MONTHLY

Rs. 60/-

POULTRY PUNCH

25, Thyagraj Nagar Market, Near Thyagraj Stadium, New Delhi - 110003
Mobile: +91-9312700599& +91-7838602297 Email: ppunch@rediffmail.com
www.thepoultrypunch.com

January 31, 2026 | Volume 42 | No. 3 | 106 Pages Including Cover


Protemin®
Organic Trace Mineral Proteinates
Matter With Mettle
ABT CORPORATION
Fe
Cu
Organic Mineral
Se
Cr
I
Zn
Mn
Protemin
IN-HOUSE MANUFACTURING
24 Years Experience
Assured Quality Control
Strong Specification
Strict Heavy Metal Check
Better Absorption
FAMIQS
ISO
GMP
HACCP

CONTENTS

January 2026

News

News in this issue

Articles in this issue

Article

Vol.XXXXII No. 3 January 31, 2026

POULTRY PUNCH MONTHLY

25, THYAGRAJ NAGAR MARKET,
NEW DELHI-110003, INDIA
Mob No: +91-9312700599 / 7838602297
E-mail : ppunch@ rediffmail.com
ppunch25@gmail.com
Web : www.thepoultrypunch.com

Single Copy : Rs. 60/-
(Postage inclusive)

SUBSCRIPTION RATES

One Year	Rs. 1000/-
Three Years	Rs. 2500/-
Five Years	Rs. 4000/-
FOREIGN:	
One Year (By Air Mail)	USD 150

* * * *

B. S. RANA
Editor & Publisher

Amit Rana
Magazine Planning

Editorial

Present Status and Future Prospects of the Poultry Sector

The poultry sector today stands as one of the most vibrant and rapidly expanding pillars of the global livestock economy. What once began as small, backyard activity has now transformed into a modern, technology-driven agribusiness powering nutrition security, employment, and rural prosperity. In India especially, the poultry industry has emerged as a growth engine—supplying affordable protein, creating millions of livelihoods, and contributing significantly to the national economy.

Over the past few years, the industry has witnessed remarkable expansion. Rising disposable incomes, urban lifestyles, improved cold-chain networks, and growing awareness of the benefits of protein-rich diets have all contributed to steady increases in egg and chicken consumption. Integrated farming models and large-scale commercial production have brought structure, efficiency, and professionalism to the sector. Today's poultry farms are powered by advancements in genetics, nutrition, automation, and biosecurity—resulting in healthier birds, higher productivity, and improved profitability.

Yet, the journey has not been without challenges. Disease outbreaks, volatile feed costs, environmental pressures, and market uncertainties continue to test the resilience of farmers and producers. Biosecurity lapses and gaps in early disease detection remain areas demanding constant vigilance. At the same time, evolving consumer expectations around food safety, traceability, and welfare are redefining industry standards. For small farmers, access to credit, training, and modern technology remains essential for long-term sustainability in an increasingly competitive market.

Despite these challenges, the **future of the poultry sector remains extremely promising.** With population growth, urbanization, and an increasing focus on health-conscious diets, demand for poultry products is projected to rise sharply. Eggs and chicken will continue to be the most preferred forms of animal protein—not only because they are nutritious and versatile, but also because they offer one of the best feed-to-protein conversion efficiencies among all livestock sectors.

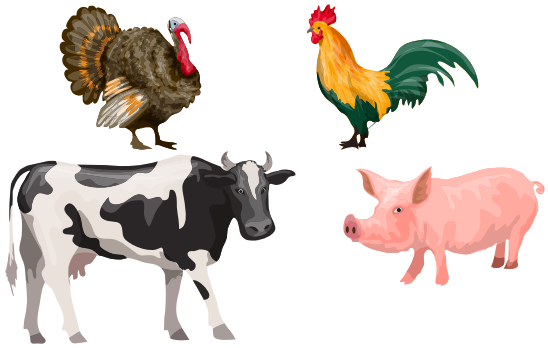
The next phase of growth will be driven by innovation. Precision farming, smart environmental control systems, climate-resilient housing, digital farm monitoring, novel vaccines, and alternative protein ingredients are set to redefine production efficiency and sustainability. At the policy level, stronger public-private partnerships, science-based regulations, and enhanced investment in research and extension services will be critical to supporting the sector's continued evolution.

Sustainability, however, will remain the guiding principle. Reducing environmental footprint while improving productivity will define the industry's progress. Equally important will be **consumer education**—building trust, promoting awareness, and responsibly countering misinformation about poultry products.

As we look ahead, the poultry sector stands at the crossroads of opportunity and transformation. With the right blend of innovation, inclusiveness, and visionary leadership, it has the power not only to nourish a growing population but also to uplift millions of farming families, strengthen the rural economy, and contribute significantly to national development.

The story of the poultry industry is far from complete—but the pages ahead promise growth, resilience, and a future powered by knowledge, sustainability, and shared progress.

– Editor



PROMOIS ПРОМОИС INTERNATIONAL

AMINO ACID *(BEST SELLER CATEGORY)*

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

BULK PRODUCTS

- Di Calcium Phosphate (DCP)
- Monocalcium Phosphate (MCP)
- Sodium Bicarbonate
- Premix (Layer)
- Premix (Broiler)

FEED SUPPLEMENT

- Choline Chloride (CCL) Liquid 75% /Powder 60%
- Toxin Binder
- Betain Hcl
- Acidifier
- Phytase
- Multienzyme
- Electrolyte
- Glycerine

PROMOIS ANTIBIOTICS

- Chlortetracycline (CTC)
- Tylosin Phosphate 10%
- Tiamulin10,45,80%
- Enrofloxacin
- Florfenicol
- Azithromycin
- Ciprofloxacin
- Amoxicillin
- Virginiamycin 11%
- Ivermectin
- Anticoccidials

VITAMINS

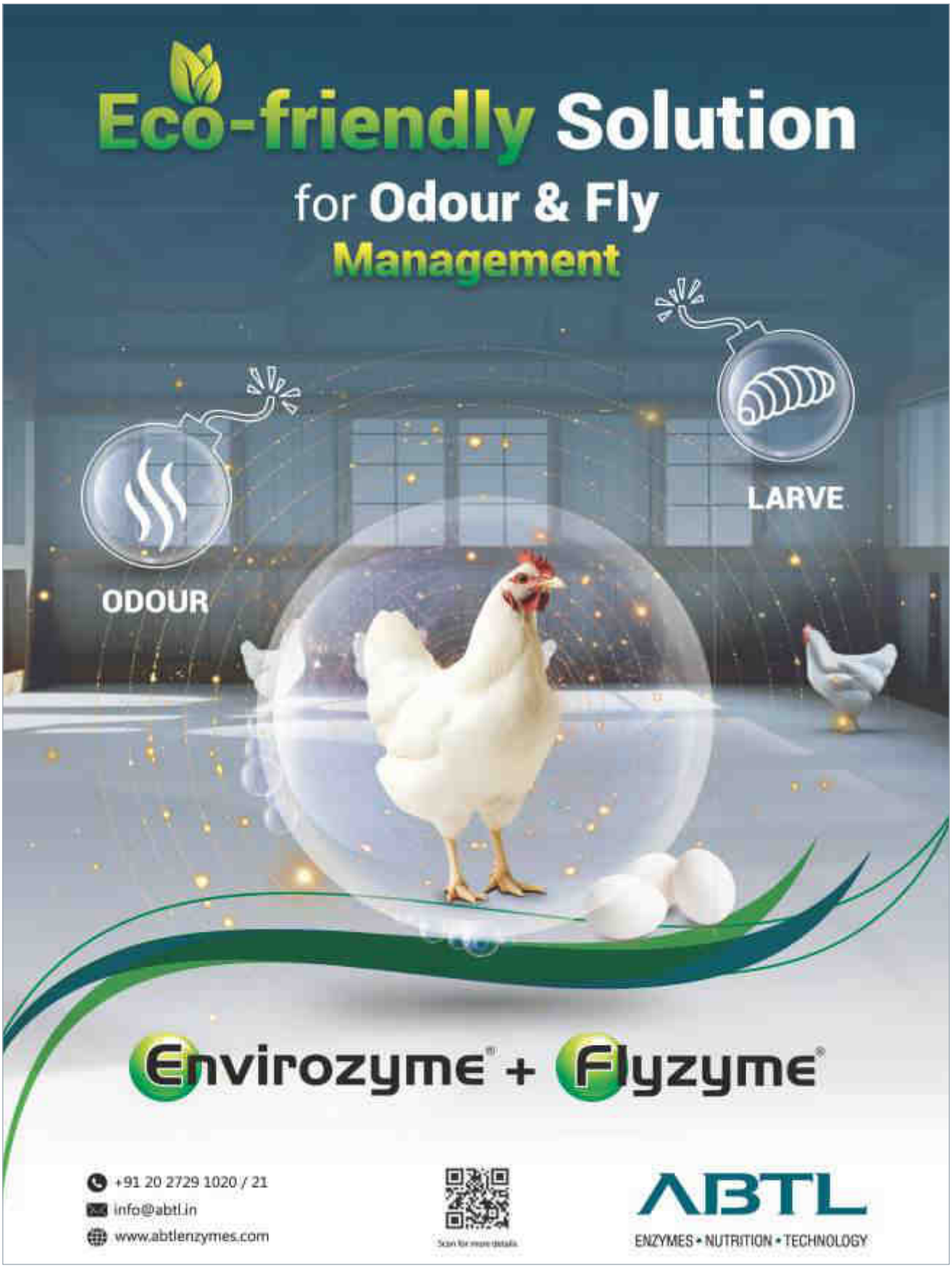
- Vitamin - A
- Vitamin - E
- Vitamin - C
- Vitamin - B1, B2, B9
- Vitamin - K

Contact us :

What's app:

+91 7054116056
+91 7388158309
+91 9559865338

sales@promoisinternationallt.com
www.promoisinternational.com


Eco-friendly Solution
for Odour & Fly
Management
ODOUR
LARVE
Envirozyme® + Flyzyme®
+91 20 2729 1020 / 21
info@abtl.in
www.abtlenzymes.com
Scan for more details
ABTL
ENZYMES • NUTRITION • TECHNOLOGY

ROSS 308 AP

BEST ACHIEVERS
NOVEMBER-2025

Aviagen INDIA

Northern Region

COMPANY: Sampoorna Feeds
FARMER NAME: Mr.Jashandeep Singh Sidhu

NOVEMBER-2025	Top #1
Farm Type	Open House
State	PUNJAB
Chicks Placed	2509
Mean Age	33.0
Avg Body Wt	2460
FCR	1.260
cFCR	1.158
Livability%	97.0
Daily Gain	74.5
EPEF	573.9

Eastern Region

COMPANY: IB Group
FARMER NAME: Mr. Kamal Krishna Roy

NOVEMBER-2025	Top #1
Farm Type	Open House
State	BENGAL
Chicks Placed	1354
Mean Age	36.0
Avg Body Wt	2777
FCR	1.468
cFCR	1.295
Livability%	95.6
Daily Gain	77.1
EPEF	502.6

Central Region

COMPANY: Japfa
FARMER NAME: Mr. Suhas Patil

NOVEMBER-2025	Top #1
Farm Type	EC House
State	MAHARASHTRA
Chicks Placed	5972
Mean Age	33.4
Avg Body Wt	2463
FCR	1.369
cFCR	1.266
Livability%	97.1
Daily Gain	73.8
EPEF	523.3

South Region

COMPANY: IB Group
FARM NAME: K S Poultry Farms

NOVEMBER-2025	Top #1
Farm Type	EC House
State	KARNATAKA
Chicks Placed	25945
Mean Age	36.0
Avg Body Wt	2731
FCR	1.483
cFCR	1.321
Livability%	97.1
Daily Gain	75.9
EPEF	496.9

NOVEMBER-Top PERFORMANCE BY AREA

Area	Chicks Placed	Mean Age	BW	FCR	cFCR(2Kg)	Livability%	Daygain	EPEF
North EC House	12030	35.3	2631	1.370	1.230	97.2	74.5	528.3
North Open House	2509	33.0	2460	1.260	1.158	97.0	74.5	573.9
East EC House	6572	34.0	2357	1.427	1.348	97.2	69.3	472.2
East Open House	1354	36.0	2777	1.468	1.295	95.6	77.1	502.6
Central EC House	5972	33.4	2463	1.369	1.266	97.1	73.8	523.3
Central Open House	2793	32.3	2271	1.387	1.326	97.2	70.3	492.9
South EC House	25945	36.0	2731	1.483	1.321	97.1	75.9	496.9
South Open House	7616	36.0	2415	1.402	1.310	94.9	67.1	454.2

NOVEMBER-Top 10 FIELD PERFORMANCE

Flock	Farm Type	State	Chicks Placed	Mean Age	BW	FCR	cFCR	Livability%	Day Gain	EPEF
Flock 1	OPEN HOUSE	PUNJAB	2509	33.0	2460	1.260	1.158	97.0	74.5	573.9
Flock 2	OPEN HOUSE	PUNJAB	10390	33.0	2491	1.330	1.221	97.0	75.5	551.0
Flock 3	EC HOUSE	PUNJAB	12030	35.3	2631	1.370	1.230	97.2	74.5	528.3
Flock 4	OPEN HOUSE	PUNJAB	2505	32.1	2393	1.360	1.273	95.8	74.5	524.8
Flock 5	EC HOUSE	MAHARASHTRA	5972	33.4	2463	1.369	1.266	97.1	73.8	523.3
Flock 6	OPEN HOUSE	UTTAR PRADESH	9389	40.0	2960	1.347	1.134	95.1	74.0	522.3
Flock 7	OPEN HOUSE	PUNJAB	14630	32.0	2293	1.320	1.255	95.8	71.6	519.6
Flock 8	OPEN HOUSE	HARYANA	3775	29.0	1951	1.250	1.261	95.7	67.3	515.1
Flock 9	EC HOUSE	MAHARASHTRA	15489	32.6	2370	1.375	1.293	97.5	72.6	514.7
Flock 10	EC HOUSE	MAHARASHTRA	7875	35.0	2582	1.386	1.257	96.5	73.8	514.1

For a nation that aspires to lead the world, a protein-deficient population is a challenge we can no longer ignore.

HELLO PROTEIN is a public awareness nationwide initiative movement born for this urgency. Our mission is simple yet transformative: to reshape India's relationship with protein and to strengthen the industry perspective towards protein awareness.

HELLO PROTEIN purpose is not to preach, but to educate, to simplify complex science, debunk long-held myths, & empower individuals with practical, everyday guidance.

Become an advocate for better nutrition; make protein a priority – not occasionally, but consciously, consistently, and proudly.

Let's join hands & make our nation protein deficit free with **HELLO PROTEIN**.

If this mission resonates with you, do drop your ideas/comments/suggestions at : **helloproteins25@gmail.com**

Mr. O. P. Singh
Founder

Alltech South Asia hosts

Poultry Nutrition Summit 2025

Colombo, Sri Lanka — Alltech, a global leader in animal health and nutrition, successfully hosted the South Asia Poultry Nutrition Summit 2025 from 16–18 December at Cinnamon Life, Colombo, Sri Lanka. Centred on the theme of "Smart Nutrition for Profitable and Sustainable Poultry Production," the three-day summit brought together more than 85 senior industry delegates from across South Asia, including poultry nutrition experts, feed millers, integrators and industry leaders.

Poultry nutrition has evolved beyond production efficiency to embrace a more holistic approach encompassing biological performance, economic viability, sustainability, biosecurity, food safety and bird welfare. As the industry faces increasing pressure from volatile raw material prices, supply chain disruptions and rising production costs, the need for smart, science-backed nutritional strategies is becoming more critical than ever.

The South Asia Poultry Nutrition Summit 2025 addressed these challenges by providing a knowledge-sharing platform focused on practical and innovative solutions that can help maintain economic balance without compromising bird performance. The summit agenda was curated to cover key industry themes such as future poultry trends, feed-mill-to-farm efficiency, gut health, precision feeding, feed formulation, meat yield optimization and sustainability-driven nutrition strategies.

The event featured a distinguished panel of global and regional experts, including Dr. Rick Kleyn, renowned poultry nutritionist and global consultant, who shared insights on advancing nutrition strategies aligned with current industry realities; Dr. Roy Brister, strategic poultry advisor at Alltech, who highlighted the importance of data-driven decision-making and precision nutrition in improving poultry performance and profitability; and Mr. Dilsahn Weviwa, managing director of Pussalla Meat Producers Pvt. Ltd., who provided the audience with a comprehensive outlook on the Sri Lankan poultry industry, highlighting key opportunities and prevailing challenges.

Along with sessions led by Alltech leaders, the summit contributed through expert-led technical sessions, panel discussions and innovation briefings, enabling participants to gain actionable insights applicable to real-world poultry operations.

