English monthly from Hyderabad, India

Poultry Fortune

Estd. 1991

Health • Nutrition • Technology • Marketing

December 2025

Annual Subscription: ₹800 Foreign USD 100

Inside ...

ROSS 308 AP

BEST ACHIEVERS
OCTOBER-2025

Aviagen® INDIA

Northern Region

COMPANY: Sampoorna Feeds
FARMER NAME: Ms.Tripta Rani

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

Eastern Region

COMPANY: IB Group
FARMER NAME: Mr. Brajesh Patel

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

Central Region

COMPANY: Japfa
FARMER NAME: Mr. Avinash Choudhary

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

South Region

COMPANY: SKM
FARMER NAME: Mr. Subash Chandra Bose

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

OCTOBER-Top PERFORMANCE BY AREA

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

OCTOBER-Top 10 FIELD PERFORMANCE

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

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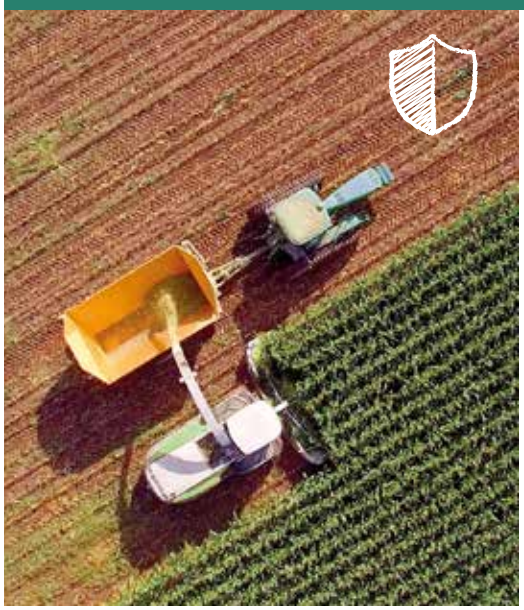
Mycotoxin Risk Management

Mitigate the risk of mycotoxins acting as predisposing factors to diseases and vaccine failure as well as overcome reproductive challenges



Why is it important?

- Mycotoxins are well-known toxic fungal metabolites commonly present in feed ingredients that affect birds differently depending on the type, life stage, and level of contamination in feed.
- Direct effects of mycotoxins are usually manifested through damaging the bird's gut and liver.
- A key consideration is the presence of mycotoxins even at low levels – they disrupt protein synthesis resulting in compromised body function including immune and barrier integrity. This can impair vaccine response and increase susceptibility of pathogenic bacteria entering the circulation causing disease and reproductive and productive challenges.
- Not all mycotoxins are the same. Most poultry feed is contaminated with more than one mycotoxin, leading to synergistic and or additive effects on bird performance.

How to maximize the potential?

- Consider mycotoxins as part of differential diagnosis for health and nutritional challenges.
- Manage risks associated with mycotoxins in the feed, even at low levels, by including a multi-pronged solution with the ability to adsorb and biotransform different types of mycotoxins while using biological compounds to protect the liver and vital organs from the negative effects of mycotoxins.

dsm-firmenich solutions

- A precise and cost-**effective mycotoxin risk management** program has consistent monitoring, risk assessment, and a comprehensive intervention strategy comprising adsorption, biotransformation, and bioprotection.

Mycofix®

- Consistent and continuous monitoring of mycotoxins by constantly analyzing feed materials helps to detect which mycotoxins are present, level of contamination, and their potential risk levels to devise a comprehensive intervention strategy.

Mycotoxin Detection Services

We recommend ensuring Optimum Vitamin Nutrition as baseline in all Poultry diets. Precise sustainability measures can help reduce the environmental footprint while ensuring lifetime production. A precision monitoring system using blood biomarkers can help predict the challenges to flock performance.

OVN™ **Sustell™** **Verax™**

PI_PoultryCampaign_Protect-MycotoxinRiskManagement_P_EN_0424_61729

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Poultry Fortune

English Monthly Magazine
(Established in May 1991)

Volume 27 Number 5 December 2025

Editor & Publisher
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Editorial & Business Office:
POULTRY FORTUNE
NRS Publications,
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Website: www.poultryfortune.com

Annual Subscription
India : Rs. 800
Foreign Countries : US $ 100
or its equivalent.

Poultry Fortune will be sent to the subscribers in India by Book Post, and to foreign subscribers by AirMail.

Edited, printed, published and owned by M. A. Nazeer and published from BG-4, Venkataramana Apts., 11-4-634, A.C.Guards, Hyderabad - 500 004, India. Printed at Srinivasa Printers.
Registered with Registrar of Newspapers for India with Regn. No. 72452 / 99. Postal Regn.No. RNP/HD/1067/2021-2023.

NRS PUBLICATIONS
www.poultryfortune.com

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Subscriptions for Poultry Fortune, English monthly, should be sent to:
The Circulation Department, Poultry Fortune, BG-4, Venkataramana Apartments, 11-4-634, A.C.Guards, Near Income Tax Towers, Hyderabad - 500 004, India. Email: info@poultryfortune.com

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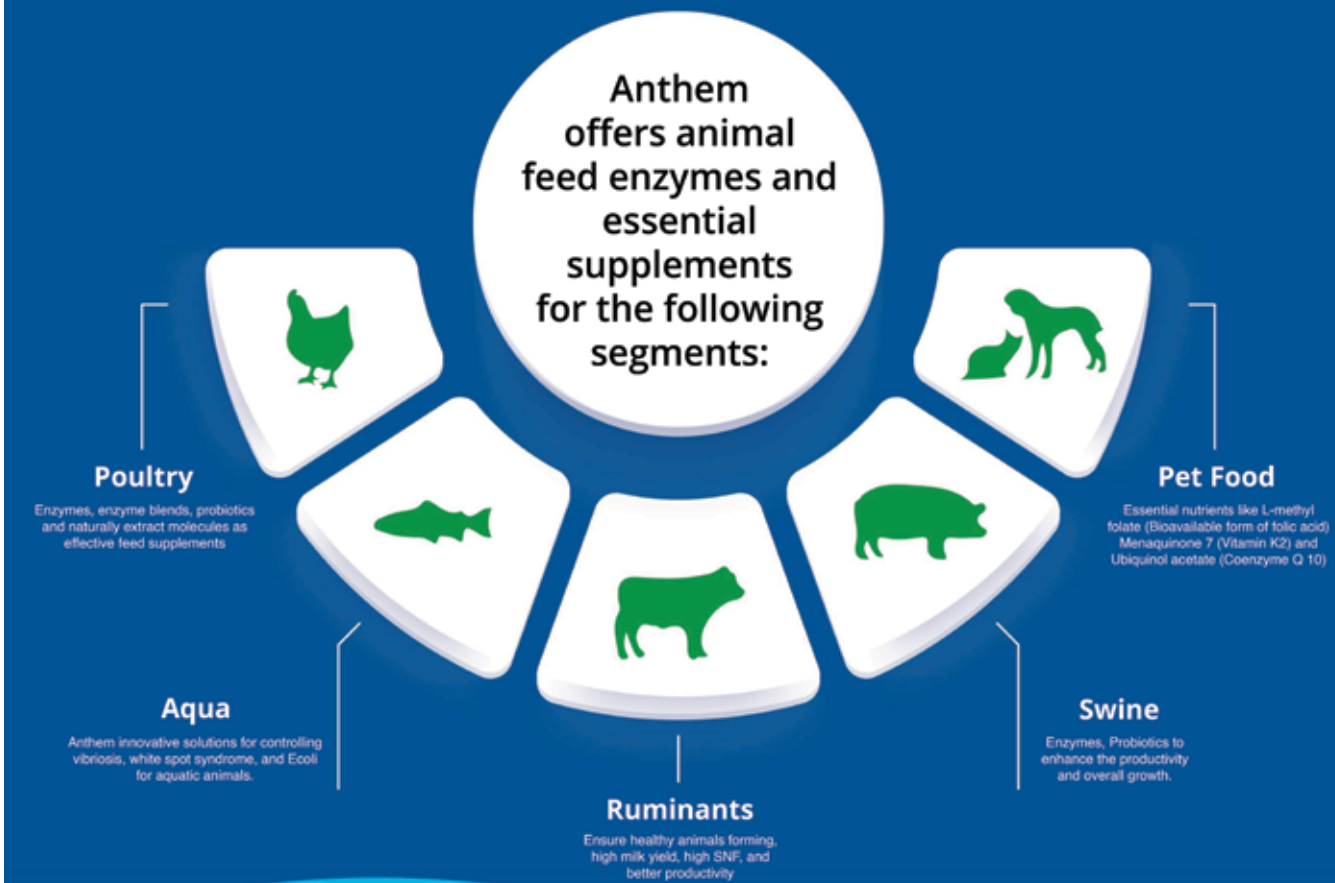

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Poultry pioneer C Jagapati Rao passes away

India's poultry exports have more than doubled to about $149 million during the first six months of the current financial year

In poultry industry, AI and sensors are used to assess and enhance the ventilation system, ensuring a comfortable environment for poultry. Its applicability in poultry extends to data collection on various aspects like microenvironment, behavior, health and movement within the poultry house. Analyzing this data allows the AI system to quickly detect deviations and make improvements

Dear Readers,

The December 2025 issue of Poultry Fortune is in your hands. In the news section you may find news about...

Chitturi Jagapati Rao, Chairman of Srinivasa Farms Group, passed away on November 29, 2025 in Hyderabad. He was 92. Considered as one of the pioneers in the poultry industry in India, Jagapati Rao was bestowed with the prestigious Denis Wellstead Award "International Egg Person of the Year 2023" by The International Egg Commission (IEC). He was the first Asian to receive this highest award. Jagapati Rao was one of the founders of NECC, an association for egg producers which has been instrumental in supporting the industry to grow exponentially. His contributions to the Indian layer industry have not only revolutionised the sector but also improved the lives of many people.

Established in October 1965, Srinivasa Farms is one of the leading poultry organisations in the country. It operates an integrated layer and broiler business. Srinivasa deals with supply of Hy-Line layer and Ross broiler chicks, poultry feed and premium soya solutions, Hello Eggs & Freshen retail egg brands and Jagapati Finance supporting poultry farmers with financing options. Jagapati Rao was a close associate of B.V. Rao who together (along with S.B. Thorat) started Venkateswara Hatcheries in 1971, which is today became Asia's largest and fully integrated poultry group. Jagapati Rao was known as a man with decency, decorum and commitment.

India's poultry exports have more than doubled to about $149 million during the first six months of the current financial year on robust demand for eggs from the Middle East. Exports of poultry products, such as eggs and egg products, stood at $71.16 million in the same period last year. In rupee terms, poultry exports stood at ₹1,288.63 crore during the first half of the current fiscal compared to ₹595 crore in the same period last year. Strong demand from countries such as the United Arab Emirates and Oman have lifted Indian poultry exports even as supplies from other origins dwindled during the year. Oman has traditionally been the largest buyer of Indian eggs.

B.V. Rao's birth anniversary was celebrated in grand style. Friends Walkers Association distributed boiled eggs to walkers and 500 eggs to sports persons on the occasion of the 90th birth anniversary and Neck Day of the Father of Poultry Dr B.V. Rao recently. Industry stakeholders distributed pamphlets about the values of the eggs. Similar celebrations were held all over india.

57th Annual Nutrition meet held in hyd, The Nutrition Society of India (NSI), the country's largest body of nutrition scientists and researchers with over 6,000 members, is set to host its two-day 57th annual conference was held at the National Institute of Nutrition (NIN), Hyderabad.

In the Articles section, **Green Muscle Disease Reducing the Incidence in Broiler Flocks**, Green Muscle Disease (or Deep Pectoral Myopathy, DPM) is a degenerative disease

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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POULTRY FORTUNE, BG-4, Venkataramana Apartments, 11-4-634, A.C.Guards, Near Income Tax Towers, Masab Tank, Hyderabad - 500 004, T.S, India.
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of the minor pectoral muscles (i.e. the tenders), which is characterized by atrophy and necrosis. The condition arises when the muscle fibers become deficient in oxygen and is associated with sudden and excessive wing flap. The development of the disease can be split into three categories.

Another Article titled, **Artificial intelligence (AI) plays a vital role in computer science as it enables the development of intelligent machines capable of performing tasks that typically require human intelligence** by Ramayampet Shirisha, says that, Artificial intelligence (AI) plays a vital role in computer science as it enables the development of intelligent machines capable of performing tasks that typically require human intelligence. In poultry industry, AI and sensors are used to assess and enhance the ventilation system, ensuring a comfortable environment for poultry. Its applicability in poultry extends to data collection on various aspects like microenvironment, behavior, health and movement within the poultry house. Analyzing this data allows the AI system to quickly detect deviations and make improvements.

Another Article titled, **Sapodo – Setting New Standards in Natural Ammonia Control for Poultry Going beyond Yucca for ammonia management** by Avitech, said that, PhyGeno, the plant-based feed ingredient division of Avitech Nutrition is dedicated to enhancing the safety and nutritive value of animals through plant-based innovations. Drawing on its legacy of working with animals and combining ancient Ayurvedic knowledge with modern evaluation and manufacturing techniques, PhyGeno offers solutions that lead to healthier products for human consumption and minimal environmental impact. Sapodo, apolyherbal formulation is rapidly emerging as a natural choice to address critical ammonia challenges in poultry farming.

