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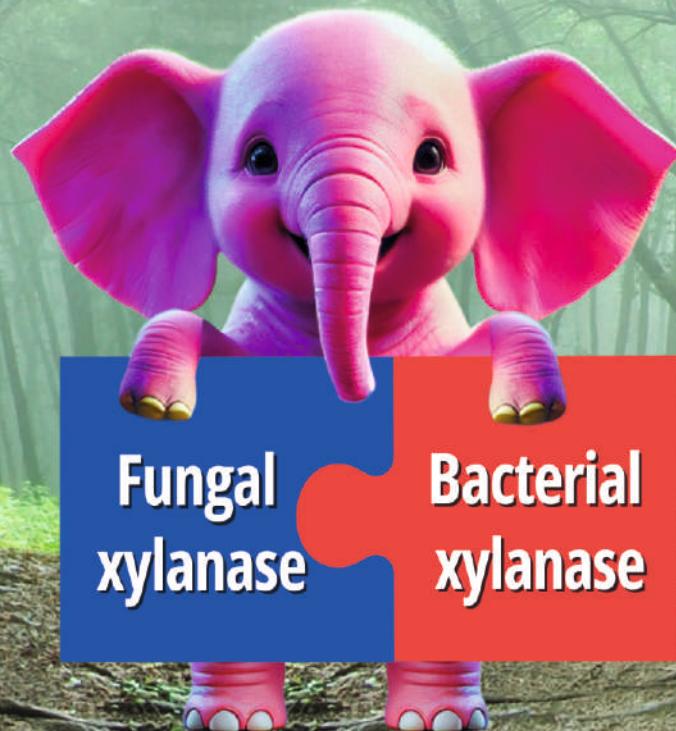


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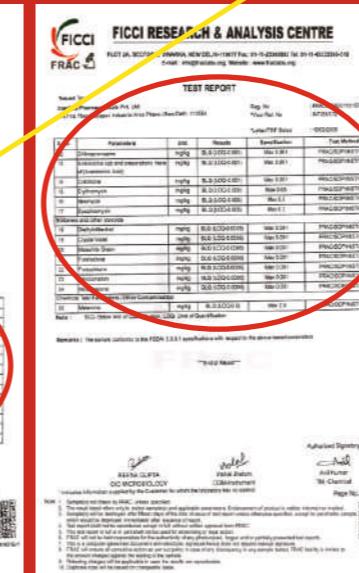
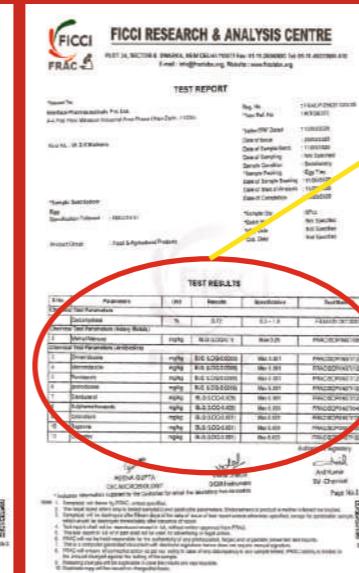
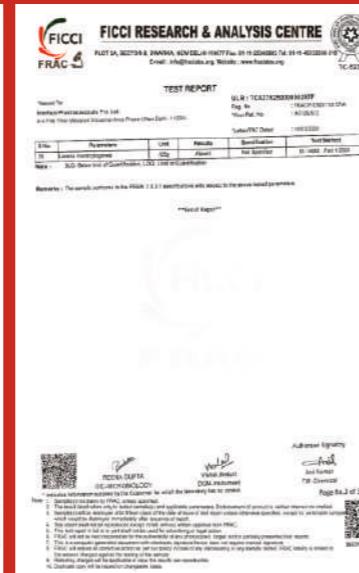
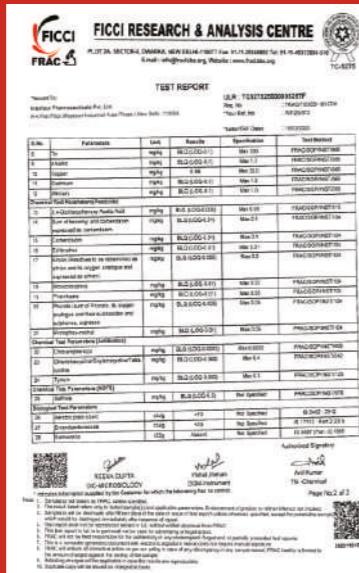
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2	Chemical Test Parameters (Heavy Metals)	mg/kg	BLQ (LOQ-0.1)	Max 0.25	FRAC/SOP/INST/066
3	Chemical Test Parameters (Antibiotics)	mg/kg	BLQ (LOQ-0.0005)	Max 0.001	FRAC/SOP/INST/125
4	Dimetridazole	mg/kg	BLQ (LOQ-0.0005)	Max 0.001	FRAC/SOP/INST/125
5	Metronidazole	mg/kg	BLQ (LOQ-0.0005)	Max 0.001	FRAC/SOP/INST/125
6	Ronidazole	mg/kg	BLQ (LOQ-0.0005)	Max 0.001	FRAC/SOP/INST/125
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12	Carbadox	mg/kg	BLQ (LOQ-0.0005)	Max 0.001	FRAC/SOP/INST/125

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S.No.	Parameters	Unit	Results	Specification	Test Method
12	Chloropromazine	mg/kg	BLQ (LOQ-0.001)	Max 0.001	FRAC/SOP/INST/125
13	Aristolochia spp and preparations there	mg/kg	BLQ (LOQ-0.001)	Max 0.001	FRAC/SOP/INST/125
14	Colchicine	mg/kg	BLQ (LOQ-0.001)	Max 0.001	FRAC/SOP/INST/125
15	Erythromycin	mg/kg	BLQ (LOQ-0.005)	Max 0.05	FRAC/SOP/INST/086
16	Neomycin	mg/kg	BLQ (LOQ-0.005)	Max 0.5	FRAC/SOP/INST/086
17	Spectinomycin	mg/kg	BLQ (LOQ-0.005)	Max 0.2	FRAC/SOP/INST/086
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19	Diethylstilbestrol	mg/kg	BLQ (LOQ-0.005)	Max 0.001	FRAC/SOP/INST/126
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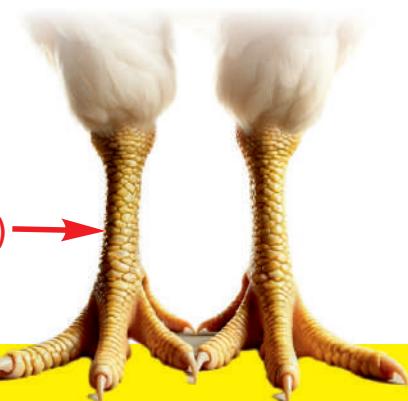


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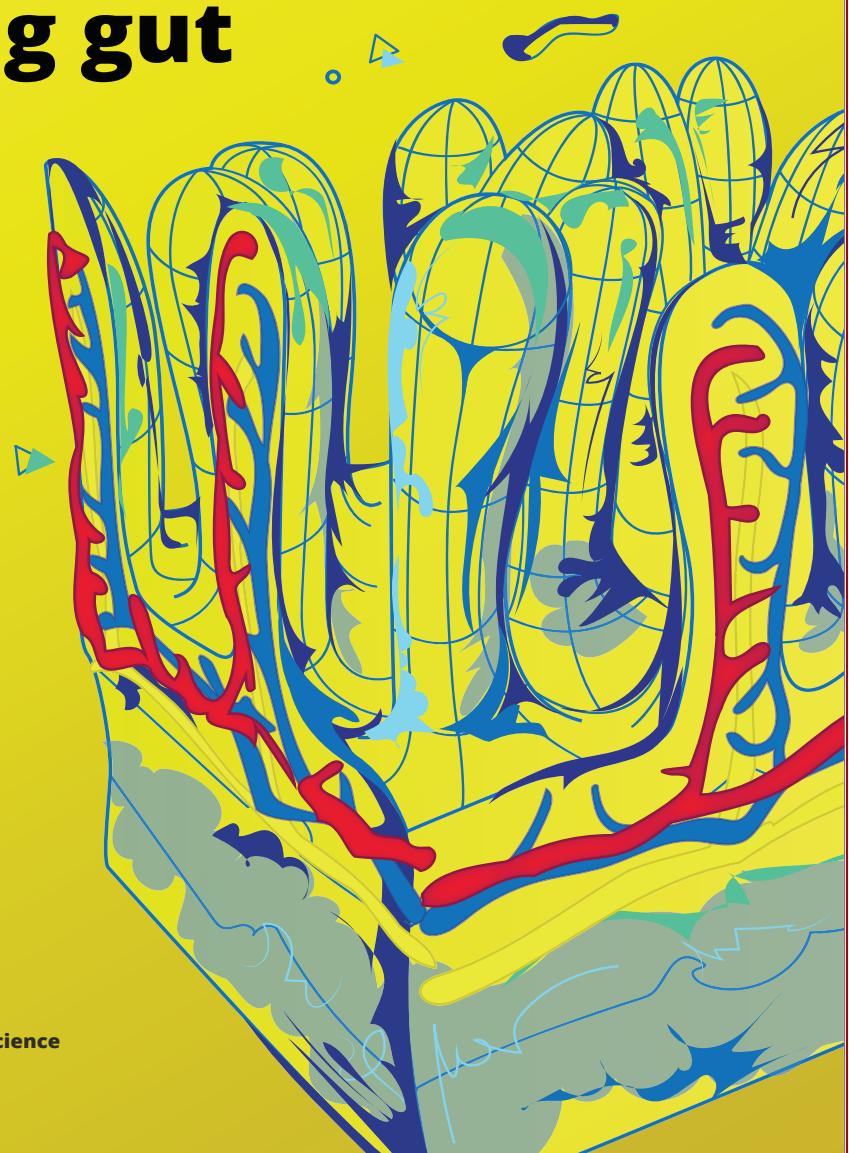
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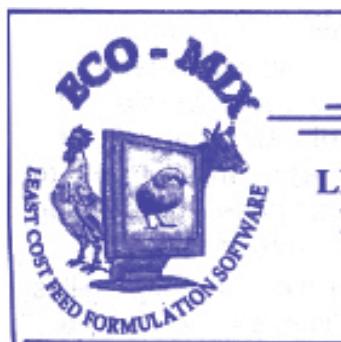
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MULTIPLE WOES OF FARMERS!

There is a havoc caused by the viral outbreak in the Poultry that is aggravated further by poor prices, peak summer and other flock health challenges! Mycotoxins are playing havoc in combination under heat stress.

Since the sufferings are not being properly represented, no support or relief appears in sight for the poor farmers. Government needs to look into this seriously and help alleviate the crisis.

Pakistan has in-inadvertently crossed the line of sponsored terrorism. Maulana Asif Munir underestimated the response of the current Modi government. India responded by very strong actions such as – suspending in Indus Water Treaty, terminating Pakistani visas and sending thousands back home. This has rattled Pakistan.

Pakistan foolishly in a fit of retaliation has announced termination of Shimla agreement – it is just like shooting its own foot. This gives freedom to India not to respect the LOC anymore.

Globally Pakistan has been singled out with glaring evidence of terror crime, which will push Pakistan decades behind.

Tezasvi Publications have organized decades of shows all over the country and focused on attracting large number of farmers, industry personalities, and relevant participants by encouraging them in the gathering. This has been the secret of success of all its Exhibitions, especially in the rural areas.

Experts of the industry complain that recent event managements collect a large sum of money by way of sponsorship but refuse to spend on attracting visitors. Their high registration fee per individual prevents people from freely participating– this is because of the exorbitant cost by way of registration fee. On second thought, the very purpose of the show is defeated when sponsors pay huge sums of money and at the same time the organisers prevent the visitors from easy participation.

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PIONEERING INNOVATION IN THE INDIAN POULTRY INDUSTRY



With his pioneering work in poultry nutrition, biotechnology, and sustainable farming, this visionary is not just transforming an industry - he is shaping the future of global food production.

- By Chandran Iyer

Featured in **Corporate Tycoons magazine** cover story for March 2025 edition.

In the ever-evolving landscape of the Indian poultry industry, one name stands out as a beacon of innovation and leadership - O.P. Singh. His humble beginnings mark the curious brain of a technophile while exploring the depths of biochemistry to his transformation into a visionary entrepreneur, his journey exemplifies the seamless fusion of scientific expertise and business acumen.

As the Managing Director of ABTL, Mr. Singh has not only revolutionized poultry nutrition but also set new benchmarks in sustainability, technological advancement, and global industry leadership.

His career trajectory underscores a deep-rooted belief: scientific research, when translated into practical solutions, can drive meaningful industry progress. "As a scientific leader, I was always passionate about innovation," says Mr. Singh. "But I realized that research alone is not enough—it must be translated into real-world solutions that every stakeholder, from large integrators to small farmers, can access at their doorstep.



