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
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From the Editor's Desk



Revitalizing the Poultry Industry: Interim Budget 2024's Provisions for the Poultry Sector

The poultry industry, a cornerstone of India's agriculture and food processing sectors, has received a significant boost with the provisions outlined in the interim budget for 2024. These targeted measures signal a promising future for poultry farmers and stakeholders, addressing critical challenges and paving the way for sustainable growth in the sector.

A standout feature of the interim budget is its focus on infrastructure development within the poultry sector. By allocating substantial funds for hatcheries, feed mills, processing plants, and cold storage facilities, the government aims to enhance the efficiency of poultry operations. Improved infrastructure not only reduces post-harvest losses but also ensures the quality and safety of poultry products, thereby bolstering consumer confidence and market competitiveness.

Additionally, the budget underscores the importance of disease control and biosecurity measures in safeguarding poultry health. The provision for vaccination programs, disease surveillance systems, and biosecurity protocols at farms and processing units is crucial for mitigating disease outbreaks and minimizing production losses. This proactive approach to disease management is essential for ensuring the sustainability of poultry farming and safeguarding farmers' livelihoods.

Moreover, the budget's emphasis on technology adoption holds immense promise for the poultry sector. By promoting the adoption of modern practices and digital solutions for farm management and monitoring, the government empowers poultry farmers to enhance productivity and efficiency. Access to information and training programs on best management practices enables farmers to make informed decisions, driving overall sectoral growth.

The provisions for market access and export promotion are another significant aspect of the interim budget's impact on the poultry sector. With incentives for poultry exports and streamlined export procedures, the government aims to tap into international markets and increase farmers' income. Expanding market opportunities not only benefits farmers but also contributes to economic growth and employment generation in the poultry industry.

In conclusion, the provisions outlined in the interim budget for the poultry sector are poised to rejuvenate the industry and unlock its full potential. By addressing infrastructure gaps, prioritizing disease control, promoting technology adoption, and expanding market access, the government lays the groundwork for a more resilient and competitive poultry sector. It is imperative for stakeholders to seize these opportunities and work collaboratively towards realizing the vision of a vibrant and sustainable poultry industry in India.

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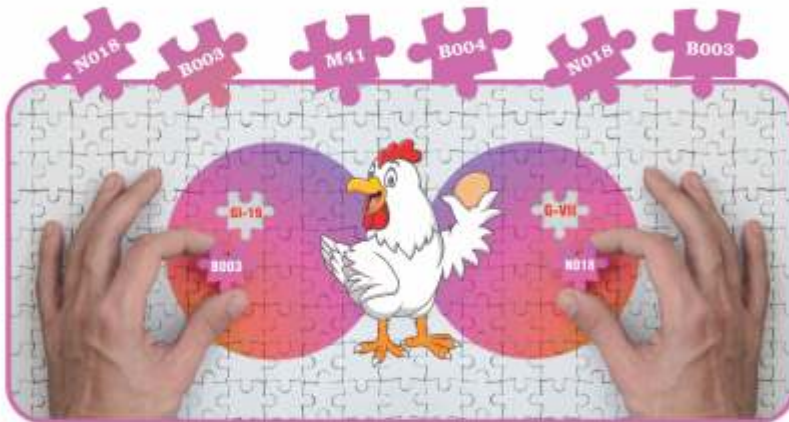
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Analyzing The Implications of The Interim Budget 2024 for The Poultry Sector

Siddhi Gupta
Co-Editor

The poultry industry in India has witnessed remarkable growth over the years, emerging as a vital component of the country's agriculture and food processing sectors. With the interim budget for the fiscal year 2024 recently announced, stakeholders in the poultry sector are keen to understand its potential impact.

The sector encompasses both egg production and broiler farming, with millions of farmers and numerous integrated poultry companies operating across the country. Poultry products, including eggs and chicken meat, are staple foods for a significant portion of the population, providing affordable sources of protein and essential nutrients.

Despite its significant contributions to food security and rural livelihoods, the poultry sector faces various challenges. These include disease outbreaks, input cost fluctuations, market volatility, and infrastructural constraints.

Additionally, concerns regarding animal welfare, food safety, and environmental sustainability have garnered increasing attention in recent years.

Key Provisions of the Interim Budget 2024 for the Poultry Sector

Investment in Infrastructure: The interim budget allocates substantial funds for the development of poultry infrastructure, including hatcheries, feed mills, processing plants, and cold storage facilities. Investments in infrastructure are

essential for enhancing the efficiency of poultry operations, reducing post-harvest losses, and ensuring product quality and safety.