Another Article titled, **Smart and Sustainable Poultry Manure Management: Turning Farm Waste into a Green Resource** by Dr Pawar Rutik Namdev, said in this article, Poultry farming plays a vital role in providing affordable meat and eggs, creating jobs, and supporting the economy. But along with growth comes a big challenge - what to do with all the manure produced every day. If not handled properly, poultry manure can cause bad odors, flies, pollution, and health risks for both people and birds. However, the good news is that manure is not just waste - it is a valuable resource full of nutrients. With the right methods, it can be turned into organic fertilizer, renewable energy, and even eco-friendly soil enhancers. Sustainable manure management helps farmers protect the environment and earn extra income at the same time.

Another Article titled, **Probiotics in poultry health and production** by Dr Sophia Inbaraj, discussed that, Why probiotics are important for chickens? Every vertebrate animal/wild bird/human requires microbiota to protect themselves against environmenta / opportunistic pathogens which they receive through placenta, milk or mothers' faecal extracts in case of animals/birds. But the poultry faces a sterile environment in hatchery so that they lack those microbiota and needed to be supplied immediately after birth in order to protect themselves from pathogens like Avian Pathogenic E.coli, Salmonella, Campylobacter, Clostridium etc. Thus, supplementation with probiotics play an important role in poultry health and production.

Another Article titled, **Integrated Approach to Backyard Poultry Development for Sustainable Rural Livelihoods** by K. Sharma, said that, Backyard poultry farming is a traditional system of rearing poultry with small flock size of native birds by farmers to meet their dietary or small cash needs. It is an eco- friendly approach. They are very active in controlling pest and providing manure. Backyard poultry provides supplementary income in shortest possible time with very minimum capital investment. Development of superior strains of backyard poultry can remarkably improve nutritional status and income of rural communities. In livestock production system, particularly poultry sectors play an important socio-economic roles in developing countries. Poultry sector has become one of the fastest growing segments in Indian agriculture and contributing a considerable proportion to the national GDP.

Another Article titled, **Erysipelas in poultry** by Dr J. Shiva Jyothi, said that, Erysipelas is a bacterial disease, caused by Erysipelothrix rhusiopathiae, a gram positive, facultative anaerobic rod. E. rhusiopathiae infects most poultry species (laying hens, turkeys & broilers) and has been isolated from many mammalian species and from fish. It is also called as Red Skin, Erysipelothrix Infection, St. Anthony's Fire.

Another Article titled, **Kadaknath Meat: A Review** by Anshul Kumar Khare, P.K.Singh, Swati Gupta and Surbhi Yadav, said that, Poultry refers to domesticated birds raised for various purposes, primarily for their meat and eggs. Some common types of poultry include chickens, turkeys, ducks, geese, and quails. These birds are specifically bred and managed within the poultry industry to meet the demand for poultry products. Indian poultry sector has attained very fast growth in the last decades; as a result India holds third position in egg production and fifth position in broiler production in the world. The total poultry population of India is 851.81 million which 16.8% higher than previous census. Total meat production in India is appprox.10 MT out of which poultry meat production is 4.5 MT (pib.gov.in). Out of 20 registered chicken breeds of India, Kadaknath is a famous breed which is popular for disease resistance, climate resistant and ability to protect themselves from predators.

Another Article by Jagadeesh N and Chanthirasekaran R, said that a healthy gut microbiome is essential not only for optimal nutrient utilization, but also for maintaining physiological balance and immune function.

Readers are invited to send their views and comments on the news, special feature and articles published in the magazine which would be published under "Readers Column". Time to time, we shall try to update you on various aspects of Poultry sector. Keep reading the magazine Poultry Fortune regularly and update yourself. Wish you all fruitful results in your efforts.

M.A.Nazeer
Editor & Publisher
Poultry Fortune

Poultry exports double in H1FY26 on strong demand from Middle East

HITTING BULL'S EYE. UAE pips Oman to become the largest buyer, aided by supply shortfalls in Turkiye and Iran

India's poultry exports have more than doubled to about $149 million during the first six months of the current financial year on robust demand for eggs from the Middle East.

Exports of poultry products, such as eggs and egg products, stood at $71.16 million in the same period last year.

In rupee terms, poultry exports stood at ₹1,288.63 crore during the first half of the current fiscal compared to ₹595 crore in the same period last year.

Strong demand from countries such as the United Arab Emirates and Oman have lifted Indian poultry exports even as supplies from other origins dwindled during the year. Oman has traditionally been the largest buyer of Indian eggs. However, this year, the UAE has surpassed Oman as the largest buyer in the first six months of the current fiscal, per the country-wise shipment data from the DGCIS.

"UAE, which opened up the market for Indian eggs last year, are importing in full swing. They have accepted our quality very well and standards are maintained," said Valsan Parameswaran, Secretary, All India Poultry Exporters Association.

GLOBAL SUPPLIES

"The shortage in global supplies due to production issues in Turkiye and Iran also contributed to the growth in Indian exports, as these countries were supplying to the Middle East market," he said. Also, Turkiye has been supplying to the US, which faced a shortage due to local production issues.

India also, for the first time, Suppiled one crore eggs during Junethis year from the Namakkal region. However, there have been no further orders from the US.

OTHER MARKETS

Besides the UAE and Oman, Indian eggs and egg products have also seen a good demand from countries such as Japan and Indonesia, among others. "The growth in demand for Indian poultry is expected to sustain. We expect strong demand till January and this financial year will be good for poultry exports," Parameswaran said.

During 2024–25, India's poultry exports had seen a decline of about 9 per cent at $185.98 million from the previous year's $205 million, per the Agricultural and Processed Food Products Export Development Authority (Apeda).

DOMESTIC OUTPUT UP

The egg production in the country is estimated at 142.77 billion during 2023–24 and registered a growth of 6.8 per cent over the past 10 years compared to the estimates of 76.48 billion during 2014–15, per the Basic Animal Husbandry Statistics 2024, released in November last year by the Department of Animal Husbandry and Dairying. Further, the production increased annually by 3.18 per cent during 2023–24 over 2022–23.

Andhra Pradesh is the largest producer of eggs with a share of 17.85 per cent, followed by Tamil Nadu at 15.64 per cent, Telangana at 12.88 per cent, West Bengal at 11.37 per cent, and Karnataka at 6.63 per cent.

Top buyers (during April–Sept) (in $ million)

Country	FY 2024–25	FY 2025–26
UAE	51.3	57.15
Oman	23.59	26.17
Maldives	9.40	10.23
Japan	3.72	10.11
Indonesia	5.60	10.12

B.V. Rao's birth anniversary celebrated in grand style

Nellore, (Kalam Sainikudu), November 6: Friends Walkers Association distributed boiled eggs to walkers and 500 eggs to sports persons on the occasion of the 90th birth anniversary and Neck Day of the Father of Poultry Dr B.V. Rao on Thursday. We gave away a pamphlet about the values of the chicken egg, courtesy of Dr K Balaswamy. President Kilari Srinivasulu Naidu, Secretary Guvvala Narayana Reddy, Treasurer Maganti Prasad, Governor-elect Nalubolu Balaramaiah Naidu, Donors Bezawada Sunil Reddy, SK Nasir Ahmed, Bellam Chenchaiah Naidu, Biradavolu Rama Mohana Reddy, Kagollu Sivaiah, Ekollu Raghavareddy, K Venkataramana, Sanampudi Subbarayudu, Nizam Venkateswarlu, Pulagala Subbarayo, VinuKonda Venkateswarlu, B Sadananda Reddy, Patti Pati Ramanaiah, E Sonu, V Aadi Narayana Reddy, Lakkakula Srinivasulu, N Srinivasa Murthy and others participated.

Also, 500 eggs were distributed with the cooperation of Bezawada Sunil Reddy. Association President and Secretary: Kilari Srinivasan and Guvvala Nasrayana Reddy, Treasurer

57th annual nutrition meet held in Hyderabad

Hyderabad: The Nutrition Society of India (NSI), the country's largest body of nutrition scientists and researchers with over 6,000 members, is set to host its two-day 57th annual conference from Friday at the National Institute of Nutrition (NIN), Hyderabad. Three pre-conference workshops were conducted on Thursday as part of the event. This year's theme, 'Suposhit Bharat for a Viksit Bharat (Well-nourished India for a Developed India)', underscores the critical role of nutrition in achieving the nation's vision of Viksit Bharat @ 2047. The two-day conference will bring together over 1,300 delegates and 200 volunteers from across India and abroad, including scientists, policymakers.

Let's continue B.V. Rao's good work

Subramaniam distributing eggs

Kazipet Urban: NECC Warangal Zonal Committee member T. Subrahmanyam said that the aspirations of Dr. B.V. Rao, the father of the poultry industry, should be continued. B.V. Rao's 90th birth anniversary was celebrated at NECC office B.V. Rao Bhavan on Hunter Road.

The event was held under the chairmanship of NECC Warangal Local Committee Chairman Avula Chandraiah. Speaking on the occasion, Subramaniam called for participation of farmers in development programmes. TPF EC members V. Rama Rao, Haribabu, Srinivas Reddy, Warangal Poultry Farmers Association Vice President G. Ramana Reddy, Treasurer Ram Prasad, Advisors Ramchandra Rao, Veeranna, Pratap Reddy, Vengaiah, Gandhi, Srinivas, NECC Market Surveyor Vinay Patel and Suman participated in the program.

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- SWISS VITAMIN - C
- SWISS VITAMIN - K
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- SWISS VITAMIN - B2
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- SWISS VITAMIN - D3
- SWISS VITAMIN - B5
- SWISS VITAMIN - B1

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- Levofloxacin

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NOVUS Introduces New Logos for Enhanced Brand Cohesion and Visibility

CHESTERFIELD, MO (November 18, 2025) – NOVUS unveiled its refreshed product logos, designed to improve visibility and align with the intelligent nutrition company's corporate identity. These updates reflect NOVUS's continued commitment to delivering high-quality products that exemplify the company's philosophy, Made of More™.

The new logos and colors can already be seen on company brochures, trade show booths, and website.

An example of the new logos and brand colors on product packaging.

Senior Director of Global Strategic Marketing Laura Munoz says the new look is in service of the company's diverse customer base, which includes nutritionists, poultry, swine, and cattle producers, veterinarians, as well as feed mills and distributors.

Following a comprehensive brand evaluation last year, we identified an opportunity to enhance the readability and recognizability of our product logos in warehouses, feed mills, and on farms, she says. The result is a new lineup of bright, eye-catching colors and bold logos that are easier to distinguish, making them more user-friendly for crews handling NOVUS products daily.

This change has been years in the making. Many of the product logos were unchanged since their launch, some going back as far as the 1990s. As part of NOVUS's broader rebranding initiative that began in 2020, the company saw an opportunity to unify its product branding.

The redesigned logos create a cohesive identity across our product line, reinforcing the connection to the corporate brand," says Megan Hayes, senior manager of marketing communications. "Customers can now easily recognize NOVUS products at a glance, with a look that reflects the company's clean, bold, and strong brand persona. Some may wonder why the product logos were not released simultaneously with the corporate rebrand in 2023. The answer is careful planning.

Updating product packaging is a global effort requiring compliance with local regulations, trademark laws, and copyright protections," Hayes says. "Additionally, NOVUS is prioritizing sustainability by using as many pre-existing product bags as possible to reduce waste. The phased approach also allowed customers to acclimate to the new corporate branding before integrating product-level changes.

The transition to new packaging will vary by region based on existing inventory levels, ensuring a smooth and efficient rollout.

China Agricultural University's Professor Honored with NOVUS International Teaching Award

CHESTERFIELD, MO (November 13, 2025) – NOVUS representatives recently presented the company's first-ever International Teaching Award to Professor Jiangxia Zheng, Ph.D., during the Poultry Science Association's Pacific-Rim Scientific Conference. The award honors exceptional educators outside of the United States who are shaping the future of poultry science through excellence in teaching, research, and mentorship.

A faculty member at the Department of Animal Genetics and Breeding, College of Animal Science and Technology at China Agricultural University, Professor Zheng has dedicated 18 years to advancing poultry education and innovation in the full range of poultry production. She currently leads a research program in egg quality and safety.

