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Poultry Fortune

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Fowl Cholera

Maintaining Water Quality for Healthy Gut of Poultry

Healthy Feed, Healthy Animals: Ensuring Productivity

Poultry Fortune

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ICAR-IVRI, Mukteswar organizes Kisan Goshti and Germplasm distribution under Scheduled Caste Sub Plan (SCSP)

Dr Amol Gurav, Dr Nitish Singh Kharayat, and Dr Ashutosh Fular provided detail insights in the Kisan Goshti regarding backyard poultry management covering the feeding and housing management, brooding management, vaccination, health management, and parasitic infestation prevention and control through lectures and demonstrations. Germplasm distribution in terms of 1200 day old chicks (RIR, whiteleghorn, Uttarafowl, Kadaknath) for 51 beneficiaries were provided. In addition to that, poultry feed (5kg / head), feeder, drinker, lime powder (30 Kgs / head) and multivitamin syrup was also provided to the beneficiaries.

Dear Readers,

The October 2024 issue of Poultry Fortune is in your hands. *In the news section you may find news about...*

ICAR- Indian Veterinary Research Institute, Izatnagar (UP) and Training and Education Centre, Pune, ICAR-IVRI successfully organized a Workshop on "**Recent Approaches for Managing Emerging and Re- emerging Diseases**" followed by **Interface Meet 2** at Pune (Maharashtra) on 10th September 2024. The event was graced by Chief Guest, Dr Triveni Dutt, Director cum Vice-Chancellor, ICAR-IVRI, Izatnagar and Dr Pravinkumar Deore (IAS), Commissioner, Department of Animal Husbandry, Government of Maharashtra as Guest of Honour. During the inaugural session, Dr HP Aithal, Station In-Charge, TEC Pune, extended a warm welcome to all dignitaries, setting the stage for insightful discussions on the critical topic of disease management in the livestock sector.

LOHMANN BREEDERS GmbH introduces new management effective immediately; Jörg Heier and Jurek Grapentin will take over the leadership of the company. The responsibility is now once again divided between two managing directors, each overseeing different areas of the business. Experienced Leadership for Operational Management who has been part of LOHMANN BREEDERS for over 11 years, will once again assume the role of Managing Director of Operations after a year of sole leadership. In this role, he will focus on operational management, including administration as well as the entire production and supply chain. Jörg Heier brings over 25 years of experience in the agricultural industry and previously served as Director of Global Production at LOHMANN for eight years before transitioning to management in 2021.

Poultry farmers are always searching for solutions to improve operational efficiency, curb the spread of diseases, cut costs, and bolster total output. These farmers are the latest in a long line of industries embracing artificial intelligence (AI) technologies to overcome age-old challenges as well as modern obstacles and disruptions. The latest generation of AI and machine learning tools are poised to help farmers meet the ever-growing food demands of the United States. Below, we explore why farmers are flocking to AI. The Role of AI in Poultry Farming Both artificial intelligence and machine learning technologies can assist with three critical areas of poultry farming.

The 'FeedFlow' project is being led by insect farming innovator Flybox and is funded by Innovate UK as part of Defra's Farming Innovation Programme. Although the UK poultry industry has seen significant advancements in production sustainability through genetic selection, it faces persistent issues including poor leg health, high mortality rates and variable feed conversion rates, as well as contributing the ammonia emissions. UK poultry production systems need to evolve to address these issues and stay competitive against low-cost imports, UK poultry production

Contd on next page

NRS GROUP

Poultry Fortune

Our Mission

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

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

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

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

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

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systems need to evolve continuously. Black soldier fly larvae are renowned for their ability to promote natural poultry behaviour and are a nutrient-rich, high-quality protein source enhanced with antimicrobial peptides.

Exploring innovations and industry trends Dr Ramakrishna Balasubramanian, Aviagen India Business Manager, opened the summit with a warm welcome, followed by Dr Peter Fisher, President of Aviagen Asia, who provided an update on the poultry market in India and across Asia. The summit featured a series of thought-provoking presentations from industry experts, including: **Jose Martin Xavier**, Regional General Manager for Marel, who shared cutting-edge innovations in poultry production and the latest market trends. Bhupinder Singh**,** CEO of Vista Processed Foods (OSI Group), who discussed new opportunities in value-added food products and their potential impact on the Indian market.

Avitech Nutrition recently hosted its Annual Sales Retreat from September 5th to 7th, 2024 in Goa. The three-day event combined business and leisure, offering a productive retreat for the team. The event commenced with a welcome note from Mr. Rahul Kapur, Managing Director of Avitech Nutrition. Mr Kapur presented a detailed overview of the company's future plans. This was followed by an insightful presentation by Dr. Dinesh T Bhosale, a renowned industry professional with over 22 years of experience.

In the Articles section, **FOWL CHOLERA** Poultry farming is one of the fastest growing and more profitable agro – business in the current Indian market scenario. However poultry farming although sounds quite profitable but a lot of people lack of proper knowledge on marketing and poultry diseases. In these poultry disease 'AVIAN CHOLERA' is known to having devasting effects upon the potential yields and profits. Fowl cholera or Avian cholera Avian cholera is highly contagious and acute septicemic disease of both domestic and wild birds caused by *Pasteurella multocida*. Different serotypes of this bacterium can trigger the disease each with varying degree of virulence. Host range Out breaks of fowl cholera occur most frequently in turkeys, chickens, ducks and geese. These disease particularly severe in poultry.

Another Article titled **Healthy Feed, Healthy Animals Ensuring Productivity** Animal feed is a cornerstone of the global food industry, playing a crucial role in enabling the sustainable and safe production of food of animal origin across the world (FAO, 2020). Despite its importance, feed hygiene remains one of the most neglected aspects within the animal nutrition and feed sector. Ensuring feed safety and nutritional quality of animal feed is vital for the overall health and performance of animals, directly influencing their well-being, growth rates, and farm profitability.

Additionally, **Maintaining Water Quality for Healthy Gut of Poultry** Water is the most important nutrient for poultry which plays a critical role in bird performance. The main functions of water are thermo regulation, digestion, and absorption of nutrients. It also acts as a carrier for administering additives, such as medication, supplements, etc. Chickens consume twice as much water as feed. Water quality takes on an increasingly valuable role as public concern over antibiotic use in the poultry industry.

Results in Layer and Broiler farming can be achieved as per specifications when the breeder guidelines are followed. Farmers and Integrators have to give sufficient time and attention to farm management and check the developments there time to time to ensure results. When you invest your hard earned money into it, a little more care and attention can prevent losses and help in profitable farming all the time.

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

M.A.Nazeer
Editor & Publisher
Poultry Fortune

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ICAR-IVRI, Mukteswar organizes Kisan Goshti and Germplasm distribution under Scheduled Caste Sub Plan

On campus distribution of chick sand other inputs among the beneficiaries by JD, IVRI Mukteswar

ICAR-Indian Veterinary Research Institute, Mukteswar campu sunder the able guidance of Dr Y. P. S. Malik, Joint Director, ICAR-IVRI, Mukteswar organized Kisan Goshti on the theme "Management of backyard poultry farming" on 11.09.2024 under the Scheduled Caste Sub Plan (SCSP) for the farmers and livestock owners of Darima and Jaspur village of Ramgarh block, Nainital district. A total offifty one farmers and livestock owners have participated in the Kisan Goshti. Dr Y. P. S. Malik, Joint Director, highlighted the importance of backyard poultry in providing the nutritional and livelihood support as well as in enhancing the family income. He urged the farmers to adopt backyard poultry in larger scale. Dr Amol Gurav, Dr Nitish Singh Kharayat, and Dr Ashutosh Fular provided detail insights in the Kisan Goshti regarding backyard poultry management covering the feeding and housing management, brooding management, vaccination, health management, and parasitic infestation prevention and control through lectures anddemonstrations. Germplasm distributionin terms of 1200 day old chicks (RIR, whiteleghorn, Uttarafowl, Kadaknath) for 51 beneficiaries were provided .In addition to that, poultry feed (5kg/ head), feeder, drinker, lime powder (30 Kgs/ head) and multivitamin syrup was also provided to the beneficiaries. All the farmers submitted the feedback on the program and appreciated the event. The programme was coordinated by Dr Nitish Singh Kharayat, Dr Madhusoodan A.P., and Dr Ashutosh Fular Scientist(s) of TAH Division, ICAR-IVRI, Mukteswar campus.

Sitting at a center is M.K.L. Prasad

Stallen's M.K.L. Prasad retires

M.K.L.Prasad, Vice President, Stallen South Asia Pvt Ltd, retired on 30 September 2024. His colleagues gave a grand send-off party at Stallen's C&F Agent, Ananthalaxmi Agencies at Rajahmundry recently.

Done this Function at Rajahmundry Anantalaxmi (Stallen C&F) participated,

From left, Joginapally Rajendar (R M, South)
K Mahesh Reddy, Hyderabad.
T Sirish Reddy, Anaparthy.
M Ramchander Rao, Vizag.
Chandragiri Sreenivas, Hyderabad.
Rajashekar Reddy, Karimnagar,
J.D.S kumar, Tanuku.
Avinash, Rajahmundry.
Bobbili Srinivas, Tanuku.

Mr M.K.L. Prasad started his career on October 27, 1980 with Cyanamid India ltd as a Sales representative. He shifted to Stallen in 1997 and completed 45 years service with these two companies.

He was the first model employee of Cyanamid, India ltd.

He retired as vice president in Stallen South Asia Pvt Ltd.

Now Mr Joginapally Rajendar taken his place as Regional Manager for AP and Telangana states.

Stallen C & F Agent at Rajahmundry.

Stallen C & F Rajahmundry, Ananthalaxmi Agencies.

ICAR- IVRI, Izatnagar and Training and Education Centre, Pune, Successfully Organises a Workshop on "Recent Approaches for Managing Emerging and Re-emerging Diseases" and an Interface Meet # 2 with the Department of Animal Husbandry, Maharashtra on 10 September 2024 at Pune

ICAR-IVRI successfully organized a Workshop on **"Recent Approaches for Managing Emerging and Re- emerging Diseases"** followed by **Interface Meet # 2** at Pune (Maharashtra) on 10th September 2024. The event was graced by Chief Guest, Dr Triveni Dutt, Director cum Vice-Chancellor, ICAR-IVRI, Izatnagar and Dr Pravinkumar Deore (IAS), Commissioner, Department of Animal Husbandry, Government of Maharashtra as Guest of Honour. The interface meet saw participation from key figures, including Shri Prakash Ahirrao (Joint Commissioner of AH), Dr S Bedkyale (Joint Commissioner & In-charge IVBP), Dr Sunil Lahane (Joint Commissioner & In-charge DIS), Regional Joint Commissioners, Deputy Directors, District Animal Husbandry Officers,

Dr Triveni Dutt, Director cum VC, ICAR-IVRI, delivering inaugural address

Deputy Commissioners, Assistant Commissioners and veterinary officers from the Department of Animal Husbandry, Maharashtra. Delegates from IVRI Izatnagar included Dr SK Singh (Joint Director, Res), Dr Rupasi Tiwari (Joint Director, EE), Dr Kiran Bhilegaonkar (Head, VPH Division), Dr Pronab Dhar (Head, Standardization Division), Dr G Saikumar (In-charge, PME Cell) and Dr Bablu Kumar (In-charge, ZTMU). Others present online were Dr SK Mendiratta (Joint Director, Acad), Dr Sohini Dey (Joint Director, CADRAD), Dr Pallab Chaudhary (Joint Director, Bengaluru Campus), Dr YPS Malik (Joint Director Mukteswar Campus), Dr Arnab Sen (Head, Kolkata Centre), Dr Gorakh Mal (Head, Palampur Centre), and Heads of various Divisions of IVRI. A total of 365 participants from the Department of Animal Husbandry, Maharashtra (112 attended physically) and other states, and staff and students of IVRI (79), have registered and attended the meeting held on hybrid mode.