Disease Control and Biosecurity: Recognizing the significant impact of disease outbreaks on poultry production, the interim budget includes provisions for disease control measures and biosecurity enhancements. This involves the implementation of vaccination programs, disease surveillance systems, and biosecurity protocols at farms and processing units. By strengthening disease control measures, the government aims to safeguard poultry health and minimize production losses.

Technology Adoption: Emphasizing the importance of technology in improving productivity and efficiency, the interim budget promotes the adoption of modern practices in poultry farming. This includes initiatives such as the dissemination of information on best management practices, training programs for poultry farmers, and the adoption of digital solutions for farm management and monitoring.

Market Access and Export Promotion: With the objective of boosting exports and enhancing farmers' income, the interim budget outlines measures to promote poultry exports. This includes the provision of export incentives, streamlining export procedures, and market

The graphic features the text 'Budget 2024' in a large, white, sans-serif font. The number '2024' is particularly large and is partially overlaid by a stack of gold coins. The top coin in the stack is prominently displayed, showing the Indian Rupee symbol (₹). The background is a dark blue with a grid of faint, glowing green numbers and lines, suggesting a financial or data-driven theme.

Budget 2024

development initiatives targeting key export markets. Expanding market access for poultry products is crucial for reducing surplus stocks, stabilizing prices, and increasing farmers' remuneration.

Support for Small-Scale Farmers: Small-scale poultry farmers constitute a significant portion of the poultry sector and often face challenges such as limited access to credit and technical know-how. The interim budget includes provisions for targeted support programs aimed at empowering small-scale poultry farmers. This may involve subsidies for inputs such as feed and vaccines, access to credit facilities, and capacity-building initiatives.

Quality Assurance and Food Safety: Ensuring product quality and food safety is paramount in the poultry industry to maintain consumer trust and meet regulatory requirements. The interim budget includes

provisions for strengthening quality assurance mechanisms, including the enforcement of hygiene and safety standards at poultry farms and processing units. By enhancing quality assurance and food safety practices, the government aims to bolster consumer confidence and facilitate market access.

Research and Development: Innovation plays a crucial role in addressing the challenges faced by the poultry sector and unlocking its growth potential. The interim budget allocates funds for research and development in areas such as genetics, nutrition, disease management, and waste management. Investing in R&D can lead to the development of disease-resistant breeds, innovative feed formulations, and sustainable production practices, thereby enhancing productivity and sustainability.

In conclusion, the interim budget

for the fiscal year 2024 presents a comprehensive set of measures aimed at addressing the challenges and opportunities facing the poultry sector in India. By focusing on infrastructure development, disease control, technology adoption, market access, support for small-scale farmers, quality assurance, and research and development, the government seeks to promote growth, enhance farmers' income, and ensure the sector's long-term sustainability. However, the successful implementation of these measures will require concerted efforts from all stakeholders, including the government, poultry industry players, farmers, and research institutions. With the right policies and interventions in place, the poultry sector can continue to thrive and fulfill its role as a key contributor to food security, nutrition, and economic development in India.