Her extensive academic

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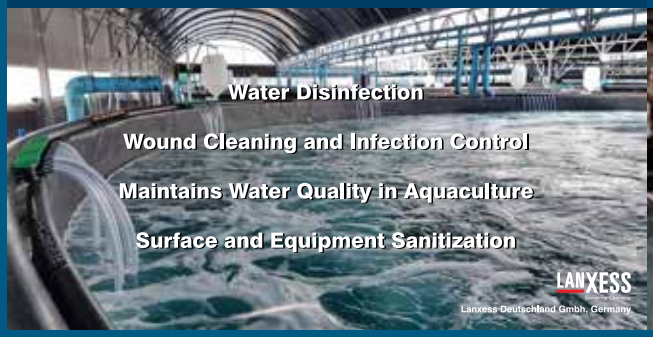

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Sodium dichloroisocyanurate 60% (SDIC)
(Powder/ Granules/ Tablets)

Trichloroisocyanuric acid 90% (TCCA)
(Powder/ Granules/ Tablets)

READY STOCK AVAILABILITY

Nutritional Supplements	DL-Tartaric acid, D-Tartaric acid, L-Arginine, L-Lysine HCl, Taurine, DL-Methionine, Glycine, Palmitic acid, Ascorbic acid, Bio Yucca, Creatine monohydrate, Lactose, Calcium propionate, Capric acid, L-Cysteine HCl mono
Energy Sources	Propylene glycol, Palmitic acid, Creatine monohydrate
Preservatives	4-Hydroxybenzoic acid, Calcium propionate, Ethyl lauroyl arginate, Phenoxyethanol, Sodium formate ,Caprylic acid, Capric acid, Dodecyl guanidine hydrochloride, Fumaric acid, Palmitic acid, Lactose, Sodium percarbonate, Paraformaldehyde 91%
Disinfectants	Paraformaldehyde 91%, Butyl diglycol Sodium dichloroisocyanurate 60% (SDIC), Trichloroisocyanuric acid 90% (TCCA), Tetraacetylethylenediamine (TAED), 2-4-Dichloro-3,5-Dimethylphenol, 4-Chloro-3,5-Dimethylphenol, Benzalkonium chloride, Dioctyl dimethyl ammonium chloride 80%, Glutaraldehyde 50%, Propylene carbonate, Octyl decyl dimethyl ammonium chloride 80%, Potassium permanganate, Sodium percarbonate, Phenoxyethanol, Dimethylaminopropylamine, Oxone™
Veterinary Medicine Intermediates	Dibasic ester, Taurine, Capric acid, Lactose, Dimethyl sulfoxide (DMSO), L-Arginine, Palmitic acid, Propylene carbonate, Bio Yucca, Ascorbic acid, Propylene glycol, Sodium percarbonate, Phenoxyethanol, Caprylic acid, L-Cysteine HCl mono
Flavor Enhancers	Aspartame, Mono sodium glutamate, Lactose

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work is matched by her commitment to education. From leading research programs to mentoring doctoral, master's, and undergraduate students, Professor Zheng is known for developing future scientists equipped to solve real-world agricultural challenges.

"My teaching philosophy centers on bridging fundamental concepts with cutting-edge industry applications through vivid case studies, aiming to transform abstract theories into practical problem-solving abilities," says Professor Zheng. "I believe effective learning occurs when students not only grasp foundational knowledge but also understand its real-world relevance. This synergy cultivates both professional competence and critical thinking."

Professor Zheng's dedication is informed by her roots: family ties in rural China that drive her mission to improve farmers' lives through agricultural science. Her influential teaching style was shaped by her mentor, Professor Ning Yang, who instilled a passion for linking inquiry with practice and cultivating a global perspective.

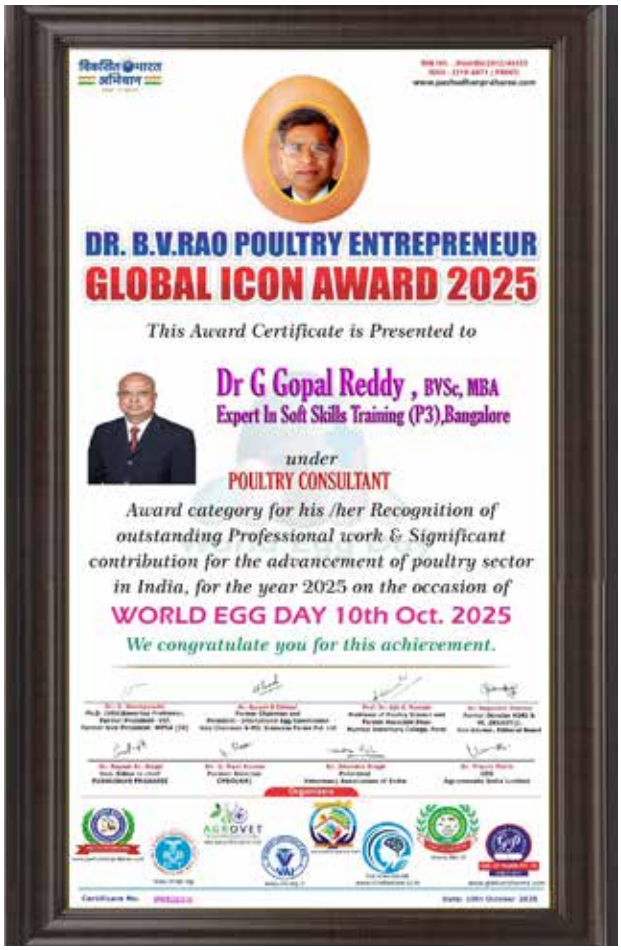
Along with publishing over 40 peer-reviewed journal papers, Professor Zheng's other accomplishments include playing a key role as China Branch Secretary of the World's Poultry Science Association (WPSA) and contributing significantly to the successful organization of the XXV World's Poultry Congress in 2016, a milestone in international poultry collaboration.

Anna Fe Perino, NOVUS Poultry Solutions Manager for Asia, said the award was created to recognize educators advancing scientific rigor and delivering solutions that benefit producers, animals, and society.

"Dr Zheng's commitment to advancing education in poultry science truly exemplifies the values of this award," says Perino. "In addition to a robust record of publication, Dr Zheng is known for her commitment to undergraduate and graduate education, teaching several undergraduate courses in poultry science and mentoring dozens of master's and doctoral students in her lab group over the past nearly 15 years. Congratulations to Dr Zheng."

NOVUS also presents its Outstanding Teaching Award to a poultry educator scientist at the Poultry Science Association Annual Meeting in the United States.

NOVUS is the intelligent nutrition company combining global scientific research with local insights to develop innovative, advanced technology that helps poultry farmers around the world get more from their flocks.



Ravioza Biotech organizes Seminar at Lucknow

Ravioza Biotech conducted an interactive seminar in Lucknow on 20th Dec 2024 at Hotel – The Centrum, Golf City Lucknow. The speaker was Dr Jeetendra Varma, President, World Veterinary Poultry Association (India) and Country Lead, International Poultry Council (USA).
He spoke about current poultry industry scenario, challenges and the future opportunities.
He emphasised on AMR issue, its scenario in India, Govt. initiatives around AMR and One Health, Alternatives to antibiotics, Govt initiatives and support to help the farmers etc.
He also elaborated the Govt schemes available to farmers to scale up their operations like NLM, AHIDF etc.

Zonal Manager, Dr Prakash Singh welcomed the participants and Dr Jeetendra Varma. He introduced the Ravioza team supporting the event, Pankaj Gawali, Komal Singh and Satendra Bahadur Singh.

The response to the seminar was excellent and was very well attended by 65 leading entrepreneurs, feed millers, integrators, large farmers, consultants, nutritionists and industry stalwarts. The guests came from different parts of the area, specially from Lucknow, Jagdishpur, Akbarpur, Barabanki, Bahraich,Sitapur, Pratapgarh, Ayodhya, Hardoi, Unnaoand surrounding areas of Lucknow.

Major integrators of U.P like Salva Agro,RK Agro,KS Agro,SBF Group,GT Krishak, KP farms, SMBD group, Mustkeem Poultry, Murga hub and many more attended the seminar.

Leading breeders of Uttar Pradesh like Sweeta Breeding Farms (Dr Pawan Singh), Pratap Breeding Farm (Mr Abhimanyu Pratap Singh), Krishna Breeding Farm (Mr Shekhar Singh), HF Breeding Farm (Moh Mahfooz), Salva Breeding Farm (Moh. Mahboob) graced the occasion. Leading veterinarians from different groups & Nutritionist Dr Praveen Singh, Dr Jaiswal, Dr Rakesh Verma also share their thoughts on current scenario of poultry industry.

Dr Arvind Singh proposed words of thanks to all the guests, consultants, Nutritionist and local people for sparing their valuable time and making the event a grand success. Special thanks are due to Dr Pawan Singh for supporting the local team and assuring the success of event. Dr Badal Singh came from Chandigarh to attend the event.

LANXESS to introduce several new biosecurity solutions for Indian market

- New products from LANXESS Biosecurity Solutions cater to the hygiene challenges in farming environments
- These will be distributed and marketed through two of LANXESS' partners Huvepharma and Alivira

India, 27 November, 2025 –Specialty chemicals company LANXESS will be introducing a range of innovative products of LANXESS Biosecurity Solutions for the Indian poultry market at the upcoming Poultry India Expo scheduled from 26th to 28thNovember, in Hyderabad. These products, namely TH4+®,BioVX™, Virkon® H20 and Glutex™ GQ1, will be launched at the expo, through LANXESS' distribution & marketing partners, Huvepharma SEA (Pune) Private Limited and Alivira Animal Health Limited (India).

Through these new products, LANXESS Biosecurity Solutions aims to bring advanced disinfection and hygiene solutions to support Indian farmers in maintaining healthier and safer farm environments.

TH4+®, a versatile broad spectrum liquid farm disinfectant and BioVX™, a multipurpose broad spectrum powder farm disinfectant will be distributed and marketed in India by Huvepharma.

Virkon® H20, a multifunctional drinking water disinfectant and acidifier for Poultry and Glutex™ GQ1, a multi-purpose broad spectrum glut-based disinfectant will be distributed and marketed in India by Alivira.

LANXESS Biosecurity Solutions belongs to LANXESS group, a global specialty chemicals company headquartered in Germany. With more than 40 years of experience in the livestock industry and over 100 registered biosecurity products in its portfolio, across more than 80 countries worldwide, LANXESS Biosecurity Solutions, is committed to the health and welfare of animals.LANXESS Biosecurity Solutions researches, develops, manufactures and supplies most of the active chemical ingredients that are used in its disinfectant formulations ensuring reliable supply and highest quality.

The company operates production sites in Brazil, UK, France and Germany, all adhering to the highest European manufacturing standards. It also has exclusive manufacturing arrangements in the USA and India.Supported with its sevenspecialized biosecurity R&D centers located in the USA, Brazil,

UK, France, Germany, Saudi Arabia and China,LANXESS Biosecurity Solutions is dedicated to bringing new solutions and technologies to farmers to shape the future of biosecurity.

Further information on LANXESS Biosecurity Solutions can be found at https://lanxess.com/en/products-and-brands/industries/biosecurity-solutions.

About LANXESS:

LANXESS is a leading specialty chemicals company with sales of EUR 6.4 billion in 2024. The company currently has about 11,800 employees in 32 countries. The core business of LANXESS is the development, manufacturing and marketing of chemical intermediates, additives and consumer protection products. LANXESS has achieved leading positions in the Dow Jones Best-in-Class Index and the MSCI ESG and ISS ESG ratings, among others, for its commitment to sustainability.

Forward-Looking Statements

This company release contains certain forward-looking statements, including assumptions, opinions, expectations and views of the company or cited from third party sources. Various known and unknown risks, uncertainties and other factors could cause the actual results, financial position, development or performance of LANXESS AG or any of its affiliated companies to differ materially from the estimations expressed or implied herein. LANXESS AG or any of its affiliated companies does not guarantee that the assumptions underlying such forward-looking statements are free from errors, nor does it accept any responsibility for the future accuracy of the opinions expressed in this presentation or the actual occurrence of the forecast developments. No representation or warranty (expressed or implied) is made as to, and no reliance should be placed on, any information, estimates, targets and opinions contained herein, and no liability whatsoever is accepted as to any errors, omissions or misstatements contained herein, and accordingly, no representative of LANXESS AG or any of its affiliated companies or any of such person's officers, directors or employees accepts any liability whatsoever arising directly or indirectly from the use of this document.

Government of Telangana Animal Husbandry, Dairy Development & Fisheries (AH) Department

Memo No. 493/AH-II(1)/2025-3 **Dated: 08.02.2025**

Sub: Animal Husbandry Department – Highly Pathogenic Avian Influenza (HPAI) Preparedness of the District to prevent ingress of Avian Influenza – Reg.

Ref: From Animal Husbandry Commissioner, DO No. K11053/2/2021-LH, Department of Animal Husbandry and Dairying, Ministry of FAHD, Government of India New Delhi, Date 07.02.2025.

The attention of all District Collectors in the State is invited to the reference cited and informed that a highly pathogenic Avian Influenza (HPAI) is reported in other States of Country and Government of India has requested the States to strengthen the Bio-security Measures for preventing the spread of HPAI and protecting the poultry population.

The District Collectors are therefore requested to enhance awareness among the poultry farmers and stake holders and the public about the HPAI prevention and critical role of the bio-security measures and prevent transportation of sick birds, proper disposal of dead birds. They should be informed to bring any unusual deaths of poultry to the notice of staff in Veterinary and Animal Husbandry Department. District level meeting may be convened with Forest Department, Police Department, Health Department and Veterinary and Animal Husbandry Department to discuss the measures to be adopted to prevent the spread of the disease from other States into Telangana, under intimation to Government.