During the inaugural session, Dr HP Aithal, Station In-Charge, TEC Pune, extended a warm welcome to all dignitaries, setting the stage for insightful discussions on the critical topic of disease management in the livestock sector.

Dr Rupasi Tiwari, Joint Director (EE) and the Organizing Secretary of the event, in her address emphasized the importance of organising such collaborative meets, highlighting that ICAR-IVRI has hosted several interface meets with various stakeholders. She presented an elaborate

Dr Rupasi Tiwari, Joint Director EE, addressing at the event

Dr Pravinkumar Deore, IAS, Commissioner AH, addressing the participants

Action Taken Report (ATR) on the key points identified during the previous meeting with the Department of AH, Maharashtra. The ATR covered crucial areas such as breeding policies, feed technologies, mastitis treatment, reproductive technologies, and antibiotic resistance, showcasing the institute's commitment to addressing critical issues in animal health and management. Dr Tiwari further outlined the expectations of participants for the workshop and shared valuable insights gathered from the registration forms. According to the participants, challenges in diagnosing and treating animals, lack of equipped laboratories at the field level and technical trainings, difficulties in differential diagnosis (non-availability of rapid diagnostic kits/methods) and antimicrobial resistance (AMR) were the primary concerns. Participants also highlighted the need for advanced veterinary technologies such as embryo transfer technologies (ETT, IVF), and multivalent and polyvalent vaccines. In response to the question regarding the most significant problems affecting livestock in their regions, participants emphasized reproductive disorders (infertility), infectious diseases (including FMD, LSD, brucellosis, HS, BQ, salmonellosis, PPR, leptospirosis, goat pox etc.), mastitis, haemoprotozoan diseases (Theileriasis) and nutritional deficiencies. The researchable areas raised by the participants included genetic improvement of livestock, development of polyvalent, protozoan and oral vaccines, AMR, metabolic diseases, rapid diagnostic tests, infertility, plant poisoning and nutritional interventions. They also expressed keen interest in receiving training from IVRI in various advanced areas and technologies such as clinical and molecular diagnostic techniques, GMP, infertility, surgical and imaging techniques.

Glimpse of proceedings of inaugural session of workshop

Dr K.N Bhilegaonkar, Head, Division of Veterinary Public Health delivering his talk

Dr Pravinkumar Deore (IAS), Commissioner of Animal Husbandry, Government of Maharashtra, highlighted the various welfare programmes implemented by the department aimed at improving farmers' livelihoods and ensuring optimal animal health services. He emphasized the importance of preventive measures for diseases like PPR, LSD and brucellosis, which have been key areas of focus. Dr Deore also addressed the growing concern of antimicrobial resistance (AMR), describing it as a pressing issue that requires immediate attention. He stressed the pivotal role field veterinarians can play in disease diagnosis, control and mitigating AMR through responsible practices and timely interventions. Dr Deore lauded the collaborative efforts of ICAR-IVRI in organizing this unique platform for dialogue between key stakeholders. He praised ICAR-IVRI for facilitating these discussions and fostering cooperation to enhance the quality of livestock healthcare in Maharashtra. The workshop, according to him, serves as a crucial step towards ensuring better health services for livestock across the state, driven by scientific advancements and a shared commitment to animal welfare.

Dr Triveni Dutt, Director,

Dr Pronab Dhar, Head, Division of Standardization addressing a query from a participant

ICAR-IVRI, highlighted the institute's significant contributions in the field of animal health and production, emphasizing its pivotal role in the eradication of several diseases and the development of animal vaccines in the country. He noted that IVRI is the sole provider of antisera and various diagnostic reagents to state biological units. IVRI also performs quality control testing of vaccines, which is a vital national service. Presently, IVRI tests 23 viral and 11 bacterial vaccines, including 200 batches of brucella and PPR vaccines, and 400 batches of FMD vaccines, with plans to scale up to testing more than 800 vaccine batches in the near future. Through CADRAD, IVRI responds to disease outbreaks and issues national advisories while also strengthening Regional Disease Diagnostic Laboratories (RDDL) across the country. Dr Dutt further elaborated on the strategic initiatives taken by ICAR-IVRI to align with the expectations of the Government of India and other stakeholders. These include revising the institute's mandate and implementing the National Education Policy (NEP). He shared that IVRI has introduced more than 90 diploma, vocational and certificate courses, along with postgraduate programmes including MVSc in 17 disciplines, PhD in 19 disciplines, an MBA in agri-business, MSc in biotechnology, and various online diploma (ODL) courses. The institute's rich intellectual property (IP) portfolio consists of 32 patents, 21 designs, and 41 copyrights. As of now, IVRI has commercialized 44 technologies including 11 vaccines, 9 diagnostics, 7 designs, 3 animal feed and nutrition products, 7 livestock products, and 4 therapeutics to 150 industrial partners. Notably, the recent commercialization of the lumpy skin disease vaccine stands out among IVRI's many innovations. Additionally, IVRI has developed over 184 ICT tools and AI-based mobile applications to support animal health initiatives. Dr Dutt also highlighted IVRI's critical role in the National Animal Disease Control Programme (NADCP), a flagship initiative launched by the Hon'ble Prime Minister in 2019 aimed at controlling Foot and Mouth Disease by 2025 and eradicating it by 2030, as well as the Brucellosis control programme through rigorous QC testing of vaccines. He mentioned IVRI's efforts in mentoring and establishing 178 start-ups under the RKVY-RAAFTAR programme, with financial support amounting to ₹ 2.3 crores. Dr Dutt expressed his gratitude to the State Animal Husbandry Department officials and veterinary officers for their active participation and contributions during the workshop. He concluded by stating that the workshop-cum-interface meet would provide valuable insights to the participants, aiding in their future endeavors and researchable issues for scientists.

The first technical session was chaired by Dr SK Singh and co-chaired by Dr G Saikumar. The session focused on emerging and re-emerging diseases with an emphasis on animal-human health and preparedness for future outbreaks. Dr P Dhar, Head, Division of Standardization, delivered an in-depth presentation on diseases such as rabies, brucellosis, tuberculosis, Japanese encephalitis, Kyasanur Forest Disease, coronaviruses, Ebola, SARS, Nipah virus, avian influenza, antimicrobial-resistant pathogens, and vector-borne diseases like Zika, yellow fever, Chikungunya, and Crimean-Congo hemorrhagic fever. He discussed the host species, geographical distribution, and the key factors responsible for occurrence and transmission. The containment strategies using a One Health approach, intensive disease surveillance (ProMED and IDSP), and preparedness for Public Health Emergencies of International Concern (PHEIC) were emphasized for better handling of future outbreaks.

Dr KN Bhilegaonkar, Head, Division of Veterinary Public Health, addressed the critical issue of antimicrobial resistance (AMR) and its management. He presented data on global antibiotic consumption in food animals, identifying 'hot-spots' of AMR, particularly in the pork

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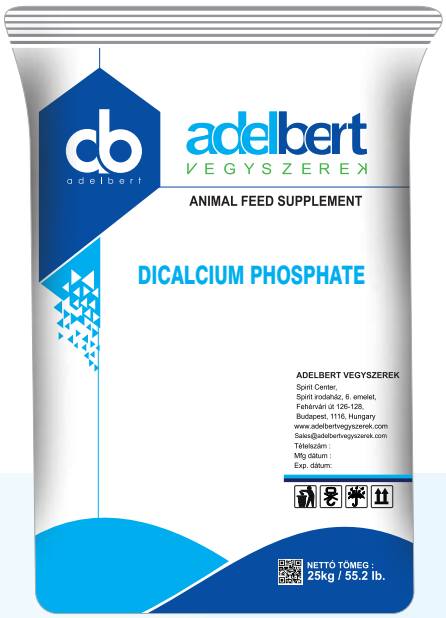

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Group photograph of delegates of Interface Meet # 2

and poultry industries, which pose significant challenges to human health. He explained the sources of resistance, including contamination of the food chain by pharmaceutical effluents, and elaborated on the consequences of AMR on both animal health and productivity, highlighting the resulting economic losses. Dr Bhilegaonkar also discussed the national plan to contain AMR, focusing on active surveillance, mass awareness campaigns, human resource development, and the implementation of guidelines from international organizations such as the World Health Organization (WHO), World

Organisation for Animal Health (WOAH), United Nations Environment Programme (UNEP), and Food and Agriculture Organization (FAO).

Dr Bablu Kumar, Principal Scientist & I/C ZTMU, IVRI, presented key technologies developed by IVRI for the diagnosis and prevention of animal diseases. These included a range of innovative vaccines such as the negative marker FMD vaccine, thermotolerant FMD vaccine, marker IBR vaccine, Lumpy Skin Disease vaccine, and vaccines for buffalo, sheep, and goat pox. He also highlighted thermo-adapted PPR and negative marker PPR vaccines, the Classical Swine Fever (CSF) vaccine, Japanese Encephalitis (JE) vaccine, Small Volume Packaging (SVP) Gumboro vaccine, duck plague vaccine, canine parvovirus, and canine distemper vaccines, as well as combined vaccines. In addition, Dr Kumar discussed the institute's advancements in diagnostic and therapeutic technologies aimed at improving livestock health and productivity.

Afterwards, Dr HP Aithal, Station In-charge, TEC-IVRI Pune, showcased the Centre's initiatives for capacity building and livelihood enhancement. He detailed the Centre's efforts to address the training needs of veterinary officers, recording livestock disease incidence, and organizing demand-driven training programmes and workshops. These initiatives include advanced imaging techniques, fracture fixation techniques, GMP (Good Manufacturing Practices) training, laboratory techniques, infertility management, and online training programmes on variety of soft skills. Dr Aithal also emphasized the Centre's engagement in webinars, interface meetings, SCSP and TSP programmes for underprivileged farmers, Kisan Melas, animal health camps, panel discussions, and consultancy services. He highlighted the development of strong linkages with the animal husbandry departments, universities, and industries to further strengthen the livestock sector.

The Technical Session 2 cum panel discussion, chaired by Dr Rupasi Tiwari, Joint Director (Extension Education), provided an engaging platform for participants to seek expert advice on a range of topics. Queries were raised on vaccination protocols for brucellosis, the feasibility of combined HS, BQ and FMD vaccinations, early detection methods of wildlife diseases to prevent their zoonosis, the potential of herb-based therapies and homeopathic treatments for the control of mastitis and LSD. Participants also discussed innovative solutions such as oral bait vaccines for control of rabies, sustained-release antibiotics, and strategies for germplasm improvement and control of AMR by strict guidelines for use of antibiotics. They also demanded customized trainings in various areas of livestock health and management. Experts from IVRI addressed each query in detail, offering valuable insights into the latest developments in veterinary science and biological supply management.

Dr Amol K Bhalerao Scientist TEC Pune and Dr Akhilesh Kumar, Scientist, Division of Medicine, IVRI, Izatnagar, coordinated the technical sessions. Dr SK Das, Principal Scientist and Dr SV Bahire, Scientist, TEC Pune acted as Rapporteurs for the technical sessions. The workshop concluded with a formal vote of thanks delivered by Dr Amol Bhalerao, marking the successful closure of the event.

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New Management at LOHMANN BREEDERS

Jurek Grapentin, Commercial Managing Director

Jörg Heier, Managing Director of Operations

LOHMANN BREEDERS GmbH introduces new management: Effective immediately, **Jörg Heier** and **Jurek Grapentin** will take over the leadership of the company. The responsibility is now once again divided between two managing directors, each overseeing different areas of the business.

Experienced Leadership for Operational Management

Jörg Heier (51), who has been part of LOHMANN BREEDERS for over 11 years, will once again assume the role of **Managing Director of Operations** after a year of sole leadership. In this role, he will focus on operational management, including administration as well as the entire production and supply chain. Jörg Heier brings over 25 years of experience in the agricultural industry and previously served as Director of Global Production at LOHMANN for eight years before transitioning to management in 2021.