A VISION FOR A SUSTAINABLE POULTRY INDUSTRY

The poultry industry faces numerous challenges, from disease management to sustainability & productivity enhancement. Recognizing these complexities early on, Mr. Singh dedicated himself to developing and commercializing innovative feed additives and health solutions that not only improve poultry performance but also align with sustainable farming practices. "Our goal has always been to create advanced solutions that cater to both local and global market needs," he explains. "Through constant research, data-driven results, and farmer education, we have been able to introduce pioneering enzyme-based feed solutions that optimize livestock nutrition and enhance sustainability".

Through constant research, data-driven results, and farmer education, we have been able to introduce pioneering enzyme based feed solutions that optimize livestock nutrition and enhance sustainability.





ACADEMIC FOUNDATIONS: THE SCIENCE BEHIND THE SUCCESS

Mr. Singh's academic journey laid a strong foundation for his future achievements. He earned a Master's degree in Biochemistry from the prestigious Banaras Hindu University (BHU), equipping him with an in-depth understanding of molecular and enzymatic processes. To complement his scientific expertise with business strategy, he pursued a Master's in Business Administration from Kellogg's School of Management, USA. This rare combination of scientific depth and business acumen would later prove instrumental in bridging the gap between research and commercialization—an asset that would define his future endeavours.

As a scientific leader, I was always passionate about innovation," says Mr. Singh. "But I realized that research alone is not enough—it must be translated into real-world solutions that every stakeholder, from large integrators to small farmers, can access at their doorstep.



OVERCOMING INDUSTRY CHALLENGES WITH INNOVATION

"The Indian poultry industry holds immense potential, but navigating regulatory hurdles, strengthening the supply chain, addressing price sensitivity, and ensuring biosecurity are critical challenges," Mr. Singh notes. "Our focus has always been on localizing global expertise to meet India's unique market needs, fostering strong partnerships with integrators and farmers, and driving innovation for cost-effective, high performance solutions." He also emphasizes the importance of investing in brand trust and consumer awareness to promote safe, high-quality food. "Ultimately, our goal is to build consumer confidence, ensuring a thriving poultry ecosystem that supports the food chain and future generations.



ESTABLISHING INDUSTRY GIANTS AND PIONEERING ENZYME-BASED NUTRITION



Early in his career, Mr. Singh played a pivotal role in establishing major poultry brands. He is a trailblazer and expanded avenues to strengthen Indian poultry industry to leave its mark globally.

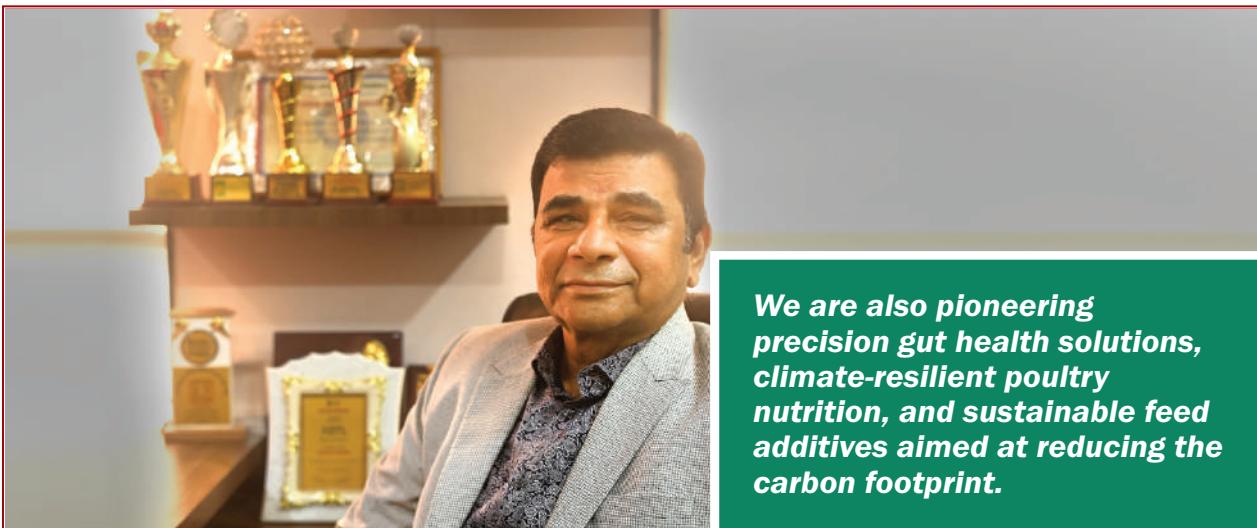
"When we introduced enzyme-based feed solutions at ABTL, the concept was still in its infancy in India," he recalls. "The industry was heavily dependent on conventional feed formulations, and there was little awareness regarding enzymology and the scientific application of fermentation technology in animal nutrition. We worked relentlessly to educate the market, demonstrating the tangible benefits of enzymes through extensive trials and data-driven results."



The industry was heavily dependent on conventional feed formulations, and there was little awareness regarding enzymology and the scientific application of fermentation technology in animal nutrition. We worked relentlessly to educate the market, demonstrating the tangible benefits of enzymes through extensive trials and data-driven results."

ABTL: A GAMECHANGER IN POULTRY NUTRITION

Driven by a relentless pursuit of excellence, Mr. Singh ventured into enzymology and its applications in animal feed—a relatively unexplored domain at the time. With this vision, he laid the foundation for ABTL, pioneering the use of enzymes in feed to enhance efficiency and sustainability. This groundbreaking approach, initially ahead of its time, eventually gained widespread acceptance, positioning ABTL as a leader in biotechnological solutions for animal health and nutrition. Under his leadership, ABTL has witnessed remarkable growth, expanding beyond India into Southeast Asia, including Sri Lanka, Vietnam, Nepal, Oman, and Bangladesh. We are also pioneering precision gut health solutions, climate-resilient poultry nutrition, and sustainable feed additives aimed at reducing the carbon footprint. "Our commitment to innovation is evident in our R&D investments," Mr. Singh states. "We allocate 20% of our annual revenue to research and development—one of the highest in the industry. This continuous investment ensures that we stay ahead of the curve in developing next-generation feed additives that improve poultry health, enhance feed efficiency, and promote sustainability."



We are also pioneering precision gut health solutions, climate-resilient poultry nutrition, and sustainable feed additives aimed at reducing the carbon footprint.

INTERNATIONAL EXPANSION & INDUSTRY RECOGNITION

Expanding ABTL beyond India into Southeast Asian, Middle Eastern, & African markets was a strategic move driven by the region's booming poultry industry, increasing demand for sustainable feed solutions, and growing focus on antibiotic alternatives. "Our international growth was fuelled by a combination of market research, localization, strategic partnerships, and innovation," he explains. "With our state-of-the-art manufacturing facility, our ability to customize products, and our top-notch performance metrics, we have established ourselves as a trusted name in global markets."

- ★ **Rising star in Animal Health by IPJA in 2009.**
- ★ **Best company in Animal Nutrition by Navabharat Agri-Tech Summit in 2018.**
- ★ **Best Animal Health & Nutrition Company by IPJA in 2019.**
- ★ **Best service in the Poultry Industry by Hybiz Tv in 2023.**
- ★ **Best CEO in the Poultry Industry by NRS Group in 2023.**

BREAKTHROUGH INNOVATIONS IN POULTRY NUTRITION

"At ABTL, we have introduced groundbreaking innovations in multi-enzyme formulations, bioactive peptides from fermentation, and systemic enzyme technology that address industry challenges," Mr. Singh highlights. "We are also pioneering precision gut health solutions, climate-resilient poultry nutrition, and sustainable feed additives aimed at reducing the carbon footprint." Additionally, ABTL is exploring artificial intelligence (AI) into poultry farming to optimize performance parameters. "We are actively exploring AI-driven solutions that integrate data analytics, machine learning, and automation to enhance farm productivity while ensuring bird health and welfare," he adds.

Driven by a relentless pursuit of excellence, Mr. Singh ventured into enzymology and its applications in animal feed - a relatively unexplored domain at the time. With this vision, he laid the foundation for ABTL, pioneering the use of enzymes in feed to enhance efficiency and sustainability.



A COMMITMENT TO SUSTAINABILITY AND FUTURE GROWTH

"The poultry industry is at a critical juncture where sustainability and efficiency must go hand in hand," Mr. Singh states. "At ABTL, we recognize that long-term growth is only possible if we align our operations with environmental responsibility. Through precision nutrition, resource optimization, and AI-driven farm management, we are committed to ensuring a low-carbon, high performance poultry industry." Looking ahead, Mr. Singh envisions ABTL evolving into a global leader in science-driven, sustainable solutions for the livestock industry. "The future of animal nutrition lies in next-generation gut health solutions, microbiome science, systemic enzymatic solutions, and AI-driven disease diagnosis," he explains. "Our goal is to continue innovating and ensuring that India plays a defining role in shaping the global poultry industry.

A LEGACY OF INNOVATION AND LEADERSHIP

Beyond corporate leadership, Mr. Singh is a thought leader and industry influencer, actively mentoring young professionals in the agri-tech and poultry sectors. His message to the next generation is simple yet profound:

"Scientific knowledge is essential, but the ability to translate it into scalable, practical solutions is what drives impact. Stay curious, challenge conventional methods, and embrace disruption - because that is where true progress lies."

With his pioneering work in poultry nutrition, biotechnology, and sustainable farming, O.P. Singh is not just transforming an industry - he is shaping the future of global food production.



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09 Improves the egg shell quality in laying hens

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Zinc Zn (Powder & Liquid)



Vitamin-D₃



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Dosage

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- 20 ml for 100 layer birds 7 days
- 25ml for 100 breeder for 7 days



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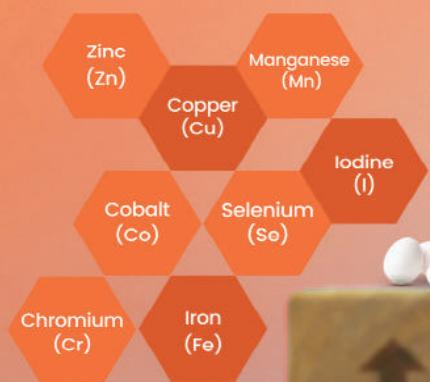


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Layers

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500 gm
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Ventri Biologicals Pvt. Ltd. continues its series of technical seminars on the “VENGEM” LPAI (H9N2) vaccine in the Month of March 2025.

Vengem Ignites Momentum in Yamunanagar & Panchkula



A powerful series of Vengem vaccine (LPAI-H9N2) awareness meetings were successfully conducted on 19th and 20th of March, 2025, in Yamunanagar and Panchkula, respectively. These events drew strong participation from poultry professionals and industry stakeholders, reinforcing the growing importance of effective disease management in layer farming.

At both venues, Mr Harjit Padda, Deputy General Manager – Sales & Marketing extended a warm welcome to the attendees and set the tone for the technical session by introducing the distinguished speakers.

Dr Namdeo Bulbule, Assistant General Manager, delivered an insightful and scientifically grounded presentation focused on comprehensive disease control strategies. He emphasized the critical role of Vengem



in boosting flock immunity and significantly reducing the economic impact of Low Pathogenic Avian Influenza (LPAI) — a persistent threat to poultry health and farm profitability.

The seminars concluded with vote of thanks from Mr Raju Tanna, Assistant General Manager, who acknowledged the valuable presence and engagement of all participants. He also offered special appreciation to the Venworld team for their relentless efforts and dedication in organizing and executing these impactful events.

These meetings served as a testament to Vengem's growing reputation as a reliable shield against LPAI, and further strengthened the trust between the brand and the poultry industries.





East to West: Vengem Leads the Fight against LPAI:

Building momentum across the nation, the Vengem vaccine awareness campaign continued its impactful journey with technical seminars held in Anand (Gujarat) and Bishnupur (West Bengal) on 19th and 20th of March, 2025, respectively.

In Anand, the event commenced with an inspiring address by Mr Deepak Khosla, General Manager, who highlighted Vengem's transformative role in reshaping poultry health through effective immunization. The session was further elevated by Dr Prakash Reddy, Deputy General Manager, who provided a strategic overview of disease control and emphasized Vengem's vital role in strengthening flock immunity against Low Pathogenic Avian Influenza (LPAI).

Dr H. G. Murade brought the seminar to a close with sincere words of appreciation,



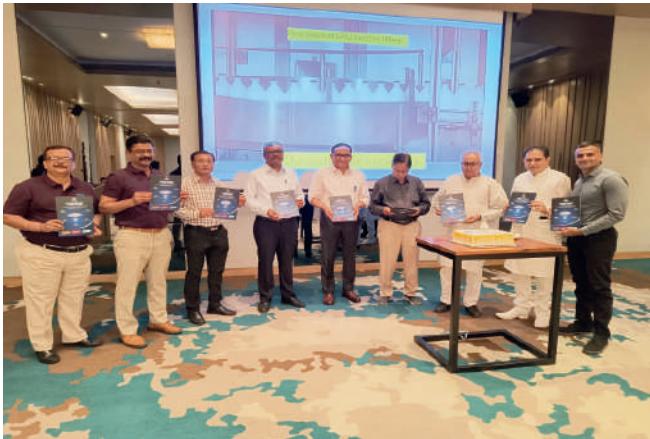
acknowledging the dedicated efforts of the local Venworld team, whose meticulous planning ensured the event's success.