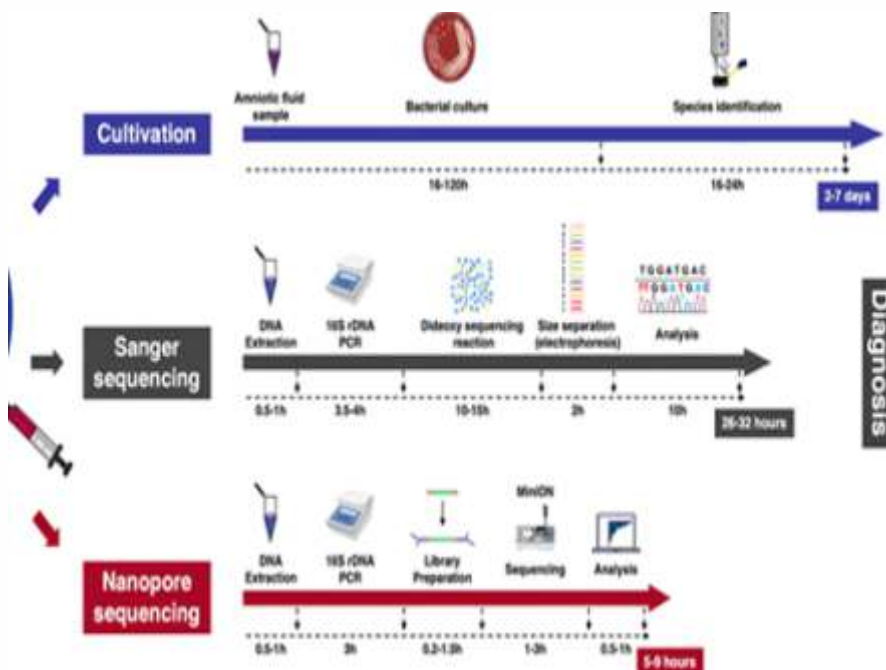


Nucleic Acid Based Diagnostic Approaches For Poultry Diseases

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The profitable poultry production is often influenced by various factors among which infectious diseases remains as a constant and critical challenge. The emergence and reemergence of novel pathogens are potential threat for the effective management of diseases in poultry farms and consequently the productivity. The turnaround time (TAT) is defined as the time interval between the specimens received in the laboratory to the time of reports dispatched with verification. The TAT for the traditional conventional diagnostic assays

involving isolation of the pathogen, serological assays etc., generally range from two to seven days (Chaemsaitong et al 2023) although the sensitivity and specificity could be analogous with molecular diagnostics. The advent of molecular diagnostics targeting the genomic material unique to each pathogen have become the game changer underscored by the time-sensitive nature of many of the treatment decisions associated with infectious diseases (Scott Powell, 2015). Hence, the availability of a rapid, accurate, specific and sensitive diagnostic assay is invaluable during an epidemic for the veterinarians to decide on the appropriate prevention and control strategies to obviate the economic loss to the farmers.





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Molecular Diagnosis/ Nucleic Acid-Based Amplification Techniques

The progress in the culture-independent assays like genomics and proteomics based approaches facilitate to discriminate the closely related species as well as to determine the phylogenetic relationship of the isolates. The sensitivity and specificity for all the molecular tests are governed by three critical control points, including nucleic acid extraction, enzymes used for amplification and the sequence of primers and probes (David. et al 2007)

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Polymerase Chain Reaction (PCR)

PCR is a characteristic example of nucleic acid amplification assay that has revolutionized the field of molecular diagnosis since developed by Mullis and Faloona. PCR is based on extraction and purification of DNA molecule and exponential amplification of the target sequence, using a thermostable DNA polymerase and two specific oligonucleotide primers. After the PCR reaction, the amplified product can be detected

by several techniques, including gel electrophoresis, colorimetric methods, and sequencing. PCR has been used for the detection pathogens with overall sensitivity and specificity ranging from 77.8% to 100% and 89% to 100% respectively. Hence, PCR can be employed for the detection of pathogens in a variety of specimen types. In addition to the conventional PCR, more advanced variants of the technique are in vogue.

Reverse Transcription-PCR (RT-PCR)

RT-PCR was designed to amplify RNA targets. In this technique, reverse transcriptase (RT) is used to convert viral RNA targets into complementary DNA (cDNA), and then the resulting cDNA is amplified by conventional PCR for the detection of infection caused by RNA viruses. RT-PCR demonstrated overall sensitivity and specificity ranging from 73% to 100% and 99% to 100% respectively in the detection of viral infection.

Real-Time PCR

In real-time PCR system, viral nucleic acid amplification and detection steps are carried out at the same time. The detection of the amplification product is relied on the amount of fluorescence emission from the specimen. The fluorescence emission from the specimen is monitored by special thermal cycler. The computer, with appropriate software connected to the thermal cycler, records the data and produces an amplification plot at every reaction cycle. The detection and quantification of amplification products can be done by using SYBR green, the TaqMan, and molecular beacon chemistries.

The SYBR green dye binds to the minor groove of double-stranded DNA (dsDNA) product and upon

excitation by appropriate light, it exhibits improved fluorescence, which is directly proportional to the accumulated dsDNA product.

The TaqMan probe is a DNA oligonucleotide with a fluorescent dye termed reporter attached to fluorophore one end (5' base) and quencher on the other (3' base). TaqMan probes are designed to hybridize to an internal region of a PCR product. During the annealing stage of the PCR, both the primer and the TaqMan probe bind to the template strand. When the Taq DNA polymerase extends the primer, the polymerase cleaves the probe by its the 5'-3' exonuclease activity. Cleavage of the probe leads to the release of the fluorescent dye resulting in fluorescence emission. The amount of fluorescence is directly proportional to the PCR product.