Expansion of International Markets

As of September 1, 2024, **Jurek Grapentin** (42) has taken on the position of **Commercial Managing Director**. He will be responsible for the company's commercial management, including sales, technical service, marketing, as well as PR and communication activities. Jurek Grapentin has over 10 years of experience in international sales and management. In his previous career, he served as Sales Manager for the DACH region and Scandinavia, as well as Regional Director for Southeast Asia and the Pacific. During this time, he successfully established five subsidiaries and led teams in sales, administration, marketing, and technical support. Additionally, he brings extensive experience as a sales and administrative manager. With his expertise and international experience in sales and marketing, Jurek Grapentin will significantly contribute to the further development and success of our company.

Strategic Direction for the Future

This realignment at LOHMANN BREEDERS represents an essential step to meet the growing and changing market demands. With two specialized managing directors, each bringing their expertise in specific areas, LOHMANN BREEDERS will further on develop innovative solutions and ideas. The new leadership will strengthen the company's two core areas: top-quality breeding animals that fully realize their genetic performance potential, and an efficient production and supply chain, complemented by outstanding customer service and after-sales support. LOHMANN BREEDERS is thus well-prepared for future challenges.

Why poultry farmers are flocking to AI ?

Poultry farmers are always searching for solutions to improve operational efficiency, curb the spread of diseases, cut costs, and bolster total output. These farmers are the latest in a long line of industries embracing artificial intelligence (AI) technologies to overcome age-old challenges as well as modern obstacles and disruptions.

The latest generation of AI and machine learning tools are poised to help farmers meet the ever-growing food demands of the United States. Below, we explore why farmers are flocking to AI.

The Role of AI in Poultry Farming

Both artificial intelligence and machine learning technologies can assist with three critical areas of poultry farming.

1. General Farm Management

Poultry farmers can access real-time insights into their farming operations with AI technologies. They can then use this data to control their poultry houses' temperatures, light, humidity, and other environmental conditions. By optimizing conditions through AI, farmers can promote better animal health and increase operational output.

2. Disease Management and Control

AI technologies can streamline disease diagnoses by identifying concerning poultry behavior, such as

cannibalization or huddling. Leading-edge solutions can even translate "chicken chatter" and detect voice fluctuations that are precursors to diseases.

3. Genetic Research
Poultry farmers can use smart sensors to gather essential data about their animals that they otherwise wouldn't catch. Then farmers can then use AI and machine learning solutions to analyze that data, improve poultry genetics, and make flocks more resilient to diseases.

The AI Solutions Revolutionizing Farm Management

Several poultry farming AI solutions are in the works, but two are already impacting industry.

Galleon, a microbiome intelligence tool developed by Cargill, allows farmers to assess flock health by analyzing microbiomes. Farmers can use these insights to guide nutritional decision-making processes and improve overall flock health.

Birdoo, conversely, is a camera monitoring platform that delivers contextualized information to farmers in real time. It supports poultry farmers by granting access to various computer vision, machine learning, and AI solutions.

These solutions are just the start of AI-driven poultry farming and are already revolutionizing how poultry is produced. With so many technological advancements underway, various sectors, including agriculture, will be able to transform their processes and improve output.

Black soldier fly larvae research boost for UK poultry sector

Funding totaling £3 million has been granted to a UK consortium which will utilise advanced technologies and black soldier fly larvae to improve poultry welfare and promote sustainability in the industry.

The 'FeedFlow' project is being led by insect farming innovator Flybox and is funded by Innovate UK as part of Defra's Farming Innovation Programme.

Although the UK poultry industry has seen significant advancements in production sustainability through genetic selection, it faces persistent issues including poor leg health, high mortality rates and variable feed conversion rates, as well as contributing the ammonia emissions.

UK poultry production systems need to evolve
To address these issues and stay competitive against low-cost imports, UK poultry production systems need to evolve continuously. Black soldier fly larvae are renowned for their ability to promote natural poultry behaviour and are a nutrient-rich, high-quality protein source enhanced with antimicrobial peptides.

Artificial intelligence systems, meanwhile, propel precision agriculture by delivering real-time data on flock welfare and early warnings of potential issues. The FeedFlow project harnesses these technologies with a cutting edge rapid intervention system. It integrates FLOX360, an in-demand computer vision platform powered by enterprise-grade AI algorithms.

Black soldier fly larvae are known for their ability to promote natural poultry behaviour and are a nutrient-rich, high-quality protein source

A rapid nutrient boost
In addition, the project incorporates Life Cycle Analysis, which is being led by Jess Callagham from the University of Chester, to assess Global Warming Potential. Flybox is also working with Nottingham Trent University's School of Animal, Rural and Environmental Sciences, which will look at how fortified BSF larvae could deliver a rapid nutrient boost that addresses health challenges more effectively than traditional feed interventions.

Emily Burton, a professor in sustainable food production at Nottingham Trent University, said: "Insects are an essential part of our transition from linear to circular resource use, and project like this are accelerating insect production to commercial viability by thinking outside the box about how we can harness them to improve poultry production."

Last year, Flybox and Nottingham Trent University embarked on a study to feed black soldier fly larvae food waste – nutritionally-enhanced using nano metre sized natural minerals – before being added to poultry feed. The work is part of a feasibility study which aims to increase the nutritional value of chickens and significantly reduce the carbon footprint of ingredients.

Aviagen Hosts Leader's Summit for Key Indian Poultry Producers

Aviagen and industry leaders are committed to strengthening the success of Indian poultry to provide communities with a nutritious, affordable protein

Sept. 24, 2024 – UDUMALPET, India. From August 21-23, Aviagen India welcomed key industry leaders to Chiang Mai, Thailand, for its Annual Leadership Summit. The event was an exclusive gathering of prominent Indian poultry producers, designed to encourage collaboration, share insights, and explore emerging trends and opportunities in the sector.

Exploring innovations and industry trends

Dr Ramakrishna Balasubramanian, Aviagen India Business Manager, opened the summit with a warm welcome, followed by Dr Peter Fisher, President of Aviagen Asia, who provided an update on the poultry market in India and across Asia. The summit featured a series of thought-provoking presentations from industry experts, including:

- **Jose Martin Xavier**, Regional General Manager for Marel, who shared cutting-edge innovations in poultry production and the latest market trends.
- **Bhupinder Singh,** CEO of Vista Processed Foods (OSI Group), who discussed new opportunities in value-added food products and their potential impact on the Indian market.
- **Dr Peter Chrystal,** Senior Poultry Nutritionist for Aviagen Asia Pacific, who offered strategies on maximizing profitability through optimized feed costs while enhancing bird health, welfare, and efficiency.

In his closing remarks, Ferry Monné, Marketing Manager for Aviagen India, expressed gratitude to the attendees, emphasizing the value of such collaborative gatherings in driving the industry forward.

Shaping the future of Indian poultry

Reflecting on the event, Dr Balasubramanian remarked, "The high level of engagement and quality discussions at the summit highlight our commitment to empowering our customers with the knowledge and tools they need to thrive in a rapidly evolving market. We are dedicated to supporting their growth and ensuring they are well-prepared to meet future challenges and opportunities."

Dr Fisher added, "India's poultry production has seen tremendous growth in recent decades, largely due to the hard work and innovation of our customers. Their dedication to delivering a sustainable, affordable, and nutritious protein source to Indian families is truly inspiring. In the spirit of 'Breeding Success Together,' this summit provided an invaluable platform for exchanging ideas and insights that will shape the future of India's poultry industry."

About Aviagen

Since 1923, Aviagen has been recognized as a preferred global poultry breeding company. Its mission is to "Breed Success Together" with its valued customers, supporting these global chicken producers in their crucial endeavor to supply sustainable, affordable and nutritious protein to communities worldwide. Committed to driving positive change in the poultry industry, Aviagen implements efficiencies that not only make commercial chicken production environmentally and socially responsible, but also economically beneficial to producers. Their holistic approach focuses on simultaneously enhancing bird performance, health and welfare, while ensuring food safety and security by upholding the highest biosecurity standards.

Avitech Nutrition Hosts Annual Sales Retreat in Goa, India

Avitech Nutrition recently hosted its Annual Sales Retreat from September 5th to 7th, 2024 in Goa. The three-day event combined business and leisure, offering a productive retreat for the team.

The event commenced with a welcome note from Mr. Rahul Kapur, Managing Director of Avitech Nutrition. Mr Kapur presented a detailed overview of the company's future plans. This was followed by an insightful presentation by Dr. Dinesh T Bhosale, a renowned industry professional with over 22 years of experience. Dr Bhosale elaborated on the role of leadership and the importance of teamwork.

The second day of the conference focused on product training.

The conference concluded with an awards distribution ceremony, celebrating the individual and team achievements of Avitech's sales team over the past year.

The retreat offered a perfect balance of work and pleasure. Attendees had the opportunity to unwind in Goa's beautiful surroundings, engaging in team-building activities and networking in a relaxed setting.

NOVUS partnering with biotech company to develop new feed additives

CHESTERFIELD, MO (September 24, 2024) – The leader in intelligent nutrition, Novus International, Inc., and Ginkgo Bioworks (NYSE: DNA), which is building the leading platform for cell programming and biosecurity, today announced a partnership to develop advanced feed additives designed to meet the evolving needs of the animal agriculture industry. NOVUS will utilize Ginkgo Enzyme Services to build more efficient enzymes that can be produced cost-effectively.

With the agricultural sector facing heightened volatility, including rising feed costs and tightening margins, NOVUS is committed to supporting its customers by optimizing the health and performance of livestock. The partnership aims to bring cutting-edge technologies to market, enhancing the sustainability and efficiency of animal production systems. These innovations are intended to improve the overall well-being of chickens, pigs, and cows, thereby supporting producers in delivering nutritious and affordable animal products to consumers.

"With the challenges and volatility facing the agriculture industry, a multifactorial approach is needed for producers to meet their financial goals and end customers to continue to enjoy nutritious and affordable meat, milk, and eggs," says Abishek Shingote, NOVUS Associate VP of Global Strategic Marketing, Technology and Innovation. "This multifactorial approach requires advanced technologies combined with application knowledge. The partnership with Ginkgo Bioworks puts NOVUS on the path to create new technologies that support health and performance consistency in chickens, pigs, and cows."

Shingote said the products NOVUS and Ginkgo Bioworks are working to develop came out of conversations with NOVUS customers and deep analysis of industry needs.

"Innovation is at the heart of NOVUS. Sustaining thriving livestock is a challenge, especially against economic, environmental and regulatory headwinds," Shingote says. "We make it our mission to find new and novel ways to support our stakeholders and the industry."

Ginkgo Bioworks is the leading horizontal platform for cell programming, providing flexible, end-to-end services that solve challenges for organizations across diverse markets, from food and agriculture to pharmaceuticals to industrial and specialty chemicals.

"Partnering with NOVUS presents an exciting opportunity to apply Ginkgo's enzyme development services in a very important domain," says Dan Rosmarin, Vice President, Commercial at Ginkgo Bioworks. "Together, we can accelerate the development of innovative products that offer tangible benefits to the animal agriculture industry, with the potential to enhance both productivity and sustainability. This partnership will leverage Ginkgo's research innovation platform combined with NOVUS' animal feed application knowledge, putting us on the path to create innovative technologies that meet the evolving needs of the livestock industry."

NOVUS is the intelligent nutrition company providing solutions for the animal agriculture industry around the world. The company's portfolio includes trace minerals, nutritional enzymes, feed digestibility and meat quality solutions, and methionine supplementation products, as well as a network of experts globally who provide guidance on management best practices. To learn how NOVUS is Made of More™, visit novusint.com.

Ginkgo Bioworks is the leading horizontal platform for cell programming, providing flexible, end-to-end services that solve challenges for organizations across diverse markets, from food and agriculture to pharmaceuticals to industrial and specialty chemicals. Ginkgo Biosecurity is building and deploying the next-generation infrastructure and technologies that global leaders need to predict, detect, and respond to a wide variety of biological threats. For more information, visit ginkgobioworks.com and ginkgobiosecurity.com, read our blog, or follow us on social media channels such as X (@Ginkgo and @Ginkgo_Biosec), Instagram (@GinkgoBioworks), Threads (@GinkgoBioworks) or LinkedIn.

