINTREX® Bis-Chelated Trace Minerals and NEXT ENHANCE® 150 Feed Solution in real-world conditions, reflecting the genetics, management styles, and climatic challenges unique to the region.

"This is a significant milestone in how we support our customers in Thailand and Indochina," says Nannapas Moonsap, Regional Sales Director – Thailand and Indochina, NOVUS. "Local broiler producers are navigating a rapidly changing production landscape. With this facility, we can partner more closely than ever before to create science-based solutions tailored to their operations."

The unit was launched in collaboration with the Department of Animal Science at Kasetsart University, Kamphaeng Saen Campus, one of the region's most respected agricultural institutions. The facility will support commercial-scale trials and student engagement, blending applied research with academic development.

"This partnership with NOVUS aligns well with our vision to train students in modern poultry production systems that meet evolving industry needs," says Assoc. Prof. Dr. Yuwares Ruangpanit, Head of the Animal Science Department, Kasetsart University, Kamphaeng Saen Campus. "By conducting trials with real-world relevance, students gain exposure to meaningful, hands-on learning, while the industry benefits from validated, localized insights."

The inauguration was attended by Asst. Prof. Dr. Sukanya Rattanatabtimtong, Assistant to the President for Research, Innovation

and International Affairs, and Asst. Prof. Dr. Chaisit Thongju, Dean of the Faculty of Agriculture at Kamphaeng Saen. Their presence highlighted the significance of this initiative to Kasetsart University's mission, reinforcing the importance of international cooperation, academic leadership, and practical innovation in strengthening the future of poultry production. It also underscored the value of the long-standing partnership between NOVUS and Kasetsart University in driving forward science-based solutions for the industry.

The Broiler Research Unit is part of a larger Animal Science Learning Center that includes facilities for livestock and poultry production, a feed mill, pasture production, and laboratories. The Center is designed to reflect the complexity of modern animal agriculture while preparing the next generation of animal scientists and industry leaders.

"This is more than a facility — it's an investment in long-term capability," says Rajeev Murthy, Managing Director for Asia Pacific, NOVUS. "Whether it's gut health, nutrient efficiency, or environmental sustainability, we are committed to being a trusted partner in helping poultry producers thrive in this region."

NOVUS is the leader in intelligent nutrition, providing solutions for the animal agriculture industry. Along with a global network of experts, the company offers solutions for poultry that support eggshell and meat quality, gut health, and help birds reach their full potential. Learn more at novusint.com.

Poultry Fortune Editor with Harbans Singh on a Sunday morning at Jubilee Hills

M.A. Nazeer with Harbans Singh, his wife and daughter on a Sunday at a restaurant in Jubilee Hills in Hyderabad.

Pleasant surprise: Poultry Fortune Editor M.A. Nazeer while returning from his routine physical exercise in the morning in Jubilee Hills in Hyderabad on Sunday, October 12, went to a nearby restaurant to have Coffee and surprisingly saw Mr Harbans Singh with his family having their breakfast. The Editor spent about 15 minutes with the once great personality of Indian poultry sector Mr Harbans Singh, his wife and the daughter.

Based at Hyderabad, Mr Harbans Singh, Promoter and CMD of Singh Poultry Pvt Ltd, had been known in poultry sector in the country for discipline in personal life and in business, maintaining ethics and morals. Though Harbans is not much active in the day to day business activity, his people are taking care of the company.

Poultry Fortune wish happy, healthy and peaceful life to Harbans Singh and his family.

M.A. Nazeer having a pleasant chat with Harbans Singh

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Union Minister Prof. S.P Singh Baghel expressed strong support for the formation of a National Poultry Development Board

Poultry Federation of India organized its 36th Annual General Meeting on the theme "Survive & Thrive in Difficult Times" at Lucknow, Uttar Pradesh.

Lucknow: Poultry Federation of India organized its 36th Annual General Meeting (AGM) on the theme "Survive & Thrive in Difficult Times" at Ramada Hotel, Lucknow. The event brought together over 1000 delegates, including farmers, breeders, feed millers, integrators, equipment manufacturers, policymakers, veterinarians, scientists, solvent plant representatives, media professionals, and other stakeholders from across India and abroad, along with 99 sponsor organizations.

The AGM commenced with opening remarks by Mr Ranpal Dhanda, President, Poultry Federation of India, who welcomed the participants and expressed his gratitude to the Department of Animal Husbandry, Government of India for their continued support to the poultry sector. Mr Dhanda highlighted PFI's vision for advancing India's poultry sector and announced the Federation's ambitious plan to establish four modern laboratories across India dedicated to enhancing quality standards, technological innovation, and the welfare of poultry farmers.

Prof. S.P Singh Baghel

Following the President's address, Mr Ravinder Singh Sandhu, presented the PFI Annual Report (2024–25), detailing the Federation's 40 key meetings conducted over the past year with government authorities, sector stakeholders, and policymakers. These initiatives focused on issues such as broiler rate stabilization, raw material quality, maize price and availability, and policy advocacy regarding the closure of meat shops during the Sawan month. Mr Sandhu also announced PFI's strategic joint venture with VIV, a leading global exhibition organizer, to host "VIV Select India" — an international poultry sector exhibition scheduled for April 22–24, 2026, at Yashobhoomi Convention Centre, Dwarka, New Delhi, which aims to promote technological innovation and global collaboration in the Indian poultry sector.

Mr Rahul Khatri presented the PFI Balance Sheet (2024–25), elaborating on the Federation's financial performance and transparency. The session was followed by several technical and knowledge-sharing presentations on topics such as Global Exhibitions, Oil Quality, Raw Material Procurement, Biosecurity, Importance of Protein, Metabolic Syndromes, Innovation, and Glucose Oxidase.

A highly engaging panel discussion on "Viksit Bharat Mein Poultry Sector Ka Yogdan" was moderated by Dr O.P. Chaudhary, Retd. Joint Secretary, DAHD, Government of India. Esteemed panelists — Mr Ricky Thaper, Dr Ajay Deshpande, Mr Divya Kumar Gulati, Dr Ajit Ranade, Mr Mohan Reddy Kasarla, Dr Sharad Singh, and Dr Jatinder Paul Singh Gill — shared valuable insights on policy frameworks, market trends, and the future growth trajectory of India's poultry sector.
The day concluded with the Bronze Sponsor Memento Distribution Ceremony, honouring 52 valued bronze sponsors, followed by a vote of thanks by Mr Sanjeev Gupta, Vice President (HQ), PFI.

In his welcome address, Mr Ranpal Dhanda reiterated PFI's demand for the implementation of HPAI vaccination in the poultry sector, citing heavy economic losses faced by farmers. He urged the government to form a committee comprising representatives from farmers, associations, departments and experts to study and recommend actionable solutions. Mr Dhanda also emphasized the need to address challenges related to maize availability, quality, and pricing, pointing out that rising maize costs—driven by ethanol diversion—are affecting poultry feed production. He cited PFI's successful initiative promoting modern maize farming across 1000 acres with 90 farmers, resulting in yields of 40 to 45 quintals per acre, compared to the traditional 10 to 15 quintals. He further raised concerns about closure of poultry meat shops during the Sawan, requesting policy intervention from the Deputy Chief Minister, and advocated for the inclusion of poultry under the agriculture sector at the national level, similar to Maharashtra's policy.