Molecular beacon is a small DNA molecule with a fluorescent dye at the 5' end and a quencher at the 3' end. The sequences at the very 3' and 5' ends are complementary to each other. The internal part of the molecule is designed to be complementary to the target sequence of a PCR product. When molecular beacon is free in solution, it will adopt a hairpin structure. This brings the fluorophore and quencher in close proximity, leading to absorption of emitted light of the fluorescent dye by the quencher and hence fluorescence is not detected. However, when a molecular beacon hybridizes to the target sequence, the fluorophore and quencher are separated, leading to the emission of fluorescence. The amount of fluorescence is directly proportional to the PCR product.

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Transcription-based amplification

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methods have several advantages, since they do not require a thermal cycler, so developing countries and budget-restricted laboratories can afford to perform the assays, they have rapid kinetics (requires fewer cycles), and they produce a single-stranded RNA product that is suitable for detection by various techniques. Transcription-based amplification methods are suitable for the diagnosis of viral infections caused by RNA viruses. They can amplify viral genomic RNA, messenger RNA, or ribosomal RNA.

This includes nucleic acid sequence-based amplification (NASBA) and transcription-mediated amplification (TMA). NASBA and TMA are similar to each other. They are isothermal amplification methods. The entire amplification process is carried out at the temperature of 41°C. In both cases, the viral RNA target is first converted into cDNA with RT and then RNA polymerase synthesizes multiple copies of viral RNA product. The only difference between TMA and NASBA in the amplification process is two enzymes (RT and RNA polymerase) are utilized in case of TMA while NASBA utilizes three enzymes (avian myeloblastosis virus reverse transcriptase (AMV-RT), RNase H, and T7 RNA polymerase).

In NASBA, three enzymes and two primers work together to exponentially amplify a target viral RNA. Primer 1 (P1) carries at its 5' end T7 RNA polymerase promoter region and at its 3' end, P1 carries sequence that is complementary to a target viral RNA sequence. Primer 2 (P2) carries a sequence complementary to cDNA strand. The amplification reaction begins with the production of cDNA copy of the viral RNA by RT using P1. RNase H degrades the viral RNA from RNA-DNA hybrid molecules.

Then, RT synthesizes dsDNA molecules using P2 and the released DNA strand. Finally, T7 RNA polymerase uses dsDNA molecules as templates to transcribe many viral RNA copies. The cycle is repeated several times, resulting in the accumulation of many viral RNA copies and dsDNA molecules. The amplified product can either be detected by gel electrophoresis at the end of the assay or in real time using molecular beacon.

Loop-Mediated Isothermal Amplification (LAMP)

LAMP is another isothermal nucleic acid amplification method that is extensively utilized for sensitive, specific, rapid, and cost-effective detection of both DNA and RNA clinical specimens. The method employs four to six unique primers which include the forward inner primer (FIP), backward inner primer (BIP), forward outer primer (F3), and backward outer primer (B3) and DNA polymerase with strand-displacement activity to amplify target DNA. The addition of RT in LAMP reaction (RT-LAMP) permits the amplification of RNA target. The primers are specifically designed to recognize six precise regions from a targeted nucleic acid sequence. In addition to the above primers, two more loop primers, namely, forward loop primer (LF) and backward loop primer (LB) were included to accelerate LAMP assay. Due to the use of four to six specific primers, LAMP assay has outstanding sensitivity and specificity in the detection of target nucleic acids. The LAMP reaction is performed in constant temperature between 60–65°C, without the need for expensive specialized equipment. The method requires only inexpensive heating block or water bath, making it very useful under