How broiler chicken industry has become India's most organised and vertically integrated agri-business

How broiler chicken industry has become India's most organised and vertically integrated agri-business

Newly-hatched pre-vaccinated day-old chicks at IB Group's commercial broiler hatchery in Mundgaon, Rajnandgaon.

The broiler integration companies have turned poultry farming – traditionally based on rearing 10-20 free-range/ backyard breed birds fed on agricultural byproducts and kitchen waste – into a commercial enterprise even for smallholders.

Raghuvendra Verma has 2.5 acres of land, on which he grows paddy, chana (chickpea) and moong (green gram) in one acre. On the remaining 1.5 acres, he raises broiler meat chickens in two environmentally-controlled (EC) poultry sheds, housing 11,000 and 9,000 birds respectively. The 38-year-old from Devkatta village in Dongarghar tehsil of Chhattisgarh's Rajnandgaon district rears them for about 37 days – from day- old chicks (DOC) weighing 35-45 gm, to slaughter-ready birds of roughly 2.5 kg.

Verma does six such cycles annually, each of some 60 days that includes 20 days of "downtime" for litter removal, floor cleaning and pressure washing of equipment. His six batches last year (mid-May 2023 to mid-May 2024) yielded marketable birds with aggregate weight of 320,865 kg.

Contract Farming

The DOCs at Verma's farm come from a broiler hatchery of the IB Group at Mundgaon in Dongarghar tehsil. This Rs 11,000 crore-turnover concern, officially ABIS Exports (India) Private Limited, also supplies the feed for his birds and farm cleaning chemicals (copper sulphate, formalin, bleaching powder and hydrochloric acid).

The broiler feed comprises a pre-starter (400 gm for 12 days when the chicks grow to 400 gm), starter (1,200 gm from 12 to 25 days, when they reach 1,300 gm) and a finisher (after 25 days). In all, the birds consume around 3,300 gm of feed to grow to 2 kg and 4,000 gm for 2.5 kg. At the end of the rearing period, the IB Group/ABIS takes back the mature birds. Their marketing is its responsibility. Verma is paid a minimum "growing charge" (GC) of Rs 10/kg. That can go up if market prices go up or he produces birds with lower mortality rates, above average body weight and less feed consumed for every kg (also called feed conversion ratio, an indicator of management efficiency).

Last year, Verma received an average GC of Rs 14.89/ kg, which, on 320,865 kg, translated into a gross revenue of Rs 47.78 lakh. After deducting expenses – mainly on labour, electricity, diesel and rice husk (used as bedding material for the chicks) – of close to Rs 2.5 lakh per cycle or Rs 15 lakh annually, he netted Rs 32-33 lakh.

Verma has invested Rs 90 lakh on the two EC sheds having automatic feeding and drinking lines (one pan for every 30 birds and one water nipple for 10-12 birds), exhaust and air circulation fans, cooling pads, lighting and diesel brooders (to provide heat and keep the chicks warm in the initial few days).

Each enclosed shed also has a control panel for regulating the feeding,

Raghuvendra Verma at his 11,000-bird environmentally-controlled poultry house in Devkatta village of Chhattisgarh's Rajnandgaon district.

brooding and lighting systems, besides maintaining the required temperature, humidity and ventilation levels. The optimum temperatures for bird growth are 32-34 degrees Celsius in the first three days, gradually reducing to 26-28 degrees during 12-24 days and 24 degrees or below after 35 days.

EC versus Open

Digeshwar Sinha (30), a five acre-farmer from Shikari Tola village in Khairagarh tehsil of Khairagarh-Chhuikhadan-Gandai district, has a smaller 3,300-sq ft "open" poultry house for 2,500 birds.

With a basic shed, feeders and drinkers, fans, sprinklers and jute curtains to beat the summer heat, wood shavings-fired bukharis or gas brooders (each for 800-1,500 birds, as against diesel brooders that can cater to 5,000), and no automation, his investment is only Rs 9 lakh.

Open houses require more space for each chick (1.3-1.4 sq ft, compared to 0.65 in EC sheds). The birds reared here have generally higher bird mortality rates (10-12% versus 3-5%), while taking longer to weigh 2 kg (34-35 versus 32-33 days) and 2.5 kg (40-42 versus 37 days).

Sinha, however, manages the farm well mostly with his own labour. In his last cycle, only 71 out of the 2,520 birds died. The ones marketed had a total weight of 5,954 kg or 2.43 kg average.

With 9,480 kg of feed consumed, his conversion ratio of 1.59 was within the 1.45-1.6 range for EC houses. While the base

Digeshwar Sinha at his 2,500-bird "open" poultry house in Shikari Tola village of Chhattisgarh's Khairagarh – Chhuikhadan - Gandai district.

GC for open houses is Rs 8/kg, the IB Group paid him Rs 13.25/kg. Minus expenditure of Rs 21,000 on Rs 78,890 of gross revenue, his net income from that batch – he, too, does six in a year – was nearly Rs 58,000.

The Rajnandgaon-headquartered ABIS Exports – the first name is derived from the initials of its founders: Amir, Bahadur, Iqbal and Sultan Ali – has 30,000-odd broiler farmers like Verma and Sinha across India. They are supplied DOCs (each costing Rs 28 and pre-vaccinated for Gumboro/Infectious Bursal Disease and Newcastle Disease), feed (Rs 40/kg) and technical inputs (through line supervisors making 5-6 visits during every cycle).

The company also markets the fully-grown birds that are directly lifted from their farms by traders.

The above integrated contract farming model was pioneered by the Coimbatore-based Suguna Foods. Out of the estimated 14 crore DOCs placed every week in broiler farms all over India, IB Group/ABIS and Suguna account for 1-1.1 crore each. Other major broiler integrators are the Venkateshwara Hatcheries (VH) Group, Baramati Agro and Premium Chick Feeds (all in Pune) and Shalimar Group (Kolkata). Each does 30-60 lakh of weekly chick placements.

The ultimate integration

The broiler integration companies have turned poultry farming – traditionally based on rearing 10-20 free-range/backyard breed birds feed on agricultural byproducts and kitchen waste – into a commercial enterprise even for smallholders. Almost 40% of the IB Group's 30,000 farmers own EC houses, having anywhere from 9,000-10,000 to 24,000-25,000 chicks with an initial investment of Rs 450-500/chick.

The broiler industry is arguably India's most organised and vertically integrated agri-business today. Dairies may procure milk directly from farmers, but don't supply them cows or buffaloes. The poultry integrators have their own feed plants as well as commercial broiler hatcheries.

IB/ABIS has 10 hatcheries – two in Rajnandgaon and the rest in Rajpura (Punjab), Muzaffarpur (Bihar), Jagdishpur (Uttar Pradesh), Jalpaiguri (West Bengal), Nagaon (Assam), Jajpur (Odisha), Aurangabad (Maharashtra) and Kolar (Karnataka).

How a new tech promises to kill weeds in rice and wheat fields, remove need for stubble-burning:

These can load over 65 crore eggs annually for hatching into chicks, which are dispatched the same day to reach broiler farms within 12-15 hours. The company has eight feed plants and also India's largest soyabean processing unit with a daily 2,000- tonnes crushing capacity at Badnawar (Madhya Pradesh). It supplies de-oiled cake, the residual meal after oil extraction and the main protein ingredient in poultry feed.

The hatcheries artificially incubate the eggs laid by hens at a parent farm that has both female and male birds. These fertile eggs are put inside "setter" machines for 18.5 days at the right temperature and humidity (to mimic the natural environment provided by broody hens for the embryos inside to develop).

From there, they are transferred to the "hatcher" machines, where the chicks come out after 2.5 days.

The IB hatchery machines are all imported from

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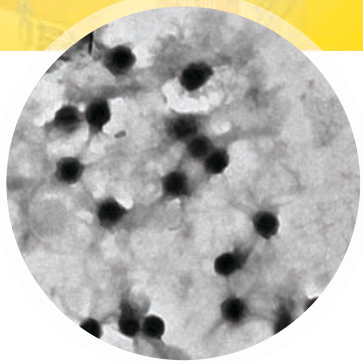
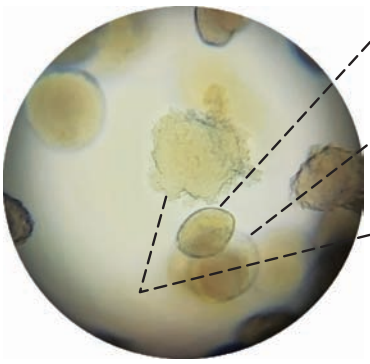


Stages of *Salmonella* colonies infected with Bacteriophages & Progressive Lysis observed on an Agar Plate, under Stereo Microscope



Colony 1 in Stage 1: Intact colony may be infected or yet to get infected

Colony 2 in Stage 2: Phage infected Colony showing Partial Lysis

Colony 3 in Stage 3: Phage infected Colony Completely lysed, cell contents with multiplied phages spreads out in search of their host

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European companies – Petersime (Belgium), HatchTech and Royal Pas Reform (both Netherlands). The vaccine injection, into the eggs (not birds) after the setting stage before going to the hatcher, is done by a separate 'In-Ovo' machine.

Backward and forward integration

The likes of Suguna, IB/ABIS and VH not only have parent farms (where the female chicks are reared for 24-25 weeks and then mated/inseminated for laying eggs till 64-68 weeks) and broiler hatcheries (where the eggs turn into DOCs). They even have the grandparent (GP) farms with male and female birds, which lay the eggs producing the parent stock.

IB Group has two GP rearing farms-cum-hatcheries at Shivpuri and Kariyagondi in Rajnandgaon district. These, in turn, obtain their GP chicks from Aviagen, the world market leader in broiler genetics. The Huntsville (US)-based company has a great-grandparent (GGP) farm and hatchery at Udumalpet (Tamil Nadu) that produces the GP stock chicks of its 'Ross 308 AP' broiler breed. The pure lines or pedigree stock chicks for growing the GGPs and hatching their eggs at this facility are imported by Aviagen India from the US.

For this agri-allied farmer, desi murgi came before eggs, and then came the big bucks

The broiler chickens produced and sold in India are largely of foreign pedigree stock like Ross, Hubbard and Cobb. The Ross and Hubbard lines are owned by Aviagen, while the VH Group has a joint venture with Cobb-Vantress, also a US poultry genetics company, for breeding broilers "suited to Indian agro-climatic and management conditions". Only Suguna Foods has developed its own 'Sunbro' pure line broiler breed.

The Indian broiler industry is highly "backward integrated" – more than dairy – but isn't as "forward integrated" as the latter. Dairies sell branded pouch milk, curd, ghee, butter, cheese and ice-cream, whereas broiler chickens are predominantly wholesaled and even retailed as live birds in the "wet market" or roadside shops.

"Forward integration is the next step. We need to move to branded sales of dressed, chilled and packed chickens, apart from ready-to-cook and ready-to-eat meat," said Zoya Afreen Alam, director of ABIS Exports.

That calls for a special effort at inducing consumer behavior change and may take time – like it did with fresh pouched milk and curd.

Courtesy: Vencobb

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Poultry Fortune presented 25 Awards to the individuals, institutions and organisations

Dr A. S. Ranade, honoured with "Life Time Achievement Award"

Prof. Dr Ajit S. Ranade B. V. Sc. & A. H., M. V. Sc., Ph. D., FIPSA.
Retired University Head of Poultry Science and Associate Dean.

Maharashtra Animal & Fishery Sciences University, Nagpur, India.

Education:

- M. V. Sc. & Ph. D. in Poultry Science with First Class with Distinction from Bombay Veterinary College, Mumbai, India.
- Completed 12 various advance courses and trainings on Poultry Science.