Mr Vijay Sardana, renowned agri-economist, expanded on these issues, addressing the impact of religious closures on poultry trade, and highlighting challenges such as retail hygiene,

export potential, rural employment, infrastructure gaps at Ghazipur market, and women empowerment.

Mr Brijesh Pathak, Deputy Chief Minister, Government of Uttar Pradesh assured that a joint meeting with senior officials and PFI representatives would soon be convened to frame concrete steps for poultry sector development. Prof. (Dr.) P.K. Shukla, President, Indian Poultry Science Association, stressed the importance of eggs and chicken in combating malnutrition, especially among children, and emphasized the role of women and farmers' empowerment.

Mr Mahipal Dhanda, Minister for Education, Government of Haryana called for a central-level poultry policy to ensure uniform implementation across states and addressed the issue of environmental challenges faced by poultry farmers.

Chief Guest of the occasion Prof. S.P. Singh Baghel, Union Minister of state for Animal Husbandry, Fisheries & Dairying, Govt of India remarked, "A healthy mind resides in a healthy body, and a healthy nation is built upon both — which cannot be achieved without eggs and chicken." He reaffirmed that eggs are vegetarian, and one of the best sources of affordable protein. He expressed strong support for the formation of a National Poultry Development Board, assuring that such an institution could propel the sector far beyond its current valuation of ₹1.2 lakh crore, strengthening livelihoods for over 1.6 million people engaged in poultry farming.

A second panel discussion on "Surviving & Thriving in Difficult Times" was moderated by Mr Anuj Khare, Editor, Aaj Tak, featuring eminent panelists including Mr Ranpal Dhanda, Mr Naveen Pasuparthy, Mr Uday Singh, Mr S.S. Lakra, Dr Pawan Kumar, Dr Pawan Singh, and Mr Mohit Malik.

Expert presentations were delivered by:

Prof. (Dr.) P.K. Shukla on "Indian Poultry Sector: Policy Interventions for Sustainable Growth and Farmer Prosperity towards Viksit Bharat"

Dr V.R. Tijare, General Manager, Venky's (India) Ltd. on "Strategies to Promote Consumption of Chicken & Eggs"

Dr P.S. Mahesh, Joint Commissioner & Director, CEAH, Bengaluru on "Disciplined Poultry Farming"

The AGM concluded with Super Platinum, Platinum, Diamond, Gold, and Silver Sponsor Memento Distributions, followed by the Vote of Thanks delivered by Mr. Ricky Thaper, Joint Secretary, PFI, who acknowledged the contributions of all sponsors, delegates, speakers, media and the PFI Executive Committee for making the 36th AGM a success.

Details of panel discussions on different sessions and aspects like – Poultry feed, Need of Poultry Board for the development of poultry sector and consumption of eggs, chicken meat and maize for poultry feed are published in the next pages.

1. Mr Uday Singh, IPEMA – Poultry India Highlights the Significance of Global Exhibitions in Uniting Diverse Stakeholders on One Platform.
2. Dr Harish Dharne & Dr Rahul Sawarkar, Oil Quality for Better Profitability & Bergaboost-Innovation for Improvement In Egg Production.
3. Mr Shailendra Garg, Raw Material Procurement Product and Product Quality Our Vision and Moral Value.
4. Dr Rahul Kulkarni & Mr Charuhas Gogate, Hargun Agro Company introduction and Product Portfolio.
5. Dr Anup Kalra, Saife Vetmed India Leading The Way, Biosecurity – the Cornerstone of AMR Control, One Health & Cost – Effective Poultry Production.
6. Dr OP Chaudhary, Retd. Joint Secretary, DAHD Government of India (Panelist : Dr Sujit K. Dutta, Mr Ricky Thaper, Dr Ajay Deshpande, Mr Divya Kumar Gulati, Dr Ajit Ranade, Mr Mohan Reddy Kasarla, Dr Sharad Singh) Panel Discussion.
7. Mr Saurabh Saboo, Importance of Protein in Poultry Sector.
8. Dr Rakesh Gupta, Metabolic Syndromes impacting Broiler Breeders.
9. Mr Pradeep Kumar Yadav, Business Overview about Sampoorna.
10. Mr J S Uppal, nu.ance Biotechnology, Innovating for a Better Tommorow.
11. Dr Shambavi, Importance of Enzyme in Broiler and Layer Diet.
12. Dr Shailaja Rajyam, Intrducing Zamira Australia, for Better Animal Health.
13. Makams Introduction: From indigenous insights to modern research.
14. Dr Phaneendranath Y.E.S Glucose Oxidase: Bridging Nutrition, Immunity, and Performance in Poultry.
15. Dr V R. Tijare, General Manager, Venkys (India) Limited, Strategies to Promote Consumption of Chicken & Eggs.
16. Dr P.S Mahesh, Director, CPDO & TI, Bengaluru Disciplined Poultry Farming.
17. Prof. (Dr) P.K Shukla, President, Indian Poultry Science Association, Indian Poultry Sector: Policy interventions for sustainable growth and farmer prosperity towards Viksit Bharat.
18. Dr SK Dutta & Dr Lipi Sairiwal, Schemes of Department of Animal Husbdry & Dairiyng, Government of India.

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Dr Ali Asgar, Managing Director, Saife Vet Med Pvt Ltd and his team MS Shuchi Arora, Anup Kalra and others during PFI AGM in Lucknow on October 8.

Telangana Poultry Federation team members participated in PFI AGM & Seminar at Lucknow. TPF President K. Mohan Reddy, NECC Hyderabad Zonal Chairman G. Chandra Shekar Reddy and the team.

Poultry Board: Animal Husbandry Minister made two big announcements for poultry farmers

Union Minister of state for Animal Husbandry, Fisheries & Dairying, Govt of India, Prof. S.P Singh Baghel expressed strong support for the formation of a 'National Poultry Development Board' for poultry development.

While two major announcements made at the 36th AGM of Poultry Federation of India (PFI) will help poultry farmers in raising chickens and reduce their costs, the fulfillment of the second announcement will reduce the distance between poultry farmers and the government and they will get technical assistance from the government as well as the benefits of the schemes.

Poultry Development Board "Poultry is a rapidly growing sector. It faces many challenges but over time, we are preparing ourselves to meet each challenge and are also planning. We are also keeping the government informed. We are also working with full force on maize, the biggest problem facing poultry," said Mr Ranpal Dhanda, President of the Poultry Federation of India (PFI). The occasion was PFI's 36th Annual General Meeting 2025.

This AGM is being held in Lucknow. On this occasion, Mr Ranpal Dhanda and Union Minister of State for Animal Husbandry and Dairying, Dr SP Singh Baghel, made two major announcements for the poultry sector. Poultry experts say that if these two major announcements are implemented, the poultry sector will gain further momentum.

The minister himself sought applications for the poultry board.

Animal Husbandry Minister Dr. SP Singh Baghel was the chief guest on the second day of the PFI's AGM. He said that animal husbandry offers numerous employment opportunities today. However, the question is that people are now introducing caste bias into animal husbandry. For example, if you tell someone to take up sheep farming, saying it's very profitable, they immediately respond, "Am I a shepherd?" Animal husbandry offers significant profits, but they don't want to do it. Those who have understood this are taking advantage of it. He also mentioned the National Poultry Development Board, similar to the National Dairy Development Board and the National Fisheries Development Board. He said that the responsibility lies with everyone, so poultry farmers and associations should submit a demand letter, which I will try to forward to the relevant authorities.