"The South Asia Poultry Nutrition Summit 2025 was designed to empower poultry professionals with practical knowledge and strategic insights needed to improve efficiency, resilience and sustainability," said Dr. Aman Sayed, Alltech managing director for India and regional director for South Asia. "Collaboration and continuous learning are essential as the industry navigates an increasingly complex market environment", he added.

The Alltech South Asia Poultry Nutrition Summit 2025 provided a valuable platform for poultry professionals to connect, learn and explore the latest nutritional innovations shaping the future of poultry production. For more information, visit www.alltech.com ■

Advancements in Coryza

Vaccine Research Leading to VH-Cor4 a Tetravalent Vaccine Powered of C3

A technical seminar series on advancements in the understanding and management of Infectious Coryza was conducted by Ventri Biologicals Pvt. Ltd. from November 10 to 14, 2025. The Odisha sessions held at Balangir (November 10) and Berhampur (November 11) were led by Prof. Robert R. Bragg, a globally recognized authority from the University of the Free State, South Africa. Both meetings began with welcome addresses by Mr. Satayajeet Mohanty (Zonal Manager), followed by the introduction of the distinguished speaker by Mr. Chita Sahoo (AGM). Prof. Bragg delivered detailed scientific insights covering disease epidemiology, strain variation, diagnostic advancements, and effective vaccination strategies, with a special focus on the VH COR4 vaccine powered by the C3 strain—designed to address the predominant Avibacterium paragallinarum strains circulating in India. The sessions were moderated by Dr. Sambhaji Nimbalkar (AGM), ensuring clear scientific interpretation for all participants. Each event concluded with a vote of thanks from Mr. Satayajeet Mohanty, acknowledging the valuable insights shared and the active participation of the attendees.

In Hyderabad on November 13 began with a welcome and speaker introduction by Mr. Suneel Sharma (AGM). Prof. Bragg delivered an in-depth session focusing on field-level challenges in Indian poultry systems and strategic approaches for effective Infectious Coryza management. The discussion session was moderated by Dr. Prakash Reddy (DGM) and Dr. Baburaj (DGM), during which Dr. Prakash Reddy also highlighted current local disease issues and interacted with team members for better field understanding. The Siddipet meeting on November 14 followed a similar structure, beginning with a welcome and speaker introduction by Mr. Suneel Sharma (AGM). Prof. Bragg addressed pathogen dynamics, strain variability, and evidence-based Coryza control methods suited for Indian poultry farms. The session was moderated by Dr. Baburaj (DGM), and the program concluded with a vote of thanks by Mr. Suneel Sharma. These knowledge-sharing initiatives reinforce Venworld's commitment to bringing global scientific expertise to Indian poultry professionals and strengthening evidence-based disease management at the grassroots level. ■

Winter Demand Drives Egg Prices

Up By 25–50%

Egg prices across several parts of the country have surged by 25 to 50 per cent, driven primarily by a sharp rise in winter demand, higher consumption patterns, and increased input costs for poultry farmers, industry sources said.

With the onset of winter, egg consumption traditionally increases due to its perceived health benefits and higher demand from households, bakeries, hotels and institutional buyers. This seasonal spike, coupled with limited short-term supply elasticity, has pushed prices upward in wholesale as well as in retail markets.

Poultry traders said prices in major consuming centres such as Delhi-NCR, Mumbai, Kolkata, Chennai and Bengaluru have seen a steady upward trend over the past few weeks. In some markets, retail prices have crossed Rs 8–10 per egg, depending on quality and location, compared to Rs 5–6 during the previous months.

Apart from seasonal demand, rising production costs have added pressure on prices. Feed prices, particularly maize and soybean meals, remain elevated, significantly impacting farmers' cost structures. Higher trans-portation costs and increased electricity expenses during winter have further contributed to the price rise.

Industry representatives pointed out that supply remains tight as many small and medium poultry farmers reduced flock sizes earlier due to low realisations and higher input costs. The lag between restocking and egg production has limited the ability of farmers to immediately respond to the demand surge.

Traders expect prices to remain firm through the peak winter months, with demand likely to stay strong until late January or early February. However, prices may stabilise once temperatures rise and fresh supplies enter the market.

Officials said the government is monitoring the situation, though eggs are not subject to direct price controls. Any significant moderation in feed prices or improvement in supply could ease prices in the coming weeks.

For now, consumers may have to brace for higher egg prices, even as the poultry industry hopes for better margins after months of subdued returns. ■

HIPRA India Showcases

Advanced Poultry Health Solutions *at the*

17th Poultry India Expo 2025, Hyderabad

HIPRA, a global leader in prevention-focused animal health, successfully participated in the 17th Poultry India Expo 2025 held at HITEX Exhibition Centre, Hyderabad. The event, South Asia's largest poultry exhibition, brought together leading poultry professionals, integrators, farmers, researchers, and technology providers from across the world.

HIPRA India reaffirmed its commitment to elevating poultry health standards in the country. The company showcased its latest innovations in poultry vaccines, hatchery vaccination solutions, and biotechnology-driven disease-prevention systems designed to support India's rapidly expanding poultry sector.

At HIPRA's booth, a wide range of products and services were showcased, highlighting the company's successful partnership with the Dutch leader in hatchery equipment, ROYAL PAS REFORM.

Our participation reflects HIPRA's long-term vision for India's poultry industry. We aim not only to provide high-quality vaccines but also to bring advanced hatchery technology, digital monitoring tools, and science-backed disease-control strategies.

HIPRA India Proudly announced the launch of HIPRAVAIR TRT, an advanced inactivated vaccines against aMPV which was unveiled by Dr. Nitin Kurkure, Director of Research, Maharashtra Animal & Fishery Sciences University, Nagpur. The unveiling ceremony was also graced by presence of Dr K Jayaraman, leading poultry consultant and Mr. Shrikrushana Gangurde, owner of Avee Broiler, Nashik.

Visitors to the HIPRA stall experienced live demonstrations of "Cofferences by HIPRA", a unique interactive session where our experts presented on topics like prevention of Avian metapneumovirus, Coccidiosis, Salmonella & Gumboro disease. They also emphasized Cutting-edge hatchery and in-Ovo vaccination solutions from HIPRA, enabling protection with precision.

The expo provided HIPRA India with an excellent platform to connect with integrators, veterinarians, distributors, and poultry entrepreneurs, strengthening its long-standing relationships within the industry. The company also held focused business meetings to discuss the industry's evolving needs in disease control, hatchery automation, and sustainable poultry production.

HIPRA India remains committed to supporting the country's position as a global poultry powerhouse through science, innovation, and partnership. ■

AgriLivestock & Feed Taiwan 2026:
Asia's Dedicated Event for Smart Livestock Farming and Feed Innovation

AgriLivestock & Feed Taiwan, part of Taiwan Smart Agriweek, one of Asia's dedicated events for livestock farming, returns to TaiNEX 1, Taipei, from 8–10 September 2026.

The event brings together innovators and solution providers—from smart livestock systems and alternative feed & additives to livestock welfare enhancement for the poultry, dairy, and swine industries—connecting **them with nutritionists, livestock farmers, feed milling companies, livestock feed manufacturers, and industry associations.**

Building on recent momentum—**with over 770 booths, 21,000 visitors from 69 countries, generating USD 88 million in procurement,** the show continues to attract both local and international audiences, creating a platform to connect, engage and network across Asia's livestock & feed sector.

Addressing Biosecurity, Feed Costs, and Operational Pressures in Livestock Farming

Taiwan's livestock industry is undergoing rapid transformation amid rising biosecurity concerns, particularly in swine and poultry sectors. Following the country's first **African Swine Fever (ASF)** outbreak, stricter controls and tighter policies have been implemented nationwide.

At the same time, egg supply disruptions, sustained feed cost pressure, and heavy reliance on imported feed ingredients— especially in the poultry sector—have

accelerated demand for professional-grade solutions including automation, monitoring, environmental control, biosecurity technologies, and alternative feed ingredients to address day-to-day farm operations.

This shift is further supported by government initiatives and subsidy programmes. Key programmes include the planned phase-out of food-waste feeding in pig farming by the end of 2026, as well as subsidies supporting upgrades to swine and livestock housing, such as ventilation systems, wastewater treatment, and animal waste treatment facilities, aimed at reducing disease risk and improving farm environmental management.

To help with these changes in the industry, AgriLivestock & Feed Taiwan takes place at the same time as the Animal Precision Nutrition International Forum Taiwan, which is organized by the Chinese Society of Animal Science and the World Poultry Science Association Taiwan Branch. This event features 18 speakers from the industry who will share useful information about farming, animal health, and nutrition management, and it also offers a chance for more than 320 industry professionals to meet and share their knowledge.

Highlighting Farm-to-Production Solutions

Focused on empowering farmers through technological advancement, the expo will showcase innovations across the livestock sector, including:

- Smart Environmental Control Systems & Equipment
- Precision Feeding Equipment
- Animal Health Monitoring Biotechnology & Equipment
- Livestock Wastewater Treatment
- Slaughtering & Processing Technology
- Egg Grading Equipment & Systems
- Animal Welfare Enhancement
- Livestock & Poultry Feed & Additives
- Pet Food & Wellness Products
- Alternative Proteins & New Feed Ingredients
- Animal Medicine & Vaccines
- Pet Medicine & Vaccines
- Feed Processing Equipment

An Unmatched Opportunity for Global Livestock-Tech Engagement

"Philippine Association of Feed Millers highly commends the Taiwan Smart Agriweek 2025. It was a well-organized event that highlighted innovative and sustainable solutions for the agri- and feed industries - globally. The networking with the Taipei Commercial Association and the VIP Tour for PAFMI delegates were greatly appreciated and helped foster meaningful connections and potential collaborations for the future between Taiwan and Philippines feed sectors.

— Teodoro C. Deocares
President of Philippine Associations of Feed Millers

More than an exhibition, **AgriLivestock & Feed Taiwan** is where global innovators meet **Asia's real operational demand**. The event connects solution providers with professional buyers seeking technologies that can be deployed across poultry, dairy, and swine farms — spanning feed milling operations, livestock housing, and smart farm management.

Secure your booth to connect with qualified buyers and partners across Asia's livestock industry.

For exhibitor enquiries and booth proposals, please contact:

Ms. Rae Chang
rae_chang@myexhibition.com.tw
+886-2-2598-2630 #114

For media

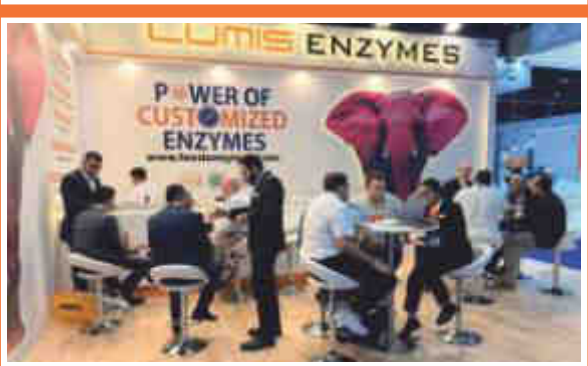
About the organizer of AgriLivestock & Feed Taiwan, part of Taiwan Smart Agriweek

Established in 2014, MY Exhibition Co., Ltd. is a subsidiary under WES Expo Group, building on its parent company's success in organizing Taiwan companies' participation in overseas trade shows.In the same year (2014), MY Exhibition launched Taiwan Smart Agriweek, aiming to create a platform showcasing agricultural innovation and technologies, bringing Taiwan's agricultural tech expertise and achievements to the global stage, while also connecting international buyers to explore trends, business opportunities, and a one-stop sourcing platform—promoting industrial upgrade and sustainable development.

Contact For Media:
Ms. Taryn Agatha
taryn_agatha@myexhibition.com.tw
+886-2-2598-2630 #101

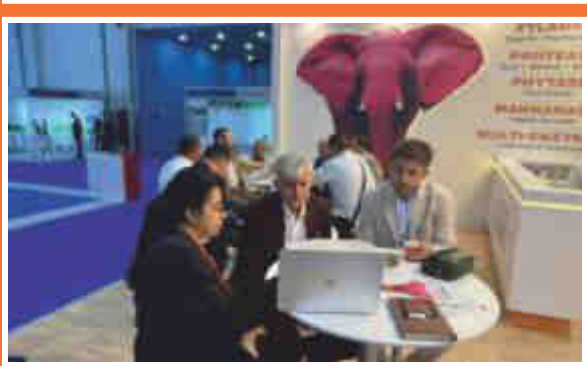
LUMIS ENZYMES

AT VIV MEA, ABU DHABI, U.A.E.



LUMIS ENZYMES

AT VIV MEA, ABU DHABI, U.A.E.



Kick-Off Meeting for WVPA Asia Meeting 2026

held in New Delhi

"Innovations in Poultry Disease Management for a Safer/Healthier World."

The World Veterinary Poultry Association (WVPA), in association with WVPA India and with Agrinnovate India Limited and Department of Animal Husbandry and Dairying (DAHD) Ministry of Animal Husbandry, as Knowledge Partners, successfully organized the Kick-Off Meeting for the 7th WVPA Asia Meeting on 9 January 2026 at NASC Complex, New Delhi. The meeting held under the chairmanship of Dr. M. L. Jat, Director General, ICAR. The Guest of Honor was Dr Inderjeet Singh, Hon VC BASU and Special Guest Dr Pravin Malik, AHC, set the strategic course for the international conference to be hosted in New Delhi on 9–10th October 2026.

The kick-off meeting brought together leaders and stakeholders from government, academia, industry, research organisations and professional bodies to deliberate on priorities, partnerships and the roadmap for the Asia Meeting. deliberations focused on strengthening disease preparedness, biosecurity, accelerating digital transformation, addressing antimicrobial resistance (AMR), improving nutritional efficiency, and advancing sustainable and profitable poultry production across Asia.

Key highlights:

- **Dr. Ajit S. Ranade** delivered the opening remarks and provided an overview of the meeting agenda and objectives and was moderator for the panel discussion.
- **Dr. Shirish Nigam,** Secretary, WVPA India, addressed the strategic role of WVPA India in strengthening Asia's poultry knowledge network, underlining that Asia accounts for approximately **50% of the world's egg and chicken production** and that coordinated regional cooperation is essential for future growth.
- **Dr. Jeetendra Varma,** President, WVPA India, outlined WVPA India's action plan and roadmap leading up to the 7th WVPA Asia Meeting (9–10 October 2026), and briefed attendees on the proposed programme structure and preparatory milestones.
- **Mr. Suresh Chitturi,** Managing Director, Srinivasa Group (Keynote Address), highlighted India's rapid growth trajectory in poultry production. He noted that India currently produces approximately 149 billion eggs annually, with a per capita egg consumption of 106 eggs per person per year and projected that egg production could reach 200 billion in future years. On poultry meat, Mr. Chitturi observed that India is the world's fifth-largest producer, with per capita chicken consumption around 7.5 kg per person per year, and an expected sectoral annual growth of 8–10%.
- **Dr. Praveen Malik,** Animal Husbandry Commissioner (AHC) DAHD, Government of India; CEO, Agrinnovate India Limited) urged industry stakeholders to bring forward practical issues and suggestions to strengthen the poultry sector and reaffirmed the Animal Husbandry Department's support for collaborative initiatives.

- The programme included a special online address by **Prof. Dr. Sjaak,** WVPA Global President, who highlighted WVPA's international activities and the association's role in fostering global exchange among poultry health professionals.
- **Dr. Inderjeet Singh**, Hon Vice-Chancellor, Bihar Animal Science University, Guest of Honour emphasised industry-led research and stronger industry-academia partnerships and called for initiatives that support rural and backyard poultry systems.
- High-level participation and active contributions from ICAR leadership included **Dr. M. L. Jat** (DG, ICAR), **Dr. Divakar Hemadri** (ADG Health) and **Dr. A. K. Samanta** (ADG, Nutrition) all of whom pledged support and provided guidance for the Asia Meeting. The DG assured the poultry industry that there will be no shortage of maize for poultry farmers in the coming days.

Leadership Panel Discussion

The meeting concluded with a Leadership Panel discussion on **"What Asia Expects from India's Poultry Leadership"**, comprising representatives from poultry industry organisations and associations, major integrators, animal health and feed companies, and academic and research experts. Mr. Ranpal Dhandha, President, PFI, Dr Yash Goyal, MD MSD, Mr Vijay Teng, President, INTAS, Mr Uday Singh Bayas President, Poultry India, Dr Arun Atrey, CEO Zenex AH, Dr Sanjay Gavkare GM, Venkys, Dr CB Pathak VP VIP, Dr Ali Asgar, MD Saife VetMed, Dr Leena Bora










Sanitrol-WS

One Solution for All Types of Water

Synergistic blend of DDAC + Organic acids
+ Metal ion binders

JK-5

Strongest Solution for Terminal Clean-out

- Provides longer residual effect.
- Perfect concentrated blend of time-tested & efficacious clean-out chemicals which are complementary to each other.
- Works effectively in low/high temperatures. No negative impact on birds even if used in their presence.