Academic Experience:

Associate Dean : 6.3 years
Head of the Departments : 11 years
Professor of Poultry Science : 16 years
University Head of Poultry Science: 23 years
Associate Professor : 11 years
Assistant Professor : 8 years

Awards:

- Awarded with **'Certificate of Appreciation, 2021'** from Poultry Federation of India, New Delhi on 23.12.2021.
- Awarded with **'Nation Builder Award 2021'** in recognition of his outstanding service towards teaching, mentoring and building ethical future Veterinarians, serving the Development of Indian Poultry Industry, for his outstanding contributions and research with international acclaim in the field of Poultry Science & Avian Studies was awarded by **Rotary Club of Alibaug Seashore** in 2021.
- Awarded **'Recognition Award,** in recognition of outstanding services towards poultry farmers and poultry industry in Maharashtra especially for addressing the outbreak of Bird Flu by the **Poultry Breeders and Farmers Welfare Association** of Maharashtra in 2021.
- Received the **'Recognition Award'** for the services provided to the veterinary field in 2019 from **Veterinary Practitioners Welfare Association (VPWA)** at VPWA Annual Function 2020 Kartutwa Gaurav Awards, Maharashtra.
- Recipient of **Best Poster Award 2019,** at the Technical Session Poster Session – II – **First Position** at the **XXXVI Annual IPSA Conference** held at CGKV, Durg, Chattishgarh, India for the research entitled "Dietary supplementation of phospholipids for improving layer performance".
- Felicitated for the enormous contribution in Indian Poultry Industry during **Chicken Doctor's Conclave 2019** at Goa by the association of **"Veterinarians in Poultry"**.
- Recipient of **"Best Academician"** Award at VPWA Annual Function 2019 Kartutwa Gaurav Awards, Maharashtra.
- Received **'Ayurvet Award 2011'** for the research article entitled 'Studies in the production of Omega 3 enriched chicken meat: II' published in the Indian Journal of Poultry Science.
- Awarded with **'Best Poultry Scientist Award'** for the year 2010 by **Indian Poultry Journalists Association** for outstanding contribution and research in the field of Poultry Science. **(National Award)**
- Awarded with **Fellow of Indian Poultry Science Association 2010** for outstanding contribution and research in the field of Poultry Science. **(National Award)**
- Awarded with **CLFMA Award 2006** for outstanding contribution and research in the field of Poultry Science at national level. **(National Award)**
- Received the **Scroll of Honour 2005** for sincere and meritorious services by Dean, Bombay Veterinary College.
- Received the **Scroll of Honour 2005 as Best Teacher** by Dean, Bombay Veterinary College.
- Received the **Scroll of Honour 2004** for sincere and meritorious services by Dean, Bombay Veterinary College.
- Received the **Best Scientist Award 2002-03** at Poultry Research Information and Scientist Meet, PRISM at Pune.
- Awarded **Bombay Veterinary College Diamond Jubilee Commemoration Prize** for the year **1986-87** for having stood first by securing the highest G.P.A. of (4.00/4.00) at Sr. M.V.Sc. class of M.V.Sc. Degree Examination.
- Awarded **Mahatma Jyotiba Phule Research Award** for the **Best Field Oriented Research Work at M.V.Sc. Level** for the year **1986**.

Dr A. S. Ranade, Former Head, Department of Poultry Science & Associate Dean,Mumbai Veterinary College,receiving Poultry Fortune Life Time Achievement Award 2024 from Ms Sonali Kulkarni, most popular actressin Marathi Cinema industry and M.A. Nazeer, Chief Executive of IIPE 2024 and Editor, Poultry Fortune on 2 August 2024 at Pune.

Contribution during Bird Flu Outbreak in 2006:

- Chairman of the special committee of MAFSU for Bird Flu Awareness Program.
- Organized symposia on Avian Influenza by Bombay Veterinary College & MAFSU in 2006.
- Organized Chicken Eating Rally by Bombay Veterinary College & MAFSU in 2006.
- Technical Inputs as an expert to Brihanmumbai & Thane Municipal Corporations & State Govt. of Maharashtra.
- Consultation to farmers, traders & consumers for control.
- Participation in chicken eating rallies, seminars and symposia on Bird Flu.
- Lectures, presentations, radio, television & press interviews

and article as an expert.
- Addressing Press Conferences as an Expert.
- Invited Panelist for a panel discussion on 'Emerging biosecurity challenges for the poultry industry - an action agenda for prevention' held at National conference on 'Challenges for the Indian poultry sector - Post Avian Influenza' on 8th November 2006 at New Delhi.

Contribution during Bird Flu Outbreak in 2021:
- Nodal officer and Expert of Maharashtra Animal & Fishery Sciences University to address Bird Flu Outbreak in Maharashtra in 2021.
- Prepared Press Note in English and Marathi to be released by MAFSU and its constituent colleges in 2021.
- Videos of talk giving information about Bird Flu in English, Marathi and Hindi to circulate on University and College websites and social media like, What's App, Face Book, Instagram, etc. were released in 2021.
- Interviews given to News Papers like Maharashtra Times, Sakal, Indian Express, Times of India, etc. in 2021.
- Interviews telecasted on various news channels and you tube channels like ABP Maza, TV 9 Marathi, Sam TV Marathi, Zee 24 Tas, BBC Marathi, Mahanagar News Portal, Live Show of Journalist Fay D'Souza etc.
- Guided Dr Markandeya, Associate Dean, COVAS, Parbhani to form Standard Operating Procedures in bird flu outbreak as directed by Collector of Parbhani District.

Dr Sandeep Karkhanis, receives **"Best CEO in Poultry Industry Award"**

Dr Sandeep Karkhanis, Managing Director,Noveltech Feeds Pvt Ltd, receiving Poultry Fortune Best CEO in Poultry Industry Award 2024 from Ms Sonali Kulkarni, most popular actress in Marathi Cinema industry and M.A. Nazeer, Chief Executive of IIPE 2024 and Editor, Poultry Fortune on 2 August 2024 at Pune.

Debaraj Das receives **"Best Business Leader Award"**

Debaraj Das, Chief Operating Officer, Baramati Agro Ltd, receiving Best Business Leader Award 2024 on 2 August 2024 at Pune.

Japfa Comfeed India Pvt Ltd receives **"Best Feed Mill Award 2024"**

Japfa Comfeed India Pvt Ltd, receiving Best Feed Mill Award 2024from Ms Sonali Kulkarni, most popular actress in Marathi Cinema industry and M.A. Nazeer, Chief Executive of IIPE 2024 and Editor, Poultry Fortune on 2 August 2024 at Pune.

Belchick - By Kwality House receives **"Best Chicken Processing Company Award"**

Dr Taralkar, General Manager, Belchik Chicken receiving Best Chicken Processing Company Award 2024 from Ms Sonali Kulkarni, most popular actress in Marathi Cinema industry and M.A. Nazeer, Chief Executive of IIPE 2024 and Editor, Poultry Fortune on 2 August 2024 at

Dr Shyam Vane receives **"Best Marketing Man in Poultry Award"**

Dr Shyam Vane, Business Manager – India, Hipra India Pvt Ltd, receiving Best Marketing Man in Poultry Award 2024 from Ms Sonali Kulkarni, most popular actress in Marathi Cinema industry and M.A. Nazeer, Chief Executive of IIPE 2024 and Editor, Poultry Fortune on 2 August 2024 at Pune.

Dr K. Balaswamy receives **"Best Egg Promotion Award"**

Dr K. Balaswamy, Consultant - NECC, President, NECPC, receiving Best Egg Promotion Award 2024 from Ms Sonali Kulkarni, most popular actress in Marathi Cinema industry and M.A. Nazeer, Chief Executive of IIPE 2024 and Editor, Poultry Fortune on 2 August 2024 at Pune.

Dr Jayanta Bhattacharyya receives **"Best Business Development Award"**

Dr Jayanta Bhattacharyya, Director, Techno - Commercial, Bentoli Agri Nutrition India Pvt Ltd, receiving Best Business Development Award from Ms Sonali Kulkarni, most popular actress in Marathi Cinema industry and M.A. Nazeer, Chief Executive of IIPE 2024 and Editor, Poultry Fortune on 2 August 2024 at Pune.

Ayugen Pharma Pvt Ltd receives **"Best Emerging Animal Health Care Company Award"**

Dr Kishor Yembarwar, Managing Director, Ayugen Pharma Pvt Ltd, receiving Best Emerging Animal Health Care Company Award 2024 from M.A. Nazeer, Chief Executive of IIPE 2024 and Editor, Poultry Fortune on 2 August 2024 at Pune.

Dr S. V. Rama Rao receives **"Exemplary Contribution to R&D on Nutrition & Tech Service Award"**

Dr S. V. Rama Rao,Scientist & Technical Services, DPR, Hyderabad, receiving Exemplary Contribution to R&D on Nutrition and Technical Services Award 2024 from Ms Sonali Kulkarni, most popular actress in Marathi Cinema industry and M.A. Nazeer, Chief Executive of IIPE 2024 and Editor, Poultry Fortune on 2 August 2024 at Pune.

Dr Abhijit Mishra receives **"Best Poultry Nutritionist (Individual)** Award"

Dr Abhijit Mishra,Consultant, receiving Best Poultry Nutritionist (Individual) Award 2024 from Ms Sonali Kulkarni, most popular actress in Marathi Cinema industry and M.A. Nazeer, Chief Executive of IIPE 2024 and Editor, Poultry Fortune on 2 August 2024 at Pune.

Dr Shive Kumar Bhardwaj receives **"Best Poultry Nutritionist (Corporate) Award"**

Dr Shive Kumar Bhardwaj, receiving Best Poultry Nutritionist (Corporate) Award 2024 from Ms Sonali Kulkarni, most popular actress in Marathi Cinema industry and M.A. Nazeer, Chief Executive of IIPE 2024 and Editor, Poultry Fortune on 2 August 2024 at Pune.

Dr Dhirendra Kumar receives **"Best Poultry Physician Award"**

Dr Dhirendra Kumar,Technical Advisor, Vesper Group and Proprietor, D K Consultations, receiving Best Poultry Physician Award 2024 from Ms Sonali Kulkarni, most popular actress in Marathi Cinema industry and M.A. Nazeer, Chief Executive of IIPE 2024 and Editor, Poultry Fortune on 2 August 2024 at Pune.

Dr Ganesh Darban receives **"Best Technical Services Provider Award"**

Dr Ganesh Darban, Manager – Technical Services, Vaksindo Animal Health Pvt Ltd, receiving Best Technical Services Provider Award 2024 from Ms Sonali Kulkarni, most popular actress in Marathi Cinema industry and M.A. Nazeer, Chief Executive of IIPE 2024 and Editor, Poultry Fortune on 2 August 2024 at Pune.

Dr Kakasaheb Kalyanrao Khose receives **"Exemplary Contribution to Poultry Industry Award"**

Dr Kakasaheb Kalyan rao Khose, Assistant Professor, Department of Poultry Science, College of Veterinary & Animal Sciences, Parbhani, Maharashtra, receiving Exemplary Contribution to Poultry Industry Award 2024 from Ms Sonali Kulkarni, most popular actress in Marathi Cinema industry and M.A. Nazeer, Chief Executive of IIPE 2024 and Editor, Poultry Fortune on 2 August 2024 at Pune.

Dr Amit Ranjan receives **"Best Sales & Customer Service in Poultry Award"**

Dr Amit Ranjan,Nutritionist, AB Vista South Asia,receiving Best Sales & Customer Service in Poultry Award 2024 from Ms Sonali Kulkarni, most popular actress in Marathi Cinema industry and M.A. Nazeer, Chief Executive of IIPE 2024 and Editor, Poultry Fortune on 2 August 2024 at Pune.