Four labs will be set up in the country for poultry farmers.

PFI President Mr Ranpal Dhanda announced during the AGM that poultry farmers face two major problems: chicken disease and feed. Feed can sometimes put chickens' lives at risk, as moisture in feed can lead to serious illnesses. On the other hand, some diseases are often undetected, resulting in losses for farmers. Therefore, with everyone's support, we have decided to build four labs across the country, where farmers can have their feed and chickens tested.

Poultry Feed: The big question for poultry farmers is how will chickens get feed in developed India?

Poultry Feed Issue: What has poultry achieved in the last 75 years? What challenges does poultry currently face? What are the solutions to these challenges? How can we increase the consumption of eggs and chicken in the country? And not only that, how can we reduce the cost of poultry? With these questions in mind, poultry experts and businessmen from across the country have gathered in Lucknow, Uttar Pradesh. The two-day Annual General Meeting of the Poultry Federation of India (PFI) is underway here.

Poultry Feed Issue: Today, the situation of poultry is like two steps forward and four steps back. There is talk of self-reliance in the country, but in the matter of poultry, one state is dependent on the other. The total feed production in the country is 60 million tons. Of this, more than 40 million tons is consumed by poultry. Maize and soybean meal are the main ingredients of feed. But everyone knows the condition of maize in the market today. In such a situation, there is talk of a developed India 2047. Production will increase in this mission. If production increases, then the need for raw materials will also increase. And as a raw material, we already have a shortage of feed. So, how will the chickens get feed in such a situation?

Now the question is whether we have the raw material. The new crop is expected to yield around 40 million to 425 million tons of maize. of this, 8 million to 10 million tons will be used for ethanol production. Consequently, feed shortages are inevitable, said Ms Divya Kumar Gulati, president of the Compound Livestock Feed Manufacturers Association (CLFMA). He made this statement at the 36th AGM of the Poultry Federation of India (PFI) in Lucknow.

Milk and wheat production have been called a revolution, why is poultry left unnoticed?

Dean, DUVASU and former Joint Commissioner, Animal Husbandry, Dr PK Shukla says that when the country needed it, wheat production increased, earning it the name Green Revolution.

The increase in milk production was called the White Revolution. Meanwhile, poultry production has increased 70-fold since 1950. However, this success of poultry has remained unrecognized. However, poultry farmers themselves are responsible for this, and they never considered this aspect. Furthermore, more than 50 million children in the country suffer from malnutrition. However, malnutrition cannot be addressed simply by providing rice. Policymakers need to promote poultry products to combat malnutrition.

Poultry Feed Maize: 'There are so many people who love maize that we have to snatch it away'

Poultry Feed Maize: Maize and soy are the two main ingredients in poultry feed. Maize is the most commonly used feed. However, the use of maize in ethanol has created a maize crisis for poultry. There appears to be no permanent solution to the maize problem in sight.

Poultry Feed Maize Buying grains for feed has always been a challenge. And now there are many lovers of maize. On one side there is poultry i.e. us. Along with this there is demand for maize in the market for ethanol production, starch and human food. This is the reason why maize has to be snatched away. The market of maize has become such that if you buy it today then you regret tomorrow that why did you buy it yesterday, if you had bought it today you would have got more profit. This is the reason why maize is becoming a big problem for the poultry sector.

Therefore, it is essential that we keep the government informed of the poultry sector's demands every two months, said Dr Pawan Kumar, poultry expert and vice president of the Poultry Federation of India (PFI) East Zone. The occasion was the PFI's 36th Annual General Meeting 2025, a two-day AGM held in Lucknow. He made this point during a conversation with Kisan Tak.

Will soy production decrease?

Dr Pawan, in response to a question from Kisan Tak, explained that last year was a good year for soy. However, this year, it is estimated that soy production may decline. This will directly impact the poultry sector. Using last year's data, we can understand demand and production in this way.

Soy production and demand at a glance.

- Last year 135 lakh tonnes of soybean was produced.
- Out of the total production, 113 lakh tonnes of soybean was crushed.
- After crushing, 90 lakh tonnes of DOC was found.
- Out of the total DOC, 20 lakh tonnes were exported.
- 60 lakh tonnes of DOC went into poultry.
- 10 lakh tonnes of DOC went into human food.

Now look at the projections for the year 2025.

- It is estimated that soybean production may decrease by 10 to 12 percent.
- Soybean production is estimated to be 105 lakh tonnes.
- This year, 6 to 8 lakh tonnes of soybean carryover is left.
- This year's production will yield 80 lakh tonnes of DOC.
- It is estimated that 10 lakh tonnes less DOC will be available than last year.
- There is little hope that DOC exports will decrease.
- This year we need at least 75 lakh tonnes of DOC.
- It would be better if only 5 lakh tonnes of DOC is exported or not at all.
- At present, the rates of soybean are low in the international market.
- Crashers are thinking of importing.
- However, we have never been able to import more than 6 lakh tonnes.
- There is a need to be alert in case of soy.

Understanding the math of ethanol is essential for corn.

- According to the government order, 1350 crore liters of ethanol is needed.
- 3.2 crore tonnes of maize will be required for 1350 crore litres of ethanol.
- 2.8 crore tonnes of rice will be required for 1350 crore litres of ethanol.
- If it is made from sugar cane, then 20 crore tonnes of cane will be required.
- The government plans to produce 40 percent ethanol from sugar and molasses.
- 60 percent ethanol should be made from grains i.e. corn and rice.
- For this also, the government has kept the ratio of maize and rice at 60:40.
- 60 percent of corn will be used for ethanol.
- 60 percent maize means 1.5 crore tonnes of maize will be required.
- Currently, 23 million to 25 million tonnes of maize is required for poultry.
- In 2026, 20 to 30 lakh tonnes more will be required for poultry.
- If we understand the demand for maize for starch, then 60 lakh tonnes are required.
- There is also demand for human food.
- If we estimate the total demand, then 4 crore tonnes to 4.2 crore tonnes will be required.
- According to estimates, soybean production is also estimated to be around 42 million tonnes.

Conclusion:

These days, there's always talk of doubling farmers' income. So, how many times will we double it? In Bihar, the income of maize farmers has quadrupled in just 10-11 years. It's important not to forget about poultry farmers while focusing on them. Their incomes may continue to decline.

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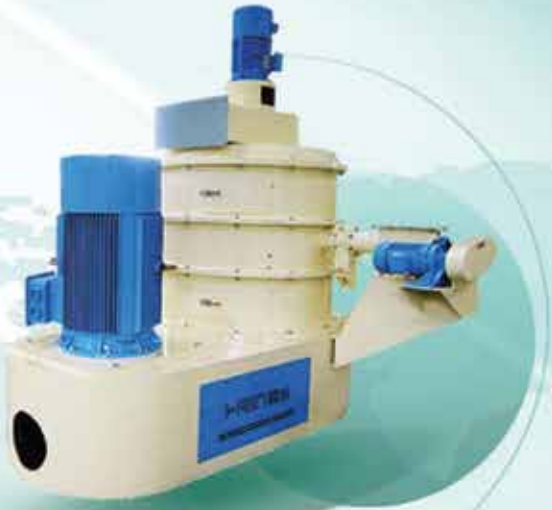

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Role of Artificial Intelligence and Machine Learning in poultry Production and Health management

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Email: sophieveto7@gmail.com

Introduction

Indian poultry industry keeps on emerging from backyard to industrial mode recording an annual growth rate ranging from 8-13% by 2033. Major private players adopted a business model of supply of freshly hatched chicken to farmers followed by collection at their broiler stage or eggs under the integrator system. During the rearing period, poultry farmers are faced with severe challenges like increased feed cost of corn and soybean meal, feed import policy regulations, lack of government subsidaries to poultry farmers, sporadic outbreaks of avian influenza and chronic respiratory diseases, rising labour cost, lack of infrastructure and cold storage facilities. In addition, India too will face acute labour shortages just like developed nations in farming, abattoir and agricultural sectors. Therefore there arises a need for shifting to mechanisation especially in the poultry sector.