The seminars concluded with vote of thanks from Mr Ram Ghate, Assistant General Manager, acknowledged the valuable presence and engagement of all participants

Simultaneously, on 20th March, 2025 Poultry farmers from Bishnupur (West Bengal) and surrounding regions. The seminar began with a warm welcome from Mr Chita Sahoo, setting the stage for a highly engaging session.

Dr Shashikant Shiwarkar delivered an in-depth technical presentation, showcasing Vengem's proven efficacy in preventing economic losses caused by LPAI and offering a comprehensive disease control roadmap for modern poultry operations. His session stressed the importance of proactive vaccination in safeguarding both flock health and industry profitability.





The Kolkata event concluded with a vote of thanks from Mr Kaustav Chattopadhyay, who recognized the contributions of all participants and applauded the organizing team's dedication.

These seminars have further solidified Vengem's position as a game-changing solution in the battle against LPAI, while reinforcing Venworld's commitment to advancing poultry health across India.

Immunity in Focus: Vengem Leads the Way in Tamil Nadu's Poultry Heartland:

The momentum of the Vengem vaccine launch campaign continued with resounding success in Coimbatore, where technical seminars were held on 25th March, 2025, targeting key poultry farming zones in the region.

The sessions began with insightful opening remarks by Mr Deepak Khosla, General Manager, who highlighted Vengem's potential to transform poultry disease management and improve farm productivity. His introduction set the tone for a highly engaging and informative event.

Dr Prakash Reddy, Deputy General Manager, delivered a powerful and data-driven presentation

on Vengem's efficacy in preventing economic losses caused by Low Pathogenic Avian Influenza (LPAI). He offered a strategic, science-based roadmap for disease control and emphasized the critical role of proactive vaccination in protecting poultry health and sustaining profitability.

Adding depth to the discussion, Dr N. Baburaj, Deputy General Manager, provided valuable updates on the broader Ventri vaccine portfolio, showcasing complementary solutions available for comprehensive poultry health management.

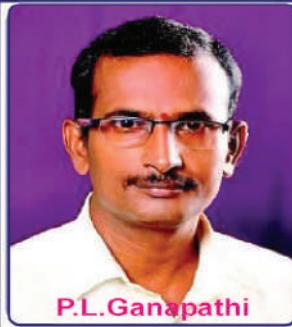
The seminar concluded on a warm and appreciative note by Mr Chinnaraj, Assistant General Manager, who expressed gratitude to the attendees, speakers, and organizing team for their participation and contributions.

The Venworld team once again played a pivotal role in the seamless execution of these events, ensuring high levels of stakeholder engagement and reaffirming their commitment to advancing poultry health across India.

The Coimbatore seminars marked another successful milestone in Vengem's expanding presence, further reinforcing its reputation as a trusted shield against LPAI.

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Venkateshwara Hatcheries Private Limited (East Zone) organised Technical seminars in West Bengal on

“Better Layer Farming Techniques” & “Biosecurity in Layer Farms”



Venkateshwara Hatcheries Pvt Ltd (East Zone) organized Technical seminars for Poultry Farmers on Friday 21st March, 2025 and Saturday 22nd March, 2025 at Bankura and Midnapur respectively. These technical seminars were attended by poultry farmers of Bankura and Midnapur and surrounding areas.

Dr Elizabeth AGM (Poultry Disease Diagnostic Lab, Bhubaneswar) moderated the meeting.

Dr Vidyasagar Punja, General Manager, (East Zone) given the welcome speech and briefed about the current situation of layer farming in India. He also informed about the first official LPAI vaccine (VENGEM) availability in India will be helpful to reduce the disease outbreak.

The speaker for the seminar Dr Sunil Nadguda, DGM - Nutritional Services explained in detail about the “Optimizing the cost of table egg production” in all aspects. During discussion, he

advised to be watchful about quality parameters to be considered while selecting the different feed ingredients. The excerpts from his presentation can be summarized as below.

- Importance of pullet development and its impact on laying productivity as foundation of long laying cycle shall be strong.
- Early Nutrition to maximize peak production and to maintain the consistency.
- Benefits of Phase feeding – to reduce the overall egg production cost and to optimize the efficiency also.
- Alternative sources of Protein & Energy and precautions to be taken while using the alternative feed ingredients.
- Impact of gut health and early chick nutrition on laying performance.



- Various strategies and solution to reduce the cost of feed and maintain good egg production.

Dr Sunil Nadgaua answered the queries of the attendees related to the subject and other technical queries regarding Poultry nutrition and management.

Dr Sanjay Deshpande, AGM (Technical) explained in detail about "Importance of Biosecurity in layer farm".

During his presentation he discussed following points

- Importance of Biosecurity in layer farm.
- Importance of cleaning and disinfection of empty sheds.
- Role of water sanitization and water acidification in laying.
- Restrict entry of diseases at different points.
- Preparation of chicks shed before arrival of chicks.

- Importance of continues disinfection in laying flock
- Strategic planning during viral problem.
- Importance of dead birds disposal in prevention of disease outbreak.

Both the technical seminars were attended by around 120+ poultry farmers from Midnapur, Bankura and surrounding areas of West Bengal. Mr Madan Maity (General Secretary, West Bengal Poultry Federation), Mr Anadi Santra (Veteran Farmer), Mr Sanat Sarkar (Vice Chairman, West Bengal Poultry federation), Mr Tapas Bhattacharya (District President Bankura Poultry Federation), Mr Balai Sanki (NECC President Kharagpur Zone) were present in seminar.

Venkateshwara Hatcheries Pvt Ltd (East region) team, Dr P K Satpati AGM (Technical Services), Dr Niraj Shukla DGM (Technical) organised this technical seminar. Dr Himadri Mukarjee, Manager (Chicks Sale) proposed vote of thanks to all.

Free Lance Poultry Consultant

DR. MANOJ SHUKLA, a renowned poultry Veterinarian, with 20 years of enriched field experience, now started Free Lance Poultry Consultancy. In the past 20 years have contributed to the development of the hatcheries in various capacities of leading companies across India - Maharashtra, Gujarat, Madhya Pradesh, Chhattisgarh, Orissa, Bihar, West Bengal, Jharkhand, North-East, Uttar Pradesh and neighbouring country of Nepal.



His areas of expertise include:

<ul style="list-style-type: none"> ➤ Commercial Layer Management. ➤ Commercial Broiler Management ➤ Nutrition (Feed Formulations). ➤ Breeder Management. ➤ Sales & Marketing of Day-Old commercial Layer chicks, Broiler chicks & Poultry Feed. 	<ul style="list-style-type: none"> ➤ Sales & Marketing of Broiler Breeder. ➤ Integration. ➤ Training to Field staff. ➤ Field Trial of Drugs & Feed additives. ➤ Speaker in Technical Seminars.
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He can be Contacted at:- **Dr. Manoj Shukla**

A-1, Gaytri Nagar, Phase-II, P.O. Shankar Nagar, Raipur, Chhattisgarh-492007

Mob. No : 09644233397, 07746013700, Res. 0771-4270230

Email : drmanu69@gmail.com

As a strategic partner, Poultry Line wishes Dr. Shukla every success in his new assignment

Strengthening Animal Nutrition: An Insightful Visit to PVS Group, Vijaywada (AP) – Ricky Thaper (www.rickythaper.com)

During visit to PVS Group of Companies, a delegation of industry leaders explored the company's state-of-the-art manufacturing facility and discussed advancements in animal healthcare, feed additives and nutrition solutions. The delegation - Mr. Ranpal Dhanda, President, Mr. Sanjeev Gupta, Vice-President (HQ), Mr. Ravinder Sandhu, Secretary and Mr. Ricky Thaper, Joint Secretary, Poultry Federation of India, engaged in meaningful discussions with Dr. PV Seshaiah, Chairman and Managing Director, Dr. Amit Kumar Patra, Business Head-Poultry & Livestock, PVS Group and other members of the PVS leadership team, about innovative feed solutions, sustainable nutrition practices, and quality-driven manufacturing. Mr. Arun Pamulapati, Director, PVS Group was on business trip to Camron, Africa.



With a strong global presence in 61 plus countries and over 30 years of experience, PVS Group of Companies continues to play a vital role in enhancing animal nutrition through research, innovation, and high-quality formulations tailored for poultry, dairy, pet and aquaculture industries under the leadership of dynamic Chairman and Managing Director Dr. PV Seshaiah. The delegation toured PVS Group's advanced R&D facilities, where they witnessed the company's commitment to scientific advancements, precision formulation

and stringent quality control measures. Discussions focused on

emerging challenges in the feed industry, regulatory frameworks and the adoption of cutting-edge biotechnological solutions to improve animal health, performance, and sustainability. Dr. PV Seshaiah, CMD, PVS Group, added that such visits and engagements reinforced their commitment to transparency and excellence in delivering solutions that meets the diverse needs of the animal healthcare industry.



Dr. PV Seshaiah, told the visiting delegates that their company has good market share in Europe, South America, Africa, Middle East,

South Asia and South East Asia and they have been regularly hosting their international clients to their state of the art facility, where they specialize in manufacturing a comprehensive range of advance animal supplements, feed additives, advanced probiotics and GMP-compliant antibiotics. Mr. Arun updated that METABO, their flagship product is in great demand, both in national and international markets. METABO has established its presence in more than 15 countries, with many more countries in the process of registration. METABO and their other products stands as a testament to PVS Group commitment to enhancing poultry health globally. Dr. Amit Kumar Patra, Business Head, said that the trust and support from their customers around the globe, inspires them to keep innovating and delivering the best in the animal healthcare sector.



It was great to interact with Dr. PV Seshaih who is master in his subject with MVSC in Pharmacology. On Social front, Dr. PVS is very active as the founder President of Aquaculture Healthcare Products Manufacturers Association (AHMA). Dr. PVS has been nominated as Executive Council Member in Krishna University is also on Advisor Board of Studies Acharya Nagarjuna University. Dr. PVS is Chairman of Krishna District Floor Ball Association and is also Fellow Andhra Pradesh Academy of Sciences. Poultry Federation of India Core Team members deeply appreciated the warm hospitality extended by the PVS Group team, making the visit both insightful and memorable. Their dedication to excellence, sustainability, and innovation further reinforces the importance of industry collaboration in driving the future of animal nutrition.





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+15.43%



Improves IBV titres
+42.73%



Reduces mortality
Lower by 7-10%



Improves body weight
(+2.80%)



Improves FCR
Lower by 1.55%

FEED INCLUSION RATE

100g of HERBAL C can be used in place of 100g synthetic Vitamin C with higher stability and better activity. 100-200g per ton of feed is recommended as depending upon severity of stress.

WATER INCLUSION RATE

10ml per 100 birds or as advised by the poultry consultant. To be given orally, mixed with drinking water, once daily. Double quantity is recommended for breeders.

PRESENTATION

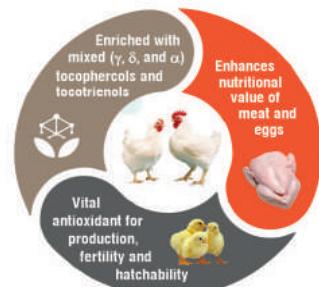
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FEED INCLUSION RATE

100 gm per ton of feed or as advised by the poultry consultant

WATER INCLUSION RATE

E Sel POWER Liquid (per 1000 birds)

Broilers	Layers	Qty
0-2 weeks	0 - 8 wks	10 ml
3-4 weeks	9 -20 wks	20 ml
5 th week & onwards	21-72 wks	40 ml

To be given orally, mixed with drinking water, once daily.

Double quantity is recommended for breeders.

PRESENTATION

1 Kg, 10 Kg & 25 Kg
500 ml & 1 Ltr



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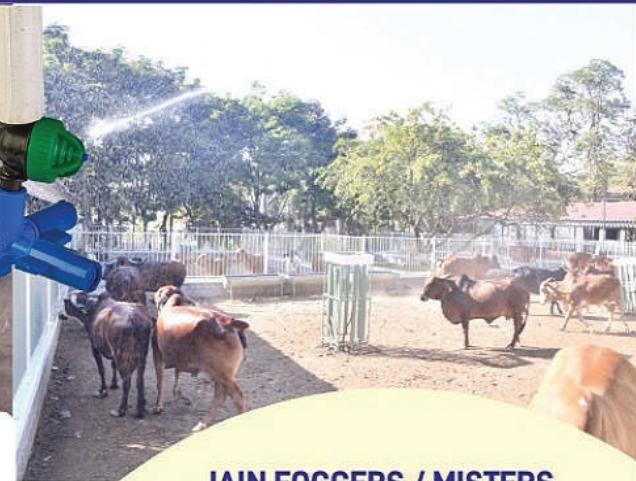
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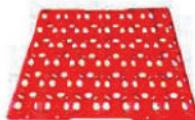
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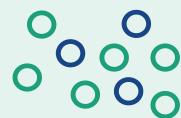


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Orffa Conducts Smart Minerals Seminar Series in India



Orffa concluded a successful seminar series across four cities (Zirakpur, Ludhiana, Pune, Coimbatore) from 20 – 26 March in India, bringing together over 200 industry professionals to discuss key advancements in poultry nutrition and trace mineral technologies. These events provided a platform for knowledge exchange, industry insights, and discussions on innovative solutions shaping the future of poultry nutrition.