Dr Shaveta Sood receives **"Best Influential Female Veterinarian Award"**

Dr Shaveta Sood, Chief Commercial Officer - South Asia, ZAMIRA Australia, receiving Best Influential Female Veterinarian Award 2024 from Ms Sonali Kulkarni, most popular actress in Marathi Cinema industry and M.A. Nazeer, Chief Executive of IIPE 2024 and Editor, Poultry Fortune on 2 August 2024 at Pune.

Dr Santosh Ire & Associates receives **"Best Innovation in Water Treatment for Poultry Award"**

Dr Santosh Ire & Associates, receiving Best Innovation in Water Treatment for Poultry Award 2024 from Ms Sonali Kulkarni, most popular actress in Marathi Cinema industry and M.A. Nazeer, Chief Executive of IIPE 2024 and Editor, Poultry Fortune on 2 August 2024 at Pune.

Samarth Pharma receives **"Best Upcoming Poultry Healthcare Products Distributor Award"**

Pradeep Gadekar, Samarth Pharma,Pune, receiving Best Upcoming Poultry Healthcare Products Distributor Award 2024 from Ms Sonali Kulkarni, most popular actress in Marathi Cinema industry and M.A. Nazeer, Chief Executive of IIPE 2024 and Editor, Poultry Fortune on 2 August 2024 at Pune.

Vet Medicare receives **"Best Poultry Nutrition & Healthcare Products Distributor Award"**

Dr Sahebrao D. Rathod and Dr Bhagat B.T, Vet Medicare,Nashik, receiving Best Poultry Nutrition & Healthcare Products Distributor Award 2024 from Ms Sonali Kulkarni, most popular actress in Marathi Cinema industry and M.A. Nazeer, Chief Executive of IIPE 2024 and Editor, Poultry Fortune on 2 August 2024 at Pune.

Allana Sons Pvt Ltd, receives **"Best Raw Material Supplier for Poultry Award"**

On behalf of Allana Sons Pvt Ltd, Dr Sahebrao D. Rathod, receiving Best Raw Material Supplier for Poultry Award 2024 from Ms Sonali Kulkarni, most popular actress in Marathi Cinema industry and M.A. Nazeer, Chief Executive of IIPE 2024 and Editor, Poultry Fortune on 2 August 2024 at Pune.

Namdev Shewale receives **"Best Egg Trader in Poultry Award"**

Namdev Shewale,Proprietor, Namdevo Eggs Merchant, receiving Best Egg Trader in Poultry Award 2024 from Ms Sonali Kulkarni, most popular actress in Marathi Cinema industry and M.A. Nazeer, Chief Executive of IIPE 2024 and Editor, Poultry Fortune on 2 August 2024 at Pune.

Sham K Bhagat receives **"Best Corporate Layer Farmer Award"**

Sham K Bhagat, Proprietor, Bhairavnath Poultry Farms, receiving Best Corporate Layer Farmer Award 2024 from Ms Sonali Kulkarni, most popular actress in Marathi Cinema industry and M.A. Nazeer, Chief Executive of IIPE 2024 and Editor, Poultry Fortune on 2 August 2024 at Pune.

Dr Rajkumar Jaipal receives **"Best Layer Farmer Award"**

On behalf of Dr Rajkumar Jaipal,Ajmer, Rajasthan, Dr Bhagwati Singh, receiving Best Layer Farmer Award 2024 from Ms Sonali Kulkarni, most popular actress in Marathi Cinema industry and M.A. Nazeer, Chief Executive of IIPE 2024 and Editor, Poultry Fortune on 2 August 2024 at Pune.

Nishith Ranjan Singh receives **"Best Layer Farmer Award"**

On behalf of Mr Nishith Ranjan Singh,Proprietor, Nitya Agro Farm, Udhauli, Uttar Pradesh, Mr Abhay K. Laul, receiving Best Layer Farmer Award 2024 from Ms Sonali Kulkarni, most popular actress in Marathi Cinema industry and M.A. Nazeer, Chief Executive of IIPE 2024 and Editor, Poultry Fortune on 2 August 2024 at Pune.

FOWL CHOLERA

Source:
Sairam Mule
Email: sairammule09@gmail.com

FOWL CHOLERA

Poultry farming is one of the fastest growing and more profitable agro – business in the current Indian market scenario. However poultry farming although sounds quite profitable but a lot of people lack of proper knowledge on marketing and poultry diseases. In these poultry disease 'AVIAN CHOLERA' is known to having devasting effects upon the potential yields and profits.

Fowl cholera or Avian cholera:

Avian cholera is highly contagious and acute septicemic disease of both domestic and wild birds caused by *Pasteurella multocida*. Different serotypes of this bacterium can trigger the disease each with varying degree of virulence.

Host range:

Out breaks of fowl cholera occur most frequently in turkeys, chickens, ducks and geese. These disease particularly severe in poultry.

Transmission:

The disease can be transmitted by horizontal and by direct or indirect contact with infected birds. The disease gets introduced to flocks through wild birds, rodents, predator attacks (dogs, cat) Newly introduced carrier birds or fomites. Dissemination of *Pasteurella multocida* within a flock is primarily by excretions from mouth, nose and conjunctiva of diseased birds that contaminate their environment. The direct contact with infected birds may be by secretions made from infected birds, requiring close contact with on another. Most common route involving contamination of environment, feed or water with faeces from infected hosts. Non fatal predator attack from wild or domestic animals (dogs, cats & raccoons are known to be carrier of high amount of bacteria is their oral cavity and underneath their nails. Contamination of equipment, clothing, cages, feeders may as well act as source of transmission. Adult animals are more susceptible to fowl cholera infection and physiological stress, such as egg lay cycles and seasonal changes , influence susceptibility.

Clinical signs:

In acute infection birds may suddenly die without showing any prior signs of illness. Symptoms include loss of appetite, fever, increased thirst, lethargy, profuse diarrhoea, respiratory distress, nasal discharge. Bluish-purple discolouration of combs and wattles due to oxygen deprivation,widespread haemorrhages. In chronic cases birds survive acute infection or exposed to a low virulence strain exhibits localized infections. Wattles, sinus, foot pads, sterna bursa and leg & wings joints become swollen. Infected birds may also exhibit torticollis from middle ear infections & meningeal involvement. Chronic form of fowl cholera may last 3 to 4 weeks and may sometimes persist for year.

Post mortem lesions:

In acute form; hypermedia is especially evident in the vessels of the abdominal viscera. Petechial and ecchymotic hemorrhage are common particularly in subepicardial and sub serosal location. Increased amount of peritoneal and pericardial fluids are frequently seen. Liver may be swollen and often develop multiple, small necrotic foci, pneumonia is particularly in turkey. In Chronic form localized infections may be found throughtout the body including the hock joints, foot pads, oviducts, and coelomic cavity. Suppurative lesions are frequently found in respiratory tract and pneumatic bones. Caseous exudates and fibrin may also infiltrate, the calvarial bones, middle ear, meninges and air spaces.

Diagnosis:

Cultural samples can be taken from the liver, lung, spleen and wattles. Additionally impression smears may reveals bipolar, Gram negative rods suggestive of Pasteurella multocida. Use of wright' strain or methylene blue readily demonstrates the bipolar morphology of Pasteurella multocida. *Pasteurella multocida* readily on blood agar but does not grow on Mac C onkey agar.

Treatment:

Sulfamethazine, Penicillins and Oxytetracycline are effective against *Pasteurella* infections. Providing chickens with multi stain probiotics may help improve intestinal health while attenuating inflammatory infections, clinical signs & mortality.

Prevention and control:

Both live and inactivated *Pasteurella multocida* vaccines are available for use in chickens.

Biosecurity measures:

Regular cleaning and disinfect poultry facilities followed by proper Disposal of dead birds. Preventing contact between wild birds, domestic birds, rodents and other animals from accessing or dropping their faeces within coops and outdoor enclosures may help in spreading of the disease.

Healthy Feed, Healthy Animals: Ensuring Productivity

Email: **askthefeeddoctor@bentoli.com**

Techno-commercial team- Bentoli Agrinutrition

Healthy Feed, Healthy Animals: Ensuring Productivity

Techno-commercial team- Bentoli Agrinutrition, Email: askthefeeddoctor@bentoli.com

Introduction

Animal feed is a cornerstone of the global food industry, playing a crucial role in enabling the sustainable and safe production of food of animal origin across the world (FAO, 2020). Despite its importance, feed hygiene remains one of the most neglected aspects within the animal nutrition and feed sector. Ensuring feed safety and nutritional quality of animal feed is vital for the overall health and performance of animals, directly influencing their well-being, growth rates, and farm profitability.

Feed hygiene refers to the practices and measures taken to ensure that the animal feed is free from contaminants such as bacteria, molds, toxins, and other harmful substances (FAO, 2020). Several factors influence feed hygiene such as microbiological causes like bacteria, parasites, prions, viruses, chemical causes like residue of heavy metals, pesticides, mycotoxins, PCB, dioxins, fertilizers, disinfectants and physical causes like soil, sand, dust, toxic plants, or banned feed ingredients (Hoffmann, 2021). The quality of feed directly affects animal well-being, growth rates, and overall farm profitability. Feed hygiene requires control throughout the feed production chain but the feedstuffs' safety can rarely be certified or verified due to the wide range of potential contamination agents and hazards encountered in different feed environments(Johan den Hartog, 2003).

Feed hygiene

In order to ensure the wellbeing, health, and productivity of animals as well as the safety of products derived from animals that are intended for human use, feed safety and feed hygiene are critical. The relationship between feed and microorganisms varies where feed can transport pathogenic microorganisms directly and transmit disease; likewise, microorganisms can also be responsible for feed spoilage and thereby indirectly cause issues (Baer et al, 2013). The inclusion of new ingredients such as animal proteins, oils, and fermented products, among others, increases the need for strict feed quality monitoring (Truelock et al, 2020). Moreover, factors such as the type of feed components involved and water activity levels also need to be considered while optimizing feed hygiene (Doyle and Mazzotta, 2000). Ensuring the feed safety and hygiene is quite challenging and involves several checks and balances

Table: Hazards in the feed chain

Biological	Chemical	Physical
Bacteria	Naturally occurring Toxins	Metal parts of equipment
Parasites	Pesticides residue	Glass
Viruses	Veterinary drug residue	Stones
Prions	Potentially toxic residue	Bones
	Chemical contaminants	Nanomaterial
	Environmental pollutants	Microplastics
		Radionuclides

(Source - FAO, 2020)

throughout the entire value chain of feed processing. The deficient feed hygiene can be attributed by four main categories of causative factors:

1. Microbial contamination

Pathogens: Feed can be a medium for pathogens such as bacteria (e.g., *Salmonella spp*, *E coli*, *Listeria spp, Clostridium spp*), viruses, fungi, and parasites. These microorganisms can cause diseases in animals, ranging from mild gastrointestinal disorders to severe systemic infections. *Salmonella* is a gram-negative enterobacter and can occur in feed. There are only two species in this genus, *Salmonella enterica* and *Salmonella bongori* (Lin-Hui and Cheng-Hsun, 2007), but almost 2,700 serotypes (serovars), of which around 10% have been isolated from birds. In general, most serotypes of Salmonella can infect several animal species (Gast, 2008), such as *Salmonella Typhimurium* and *Salmonella Enteritidis*. The origins of pathogenic *E. coli* in a flock can also be traced to feed contamination (Stanley & Bajagai, 2022). Another commonly encountered bacteria entered through contaminated feed is Clostridium causing necrotic enteritis and is majorly responsible for slow but steady mortality in growing flock. The presence of these pathogens can lead to gastrointestinal diseases, contributing to mortality rates as high as 30% in affected flock (G.Yu., Laptev et al., 2023)

Mold and Mycotoxins: The molds can grow on improperly stored raw materials and feed, producing mycotoxins (secondary metabolites that are toxic to animals). Common mycotoxins include aflatoxins, ochratoxins, trichothecenes, zearalenone and fumonisins. These

compounds can cause digestive disturbances, damage to the reproductive system, liver damage, immunosuppression, and even cancer in animals. These mycotoxins can affect the animal in several ways, from decreasing performance to severe disease (Esmail, 2021; Government of Manitoba, 2023).