In recent times, artificial intelligence and machine learning plays an important role of farm mechanisation employing various environmental sensors and robots. AI and ML have been proven to be useful in various poultry house operations like environmental monitoring and poultry welfare. Artificial intelligence are computer systems which are trained to perform human-like jobs which involve learning, reasoning, perception, and decision-making, often mimicking human cognitive functions. Machine learning is a subset of AI which involves utilising previous data and analytics to predict the outbreaks, environmental risk factors etc. Deep learning techniques also emerge from ML in which artificial neural networks are used. It uses unstructured data such as image, audio, and video etc to derive features automatically without human interruption using neural networks such as CNN, RNN etc.

Sex identification

One of the important operation in poultry industry is the sex identification which is done by vent sexing. This involves labour and operational costs whereas through ML techniques which involves analysing minute differences in egg morphology, chick features such as facial images, wing patterns etc both in-vivo and post-hatch, respectively, the sexing can be done in a non-invasive manner. This reduces the labour cost and facilitates ethical removal of male eggs at a very early stage. An accuracy of 88-98% were achieved as per past reports.

Precision feed formulation

Poultry nutrition is an important component of poultry industry which costs around 70% poultry production. In recent years AI and ML facilitates precision feed formulation using the previous decades data, age and purpose of bird, available feeds, season of the year, cost factors etc in an effective manner so that the birds get balanced nutrition.

Poultry health management

Computer vission usion using modern cameras and vocalisation analysis integrated deep learning networks and analysis will provide accurate information about healthy and diseased poultry groups.

Computer vision

Computer vision involves cameras which then combined with mathematics and computer engineering extract the minor variations in temperature, body weight and behavioural pattern of the chickens. Various cameras such as visible light cameras, infrared cameras and depth cameras were used. Visible light cameras have been used for broiler weight prediction, lameness identification and to observe behavioural patterns.

Infrared cameras non-invasively measures bird's temperature, water drinking pattern, broiler stretching pattern and layers nest occupation etc.

Depth cameras involve 3D images of chicken in a more discerning manner to analyse the behavioral patterns and adjust environment and adopt health measures.

Vocalization analysis

The poultry sounds acts as important non-invasive, wellness analyzing method in respiratory illness such as avian influenza, Newcastle disease, chronic respiratory disease, fowl coryza etc. Various sounds such as sneezing, tracheal rales, snores, coughs will be audio recorded for real time diseases tracking. The pecking sounds of the birds were recorded to differentiate feed intake of healthy and diseased birds and to monitor vices like feather pecking. In addition, acoustic sensors were used

to measure the sounds emitted by the characteristics of sounds emitted by hens. Analysis of acoustic data can serve as a reliable stress indicator (Du et al., 2018), measure food intake (Aydin et al., 2015), and disease detection.

The sound, image and video datas will be preprocessed and analysed by AI/ML classifiers such as Convolution Neural Network (CNN), Support Vector Machine (SVM), Artificial Neural Network (ANN), Deep Neural Network etc. into normal and abnormal abnormal behaviours.

Environmental monitoring

The environmental parameters surrounding the poultry houses such as temperature, relative humidity and built up of excess moisture in the litter materials, carbon dioxide and ammonia gases affect the poultry production like weight gain, feed intake, make them prone to various respiratory and conjunctival diseases. Various sensors were employed to measure temperature, relative humidity, CO_2 and NH_3 concentration inside the poultry house. These sensors send real time signals and warning and also help to maintain normal temperature in poultry houses.

Conclusion

Artificial intelligence and machine learning have become essential in modern poultry farming, delivering transformative benefits across health management, efficiency, and sustainability. Their capacity for early disease detection, optimized feeding, behavioral assessment, and environmental control mitigates risks, boosts productivity, and improves animal welfare. Continued research and integration of these technologies promise to further empower poultry producers, promote public health, and advance the sector toward more resilient, sustainable, and data-driven operations worldwide.

References

Can be given on request.

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From Waste to Wonder: How Poultry By-products are turned into Collagen, Pet Food and more

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Highlight Points
This article discusses how poultry by-products such as feathers, blood, bones, skin, and fat, once considered waste, are now being transformed into high-value products like collagen supplements, pet food, biofuels, and biodegradable plastics. It highlights how these innovations contribute to a circular economy by reducing waste, lowering environmental impacts, and creating new revenue streams. The message to readers and stakeholders in the poultry industry is clear: by embracing technology and innovation, by-products can be turned into co-products that support sustainability, profitability, and long-term industry growth.

When you think of chicken, you probably imagine juicy drumsticks, grilled breasts, or golden nuggets. But have you ever wondered what happens to the rest of the bird, the feathers, bones, skin, blood, and internal organs?

For decades, these poultry by-products were treated as waste, often discarded or used in low-value applications. Today, thanks to food technology and biotechnology, they are being transformed into high-value products like collagen supplements, pet food, biofuels, and even biodegradable plastics. This shift is not just about reducing waste, it's about creating a more sustainable, circular economy in the poultry industry.

The Scale of Poultry By-products

Globally, poultry production is booming. With billions of chickens processed annually, by-products represent 30–40% of the live bird's weight. These include:

- Feathers (5–7%)
- Blood (3–4%)
- Internal organs (offal, 12–15%)
- Bones, skin, and fat

Discarding such massive volumes creates environmental and economic challenges.

Instead, modern technology is unlocking their hidden value.

Feathers: From Fluff to Functional Materials

Chicken feathers may seem like little more than fluff, but they are made of keratin, a tough, fibrous protein. Keratin is the same protein found in human hair and nails, making feathers surprisingly useful.

Applications:

- Feather meal: Processed into a high-protein ingredient for animal feed.
- Bioplastics: Researchers convert feather keratin into biodegradable plastics that could replace petroleum-based plastics.
- Textiles & composites: Feathers are used in lightweight insulation materials and even in construction boards.

In the future, feathers could help solve two problems at once: waste management and plastic pollution.

Blood: A Nutrient - Rich Resource

Chicken blood, once considered

waste, is rich in protein and iron. Food technologists are finding innovative uses for it:

- Blood meal: A high-protein animal feed supplement.
- Bio-fertilizers: Rich in nitrogen, blood meal enhances soil fertility.
- Functional ingredients: Extracted haemoglobin proteins show potential as natural colorants or antioxidants in food systems.

What was once a disposal problem is now a valuable agricultural input.

Bones and Skin: The Collagen Goldmine

Poultry bones and skin are packed with collagen, the structural protein that supports skin, joints, and connective tissue.