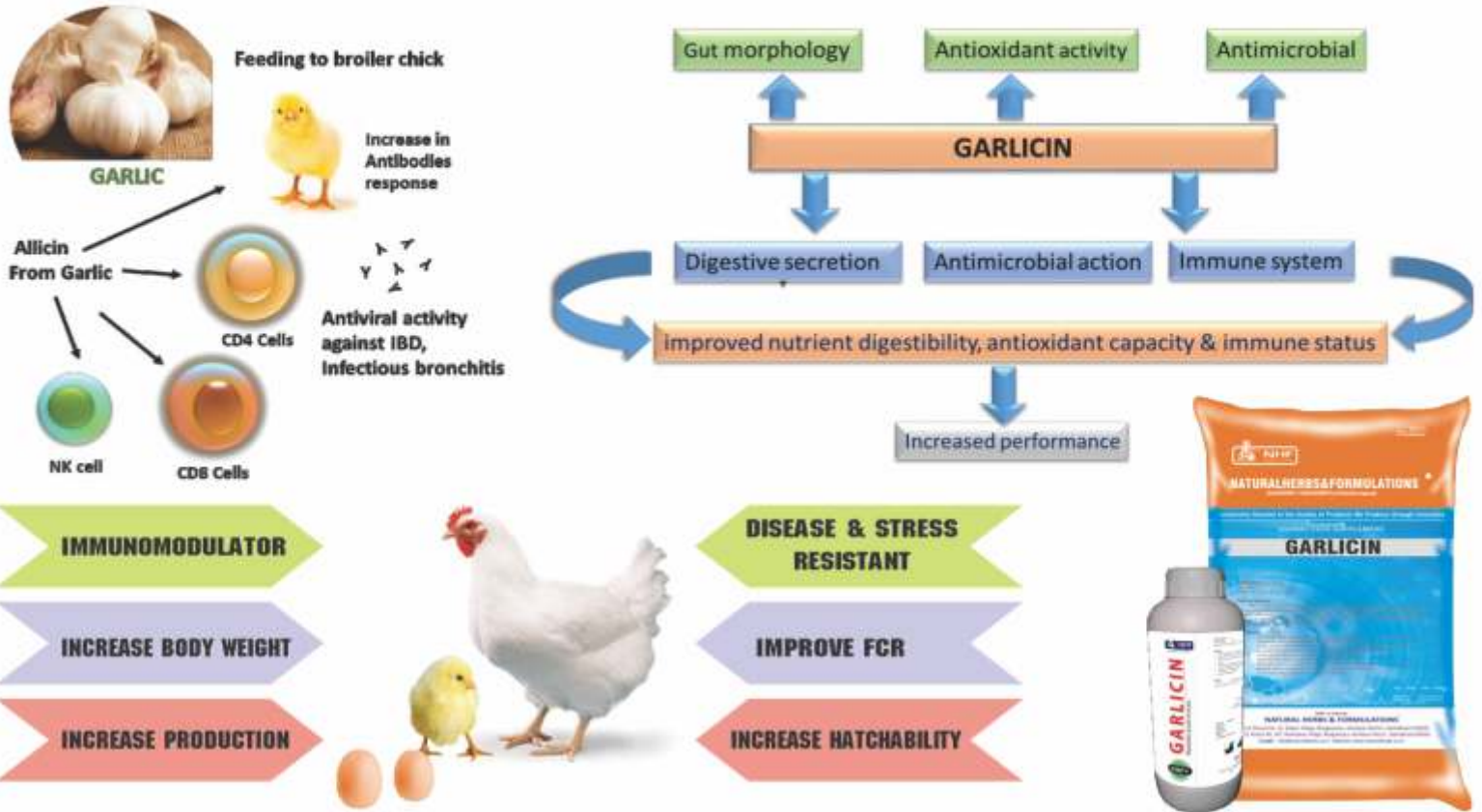
poor laboratory settings. The LAMP reaction takes turnaround time of less than 1 hour and the amplified product can be detected by several methods, including the real-time measurement of the turbidity caused by precipitated magnesium pyrophosphate using a turbidometer, visual detection of magnesium pyrophosphate precipitation following completion of the reaction, detection of fluorescence under ultraviolet light or natural light by adding an intercalating fluorescent dye to the final reaction mixture, and visualization of the bands with various sizes using agarose gel electrophoresis.

DNA Microarrays

In DNA microarray diagnosis, fluorescently labeled viral nucleic acids in a test sample are used to screen an array of oligonucleotide probes immobilized on a solid surface (e.g., glass slide). The oligonucleotide probes used here are specific for the genome of the target virus. The results of hybridization between immobilized probes and target sequences labeled with fluorescent dyes are detected and quantified by fluorescence-based detection. It is a high-throughput tool as it allows multiplex detection of a large number of potential viral pathogens in clinical specimens. The limitations of the technique includes, too expensive to be used for routine clinical diagnosis, labor-intensive, and time-consuming (the hybridization process may take hours to days to complete). Nonspecific hybridization between test materials and immobilized probes can affect the sensitivity of the assay. In addition, designing of specific probes requires almost complete information of the genetic makeup the virus of interest. The assay detects only

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those viral pathogens that have target probes on the array.