TN-8

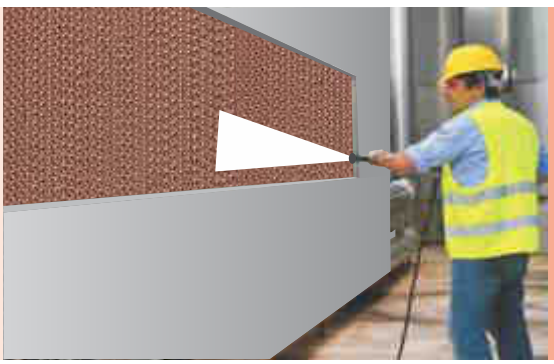
Modern Chemo- Gaseous Sterilant

- Unique synergistic combination of biocides to provide maximum microbial action.
- Contact sterilant & provide chemo-gaseous effects. Thereby, it also disinfects difficult to reach areas of shed & hatchery.

MULTIACT SUPER

The Best Solution for Cooling Pad Cleaning

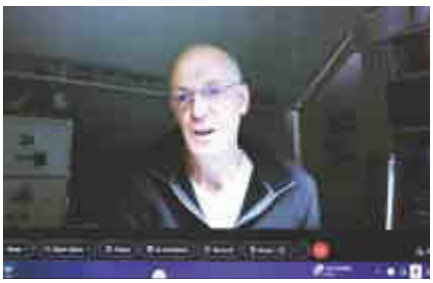
- Cooling pad treatment removes scale, mineral deposits, junk, slime from water lines and cooling pads.
- Phosphate-free, citrated, biodegradable.
- Non-staining and safe. Ideal for cleaning & descaling nipple waters & cooling pads.



AYUGEN® PHARMA PVT. LTD.
(An ISO 22000:2018 & GMP Certified Company)

Regd. Office: 202, "Aranya," Aamachi Colony,
Behind Venky's Express, Bavdhan Pashan Road,
Pune - 411021. Maharashtra, India.
Contact No.+91 9730076211/ 9730076216
E-mail : info@ayugenpharma.com





Vamso, Dr NK Mahajan, Mr Mohit Malik, Mr SK Malhotra, Dr Divakar Hemadri ADG ICAR, Dr AK Samanta ADG ICAR, Maj Gen ML Sharma Gen Secy NAVS were among the panelist. The panel explored regional expectations, potential avenues for public-private collaboration, student engagement and capacity building, technology transfer, and pathways to strengthen preparedness against transboundary diseases and AMR.

Notable commitments announced during the session included support from industry associations to promote attendance and sponsorship for veterinary students and emerging professionals.

Closing

The Kick-Off meeting reaffirmed India's readiness to host an inclusive and high-impact international forum that will advance science, policy and industry practice in poultry health and production across Asia. The organisers expressed their appreciation to all participants, speakers and partner organisations for their active contributions. The meeting closed with a formal word of thanks by **Dr. B. Barman**.

About WVPA & WVPA India

The World Veterinary Poultry Association (WVPA) is a global professional body founded in 1959 that brings together veterinarians and avian health professionals from academia, research, government and industry. WVPA presently has branches across multiple countries and works to promote scientific exchange and best practice in poultry health and production. WVPA India is the national branch facilitating regional cooperation and the organisation of the WVPA Asia.

For any enquires pls contact,
WVPA India or
Agrinnovate India Limited at
dr.barman@gmail.com
Pls visit
www.wvpaasiameeting2026.com


Poultry India 2025 Witnesses Optima Life Sciences at Its Innovative Best

Optima Life Sciences marked a powerful presence at **Poultry India Expo 2025**, reinforcing its commitment to innovation, quality, and customer trust. The stall was formally inaugurated by **one of our esteemed European distributors,** symbolizing our expanding global footprint and strengthening international collaborations.

This year, Optima Life Sciences presented a **unique manufacturing-facility-themed stall**, designed to give visitors a closer look at our production excellence, stringent quality standards, and the scientific rigour behind every product. This setup was crafted to build deeper trust among customers by showcasing how our products are made with precision, consistency, and global-quality benchmarks.

A key highlight of the event was the **special launch of our proprietary probiotic strain – Bacillus velezensis OLS-1101**. The unveiling was done by the distinguished inventors:

- **Dr. Sudipto Haldar,** Director, Agrivet; PhD, Animal Nutrition
- **Dr. Amit Pal,** Scientist G, Division of Pathophysiology, NICED Kolkata

The expert discussion held during the launch was attended by **leading veterinarians, consultants, and key customers** from the poultry industry. The session provided scientific insights into the strain's development, its unique mode of action, and its potential to transform poultry gut health management.

To further elevate the visitor experience, Optima Life Sciences curated a **premium Golf Play Zone**, offering a business-class networking activity widely appreciated within the industry. The booth also featured a **fine-dine experience**, creating an engaging environment that led to candid moments and pure networking for our guests.

Optima Life Sciences' participation this year was a testament to our continuous pursuit of excellence, innovation, and customer-centric solutions. We remain committed to advancing poultry health with science-backed products and strengthening our partnerships across India and beyond.

EXPATICA BIOPHARMACEUTICA Pvt. Ltd. and ABTEC Ltd. Sign MoU for R&D Collaboration & YELM Pro®

*unveiled by **H.E. Dr. C.V. Anand Bose,** the Honorable Governor of West Bengal*

EXPATICA BIOPHARMACEUTICA signed a Memorandum of Understanding (MoU) with the Agro Biotech Research Center Ltd. (ABTEC), presided over by the Honorable H. E. Dr. C. V. Anand Bose, Governor of West Bengal; Chairman of the ABTEC Ltd., Mr. K. M. Jacob; Dr. Sachindra Nath Mandal (Executive Director, EXPATICA BIOPHARMACEUTICA); and Dr. Mithilesh Kumar Jaiswal (Additional Director, R&D).

EXPATICA BIOPHARMACEUTICA Pvt. Ltd., a company based in Mumbai, the "City of Dreams," guided by the philosophy "Expert guide to biopharmaceuticals," is an ISO 9001 and GMP certified member of the Association of Industry Veterinarians and Researchers. EXPATICA BIOPHARMACEUTICA is a new-generation, research-driven, innovative Indian bio-pharmaceuticals company offering new levels of excellence in veterinary pharmaceutical formulations for better animal health & nutrition through the use of a broad range of "eco-safe innovative biotic components."

Agro Biotech Research Center Ltd., a company based in Kottayam, "City of Letters," stands at the forefront of bioscience innovation, dedicated to advancing human, animal, and plant health through cutting-edge scientific research. ABTEC Ltd. is committed to developing natural and organic products. Guided by a passion for innovation and a dedication to research excellence, ABTEC has evolved into a leading force in the bioscience industry.

This MoU has been signed to collaborate on Research and Development (R&D) initiatives. Under the MoU, the two organizations aim to build a knowledge platform to support. This strategic partnership aims to leverage the strengths of both companies to develop innovative probiotic and phytobiotic solutions for the agro-veterinary segment. The collaboration will focus on sharing of good global practices in animal nutrition and technology.

YLEM Pro® is a unique combination of 4-in-1 clinically studied postbiotics, paraprobiotics, probiotics, and prebiotics that work in synergy to enhance trained immunity and support a balanced gut microbiome. The term "YLEM" is related to the concept of "the Cosmic egg," also referred to as "Bramhand (Universe)," as it contains multiple components for various functions. This product is a new multi-pronged approach to replace antibiotics. The YLEM Pro® is the outcome of the R&D initiatives of EXPATICA in collaboration with Agro Bio-Tech Research Centre Ltd. (ABTEC) for the screening & development of novel gutbiotics. All the probiotic strains used in this product are stable in nature.

The chairman of ABTEC Ltd., Mr. K.J. Jacob, said, "The coupling of EXPATICA's innovation and ABTEC's R&D base will certainly give an extra boost to our start-ups. This partnership aims to move from intent to implementation, turning this MoU into measurable outcomes and tangible results. I want to express my gratitude to the management and the dedicated teams at both organizations, who have worked tirelessly to bring this agreement to fruition."

Dr. Sachindra Nath Mandal, Executive Director of EXPATICA BIOPHARMACEUTICA, said, "This partnership marks a pivotal moment in our shared journey to transform biopharmaceutical innovation. Our collaboration will accelerate R&D and drive scientific excellence. Together, we're committed to making a meaningful impact on global health."

Mr. Bibin Jacob, Managing Director and CEO of ABTEC Ltd. Said, "We are excited to partner with ABTEC Ltd., to drive innovation in Agri- Livestock and Start-up Entrepreneurship".

Dr. Mithilesh Jaiswal (Additional Director R&D) said, "This collaboration aligns with our commitment to developing and delivering effective and eco-friendly solutions for the sustainable health benefits of Agri-Livestock.

Build on a legacy of innovation

Meyn

Meyn Food Processing Technology B.V. is a company based in Oostzaan, Netherlands and was established in 1959. The company solely focuses on hightec solutions for the poultry processing industry. For decades, Meyn has focused exclusively on serving the poultry sector with global experience.

Meyn is trusted by top poultry processors in over 100 countries around the globe and plays a key role in meeting the ever-growing world demand for protein.

Meyn India Pvt. Ltd. is a 100% wholly subsidiary of Meyn Food Processing Technology B.V. established in 2018 in Greater Noida, Delhi NCR.

Meyn India

Meyn India brings world-class poultry processing technology directly to South Asia. With a local facility and dedicated in-house engineering team, Meyn India ensures minimal downtime by maintaining a strong inventory of essential spare parts for quick delivery. More than just an office, Meyn India embodies the company's commitment to tailored solutions and top-tier service.

Since its inception in India, it has been rapidly transforming the region's poultry processing landscape. This commitment to reliable, high-quality service has built a loyal customer base, and has positioned Meyn India as a trusted leader in the region's poultry processing landscape.

Visit meyn.com
Feel free to contact Meyn India Private Limited
Call +91-120-6910900 or mail meynindia@meyn.com

Birds prefer meyn®

Meet the Powerhouse

The driving force of Meyn India is a dynamic team of highly skilled professionals who bring unmatched expertise to the table. Our team is composed of:

- **Service Engineers:** Ready to ensure your equipment runs smoothly and efficiently.
- **Spare Parts Manager:** Keeping inventory stocked with the essential components you need, minimising downtime.
- **Capital Sales Manager:** Ensuring that you have access to the most advanced poultry processing technology in the world.

Together, this team of specialists ensures that every customer interaction is smooth, and tailored to meet specific needs.

Message from Director Desk

Meyn, our customers are the heartbeat of everything we do. We are deeply grateful for your trust and partnership, and it is our honour to serve you with the finest poultry processing equipment and services available today.

As we continue to grow together, rest assured that our team is always just one call away. Whether it's an inquiry about our equipment or a service-related question, our dedicated experts are ready to assist you with prompt, satisfactory solutions.

Thank you once again for choosing Meyn. We look forward to many more years of innovation and shared success.

- Mr. Mukanjay Singh, Director

Memorial Tribute to

Late Shri Chitturi Jagapati Rao

Chairman, Srinivasa Farms Pvt. Ltd.

(15.04.1933 – 29.11.2025)

A solemn and dignified memorial meeting was held to pay heartfelt tribute to the fond memory of Late Shri Chitturi Jagapati Rao, the legendary pioneer of India's poultry sector and International Egg Person of the Year – 2023. The tribute took place at the Telangana Poultry Federation, Pedda Amberpet, Hyderabad, commencing at 10:00 AM.

The tribute programme was jointly organised by the Telangana Poultry Federation, the Indian Poultry Equipment Manufacturers Association (IPEMA – Poultry India), and the All-India Poultry Journalists Association, with active participation from members of the National Egg Coordination Committee (NECC). The event drew poultry farmers, industry leaders, and representatives from Telangana and other states, making the programme a resounding success.

Members of the Chitturi family- Suresh Rayudu Chitturi, Jahanavi Chitturi, Harsha Chitturi, Samyuktha Chitturi, along with other family members-graced the occasion. Floral tributes were paid and a ceremonial lamp was lit in memory of the departed visionary, followed by condolence messages and heartfelt tributes.

Speaking on the occasion, Uday Singh Bayas, President, IPEMA, fondly recalled Shri Jagapati Rao's remarkable journey, noting that he devoted his entire life to the growth of the poultry sector and the welfare of farmers. He described Shri Jagapati Rao as a true institution builder whose vision brought Indian poultry global recognition.

Family members and speakers noted that Shri Jagapati Rao was a co-visionary behind institutions such as Srinivasa Farms and NECC, and that his leadership, values, and service-driven approach transformed the lives of thousands of poultry farmers. He is remembered with profound respect as a Poultry India Legend, whose enduring legacy will continue to inspire generations to come.

The memorial meet was attended by several eminent leaders of the poultry fraternity, including Lakshma Reddy, Dr. Senthil Kumar, Murthy, D. Sudhakar, G. G. Chandra Shekhar Reddy, Mohan Reddy, V. Bhaskar Reddy, P. Venkat Rao, K. Narayana Reddy, V. Kondal Rao, P. Venu Madhav Reddy, Sanjeev Chintawar, Chakradhar Rao, and Abhisek Reddy, along with many senior members of NECC, TPF, IPEMA, poultry journalists, and poultry farmers.

The entire poultry fraternity across the country deeply mourned the loss of Shri Chitturi Jagapati Rao, remembering him as a compassionate leader, visionary entrepreneur, and an unwavering champion of poultry farmers.

Bhuvana Nutribio Sciences, India & Andres Pintaluba S.A. (APSA) Spain

Successfully Hosts 2nd Technical Seminar

under Bhuvana – Pintaluba Tech Series in Raipur

Bhuvana Nutribio Sciences, India & Andres Pintaluba S.A. (APSA), Spain, successfully organized its **2nd Technical Seminar under the Bhuvana–Pintaluba Tech Series on 15th Dec 2025 at Hotel Sayaji**. The event marked an important milestone in Bhuvana-Pintaluba's ongoing efforts to promote science-led, practical solutions for the poultry industry.

The seminar commenced with a **Ganesh Vandana**, followed by a welcome address by **Dr. Nikhil Adagale, General Manager, Bhuvana**. In his address, he emphasized the company's strong commitment to advancing poultry health through innovation, research, and technical excellence.

The keynote session was delivered by **Dr. Rais Rajpura**, Assistant Professor at the Department of Animal Science, Anand Agricultural University, Anand, Gujarat, and an internationally experienced Technical Advisor. His presentation on **"Integrated Approach to Gut and Respiratory Health in Poultry"** offered valuable scientific insights and practical strategies aimed at improving flock performance and overall farm profitability.

Following the keynote address, **Dr. Jyoti Kumar Mainali, Area Manager-Asia of Andres Pintaluba S.A. (APSA)**, presented an overview of the company's corporate profile. She highlighted its **European-origin Tiamulin 10%** (APSAMIX TIAMULIN 10%) and other research-driven products like APSAVIT OVOSMART, APSA MIOCHEM 20, and APSA AMINOVIT, developed through robust R&D capabilities.

Further, **Dr. Nikhil Adagale** shared insights into the Bhuvana journey, outlining the organization's core strengths in gut health management and showcasing **innovative tablet-based solutions** designed to address critical poultry health challenges. (**GutPROP WS**).

The seminar witnessed active participation from **key poultry stakeholders and protein producers from Chhattisgarh and Odisha**. The interactive technical discussions were highly appreciated for their depth, practical relevance, and industry-focused approach.

Key protein producers in attendance included:

Mr. S. S. Brahmankar, Mr. Achin Banarjee, Mr. Dhanraj Banarjee, Mr. Mukesh Brahmankar, Mr. Govind Chandrakar, Mr. Virendra Chahal, Mr. Sachidanand Meher, Mr. Nalin Meher, Mr. Binaya Meher, Mr. H. Suryakumar, Mr. Yashwant Chandrakar, Mr. Rajesh Chahal, Mr. Muhamad, Dr. Manoj Shukla, Dr. Amit Yeskal, Dr. Bijendra Sahu, Dr. Shlok Sahu, Mr. Gopal Ugra, Mr. Suman Mishra, Mr. V. Ramna, Mr. Shivdev Singh Kalkat, along with other esteemed protein producers.