Through enzymatic hydrolysis, collagen is broken down into gelatin and collagen peptides, which are widely used in:

- Nutraceuticals: Collagen supplements for skin health, joint support, and anti-aging.
- Food industry: Gelatin in confectionery, desserts, and capsules.
- Biomedical uses: Collagen scaffolds for wound healing and tissue engineering.

This is one of the most profitable transformations of poultry by-products, turning what was once discarded into premium health products.

Fat and Offal: Energy and Nutrition

- Rendered poultry fat is used in pet food formulations, biodiesel, and even cosmetics.
- Edible offal (liver, gizzard, heart) is consumed directly in many cuisines.
- Inedible offal can be processed into protein meals for livestock and aquaculture feeds.

This ensures nearly every part of the bird has a nutritional or industrial use

Pet Food: A Growing Market

One of the fastest-growing destinations for poultry by-products is the pet food industry. Dogs and cats thrive on diets rich in animal protein. Poultry by-productslike organ meats, bone meal, and fatsare not only safe but nutritionally balanced for pets. This shift not only adds value to poultry waste but also supports the booming global pet care industry.

Beyond Food: Poultry in Energy and Innovation

Some of the most exciting applications of poultry by-products are outside the food chain:

- Biofuels: Poultry fat is being converted into biodiesel, offering a renewable alternative to fossil fuels.
- Biogas: Anaerobic digestion of poultry waste produces methane for energy.
- Bioplastics: As mentioned, keratin from feathers and proteins from by-products are being turned into eco-friendly materials.

This shows how poultry by-products are helping create a sustainable bio economy.

Why This Matters: Sustainability and Circular Economy

By-product utilization is no longer just an option—it's a necessity. Efficient use of poultry waste helps:

- Reduce environmental pollution from disposal.
- Cut greenhouse gas emissions by replacing fossil fuels.
- Improve profitability for poultry processors.
- Support sustainable food systems by making full use of each bird.

In short, by-products are no longer "waste", they are co-products with economic and ecological value.

Challenges Ahead

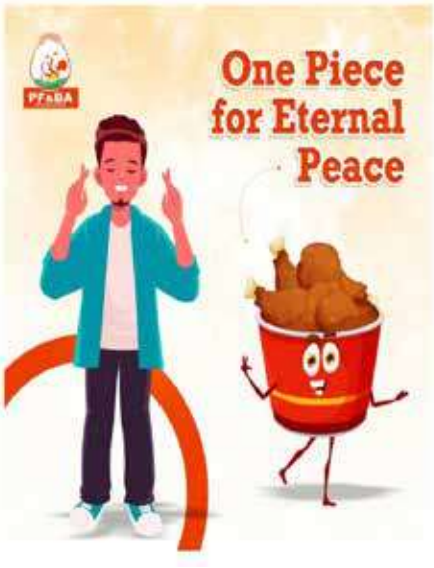
Despite the progress, there are still hurdles:

- Consumer perception: Some people hesitate to accept products made from by-products.
- Safety standards: Strict regulation is needed to ensure hygiene and safety.
- Technology costs: Advanced processing methods require investment.

Overcoming these challenges will be key to scaling up sustainable poultry by-product utilization.

The Future: From Waste to Wonder

Imagine collagen-rich supplements from chicken skin, biodegradable packaging from feathers, and eco-friendly biodiesel from poultry fat, all part of your everyday life. This isn't the future; it's already happening in labs and industries worldwide. The humble chicken, already central to global diets, is now proving that even its by-products have value far beyond the dinner plate. By embracing innovation, we can transform poultry waste into wonderful resources that support health, sustainability, and a greener planet.



Feed Passage Syndrome in Poultry

Dr Chandramohan, Chief Technical Officer, Neotle Global Pvt Ltd

Feed passage syndrome, also known as "undigested feed passage," occurs when partially or fully undigested feed appears in the droppings of poultry. This condition is often a symptom of underlying gut health issues that disrupt digestion and nutrient absorption, and it can lead to reduced feed efficiency, slower growth, and other economic losses in poultry production.

Causes of Feed Passage Syndrome:

Several factors can contribute to feed passage in poultry, including:

1. Dysbacteriosis: An imbalance in the gut microbiota disrupts normal digestion as enzymes produced by the bacteria also aid in digestion of the nutrients in the gut. Hence, dysbacteriosis often leads to poor feed breakdown and undigested feed in droppings.
2. Coccidiosis: This intestinal parasite damages the gut lining, alters the structure of the gut, erodes the intestinal epithelium leading to reduced nutrient absorption and bloody diarrhoea with undigested feed particles.
3. Feed Quality: Diets with low nutrient density lacking in digestible nutrients or improperly formulated feed can overwhelm the digestive system, causing incomplete digestion. A balanced feed is required as over supply of nutrients is also detrimental to gut health and proper digestion.
4. High Fiber Content: Diets high in indigestible Fibers can speed up gut transit time, leading to feed passage syndrome.
5. Mycotoxins/anti-nutritional factors: Toxins produced by certain moulds or anti-nutritional factors present in the feed can cause inflammation of the gut lining and damage it , impairing digestion and nutrient uptake.
6. Enzyme Deficiency: Enzymes are crucial for breaking down feed components like proteins, fats, and carbohydrates. As the enzymes produced by the bird and bacterial enzymes produced by the gut microbiota are not enough, enzymes are also added as feed additives. Enzyme deficiency, whether due to diet or gut health issues, can lead to undigested feed.
7. Stress and Rapid Transit Time: Environmental stressors (e.g., high environmental temperature increases water consumption and thereby speeds up gut transit time), and sudden dietary changes also causes undigested feed to appear in the droppings.
8. Hardness / Fineness of feed: Inappropriate durability of the feed also causes changes in rate of gut movement leading to undigested feed in the droppings.
9. Poor Bio-security: If bio-security measures are not adequately adopted, the environmental bacterial load increases in the system that gets into the gut and thereby disturbs eubiosis, Ultimately, the gut health is impaired due to increased load of pathogens and leading to high quantity of undigested feed passage.

Normal dropping

Droppings with undigested feed

Droppings with undigested feed & orange mucous

Watery droppings with undigested feed & orange mucous

Clinical Signs of Feed Passage Syndrome:

Birds with feed passage syndrome exhibit specific symptoms, including:

- Undigested Feed in Droppings: This is the most characteristic sign, with noticeable feed particles like grains and fiber appearing in feces.
- Diarrhoea and Wet Droppings: Watery feces are common, as poor digestion often leads to intestinal inflammation, increased water consumption and faster passage through the gut.
- Poor Growth and Feed Conversion: Since nutrients are not fully absorbed, affected birds will suffer from deficiency of required nutrients and hence, will show reduced growth rates/ require more feed to gain weight leading to poor feed conversion efficiency.
- Increased Feed Intake with No Weight Gain: Birds may eat more to compensate for the lack of nutrient absorption, but this does not lead to the expected weight gain.
- Dirty birds, discolored feathers, increase in water: feed ratio, wet litter, poor air quality, uneven growth, increased mortality etc.,

Economic Impacts:

Feed passage syndrome can result in severe economic challenges:

1. Increased Production Cost: Due to feed passage wastage of feed and nutrients through faeces is more and birds take further more feed to meet out its requirements and for performance which ultimately increases production cost
2. Reduced Growth Rates: Affected broilers may take longer to reach market weight, which can disrupt production schedules
3. Poor litter Quality: Watery droppings will lead to poor litter and air quality, due to excess ammonia production and bacterial load in the environment, higher level of culls and increased mortality.
4. Healthcare and Management Costs: Managing underlying causes, such as coccidiosis or dysbacteriosis, may require medication, additional biosecurity measures, better supervision and more labor.
5. Poor Meat and Egg Quality: Birds experiencing malnutrition due to poor nutrient absorption may produce lower-quality meat and eggs which will bring down their grades in the market leading to less monetary realization.