2. Chemical contamination

Pesticides: Residues from agricultural chemicals used in crop production can contaminate animal feed. Chronic exposure to these chemicals can lead to various health issues in animals, including digestive disturbances, reproductive problems and carcinogenesis.

Heavy metals: Contaminants such as lead, mercury, and arsenic can accumulate in animal feed through environmental sources, such as soil or water. These metals are toxic and can cause neurological, renal, and hepatic damage.

Feed additives: While additives like antibiotics, vitamins, and minerals are often used to promote growth and prevent disease, improper usage can lead to issues such as antibiotic resistance or toxicity.

3. Physical Contaminants

Physical contaminants such as stones, metal fragments, and plastic can cause physical damage to the animals' digestive systems, leading to injuries or blockages. Ensuring that feed is free from such hazards is crucial for maintaining animal health.

4. Spoilage and Nutrient Degradation

Oxidative rancidity: Fats and oils in feed can undergo oxidation, leading to rancidity. This not only reduces the palatability of the feed but also decreases its nutritional value, particularly affecting fat-soluble vitamins (A, D, E, and K).

Nutrient depletion: Improper storage conditions can cause degradation of essential nutrients, such as proteins, vitamins, and minerals. For example, exposure to light can degrade vitamin A and D in feed.

Importance of feed hygiene

1. Animal health & welfare: Contaminated feed can lead to a range of health issues in animals including gastrointestinal infections, reduced growth rates, and decreased reproductive performance. For example, *Salmonella or E. coli* contamination can lead to gastrointestinal illnesses, while molds and fungi can produce mycotoxins that are toxic to livestock.

2. Nutrient integrity: Poor feed hygiene can lead to spoilage, reducing the nutritional value of the feed. Contaminated feed may result in nutrient deficiencies which may lead to reduced feed intake and low FCR.

3. Productivity and performance: Poor feed hygiene can negatively impact overall productivity of animals. This can result in deficiencies or

imbalances that affect animal growth, reproduction, and overall health.

4. Quality of animal products: The nutritional quality of animal products can be directly influenced by the quality of feed. Poor-quality feed can lead to lower-quality meat, milk, and eggs, affecting taste, texture, and nutritional content of the animal products.

5. Economic impacts: Poor feed hygiene can lead to death of livestock, and decreased production efficiency resulting in economic implications for farmers and the broader agriculture industry.

6. Regulatory compliance: Many countries have strict regulations regarding feed hygiene to ensure better animal and public health. Non-compliance can result in legal consequences and financial penalties. Good feed hygiene practices are often necessary for accessing certain markets, especially for export. This is important for maintaining consumer trust and ensuring the safety of the food supply chain.

Controls measures to maintain good feed hygiene:

Good feed hygiene is essential for maintaining the health of livestock, ensuring food safety, and preventing the spread of diseases. Below are some key control measures for maintaining good feed hygiene:

1. Stringent Selection & Monitoring of Raw Materials

Ensure that feed ingredients sourced from reputable suppliers with stringent quality control measures. Conduct regular testing of feed for contaminants such as mycotoxins, pathogens, and chemical residues. Regular training to all personnel involved in feed production and handling on hygiene practices and the importance of maintaining feed quality.

2. Proper Storage of Feed

To avoid contamination and spoiling, feed and feed ingredients should be stored in dry, clean, and well-ventilated areas. Regular cleaning and sterilization of storage bins, silos. Implement an integrated pest management program to control rodents, insects, and other pests.

3. Feed Handling Practices

Regular cleaning and disinfection of all equipment used in feed production, transport, and feeding. Avoid cross-contamination between different types of feed, especially medicated and non-medicated feeds. The vehicles used for transportation of raw material and feed should be clean and free from contaminants.

4. Biosecurity Measures

Identify potential hazards in the feed production and handling process. Establish and monitor critical control points to prevent or reduce the risk of contamination. Limit access to feed storage and production areas to authorized personnel only. Enforce strict hygiene protocols for visitors and personnel entering feed production areas. Implement corrective actions when deviations from critical limits occur. Dispose of contaminated feed safely and in accordance with local regulations to prevent environmental contamination.

5. Use of Additives

Use approved preservatives (mold inhibitors, natural antimicrobials, antioxidants, and toxin binders) to extend the shelf life of feed and prevent microbial growth. Incorporate probiotics and enzymes to improve feed digestibility and reduce the risk of harmful bacteria.

By following these control measures, we can significantly reduce the risk of feed contamination and ensure that your livestock receive safe, high-quality nutrition.

Conclusion:

Feed hygiene needs to be ensured for successful animal production and public health. Good feed quality can be attained through adhering to essential practices addressing emerging challenges and maintaining high standards of feed hygiene.

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More references can be provided on request.

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Maintaining Water Quality for Healthy Gut of Poultry

Dr Ashok Rajguru, Program Manager, Trouw Nutrition South Asia

Introduction

Water is the most important nutrient for poultry which plays a critical role in bird performance. The main functions of water are thermoregulation, digestion, and absorption of nutrients. It also acts as a carrier for administering additives, such as medication, supplements, etc. Chickens consume twice as much water as feed. Water quality takes on an increasingly valuable role as public concern over antibiotic use in the poultry industry. Water quality is one of the most critical and least appreciated factors for bird performance. Therefore, providing a clean and safe water supply is crucial for optimal broiler performance (Fig.1).

Figure 1: Supply of clean water to birds

To ensure water quality, we must check the following parameter

- Physical examination- Color, taste, odour and Turbidity
- Chemical Test – pH, Hardness, TDS, Alkalinity, Mineral level
- Microbial Analysis – Total bacterial count, Coliform, Enterobacteriaceae, E. coli, Salmonella, Mold count

❖ **Physical Examination**

Drinking water should be clear, tasteless, odourless, and colourless. As a general observation, a reddish-brown colour may indicate the presence of iron, while a blue colour indicates the presence of copper. Hydrogen sulfide is indicated by a rotten egg odour. Hydrogen sulfide may also combine with iron to form black water (iron sulfide), implicating the presence of sulfate-reducing bacteria. Taste can be affected by the presence of salts, and a bitter taste is usually associated with the presence of ferrous and manganese sulfates. Turbidity results from suspending materials such as silt, clay, algae or organic materials in water.

❖ **Chemical analysis**

1. **Water pH**

The acidity or alkalinity of water is measured by pH. A pH of 7 indicates that the water is neutral, a pH less than 7 indicates acidity and a pH greater than 7 indicates alkalinity. High-pH water is also unacceptable since it reflects high levels of calcium and magnesium, which can clog watering systems. Poultry accepts water on the acidic side better than they accept water on the alkaline side. The ideal water pH should be 5.5-6.

2. **Total Dissolved Solids (TDS)**

Measurement of total dissolved solids (TDS), or salinity, indicates levels of inorganic ions dissolved in water. Calcium, magnesium, and sodium salts are the primary components that contribute to TDS. High levels of TDS are the most found contaminants responsible for causing harmful effects in poultry production.

3. **Hardness**

Hardness refers to the presence of dissolved minerals such as calcium and magnesium in either bicarbonate or sulfate form and is expressed as an equivalent of calcium carbonate. Hard water is commonly associated with the buildup of deposits and the formation of scale in the components of the watering system. High levels of magnesium sulfate ($MgSO_4$) may cause an increase in water consumption, wet droppings, and a drop in production. Extreme hardness may diminish the effectiveness of water-administered medications, disinfectants, and cleaning agents.

4. **Alkalinity**

Alkalinity is measure of the capacity of water to neutralize acids. The Alkalinity predominantly content carbonates, bicarbonates and hydroxides. The bicarbonate ion is usually prevalent. Alkalinity is generally associated with high pH, Hardness & TDS. High alkalinity water may have distinctly flat, unpleasant tast.so alkalinity should not exceed 200 mg/ L for potable water. Alkalinity is important because it majorly decides the water acidifier required quantity for desired pH reduction.

Table 1: Water Quality (Chemical) Standard for Poultry

Water Quality Parameter	Maximum Value
Total Hardness	300 mg/L
TDS	1000 mg/L
Alkalinity	300 mg/L
pH	5.5-6
Calcium	100 mg/L
Chloride	250 mg/L
Copper	0.6 mg/L
Cadmium	0.01 mg/ml

Iron	0.3 mg/L
Lead	0.02 mg/L
Magnesium	125 mg/L
Nitrite	4 mg/L
Nitrate	20 mg/L
Sodium	50 mg/L
Sulfate	250 mg/ml
Zinc	1.5 mg/L

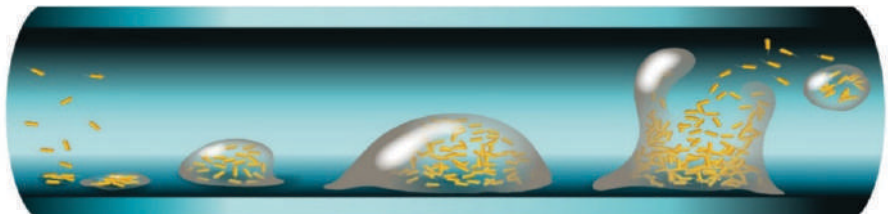
** Watkins, S. 2008. Water: Identifying and correcting challenges. Avian Advice 10(3): 10–15*

❖ **Microbial Analysis**

Water is the most important nutrient for bird performance, but water is also a major source of water contamination which disturbs poultry gut health and overall performance. Water is a carrier of microbial challenges and easily can contaminate the drinking system of broiler houses with biofilms (Fig. 2) which would affect the quality and quantity of water intake. When bacteria attach to the interior wall of a water pipe, they begin to exude a sticky substance called biofilm (fig.2). This substrate becomes an ideal home for bacteria to reproduce and colonize. Biofilm can build up rapidly and become a breeding ground for waterborne pathogens, such as E. coli. Biofilms will affect bird performance consequent to the reduced effectiveness of medication & vaccination, reduced nipple flow rate, blocked drinking system/nipple or nipple leakage and increased bacterial disease mortality. There should be bacterial count within permissible limits. (table no.2). E. coli is introduced into the water system, and they can survive/multiply in the biofilm.

Table 2

Maximum recommended microbiology values in water*	
	cfu/mL
Total bacteria	< 100
Total Coliform	< 50
Faecal Coliform	0
Enterobacteria	< 100
E. coli	< 100
Yeast	< 5000
Mould	< 100



pathogens that enter the bird through contaminated water, while others focus on preventing pathogen intake.

1. **Acidification supports digestion**

Providing a level of protection against pathogens that enter the bird via the biofilm, acidification helps control water and stomach microbes while reducing pathogenic bacteria in birds' intestines. Water acidifiers reduce the pH of water to less than 4.5 a level at which many pathogenic bacteria struggle to survive. Low pKa (strength of an acid) and undissociated organic acids reaching the stomach may also help control gram-negative bacteria ingested through contaminated feed or faces. These organic acids may deliver antimicrobial efficacy in the acidic stomach region as they pass through the walls of bacteria and fungi, altering their metabolism.