SABYASACHI GHOSH
Special Chief Secretary to Government

To
All the District Collectors in the State

Copy to:

1. The Director(FAC), Veterinary & Animal Husbandry, Telangana, Hyderabad
2. OSD to C.S. for information SF/SC

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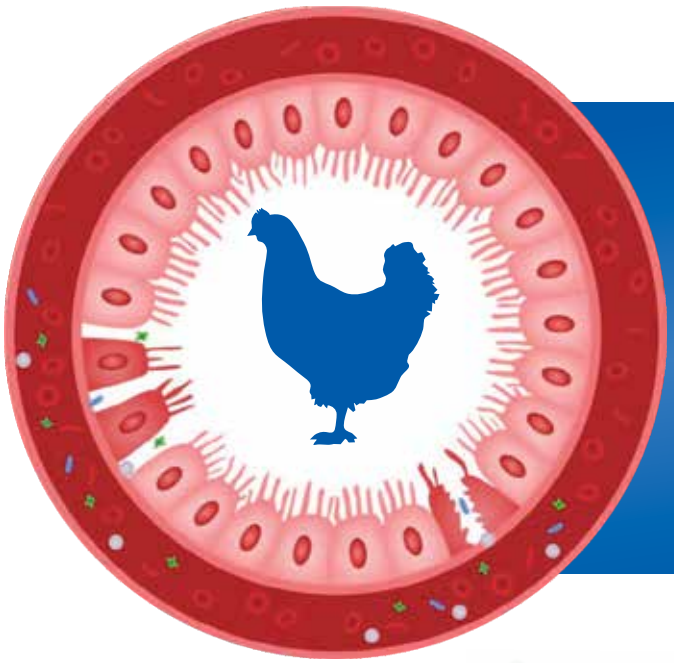

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Poultry pioneer C. Jagapati Rao passes away

Hyderabad: ChitturiJagapati Rao, Chairman of Srinivasa Farms Group, and one of the founders of National Egg Coordination Committee, passed away on November 29, 2025 in Hyderabad.He was 92.

It was just a month ago on Dasara day in October that Srinivasa Farms, that he had founded, celebrated its diamond jubilee (60 years) formation day.

Considered as one of the pioneers in the poultry industry in India, Jagapati Rao was bestowed with the prestigious Denis Wellstead Award "International Egg Person of the Year 2023" by The International Egg Commission (IEC). He was the first Asian to receive this highest award.

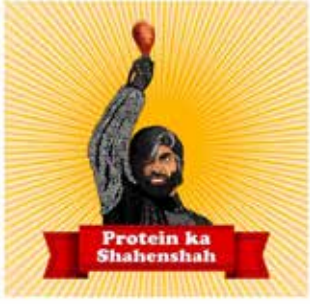
Jagapati Rao was a close associate of B.V. Rao who together(along with S.B. Thorat) started Venkateswara Hatcheries in 1971, which is today became Asia's largest and fully integrated poultry group.

M. Venkaiah Naidu, Former Vice President of india, with the family members of C Jagapati Rao on November 29, Suresh Rayudu , Bhaskar and Satyanarayana Raju seen in the picture

Jagapati Rao was one of the founders of NECC in India, an association for egg producers which has been instrumental in supporting the industry to grow exponentially. His contributions to the Indian layer industry have not only revolutionised the sector but also improved the lives of many people.

Jagapati Rao was known as a man with decency, decorum and commitment.

Srinivasa Farms which was established in October 1965 is now led by his son Suresh Rayudu Chitturi, Managing Director, who also became the Chairman of IEC a few years ago. Srinivasa Farms is one of the leading poultry organisations in the country. It operates an integrated layer and broiler business.Srinivasa deals with supply of Hy-Line layers and Ross broiler, poultry feed and premium soya solutions, Hello Eggs & Freshen retail egg brands and Jagapati Finance supporting poultry farmers with financing options.



Novus Appoints New Technical Service Manager to Asia

Bangkok, Thailand (October 7, 2025): With over 10 years at NOVUS and a lifetime of experience in the agriculture industry, David Sanchez Torres is bringing his expertise to Asia as the new senior regional technical services manager in Asia; based at the regional office in Bangkok, Thailand.

In this role, he works with the technical and commercial teams as they help customers meet their goals through solutions that optimize overall performance, support gut and structural health, enhance reproductive capability, and provide advice on strategic nutrition programs.

Until recently, Torres coordinated the diverse technical services team throughout North and South America as NOVUS's

David Sanchez Torres

senior regional technical services manager for the Americas.

With expertise in feed formulation, poultry nutrition, mineral and enzyme nutrition, and calcium and phosphorus metabolism, Torres is ready to help customers solve on-farm challenges by connecting his knowledge with their business potential.

"I'm excited about the opportunity to join the Asia team. I've followed NOVUS's strong presence and significant growth potential in the region, and I'm eager to contribute," Torres says. "Joining this team allows me to leverage my experience from the North and Latin American markets, sharing insights and strategies that can be valuable to the Asia team's innovative initiatives. It's clear that this region is at the forefront of our industry's advancements, and NOVUS's commitment to helping every animal meet its growth potential through intelligent nutrition is a mission I am passionate about."

Senior Director and Managing Director of Asia Pacific Rajeev Murthy says bringing Torres from the Latin American team was the right choice for professional and personal reasons.

"David has been with NOVUS for over 10 years, supporting customers in the Americas. He has deep expertise in our product platforms, especially in minerals and enzymes. Asia is a high-growth market for NOVUS and our customers and technical team will benefit from his expertise," he says. "At the same time, Asia is very diversified in terms of production systems and cultures; this will enrich David's professional development journey."

Prior to joining NOVUS, Torres served as regional manager and product leader in Latin America for Alltech, Inc., and international technical manager at Premex, Inc.

He has a degree in animal science from Universidad de La Salle in Colombia, a master's degree in animal nutrition from University of Viçosa in Brazil, and a business degree from the University Industrial Santander in Colombia. He is a member of the Asociación Colombiana de Médicos Veterinarios y Zootecnistas Especialistas en Avicultura (AMEVEA).

AMR Stewardship Drive 2025

Building Partnerships for Strengthening our Response to AMR

20 November 2025: New Delhi

Programme Outline

1030–1130 hrs: Inaugural Session: Setting the Context

Antimicrobial Resistance (AMR) is emerging as one of the most serious public health threats globally impacting not only human and animal health, but also food safety, trade, and economic security. In India, the situation is particularly alarming. As one of the largest consumers of veterinary antibiotics, the country is projected to see a staggering **312% rise in antibiotic use in animal production by 2030 (FAO).** The overuse and misuse of antimicrobials across the livestock, poultry, and fisheries sectors, coupled with the intensification of animal production and close animal-human contact, have accelerated the spread of AMR. If left unchecked, AMR could lead to longer and more severe illnesses in animals, lower productivity, and rising treatment costs—ultimately threatening food systems and livelihoods. This challenge is compounded by gaps in awareness, poor recording of antibiotic usage, and limited access to diagnostic tools.

Recognizing the urgency of the situation, the CII FACE jointly with **INFAH (Indian Federation of Animal Health Companies) as Knowledge Partner** is going to organize the fourth session of the **AMR**

Stewardship Drive 2025 - a nation-wide, multi-city outreach campaign focused on **awareness, capacity building, and stewardship in animal agriculture.** This initiative aims to create a grassroots movement, engaging key stakeholders such as veterinarians, para-vets, fisheries professionals, students, and farmers.

1130–1330 hrs: Technical Session: Ground Ground-Level Strategies for AMR Mitigation

While policy frameworks and national strategies are essential, the real battle against Antimicrobial Resistance (AMR) must be fought and won on the ground—through practical interventions, informed stakeholders, and context-specific solutions. This technical session focuses on translating AMR stewardship principles into **actionable, field-level strategies** across the livestock and aquaculture value chains.

This session will showcase implementable strategies for the livestock and aquaculture sectors across three key themes:

1 **Ethnoveterinary Medicine & Herbal Alternatives**

- Role of herbal and indigenous preparations in reducing AMU
- Practical adoption: Success stories from different states

2 **Responsible Antibiotic Use and Compliance**

- Understanding antibiotic classification & withdrawal periods
- Farm-level record-keeping and traceability systems
- Strengthening the role of veterinarians and para-vets

3 **Diagnostics, Surveillance, and Alternative Approaches to Combat AMR**

- Deployment of field diagnostic kits for timely disease detection
- Adoption of sampling techniques and integration with surveillance networks
- Promotion of alternative approaches such as probiotics, vaccines, immunomodulators, and precision nutrition to reduce reliance on antibiotics
- Encouraging research and field validation of novel solutions for sustainable AMR mitigation

4 **Policy-Level Interventions for AMR Stewardship in Animal Agriculture**

- One Health Policy Integration: Establishing convergence between human, animal, and environmental health sectors for coordinated AMR governance.
- Incentive Mechanisms for AMR Reduction: Developing financial and policy incentives for adoption of vaccines, probiotics, herbal alternatives, and improved biosecurity practices.
- Public–Private Partnerships (PPP): Leveraging PPP models to strengthen diagnostics, traceability, and certification systems for AMR-responsible production.
- Trade and Export Readiness: Aligning India's animal agriculture sector with global food safety and residue standards to enhance export competitiveness.
- Evidence-Based Policymaking: Using data from regional AMR stewardship drives, industry pilots, and research studies to inform policy interventions and national action plans.

1330 hrs: Lunch & Networking

New dates for the Alltech ONE conference

From World Without Cows at COP30 in Brazil this week to our upcoming North America joint venture with ADM, Alltech has a lot to look forward to as we move into 2026.

With so much positive momentum for our industry, we're excited to share that there's even more ahead: the Alltech ONE Conference is coming back to Lexington, Kentucky, May 24–26, 2027.

Originally planned for 2026, we have decided to move the event to 2027 to align with major milestones across our business and the broader agri-food industry. It will be worth the wait!

This world-class event will spotlight the power of connection, collaboration and bold thinking to address agriculture's most significant challenges and unlock its greatest opportunities.

Whether you are returning to ONE or joining us for the first time, the Alltech ONE Conference promises to inspire, challenge and connect. We look forward to welcoming you in 2027.

Members of TPF, NECC and IPEMA met recently Telangana State Chief Minister Anumula Revanth Reddy and requested him to support poultry sector.

Telangana Poultry Federation *(***TPF***), led by* **President K. Mohan Reddy**, *along with* **IPEMA–President Uday Singh Bayas**, **V. Bhaskar Rao** *(***General Secretary**, **TPF***), G.* **Chandrashekar Reddy** *(***Chairman**, **NECC – Hyd Zone***), and* **G. Vinay Prasad** *(***E.C. Member**, **TPF***) met* **Mr Thummala Nageswara Rao garu**, **Minister for Agriculture**, **Marketing**, **Co-operation**, **and Handlooms** & **Textiles**, **Government of Telangana** *in Hyderabad recently.*

Greetings to the poultry farmers of the joint Karimnagar district

Greetings to the poultry farmers of the joint Karimnagar district. From now onwards, you can pay 0.50 paise per chicken and inform the weight and number of chickens at the Association office in Telangana State. We have all decided the procedures related to this in the past. By following them, we will be able to sell according to the weight of the chicken and get the same rate and a good rate. Therefore, let all the farmers come together and cooperate with each other for all of us. You can come to the office and register details of your chickens.

Thank you for your cooperation.

Artificial Intelligence (AI) in Poultry Industry

Dr R.Shirisha, Assistant Professor, Department of Poultry Science, College of Veterinary Science, Korutla, Jagtial, Telangana

In the poultry industry, AI and sensors are used to assess and enhance the ventilation system, ensuring a comfortable environment for poultry. Its applicability in poultry extends to data collection on various aspects like microenvironment, behavior, health, and movement within the poultry house. Analyzing this data allows the AI system to quickly detect deviations and make improvements. It can also assess ambient conditions, poultry health, and equipment failures, and even perform tasks like removing dead birds and analyzing litter moisture. AI's benefits also extend to postharvest activities for broiler chickens and egg collection.

It accurately grades poultry quality, streamlines processing operations, and provides valuable insights for enhancing efficiency. In commercial poultry farms, AI integration manages equipment automatically, optimizing performance and productivity by controlling machinery and equipment based on collected data.

Introduction

In global egg production, India holds the third position, producing a staggering 82.93 billion eggs, and ranks fifth in broiler meat production, yielding approximately 4.4 metric tons as per the 20th livestock census. Artificial intelligence (AI) plays a vital role in computer science as it enables the development of intelligent machines capable of performing tasks that typically require human intelligence. In the poultry industry, AI and sensors are used to assess and enhance the ventilation system, ensuring a comfortable environment for poultry. Its applicability in poultry extends to data collection on various aspects like microenvironment, behavior, health, and movement within the poultry house. Analyzing this data allows the AI system to quickly detect deviations and make improvements. It can also access ambient conditions, poultry health, and equipment failures, and even perform tasks like removing dead birds and analyzing litter moisture.AI's benefits also extend to postharvest activities for broiler chickens and egg collection. It accurately grades poultry quality, streamlines processing operations, and provides valuable insights for enhancing efficiency. In commercial poultry farms, AI integration manages equipment automatically, optimizing performance and productivity by controlling machinery and equipment based on collected data.

Highlight Points:

Artificial intelligence (AI) plays a vital role in computer science as it enables the development of intelligent machines capable of performing tasks that typically require human intelligence.