Management and Prevention Strategies:

Addressing feed passage syndrome requires identifying and managing the underlying causes. Here are some key approaches:

1. 1. Optimize Diet Formulation: Ensuring balanced, high-quality feed with digestible protein, fat and carbohydrates with adequate levels of vitamins, minerals and any other gut health enhancers can reduce the risk of feed passage.
2. 2. Use of Enzymes: Adding enzymes like Xylanases or Proteases or any other carbohydrases that can improve digestion, especially if there are ingredients in the feed that poultry struggle to digest as even under normal circumstances, only 80-90% of feed ingredients are digested.
3. Coccidiosis control: Implementing an appropriate coccidiostats management program can protect gut integrity and improve nutrient absorption. One has to show extreme caution in selection of anti-coccidial chemicals keeping in mind the need to follow a rotation policy and also possible interactions with other additives being used.
4. Improve Gut Health with Additives: Feed additives like gut health enhancers can support a balanced microbiome in the gut and improve its health as bacterial enzymes produced by favourable bacteria aid in digestion and bacterial toxins produced by pathogenic bacteria cause inflammation of the gut and impair digestion.
5. Broad spectrum natural Bio-polymer: Concept of the bio-polymer with broad spectrum anti-bacterial, anti-inflammatory and immune modulation properties is getting popular in reducing gut impairment and tackling feed passage syndrome.
6. Reduce Stress and Environmental Factors: Managing temperature, ventilation, stocking density, and other stressors effectively can help maintain stable digestion and reduce transit time issues.
7. Monitor and Control Mycotoxins: Effective monitoring of feed ingredients quality and their storage conditions, using mycotoxin binders in feed etc., can prevent mycotoxicosis and the associated gut damage.

Conclusion:

Feed passage syndrome is a sign of impaired digestion and nutrient absorption, often due to underlying gut health issues or dietary imbalances. Managing this condition through diet optimization, gut health support, and preventive measures can help improve feed conversion, promote growth, and reduce economic losses in poultry production. Early intervention and routine monitoring are essential to maintain a healthy flock and efficient production system.

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Rising Feed Costs and Maize Supply Challenges:

Implications for Sustainable Poultry Production in India

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Introduction:

India's poultry industry, one of the fastest-growing agribusiness sectors globally, is now confronting a crisis that strikes at its very foundation—feed costs. For decades, the industry's resilience has rested on two essential pillars: maize (corn) and soybean meal. Together, these ingredients form nearly 70% of the total cost of production in poultry farming. Their availability and affordability have enabled India to become one of the largest producers and consumers of chicken and eggs, providing affordable protein to over 1.4 billion people.

But in 2025, this balance has been severely disrupted. Surging feed prices, policy-driven shifts in crop usage, and the global scramble for grains have combined to squeeze farmers, disrupt markets, and raise consumer concerns.This crisis is not only about economics-it cuts across the spectrum of food security, farmer livelihoods, and sustainability. The poultry sector feeds India's nutritional needs with accessible protein, and any instability in its foundation carries far-reaching consequences.

The Anatomy of Poultry Feed:

Why Maize Matters

To appreciate the scale of the crisis, one must understand the central role of maize in poultry diets.

- Maize as energy: Poultry birds require high-energy diets for fast growth and efficient egg production. Maize, rich in starch and easily digestible, delivers this critical energy.
- Soybean as protein: Complementing maize, soybean meal balances rations by supplying high-quality protein essential for muscle development, immunity, and egg formation.

Together, maize and soybean form the backbone of poultry feed. In India, maize alone contributes nearly 50% of a standard ration, which means any spike in its price reverberates across the industry like a seismic shock.

Ethanol Policies: The New Game-Changer

The Indian government's ambitious 20% ethanol blending mandate by 2025–26 is a landmark policy, aimed at reducing crude oil imports, lowering carbon emissions, and promoting green growth. But while this initiative is noble in intent, it has had unintended side effects on food and feed systems.

- Ethanol is maize-intensive: The push for ethanol requires massive maize inputs.
- From exporter to importer: India, once a net exporter of corn, has begun importing to meet domestic demand.
- Price escalation: Domestic maize prices have soared, often breaching ₹25,000 per metric ton.

For poultry farmers, this translates into feed bills that have jumped 7–8% within a year, even as farmgate prices of eggs and broilers remain stagnant. The outcome: shrinking margins and mounting financial stress.

Beyond Maize: Soybean and Oilseed Complexities

While maize is the most visible concern, soybean—the protein powerhouse of poultry diets-has also added to the industry's woes.

- Global supply issues: Weather disruptions in South America and strong international demand have tightened global soybean supplies.
- Domestic constraints: In India, competition between oilseed cultivation for edible oils and soybean meal for feed has further restricted availability.
- Price escalation: As a result, soybean meal prices have surged, compounding the financial burden on poultry farmers.

This creates a double whammy: expensive maize for energy, and costly soybean meal for protein.

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Distillers Dried Grains (DDGS): Boon or Bane?

The ethanol revolution has given rise to a byproduct—Distillers Dried Grains with Solubles (DDGS). This protein-rich residue is gaining attention as a feed substitute.

- The promise: DDGS is relatively affordable and has a decent protein profile. Feed millers are cautiously blending it at 10–15% inclusion levels to reduce costs.
- The concerns: Farmers remain skeptical. Questions persist about its nutritional consistency, aflatoxin contamination risks, and bird performance under large-scale substitution.

For smallholders like Ramesh, adopting DDGS requires technical know-how and confidence—both of which remain limited.

The Debate Around GM Imports

Another hot-button issue shaping the future of poultry feed is genetically modified (GM) imports.

- Proponents argue: Duty-free GM maize and soybean imports could bridge supply gaps, stabilize prices, and ensure feed availability.
- Critics warn: Such imports could undermine biosafety, erode farmer seed sovereignty, and make India dependent on foreign corporations.

The debate continues, with the poultry industry anxiously awaiting policy clarity. In the meantime, uncertainty clouds future feed security.

Exploring Alternatives: Sorghum and Millets

With maize under pressure, researchers and policymakers are reviving interest in sorghum, pearl millet, and finger millet as feed alternatives.

- Sorghum's potential: Studies show it can replace up to 50% of maize in poultry rations without major loss of performance.
- Millets: Rich in micronutrients, they support bird health but require careful formulation to overcome anti-nutritional factors.
- Broader benefits: Reviving millet cultivation could provide new markets for dryland farmers and align poultry feed strategies with India's climate-resilient agriculture goals.

Impact on Consumers: Eggs and Chicken Get Costlier

The consequences of feed inflation ultimately reach the consumer's plate.

- Egg prices in some cities have touched ₹7–8 per piece.
- Broiler chicken, once the "common man's protein," now retails at ₹200–220 per kg in many states.