The seminars began with an introduction to Orffa and its commitment to pioneering advancements in animal nutrition. Sabiha Kadari, General Manager, South Asia at Orffa, and Ramakanta Nayak, Managing Director of Asia Pacific at Orffa, highlighted Orffa's dedication

to delivering science-driven solutions that address industry challenges and enhance livestock performance. Reflecting on Orffa's mission, they stated: "At Orffa, we are committed to bringing science-driven, sustainable solutions to the animal nutrition industry in South Asia. Through continuous innovation and strong partnerships, we aim to support the region's evolving needs and contribute to more efficient livestock production"

Sopaphan Pruekvimolphan, Technical Manager at Orffa, presented a comprehensive view of trace mineral technologies, highlighting their role in improving poultry health and productivity.





Building on this, Jolien van Soest, Global Solution Manager - Mineral Nutrition at Orffa, introduced Orffa's Smart Mineral Mixtures, an innovative third-generation trace mineral concept designed to optimize supplementation strategies for enhanced performance and sustainability.

The seminars also featured valuable insights from industry experts. Dr. Dinesh Bhosale, Former Chairman of CLFMA, provided a comprehensive overview of the current poultry market, highlighting key challenges, emerging opportunities, and trends shaping the industry. Dr. Chandrakant Patil, Technical Consultant, shared his expertise on critical aspects of dairy nutrition and production strategies. The seminar also highlighted the importance of nutrition in human health. Dr. Pawan



Kumar, Protein Awareness Campaigner, delivered an insightful session on the critical role of protein consumption, emphasizing its impact on overall well-being and the growing need to promote high-quality protein sources.

The seminar series reinforced the importance of innovative trace mineral technologies, the evolving challenges in the animal nutrition sector, and the role of advanced nutrition in improving efficiency and sustainability.

About Orffa - <https://orffa.com/>

Orffa develops and delivers innovative and sustainable feed solutions worldwide. Through advanced technology and deep market knowledge, Orffa helps livestock farmers and feed producers optimize animal health and performance.





Remarkable Participation of INDIAN HERBS at VIV ASIA Bangkok, Thailand, 12-14 March, 2025

INDIAN HERBS, The global leader in the Herbal Animal Health Care Products Industry since 1951, made a remarkable impact at VIV ASIA 2025, held in Bangkok, Thailand, from March 12th to 14th. The event was a resounding success, drawing business partners, customers, consultants and poultry nutritionists from around the world. Our sales and marketing team warmly welcomed all visitors, fostering meaningful discussions and collaborations.

The event served as an excellent platform to engage with customers, distributors and industry leaders on a global scale, reinforcing our commitment to herbal solutions for sustainable animal health and nutrition. We showcased our latest innovations and phytogenic solutions to address industry challenges. The enthusiasm and interest from our partners reaffirmed the growing demand for scientifically validated herbal solutions in the global animal health sector. We extend our sincere gratitude to everyone who visited our booth, shared valuable insights and contributed to making this event a tremendous success.

As a pioneer of Veterinary Ayurveda, INDIAN HERBS has consistently led the way in developing cutting-edge phytogenic feed supplements and healthcare products for over seven decades. Our dedication to innovation keeps us at the forefront of phytogenic research. Guided by the philosophy of 'Traditional Glory and Modern Science,' we are committed to transforming herbalism into a dynamic, scientifically validated and evidence-based discipline. Our phytogenic solutions offer superior efficacy at a lower cost, providing natural alternatives to synthetic products, free from side effects and residual toxicity.

Recognizing the evolving challenges in the animal industry, INDIAN HERBS has developed natural alternatives in key areas such as antimicrobial growth promoters (AGPs), nutritional supplements, immunopotentiators, metabolic stimulants, gut enhancers, respiratory antiseptics, anti-stress agents, and adaptogens. Our phytogenic solutions leverage the synergistic effects of plant-derived bioactive compounds, enabling animals to reach their full genetic potential while enhancing growth, immunity and disease resistance. Utilizing advanced scientific techniques, we have successfully deciphered the safety, efficacy and mechanisms of action of our products.

Our extensive product portfolio consists of over 230 products for poultry, cattle, swine, equine, aqua and companion animals. We adhere strictly to quality norms and regulatory compliance, with a strong focus on research and development. Our R&D and QC laboratories, equipped with state-of-the-art scientific instruments, ensure product quality and consistency. We rigorously pursue herbal standardization and phyto-analytical profiling while validating product safety and efficacy through scientific trials in collaboration with global research institutes and veterinary universities.

INDIAN HERBS products are natural, safe, effective and environmentally friendly, eliminating the need for a withdrawal period. As concerns grow over the adverse effects of synthetic medicines, veterinarians, poultry nutritionists and stakeholders are increasingly seeking clean and green alternatives to produce chicken and eggs free from residues. Our herbal solutions have gained widespread acceptance in the global poultry industry. INDIAN HERBS remains steadfast in its mission to promote natural solutions for improved animal health and production performance.

Currently, INDIAN HERBS successfully markets its products in over 50 countries worldwide. Our R&D Centre, approved by the Ministry of Science and Technology, Government of India since 1986, is equipped with cutting-edge facilities for the standardization and quality control of herbal products.

Our stall at VIV ASIA 2025 attracted a significant number of global visitors, including feed millers, integrators, large-scale farmers, consultants, nutritionists and distributors. The technical team of INDIAN HERBS diligently addressed all visitor inquiries to their satisfaction. Reaffirming our vision and commitment to sustainability and global well-being, INDIAN HERBS continues to support the animal healthcare industry with innovative, antibiotic-free, residue-free and environmentally friendly phytogenic solutions, ensuring feed-to-food safety.

We extend our heartfelt appreciation to our customers, patrons, scientists and well-wishers for their unwavering support, cooperation and guidance. We look forward to continuing our journey of delivering nature's finest solutions for animal health and strengthening our global partnerships.



Marek's Disease of Poultry: A Field Perspective

Dr. M.A.Mujeeb Ather
Former Deputy Director Disease Investigation Wing
Veterinary Biological Research Institute Hyderabad

Introduction

The occurrence of disease problems in poultry in India and their relative importance have been related to: a) Difference of climate b) Method of management c) Levels of development of poultry

Under commercial condition, complicated infections involving multiple etiologies with: a) Viruses b) Bacteria c) Mycoplasma d) Immuno suppressive agents e) Unfavorable environment conditions

Marek's Disease

Marek's Disease is a highly contagious viral disease of poultry, primarily affecting chickens. It's is characterized by T-cell lymphomas and peripheral nerve enlargement.

Marek's disease (MD) is a significant concern in India, particularly in the poultry industry. The prevalence of Marek's disease virus (MDV) among commercial layer chickens is around 50%.The highest prevalence was observed in chickens aged 17 to 40 weeks, followed by those aged 9 to 16 weeks.

In South India, serological evidence of Marek's disease was found to be 55% in Karnataka and Kerala, 53% in Tamil Nadu, and 38% in Andhra Pradesh & Telangana. The disease causes economic losses due to mortality, morbidity, and reduced egg production.

Control measures, including vaccination are essential to manage the spread of Marek's disease in poultry farms. Marek's disease is one of the most ubiquitous avian infections, it is identified in chicken flocks worldwide. Every flock, except for those maintained under strict pathogen-free conditions, is presumed to be infected.

Although clinical signs of disease are not always apparent in infected flocks, a subclinical decrease in growth rate and egg production may be economically important.

Etiology

Marek's disease virus is a member of the genus Mardivirus within the subfamily Alphaherpesvirinae. Within the genus Mardivirus are three closely related species previously designated as three serotypes of Marek's disease virus.

Gallid alphaherpesvirus 2 (MDV serotype 1) represents all virulent Marek's disease virus strains and is further divided into pathotypes, designated as mild (m), virulent (v), very virulent (vv), and very virulent plus (vv+).

Gallid alphaherpesvirus 3 (MDV serotype 2) and Meleagrid alphaherpesvirus 1 (turkey herpesvirus, MDV serotype 3) represent avirulent virus strains isolated from chickens and turkeys, respectively, and are commonly used as vaccines against Marek's disease.

Three Sero-types-1,2,& 3 Serotype 1 • Mildly Virulent (MMDV) • Virulent (VMDV) • Very Virulent (VV DV)

Pathogenesis

Currently, four phases of infection with Marek's disease are recognized:

1. Early cytolytic infection (productive-restrictive)
2. Latent infection
3. Second phase of cytolytic, productive-restrictive infection coincident with permanent immunosuppression
4. Proliferative phase, involving nonproductively infected lymphoid cells that may or may not progress to the point of lymphoma formation

Epidemiology

Marek's disease is highly contagious and readily transmitted among chickens. The virus matures into a fully infective, enveloped form in the epithelium of the feather follicle, from which it is released into the environment. It may survive for months in poultry house litter or dust. Dust

or dander from infected chickens is particularly effective in transmission.

Once the virus is introduced into a chicken flock, regardless of vaccination status, infection spreads quickly from bird to bird. Infected chickens continue to be carriers for long periods and act as sources of infectious virus. Shedding of infectious virus can be decreased, but not prevented, by prior vaccination.

Severe clinical outbreaks of Marek's disease in commercial flocks, with mortality rates from reaching 40%–80% in chickens 8 to 17 weeks old, have been reported in France, Israel, Germany, India.

Factors responsible for Marek's

The incidence of Marek's disease is quite variable in commercial flocks and depends on the following factors:

- Strain and dose of Vaccine virus
- Age at exposure
- Maternal antibody
- Host sex and genetics
- Several environmental factors, including stress

Typically, affected birds show only listlessness before death, however, a transient paralysis syndrome has been associated with acute MDV infection.

This syndrome is rare in immunized birds. Death is the result of paralysis, rendering the birds unable to reach food and water.

Symptoms

- Neurological Form: Paralysis of legs, wings, and neck.
- Visceral Form: Tumors in internal organs like the liver, spleen, and kidneys.
- Ocular Form: Changes in iris color and pupil shape, leading to blindness.
- Cutaneous Form: Enlarged feather follicles and skin lesions.

Age: 12 to 24 weeks and older birds
Incubation Period: 3-4 weeks and several months

Classical: Progressive Paralysis of wings and legs, Torticollis and death (15%).

Acute: Sudden death and depression (80% mortality)

Paralytic: Sudden paralysis of legs, wings and neck with low mortality.

Transmission

The Virus is frequently present in:

- Desquamated feather follicle epithelial cells
- Oral Secretions
- Nasal Secretions
- Tracheal Secretions

The Virus is transmitted by:

- Direct or indirect contact between the birds
- Air borne
- No vertical transmission
- Stress

Lesions

Acute Form

- Diffuse Lymphomatosis with enlargement of Liver, Spleen, heart, kidneys, lungs, gonads and proventriculus

Classical Form:

- Enlargement of peripheral nerves
- Occasional Lymphomas in ovary and sometimes in liver, spleen, kidney, heart and lungs.

Diagnosis

- Standard criteria:
 - History and clinical signs, gross pathological findings, and histological examination
- Advanced criteria: Immunohistochemical testing, standard and quantitative PCR assay, virus isolation

For the diagnosis of Marek's disease, it is critical to diagnose the tumors and not the infection because MDV is considered ubiquitous within commercial poultry flocks.

Usually, diagnosis is based on enlarged nerves and lymphoid tumors in various viscera.

The absence of bursal tumors helps distinguish this disease from lymphoid leukosis, although the presence of bursal tumors does not exclude Marek's disease.

Prevention and Control

- Vaccination: Effective vaccines are available and are crucial for prevention.

- Biosecurity: Implementing strict biosecurity measures to prevent the spread of the virus.
- Good Management Practices: Ensuring proper nutrition, clean water, and a stress-free environment
- Breeding for genetic resistance

Unfortunately, there is no treatment for Marek's Disease.

The most widely used vaccines include the following:

- Turkey herpesvirus (HVT, naturally avirulent Meleagrid alphaherpesvirus)
- SB-1 or 301B/1 (naturally avirulent Gallid alphaherpesvirus)
- CVI988/Rispens (attenuated Gallid alphaherpesvirus)

The HVT vaccine is now commonly used to create recombinant vaccines featuring the insertion of genes from other poultry viruses, such as Newcastle disease virus, infectious bursal disease virus, avian influenza H5 hemagglutinin, and infectious laryngotracheitis virus. These recombinant vaccines offer protection against both Marek's disease and the virus gene insert.