The event served as a strong branding and engagement platform for Bhuvana Nutribio Sciences India & Andres Pintaluba S.A. (APSA) Spain, while opening new business opportunities across the eastern and central regions of India. **Bhuvana-Pintaluba expressed its sincere gratitude to all participating protein producers for their active involvement and continued encouragement toward its mission of delivering science-backed poultry solutions**.

Team Bhuvana - Pintaluba!

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

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

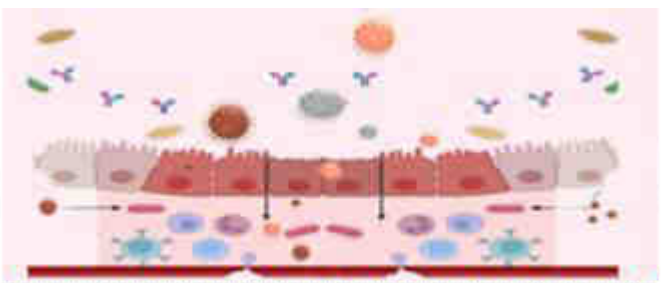
Environmental changes cause immuno-suppression and make the birds more prone to viral infections. These viral challenges namely Newcastle disease (ND), avian influenza (AI), infectious bronchitis (IB), and others—continue to impose a significant threat to the poultry industry worldwide, resulting in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

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

Understanding the Role of Mucosal Immunity

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

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



Mucosal immunity- Defence at the entry point of the virus

Key components of mucosal immunity include:

- **Mucus layer:** Forms the first protective barrier at mucosal surfaces. Mucin, a structural protein (lubricant) in the mucus layer secreted by goblet cells entraps viral particles and inhibit epithelial adhesion and penetration.
- **Secretory IgA (sIgA):** The most important antiviral antibody at mucosal sites. sIgA binds to viral antigens, neutralizes them extracellularly and intracellularly, and prevents attachment and entry into epithelial cells.
- **Tight junction proteins:** Tight junction proteins (claudins, occludin, ZO-1) function as selective

permeability regulators that prevent paracellular leakage. Viral pathogens frequently disrupt TJ integrity to facilitate epithelial invasion. Enhanced TJ expression strengthens the mucosal barrier, limiting viral penetration and subsequent viremia.

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

Importance of Feed-Based Mucosal Defence Approaches

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

Feed-based mucosal defence solutions offer several advantages:

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

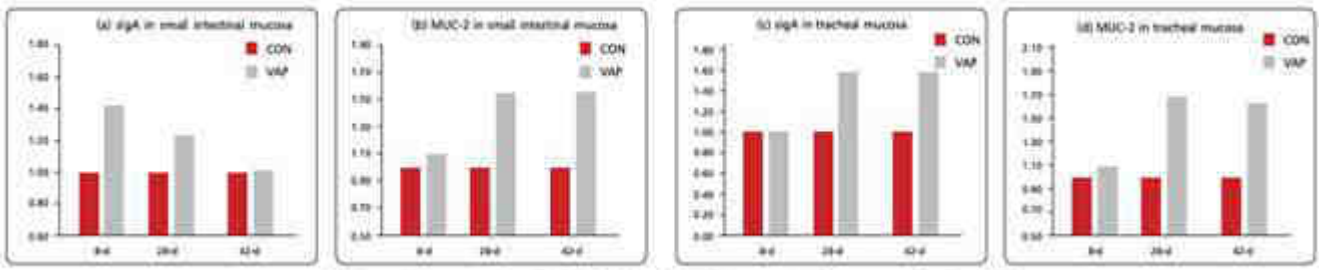
These attributes justify the integration of functional feed additives in comprehensive disease prevention programs.

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

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

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

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



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

Research Evidence and Field Validation

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

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

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

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

Way forward

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

Effect of Pesticides on Poultry Health and Performance

Dr R.N Sreenivas Gowda* and **Dr B.P.Manjunath****

*Former and Founder VC, KVAFSU, Bidar. former Director IAH&VB, Bangalore, Former Prof and University Head, Dept. of pathology, Veterinary College UAS Bangalore

** Director, GROEXL PVT LTD, Bengaluru

INTRODUCTION

The poultry industry is growing fast to meet the demand of animal protein for the rapidly growing population through eggs and meat supplementation. Like mycotoxins, the pesticides also enter in the animal and human food channel and cause significant residual effects. Pesticide toxicity in poultry feed occurs when pesticides used on crops and their storage, or environmental sprays contaminate the feed, either directly or through bioaccumulation, which can then be passed on to consumers through products like meat and eggs.

Few facts about Pesticides:

- Pesticides are used during crop cultivation to control pests, and residues can remain in the harvested grains used for feed
- Higher toxicity of some pesticides in birds than in mammals is due to the lower activity of avian metabolic enzymes.
- The bioaccumulation in birds is limited for very hydrophobic pesticides resistant to metabolic degradation.
- The gut microbiota in chickens exposed to thiram exhibited a significant decline.
- The ability to metabolize pesticides is weaker in young chicks compared to adult hens, making them more vulnerable.
- Mycotoxins and pesticides simultaneously found ,high rates of co-occurrence and bioaccumulation rates: Mycotoxins complicate pesticide toxicity and vis versa is also true.

Birds physiological factors differ in absorption of toxins

Characteristics of avian anatomy and physiology differs in the absorption od toxicity of pesticides between birds and mammals and are influenced by many factors. Birds gulf food more rapidly than mammals, and hence the birds ingest more pesticide from contaminated feed in a given time. Further, the birds are oviparous animals, and their eggs additionally provide a characteristic excretory route for lipophilic pesticides, which exposes the next generation to the pesticide at an early embryo developmental stage.

Furthermore, the liver is more vulnerable in birds than in mammals, and avian urine is voided into the cloaca with the possible reabsorption of metabolites from here in addition to the intestine. Finally, the existence of the coccygeal mesenteric vein connecting the hepatic portal vein to the renal one facilitates the transport of the pesticide and its metabolites through the blood stream from the gastrointestinal tract to both the liver and kidneys, which increases the contribution of metabolism in the avian kidney.

Metabolism of a pesticide is one important factor in controlling its bioaccumulation. The acute oral toxicity of pesticide varies widely among avian species, depending on body size, feeding habits, and the activity of metabolic enzymes.

How the contamination of pesticides occurs in poultry?

Contamination of poultry feed may occur during handling, storage and transportation, or it may result from accidental or deliberate. Risk management should be based upon prevention rather than reaction after detection of the problem.

Pesticides enter poultry feed through several distinct pathways, primarily revolving around contaminated inputs, environmental exposure, and other management practices.

1. Contaminated Feed (Primary Pathways:

Contaminated feed is considered the leading source of pesticide residues in poultry:

a) **Agricultural Residues:** Grains used in poultry feed (such as soy, corn, or wheat) often contain residues from pesticides applied during cultivation.

b) **Imported Ingredients:** Feed ingredients like soya from regions with high pesticide can introduce chemicals that are otherwise banned in the destination country.

c) **Cross-Contamination:** Feed can be contaminated during storage or transport by insects or mites carrying fungal spores or chemical residues.

2. Direct On-Farm Application:

Pesticides are intentionally introduced to control premise pests and ectoparasites.

- **Ectoparasites Control:** Chemicals like fipronil or pyrethroids (e.g., permethrin) are sometimes used—legally or illegally—to treat red mites, lice, and ticks directly on the birds or their housing.
- **Premise Management:** Residual sprays, baits, and space sprays are used on walls, floors, and litter to control beetles, flies, and rodents.

3. Environmental Exposure

Poultry can absorb pesticides from their immediate surroundings through ingestion or inhalation.

- **Soil and Litter:** In free-range or deep-litter systems, birds may consume contaminated soil or peck at treated litter.
- **Water Sources:** Pesticides can leach into groundwater or surface water used for drinking water in poultry.
- **Airborne Pollution:** Birds can inhale pesticide-contaminated dust or air, especially if they are located near treated agricultural fields.

4. Human Error and Misuse

Accidental introduction often stems from improper handling or illegal practices.

- **Improper Storage:** Storage of pesticides near feed can lead to accidental spills or contamination.
- **Off-Label Use:** Using unauthorized pesticides for food-producing animals.
- **Treated Seed:** Accidentally using seeds treated for planting (with fungicides or insecticides) as animal feed is a known error.

Common Pesticides and Their Effects

- **Organophosphates (e.g., Diazinon, Chlorpyrifos):** These inhibit cholinesterase, leading to hyperstimulation of the nervous system. Signs include diarrhea, incoordination, paralysis, and respiratory distress. Chronic exposure can lead to hyperglycemia and reduced growth rates.
- **Carbamates:** These act similarly to organophosphates but with more reversible effects. High exposure causes muscle twitching, weakness, and pupil constriction.
- **Pyrethroids (e.g., Deltamethrin, Bifenthrin):** While generally less toxic to birds than mammals, they can cause liver and kidney damage, loss of intestinal villi, and reduced egg production.
- **Neonicotinoids (e.g., Imidacloprid):** Used for beetle and fly control, these can cause neurobehavioral abnormalities, lethargy, and organ congestion.
    - **Herbicides (e.g., Glyphosate):** Chronic exposure to glyphosate has been linked to oxidative stress, , lipid damage, and negative immune gene expression in broilers. And weakened eggshells, and delayed embryo growth.
    - **Thiram:** Causes leg deformities (tibial dyschondroplasia) and reduces egg quality/production in layers.
    - **Organochlorines (e.g., DDT):** Mimic hormones, cause reproductive issues, and accumulate in fat.

Some examples of active ingredients and their molecular weights include:

- **Glyphosate:** approx. 169 g/mol
- **Atrazine:** approx. 215.68 g/mol
- **Glufosinate-ammonium:** approx. 198.2 g/mol
- **2,4-D amine salt:** approx. 222.1 g/mol
- **Chlorpyrifos:** approx. 350.59 g/mol
- **Lambda-cyhalothrin:** approx. 449.85 g/mol
- **Difenoconazole:** approx. 405.6 g/mol
- **Pyraclostrobin:** approx. 387.9 g/mol

These low molecular weight compounds contribute to properties crucial for pesticide function, such as systemic mobility within the plant or persistence in the environment

Impact of pesticides on poultry

Pesticides negatively impact poultry production by causing health issues like immunosuppression, reproductive problems (reduced hatchability, thin shells), organ damage, and growth stunting, leading to economic losses, while residues also pose food safety risks for consumers, creating a complex challenge for the industry. Exposure, often via contaminated feed or environment, disrupts hormone balance, damages tissues (liver, kidneys, bone), reduces immune function (lower WBC, thymus weight), and affects bird performance (weight gain, egg laying).

Direct Effects on Poultry Health and Productivity

Pesticide exposure, whether acute (short-term) or chronic (long-term), negatively affects several biological systems:

- **Growth and Performance:** Chronic exposure to herbicides like glyphosate or insecticides like malathion significantly reduces body weight gain and feed intake. High doses of carbendazim (200–800 mg/kg) also lead to reduced growth.
- **Egg Production:** Exposure to organochlorines (OCPs), organophosphates (OPPs), and some fungicides causes a drop in egg laying rates and egg size.
- **Reproductive Issues:** Chemicals such as thiram and nicarbazin can decrease hatchability and cause soft-shelled or discolored eggs. Long-term exposure to persistent pesticides can lead to infertility, embryo mortality, and transgenerational metabolic disorders in offspring.
- **Immunosuppression:** Pesticides weaken the immune system by reducing white blood cell counts and T-lymphocyte proliferation. This makes birds more susceptible to secondary infections and reduces the effectiveness of vaccination programs.
- **Organ Damage:** Toxicity often manifests as lesions in the liver, kidneys and heart (vacuolar changes, necrosis) , as well as neurological symptoms like paralysis, tremors, and ataxia.

Symptoms

Toxicity is suspected when a flock shows sudden behavioral changes or a drop in production.

- **Clinical Signs:** Loss of appetite, ataxia (incoordination), paralysis, diarrhea, convulsions, and increased mortality.
- **Post-mortem Lesions:** Common findings include an enlarged yellow liver, kidney inflammation, gizzard ulceration, and pulmonary edema.
- **Diagnosis:** Definitive diagnosis requires analyzing liver or brain tissue for chemical residues or testing for depressed cholinesterase activity.

Diagnosing pesticide toxicity in poultry involves observing clinical signs (lethargy, paralysis, diarrhea, respiratory distress), performing post-mortem (necropsy) to find organ damage (liver, kidneys, brain), and lab tests like acetylcholinesterase (AChE) assays in blood/tissues and chemical residue analysis in feed/tissues, with specific signs depending on the pesticide (e.g., SLUD for carbamates, neurological issues for neonicotinoids).

Diagnostic Differences

Feature	Mycotoxicosis	Pesticide Toxicity
Onset	Often subclinical or chronic; signs may follow a new feed batch.	Often acute and rapid; high mortality shortly after exposure [Previous Turn].
Oral Lesions	**Characteristic:** Yellow plaques, ulcers, or crusts on the tongue, palate, and beak (Trichothecenes/T-2).	Rare, except for caustic pesticides like copper sulfate which cause blue-green erosions [Previous Turn].
Neurological	Tremors or lack of coordination (DON, T-2).	Severe seizures, splayed legs, or paralysis are more typical [Previous Turn].
Organ Damage	**Liver:** Enlarged, fatty, yellow (Aflatoxin). **Kidney:** Swollen, visceral gout (Ochratoxin).	Often non-specific congestion or pulmonary edema [Previous Turn].
Feathering	Poor feather quality and ruffling are common.	Generally not a feature of acute poisoning [Previous Turn].
Immune System	Significant immunosuppression and atrophy of the Bursa of Fabricius.	Typically no immediate effect on immune organs [Previous turn]

IMPACT

a) Industrial Impact

- Economic losses due to reduced productivity (weight, eggs) and increased mortality.
- Food safety concerns for consumers due to residues in meat and eggs.

Key issues

1. **Bioaccumulation in Meat and Eggs:** Many pesticides are lipophilic (fat-soluble) and accumulate in abdominal fat, muscle, and egg yolks. Residues in the skin and liver are often significantly higher than in breast muscle.
2. **Regulatory Rejections:** Detection of residues exceeding Maximum Residue Limits (MRLs) can lead to the seizure and destruction of products, resulting in total economic loss for the producer.
3. **Bio-Control Interference:** Chemical pesticides can negatively impact beneficial entomopathogenic fungi (like Beauveriabassiana) used for natural pest management in poultry houses, potentially leading to increased reliance on chemical treatments.

b) Public health concerns

- **Residues in products:** Pesticides can accumulate in poultry products like meat, liver, and eggs, posing a risk to human consumers.
- **Bioaccumulation:** Some pesticides are persistent and can build up in the body over time.
- **Consumer safety:** Pesticide residue limits are set by regulatory bodies, but contamination exceeding these limits is a significant concern for food safety.

Management and prevention

Proper feed management: Ensure feed is stored in clean, pesticide-free areas and is properly sourced.
Strict monitoring: Monitor feed for pesticide residues, especially when introducing a new batch or source.
Pesticide-free practices: Limit the use of pesticides on crops, in poultry houses, and on stored feed.

Prevention is paramount:

- **Source high-quality feed:** Use reputable suppliers with strict quality control.
- **Store feed properly:** Keep feed in a cool, dry, and well-ventilated area, and use pallets to prevent contact with moisture on the floor.
- **Follow FIFO:** Use the "First-In, First-Out" principle to ensure the oldest feed batches are used first.

Control rodents and pests: Secure storage areas to prevent rodents and insects from contaminating feed with droppings or urine.

To overcome pesticide toxicity in poultry feed, a multi-pronged approach is necessary, focusing on prevention, detoxification, and supportive care of liver

The liver is vital for metabolism and detoxification, making it a frequent target for toxins. Liver tonics are supplements that can assist and protect the liver from damage caused by residues, and also assist liver to flush out toxins, helping birds recover faster from exposure to pesticides, mycotoxins, and other harmful substances. A healthier liver strengthens the bird's immune system, making it more resilient to stress and disease.

Mitigation and Safe Usage

To minimize negative effects, producers should:

- Use only products clearly labelled "For Use On Poultry".
- Ensure accurate dosing; overdoses are potentially fatal, especially for young birds.
- Protect feed and water from contamination during application.
- Consider specific to reduce the bioavailability of pesticide residues already present in feed as the dynamics of absorption and metabolism varies.

Inorganic (Mineral-Based) Binders -

These are naturally occurring clay minerals that adsorb toxins onto their surface.