Such price escalation risks alienating low-income consumers, undermining the affordability advantage that made poultry India's most popular protein. It also threatens to slow down the sector's impressive growth trajectory.

Industry Response: Coping with the Crisis

Despite the challenges, the poultry sector is innovating to survive.

- Backward integration: Major firms like Suguna and Venky's are investing in captive feed mills and raw material procurement systems to control input costs.
- Nutritional optimization: Precision feeding, enzyme supplementation, and advanced feed additives are being deployed to improve feed conversion efficiency.
- Policy lobbying: Industry associations are pressing the government for duty-free imports, subsidies on alternative grains, and improved logistics infrastructure.

These strategies show resilience but are unlikely to completely offset the feed cost crisis without stronger policy support.

The Road Ahead: Balancing Food, Fuel, and Farmers

The poultry feed crisis illustrates the delicate balance between energy security and food security.

- On one side, the ethanol program reduces crude dependence and creates markets for maize growers.
- On the other, it inflates feed prices, jeopardizing poultry protein affordability.

The way forward lies in integrated policymaking. Instead of a "food versus fuel" dilemma, India must pursue a "food and fuel together" approach, supported by:

- Strategic imports of maize and soybean during shortages.
- Incentives for cultivation of alternative grains.
- Better post-harvest storage and logistics.
- Research on feed innovations to reduce maize dependence.

Conclusion:

India's poultry industry stands at a pivotal moment. Rising feed costs are not a passing storm but a structural challenge that could reshape the future of this sector. Handled well, the crisis could accelerate innovation, diversify feed sources, and make the industry more resilient. Handled poorly, it risks pushing countless small farmers out of business, raising consumer prices, and reducing access to affordable protein for millions. A collective effort involving government, farmers, feed manufacturers, and researchers is the only way forward to secure the foundations of India's poultry industry and protect both food security and farmer livelihoods.

CO_2 - Induced Euthanasia: Scientific Advances and Regulatory Perspectives for Hatchery Cull Birds

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Introduction

Chick culling is a common practice in poultry hatcheries, carried out mainly for economic and biological reasons. It involves separating and killing chicks that are considered unprofitable or unsuitable for production most often male chicks, since they cannot lay eggs and are not efficient for meat production, as well as weak or unhealthy female chicks that would not survive or contribute productively. Because egg-laying breeds and meat-producing breeds are selectively bred for different purposes, raising surplus males would add unnecessary costs, so they are usually culled shortly after hatching or being sexed.

Hatcheries employ trained workers to quickly distinguish between male (cockerels) and female (pullets) chicks, while also checking for signs of illness or defects among the flock. Removing weak or unviable chicks helps maintain overall flock health and reduces the risk of disease. This practice, however, has sparked major ethical and welfare concerns worldwide. In response, researchers are developing alternatives like **in-ovo sexing**, a technique that determines an embryo's sex before it hatches, thereby avoiding mass culling. Some countries, under public pressure and with technological advances, have already moved to ban chick culling.

In summary, while chick culling continues as a standard method in hatcheries for efficiency and cost reasons, it remains controversial and is increasingly challenged by demands for more humane solutions.

Welfare Guidelines

The **American Veterinary Medical Association (AVMA)** requires that euthanasia methods, such as CO_2 gassing, must result in a quick loss of consciousness followed by death with minimal suffering. Only AVMA-approved methods are permitted, including rapid maceration and gas displacement using CO_2 or nitrogen. Procedures must be carried out by trained staff, and hatcheries are obligated to regularly verify that these methods are both effective and compliant with welfare standards.

The **National Farm Animal Care Council (NFACC)** poultry code specifies that weak, injured chicks or live embryos not intended for further use must be euthanized promptly, and no later than one hour after processing. Hatcheries are required to establish clear standard operating procedures (SOPs) for culling, euthanasia techniques, and proper documentation. Chicks must be handled carefully to minimize stress and injury, and equipment must be routinely inspected to prevent welfare breaches.

- Regulations highlight the need for accurate documentation of culling decisions and continuous monitoring of welfare practices. Any mishandling—such as live chicks identified in waste streams—is considered a major compliance violation and requires corrective training or action.
- In the **European Union** and other jurisdictions, laws are standardized to prevent avoidable suffering, mandating the use of approved gases or mechanical euthanasia methods. More recently, governments have begun enacting measures to restrict inhumane practices and shift toward alternatives such as in-ovo sexing.
- Rising public concern about animal welfare has intensified opposition to chick culling, with consumers and advocacy groups pushing the industry to adopt non-lethal solutions. Among these, **in-ovo sexing**—which determines chick sex before hatching—has gained recognition as a promising alternative.
- For hatcheries, the central challenge is balancing welfare responsibilities with economic demands and market expectations. To maintain public trust and uphold ethical standards, the industry must focus on transparency, strict adherence to humane protocols, and continued investment in technological innovation.

Mechanism: How CO_2 Induces Unconsciousness and Death

- CO_2 euthanasia operates through two main physiological effects: hypoxia (oxygen deprivation) and hypercapnia (excess carbon dioxide in the blood). When animals inhale high concentrations of CO_2, the following occurs:
- Carbon dioxide builds up in the bloodstream, causing acidification (lower blood pH), which triggers respiratory distress and rapid loss of consciousness.
- Rising CO_2 levels simultaneously reduce oxygen availability, causing hypoxia that further accelerates unconsciousness and ultimately

leads to death.

- Visible signs such as loss of posture and insensibility occur relatively quickly after exposure, followed by cessation of breathing and, finally, cardiac arrest.
- When applied correctly, CO_2 protocols induce unconsciousness before the onset of significant pain or distress.
- To minimize suffering, optimal procedures emphasize gradual introduction of CO_2 rather than sudden, high concentrations. Improper gas administration (such as bottom-filling chambers) increases observable distress behaviors, whereas top-fill systems or gradual displacement methods promote uniform distribution and reduce discomfort.

Chamber Design, Equipment, and Safety Protocols

- Chamber Design: Hatchery CO_2 chambers are sealed enclosures that allow controlled gas infusion. They range in size to accommodate single or multiple chicks. Gas enters from above to encourage gradual and even filling.
- Gas Monitoring: Real-time monitors track CO_2 levels, maintaining effective concentrations (generally 70–90%) to ensure euthanasia is swift but humane. Flow rates must be regulated to prevent distress.
- Ventilation Control: Valves regulate gas movement, preventing oxygen from re-entering during euthanasia. After use, exhaust systems release gas safely.

Safety Protocols for Effective and Humane Operation

- Regularly inspect chambers for airtight seals to prevent leakage.
- Use environmental CO_2 detectors to safeguard workers from accidental exposure.
- Ensure staff are fully trained in equipment use, emergency procedures, and welfare guidelines.
- Clean and maintain equipment routinely to uphold operational reliability and humane standards.

Standard Operating Procedures for CO_2 Euthanasia in Poultry

Prefill vs. Gradual Fill Approaches

Prefill Method (Immersion)

- In this method, the chamber is first filled with a high concentration of CO_2 (close to 100%) before chicks are placed inside.
- Birds are immediately exposed to an atmosphere saturated with CO_2, leading to rapid unconsciousness and death.
- This approach is generally considered more suitable for poultry, as it minimizes the prolonged distress sometimes observed with gradual filling.
- It does not require precise control of gas flow during euthanasia, but chambers must be cleared and cleaned between groups. Since CO_2 is heavier than air, it can accumulate at the bottom, causing uneven exposure if not properly managed.