The absence of bursal tumors helps distinguish this disease from lymphoid leukosis, although the presence of bursal tumors does not exclude Marek's disease.

Bivalent vaccines consisting of HVT and either the SB-1 or 301B/1 strains of Gallid alphaherpesvirus have been used to provide additional protection against challenge with virulent MDV isolates.

Currently available commercial vaccines such as CVI988/Rispens and the new long terminal repeat (LTR) insertion derivatives appear to be the most protective against Marek's disease.

Vaccines are administered at hatch or in ovo to embryos at the 18th day of incubation.

In ovo vaccination is now performed by automated technology and is widely used for vaccination of commercial chickens, mainly because of

decreased labor costs and greater precision of vaccine administration.

Proper handling of vaccine during thawing and reconstitution is crucial to ensure that adequate doses are administered.

Cell-associated vaccines are generally more effective than cell-free vaccines because they are less susceptible to inactivation by maternal antibodies. Under typical conditions, vaccine efficacy is usually > 90%.

Since the advent of vaccination, losses from Marek's disease have decreased dramatically in broiler and layer flocks. However, disease may become a serious problem in individual flocks or in selected geographic areas.

- Of the many causes proposed for these excessive losses, early exposure to very virulent virus strains appears to be among the most important.

Effective Vaccination

- The recommended dose is 1000 PFU's per chick.
- Proper and adequate immunization in the chicks requires at least 5000 PFU's
- Vaccination of breeders with a serotype 1 or 2 would make progeny respond better to vaccination with HVT.
- The combination of serotype 1 or 2 is much more effective against infection with very harmful strains of Marek's disease

Key points

- Marek's disease is a highly contagious neoplastic disease characterized by T-cell lymphomas and peripheral nerve enlargement.
- Leg paralysis is a common clinical sign
- Presumptive diagnosis can be made based on history, clinical signs, gross pathological findings, and histological examination.
- Vaccines are highly protective and should be used in combination with good biosecurity





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CALCIUM AND PHOSPHORUS NUTRITION FOR BROILERS (AN INDIAN PERSPECTIVE)

Dr. Vinod Koskewar¹ and Dr. Sushant Labh²

¹Premium Chick Feed Pvt Ltd

²Kemin Industries South Asia Pvt Ltd

Introduction:

Calcium (Ca) and phosphorus (P) are essential macro-minerals in broiler nutrition, playing a crucial role in skeletal development, metabolic functions, and overall growth performance. These minerals must be supplied in the right balance to maximize feed efficiency, ensure strong bone formation, and prevent metabolic disorders. In India, where poultry farming is a rapidly growing sector, optimizing Ca and P nutrition is vital to improving bird health and farm profitability. The availability of mineral sources, variability in ingredient digestibility, and reliance on plant-based feeds necessitate precise supplementation strategies, including the use of phytase enzymes to enhance phosphorus bioavailability. This article explores the latest advances in Ca and P nutrition for broilers, highlighting their impact on growth, feed formulation, and sustainability in the Indian poultry industry.

Role of Calcium and Phosphorus in Broilers:

Bone Development and Strength: About 99% of calcium and 80% of phosphorus in a broiler's body are stored in the skeleton. These minerals are indispensable for forming strong, healthy bones that can support rapid growth and high meat yield.

Metabolic Functions: Calcium plays a role in nerve transmission, muscle contraction, and blood clotting. Phosphorus is vital for

energy metabolism (ATP production), cellular function, and DNA/RNA synthesis (E. Humer et al., 2015).

Enzymatic and Hormonal Interactions: Vitamin D3 regulates calcium and phosphorus absorption, while an imbalance of these minerals can hinder enzymatic processes critical to digestion and growth (Markus Rodehutscord et al., 2022).

Sources of Calcium and Phosphorus:

Common feed ingredients providing these minerals include:

- Calcium: Limestone, dicalcium phosphate (DCP), monocalcium phosphate (MCP), meat and bone meal (MBM), and fish meal.
- Phosphorus: DCP, MCP, MBM, and plant-based sources (phytate phosphorus).

Calcium and Phosphorus Recommendations for Broilers:

Based on life stages, broilers require varying levels of these minerals. Breeding companies come out with the standard levels of these and revise the specs from time to time. Of late, there has been a lower requirement of both these minerals, apart from the early stages. In the table below, Cobb and Ross standards for the same are illustrated. Nutritionists in India follow the levels based on their experience, which are these levels or slightly tweaked levels.

BREED	Cobb Total Calcium requirement (%)				
	NUTRITION SPECS YEAR	D 0-8	D 9-18	D 19-28	
COBB	2022	0.96	0.80	0.74	0.72
COBB	2018	0.90	0.84	0.76	0.76
	Difference	0.06	-0.04	-0.02	-0.04
	Difference %	6.7	-4.8	-2.6	-5.3
Cobb Available Phosphorus requirement (%)					
BREED	NUTRITION SPECS YEAR	D 0-8	D 9-18	D 19-28	D >29
COBB	2022	0.54	0.40	0.37	0.36
COBB	2018	0.45	0.42	0.38	0.38
	Difference	0.09	-0.02	-0.01	-0.02
	Difference %	20.0	-4.8	-2.6	-5.3

Table 1: Cobb Total Calcium and Available Phosphorus requirement comparison for year 2018 and 2022.

BREED	Ross Total Calcium requirement (%)				
	NUTRITION SPECS YEAR	D 0-10	D 11-24	D 25-39	
ROSS	2022	0.95	0.75	0.65	0.60
ROSS	2019	0.96	0.87	0.78	0.75
	Difference	-0.01	-0.12	-0.13	-0.15
	Difference %	-1.0	-13.8	-16.7	-20.0
Ross Av P requirement (%)					
BREED	NUTRITION SPECS YEAR	D 0-10	D 11-24	D 25-39	D >40
ROSS	2022	0.50	0.42	0.36	0.34
ROSS	2019	0.48	0.44	0.39	0.37
	Difference	0.02	-0.015	-0.03	-0.03
	Difference %	4.2	-3.4	-7.7	-8.1

Table 2: Ross Total Calcium and Available Phosphorus requirement comparison for years 2019 and 2022.

(Values taken from Cobb broiler performance and nutrition supplement 2022, available on Cobbvantress website and Ross broiler specification 2019 and 2022, available on Aviagen website)

The Importance of Balance: Total Calcium (Ca) to Available Phosphorus(P) Ratio:

The interplay between calcium and phosphorus is so strong that excess or deficiency in one mineral directly impacts the other's utilization. The recommended dietary ratio of Ca to P typically ranges from 1.5:1 to 2:1 for broilers (Rafael F. Sens et al., 2021). An imbalance can cause the following issues:

- Excess Calcium: Reduces phosphorus absorption, lowers feed efficiency, and impairs the digestibility of other nutrients like fats and proteins (Markus

Rodehutscord et al., 2022).

- Excess Phosphorus: This leads to poor bone mineralization and hinders calcium retention (Laura Shiromi David et al., 2023).

Calcium, Phosphorus, and Vitamin D3 Synergy:

Vitamin D3 is a key player in the absorption of both calcium and phosphorus. A deficiency in vitamin D3 reduces calcium and phosphorus uptake, resulting in bone disorders like rickets and poor growth performance. The inverse relationship between vitamin D3 levels and mineral requirements means that higher vitamin D3 in the diet can allow for slightly reduced levels of calcium and phosphorus.

Dietary supplementation of 25-(OH)2-D3 has a positive impact on performance, tibia ash, and serum concentration of Ca, P. This supplementation can also spare some available P in the diet, even in diets containing phytase (with Ca, available P, and sodium matrix). In many cases, the P sparing effect of 25-(OH)2-D3 is without any apparent change in tibia morphology. At 250 mg/kg 1,25(OH)2-D3 can spare almost 0.1% available P, which is equivalent to 6kg Di-Calcium Phosphate (DCP) per ton of feed.

Vitamin D and its metabolites 25-(OH)-D3 and 1,25-(OH)2 -D3 have numerous functions in the avian system, though the maximum attention is given to Ca and P metabolism, bone health, and eggshell structures of broilers and layers. Plant sources of vitamin D cannot be relied upon to cater to the full needs of birds. Technically, 1,25-(OH)2-D3 supplementation to diet should be more effective than 25-(OH)-D3 in alleviating negative effects associated with Ca and P imbalance and dietary vitamin D deficiency. In broilers 1,25-(OH)2 -D3 can help lower down/potentiate Av P. Weak chicks from the young

hatch and management-challenged chicks can benefit more from this supplementation.

Phytate Phosphorus neutralization and Phytase matrix consideration:

A large portion of phosphorus in plant-based feed ingredients (e.g., corn, soybean meal) is bound as phytate, which is poorly digestible by broilers. In Indian poultry diets based on vegetable ingredients, up to 70% of P is present as phytate-P, bound to the phytic acid molecule and unavailable for digestion and absorption. Regular levels of phytate in corn- and soybean meal (SBM)-based diets range from 2.5 to 4.0 g/kg and can cause a negative impact on growth performance and feed efficiency, as phytate can form complexes with protein, amino acids, and also other minerals (Rafael F. Sens et al., 2021).

Analyzing the phytate levels in diets is very important while formulating. Rice polish, Deoiled Rice Bran(DORB), Cottonseed extract, Rapeseed meal, Wheat bran, and Sunflower meal have high phytates. Maize gluten meal, Ground nut extract, and Soymeal also have moderate levels of phytates. Generally, the phytate levels in broiler diets range around 0.18-0.30% and layer diets 0.30-0.50%. When formulating with alternate ingredients, the overall phytate level in the diet increases, and this impact on other essential nutrients and, ultimately, performance needs to be minimized by the addition of a good phytase at a higher dose.

Phytases are commonly used to hydrolyze phytate into free myo-inositol and 6 molecules of inorganic phosphate. Phytate degradation and elimination from the gastrointestinal tract with the use of phytase is correlated to significant improvements in P and Ca digestibility, ash content in tibia bone, weight gain (WG), and feed efficiency (J. I. M. Fernandes et al., 2019) and the extent to

which phytate is eliminated from the tract can be intensified with greater levels of phytase.

The precise application of phytase matrix requires analyzing values of the phytate content of feed raw materials actually in use. It's suggested to avoid applying the P matrix more than 90% of phytate levels in diets.

Phytase effects on the digestibility of amino acids and minerals other than P are inconsistent in the literature (Lagos et al. 2023). Expertise based on experience and a holistic approach with other enzyme matrices can help to take a call. The digestibility and requirements of antagonistic feed constituents, such as Ca, must be better elucidated to avoid excessive inclusion in the feed. The matrix value applied for any given dose of phytase is specific for the phytase source and is related to a combination of factors including differences in stability during the pelleting process and gastrointestinal tract, as well as differences in the efficiency of the phytase in degrading Inositol hexakisphosphate (InsP₆) and each lower ester under the conditions of the gastrointestinal tract

High Calcium Levels and its hidden cost:

Excess dietary calcium binds with phytates, reducing phosphorus bioavailability and protein digestibility.

We have a problem with excess calcium. This excess calcium in the diet comes through

- Ingredient adulteration (soya and other ingredients adulterated with Limestone powder(LSP))
- Water in Indian farms generally has a higher Total Dissolved Solids (TDS) and Ca between 100-200 mg/L
- Additives have LSP as a carrier
- Adulteration of some ingredients with soil
- LSP, being the cheapest ingredient at

times, is used as filler in premix and full feed

Overloading broiler diets with calcium might seem like a good idea, but it can have undesirable effects in several ways. Some of the hidden costs of over calcium in diets are as follows.

- Lower Feed Intake and Growth: Too much calcium can depress feed consumption, slowing down growth rates.
- Compromised Gut Health: During stressful months, acidifiers are often added to feed to control gut pathogens. However, excess calcium raises gut pH, undermining the acidifiers' effectiveness (Laura Shiromi David et al., 2023).
- Reduced Fat Absorption: Calcium interacts with dietary fats, forming indigestible "soaps" that hinder fat absorption.
- Impaired Protein Digestion: Calcium binds to proteins in the lower gastrointestinal tract, leading to undigested residues in droppings.
- Mineral Imbalances: High calcium levels disrupt the absorption of other critical minerals like phosphorus, magnesium, manganese, and zinc, forcing nutritionists to adjust premix levels. Excess Ca in the diet depresses P digestibility, +0.1% Ca levels decrease P digestibility by 4% (J. I. M. Fernandes et al., 2019).