Next-Generation Sequencing (NGS)

NGS involves preparation of test sample, sequencing of the target nucleic acid fragments using one of the available NGS platforms, and analysis of the sequence data using suitable bioinformatic tools. Several companies produce different NGS machines that use different methods of sequencing, reagents, and data analysis tools. Eg. ,

Pyrosequencing (Roche 454) detects release of pyrophosphate following incorporation of nucleotides in a DNA polymerization process. Illumina's NGS platforms detect release of fluorescent labels from incorporated nucleotides in a DNA polymerization process. The emerging technologies like Oxford nanopore (Minlon) platform sequences the target nucleic acid by sensing the ionic current of DNA/RNA molecules that pass through the nanopores. Unlike PCR

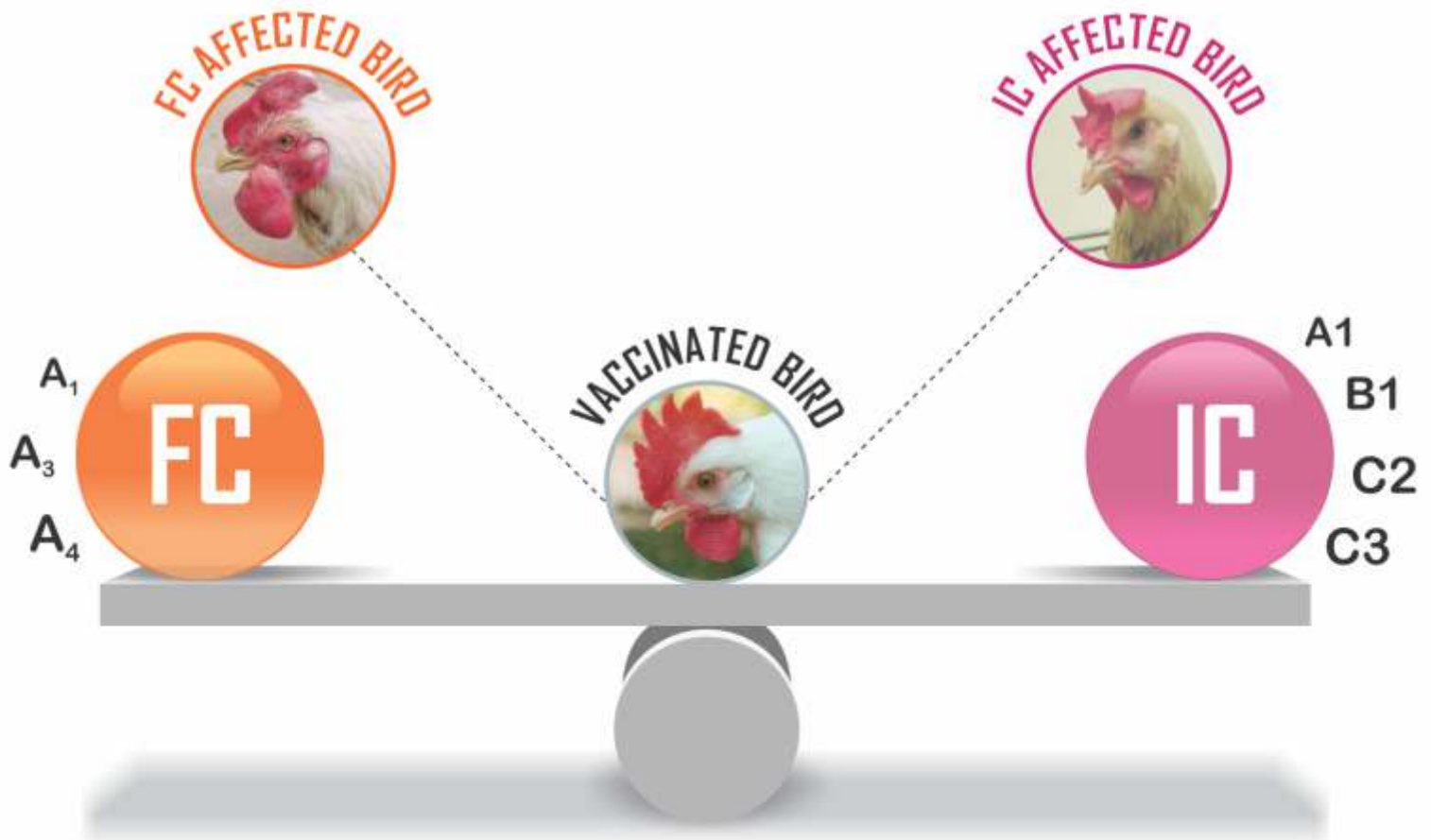
and DNA microarray methods, NGS does not require prior knowledge of genomic sequences of the viral pathogens. It does not also require target specific PCR primers and oligonucleotide probes. But the limitations like the turnaround time, the number of samples per run, cost of sequencers, and requirement of skills in bioinformatics are the constraints in its wider usage.