1. **Hydrated Sodium Calcium Aluminosilicate (HSCAS):** Widely used and particularly effective at binding aflatoxins and pesticides. It is cost-effective and commonly used. Binding of of pesticides is pH independent.
2. **Carbon-based or derived from biological sources-**
   - o **Activated Charcoal (Activated Carbon):** Known for its high porosity and broad-spectrum binding ability against various chemicals, pesticides, and mycotoxins. It is often used in cases of acute poisoning.
3. **Yeast Cell Wall Extracts:** Components such as mannan oligosaccharides (MOS) and beta-glucans are effective at binding specific mycotoxins and pesticides and also help modulate the immune system and support gut health.
4. **Plant/Herbal Extracts:** Certain compounds and insoluble fibers from plants are being explored for their binding capabilities and antioxidant properties.

Bio- transforming Agents-

Some advanced approaches use biological methods to neutralize toxins:

- **Enzymes:** Specific enzymes can break down residues into less harmful, non-toxic metabolites.
- **Bacteria/Probiotics:** Certain strains of lactic acid bacteria and other microbes can help detoxify within the g
- **Liver correctives**

Combination Products: Pesticide mitigation requires multi-pronged approach including binding and protecting liver and other tissues
Many commercial products use a combination of these ingredients to offer broad-spectrum protection against a variety of contaminants, including mycotoxins and chemical residues.
Always consult manufacturer guidelines and potentially a poultry nutritionist to select the most appropriate binder based on the specific feed contamination risk.

Conclusion

Pesticide toxicity in poultry operations typically occurs through contaminated feed, water, or direct exposure from pest control measures within the housing. Common toxic agents include organophosphates, carbamates, pyrethroids and neonicotinoids.

Pesticide toxicity causes oxidative stress, organ damage (liver, kidney), immune suppression, and reduced growth, entering through contaminated feed/water or direct exposure, but can be mitigated by using antioxidants (Vitamin E, Selenium), mycotoxin binders, careful application, removing contaminated sources, and implementing Integrated Pest Management (IPM) for safer insect control with botanicals or physical methods, protecting bird health and food safety.

DHUMAL INDUSTRIES | Poultry Simplified

DHUMAL INDUSTRIES UNVEILS NEXT-GENERATION 50-INCH DIRECT DRIVE VENTILATION FAN FOR POULTRY & LIVESTOCK HOUSES

Engineered for efficiency, longevity, and lowest lifetime cost
Designed and manufactured in India

- High-performance, corrosion-resistant
- Built with a high-grade Polypropylene (PP) body
- Powered by a 1.5 HP heat-dissipating induction motor
- Delivers up to 24,000 CFM (Approx. 40,000 m^3/hr) of air
- Direct Drive Design- eliminates belt losses, up to 20% energy savings, reduced maintenance
- Operational life of up to 15 years

Dhumal Industries India Pvt. Ltd.
Gut No. 157B, 2+3, Peth Road, At Ramshej,
Post - Ashewadi, Tal - Dindori, Nashik - 422003, (MH)
Tel: +91 78878 66084, +91 253 2350384 / 2350684

Broiler Breeder Layer

Scan to Know More

Nashik : +91 9657003684 | Pune : +91 9970100290 | Hyderabad : +91 9970100288 | Bengaluru : +91 9972578084 | Kolkata : +91 9903910984 Anand: +91 7028152484 | Ambala : +91 7773927 484 | Lucknow : +91 7219130084 | Vellore : +91 9443162398 | Bhopal : +91 8380093284 | Bhubaneswar : +91 9028887884 | Bhilai : +91 9713111666 | Palladam: +91 9443162398 | Hajipur: +91 9684704032 | Vijayvada: +91 9028884284

www.dhumal.com | sales@dhumal.com

Mycoplasma-Associated Respiratory Disease in Poultry:

Pathogenesis, Transmission and Modern Control Strategies

Dr. Sanjay Singhal
Chief Operating Officer
Stallen South Asia Pvt. Ltd.

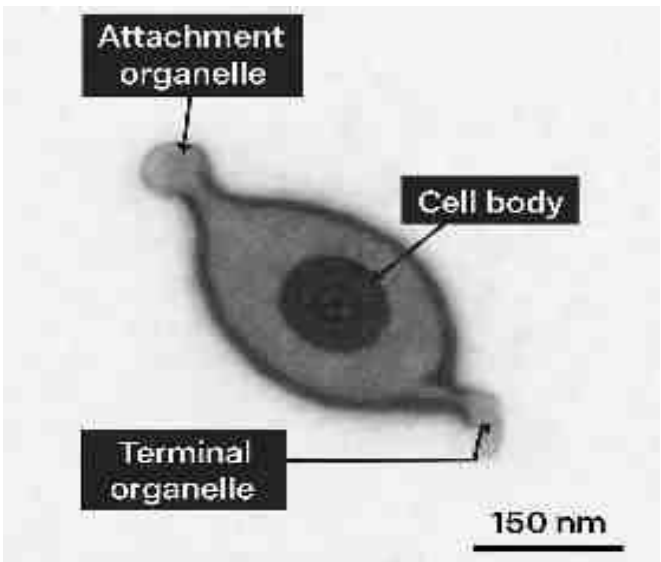
Dr. Kishor Gedam
Product Manager
Stallen South Asia Pvt. Ltd.

Introduction

Respiratory disease remains a major limitation to productivity and welfare in commercial poultry production worldwide. Among bacterial pathogens, Mycoplasma gallisepticum (MG) and Mycoplasma synoviae (MS) are of particular importance due to their ability to establish chronic infections, interact synergistically with respiratory viruses, and persist within intensive production systems (1,2). The epidemiological and clinical impact of Mycoplasma infections has increased in recent decades as a consequence of production intensification, environmental stressors, viral evolution, and declining antimicrobial efficacy (3). These factors have shifted Mycoplasma infection from a discrete disease entity to a complex, multifactorial respiratory syndrome requiring integrated management and targeted therapeutic strategies.

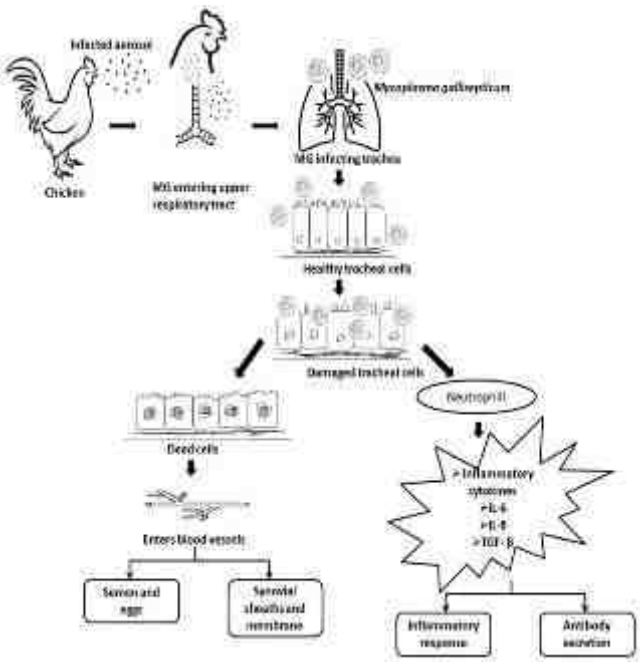
Etiology and Biological Characteristics

MG and MS belong to the class Mollicutes, characterized by the absence of a cell wall, reduced genome size, limited metabolic capacity, and strict dependence on host-derived nutrients (4). The lack of a cell wall confers intrinsic resistance to β-lactam antimicrobials and allows close adherence to host cell membranes. High genetic plasticity and phase-variable surface lipoproteins facilitate antigenic variation and immune evasion, enabling long-term persistence within the host (4,5).



Pathogenesis and Lesion Development

Adherence to the respiratory epithelium is the critical initial step in Mycoplasma pathogenesis. MG and MS attach to ciliated epithelial cells of the trachea, lungs, air sacs, and conjunctiva via membrane-bound adhesins localized in specialized tip structures, including surface lipoproteins such as GapA and CrmA (4,6). Following colonization, Mycoplasmas induce ciliostasis, epithelial degeneration, and impairment of mucociliary clearance, promoting persistent infection and secondary bacterial invasion.



The host inflammatory response plays a central role in lesion development. Mycoplasma lipoproteins activate Toll-like receptor-2 pathways, stimulating epithelial cells and macrophages to release pro-inflammatory cytokines such as IL-1β, IL-6, and TNF-α (7). These responses result in mucosal edema, glandular hyperplasia, mucosal thickening, and accumulation of catarrhal to caseous exudate within the air sacs. Gross lesions commonly include airsacculitis, tracheitis, and, in complicated cases, fibrinous pericarditis and perihepatitis (2). MS may disseminate to synovial tissues, causing synovitis and lameness, and is strongly associated with eggshell apex abnormalities (EAA) in layers (8).

Transmission Dynamics and Epidemiology

MG and MS persist in poultry populations through both vertical and horizontal transmission. Vertical transmission via infected eggs results in early colonization of chicks at hatch and contributes significantly to economic losses (9). Horizontal transmission occurs via aerosols, respiratory secretions, contaminated feed and water, and mechanical spread through personnel and equipment (2). Mycoplasmas may survive for several hours in dust and organic material, facilitating indirect transmission. Sub clinically infected carrier birds that intermittently shed organisms further complicate detection and control, particularly in multi-age production systems (1).

Disease Synergy and Environmental Influences

In commercial poultry, Mycoplasma infections rarely occur as single-agent diseases. MG infection predisposes the respiratory tract to enhanced replication of infectious bronchitis virus (IBV), resulting in increased air sac lesion severity, prolonged viral shedding, and higher viral loads (10). MS infection, particularly in association with nephropathogenic IBV strains, has been strongly linked to EAA, leading to downgraded eggs, reduced hatchability, and sustained production losses (8).

Synergistic interactions between Mycoplasma spp. and Newcastle disease virus (NDV) have also been reported, with even lentogenic NDV strains producing severe respiratory disease in the presence of Mycoplasma due to amplified epithelial damage and impaired mucosal immunity (11). Environmental stressors further exacerbate disease expression; ammonia impairs ciliary function, dust facilitates deep respiratory deposition of pathogens, and temperature stress suppresses mucosal immunity (3).

Antimicrobial Challenges in Mycoplasma Control

Antimicrobial therapy remains an important component of Mycoplasma control; however, increasing antimicrobial resistance has reduced the effectiveness of traditional agents. Rising minimum inhibitory concentrations (MICs) have been reported for macrolides, tetracyclines, and fluoroquinolones commonly used in poultry (12–14). The absence of a cell wall, high mutation rates, chronic persistence, and inappropriate antimicrobial use contribute to resistance development and therapeutic failure (12,13). In addition, Mycoplasmas adhere closely to host cell membranes and may occupy intracellular niches, limiting the efficacy of antimicrobials with poor tissue penetration.

Comparative Antimicrobial Activity Against Avian Mycoplasmas

Table 1 summarizes comparative in vitro activity (MIC_{90} values) of antimicrobials commonly used in Mycoplasma control.

Antimicrobial	MG MIC_{90} (µg/mL)	MS MIC_{90} (µg/mL)
Tylvalosin	0.008–0.03	0.01–0.05
Tylosin	0.06–0.5	0.1–1.0
Tilmicosin	0.03–0.25	0.06–0.5
Doxycycline	0.25–2.0	0.5–4.0
Enrofloxacin	0.12–1.0	0.25–2.0

(12-15)

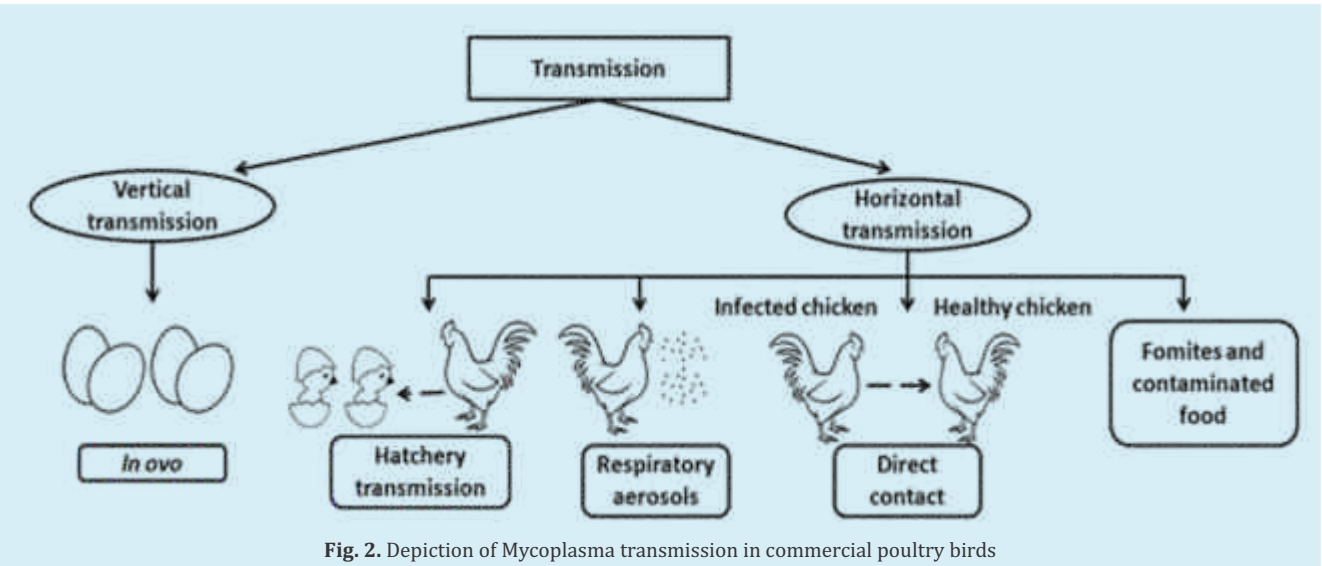


Fig. 2. Depiction of Mycoplasma transmission in commercial poultry birds

Pharmacological considerations for the Use of Tylvalosin

Tylvalosin is a semi-synthetic macrolide developed to address pharmacological limitations of earlier-generation antimicrobials. Structural modification of the tylosin molecule enhances lipophilicity, resulting in improved membrane permeability, intracellular accumulation, and tissue retention (16). Pharmacokinetic studies demonstrate rapid oral absorption and extensive tissue distribution, with lung concentrations four- to eight-fold higher than plasma levels (17).

In vitro studies consistently report low MIC_{90} values against MG and MS (Table 1), indicating strong intrinsic activity against contemporary field isolates (15). Importantly, tylvalosin demonstrates superior intracellular penetration, including accumulation within macrophages, enabling effective targeting of intracellular Mycoplasma populations (16). Beyond antimicrobial activity, Tylvalosin exhibits immunomodulatory effects, including reduced production of TNF-α and IL-6 and decreased neutrophil infiltration, which may mitigate excessive inflammatory responses during Mycoplasma–viral synergistic infections (18).

Integration of Tylvalosin into Comprehensive Control Programs

While antimicrobial therapy alone cannot eradicate Mycoplasma, tylvalosin represents a rational option when integrated into comprehensive control programs including biosecurity, environmental optimization, vaccination against respiratory viruses, and routine monitoring using PCR and serology (1,2). Field studies in broilers, layers, and breeders demonstrate improved respiratory health, production performance, and reduced vertical transmission when tylvalosin is applied strategically (8,19).

Conclusion

Mycoplasma-associated respiratory disease remains a significant challenge in modern poultry production due to pathogen persistence, viral synergy, environmental stress, and antimicrobial resistance. Tylvalosin, with its favorable pharmacokinetic profile, strong activity against MG and MS, intracellular penetration, and immunomodulatory properties, addresses several limitations of traditional antimicrobials. When incorporated into integrated disease management strategies, tylvalosin contributes meaningfully to improved respiratory health and production outcomes in poultry.