Formulating diets with digestible calcium and digestible phosphorus specs:

Currently, we formulate based on total calcium and available phosphorus and aim to formulate on digestible levels in the coming years. Formulating broiler diets with optimal digestible calcium and phosphorus levels is theoretically essential for maximizing performance and profitability. However, it requires overcoming challenges that are

being faced globally as well as in the Indian subcontinent

Variability in ingredient digestibility:

Ingredients such as dicalcium phosphate (DCP), monocalcium phosphate (MCP), and limestone often vary in their mineral content and digestibility due to differences in processing, source, and quality. For example:

- The phosphorus digestibility in DCP may range from 85–90%, depending on the source.
- Limestone solubility varies with particle size and purity, impacting calcium digestibility.
- A significant portion of phosphorus in plant-based ingredients (e.g., corn and soybean meal) is bound as phytate, making it indigestible without phytase supplementation. Variability in phytate content complicates accurate formulation.

Lack of Accurate Digestibility Data (published and real-time): Many feed ingredients lack standardized published data on digestible calcium and phosphorus levels. Nutritionists often will have to rely on generalized values or outdated information, leading to inaccuracies in formulations. For the same ingredient, there is a huge variation in published digestible calcium and phosphorus levels.

Limestone Solubility and its implications:

Limestone is one of the most common sources of calcium in broiler diets, widely valued for its availability and cost-effectiveness. However, the solubility of limestone can significantly impact its nutritional efficiency and the overall health and performance of broilers.

Solubility and Particle Size: Limestone solubility is influenced by its particle size. Fine particles dissolve more rapidly in the gut, releasing calcium faster, while larger particles dissolve slowly, providing a sustained calcium supply. Solubility at times

depends on the source/ore of limestone also. In India, the use of fine limestone is more but coarse grind limestone needs to be preferred more.

Fine Limestone: Highly soluble, suitable for early calcium needs.

Coarse Limestone: Less soluble, ideal for sustaining calcium levels over time.

Role of Acid Binding Capacity: Fine-grinded limestone has a high acid-binding capacity, meaning it can neutralize stomach acidity. This property can sometimes interfere with the gut's natural digestion process, particularly for other nutrients like protein and phosphorus.

Key Takeaways:

- Calcium and phosphorus are foundational to broiler health, especially for skeletal growth and metabolic processes. Adjusting calcium and phosphorus levels based on life stage and environmental factors ensures optimal bird performance. Maintaining the correct Ca: P ratio is crucial to avoiding nutrient imbalances and maximizing performance.
- Indian diets are typically rich in calcium. While it might seem beneficial to add extra calcium to broiler diets, doing so can have several negative consequences.
- Supplementation of Vitamin D and its metabolites 25-(OH)-D3 and 1,25-(OH)₂-D3 have numerous functions in avian systems, though the maximum attention is given to Ca and P metabolism, bone health, and eggshell structures of broilers and layers.
- Supplementation of a good phytase can overcome challenges associated with phytate phosphorus in plant-based diets. The precise application of phytase matrix requires analyzing values of the phytate

content of feed raw materials actually in use.

- Solubility and particle size of limestone can significantly impact its nutritional efficiency and the overall health and performance of broilers.
- Global data on digestible phosphorus and calcium is not standardized. There is a need to generate data for Indian ingredients.
- Lameness in broilers and layers should be thoroughly investigated and then action needs to be taken. Supplementing more calcium doesn't work in 99% of cases of lameness.
- By paying close attention to these critical minerals, poultry nutritionists can unlock the full potential of broiler diets, boosting growth, feed efficiency, and profitability.

Conclusion:

Optimizing calcium and phosphorus nutrition is key to improving broiler performance, skeletal integrity, and feed utilization. As Indian poultry producers and nutritionists transition towards more efficient feeding strategies, it is crucial to adopt precise mineral balancing, utilize digestible Ca and P values, and incorporate phytase enzymes to enhance phosphorus absorption. Over-supplementation of calcium can lead to hidden costs, including impaired nutrient digestibility and poor gut health. Furthermore, understanding the solubility and particle size of calcium sources like limestone can significantly improve mineral utilization. With continuous research and innovation, the Indian poultry sector can refine its approach to these important mineral nutrition, leading to better productivity, economic efficiency, and environmental sustainability.

References are available upon request

Focuses on Strengthening Animal Health through Public-Private Partnerships



New Delhi, March 20, 2025 – The Indian Federation of Animal Health Companies (INFAH) hosted its National Seminar 2025 at the India Habitat Centre, New Delhi, themed "Strengthening Animal Health and its Economics through Public-Private Partnership for Viksit Bharat."

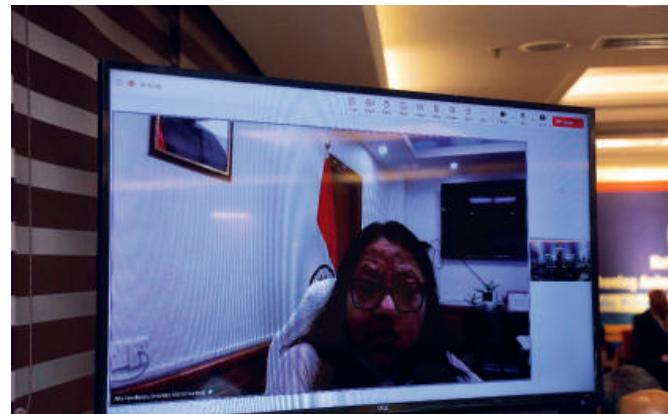
In the day-long event, over 100 delegates, including scientists, academicians, policymakers, regulators, and industry leaders, participated to deliberate on advancing veterinary health through Public Private Partnerships.

INAUGURAL SESSION

- Dr. Anup Kalra, Joint Secretary, INFAH, opened the session by highlighting the evolution of INFAH as a pivotal bridge

between government, academia, and industry, and emphasized that collaborative models are crucial to realizing India's Viksit Bharat goals.

- Dr. Shirish Nigam, President, INFAH, delivered the welcome address, reiterating that while business can drive progress 364 days a year, one day must be dedicated to industry introspection and united advocacy. He outlined INFAH's commitment to policy reforms and presented key demands to the Ministry for regulatory clarity, faster product approvals, and technology enablement. He also acknowledged the support from current management committee comprising of Dr. Aman Syed (Vice President), Dr. Anup Kalra (Joint Secretary), Dr. Manoj Sood (Treasurer) as well as Executive members Dr. Vijay





Makhija, Mr. Vijay Teng, Mr. Satish Pasrija, Dr. Arun Atrey, Mr. Gautam Chatterjee, Ms. Ashwini Deshpande, Dr. Vinayak Surve & Mr. Sushanta Dey.

KEYNOTE ADDRESSES

- Prof. Dr. S. P. Singh Baghel, Hon'ble Minister of State for Fisheries, Animal Husbandry & Dairying, served as the Chief Guest. He expressed his admiration for INFAH's proactive role and emphasized that while laboratories are critical, outcomes must reach quickly, and that farmers and animals truly benefit. He called PPP models the "most successful approach" for rural transformation. Hon'ble minister also mentioned that animal husbandry is not a parallel economy; it should be considered a primary sector. The government aims to double farmers' income, and livestock farming is crucial in achieving this goal.
- Ms. Alka Upadhyaya, IAS, Secretary, DAHD, delivered the Thematic Address, emphasizing a One Health approach



and public-private convergence to tackle antimicrobial resistance (AMR), zoonotic threats, and animal welfare challenges. She shared how India is now 100% self-reliant in vaccine production for livestock sector. She even demonstrated recent studies which highlight the importance of deworming before vaccination to improve animal health. She also highlighted the issue of mastitis and called for a nationwide program to address mastitis awareness and prevention. Madam Secretary acknowledged the critical role INFAH plays in shaping policies for the livestock sector and called for increased engagement between policymakers and industry stakeholders before formulating regulations.

- Dr. Abhijit Mitra, Animal Husbandry Commissioner, Ministry of Fisheries, Animal Husbandry & Dairying, highlighted the issue of Anti-Microbial Resistance (AMR) and shared how INFAH is helping by providing the data on the sale of Antimicrobials in animal health. He also reiterated the





importance of government, industry, and research institutions working together to achieve self-reliance in veterinary medicine and improve animal health standards.

- Shri Abhay Mahajan, KVK, DRI, Chitrakoot, emphasized holistic rural development through ethnoveterinary practices, traditional knowledge, and youth empowerment. He mentioned the aim should be to expand the Chitrakoot model beyond MP & UP to other regions of the country.
- Dr. Raghavendra Bhatta, DDG (Animal Science), ICAR emphasized on the livestock sector's contribution to the economy and India's goal to be PPR and rabies-free by 2030. He encouraged the industry to align with global export standards and leverage the growing market for preventive animal health solutions. He encouraged all participants to shift mindset from "PPP" to "Partnership for Prosperity".
- Dr. Gauri Shankar, Deputy Drugs Controller, CDSCO, shared CDSCO's progress with digital platforms like Sugam and underscored the need for mutual trust and accountability in regulatory pathways to foster innovation.
- Dr. Hirofumi Kugita, Representative for Asia-Pacific, World Organisation for Animal Health (WOAH), through his message highlighted international collaboration for disease surveillance and control. He emphasized aligning India's veterinary health standards with global guidelines to improve trade



access and animal welfare outcomes.

TECHNICAL SESSION HIGHLIGHTS

Session 1: Topic of "Public-Private Partnerships in Animal Health & Nutrition"

- Chairperson: Dr. Raghavendra Bhatta, DDG (Animal Science), ICAR
- Dr. P. K. Shukla, President, Indian Poultry Science Association,
- Dr. Praveen Malik, CEO, Agrinovate India Ltd.

Keynotes of the Session:

- Identified key roadblocks in testing protocols and regulatory timelines and called poultry India's "protein factory" and outlined innovations in feed efficiency, circular economy practices, and waste minimization to combat malnutrition. Advocated for better technology transfer, nutrition security, and disease surveillance.

Session 2: Topic of "Regulatory Framework for Animal Health Drugs & Biologicals"

Chairperson: Dr. Praveen Malik, CEO, Agrinovate India Ltd

- Dr. Arun Atrey, Managing Committee, INFAH
- Dr. Gauri Shankar, Deputy Drug Controller, CDSCO
- Dr. M. Kalaivani, Senior Scientific Officer, Indian Pharmacopoeia Commission
- Dr. Nitin Bhatia, Member of INFAH Subcommittee

- Dr. D.J. Kalita, Member of INFAH Subcommittee

Key notes of the session:

- Discussed IPC's initiative to draft vaccine monographs and supported waivers based on global benchmarking.
- The session stressed that a unified, efficient framework will de-risk innovation and fast-track animal health solutions.

Session 3: Topic of "Imports & Exports of Veterinary Products"

Chairperson: Dr. Indrajeet Singh, Vice Chancellor, Bihar Veterinary University

- Dr. Manoj Sood, Treasurer, INFAH
- Dr. Gagan Garg, Deputy Commissioner (Trade), DAHD
- Dr. Vijay Makhija, Managing Committee, INFAH
- Dr. Shyam Vane, Member of INFAH Subcommittee

Key notes of the session:

- Outlined regulatory inconsistencies and called for standardized classifications of feed additives, medical devices, and diagnostics as well as single window clearance.
- Emphasized the need for policy predictability, indigenous manufacturing, and incentives

for global veterinary product exports.

Session 4: Topic of "Ayurveda & its Role in Animal Health"

- Dr. Mohan ji Saxena, shared his wisdom and thoughts on health & ayurveda. He highlighted how our economy is going to be affected due to animal health. He appealed everyone to think of not just being healthy but Health Index. He also encouraged for scientific validation of Ayurveda for mainstream application in animal care and emphasized the importance of hygiene, immunity and nutrition in animal care.

Session 5: Topic of "Navigating the Intellectual Property & Trade Regime"

- Dr. Manisha Shridhar, Regional Advisor (WHO SEARO), delivered a compelling address tracing the history of IP—from the Paris and Berne Conventions to TRIPS. She emphasized India's opportunity to lead global innovation by bridging traditional knowledge with patent systems, and the value of technology transfer via models like the Bayh-Dole.

Way Forward

A comprehensive report compiling all session discussions and outcomes will be submitted to the Hon'ble Minister and DAHD. This will serve as a roadmap for targeted policy actions and collaborative innovations in animal health.



Carus Laboratories Honoured with the Sardar Patel Unity Award 2025 for Emerging Leader in Animal Healthcare



Carus Laboratories has proudly received the prestigious Sardar Patel Unity Award 2025 under the category of Emerging Leader in Animal Healthcare, presented by the Topnotch Foundation.

The award ceremony was held in Goa in the esteemed presence of Padma Shri Hema Malini ji and Hon'ble Union Minister Mr. Shripad Yesso Naik. Representing Carus at the event were Mr. Jitender Pilani (Director) and Mr. Lalit Kapoor (Vice President), who accepted the honour on behalf of the entire Carus team.

This recognition affirms Carus Laboratories' steadfast commitment to research-led innovation, advanced manufacturing practices, and veterinarian-driven excellence. With a strong team of over 500 professionals

and a FAMI-QS, ISO 22000:2018, and HACCP-certified manufacturing facility, Carus continues to raise the bar in the Indian animal health industry.