Gradual Fill Method (Displacement)

- Here, CO_2 is introduced into the chamber at a steady rate while birds are already inside.
- AVMA guidelines recommend gas displacement rates of 10%–30% of chamber volume per minute, based mainly on rodent studies, to reduce discomfort during induction.
- However, for poultry, slower fill rates can cause hyperventilation or distress.
- Gradual filling is more commonly used for young swine, while poultry generally respond better to the prefill method.

Concentration and Exposure Guidelines

- CO_2 levels of 80%–100% are typically required to achieve humane and effective euthanasia in poultry.
- Newly hatched chicks can tolerate high CO_2 concentrations but usually need up to five minutes of exposure to ensure death.
- After unconsciousness occurs, gas flow should be maintained for at least 1–5 minutes, or until respiration, heartbeat, and reflexes have completely ceased.
- Death must always be manually confirmed; if there is any uncertainty, a secondary method such as cervical dislocation should be used.
- Chamber volume, gas concentrations, and flow rates must be accurately calculated to guarantee rapid and uniform displacement of air. Flow rates between 30%–70% of chamber volume per minute are commonly recommended.

Animal Welfare Outcomes

Behavioral Indicators of Distress and Insensibility

- Common behavioral signs observed during CO_2 euthanasia include:
    - Headshaking (HS) and gasping (GS): Reflect irritation and breathlessness, signaling distress prior to unconsciousness.
    - Loss of posture (LOP): Marks the onset of insensibility.
    - Cessation of rhythmic breathing (CRB): Indicates respiratory arrest.
    - Cessation of movement (COM): Confirms death.
- Research shows that immediate exposure (immersion) to high concentrations of CO_2 (90–100%) leads to faster insensibility and death compared to gradual filling methods, while also shortening the duration and frequency of distress behaviors.
- Since distress behaviors appear

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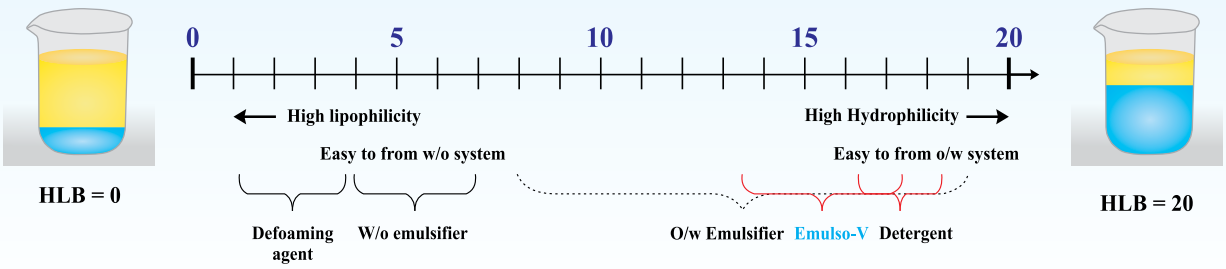

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at lower CO_2 levels than those required for unconsciousness, minimizing the time between exposure and loss of sensibility is critical, particularly for young chicks.

Comparative Effectiveness and Welfare Considerations

- CO_2 euthanasia (immersion method): Considered humane when carried out correctly, ensuring rapid unconsciousness and death.
- Maceration: Provides instantaneous death but is perceived as a more violent physical method, often subject to public criticism.
- Cervical dislocation: Effective if performed properly but requires expertise, with potential welfare issues if done incorrectly.
- Compared with alternatives, CO_2 euthanasia is less physically traumatic and adaptable to large-scale use, though distress during early exposure remains a welfare concern requiring refined protocols.
- Practical Application in Hatcheries

Training and Handling Protocols

- Personnel must be trained to:
  - Identify signs of distress, unconsciousness, and death.
  - Safely operate CO_2 systems and follow emergency procedures.
  - Apply correct bird-handling practices to reduce pre-euthanasia stress.
- Backup methods such as cervical dislocation should always be available to ensure death when needed.

Scalability: Single-Bird vs. Mass Euthanasia

- CO_2 equipment can be adapted for different scales:
  - Small chambers: Suitable for individuals or small groups; allow precise monitoring.
  - Large chambers: Facilitate batch euthanasia, enhancing efficiency.
- Effective CO_2 distribution is crucial to ensure all animals are exposed consistently.
- Routine maintenance and calibration of equipment are essential for compliance with welfare standards and reliability of outcomes.

Legal, Ethical, and Social Aspects Compliance with Local and International Regulations

- Poultry hatcheries are subject to strict national and international regulations that govern humane euthanasia practices.
- In the United States, guidelines from the American Veterinary Medical Association (AVMA) and the National Farm Animal Care Council (NFACC) set standards designed to reduce pain and distress, including protocols for CO_2 euthanasia of chicks.
- Within the European Union, unified regulations permit the use of methods such as mechanical grinding and CO_2 gassing. However, several EU member states—such as Germany, France, and Luxembourg—have introduced or are planning bans on chick culling, shifting instead toward alternatives like in-ovo sexing.
- Across regions, compliance requires strict adherence to welfare standards, transparent documentation, and accountability within hatchery operations.
- Addressing Public Concerns and Ensuring Transparency
- Public opposition to chick culling is increasing, mostly due to ethical debates over the mass killing of male and non-viable chicks.
- Hatcheries can help address these concerns by openly communicating their euthanasia methods, while also adopting and showcasing alternatives like in-ovo sex determination.
- In response to consumer demand and ethical scrutiny, industry leaders are increasingly investing in "no-kill" egg production and other innovative, welfare-friendly approaches.

Future Directions and Ongoing Research

Enhancing Welfare Monitoring

- Research is aimed at improving the accuracy of welfare assessment during euthanasia, with a focus on refined behavioral and physiological indicators such as the timing of distress and loss of consciousness.
- Emerging sensor-based and automated monitoring systems now allow for continuous, real-time tracking of animal welfare, making it possible to optimize euthanasia protocols more precisely.
- Development of Humane Alternatives
- In-ovo sexing technologies enable detection of chick sex before hatching, offering a major alternative that reduces or eliminates male chick culling.
- Genetic innovations, including CRISPR-based sex determination methods, are being explored as long-term solutions to prevent the hatching of unwanted male chicks.
- Researchers are also testing new gas mixtures and euthanasia technologies to achieve improvements in both animal welfare outcomes and operational practicality.

Together, these legal frameworks, societal demands, and scientific innovations reflect a strong and growing commitment to advancing animal welfare in hatcheries—ensuring practices meet both ethical expectations and evolving regulatory standards.

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22 Field Trials*

1,08,236 broiler chickens

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40 - 70 points#
Improvement in cFCR

Upto 70 g
Improvement in BWT in open shed

Upto 120 g
Improvement in BWT in EC shed

Upto 30%
Improvement in livability vis-à-vis antibiotic control

#1 FCR point represent third/last decimal point of 1000

*Majority of field trials were conducted at same farm with multiple sheds in integrations across various geographical locations and at different time of the year. Some of the integrators were generous in sharing complete production indices while others communicated the summary of the trial results. In the field trials, Improval™ MS was compared with antibiotic/probiotic/antibiotic + probiotic/probiotic + prebiotic control. Detailed reports availble on request.

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