As a low pH is required for the digestion of most plant- and animal-derived proteins, organic acids can help assure less undigested protein reaches the hindgut, potentially reducing the threat of dysbacteriosis. **Selko pH** a blend of organic acids may be worth considering when the objective is to combat biofilm and improve animal digestion, gastrointestinal microbial balance or animal performance. Selko-pH improved the zootechnical performance of broilers and could be a suitable alternative to in-feed AGPs to maintain growth performance. (Table. 3 & Fig.3)

Treatment Table.3

	Application Rate
Negative Control*[1]	-
Positive Control*[2]	50 ppm
Selko pH**	1L/1000L water

*Water pH:7.80
**Water pH:3.42
- - Daily stepwise approach: day 1, Day 2, Day3:0.8 L/1000 L water, >4 days:1 L/1000 L water
- BMD (bacitracin methylene di salicylate) in feed

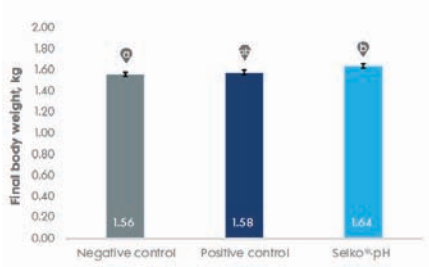


Fig.3 Final body weight (83% confidence interval as error bars) of broilers receiving an antibiotic growth promoter (AGP) in feed (positive control) or Selko®-pH in water on day 35. Columns with different superscripts (a,b) are significantly different ($p < 0.05$)

2. **Flushing pipeline**

Clean drinking water begins with flushing. The system should be flushed with clean water between bird cycles and after any treatment, such as vaccines, antibiotics or vitamins delivered through water. As disease risk is highest during a bird's first week, it is advisable to flush systems at least twice during the first week of production. Flushing with clean water loosens substances that can contribute to biofilm and washes away buildups that can clog equipment. High-pressure flush (2 to 3 bars/units) should be applied during the flushing process.

UT-VENBIOL GOLD

MICROBIOLOGICAL FEED INGREDIENT

Bacillus subtilis DSM 32540 and
Bacillus amyloliquefaciens CECT 5940

Striving for immunized GUT, Healthy Digestion

EXCELLENT PERFORMANCE

Optimizes gut health

Prevents diseases

Enhance performance

Benefits

01 Improve gut health by supporting growth of gut friendly bacteria

02 Improve feed efficiency and Performance of the bird

03 Induces resistance to environmental transition stress impact on gut health

04 Replacement of AGP free feed production along with disease prevention

05 Higher and faster return on investment

06 The best immuno modulator and enrich appetite of bird

07 Inhibits growth of pathogens like Clostridium perfringens, Salmonella species and E. Coli

08 Introduction of secondary metabolites strengthens Villi integrity for effective nutrients absorption

Dosage

UT VENBIOL GOLD
500gm/ metric ton
of feed

Composition

Preparation of ***bacillus subtilis DSM 32540, bacillus amyloliquefaciens CECT 5940*** and calcium carbonate as a carrier with a minimum guaranteed concentration of $2X10^9$ CFU/gm of product.

Venky's

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Feed Supplement Division
Venkateshwara House, S. No. 114/4/2
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For trade enquiry:

Contact no.- 020-71251840
Website- www.venkys.com
Uttara Impex Pvt Ltd

3. **Disinfection with Hydrogen peroxide**

A simple and effective disinfectant usage between cycles like hydrogen peroxide will work very well in killing many bacteria and removing biofilm buildup. It also helps to prevent biofilm formation to some extent. Applying the proper concentration of hydrogen peroxide (35 % conc.) with 1-3 % water solution and allowing adequate treatment time is important to achieve desired disinfection results. Hydrogen peroxide works best for disinfection purposes and not for regular practice or as a substitute for water acidification.

4. **Chlorination as water sanitization approach**

Chlorin can be used as a maintenance disinfectant during the production cycle. Flushing is the first step in the disinfecting process, followed by chlorination. Generally, a concentration of sodium hypochlorite at 15% (100 to 150 mL/1000 L water) or chlorine dioxide applied at 0.2 to 0.4 mg/L water is recommended. The target level of residual free chlorine is important and should be between 2-3 ppm or oxidative reduction potential (ORP) in the range of 650 to 700 millivolts. Chlorination becomes even more effective when combined with a proper approach to acidification for effective killing bacteria.

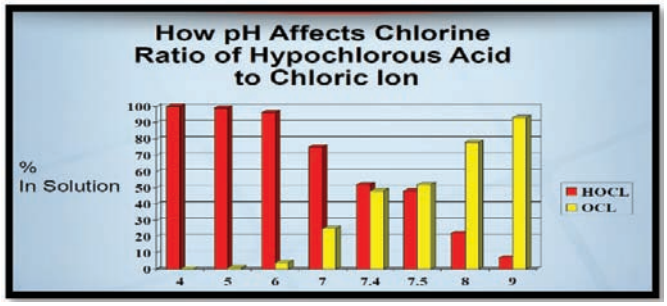

Fig. 4: pH dependent effectiveness of free chlorine

Conclusion

Poor water quality can lead to increased water microbial growth which impacts bird gut health and builds up biofilm inside the drinker pipeline. A regular sanitation program on farms will help to improve water quality. The microbial, chemical, and physical quality of water should be monitored regularly or periodically. A good pipeline cleaning program should be in place to increase the shelf life of pipelines and to prevent the formation of biofilms. A water sanitation cum acidification protocol should be in place for improving the quality of water that has been provided to birds and for optimizing their gut health conditions. Selko pH when applied in the right dose in the drinking water of poultry, improves the overall bird performance and can serve as an effective product in antibiotic-free rearing practices as well.

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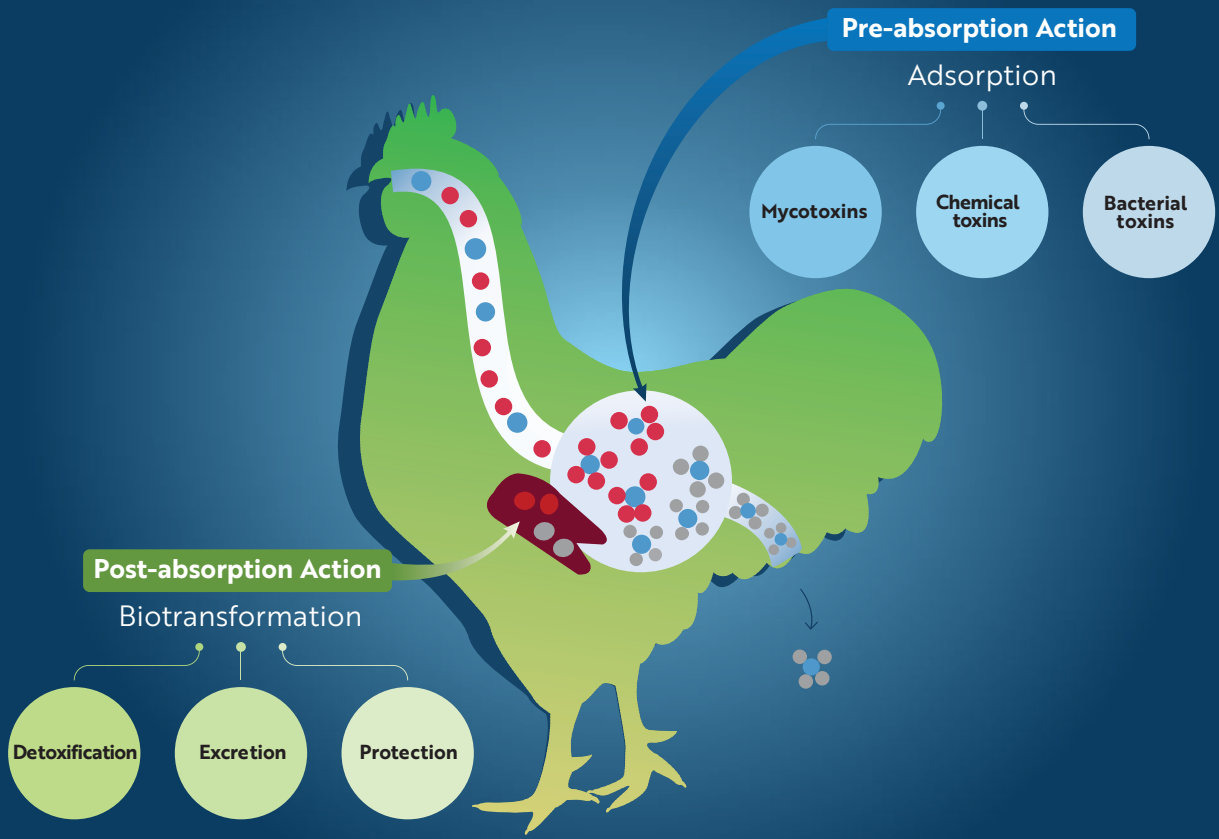

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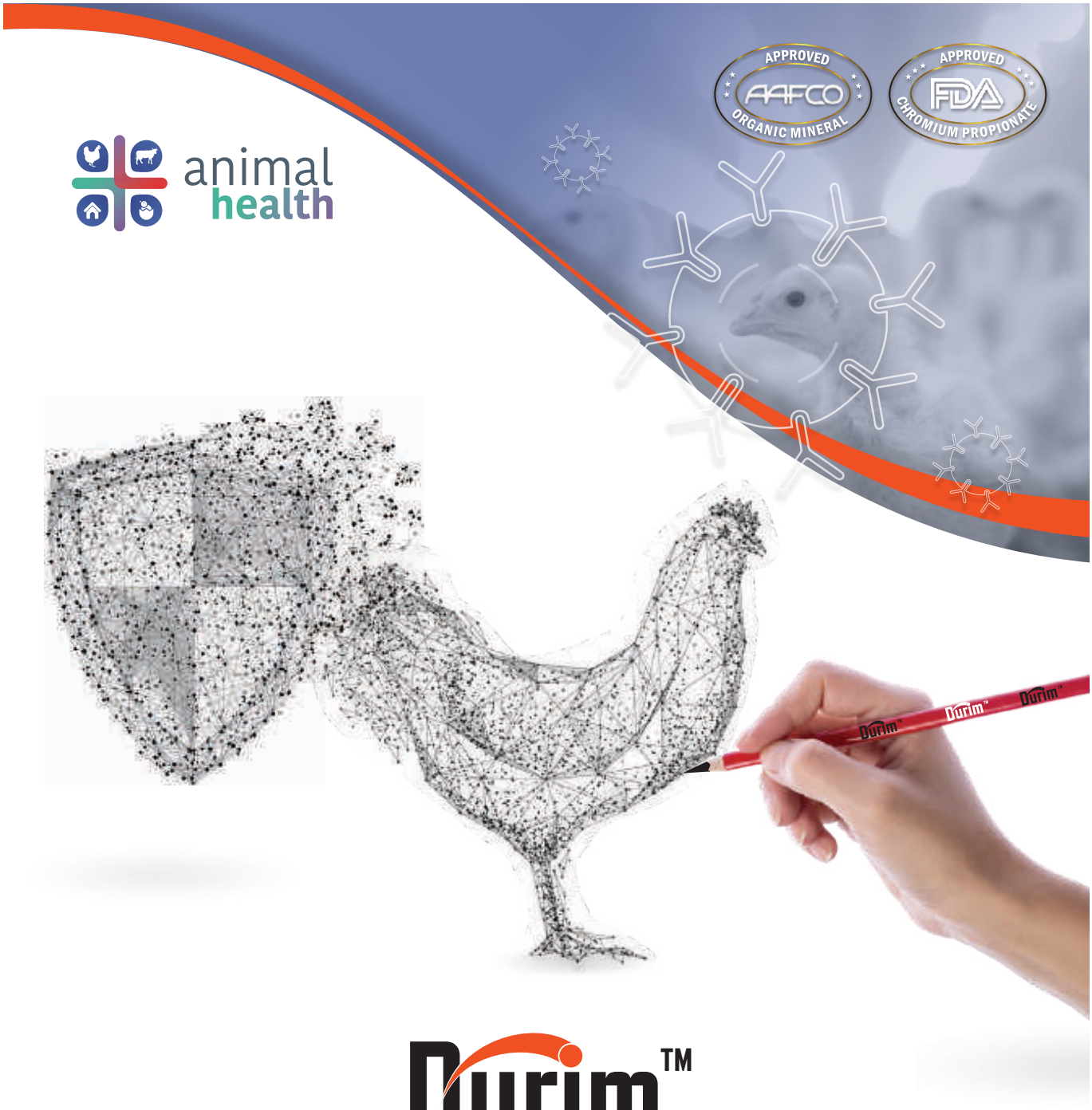

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