“This award is a tribute to the passion, dedication, and relentless pursuit of quality by our team. We extend our heartfelt thanks to the veterinary community, our partners, and the farmers who trust and support us,” said Mr. Jitender Pilani, Director.

“It’s a moment of pride for our field force and technical teams whose efforts at the grassroots make this recognition possible,” added Mr. Lalit Kapoor, Vice President.

Carus remains focused on its mission—Building India’s Animal Health Legacy through innovation, integrity, and inclusive growth.



Scan QR code for YouTube video

Carus Laboratories Inaugurates State-of-the-Art New QC Lab



Karnal, Haryana | Carus Laboratories proudly announced the inauguration of its newly established Quality Control (QC) Laboratory at its manufacturing facility, a significant step towards strengthening its commitment to quality, innovation, and compliance.

The inauguration ceremony was graced by Dr. Arun Pilani (MD), Mr. Jitender Pilani (Director), and Mr. Anup Anand (Plant Head). Together, they unveiled a cutting-edge facility equipped with advanced analytical instruments and technologies designed to ensure that all veterinary healthcare products adhere to standard guidelines.

“This new lab reflects our unwavering focus on scientific precision and our dedication to delivering consistently safe and effective products to the market,” said Dr. Arun Pilani, MD during the event.

The lab is designed to facilitate a broad spectrum of quality testing procedures, from raw materials

to finished products. With features like high-performance liquid chromatography (HPLC), UV spectrophotometry, viscosity testing systems, Reflective meter, and polarimeter, the facility is equipped to meet both national and international regulatory requirements.

Mr. Ankit, the Head of QC, added, “Our team has worked diligently to create an environment that supports innovation and data integrity. With the installation of top-tier instruments and a focus on continual improvement, this lab marks a new era for Carus in quality assurance.”

The inauguration concluded with a walkthrough of the lab, showcasing its world-class infrastructure and scientific rigor.

This initiative underlines Carus Laboratories’ vision to lead the animal healthcare industry with trusted, validated, and quality-driven solutions.



Soy Excellence Center, Good Initiative by USSEC Aiming to Boost Skills Development of Mid-Career Professionals Associated in the Poultry, Aqua, Livestock and Food Industry in India

- Ricky Thaper (www.rickythaper.com)



As one of the fourteen members of Regional Advisory Council (RAC) of Soy Excellence Center-India, I attended SEC India Annual Regional Global Governance meeting in Bangalore on April 02, 2025. Besides fourteen RAC members, the meeting was attended by USSEC Leadership and US Stakeholders who obtained great inputs on the Indian Protein Value Chain/Industry and the need for workshop/skill development. It was great to interact with Mr. Kevin Roepke, Regional Director, for South Asia and Sub-Saharan Africa, USSEC and with Global Advisory Panel of SEC; Mr. Mark Reed, the new Chairman of SECs (Illinois Soybean Association), Ms. Annie Meis, Vice-Chair of SECs (Nebraska Soybean Board), Mr. David Williams (Michigan Soybean Committee) and Kellie Gypin, Focus Areas Advisor of SECs

With global protein demand projected to grow by 15% by 2031 as the world population reaches close to 10 billion, the food and agriculture sectors face a huge challenge for providing nutritious food to large sections of the population. Referred as the 'King of beans,' soybeans account for a large portion of direct and indirect protein consumed around the world. About 76% of soy production is used as low-cost, quality protein for animal feed for meat and dairy production, 20% is consumed as edible oils and human food products - tofu, soy milk, and tempeh, and 4% is used for industrial purposes, primarily in the form of biodiesel. U.S. Soybean Export Council (USSEC) ensures market access for the use of U.S. soy for human consumption, aquaculture, and livestock feed in more than 90 countries. Its members represent the soy supply chain including farmers, processors, commodity shippers, merchandisers, allied agribusinesses, and agricultural organizations. The council is funded by the U.S. soybean checkoff, USDA Foreign Agricultural Service matching funds and the industry.



Soy Excellence Center (SEC) since its launching in 2019, the focus of the USSEC

has been to expand and include several regionals across globe and set up SECs that meet local workforce skilling needs. The aim of these centres is to build capacity and market potential of food and agriculture businesses. The focus is to ensure a future in which soy is known across the globe as a key change agent. USSEC operates SECs in five regional hubs-the Americas, Asia, India, Middle East and North Africa & Sub-Saharan Africa. SECs offers basic certificate courses in poultry, feed milling, aquaculture, and soy food and beverage to enhance industry expertise and sustainability. These courses equip professionals with essential knowledge on feed formulations, global milling practices, aquaculture advancements and soy-based food innovations. Through expert-led training and interactive learning, the centre boosts technical skill enhancements that drive productivity and food security. By fostering a skilled workforce and promoting best practices, the centre strengthens the global soy value chain, reinforcing USSEC's commitment. These centres globally aimed at improving health and nutrition of communities in emerging markets like India. This is achieved by strengthening the capacity and market potential of businesses within the food supply chains through training of the workforce.

US Soy is America's No. 1 agricultural export, which contributed \$31.2 billion to the U.S. economy during the last marketing year. USSEC board leaders are key to guiding growth and important contributors to U.S. Soy's mission of differentiating and elevating a preference for U.S. Soy and attaining market access. SECs are located in key emerging soy export markets around the world and are an 'in-the-trenches' deployment of soy demand capacity building, where we focus on community-based education through peer-to-peer workforce training for early to mid-stage soy professionals. From

2019 to 2024, USSEC's SEC programs have engaged 31,400 participants, reached more than 40 different countries, held 137 structured training events reaching 17,652 participants in the 2023-24 market year alone. Grown our mobile-optimized online educational program, launched in 2022 and taught in three different languages - English, Spanish and Arabic - to a user base of more than 3,300 annual participants. By highlighting the essential role soy plays in animal and aquaculture diets, and for human food consumption, USSEC's SEC program is growing the global demand for U.S. Soy today and collaborating to build new markets for future demand.



In February, 2024, USSEC had announced the launch of the SEC-India, targeted at early-to mid-career professionals to support its livestock and food sectors. The SEC India is in response to the growing needs which also aligns with the 'Skills India' initiative of the government which focuses on enhancing the skill-set of the youth to prepare them for the rising future opportunities. SEC India is addressing the nation's

increasing protein needs through capacity-building and workforce training programs. SEC India's world-class curriculum fosters education advancement for employees and employers in agribusiness, thereby elevating expertise and competencies. Last year, SEC India and Karnataka Poultry Farmers and Breeders Association signed a memorandum of understanding to accelerate work-force training and capacity building of India's rising poultry sector. SEC offers free online programs in poultry, feed milling, aquaculture and soy food and beverage processing. It addresses and bridges the education gap with the skills needed to feed India's growing population. It improves health and nutrition across communities by strengthening the capacity and market potential of businesses within food and agriculture. The program also builds a global community of protein professionals who can network amongst themselves for enriching their skills sets.



The opening of SEC India had come at a time when the livestock - dairy, poultry and fisheries sector in India has emerged as a significant engine of growth in agriculture, playing a vital role in the overall agricultural landscape. According to the economic survey of India (2024-25), the livestock has witnessed a compound annual growth rate (CAGR) of 12.99%. Termed as one of the key 'sunrise sectors' of the Indian economy, the fisheries sector also continues to make its mark and grow at a very healthy pace registering the highest average annual growth

of 9.08% in value of output during amongst allied sectors under agriculture, according to a Niti Aayog report, 2024. Need for enhancing the skill needs of professionals associated with the livestock sector has become quite critical for the growth of the sector.



Home to the world's largest population, India's poultry sector recognizes the importance of keeping pace with the rising demand for animal protein and eggs. In 2023-24, India's egg production, second largest in the world, was estimated at 142.77 billion. The poultry meat production was estimated at 5.09 million tonne (MT). The SEC India is currently offering training programmes which offer online and offline workshops, which covers sectors including poultry, feed milling, aquaculture and soy food and beverage processing. The training program provides participants access to modular, on-demand training resources, live seminars and workshops. It provides access to experts of the industry from the USSEC's huge global network.



Mr. Kevin Roepke, Regional Director, for South Asia and Sub-Saharan Africa, USSEC, emphasized the importance of investing in people, stating, human capital development is a critical driver of organization growth. Companies that prioritize their workforce achieve higher performance and strong retention. Mr. Roepke said that with India's vibrant young force, the SEC paves the way for growth and innovation. According to Mr. Roepke, the establishment of Soy Excellence Center India exemplifies the US Soybean Export Council's steadfast dedication to advancing Indian agriculture. Since initiating our partnership with India's ag sector in 1996, US Soy has diligently collaborated with expertise across the poultry, aquaculture, soybean processing, and soy foods sectors. These industries now constitute the robust, multifaceted, and proactive Regional Advisory Council, which serves as the driving force behind the SEC's progress. The recent incorporation of a dairy curriculum underscores our acute responsiveness to the evolving demands of the industry. In the mere twelve months since its inception, the SEC India has successfully equipped over 500 entry level to mid-career professionals with critical skills. We look forward to sustained collaboration with industry stakeholders to address talent development, thereby contributing to the overarching imperative of enhancing nutrition security through heightened protein consumption.



Dr. Vijay Anand, Center Lead- India Soy Excellence Center said that SEC India program demonstrates USSEC commitment to its mission of feeding the minds of those who will feed the world, the next generation of agri-professionals. According to Vijay E. Pilli, SEC India is more than a training program, it's a transformative platform. It's digital continuing education community fosters life-long learning, enabling participants to engage with content, peers and experts worldwide, creating a truly global exchange of knowledge.

On April 03, 2025, all the fourteen members of Regional Advisory Council (RAC) of Soy Excellence Center-India, along with USSEC Leadership and US Stakeholders attended the inauguration of the final session (Part 3) of the Feed Formulation Lab in which around 50 participants, who had earlier completed online session of Part-1 and Part-2, were attending lectures of experts - Mr. Kemal Burak Kayhan, Director, Feedback Yazilim, Türkiye, SIRRI Kayhan, USSEC, Türkiye, Dr. NC Manju, Consultant, Poultry Nutrition and Dr. Sushil Silva, Regional Head of Animal Nutrition, USSEC, SAASSA Region. The participants were given training on BestMix software.



One of the participants of these online courses noted 'SEC's curriculum provided him with a unique opportunity to learn about the poultry industry and the role of nutrition from a global lens.". Another participant said the learning at the feed milling course was informative as instructors were highly knowledgeable and extensively covered the course topics.



Those professionals who are interested in attending these courses at SEC can access information at - <https://soyexcellence.org> and can contact for SEC-India programs: Vijay Anand E. Pilli (vanand@ussec.org); Jaison John (jjohn@ct.ussec.org); Ms. Archana Udayagiri (audayagiri@ct.ussec.org); Ms. Megha Shankar (mshankar@ct.ussec.org); Franklin Manuel (fmanuel@ct.ussec.org)

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Broiler Lifting Rates for the month of MARCH_2025

place	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Hyderabad	85	95	100	100	85	73	73	63	63	68	73	73	78	78	83	86	96	96	96	96	101	101	94	99	104	106	116	131	# #			
Karimnagar	85	95	100	100	85	73	73	63	63	68	73	73	78	78	83	86	96	96	96	96	101	101	94	99	104	106	116	131	# #			
Warangal	85	95	100	100	85	73	73	63	63	68	73	73	78	78	83	86	96	96	96	96	101	101	94	99	104	106	116	131	# #			
Mahaboobnagar	85	95	100	100	85	73	73	63	63	68	73	73	78	78	83	86	96	96	96	96	101	101	94	99	104	106	116	131	# #			
Kurnool	85	95	100	100	85	73	73	63	63	68	73	73	78	78	83	86	96	96	96	96	101	101	94	99	104	106	116	131	# #			
Vizag	85	95	100	100	100	100	100	94	94	84	84	89	89	89	89	79	79	79	81	84	94	99	99	99	99	99	99	99	104	109	# #	
Godavari	86	96	101	101	101	101	101	95	95	85	85	90	95	95	85	85	85	87	90	100	105	105	105	105	105	105	105	110	112	122	137	# #
Vijayawada	86	96	101	101	101	101	101	95	95	85	85	90	95	95	85	85	85	87	90	100	105	105	105	105	105	105	105	110	112	122	137	# #
Guntur	86	96	101	101	101	101	95	88	85	80	85	90	90	85	85	85	87	92	100	103	103	103	103	103	103	100	108	113	122	137	# #	
Ongole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Nammakkal	102	102	102	105	107	107	107	86	86	92	95	99	104	106	106	106	106	106	106	106	106	104	96	96	101	101	101	113	113			

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NATIONAL EGG CO-ORINATION COMMITTEE