Table 2. Pharmacokinetic and Pharmacodynamic Properties of Tylvalosin Compared with Other Antimicrobials

Parameter	Tylvalosin	Tylosin	Tilmicosin	Doxycycline
Lung:plasma ratio	4–8 : 1	~1–2 : 1	~3–4 : 1	~1 : 1
Intracellular penetration	High	Low–moderate	Moderate	Moderate
Tissue retention	Prolonged	Short–moderate	Prolonged	Moderate
Anti-inflammatory effects	Demonstrated	Not reported	Not reported	Not reported

(16-18)

References:

1. Ley DH. Mycoplasma gallisepticum infection. Diseases of Poultry.
2. Kleven SH. Control of avian mycoplasmosis. Avian Dis. 2008.
3. Cook JKA et al. Infectious bronchitis and respiratory disease complexity. Avian Pathol.
4. Razin S et al. Molecular biology of Mycoplasmas. Microbiol Mol Biol Rev. 1998.
5. Gautier-Bouchardon AV. Antimicrobial resistance in avian Mycoplasma. Microbiol Spectr. 2018.
6. Evans JD et al. Adhesion mechanisms of M. gallisepticum. Avian Dis.
7. Muhlradt PF et al. Mycoplasma lipoproteins and immune activation. Infect Immun. 1997.
8. Catania S et al. Mycoplasma synoviae and eggshell apex abnormalities. Avian Pathol. 2010.
9. Carpenter TE et al. Economic impact of vertical MG transmission. Avian Dis. 1981.
10. Evans RD. Synergism between MG and IBV. Avian Dis. 1998.
11. Kleven SH. NDV–Mycoplasma interactions. Avian Dis. 2008.
12. Hannan PC. Antibiotic resistance in Mycoplasma. J Vet Pharmacol Ther. 2000.
13. Le Carrou J et al. MIC trends in avian Mycoplasma. Vet Microbiol. 2006.
14. Lysnyansky I et al. In vitro susceptibility of avian Mycoplasmas. Avian Pathol. 2015.
15. Gautier-Bouchardon AV et al. Resistance mechanisms in avian Mycoplasmas. Microbiol Spectr. 2018.
16. Fischer AH et al. Macrolide intracellular pharmacodynamics. J Antimicrob Chemother. 2015.
17. Taylor DJ. Macrolide pharmacokinetics in poultry. Vet J. 2012.
18. Sirimalaisuwan A et al. Anti-inflammatory effects of tylvalosin. Res Vet Sci. 2013.
19. McLaren J et al. Clinical efficacy of tylvalosin in broilers. Poultry Sci. 2017.

Biofilms: The Bacterial Fortress

TECHNICAL TEAM, HUVEPHARMA SEA

One common survival strategy used by bacteria is to form biofilms. These communities and their inherent resistance to antimicrobial agents are at the root of recurrent bacterial infections in livestock rearing.

Bacteria have adapted to a "biofilmed" state to survive unfavourable environmental conditions such as those which are poorly oxygenated, have extremes in temperature or are lacking in nutrients. In the natural environment, biofilms act as a reservoir for microbial species, constitute a major component of the bacterial bio-mass and guarantee ecological balance. But in livestock buildings, they are a source of permanent contamination that is particularly difficult to eliminate.

A livestock rearing house is a closed space with a dynamic mi-crobial ecosystem due to the high concentrations of organic matter, high temperatures and high humidity levels. The characteristics of this microbial ecosystem are determined by the microbiota of each animal and that of the herd. Animal excrement regularly enriches the microbiota of the building, especially with strains of enterococcus, coliforms, tract of the animals. The presence of animals in the barn causent air. This warm air rises to the top of the building, carrying with it many micro-organisms in the form of bioaerosols. Thus, all surfaces of the building become contaminated and biofilms are formed (see Figure 1).

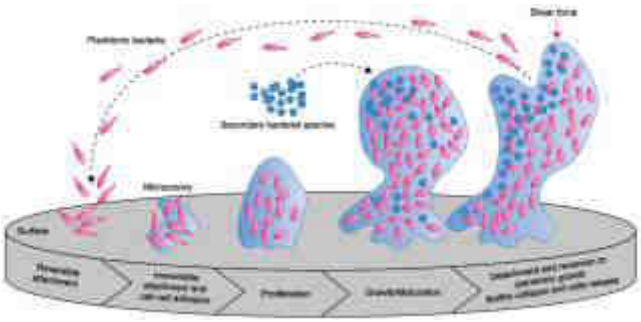


Figure 1. Steps leading to bacterial biofilm formation.

Biofilms are complex structures, constituting a considerable bacterial reserve in livestock buildings. They are formed on surfaces through the accumulation of stacked bacteria which secrete a protective polysaccharide or extracellular polymeric substances (EPS) during the maturation phase. This mucous matrix is excreted through a network of channels in which the medium can circulate.

The thickness of the biofilm does not increase indefinitely. Large aggregates or single cells may detach from mature bio-film and can directly seed other surfaces. The detachment of parts of the biofilm is partly due to variations in temperature and humidity inside the buildings. This contributes to air-borne bacterial spread, causing increased infectious pressure and new animal contaminations (see Figure 2).

The structures forming biofilms contain channels in which nutrients can circulate, and cells in different regions of a biofilm exhibit different gene expressions. The biofilm is therefore a mosaic of micro-niches containing different species but also different phenotypes of the same bacterial species. The cohesion of this microbial community relieson synergistic interactions and homeostatic mechanisms. The complexity of biofilm structure and metabolism has led to the analogy of biofilms to tissues of higher organisms eukaryotes), highlighting their remarkable evolutionary importance. Bacteria in a biofilm can be 1,000 times more resistant than individual bacteria. They acquire increased resistance to antimicrobial agents in two main ways:

1. Physico-chemical resistance

is the failure of an agent to penetrate the full depth of thebiofilm. Polymeric substances like those that make up the matrix of a biofilm are well known to retard the diffusion of antibiotics or disinfectants.

2. Extra-chromosomal resistance

Bacterial resistance to disinfectants is higher when bacteria are in biofilms, due to the acquisition of specific resistance genes carried by plasmids (circular periplasmic chromo-somes). In a biofilm, the plasmids are transferable between bacteria by intercellular bridges. Thus, the acquired resistance can be quickly spread to all bacterial species via horizontal transfer.

Numerous bacterial species and genera that cause infections in animals, and which may or may not have zoonotic potential, can form biofilms. Some examples are:

- Salmonella
- Campylobacter
- Escherichia coli
- Pseudomonas
- Staphylococcus
- Streptococcus

Biofilms increase infectious pressure and bacterial resistance to antibiotics, disinfectants and the immune response of the host. In animal husbandry, contamination of surfaces, air conditioning, ventilation and water distribution system with biofilms is a huge problem. But several of these bacterial species also have an impact downstream in food industries because of their ability to cause infections or food poisoning in humans.

Biofilms are therefore a constant threat to biosecurity because of their ability to diffuse into the environment and colonise all kinds of media. Their resistance to extreme conditions, including disinfection procedures, only makes matters worse. Trying to disinfect without breaking biofilms is useless, and the best and most economical way to break the biofilm is to use detergents. Before the disinfection step, it is imperative to carry out a cleaning step with a detergent to dissolve and eliminate both the visible organic deposits and most of the EPS of the biofilm.

Adherence to this procedure and to general biosecurity management rules guarantees increased effectiveness of the disinfectant and suitable decreasing contamination of the surfaces before placing a new flock or herd in the building. Huvepharma, through its expertise in biosecurity and animal health, provides a range of detergents and disinfectants to eliminate biofilms.

From INR to USD:

Reimagining India's Poultry Industry through Export

by **Dr. Chandan,** Owner, LIORAA

(Strategic Advisor for Animals Nutrition and Health Organiztions)

Two months ago, I was shopping for groceries in a supermarket in Singapore when I couldn't help whispering, "So costly," while staring at the price of eggs. A pack of 10 eggs cost SGD 3.7—roughly ₹252. That's ₹25 per egg, enough to buy four eggs back home in India. A week later, I was in Namakkal, Tamil Nadu, sitting with Ramanna, a layer farmer, during a meeting. He was visibly worried. The lifting rate had dipped again, thanks to oversupply. Soaring input costs added pressure from the other side. "We raise good birds," he sighed, "but we sell them like they're invisible."

His frustration echoes across India's poultry belt. Farmers and integrators produce millions of tons of chicken and eggs, yet struggle to break free from the fluctuating price barriers of the domestic market. Their produce is commoditized, their margins squeezed. But when premium markets like Singapore, UAE, and Saudi Arabia surround us, why aren't we tapping into them?

The truth is sobering: India is not yet producing world-class poultry. Nor does it enjoy a cost advantage or internationally recognized disease-free zones. But that doesn't mean it can't. We've been myopic—focused only on domestic demand. What if, instead of chasing prices in local mandis, India's poultry sector aimed for supermarket shelves in Singapore and breakfast tables in Dubai? The challenge isn't just production—it's transformation. It's time to stop thinking in kilos and cartons, and start thinking in destinations, differentiation, and dollars.

Why Export Is a Strategic Imperative

India's poultry industry has grown rapidly over the past two decades, driven by improved genetics, feed efficiency, and vertical integration. Yet its export footprint remains negligible. Friends often say, "We can't compete with the US or Brazil." I always counter: "If Thailand can, if Vietnam and the Philippines can, why can't we?"

Global demand for processed, frozen, and ready-to-cook poultry is surging—especially in ASEAN, Gulf countries, and parts of Africa. These markets are hungry for affordable, safe, and culturally adaptable protein. India has the scale, but not yet the systems to serve them. To compete globally, we must first acknowledge the gap. We need to build the infrastructure, protocols, and branding required to meet international standards. That means creating disease-free zones, enforcing biosecurity, and adopting world-class farming and processing practices—not just for export, but as a blueprint for domestic transformation.

Poultry SEZs: Building Export-Grade Ecosystems

One bold solution is the creation of Animal Husbandry Special Economic Zones (SEZs)—with Poultry SEZs as a priority. These zones, strategically located in coastal states like Tamil Nadu, Andhra Pradesh, Gujarat, and Odisha, would be dedicated to producing poultry exclusively for international markets. Within these SEZs, only world-class practices would be permitted—from hatchery hygiene and feed protocols to slaughter standards and cold chain logistics. Farms and processors would operate under export-grade compliance, with strict traceability and veterinary oversight.

These SEZs must be supported by robust shipping infrastructure. Ports near these zones should be equipped with fast-loading docks, quality inspection labs, and veterinary certification facilities. Time-sensitive exports like frozen chicken and processed eggs require seamless logistics. A delay of hours can mean the loss of entire consignments. These SEZs must be built with speed, safety, and scale in mind.

To attract investment and signal national priority, the government should also consider sector-specific taxation for produce originating from these SEZs. Preferential GST rates, income tax rebates for SEZ-based processors, and customs duty waivers on imported equipment could incentivize participation and innovation. More importantly, such targeted taxation would drag focused government attention toward poultry as a strategic export sector—creating a fiscal identity that distinguishes it from general agriculture.

These SEZs wouldn't just serve global demand—they would act as incubators for best practices, influencing the broader domestic industry over time. What begins as an export hub could evolve into a national benchmark for quality, compliance, and profitability.

Processed Poultry: The Format That Wins

The future of poultry exports lies in value-added formats. Raw carcasses have limited appeal and low margins. But ready-to-cook and ready-to-eat products-marinated fillets, spiced wings, grilled strips-are in high demand across international markets. These formats offer better shelf life, higher consumer appeal, and stronger brand potential.

Processed poultry also enables byproduct monetization— bones, skin, and offal can be converted into pet food, gelatin, and other value-added products. This expands the revenue base and strengthens the economics of the entire poultry chain.

India can tap into this by developing regional brands that reflect its culinary heritage. Imagine "Tandoori Chicken Strips" in Southeast Asia or "Masala Wings" in Gulf supermarkets-products that carry both flavor and identity. But branding must be backed by quality. Without export-grade processing and packaging, even the best recipes won't travel far.

Eggs: Small Format, Big Opportunity

Eggs are among the most efficient sources of animal protein, and their global demand is rising—especially in processed formats. India, with its vast layer population, can become a reliable supplier of egg powders, liquid eggs, and boiled formats.

Currently, low domestic prices often compel farmers to compromise on quality. When an egg sells for ₹6–7 in India but fetches ₹20–25 in Singapore, the opportunity gap is glaring. Can we afford to ignore it?

Egg powders serve baking and food manufacturing industries, while liquid eggs cater to hotels, airlines, and catering services. Boiled and peeled eggs are ideal for ready-to-eat segments. With proper grading, packaging, and cold chain support, eggs can become a high-volume, high-frequency export item—quietly powerful, globally relevant.

Export as a Roadmap for Domestic Reform

Export orientation isn't just about foreign exchange—it's about raising the bar. By building SEZs, enforcing global standards, and incentivizing excellence, India can create a roadmap that transforms its entire poultry ecosystem. What starts as an export hub can evolve into a domestic benchmark.

Farmers and integrators outside SEZs will begin to adopt best practices to qualify for future inclusion. Processors will upgrade facilities to meet export norms. Cold chain operators, logistics providers, and even hatchery suppliers will align with the new expectations. In time, the SEZ model will ripple outward—lifting the entire sector.

The Road Ahead

India's poultry entrepreneurs, integrators, and policymakers must now embrace a new narrative—one that sees export not as an afterthought, but as a strategic engine. Whether it's a broiler processor in Tamil Nadu, an egg cooperative in Andhra Pradesh, or a cold chain startup in Maharashtra, the message is clear: think global, act strategic, build bold.

India's poultry industry is not yet world-class. But with vision, investment, and policy alignment, it can be. The world is waiting—and it's hungry.


CHAMPION OF THE CHAMPIONS
THE GAME CHANGER
METABO
A NEW BIO-INVENTION TO GET HIGHER PROFITS
IHC International Health Care Limited
ANIMAL HEALTH CARE DIVISION
Regd & Corporate office 4th Floor, PVS LAND MARK, Plot No.11,11A,11B,12&15, Industrial Park, Mangalagiri -522 503, Guntur, Andhra Pradesh, INDIA.
Customer Care : +91 863 2341300 Website: internationalhealthcare.in
HACCP
GMP


Rioth Healthcare Private Limited
One stop station for COCCDIOSIS
(It is an Shuttle and Rotation Program)
MONOVALENT
Monicar
Monarsin
SkyCox
ROTATION
This cycle prevent
Drug
Resistance
DIVALENT
Lasasodium
Sodium Lasalocid 15% granular
MONOVALENT GLYCOSIDE
Madcin
Maduramycin 1% granular
CHEMICAL
Zuril
Coccidol
NicmadciN
Rebicline
NicmadciN
Deccox
Skyqot 25
SHUTTLE
Rotation Means:-
a) Sufficient Rest Period
b) Using Different Classes
c) Chemical Cleanup once a year
d) Do not overuse same
Anti Coccidial
For more complete advice, taking into account all possible options for anticoccidial programmes and intestinal health related problems, Rioth developed the Intestinal Control Guide,
an interactive programme designed to help you choose the optimal rotation.
Rioth Healthcare Pvt. Ltd.
Contact Details : +91-8879785563, +91-9892729668; Customer Care No.: +91 9667503888; Email : CustomerCare@riothhealthcare.com; website: www.rioth.in

Understanding the Gastro Intestinal Tract of the Chicken

(Barrier Functions and Structure's)

Dr. S. K. Maini
Consultant, Vesper Group, Bengaluru

Gut health heavily depends on the maintenance of a delicate balance between the host, the intestinal microbiota, the intestinal environment, various stress, dietary nutrients and composition, presence of mycotoxins, anti nutrients and other antagonistic compounds. If this balance is disturbed, the birds suffer, their growth, health and performance are all compromised.

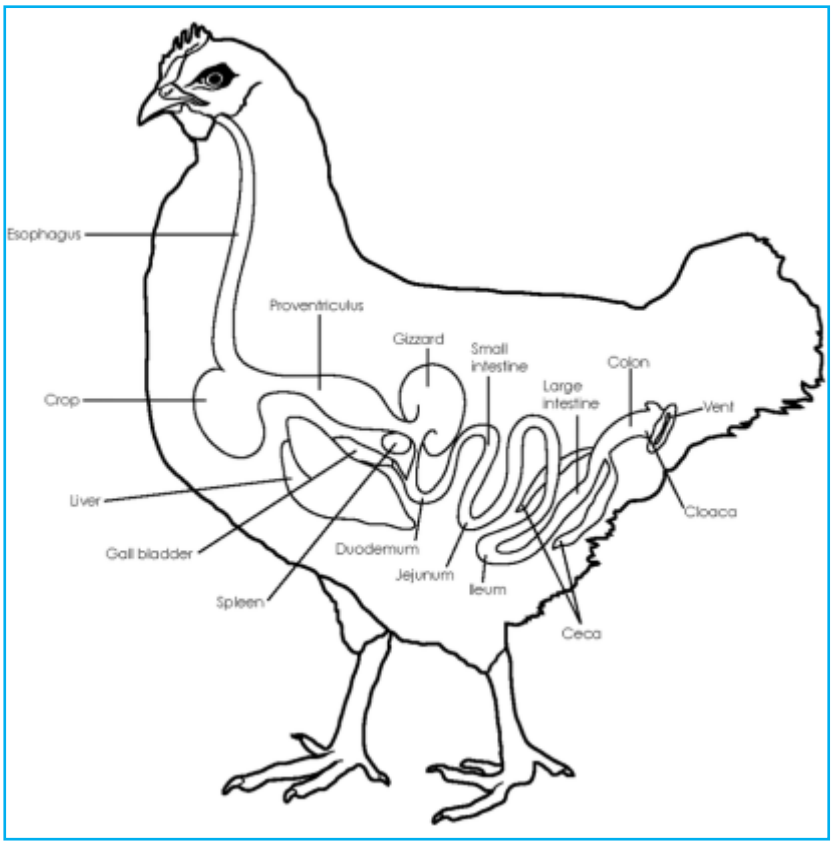
The gastro-intestinal tract of a bird is a highly specialised tube, that starts at the beak and ends in the cloaca. The primary function of the gastro-intestinal tract of the chicken is to digest and absorb the nutrients contained in the feed being fed, to meet the metabolic demands for maintenance, growth, development, production and reproduction, and forms a barrier to prevent the entry of pathogens (Bacteria, Virus's, Fungus, Protozoa etc), biotoxins (mycotoxins, tannins, anti-nutrients, incompatiable chemicals, medicines and drugs etc.), due to its barrier function, a state of desirable homeostasis exists, that is essential for the birds growth, immunity, health and performance.