Recent advancements in machine technologies have significantly revolutionized daily activities in poultry production, aiming to reduce labor requirements, enable 24/7 monitoring, and facilitate remote reporting. Notable examples include the implementation of specialized robots like **GohBot** and **Chicken Boy**.

GohBot, equipped with imaging sensors and machine learning capabilities, adeptly navigates poultry house floors, collecting floor eggs, and monitoring environmental factors such as temperatures, gases, and light levels.

Chicken Boy, an innovative autonomous robot suspended from the ceiling, utilizes artificial intelligence and sensor technology to evaluate the surrounding environment, identify equipment malfunctions, monitor the health of poultry and perform tasks such as removing deceased birds and analyzing moisture levels in the litter.

A. Farm Management

Recently, computers have been employed to store farm- related information, with data stored in spreadsheets or specialized software. The implementation of AI in farm management will bring efficiency, accuracy, and faster decision-making to the system.

B. Disease Management

Artificial Intelligence (AI) is expected to simplify this process shortly, particularly through its role in assisting with diagnosis. This is where machine learning and big data come into play, proving instrumental in effective disease management. Using cameras installed on farms, AI can swiftly identify issues like huddling and cannibalism among birds, promptly notifying caretakers to make faster decisions and minimize losses.

C. Feed formulations

AI accelerates the evaluation of the impact of Different feed formulations, a task practically unmanageable for humans at such speed. Programming and robotics, enabled by AI, contribute to enhancing breed genetics by identifying breed characteristics and simplifying

decision-making in the selection process. AI's prowess in data collection, processing, and analytics greatly enhances the efficiency and cost- effectiveness of conducting trials, comparative studies, and research and development in the poultry industry. It streamlines processes, delivers accurate outcomes, and empowers better decision-making, leading to significant advancements and improvements in poultry farming practices.

D. Precision livestock farming

Precision Livestock Farming (PLF) is a management strategy in livestock production that utilizes principles and advanced technologies from process engineering. It involves automatic data collection, access, and processing using smart sensors to compile diverse data sources into a central database. The collected data is subsequently analyzed to develop an automated management system for the monitoring and control of animal health, animal performance and animal welfare. The poultry housing and equipment industry is continuously evolving, introducing new technologies that align with modern communications and ventilation systems. However, financial constraints in many developing countries limit the accessibility of such technologies for the majority of poultry producers.

Conclusion:

There is a strong consensus regarding the significant impact of Artificial Intelligence in the poultry industry. Many companies have already begun exploring the application of AI throughout the value chain and are actively implementing AI solutions. The potential of Artificial Intelligence in the poultry industry is immense, as it addresses numerous challenges that cannot be overcome without the integration of machines and robotics. Embracing new technologies will lead to more affordable chicken and eggs for consumers by optimizing the entire production system's efficiency.

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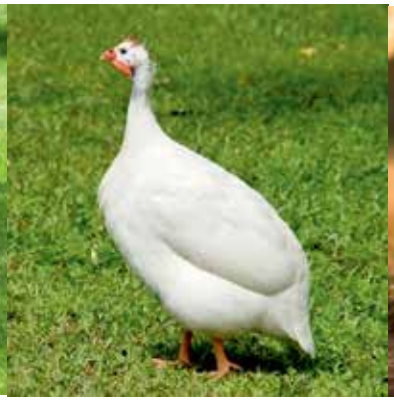


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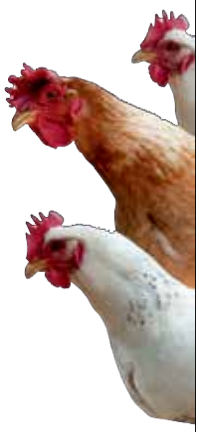
- Toxin Binder

- Glutamine
- Leucine
- Arginine
- Premix (Broiler)
- Premix (Layer)

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Smart and Sustainable Poultry Manure Management: Turning Farm Waste into a Green Resource

College of Veterinary Science and Animal Husbandry, DUVASU Mathura (281001)

Dr Pawar Rutik Namdev (MV. Sc Scholar)

Introduction

Poultry farming plays a vital role in providing affordable meat and eggs, creating jobs, and supporting the economy. But along with growth comes a big challenge — what to do with all the manure produced every day. If not handled properly, poultry manure can cause bad odors, flies, pollution, and health risks for both people and birds.However, the good news is that manure is not just waste — it is a valuable resource full of nutrients. With the right methods, it can be turned into organic fertilizer, renewable energy, and even eco-friendly soil enhancers. Sustainable manure management helps farmers protect the environment and earn extra income at the same time.

Poultry Manure: A Hidden Treasure

Poultry manure is rich in nitrogen, phosphorus, and potassium, the same nutrients found in chemical fertilizers. Instead of being thrown away, it can be recycled to improve soil fertility and reduce the need for synthetic fertilizers.But before using it directly, it must be properly treated — because raw manure can spread diseases, attract pests, and pollute water. That's why farmers are now adopting scientific and eco-friendly manure management methods.

1. Composting: The Natural Way to Recycle

Composting is one of the simplest and most sustainable ways to manage poultry manure. It uses natural microbes to break down waste into a safe, odor-free, and nutrient-rich organic fertilizer.

Dr Shipra Tiwari (MV. Sc Scholar)

Benefits of Composting:

- Reduces smell and fly problems.
- Kills harmful bacteria and parasites.
- Improves soil structure and fertility.

How to Compost Effectively:

- Mix manure with dry materials like sawdust, straw, or crop residues.
- Keep moisture around 50–60%.
- Turn the compost pile regularly for proper aeration.

After 6–8 weeks, you get dark, crumbly compost that can be used in fields, gardens, or organic farming — a perfect example of turning waste into wealth.

2. Anaerobic Digestion: Turning Waste into Biogas

Another modern and eco-friendly

Dr Mahendra Patel (Ph.D Scholar)

solution is anaerobic digestion (AD). In this process, manure is stored in a sealed tank where microbes break it down without oxygen, producing biogas (mainly methane) and a nutrient-rich slurry called digestate.

Advantages:

- The biogas can be used for cooking, lighting, or generating electricity.
- It reduces greenhouse gas emissions and unpleasant smells.
- The leftover digestate can be used as an organic fertilizer.

Small farmers can use fixed-dome biogas plants, while larger farms may use advanced biogas reactors. This approach supports clean energy production and reduces waste pollution.

3. Nutrient Recovery and Organic Fertilizer Production

Modern farms now use nutrient recovery systems that extract nitrogen and phosphorus from manure. These nutrients can be turned into pellets or granules, making it easy to store, transport, and apply to crops.

- Pelletized manure releases nutrients slowly, improving soil

fertility over time.

- Some systems even produce struvite crystals, a mineral fertilizer made from recovered nutrients.

Such innovations not only prevent nutrient loss but also promote eco-friendly fertilizer production.

4. Biochar: A Smart Soil Enhancer

Biochar is a charcoal-like product made by heating manure in the absence of oxygen (a process called pyrolysis). It is gaining attention for its ability to trap carbon, improve soil health, and reduce bad odors.

Benefits:

- Improves soil moisture and nutrient retention.
- Stores carbon in the soil for years, helping fight climate change.
- Reduces ammonia emissions from manure.

Mixing biochar with compost makes a powerful soil booster — good for both the environment and productivity.

5. Responsible Land Application

Applying manure directly to fields can be very beneficial — if done carefully. Over-application can lead to runoff and groundwater pollution, so the key is balance.

Smart Practices:

- Test the soil and manure before application.
- Apply only what the crop needs.
- Avoid spreading before heavy rain.
- Use buffer zones near water bodies.

With precision farming tools and proper planning, manure can safely return nutrients to the soil and enhance crop yields.

6. Smart and Digital Manure Management

Technology is helping farmers manage manure more efficiently. Modern poultry houses now use:

- Automatic belt systems to remove manure and reduce odor.
- Sensors and IoT devices to monitor temperature, moisture, and gas levels.
- Blockchain technology to ensure traceability and certify organic fertilizer production.

These smart systems make manure management cleaner, safer, and more transparent — aligning with global sustainability goals.

7. Government Support and Farmer Awareness

India has launched several programs like the National Biogas and Manure Management Programme (NBMMP) and the Waste-to-Wealth Mission to promote sustainable manure handling.Training farmers on composting, biogas generation, and safe disposal practices is essential for widespread adoption. Collaboration between government agencies, universities, and poultry producers can lead to zero-waste farming systems.

Conclusion: The Road Ahead

Sustainable poultry manure management is about seeing waste as a resource. When handled scientifically, manure can provide energy, fertilizer, and environmental benefits all at once.By adopting composting, biogas production, biochar technology, and smart monitoring, farmers can protect nature, reduce costs, and create additional income sources.As India aims for Viksit Bharat 2047, sustainable manure management will play a key role in achieving clean energy, green growth, and agricultural sustainability. With the right knowledge and technology, the poultry industry can become a true model of eco-friendly and profitable farming.

Probiotics in poultry health and production

Why probiotics are important for chickens?

Every vertebrate animal/wild bird/ human requires microbiota to protect themselves against environmental/ opportunistic pathogens which they receive through placenta, milk or mothers' faecal extracts in case of animals/birds. But the poultry faces a sterile environment in hatchery so that they lack those microbiota and needed to be supplied immediately after birth inorder to protect themselves from pathogens like Avian Pathogenic *E.coli*, *Salmonella*, *Campylobacter*, *Clostridium* etc.Thus, supplementation with probiotics play an important role in poultry health and production.

Maintainence of gut health

Probiotics act by a mechanism called competitive exclusion where the probiotics and commensal bacteria occupy the available niches in the GIT, proliferate and compete with pathogens for nutrients. In addition, the probiotics help to uphold the tight junctions, mucous production and produce antimicrobial proteins which will inhibit pathogenic bacteria. Probiotics supplementation reduces the harmful microbiota like *Clostridium* and Enterobacteriaceaceby producing inhibitory substances both from the host and the bacterial side. The host defense peptides like avian beta defensins and cathelicdins were stimulated during probiotic supplementation. Antimicrobial proteins such as plantaricin K (PlnK) from *Lactobacillus plantarum* and lactobacillins and microcins are ribosomally synthesized from probiotics which inhibits pathogenic bacteria like *E.coli*, *Salmonella* and *Clostridium* colonisation. The anaerobiosis created by growth and multiplication of beneficial bacteria inhibit aerobic pathogen growth. The probiotics improve the gut barriers by upregulating the production of tight junction proteins like claudin and occludin which inturn prevent pathogen and toxin entry into the GIT. Probiotics increase mucous production which helps in lubrication, feed mixing and prevent pathogen adhesion. The probiotic supplementation will stimulate fast epithelial cell regrowth and villi regenerationof the GIT which will facilitate nutrient absorption and increased feed conversion efficiency, body weight etc.

Immunomodulatory effects

The environmental factors such as temperature, transport and poor nutrition create stress in poultry. The stressors induce oxidative radicals leading to inflammation and necrosis causing lesions in vital organs like liver and kidney. Supplementation of probiotics have proven to improve the antioxidant levels of enzymes like superoxide dismutase, catalase and glutathione peroxidase. Probiotics have been proven to improve the growth of immune organs such as bursa of fabricious in chickens.Supplementation with probiotics improved innate immunity by stimulating the production of antimicrobial proteins like avian beta defensins and cathelicdins. Studies have revealed that immunoglobulins like IgY and IgA by stimulating Th2 cells and cell mediated immune response related cytokines like IL-2 and IFN-gamma were increased in the subclinical necrotic enteritis groups treated with probiotics. $CD3^+CD4^+$/ $CD3^+CD8^+$ ratioisconsideredasadirect index for evaluating the immunity condition of a bird which was found to be significantly improved by probiotic supplementation.

Inhibition of environmental and social stressors

Environmental stressors such as heat, transport and poor nutrition act on the gut-brain-pituitary axis to secrete corticotropin-releasing factor (CRF) from the hypothalamus. CRH stimulates adrenocorticotropic hormone from anterior pituitary to release corticosterone by birds from the adrenal cortex into circulation. The stress hormones act on intestinal cells to loosen the tight junctions, breaking the intestinal integrity and gut epithelial barrier which allows bacterial transport into the gut. The stressors also stimulate the release of pro-inflammatory cytokines such IL-2, IFN-Gamma and TNF-α to produce a local inflammation of the intestine. But supplementation with probiotics balances the gastrointestinal pH that prevent pathogenic adherence, maintain the integrity of intestinal epithelial cells, adequate mucin and maintainence of tight junctions which overall protected infections during stress conditions.

The stressor stimulation of brain also leads to neuronal stimulation which leads to serotonin deficiency which is responsible for behavioural disorders such as aggression, feather pecking, anxiety and cannibalism. Probiotic bacteria secretes neurotransmitters such as 5-Hydroxy Tryptamine (5-HT), GABA and monobactums that inhibits hypertensive activities due to stress and provides calming effect.