FOR THE MONTH OF APRIL 2007

FOR THE MONTH OF APRIL- 2025

Name Of Zone / Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Average	
NECC SUGGESTED EGG PRICES																																	
Ahmedabad	450	425	425	425	425	430	435	415	415	415	415	415	415	415	415	415	420	425	430	430	430	430	430	430	430	435	440	-	-	428.21			
Ajmer	375	375	375	380	402	410	410	390	385	375	375	385	385	390	390	375	375	370	370	375	375	377	377	377	377	377	377	-	-	381.75			
Banwala	395	395	395	395	400	410	395	395	395	395	395	395	395	395	395	370	368	368	368	370	372	374	376	378	378	378	378	-	-	386.71			
Bengaluru (CC)	510	510	510	490	480	480	480	480	470	460	450	450	450	450	450	450	450	450	450	440	440	430	430	435	435	440	445	-	-	458.75			
Brahmapur (OD)	462	440	425	425	425	430	430	430	410	410	410	415	415	415	425	425	425	410	410	410	415	420	427	427	427	427	427	-	-	421.79			
Chennai (CC)	520	520	495	470	470	480	480	460	460	460	460	460	460	460	460	460	460	460	460	460	450	450	460	470	-	-	-	-	-	468.33			
Chittoor	520	520	495	470	470	480	480	460	460	460	460	460	460	460	460	460	460	460	460	460	460	450	450	460	470	-	-	-	-	-	468.33		
Delhi (CC)	415	415	415	415	421	421	421	421	410	410	410	415	415	415	415	415	415	415	415	415	410	415	420	427	427	427	427	-	-	-	-	-	410.82
E. Godavari	460	425	425	425	430	435	435	435	415	415	415	415	415	415	415	415	415	405	410	410	395	395	400	400	405	410	415	415	-	-	414.11		
Hospet	460	460	440	420	420	425	425	415	405	395	395	395	395	395	395	395	395	395	395	395	385	385	375	380	380	385	390	395	-	-	404.29		
Hyderabad	455	425	425	400	400	405	410	410	390	390	390	390	390	390	395	395	400	405	405	405	405	405	405	405	405	405	410	415	-	-	405.54		
Jabalpur	419	410	410	410	410	410	422	422	405	400	400	405	415	415	415	415	415	410	410	410	395	395	400	400	405	410	415	415	-	-	409.64		
Kolkata (WB)	470	480	460	465	470	490	490	470	455	450	460	465	470	475	475	475	475	475	475	475	475	475	476	476	476	476	476	476	-	-	466.39		
Ludhiana	395	395	380	390	403	410	410	395	395	395	395	395	395	395	395	395	395	390	390	390	375	375	375	375	375	375	375	375	-	-	385.57		
Mumbai (CC)	515	500	500	480	460	465	470	470	460	450	450	440	440	445	445	455	460	460	460	460	450	450	450	450	450	450	455	460	465	-	-	461.07	
Mysuru	510	510	510	490	480	470	470	470	455	450	450	450	450	450	450	450	450	440	440	440	430	430	435	435	435	440	445	445	-	-	457.5		
Namakkal	465	465	465	445	425	425	435	435	415	415	415	415	415	415	415	415	415	415	415	415	415	415	405	405	410	420	-	-	-	-	-	421.43	
Pune	500	485	485	465	465	465	470	470	460	450	440	440	445	445	455	455	455	450	450	450	450	450	450	450	450	455	460	465	-	-	458.21		
Raipur	440	420	420	410	410	410	410	410	410	410	400	400	405	415	415	415	415	405	400	400	400	405	405	405	405	410	410	-	-	408.75			
Surat	460	450	450	440	450	440	445	445	435	435	435	435	435	435	435	435	435	435	435	435	435	435	435	435	435	440	445	-	-	438.21			
Vijayawada	470	450	440	430	430	440	440	440	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	425	430	-	-	427.86			
Vizag	460	440	440	440	440	445	445	435	435	435	435	435	435	435	435	435	435	415	420	425	425	425	425	425	425	430	430	-	-	431.43			
W. Godavari	460	425	425	425	430	435	435	415	415	415	415	415	415	415	415	415	415	405	410	410	395	395	400	400	405	410	415	415	-	-	414.11		
Warangal	457	427	427	402	402	407	412	412	392	392	392	392	392	392	392	392	392	397	402	407	407	407	407	407	407	412	417	-	-	407.54			
Prevailing Prices																																	
Allahabad (CC)	443	429	433	433	438	452	452	448	438	438	438	443	443	443	438	438	438	438	438	438	438	429	429	429	429	429	429	433	433	-	-	437.07	
Bhopal	410	410	410	410	410	410	415	415	415	415	415	415	415	415	415	415	415	410	410	410	410	410	410	410	410	415	415	-	-	402.68			
Indore (CC)	400	400	400	405	420	420	425	415	415	415	415	415	415	415	415	415	415	420	410	410	410	410	410	410	410	410	410	410	-	-	407.86		
Kanpur (CC)	424	424	424	424	429	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	-	-	433		
Luknow (CC)	450	450	450	467	467	483	483	467	467	467	467	467	467	467	467	467	467	467	467	467	467	467	467	467	467	467	467	467	-	-	459.64		
Muzaffarpur (CC)	450	450	450	460	470	470	460	460	455	455	455	455	455	455	455	455	455	455	455	455	455	455	455	455	455	455	455	455	-	-	449.64		
Nagpur	460	440	440	440	440	460	460	420	420	410	410	410	410	410	410	410	410	440	440	440	440	440	440	440	440	420	420	420	420	420	-	-	431.25
Patna	450	450	450	460	470	470	460	460	455	455	455	455	455	455	455	455	455	455	455	455	455	455	455	455	455	455	455	455	-	-	449.64		
Ranchi (CC)	462	457	448	448	457	450	457	457	457	457	457	457	457	457	457	457	457	457	457	457	457	457	457	457	457	457	457	457	-	-	450.96		
Varanasi (CC)	433	433	433	433	433	450	457	457	440	440	440	440	440	440	440	440	440	440	440	440	440	440	440	440	440	440	440	440	-	-	438.25		

POULTRY LINE, MAY_2025

Aflatoxicosis in Poultry

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Introduction:

The aflatoxins are toxic and carcinogenic metabolites of *Aspergillus* spp (*Aspergillus flavus*, *A. parasiticus*, and others) that affect poultry as well as other animals. Aflatoxicosis in poultry primarily affects the liver but can involve immunologic, digestive, and hematopoietic functions. Aflatoxicosis adversely affects the weight of birds, feed intake, feed conversion efficiency, pigmentation, processing yield, egg production and eggshell quality, male and female fertility and hatchability. Susceptibility to aflatoxins varies according to species; in general, ducklings, turkeys, and pheasants are susceptible, whereas chickens, quail, and guinea fowl are relatively resistant. Aflatoxicosis causes general unthriftiness, with high morbidity and mortality rates possible, lesions in the liver, with reddening due to necrosis and congestion or yellowing due to lipid accumulation, hemorrhages in liver and other tissues. Aflatoxins are carcinogenic; however, tumor formation is rare with natural disease, probably because the animals do not live long enough for this to occur.

Aflatoxicosis is a type of poisoning from ingestion of aflatoxins in contaminated poultry feed. The 4 aflatoxins of concern are B1, B2, G1, and G2, with B1 being the most predominant and toxic. Low levels of residual AFB 1 in poultry feeds can cause reduction in growth,

feed conversion, egg production, and compromised immune functions, resulting in significant economic costs to producers. Aflatoxin toxicity may lead to reduced feed intake, reduced weight gain, liver damage, jaundice and eventually death. The response of animals to aflatoxin contaminated feed depends on the aflatoxin concentration, animal species, and age and sex.

Mycotoxins are secondary metabolites produced during the growth of molds and can contaminate grains or feeds. Aflatoxins are mainly produced by *Aspergillus* fungi such as *Aspergillus flavus* and *Aspergillus parasiticus*. AFB1 is the most common aflatoxin in grains and the most toxic mold metabolite. AFB1 reduces the production performance and increases the disease susceptibility of broilers, which have serious negative effects on the development of the broiler industry. Aflatoxin impacts the neuroendocrine system, reduces pancreatic enzyme activity and bile concentration, reduces the digestion of nutrients, inhibits the feeding center, and reduces the feed intake of broilers. Aflatoxin also affects the metabolism of energy, carbohydrates, lipids, vitamins, proteins, and amino acids in broilers, which reduces the utilization efficiency of nutrients. Aflatoxin can cause damage to DNA and inhibit protein synthesis, resulting in significant decreases in plasma total protein (TP), albumin (ALB), serum transaminase (AST), and globulin (GLOB) levels. AFB1 increases

the generation of reactive oxygen species (ROS) and lipid peroxidation, and inhibits the scavenging of oxygen radicals by antioxidants in vivo, leading to oxidative damage in broilers. Additionally, aflatoxin has obvious liver toxicity. At present, serum or plasma AST, alkaline phosphatase (ALP), and alanine aminotransferase (ALT) levels are used as indexes when measuring the effects of aflatoxin on liver toxicity in broilers.

Good Practice Based on Current Knowledge

- Do not store food in damp conditions
- Buy smaller quantities of feed during winter
- Ensure litter is not mouldy

➤ For mobile systems, move housing onto fresh ground with clean dry litter

Treating Aflatoxicosis in Poultry

No specific treatment for aflatoxicosis is known. Since aflatoxins do not accumulate and persist in body tissue, birds do recover from moderate intoxication after the contaminated feed has been removed.

Supportive care: Isolate the bird from the flock and place in a safe, comfortable, warm location with easy access to water and food.

Remove source of potential toxin source to prevent further illness among other flock members.

N-acetylcysteine (NAC)	800 mg/kg BW; Provided protection of broiler chicks against negative effects on performance, liver and renal damage, and biochemical alterations induced by AFB1.
Probiotics	Added to the diet; can be used to alleviate the negative effects of contamination of broiler feed with AFB1 on bird health.
Activated charcoal	Considerably reduced the toxicity of AFB1 in the experimental chickens.
Grape seed extract	250-500 mg/kg; has protective effects against aflatoxicosis caused by AFB1.
Licorice (<i>Glycyrrhiza glabra</i>) extract	450 mg/kg or 0.4% in drinking water; helps diminish the detrimental effects of aflatoxins in feed.
Turmeric (<i>Curcuma longa</i>)	222 mg/kg (powder) or 5 mg/kg diet (extract); ameliorated the adverse effects of AFB1 on serum chemistry in terms of total protein, albumin and γ -glutamyl transferase activity.
Sea buckthorn (<i>Hippophae rhamnoides</i>) oil	Has a potent hepatoprotective activity, reducing the concentration of aflatoxins in liver and diminishing their adverse effects.
Milk thistle (<i>Silybum marianum</i>) seed extract	0.5-1% diet; can provide protection against the negative effects of AFB1
Black cumin (<i>Nigella sativa</i>) extract	1% of diet; can help alleviate the negative effects of aflatoxins in diet.

Aflatoxicosis and Diet Supplementation

Incorporation of sodium bentonite in broiler diets has been shown to reduce the incidence and severity of the hepatic histopathology changes associated with aflatoxicosis. There are reports of a yeast component (esterified glucomannan) being shown to diminish the adverse effects of aflatoxins in broiler chicks.

The addition of yeast component, mannan-oligosaccharide (MOS) to the diet of quails significantly reduced the adverse effects of aflatoxins on feed consumption, body weight gain and feed conversion ratio.

The supplementation of 0.5% *Saccharomyces cerevisiae* partially ameliorated the adverse effects of aflatoxins in broilers in respect of weight gain, feed efficiency, total serum protein and prothrombin time.

A calcium montmorillonite clay that is commonly used as an anticaking agent in feeds, significantly protected broiler chicks from the effects of high-level exposure to aflatoxins.

Aflatoxin from *Aspergillus flavus* in cockerels could be successfully reversed

by the concurrent administration of alcoholic extract of *M myristica*, a tree widely distributed along the west coast and central Africa.

Supplementation of selenium had some protective action against the toxic effect of aflatoxin B-1 in Japanese quail.

Control and Prevention of Aflatoxicosis in Poultry

Good hygiene and the regular cleaning of storage bins, silos and feeding equipment are extremely important. Control is best achieved by the avoidance of contaminated feeds. Good storage of feed will be important. Aflatoxin formation has been shown to be associated with high relative humidity in houses and with storage of the feed in the house for long periods. Since relative humidity and storage time in houses can be altered, aflatoxin formation might be limited by controlling these two factors.

Conclusion:

Aflatoxin B1 is a common contaminant of poultry feeds in tropical and subtropical climates. It has great potential of low levels of aflatoxin B1 to deteriorate broiler performance.

 A close-up photograph of a liver section showing extensive yellowish-orange discoloration and necrotic areas, characteristic of aflatoxicosis.	 A photograph showing four kidney halves arranged in a row against a dark background. The first kidney is labeled 'Normal' and the last one is labeled 'Severely affected'. A horizontal arrow below the kidneys is labeled 'Increase in toxin concentration' with an arrow pointing to the right, indicating a progression from normal to severely affected.
Liver condition in Aflatoxicosis	Effect of increase in Aflatoxin concentration

5%
Composite
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