How the barrier function works:

Selective Permeability: Allows essential nutrients, water, and electrolytes to pass while restricting or stopping the harmful substances.

Physical & Chemical Defense: The mucus layer and antimicrobial peptides provide protection from harmfull micro-organisms.

Immune Surveillance: Local immune cells monitor and respond to various types of microbial threats, entering through the contaminated drinking water or feed.



The Gastro-intestinal tract of the chicken like other animals, normally harbours and maintains a variety of microbiota consisting of bacteria, virus's, protozoa, fungi etc., which keep changing with the environment, season, weather conditions, various stresses, type of feed, its composition and the birds age, helping the digestion, absorption of nutrients and the immune functions of the birds and disease resistance, to ensure good overall performance.

Factors Affecting/Damaging the Barrier Function:

Stress: Can activate the HPA axis, leading to barrier dysfunction.

Diet: Amino acids (like arginine, glutamine, threonine) and supplements (like Chlorella vulgaris) can support barrier integrity, while poor nutrition weakens it.

Infectious Agents: Pathogens (e.g., Salmonella) and toxins directly damage the barrier.

Microbiota Imbalance: Dysbiosis increases susceptibility to disease.

This barrier function needs to be maintained in good working conditions at all the times, to ensure, there is no inflammation, physical damage, and the gut integrity is adequately maintained to ensure proper absorption of nutrients, their utilisation and metabolism for the birds requirements, to ensure performance as per its genetic potential.

The intestinal barrier consists of 4 layers: microbiological, chemical, physical and immunological. Under the influence of exogenous or endogenous factors, the intestinal barrier is damaged, leading to a phenomenon called "leaky gut".

maintained by specialized cells and influenced by diet and microbiota.

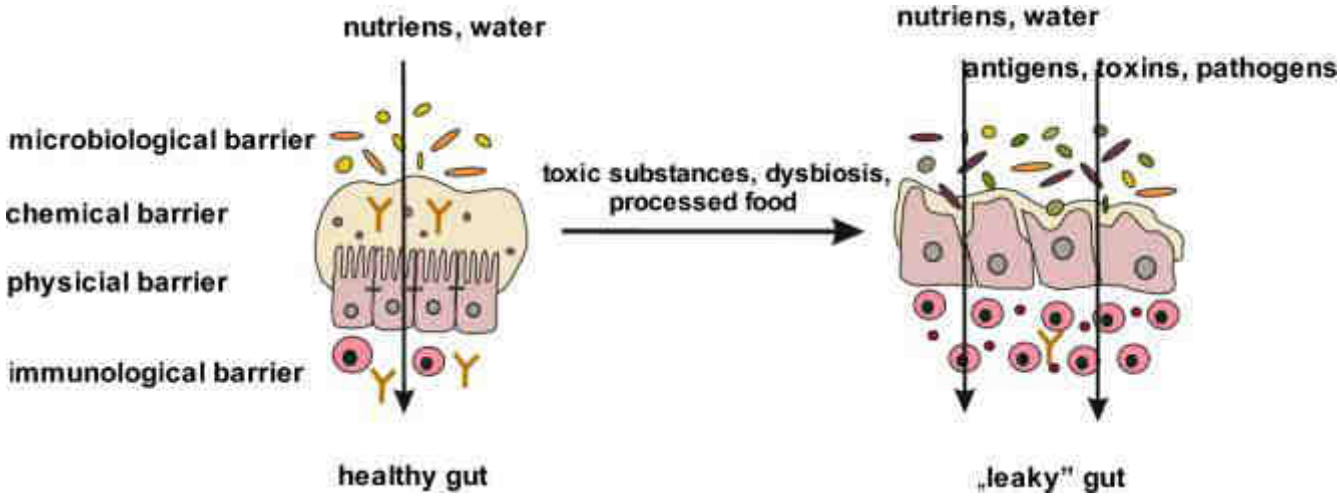
Epithelial Cells: A single layer of cells forms the primary physical barrier, connected by junctions. Intercellular Junctions: Tight junctions (TJs), adherens junctions, and desmosomes seal the spaces between cells, controlling paracellular (between cells) transport of the required nutrients and preventing leakage of unwanted materials into the blood stream out of the intestinal lumen.

Mucus Layer: Secreted by goblet cells, this thick layer separates microbes from the epithelium, housing antimicrobial peptides and maintaining microbial balance.

Microbiota: A balanced gut flora contributes to barrier integrity and competes with pathogens.

Immune Cells: Located in the lamina propria, these cells provide immune defense against invaders.

Specialized Cells: Goblet cells (mucus), Paneth cells (antimicrobial), tuft cells, and enteroendocrine cells support barrier function and nutrient absorption.



The barrier function in the chicken intestine is a crucial defence system, acting as a selective filter using a single cell layer (epithelium) with tight junctions, mucus, and immune cells to absorb nutrients while blocking pathogens, toxins, and antigens from entering the bloodstream, with its integrity essential for health and performance,

A clear understanding of the Gastro Intestinal Tract of the chicken, the barrier system and its maintenance is vital for optimum bird health, growth, feed consumption, digestibility, efficiency etc., is a must, barrier system dysfunction leads to disease (like necrotic enteritis, coccidiosis), loss of production and poor over all performance..

Management of Layer Birds During Winters

Surbhi Singh[1]*, A.K. Verma[2], Raj Kapoor Verma[1], K.D. Singh[2], S.S. Kashyap[1], Shrey Gautam[3], Sonu Jaiswal[4]

[1]Department of Livestock Production and Management
[2]Department of Livestock Farm Complex
[3]Department of Animal Nutririon
[4]Veterinary Clinical Complex, College of Veterinary Science and Animal Husbandry, C.V.Sc. & A.H., Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya-224229

INTRODUCTION

Winter is a critical season for layer poultry farming in Uttar Pradesh. From December to February, farmers face cold nights, dense fog (kohra), chilly winds, and high humidity, especially in eastern and central UP. These conditions cause cold stress, which directly affects feed intake, egg production, egg quality, bird health, and farm profitability. Layer birds are highly sensitive to environmental stress. During winter, a major portion of feed energy is used to maintain body temperature, leaving less energy for egg production. However, with simple, low-cost, and scientific winter management practices, farmers can successfully maintain production even in harsh winter conditions.

Why Winter Becomes a Problem for Layer Birds

In winter, birds face:

- Increased cold stress
- Reduced daylight hours
- Higher energy requirement
- Higher risk of respiratory diseases
- Wet litter and ammonia buildup
- To get maximum profit out of poultry farming in winter, proper management of temperature, humidity, litter
- Feed, water, light and ventilation should be there. These practices are of much importance while managing the birds as they affect their health and production.

While doing poultry farming in winter, farmers should keep following points in mind –

1. **Poultry house management:** Temperature maintenance of poultry house is of utmost importance for day old chicks as well as for adult birds. For day old chicks, shed should be pre-heated one to two days before the arrival of chicks. Day old chicks are most susceptible to cold stress because they are not insulated with feathers and produce less heat than adult birds hence winter stress to chicks can affect their growth rate to a great extent. House or shed should be built in such a way that maximum sunlight reaches the shed during winters, mostly east-west arrangement of a rectangular poultry house gives the greatest intensity of sunlight in winters. Uniformity of temperature in the poultry shed is also an important factor. Behaviour of birds is used to assess that whether the birds are comfortable in the poultry shed or not. If the birds are sitting closer to each other causing crowding, this means the temperature is low in the shed which is making the birds stressed. This can be managed by increasing the heat of the source or installing extra heat sources in the shed. There are some open spots in the poultry houses where gunny bags could be hanged down to protect the poultry from chilled air.
2. **Poultry house ventilation:** Sliding windows should be installed in poultry houses which can be operated by the farmer to maintain the temperature of the house. These windows can be opened during daytime to recycle the air generated in the shed with fresh surrounding air and can be closed in night to keep the shed warm. If ventilation is not proper, it will lead to respiratory problems in birds. Ventilation rate may be increased if there is ammonia or wet litter problem.
3. **Poultry litter management:** Proper bedding material on the floor serves as a protection of birds from cooling impact of ground and decreases dampness of litter. Around 6 inches of litter is required in houses in winter. The litter is required to be maintained efficiently because it gets wet quiet easily with water coming from drinkers, droppings and roof. If not maintained it can result in anaerobic bacterial growth and eventually ammonia production which is detrimental for bird's health. When the litter gets wet, it leads to the formation of cakes which implies that the litter needs to be replaced.
4. **Poultry feeding management:** Poultry utilizes nourishment to keep up or maintain the body temperature. When climate gets cold, the feed needs to be increased as during winter, birds require additional vitality for keeping up their body temperature. That's why poultry feed should have a high caloric value as compared to feed given in summer season because such type of feed keeps the birds warm. In winter, 3400 Kcal/kg ME and 23% protein is required. Raising the amino acid levels, even above recommended levels, will support better food conversion ratio (FCR), high growth rates and maximum egg production level.
5. **Poultry light management:** Light management also plays an important role in winters. Birds go on moulting in winters, and during this phase birds go out of production. In such circumstances, it is very much important to give extra light to keep them in production. Normally, 14-16 hours light duration is recommended. Therefore, hanging a light bulb in the shed can be considered to extend the daylight hours for proper egg production by layers.

Winter Respiratory Diseases:

CRD – Chronic Respiratory Disease

(Local name: Sardi wali bimari / Thandi ki bimari)

Common signs:

- Sneezing and coughing
- Nasal discharge
- Swollen face or sinuses

Management of CRD

1. Maintain strict biosecurity on the farm.
2. Keep litter dry and clean.
3. Proper disposal of dead birds
4. Provide proper ventilation to remove dust and harmful gases.

Infectious Coryza

(Local name: *Naak aur chehre ki sujan, Nakk phoolna*)

Common signs:

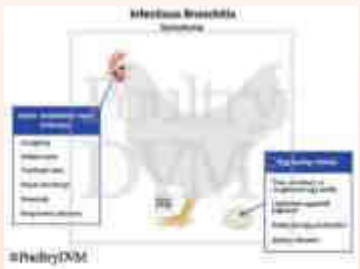
- Severe swelling of face and eyes
- Watery eyes and nasal discharge
- Foul smell from beak
- Drop in feed intake and egg production

Management of Infectious Coryza

1. Isolate infectious bird.
2. Maintain proper sanitation and ventilation.
3. Avoid overcrowding of birds.

Infectious Bronchitis

(Local name: *Khansi wali bimari / Anda girne ki bimari*)



Common signs:

- Coughing and gasping
- Respiratory distress
- Sudden egg drop
- Poor egg shell quality

Management of Infectious Bronchitis

1. Maintain good ventilation and hygiene.
2. Avoid overcrowding to reduce stress.
3. Follow proper vaccination program.

Coccidiosis

(Local name: *Khooni dast / Laal potty*)

Common signs:

- Bloody droppings
- Weakness
- Reduced growth and egg production

Management of Coccidiosis

1. Always keep litter dry and clean.
2. Avoid overcrowding.
3. Ensure good ventilation to reduce moisture.
4. Regular use anticoccidial drugs in feed and water.

Feeding for Cold Days: Energy Is the Key

Cold weather increases the energy requirement of layer birds.

- Birds eat more feed in winter
- Increase energy using maize or small oil supplementation
- Feed birds during early morning and late evening
- Keep feed dry and mold-free
- Supplement Vitamin A, D, and E to improve immunity and egg quality

Proper feeding ensures birds use energy for egg production, not just body heat.

Water: The Silent Reason Behind Egg Drop

Water intake decreases in winter but remains equally important.

- Ensure clean, fresh water at all times
- Provide slightly lukewarm water during extreme cold
- Clean drinkers daily
- Low water intake leads to sudden egg drop

Paani kam = Anda kam

Light Is Life: Prevent Winter Egg Drop

- Short days reduce laying hormones.
- Provide 14–16 hours of light daily
- Use bulbs or LED lights
- Ensure uniform light distribution
- Timers help maintain a fixed lighting schedule

Proper lighting keeps birds in continuous egg production.

Health Care: Prevention Is Better Than Loss

- Follow proper vaccination schedule
- Avoid overcrowding
- Keep litter dry and ammonia-free
- Use vitamins and electrolytes as preventive support
- Call a veterinarian at early signs of disease

Early action saves birds, feed, and money.

Egg Collection & Handling: Protect Every Anda

- Collect eggs frequently, especially in the morning
- Cold and damp nests increase cracks
- Store eggs in a clean, dry, moderately warm place
- Avoid sudden exposure of eggs to cold air

Good egg handling improves market value and profit.

Conclusion

Winter does not have to be a loss-making season for layer farmers in Uttar Pradesh. With proper housing, balanced feeding, clean water, adequate lighting, and timely health care, winter stress can be effectively managed.

Simple, affordable, and scientific practices help farmers maintain bird health, egg production, and farm profitability, even during harsh winter conditions

AVIAGEN Brief

WATER QUALITY

This Aviagen Brief has been written specifically for producers in Asia and the Middle East where typical ambient temperatures can range from below freezing to above 50°C (122°F). This advice may be useful in other regions, but this must be discussed with your local Technical Service Manager.

INTRODUCTION

Water is an essential biological ingredient of life. Not only is it a vital nutrient, but it is also involved in many essential physiological functions such as:

- Digestion and absorption, where it supports enzymatic function and nutrient transportation.
- Thermoregulation.
- Lubrication of joints and organs and the passage of feed through the gastrointestinal tract.
- Elimination of waste.
- It is also an essential component of blood and body tissues.

Chickens consume about twice as much water as feed, although this ratio can be much higher during hot conditions. About 70% of a chick's weight is water (this can be as high as 85% at hatch), therefore, any reduction in water intake or increase in water loss will have a significant effect on the lifetime performance of the chick. Due to the essential role that water plays in the health and performance of biological systems, it is vital to ensure that an adequate, clean supply of water is provided if optimal bird performance is to be achieved.

This Aviagen Brief provides information on the factors that influence water consumption and water quality, highlighting methods to maintain and/or increase water intake, and discussing what constitutes good water quality and how to maintain it.

WATER LOSSES

The water intake of the body should remain in balance with water loss if dehydration is to be avoided. The main sources of water loss are respiration, transpiration, and excretion of feces and urine. Fecal water loss is about 20–30% of the total water consumed, but the most important loss of water is via the urine. The characteristics of water loss will change, depending on the environment and the humidity, for example, while evaporative heat loss may represent only 12% of the water loss in birds at 10°C (50°F), it can increase to 50% when the environmental temperature reaches 30°C (86°F). This is a critical factor with regard to the chick where water represents a larger proportion of its weight.

KEY POINT

Immediate water availability when chicks are placed in the house is important if permanent damage to the biological performance of the flock is to be avoided.

WHAT INFLUENCES WATER CONSUMPTION IN CHICKS?

AGE

Water intake is closely linked to feed intake and bird age (growth response). As the bird gets older, the demand for water will increase (Figure 1). Water quality and availability, therefore, have the potential to impact heavily on the growth performance of the modern broiler, and any husbandry technique that limits water (such as part house brooding or failing to increase drinker space in the first 10 days) will have a parallel negative effect on growth.

FIGURE 1. Water Consumption (ml/chick/week). Adapted from Bailey, 1999 and the current Ross Broiler Performance Objectives, (based on the assumption that water intake is 1.8 times that of feed intake).

SEX

The sex of the bird will also affect water intake. The water intake of males will be greater than that of females from the first week of life. Water:feed ratio is also higher in males than in females. Adipose tissue differences between the sexes explain these differences in water intake (females being fatter than males; fat has a lower water content than protein).

ENVIRONMENTAL TEMPERATURE

Environmental temperature can impact heavily on water intake (Figure 2). The water intake of chickens is approximately double that of feed intake (1.8:1, at a temperature of 21°C (70°F) in bell drinkers). However, in heat-stressed birds this level will be increased. A chicken's water intake will increase by 6–7% for each degree above 21°C (70°F, NRC, 1994).