Benefits of probiotic supplementation

- Improved FCR, body weight

- Reduce disease incidence
- Improved meat quality
- Increased egg production and its quality

Points to be consider

- Dosage
- Age of birds

Conclusion

Probiotics are highly beneficial for poultry health and production, offering a safe and effective strategy to improve gut integrity, enhance immunity, and boost growth and feed efficiency. Their use helps maintain balanced intestinal microflora, reduce pathogen load, and support nutrient absorption, ultimately leading to improved performance and bird welfare. Probiotics also lessen the reliance on antibiotics, helping combat antimicrobial resistance while promoting sustainable poultry farming.

Integrated Approach to Backyard Poultry Development for Sustainable Rural Livelihoods

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Introduction:

Backyard poultry farming is a traditional system of rearing poultry with small flock size of native birds by farmers to meet their dietary or small cash needs. It is an eco- friendly approach. They are very active in controlling pest and providing manure. Backyard poultry provides supplementary income in shortest possible time with very minimum capital investment. Development of superior strains of backyard poultry can remarkably improve nutritional status and income of rural communities. In livestock production

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system, particularly poultry sectors play an important socio-economic roles in developing countries. Poultry sector has become one of the fastest growing segments in Indian agriculture and contributing a considerable proportion to the national GDP.

Growth of the poultry and its allied sectors is due to the tremendous efforts towards advancements of new technologies and efforts towards nutritional improvements. The largest share of the rural community depends on livestock for their daily livelihoods. Most of the backyard poultry production in India comprises rearing of indigenous birds with poor production performances. Improved varieties of chicken in the backyard poultry production can be easily boost up and can promise a better production of meat and egg. Poultry products carry a much higher price than that of commercial poultry and is highly preferred among peoples.

Population and Growth of Backyard poultry production:

The backyard poultry population is unevenly distributed across the Eastern, Northeastern and Central Indian states contributing significantly for backyard poultry production. These states have a large tribal and rural population where poultry farming is embedded in their socio-cultural structural and contributes

S. No.	Name of Breed	Developed by / Source	Key Features
1	**Vanaraja**	Indian Council of Agricultural Research (ICAR) – Directorate of Poultry Research (DPR), Hyderabad	Dual-purpose, good egg layer (160–180 eggs/year), hardy, multi-colored plumage, ideal for free-range.
2	**Gramapriya**	ICAR – Poultry Development Programme (PDP), Hyderabad	High egg production (220–240 eggs/year), early maturity, attractive color, low maintenance.
3	**Kuroiler**	Keggfarms Pvt. Ltd., Delhi	Fast-growing, meat and egg purpose, resistant to diseases, lays 150–200 eggs/year.
4	**Srinidhi**	ICAR – DPR, Hyderabad	Dual-purpose, attractive color, disease-resistant, high livability, suitable for backyard.
5	**Kadaknath (Improved)**	MP State Poultry Federation, Jhabua & ICAR	Indigenous breed, black meat (high in protein & low in fat), premium market value.
6	**Rajasri**	Sri Venkateswara Veterinary University (SVVU), Andhra Pradesh	Good egg producer (~200 eggs/year), attractive feathers, adapted to backyard systems.
7	**Nandanam Chicken (4 & 5)**	Tamil Nadu Veterinary and Animal Sciences University, Chennai	Fast-growing dual-purpose breed for Tamil Nadu conditions, lays 180–200 eggs/year.
8	**Kaveri**	Karnataka Veterinary, Animal and Fisheries Sciences University	Dual-purpose, early maturing, brown feather, 140–160 eggs/year.
9	**Hitcari**	Central Avian Research Institute (CARI), Izatnagar	Egg-type bird for rural poultry; good scavenger, lays 160–180 eggs/year.
10	**CARI Nirbheek**	ICAR – CARI, Izatnagar	Dual-purpose bird, developed especially for low-input backyard poultry, lays ~180 eggs/year.
11	**CARI Shyama**	ICAR – CARI, Izatnagar	Desi-type colored bird with better body weight and livability, scavenger friendly.
12	**Jharsim**	Jharkhand State Livelihood Promotion Society (JSLPS)	Suitable for tribal regions, moderate egg and meat yield.
13	**Kamrupa**	Assam Agricultural University, Khanapara	Dual-purpose, developed for northeast India, good scavenging and disease resistance.
14	**Tripura Black**	Central Poultry Development Organisation (CPDO), NE Region	High meat quality and local adaptation; black plumage.
15	**Giriraja / Girirani**	Karnataka Veterinary, Animal and Fisheries Sciences University	High body weight, good egg production, rural-friendly, needs some supplementation.

significantly to daily food and income needs.

As per the 21st Livestock Census (2024), India had around 317 million poultry birds, out of which about 95 million (~30%) are reared under backyard systems. These indicating a growing preference for indigenous and dual-purpose breeds in rural areas. Egg production rate of backyard poultry is 20 billion eggs/year. It has the growth rate of nearly 3-4% and has the market share of 15 % for backyard poultry rearing.

Major states with high backyard poultry populations include:

- Assam
- Arunachal Pradesh
- West Bengal
- Jharkhand
- Odisha
- Chhattisgarh

- Bihar

Conventional and improved varieties of backyard poultry:

In rural poultry farming, 5-50 numbers of birds are raised under a traditional extensive backyard scavenging system without special management of feeding or housing. Usually non-descriptive desi birds are reared in some areas. Specific improved varieties of backyard chickens for meat or eggs purpose and few varieties for dual purpose are also now available for backyard rearing. Rural poultry farmers can rear the improved chicken varieties under free range, semi intensive or intensive conditions. In India, several research organization have develop different backyard chicken varieties which have successfully been reared by farmers from many parts of the country.

Government schemes for rural poultry development:

The component of poultry development schemes carried out by Government of India provides the benefits to the people from Below Poverty Line. This is one of the initiatives of the Government has taken to mainly enable them to gain subsidiary income and nutritional support for livelihood. Government of India has a various schemes for the rural poultry development.

Schemes for Rural Backyard Poultry Development:

- National Livestock Mission (NLM)
- Rashtriya Krishi Vikas Yojana (RKVY)
- Scheduled Tribe Component (STC)
- Scheduled Caste Sub-Plan (SCSP)
- Sub-Mission on Skill Development, Technology Transfer, and Extension (under NLM)
- Poultry Venture Capital Fund (PVCF) – Credit Linked Subsidy Scheme (now merged under NLM)
- Integrated Tribal Development Program (ITDP)
- Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) – Convergence for Poultry Shed
- Deendayal Antyodaya Yojana – National Rural Livelihoods Mission (DAY-NRLM)
- State-Specific Poultry Development Schemes (e.g., Tamil Nadu, Odisha, Jharkhand, etc.)

Housing Management in Free-Range Backyard Poultry Rearing

Free-range backyard poultry rearing is a traditional and sustainable system where chickens are allowed to roam freely during the day for natural foraging and return to shelter at night. This method reduces feed costs and promotes natural behavior. Proper housing remains essential for ensuring bird health, safety, and productivity. The primary function of housing in free-range systems is to provide shelter at night and protection from predators, adverse weather and a comfortable space for roosting and laying eggs. Simple low-cost sheds constructed from locally available materials like bamboo, thatch, wood or tin sheets are ideal. Each adult chickens requires approximately 2.5 to 3 square feet of floor space for night shelter.

The shelter should be built on elevated, well-drained land near the owner's residence for easy monitoring. Nesting boxes (one for every 4–5 hens) lined with straw or husk should be provided for egg-laying, along with wooden roosting poles placed 2–3 feet above ground for chicken to perch at night. The litter should be dry and absorbent, using materials like rice husk, straw, or dry leaves, and regularly changed to maintain hygiene. Seasonal adjustments are also important such as thatch roofing and adequate water supply help birds cope with summer heat, while plastic or jute curtains and extra bedding provide warmth during winters.

Feeding Management in Backyard Poultry Rearing

In free-range systems, chickens naturally forage for insects, green grasses, grains, and kitchen waste which lowers feed costs. However, scavenging alone is insufficient to meet the nutritional needs of growing chicks and laying hens. Hence, supplementary feeding becomes necessary. Birds should be offered grains such as broken rice, maize, wheat, and oil seed cakes in the morning and evening to maintain balanced nutrition. For layers, providing calcium sources like crushed shells, limestone powder, or oyster shells is essential for strong eggshell formation. Locally available protein-rich feeds like termites, earthworms, or cooked fish waste can also be used to enhance productivity. Kitchen scraps and seasonal green leaves add variety and help meet the vitamin and mineral requirements of the flock.

Watering Management in Backyard Poultry Rearing

Access to clean and fresh drinking water is vital for the health and performance of backyard poultry. Water containers should be kept in shaded areas to prevent heating, especially during summer, and should be cleaned daily to maintain hygiene. Fresh water must be available at all times, and multiple water stations should be necessary for larger flocks or scattered areas. In hot weather, offering cool water for multiple times a day helps reduce heat stress and maintain feed intake. During winter, slightly lukewarm water may encourage birds to drink more, ensuring proper hydration. Poor water management can lead to dehydration, poor growth, and disease outbreaks.

Health Care Management in Backyard Poultry Rearing

Health care in backyard poultry involves a mix of preventive and curative practices. Regular vaccinations are crucial to protect birds against common diseases like Newcastle disease, fowl pox, Marek's disease, and infectious bursal disease (IBD). Deworming every 2 to 3 months helps control internal parasites that can lower productivity. Farmers should keep the shelter and surrounding area clean and dry, regularly remove wet litter, and properly dispose of droppings to reduce disease risk. Birds must be observed daily for signs of illness such as lethargy, loss of appetite, diarrhea, or abnormal behavior. Early detection and immediate isolation of sick birds can prevent disease spread within the flock. In many rural areas, natural remedies like neem leaves, turmeric, and garlic are used for their traditional antimicrobial properties.

Conclusion

Backyard poultry production stands as a vital pillar of rural livelihood, food security, and nutritional well-being in India. It is a low-investment, high-return enterprise that empowers small and marginal farmers, especially women, by providing a steady source of income and animal protein. With increasing support from government schemes, access to improved dual-purpose breeds, and awareness of scientific management practices, backyard poultry has transformed from a subsistence activity into a sustainable micro-enterprise. Its contribution to egg and meat production particularly in underserved and remote areas plays a crucial role in bridging nutritional gaps and enhancing rural resilience. As the sector continues to grow, strengthening health care delivery, market access, and capacity building will be essential to unlock its full potential. Promoting backyard poultry as a scalable and inclusive livelihood strategy can significantly contribute to rural development, poverty alleviation, and national food security goals.

Erysipelas in Poultry

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Etiology:
Erysipelas is a bacterial disease, caused by *Erysipelothrixrhusiopathiae*, a gram positive, facultative anaerobic rod. *E. rhusiopathiae* infects most poultry species (laying hens, turkeys, broilers) and has been isolated from many mammalian species and from fish.Itis also called as Red Skin, Erysipelothrix Infection, St. Anthony's Fire

Transmission:
E. rhusiopathiae spreads horizontally, not vertically. Chickens are infected mainly through breaks in the mucous membranes or skin, from wounds or bites from vectors. The red poultry mite (*Dermanyssusgallinae*), is also a potential vector of *E. rhusiopathiae*, and can act as reservoir hosts, allowing it to persist on the premises between flocks as a source of infection for the next flock of birds. Incidence has often been reported to be higher in males than in females, possibly because fighting males receive numerous skin abrasions that serve as portals of entry for the bacteria. In some instances the incidence is higher in hens than toms because of artificial insemination techniques that provide a means of transmission.The organism may survive for long periods in the soil and most outbreaks are thought to originate from contaminated soil or premises. Sheep, swine and rodents may be carriers of the disease organisms. Recurrence of the disease on a premise is common. Predisposing or aggravating factors include over-crowding damp or inclement weather and poor sanitation and range management.

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Clinical signs:
Acute mortality is the first clinical sign of laying hens infected with Erysipelas. A few lethargic birds, some diarrhea and some swollen heads can be seen. Erysipelas seems to affect layers at older age (43-73 weeks). Occasionally, the snood of toms may be turgid, swollen and purple. Some birds may be found lame with swollen leg joints due to localization of the infection. In breeding flocks, this disease occasionally is associated with decreased fertility and hatchability.

Lesions:
The most characteristic lesions are small or diffuse hemorrhages located in almost any tissue or organ. Such hemorrhages are commonly observed in the muscles, heart, liver, spleen, fat and other tissues of the body cavities. Hemorrhagic conditions of skin may result in purple blotches. The liver and spleen are usually enlarged, congested and occasionally contain necrotic foci. Enteritis or inflammation of the intestinal tract is commonly observed, as in most septicemic diseases.

Diagnosis:
Post-mortem shows signs of septicemia; swollen liver and spleen and point bleedings in fat tissue. The diagnose is confirmed by bacterial culture or PCR from liver, spleen, or bone narrow.

Treatment:
Isolate the bird from the flock and place in a safe, comfortable, warm location with easy access to water and food. Limit stress. Various antibiotics have shown efficacy in treating erysipelas; however, penicillin is best. Penicillin injections in the leg or breast muscles of visibly sick birds is effective in decreasing mortality. One injection is usually sufficient, but more may be given if necessary. Water and feed medication may be of value under certain conditions. **Control:**
Good management practices that aid in preventing erysipelas include avoiding the use of ranges previously occupied by swine, sheep or turkeys where erysipelas is known to have existed. Debeaking, removal of the snoods of toms, measures that prevent injury from fighting, avoiding overcrowding and providing well drained ranges will aid in preventing this disease problem. Maintaining an effective biosecurity plan is critical to preventing disease.