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Merits and Dmerits of nucleic acid based diagnostic assays			
Detection methods	Qualitative/ Quantitative	Advantage	Limitations
Conventional PCR	Qualitative	<ul style="list-style-type: none"> ➤ Sensitive and specific ➤ Widely employed nucleic acid-based detection format ➤ Multiplex detection potential 	<ul style="list-style-type: none"> ➤ (High risk of contamination) ➤ Prone to inhibitors ➤ Time-consuming and labor-intensive ➤ Qualitative ➤ Requires thermal cycler and gel documentation apparatus
Conventional RT-PCR	Qualitative	<ul style="list-style-type: none"> ➤ Sensitive and specific ➤ Multiplex detection potential 	<ul style="list-style-type: none"> ➤ RNA handling might be difficult ➤ High risk of contamination ➤ Time-consuming and cumbersome ➤ Relatively expensive ➤ Prone to inhibitors ➤ Mutation within PCR primer regions may occur in some RNA viruses which have high mutation rates, leading to reduced sensitivity
Real-time PCR/RT-qPCR	Quantitative	<ul style="list-style-type: none"> ➤ Highly sensitive and specific ➤ Lower cross-contamination risk due to closed tube operation ➤ Rapid and less labor-intensive ➤ Multiplex detection ➤ Genotyping ➤ Determination of the viral load (quantitative) 	<ul style="list-style-type: none"> ➤ Requires expensive laboratory equipment and fluorescent probe ➤ Designing of TaqMan probes requires almost complete information of the target nucleic acid sequence ➤ Primer dimer artifact is a problem in case of SYBR green method ➤ Prone to inhibitors
Transcription-Based Amplification: TMA & NASBA	Quantitative	<ul style="list-style-type: none"> ➤ Sensitive and specific ➤ Simple and rapid (fewer cycles are required) ➤ Multiplexing potential ➤ Quantification ➤ Genotyping ➤ Does not require thermal cycler 	<ul style="list-style-type: none"> ➤ RNA handling might be difficult ➤ Requirement of three enzymes in case of NASBA ➤ Use of enzymes that are not thermostable ➤ Nonspecific interactions of the primers may increase as the amplification process occurs at a lower temperature (41°C)
LAMP/ LAMP-RT	Quantitative	<ul style="list-style-type: none"> ➤ Highly sensitive and specific ➤ Easy to perform ➤ Does not require expensive thermal cycler ➤ Rapid (Results in <1 h) ➤ Quantitative ➤ Genotyping ➤ Simple detection systems (using naked eye) ➤ Relatively resistant to inhibitors present in the sample 	<ul style="list-style-type: none"> ➤ Requirement of six primers ➤ High risk of carryover contamination ➤ Limitation for multiplexing ➤ Visual detection using naked eye alone is subjective since it depends on observer's perception of color

Molecular assays for diagnosis of important poultry diseases:

S.No.	Disease	Genome	Target gene	Purpose
1.	Newcastle disease	RNA	Fusion gene	Diagnosis, Pathotyping and Genotyping
2.	Infectious bronchitis	RNA	Nucleoprotein gene S1 protein gene	Diagnosis Genotyping
3.	Infectious bursal disease	RNA	VP2 gene	Diagnosis and Pathotyping
4.	Avian encephalomyelitis	RNA	VP2 gene	Diagnosis
5.	Avian Nephritis	RNA	ORF1	Diagnosis
6.	Chicken Astrovirus	RNA	ORF 1b	Diagnosis
7.	Avian Reovirus	RNA	S4	Diagnosis
8.	Marek's disease	DNA	MEQ gene 132 bp repeat	Diagnosis & Genotyping DIVA : Vaccine (multiple bands) and virulent strain (single/ double bands)
9.	Avian leukosis complex	DNA	DNA pol	Diagnosis and genotyping
10.	Reticuloendotheliosis	DNA	LTR	Diagnosis
11.	Fowl adenovirus	DNA	Hexon gene	Diagnosis and genotyping
12.	Chicken infectious anaemia	DNA	VP1	Diagnosis
13.	Infectious laryngotracheitis	DNA	gB, TK, ICP-4	Diagnosis
14.	Infectious Coryza- <i>A. paragallinarum</i>	DNA	HPG1-PCR & HPG2-PCR; 16S rRNA HPG2-PCR HMTp210	Diagnosis Sequencing Species specific identification Multiplex PCR for molecular serotyping
15.	Necrotic enteritis- <i>C. perfringens</i>	DNA	A type strains: Alpha (cpa) C type strains: Beta (cpb), & beta2 (cpb2) toxin genes	Multiplex PCR to Differentiate A/ C strains
16.	Fowl Cholera- <i>P. multocida</i>	DNA	KMT1 gene Multiplex PCR	Diagnosis Capsular typing
17.	<i>Mycoplasma synoviae</i>	DNA	16S rRNA	Diagnosis
18.	<i>Mycoplasma gallisepticum</i>	DNA	16S rRNA ;mgc2	Diagnosis
			<ul style="list-style-type: none"> ➤ MG and MS strains can be discriminated by core genome MLST ➤ DIVA : MLVA (multilocus variable tandem array) and MAMA (mismatch amplification mutation assay) 	