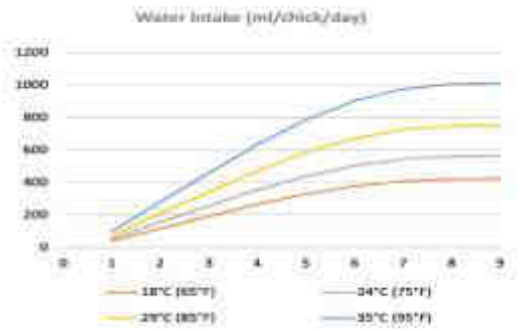


FIGURE 2. Effect of Environmental Temperature on Water Intake. (Based on daily feed consumption defined in the current Ross Broiler Performance Objectives, and the assumption that water intake increases by 3.33% per °F increase in temperature [6% per °C], Singleton, 2004).

It is strongly recommended that each house has a water meter installed and that accurate daily records of water intake are maintained.

KEY POINT

- Increases in water intake will occur with age and environmental temperature.
- Water availability must reflect these changes if performance is not to be restricted.
- Each house should be fitted with a water meter.

WATER TEMPERATURE

With the exception of water used for vaccination, little thought is given to the temperature of the water presented routinely to birds. Stored water tends to be at a similar temperature to that of its environment. This is not significant in cold climates, but in hot climates water consumption will be reduced as the water temperature increases. Work by Beker and Teeter (1994) found the preferred water temperature of birds to be around 10°C (50°F), with water temperatures of 26.7°C (80°F) and above leading to significant reductions in water consumption and daily weight gain. It is therefore important to regularly monitor water temperature. If it regularly exceeds 24°C (75°F), then thought should be given to developing methods of cooling water temperature in hot weather. This may involve running the drinker supply pipes through a cool pad reservoir or even across the face of the cool pad airflow.

Positioning the water tank and supply pipes underground will also help to protect the water from the ambient air temperature, keeping it cool. Pipes and tanks that are exposed to the sun should be insulated and shaded to prevent heat gain. It is also good practice to flush the drinker lines at regular intervals in hot weather to keep the water as cool as possible.

For vaccination the target water temperature should be <20°C (68°F). In hot weather this can be achieved through the addition of ice to the storage tank before vaccination commences. It is important to ensure that all the ice is melted before addition of the vaccine to prevent nonuniform mixing.

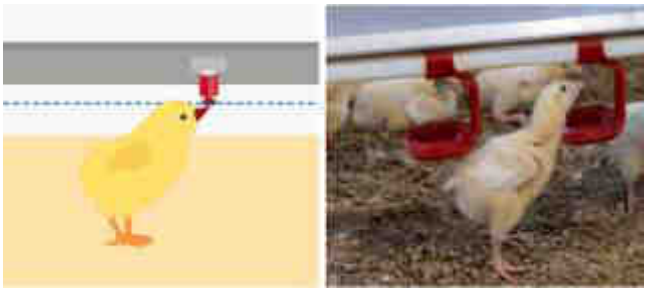
DRINKING SYSTEMS

In most modern broiler units, nipple drinkers are the system of choice; these have the advantage of reducing disease spread, providing cleaner water, and reducing the labor requirements for clean out. However, good management is necessary for the proper operation of nipple drinker systems. Management factors that influence water intake in such systems are water line height (birds should lift their heads to reach the nipple drinker which should be higher than the birds' back to prevent bumping and leakage, see Figure 3), water line maintenance (regular flushing and cleaning), drinker line location, and water pressure.

Nipple flow rate will also influence water consumption and should be checked regularly against the manufacturer's recommendation. The flow rate should be correct in all drinker lines throughout their entire length. For young chicks, water pressure (and flow rate) should be low. Pressure should be gradually increased with age and weight so that water flow is increased as birds get older in accordance with demand. As a general rule, water pressure should be adjusted so that there is a flow rate of at least 60 ml/min available from each nipple. To achieve good performance the nipple lines should be controlled to meet the birds' requirement rather than to simply protect the litter. In general, the systems with higher flow rates produce better growth rates by increasing both feed and water consumption, but water leakage and litter deterioration is more likely.

The negative growth impact of low nipple flow rates is most commonly seen in birds growing to higher weights (>2 kg [4.4 lb]), where the increased water demand cannot be met and feed intake is reduced. The effect of low nipple flow rates is even clearer if the stocking density is increased and the bird:nipple or bird:drinker ratio is high. As a useful guide, use the Lott equation to calculate static weekly flow: (weeks of age)* 7 + 20 ml/min may be a helpful reference.

Where bell drinkers are the system of choice, drinkers should be cleaned daily to prevent the build up of organic matter. Height should be adjusted so that the base of the drinker is level with the broiler's back from 18 days onward (Figure 3).



Correct nipple drinker height for birds under 7 days old (bird's back-to-floor angle: 35–45°).

Correct nipple drinker height after 7 days old (bird's back-to-floor angle: 75–85°).

Correct height of bell drinker.

FIGURE 3. Drinker Height of Bell and Nipple Type Drinkers.

No matter what drinker system is installed, the provision of adequate drinker space is essential if water intake is not to be reduced. As a guide, 83 nipples or 8 bell drinkers per 1000 birds should be provided post-brooding. Where ambient temperatures and/or heavier liveweights (>2 kg [4.4 lb]) are

used, drinker space should be increased by up to 50% of these guidelines.

KEY POINT

- In most broiler units, nipple drinkers are the system of choice. Good management of these systems is critical with water line maintenance, drinker line location, water pressure, and nipple flow rate all affecting water intake.
- Regardless of the water system in place, drinker height and provision of adequate drinking space is critical.

FEED EFFECT ON WATER INTAKE

Any nutrient that promotes mineral excretion through the kidneys also promotes increased water consumption. Therefore, excess minerals in feed or water above nutritional requirements will lead to an increase in water intake. This is also true for high protein diets where any protein not used for protein synthesis is deaminated and excreted in the urine. This energy-demanding process is associated with an increase in water loss.

In particular, the presence of inorganic elements such as sodium (Na), potassium (K), and chloride (Cl) will be associated with increased water consumption and wetter droppings. A moderate increase in dietary sodium is not normally a problem where birds have access to low sodium drinking water; they will increase the water intake if the diet is high in salt and excrete the excess. However, in areas where water sodium levels are elevated, it is important to factor this added supply into practical diet formulation, otherwise unevenness and poor growth rate will occur. Recent Ross Nutritional Specifications specify 0.18–0.23% sodium in broiler diets. These reflect total sodium intake and, therefore, any contribution from the water should be included.

The dietary requirement for potassium is low, 0.6–0.9% being adequate, levels of intake above this may, however, have a thirst-inducing effect, increasing fecal moisture. This is normally seen where soya is used as the single protein source to provide high protein starter diets. The general standard should be to control dietary potassium to a total intake of <0.9%.

Chloride levels should equal sodium levels (0.18–0.23%). The total chloride level is generally constrained by delivering a proportion of the sodium requirement as sodium bicarbonate rather than as salt (sodium chloride).

Deficiency states are uncommon.

WATER QUALITY

A supply of clean, uncontaminated water should be freely available to the birds at all times. However, depending on the source, the water supplied to the birds may contain excessive amounts of various minerals or be contaminated with bacteria. Acceptable levels of minerals and organic matter in the water supply are given in Table 1.

TABLE 1: Water Quality Criteria for Poultry

CRITERIA	CONCENTRATION (PPM)	COMMENTS
Total Dissolved Solids (TDS)	<1,000	Good.
	1,000–3,000	Satisfactory: Wet droppings may result at the upper limit.
	3,000–5,000	Poor: Wet droppings, reduced water intake, poor growth, and increased mortality.
	>5,000	Unsatisfactory.
Hardness	<100 Soft	Good: No problems.
	>100 Hard	Satisfactory: No problem for poultry, but can interfere with effectiveness of soap and many disinfectants and medications administered via water.
pH	<6	Poor: Performance problem, corrosion of water system.
	6.0–6.4	Poor: Potential problems.
	6.5–8.5	Satisfactory: Recommended for poultry.
	>8.6	Unsatisfactory.
Sulfates	<200	Satisfactory: May have a laxative effect if sodium (Na) or magnesium (Mg) is >50 ppm.
	200–250	Maximum desirable level.
	250–500	May have a laxative effect.
	500–1,000	Poor: Laxative effect (birds may adjust), can interfere with copper absorption; additive laxative effect when combined with chlorides.
	>1,000	Unsatisfactory: Increased water intake and wet droppings, health hazard for the young birds.
Chloride	<250	Satisfactory: Maximum desirable level, levels as low as 14 ppm may cause problems if sodium is >50 ppm.
	250–500	Acceptable with caution.
	>500	Unsatisfactory: Laxative effect, wet droppings, reduced feed intake, increases water intake.
Potassium	<300	Good: No problems.
	>300	Satisfactory: Depends on the alkalinity and pH.
Magnesium	50–125	Satisfactory: If sulfate level is >50 ppm magnesium sulfate (laxative) will form.
	>125	Laxative effect with intestinal irritation.
	300	Maximum desirable level.
Nitrate Nitrogen	10	Maximum (sometimes levels of 3 mg/L will affect performance).
Nitrates	Trace	Satisfactory.
	>Trace	Unsatisfactory: Health hazard (indicates organic material fecal contamination).
Iron	<0.3	Satisfactory.
	>0.3	Unsatisfactory: Growth of iron bacteria (clogs water system and bad odor).
Fluoride	2	Maximum desirable level.
	>40	Unsatisfactory: Causes soft bones.
Bacterial Coliforms	0 colony forming unit (CFU)/mL	Ideal: Levels above indicate fecal contamination.
Calcium	60	Average level.
Sodium	50–300	Satisfactory: Generally no problem, may cause loose droppings if sulfates are >50 ppm or if chloride is >14 ppm.

**If there are issues with intestinal health, a more acidic water pH of 5–6 will be beneficial.*

KEY POINT
- Excess levels of some inorganic elements such as Na, K, and Cl will increase water intake and the occurrence of wetter droppings.
- Dietary levels of these elements should be in line with Aviagen nutritional recommendations.

Regular assessments of water quality are necessary for monitoring microbial load and mineral content. The water supply should be checked for the level of calcium salts (hardness), salinity, and nitrates. After cleaning out and prior to chick delivery, water should be sampled for bacterial contamination at source, from storage tanks and from drinkers.

Regular assessments of water quality throughout the production period itself should also be made. Ideally, these should be taken from a tap between the tank and the first drinker. Where the facility of a tap does not exist, the water sample should be taken from the first drinker. The main water connection at the top of the drinker should be removed and drained so that any build-up of bacteria and debris can be flushed through allowing an accurate water sample to be taken. Water should be left running for at least 2 to 3 minutes before the sample is taken. As with all testing, the results should properly reflect the water status and, therefore, care to avoid contamination either during sampling or during transport to the laboratory is necessary.

If proper maintenance of the water line does not occur, microbial contamination can build up, affecting bird performance, reducing the effectiveness of medication and vaccination, and reducing nipple flow rate. Implementing a regular water sanitation and line cleaning program will prevent the build-up of microbial contamination. Controlling bacterial load is much more difficult with open drinker systems as they are exposed to contamination by fecal dust and the oral and nasal secretions of birds as they drink (**Table 2**).

TABLE 2. Effect of Drinker Types on Water Bacteria Contamination (Micro-Organisms/ml of Sample). Adapted from Macari and Amaral, 1997.

MICRO- ORGANISMS	NIPPLE		BELL DRINKER	
	Entrance+	End++	Entrance	End
Total Coliforms	640	3,300	1,600	1,700,000,000
Fecal Coliforms	130	230	1,000	80,000,000
Escherichia Coli	110	900	900	66,000,000
Fecal Streptococcus	55	1,200	2,000	36,000,000
Mesofiles Micro-Organisms+++	24,000	700,000,000	86,000	1,400,000,000

Closed nipple systems have the advantage of reducing disease spread, but even with these, dosing with a sanitizer that is effective in the presence of organic load and biofilms is regularly required. Chlorination to give between 3 and 5 ppm at drinker level (using for example chlorine dioxide), or UV radiation are effective means of controlling bacterial contamination. Treatment should occur at the point of water entry into the house.

High levels of calcium salts or iron in the water may lead to the valves and pipes of the drinker system becoming blocked. Where this is a problem, it is advisable to filter the supply using a filter which has a mesh of 40–50 microns. For further information on water line sanitation programs, refer to **Aviagen Brief—Water Line Sanitation,** 2021.

KEY POINT
- A supply of clean, uncontaminated water should be freely available at all times.
- Regular assessments of water quality should be made to ensure microbial load and mineral content are within acceptable levels.

CONCLUSION

Water is an essential ingredient for life, a clean supply of which should be readily available from placement throughout production. Any restriction in water intake or contamination of water will ultimately affect the growth rate and overall performance of the bird. There are many factors that can affect water intake including age, sex, environmental temperature, water temperature and the drinker system type. The bacterial and physical quality of water should be monitored regularly, and where required, corrective action should be taken to ensure that bird performance is not compromised.

IN SUMMARY

- Unrestricted access to a source of good quality water at an appropriate delivery temperature (10–12°C/50–54°F) should be available.
- Provide adequate drinker space and ensure that drinkers are easily accessed by the whole flock.
- Monitor the feed to water ratio daily to check that birds are drinking sufficient water.
- Make allowances for increased water intake at higher temperatures (6.5% increase per degree over 21°C (70°F).
- In hot weather, take steps to ensure that water is as cool as possible, e.g. flush drinker lines, use a cool pad, position tankers and drinkers underground or insulate.
- Regular testing of the water supply for temperature, bacterial load, and mineral content should occur and where necessary the appropriate corrective action taken.

REFERENCES

- Bailey, M. 1999. *The water requirements of poultry. In Recent Developments in Poultry Nutrition 2 (ed J. Wiseman and P.C. Garnsworthy)*, pp 321–337. Nottingham: Nottingham University Press, UK.
- Beker, A. and Teeter, R.G. 1994. *Drinking water and potassium chloride supplementation effects on broiler body temperature and performance during heat stress.* Journal of Applied Poultry Research, pp 87–92.
- Macari, M. and Amaral, L.A. 1997. *Importancia da Qualidade da Agua Na Criacao de Frangos de Corte: Tipos, Vantagens e Desvantagens.Anais da Apinco Campinas*, pp 121–143.
- National Research Council. 1994. *Nutrient requirements of poultry. 9th Rev. Ed.* NAS-NRC, Washington, D.C.
- Singleton, R. 2004. September issue. *Hot weather broiler and breeder management.* In Asian Poultry Magazine, pp 26–29.

SUBSCRIPTION ORDER FORM

To,
The Circulation Manager
POULTRY PUNCH PUBLICATIONS(I) PVT. LTD.
25, Thyag Raj Nagar Market, New Delhi - 110 003

Dear Sir,

I/We wish to subscribe to Poultry Punch/Poultry Flame for One Year/Three Years/Five Years from ..... to .....

I/We have sent you the subscription amount of Rs. .....

by DD / No. ..... dated ..... drawn .....

on ..... Bank ..... Branch .....

Send DD favouring POULTRY PUNCH PUBLICATIONS (I) PVT.

PERSONAL INFORMATION

Name ..... Address .....

.....

SUBSCRIPTION CHARGES

	Poultry Punch (English Monthly)	Poultry Manch (Hindi Monthly)
One Year	Rs. 1000.00/-	Rs. 500.00/-
Three Years	Rs. 2500.00/-	Rs. 1200.00/-
Five Years	Rs. 4000.00/-	Rs. 2000.00/-

ADVERTISEMENT INDEX

Venworld®
THE BEST IN ANIMAL HEALTHCARE

Venky's

NATEXT™

Poultry Feed Premix

Enriching Gut with phytogenics

For further information please contact :

VENKY'S (INDIA) LIMITED

ANIMAL HEALTH PRODUCTS DIVISION

An ISO 9001 Certified Company

"Venkateshwara House", S.No.: 114/A/2, Pune - Sinhagad Road, Pune - 411 030 (India)

Tel : +91- 20-24251803 Fax : +91-20-24251060 / 24251077 www.venkys.com e-mail : ahp@venkys.com

Rs. 60 Per Copy
RNI No. : 42917/84
Regn. No.: DL(S)-17/3213/2024-26
Printed & Published on 25 January 2026
Posted on 31 January 2026

Edited, Printed, Published & Owned by: B.S. Rana, 25 Thyagraj Nagar Market, New Delhi-110003
and Printed at A.M. Offseters - 1810/1, Giani Bazar, Kotla Mubarakpur, New Delh-110003