Kadaknath Meat: A Review

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Introduction

Poultry refers to domesticated birds raised for various purposes, primarily for their meat and eggs. Some common types of poultry include chickens, turkeys, ducks, geese, and quails. These birds are specifically bred and managed within the poultry industry to meet the demand for poultry products. Indian poultry sector has attained very fast growth in last decades; as a result India holds third position in egg production and fifth position in broiler production in world. The total poultry population of India is 851.81 million which 16.8% higher than previous census. Total meat production in India is appprox.10MT out of which poultry meat production is 4.5MT (pib.gov.in). Out of 20 registered chicken breeds of India Kadaknath is a famous breed which is popular for disease resistance, climate resistant and ability to protect themselves from predators.

Kadakanath is native of Jhabua and Dhar district of Madhya Pradesh and it is also found in Bastar Chhattisgarh. Kadaknath chickens are now found in 117 districts across 20 Indian states, as well as in some Asian nations. While the overall market is growing, there have been reports of declining populations in specific areas like Jhabua, Madhya Pradesh, where the breed originated. This may be due to factors like high demand and genetic erosion. Indigenous tribes such as Bhils and Bhilalas in these areas have conventionally reared this breed as part of their poultry-keeping practices. The communities, in particular, have maintained Kadaknath for generations, integrating it into their cultural tradition, cuisine, and medicinal habits.(Swati et al., This breed is notable by its unique black pigmentation, which extends to its feathers, skin, meat, bones, and internal organs due to high melanin levels. Its adaptability to exigent environmental conditions, disease resistance has contributed to its survival and perpetuation among rural farming communities. Kadaknath was granted a Geographical Indication (GI) tag in 2018, officially establishing its status as a native poultry breed of Madhya Pradesh because of unique characteristics (Finanacial express/ cited 5/6/25)

Jet Black, penciled, and golden are three varieties of kadaknath breed. Kadaknath breed is popular for its black meat and known as black meat chicken or Kalamasi. Kadaknath chicken breed is famous for its meat quality, texture and taste. The meat of this breed is considered to be a delicacy due to its perceived taste and flavour. Furthermore, the meat of this breed is presumably known to have better nutrient profile as compared to meat of other breed. Therefore, Kadaknath meat is being sold in niche market with a premium price (2 to 3 times) than that of broiler meat.

Kadaknath Meat Characteristics

Ayyam Cemani, Kadaknath and Silkie are 3 different breeds of Black Meat Chicken are available in the world (Kumar et al., 2021). All of them have dark brown and black flesh. These breeds have attracted tremendous attention due to its unique black colour hyper-pigmentation. The hyper-pigmentation is due to the *fibromelanosis* (*Fm*) phenomenon caused by the excessive deposition of eumelanin in almost all parts of the body including muscles and internal organs. The cooked meat is also greyish-black in color, which may not give a pleasant and appealing look to our eyes; however, it has a delicious flavour.

The dressing percentage is generally lower in the Kadaknath and it varies from 61-65% (Arora et al. 2011., Haunshi et al. 2021., Bhardwaj et al. 2006 Rajkumar et al. 2016). Thick feather covering or greater feather percentage relative to body weight of this breed might be contributing to the lower dressing percentage. Abdominal fat (as a proportion of dressed weight) at 12 weeks age was low in Kadaknath (0.11%) when compared to White Rock (1.74%). However, it was higher than that of

Proximate composition of kadaknath meat

SNo.	Parameters	Percent
1	Moisture	73-75
2	Protein	18-25
3	Fat	0.73-1.03
4	Ash	1.01
5	Phosphorous	0.18
6	Calcium	0.08
7	Cholesterol	184.75 mg/100 gm
8	Gross Energy (Kcal / kg)	1557.67 ± 31.99

Aseel Peela (0.02%) and WLH (0.07%) breeds (Arora et al. 2011). These findings suggest that native chickens including Kadaknath have less fat content in their body.

The texture of the breast and thigh meats of Kadaknath was significantly tougher than those of White Rock breed. However, there was no difference in the texture of breast meat of Kadaknath, Aseel Peela and WLH breeds although the texture of thigh meat of Kadaknath was better than Aseel Peela and WLH breeds (Arora et al. 2011). Texture profile values are comparatively higher for kadaknath breed than other breeds.

The moisture content of thigh and breast muscles of Kadaknath were higher than Aseel breed slaughtered at the age of 20 weeks. Protein content was significantly higher in breast muscle while fat content was significantly higher in thigh muscle. No difference was observed between Kadaknath and Aseel in protein and fat percentage of respective muscles (Haunshi *et al*., 2013b). However, protein content was higher, while fat and moisture contents were lower in emulsion and nuggets prepared from the meat of Kadaknath as compared to those of Aseel, Vanaraja and commercial broilers (Singh *et al*. 2016). Detailed investigations on the comparative assessment of nutrient contents of meat of Kadaknath in comparison with commercial broiler chickens are required. It has been found that the total protein content in Kadaknath meat is 25.47 per cent. This could be due to better protein assimilation during digestion and absorption. Kadaknath meat and eggs are rich in nutrients, vitamins, and protein; and have less fat and cholesterol. In another report, fat content was 0.73-1.03 per cent in Kadaknath meat, 13-25 per cent in other chicken breeds, while cholesterol level was 184.75 mg/100 gm in Kadaknath meat and 218.12 mg/100 gm in other breeds. It is reported that low cholesterol content in indigenous poultry breed makes these birds lean due to high metabolic activity. High levels of 18 amino acids, 8 of which are essential for humans, are found in Kadaknath meat. the level of amino acids, particularly those known to impart a sweet and umami (savoury) taste to the meat, were higher in the Kadaknath Vitamin B1, B2, B6, B12, C, E, niacin, calcium, phosphorus, iron, nicotinic acid are found in the meat of Kadaknath

The Central Food Technological and Research Institute (CFTRI), Mysore, studied the medicinal properties of Kadaknath meat and found it suitable for heart patients as it increases blood supply to the heart (pureecoindia.in). A recent Nature Communications report suggests that black meat may positively treat atherosclerosis, as more linoleic acid and less cholesterol means protection against stroke, heart attack, and other essential heart conditions. This could be due to improving haemoglobin synthesis and angiogenesis. (https://www.hindustantimes.com/). Even the Chinese people have been using their dark meat chicken in a traditional way to treat various ailments for many years.

Kadaknath meat also shows aphrodisiac property and peculiar effectiveness in treating women's discuss, sterility, Menoxenic (abnormal menstruation), habitual abortion although scientific studies related to these are scanty. Kadaknath has special medicinal value in homeopathy and a particular nervous disorder. Kadaknath meat is helpful in pulmonary problems.

Kadaknath chicken meat also possesses strong antioxidant properties, which contribute to its health benefits. The presence of natural antioxidants suggests that Kadaknath meat could have potential applications in the food, nutraceutical, and cosmeceutical industries. Kadaknath meat also exhibits high potential for value addition.

Conclusion

Kadaknath meats is highly nutritious proteineous food with low fat and cholesterol values and containing all amino acid and vitamins and have larger market value with high prices due to its medicinal and nutraceutical quality. Despite its advantages, Kadaknath faces challenges such as low productivity and competition from commercial breeds. However, rising demand for organic and nutrient-rich foods presents new opportunities for its conservation and commercialization. Supporting Kadaknath farming not only helps preserve genetic diversity but also strengthens rural livelihoods and sustainable agriculture, making it a valuable asset for both health-conscious consumers and the poultry industry.

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Sapodo – Setting New Standards in Natural Ammonia Control for Poultry Going beyond Yucca for ammonia management

PhyGeno, the plant-based feed ingredient division of Avitech Nutrition is dedicated to enhancing the safety and nutritive value of animals through plant-based innovations. Drawing on its legacy of working with animals and combining ancient Ayurvedic knowledge with modern evaluation and manufacturing techniques, PhyGeno offers solutions that lead to healthier products for human consumption and minimal environmental impact. **Sapodo**, a polyherbal formulation is rapidly emerging as a natural choice to address critical ammonia challenges in poultry farming.

Understanding the Impact of Ammonia in Poultry Production

Ammonia, a natural by product of animal waste and decomposition, poses significant threats in poultry farms when present at high concentrations. Elevated ammonia levels are **harmful to both animal health and the environment**, leading to a cascade of negative effects on poultry production. These include **reduced body weight gain, impaired feed conversion, decreased survivability, and a weakened immune response**. Furthermore, high ammonia can cause respiratory illness, eye irritation, increased susceptibility to pathogens, and compromised immune responses in birds, ultimately impacting overall performance and profitability for farmers. Effectively controlling ammonia is therefore crucial for fostering healthy living conditions and improving bird performance.

Sapodo: A Comprehensive Strategy for Ammonia Management

Sapodo is a **natural phytogenic feed additive** specifically formulated for efficient ammonia control. It is a polyherbal formulation containing saponins and glycosides, among other bioactive compounds, which collectively enable a multi-pronged approach to ammonia management. Sapodo's strategy involves two key mechanisms:

- **Direct Binding:** Sapodo contains **bioactive compounds that directly bind lower gut and environmental ammonia levels**. This immediate action helps to neutralize existing ammonia, reducing its toxic effects on animals and improving air quality within the farm.

- **Urease Inhibition:** Beyond direct binding, Sapodo's bioactive compounds also **control ammonia production by inhibiting the urease enzyme**. Urease is responsible for converting urea into ammonia, so by inhibiting this enzyme, Sapodo addresses the root cause of ammonia generation, providing a more sustainable and long-term solution.

This dual-action approach ensures a **comprehensive reduction of ammonia** in the poultry environment, creating a healthier and more productive setting for animals.

Unlocking Superior Ammonia Management: Sapodo's Proven Advantage Over Yucca Schidigera Products

Comparative Efficacy: Sapodo's Demonstrated Superiority

To validate Sapodo's effectiveness, comprehensive in-vitro evaluations were conducted at the Avitech Centre for Nutrition Science (ACNS), comparing its ammonia binding capability against a commercially available Yucca product. The results **unequivocally demonstrate Sapodo's superior performance**.

Study 1: Quantitative Evaluation (B50 Value)
The first trial focused on estimating the B50 value, a key indicator quantifying the amount of an ammonia-binding substance needed to reduce ammonia concentration in an aqueous solution by 50%. A lower B50 value signifies a stronger ability of the product to bind ammonia.

- **Methodology:**

The ammonia control agent was weighed, mixed with phosphate EDTA buffer, stirred for 10 minutes, and centrifuged. The supernatant was then used to prepare aliquots for B50 estimation. Samples were treated with ammonium sulfate solution, nitroprusside, and hypochlorite, followed by incubation, and optical density measurement at 630 nm to determine the percentage of free ammonia.

- **Results:**

The study revealed that **only 3.6 mg of Sapodo was required to achieve a 50% reduction in ammonia** in the solution, compared to **5.4 mg of Yucca**. This critical finding indicates that **Sapodo is 50% more effective in binding ammonia than Yucca**.

Study 2: Qualitative Evaluation (Colorimetric Study)
The second trial employed a colorimetric study, utilizing the salicylate method based on the Berthelot reaction, to visually assess ammonia binding efficiency at different dosages.

- **Methodology:**

Stock ammonia solution was prepared. A reaction mixture was used to assess ammonium concentration with varying levels of ammonia binder (25 mg, 50 mg, 100 mg, and 150 mg). The color variation was then compared against an ammonia color chart.

- **Results:**

At **25 mg and 50 mg dosages**, Sapodo-containing test tubes exhibited a **light-yellow hue**, indicating a significant decrease in ammonia levels, whereas Yucca tubes showed a light green hue.

More strikingly, at **100 mg and 150 mg dosages**, the Sapodo test tubes demonstrated a **complete reduction of ammonia concentration**, evidenced by a dark yellow color. In contrast, Yucca only showed a slight reduction, presenting a light-yellow hue at these higher concentrations.

The color variation clearly shows that **Sapodo is more effective as an ammonia control agent** compared to Yucca at different concentrations, demonstrating a **superior performance** in reducing ammonia production.

Beyond Binding: The Multifaceted Benefits of Sapodo for Poultry Productivity

Sapodo's superior ammonia control translates into a multitude of benefits for poultry farmers, directly impacting productivity and animal welfare:

- **Improved Nutrition:** Optimizes feed intake and ensures better nutrient utilization.
- **Enhanced Health:** Reduces susceptibility to respiratory infections and decreases the incidence of Ascites. Sapodo addresses issues more effectively than Yucca, improving bird performance.
- **Increased Productivity:** Improves overall performance and efficiency, leading to enhanced growth and productivity.
- **Farm Hygiene:** Significantly improves air quality and reduces offensive odor generated by manure.

Furthermore, Sapodo is **100% natural and safe, cost-effective**, and **compatible for inclusion in premixes or complete feeds**, demonstrating excellent stability through pelleting and extrusion processes.

Conclusion: A Cleaner, Healthier Future with Sapodo
Sapodo's **proven superior efficacy in binding and inhibiting ammonia**, as demonstrated by rigorous in-vitro trials, positions it as the premier plant-based solution for ammonia management in poultry farming. By effectively addressing ammonia-related challenges, Sapodo not only safeguards animal health and the environment but also significantly **boosts farm productivity and profitability**. With Sapodo, PhyGeno offers a clear path towards clean feed, a clean conscience, and a clean planet for generations to come.

Efficacy of Enterosure HC Dry in Broiler Breeder during Laying Period

Jagadeesh N and Chanthirasekaran R Kemin Industries South Asia Pvt Ltd

Gut Health: A Cornerstone of Poultry Performance

The gastrointestinal tract (GIT) of poultry harbors a diverse microbiota—bacteria, fungi, protozoa, and viruses—that begins to develop at hatch through exposure to feed, the environment, and handlers. This microbial community plays a vital role in digestion, nutrient absorption, immunity, and overall bird performance. In high-performing poultry lines, elevated feed intake can strain the digestive system, leading to undigested nutrients in the small intestine. This often triggers dysbiosis—a microbial imbalance—resulting in inflammation, compromised gut integrity, and nutrient malabsorption.

A healthy gut microbiome is essential not only for optimal nutrient utilization but also for maintaining physiological balance and immune function. Poor gut health can depress growth and productivity, making intestinal health a key focus for the poultry industry. Additionally, the GIT influences food safety, animal welfare, and environmental sustainability.

The global restriction on antibiotic growth promoters due to rising antimicrobial resistance has led to increased digestive disorders in poultry. While alternatives such as enzymes, probiotics, organic acids, and plant extracts are available, they often fall short in delivering consistent performance and pathogen control. This has intensified the need for advanced, comprehensive solutions that enhance intestinal resilience and effectively manage enteric diseases.

To meet the growing demand for sustainable and profitable protein production, the poultry sector must prioritize gut health through innovative strategies that go beyond conventional approaches—ensuring robust immunity, efficient feed conversion, and improved overall performance.

ENTEROSURE™ HC Dry is a combination of multifunctional, broad-spectrum Bacillus strains, which improve the control of enteric pathogens such as *Clostridium perfringens*, enteric *E. coli*, *Salmonella* species, and *Enterococcus* species with superior performance and return on investment, with the following benefits

- Maximizing Intestinal Resilience
- Reduces Clostridial toxins.
- Better growth of commensals
- Reduces the expression of the Salmonella invasive gene.
- Reduces dysbacteriosis.
- Improves FCR
- Efficient and Sustainable Poultry Production

OBJECTIVE

The main objective of the trial was to check the efficacy of ENTEROSURE™ HC Dry on Gut Health in Broiler Breeders during the laying period in terms of mortality, egg production, and hatching egg selection in actual farm conditions in Cobb-430Y broiler breeders.

TRIAL DESIGN

The experiment was conducted in a well-managed broiler breeder farm in India in 2023. The details of the experimental groups are given in Table 1. A total of 20316 Cobb-430y broiler parent female birds were selected for a 16-week study. Birds were placed in two different sheds with an open-sided California cage system under natural environmental conditions. The birds were fed with a breeder mash feed diet and *ad libitum* water during the experimental period.

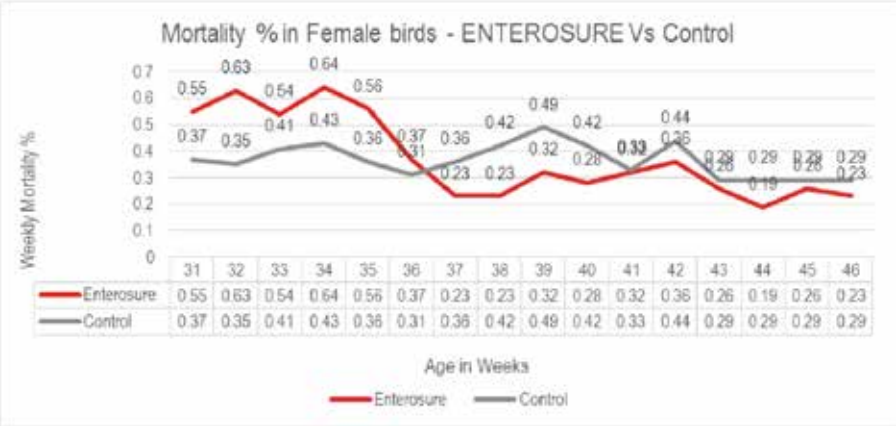
PARAMETERS MEASURED

- Livability – assessed in terms of mortality %
- Productivity – assessed by Hen Day Production %
- Hatching eligibility – assessed by Hatching Egg selection %

Dosage and trial details of experimental groups

GROUP	DESCRIPTION	NUMBER OF BIRDS
Control	Breeder diet without any probiotics/ prebiotics	10,316
Treatment - ENTEROSURE™ HC Dry*	Broiler diet with ENTEROSURE™ HC Dry through feed for 16 weeks at the dose of 200g per ton of feed	10,000

Note: *ENTEROSURE™ HC Dry is an intestinal health enhancer developed by Kemin Industries, containing multifunctional, broad-spectrum *Bacillus* strains having specific modes of action against *Clostridium perfringens*, *Enteric E. coli*, *Salmonella* species and *Enterococcus* species.



	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46
Enterosure	0.55	0.63	0.54	0.64	0.56	0.37	0.23	0.23	0.32	0.28	0.32	0.36	0.26	0.19	0.26	0.23
Control	0.37	0.35	0.41	0.43	0.36	0.31	0.36	0.42	0.49	0.42	0.33	0.44	0.29	0.29	0.29	0.29

Figure 1: Mortality % of experimental groups (Female birds) during the trial period

RESULTS

Results indicated that the treatment group fed with ENTEROSURE™ HC Dry had superior performance in terms of mortality, production, and selection percentage. The study revealed that ENTEROSURE™ HC Dry could be used from the initial chick stage or from housing to till culling to get better production performance; otherwise, an initial cushioning period of 5 to 6 weeks is required to combat field or bird challenge and to get superior performance. The detailed results are mentioned below.

Impact on Mortality

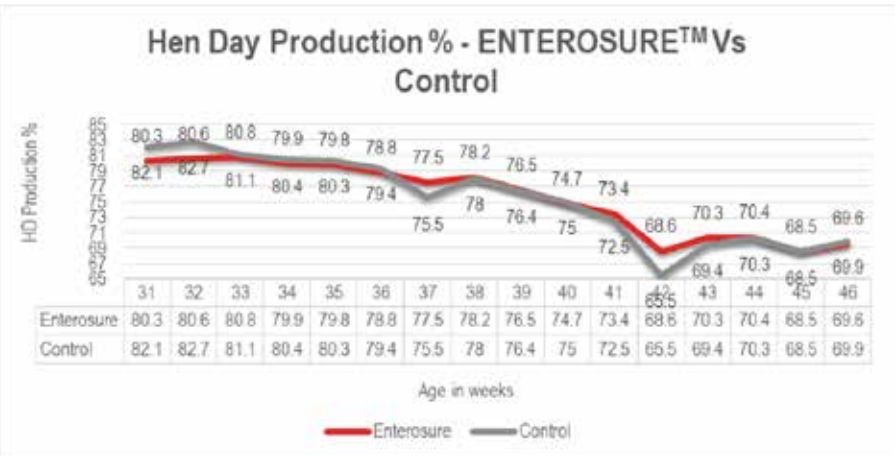
Over the 16-week trial period, female mortality in the ENTEROSURE™ HC Dry group was 1.06% higher than the control group during the first 6 weeks of supplementation. However, in the following 10 weeks, mortality in the ENTEROSURE™ group was 0.94% lower than the control group, indicating improved outcomes over time.Week-wise mortality details for both ENTEROSURE™ and the control group are given in a graphical representation in Figure 1.

Hen Day production (HD%)

In the total trial period of 16 weeks, the ENTEROSURE™ HC Dry group had Hen Day production of minus 1.0% compared to the control group in the first 6 weeks after supplementation and 0.7% higher compared to the control group in the next 10-week period with ENTEROSURE™ supplementation. Week-wise Hen Day production details for both ENTEROSURE™ and the control group are given in graphical representation in Figure 2.

Hatching Egg Selection (HE%)

In the total trial period of 16 weeks, the ENTEROSURE™ HC Dry group had a Hatching Egg Selection % on par with the control group in the first 6 weeks after supplementation and 0.2% higher compared to the control group in the next 10-week period with ENTEROSURE™ supplementation. Week-wise Hatching Egg selection % details for both ENTEROSURE™ and the control group are given in graphical representation in Figure 3.



	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46
Enterosure	80.3	80.6	80.8	79.9	79.8	78.8	77.5	78.2	76.5	74.7	73.4	68.6	70.3	70.4	68.5	69.6
Control	82.1	82.7	81.1	80.4	80.3	79.4	75.5	78	76.4	75	72.5	65.5	69.4	70.3	68.5	69.9

Figure 2: Hen Day Production % of experimental groups during the trial period

ENTEROSURE™ HC Dry Enhances Broiler Breeder Performance

The use of ENTEROSURE™ HC Dry in broiler breeders has demonstrated clear benefits in productivity, cost-efficiency, and chick quality. During a 16-week trial period—from 31 to 46 weeks of age—supplementation led to a 0.94% reduction in female mortality, a 0.7% increase in total egg production, and a 0.2% rise in hatching egg output during the final 10 weeks, following an initial 6-week adaptation phase. Additionally, there was a 0.1% improvement in overall production and selection rates.

These results suggest that ENTEROSURE™ HC Dry can be effectively used throughout the bird's lifecycle—from chick stage to culling—to support consistent performance. When introduced mid-cycle, the product typically requires 5 to 6 weeks to overcome initial field and bird-level challenges before delivering measurable improvements. This makes ENTEROSURE™ HC Dry a strategic solution for enhancing intestinal health and maximizing productivity in broiler breeder operations.

Conclusion

The study demonstrates that ENTEROSURE™ HC Dry significantly enhances the economic performance of broiler breeder birds by improving key productivity metrics such as Hen Day egg production, hatching egg selection, and overall livability. These results position ENTEROSURE™ HC Dry as a highly effective intestinal health promoter, capable of supporting gut integrity, optimizing production parameters, and improving bird survivability in breeder layer operations.

References are available upon request

ZeneX Animal Health
Rich past. Exciting future

Fuelled by *Bacillus siamensis* ZMT03, the novel probiotic strain isolated from chicken GIT

22 Field Trials*

1,08,236 broiler chickens

Safe | **Performance booster** | **Anti-infective** | **Anti-inflammatory**

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.

Green Muscle Disease Reducing the Incidence in Broiler Flocks

Dr S.F. Bilgili, Graduate Program Officer, Department of Poultry Science, Dr Joseph Hess, Extension Specialist and Associate Professor

Figure 1: Deep Pectoral Myopathy

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

Introduction

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

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

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

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

Why Does DPM Target Broiler Breast Muscles?

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

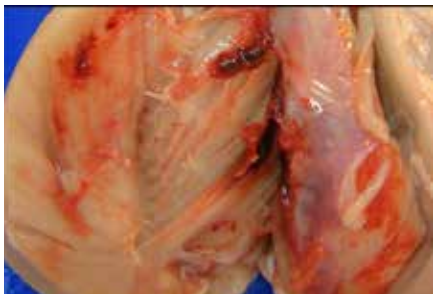


Figure 2: Early Acute Pectoral Myopathy

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

Recognition and Identification of the Development Stages in DPM

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

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

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

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

Factors affecting the occurrence of DPM

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

DPM is associated with the following factors:

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

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

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

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

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

Figure 3: Pectoral Myopathy - developing lesions

Figure 4: Aged Pectoral Myopathy

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

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

Table 1: Flock Management Guidelines to Minimize Unnecessary Wing Activity

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

Conclusion: Reducing DPM is a broiler management responsibility.

About the Authors

Dr S.F. Bilgili is Professor and Extension Scientist in the Department of Poultry Science at Auburn University, Ala- bama, USA. His current responsibilities include developing and implementing outreach and research programs in the areas of broiler processing technology, slaughter and processing efficiency, broiler carcass quality and meat yield, food safety and animal welfare. He has authored or co-authored numerous articles in scientific and trade journals and serves on several industry and academic committees. He is currently Chairman of the National Chicken Council Ani- mal Welfare Scientific Advisory Committee.

Dr Joseph Hess is an Extension Specialist and Associate Professor in the Poultry Science Department at Auburn Uni- versity, Alabama, USA. His research focuses on practical aspects of management and nutrition in broilers and broiler breeders and he engages in practical research projects that can provide immediate feedback to the industry in terms of poultry performance, product quality or feed technology. He is a member of the Poultry Science Association, the Southern Poultry Science Society, the Alabama Poultry & Egg Association and works closely with the Alabama Feed & Grain Association.

Date of Publishing:
8 December 2025

RNI Regn. No. 72452/99
Postal Regn. No. HCD-1067/2024-2026

Date of Posting:
9th, 10th December 2025

Posting at BPC-IV, Patrika Channel, Nampally, Hyderabad - 500 001

Poultry Fortune, BG – 4, Venkataramana Apts, 11-4-634, A. C. Guards, Hyderabad – 500 004, Telangana, India.