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Avian Malaria in Birds

Introduction

Avian Malaria is protozoal disease transmitted by the mosquitoes. Malaria means bad air, this term was given because earlier people believed that foul air coming from the swamps was the cause of disease. In human malaria, only erythrocytes are infected. But in Avian Malaria, exoerythrocytic stages are found which results in extensive damage to many tissues and organs. Outbreaks of avian malaria are found mostly in Asia, Africa, and South America. Avian Malaria is seen worldwide and is an economically important disease to poultry industry. Young birds are more affected than older birds. However, the infection is mainly seen in pigeons and wild birds in India

Etiology

It was Danilewsky, who first saw the malarial parasite in the blood of birds in 1884 (Kreier 1977). Caused by parasites of the Plasmodium genus belonging to the Phylum Apicomplexa. Domestic fowls are infected with species of Plasmodium such as: *P. gallinaceum* occurs in jungle fowl and domestic hens; *P. juxtannucleare* parasitizes domestic hens and turkeys; *P. durae*, *P. griffithsi*, *P. hermani*, *P. kempfi*, and *P. lophura* occur in turkeys. Avian malaria is transmitted by mosquitoes - *Culex*, *Aedes*, *Culiseta*, *Anopheles*, *Mansonia* and *Aedeomyia* (Valkiunas 2005).

Life Cycle

The infected mosquitoes inject the infective stages of sporozoites into birds on feeding behaviour of blood meal. Later this sporozoites invades cells of the reticuloendothelial system. Then

occurs the two generations of exoerythrocytic schizogony. Merozoites produced by the second generation schizonts invade erythrocytes resulting in schizogony (with released merozoites infecting other cells or erythrocytes) or gametogony in other cells (Peirce 2000). An interchange of parasites between blood and reticuloendothelial tissues may occur, resulting in secondary exoerythrocytic schizonts (phanerozoites), especially in spleen, kidney and liver endothelial cells. Gametocytes are taken up by the mosquito when it feeds on infected birds, after which gamete formation takes place in the midgut, oocyst development, and sporogony occur in the infected mosquito. The resulted sporozoites then invade the mosquito's salivary gland and enter the host bird during feeding of infected mosquito. Avian plasmodia develop in culicine mosquitoes, predominantly the genera *Culex* and *Aedes*.

P. gallinaceum, *P. juxtannucleare*, and *P. durae* are the most pathogenic for domestic fowl and can cause 90% mortality.

Exoerythrocytic schizonts in the brain may block capillaries resulting in death caused by central nervous system dysfunction.

Clinical signs and lesions

Depends on no apparent signs to severe anemia and death in birds. Common signs are fever (Williams 2005), depression, anorexia, reduced weight gain, poor feed conversion, anaemia, ruffled feathers, closed eyes, fallen heads, green faeces and often death.

The chronic nature of Avian malaria is usually sub-clinical in nature, but

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Salmonella
Typhimurium Gallinarum Choleraesuis, Derby, Dublin, Enteritidis, Pullorum

E. Coli
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Clostridium Perfringens
Type A, C, B, D, E

Staphylococcus Aureus

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disease can relapse under stressful conditions.

Gross lesions include – Presence of watery blood with enlarged liver, spleen & heart, petechial haemorrhages in liver, spleen, serosal layer of intestine etc.

Microscopically, there is presence and deposition of malarial pigments inside of kuffer cells and macrophages of liver & spleen. Extramedullary erythropoiesis and granulopoiesis are seen in liver, spleen, and kidneys. Presence of intraendothelial schizonts in liver, spleen, lung, heart and kidney (Goswami et al., 2013).

Diagnosis

- Microscopic examination of

blood smear stained with Giemsa stain reveals presence of erythrocytic meronts and gametocytes. It is a Gold standard test.

- Decrease in plasma albumin and 2-globulin.
- Molecular diagnosis using PCR assay.

Treatment & Control

Eradication of mosquitoes is the best way to control the disease. Another method to control the disease is isolation of the flock from the intermediate host by suitable housing. There is no approved drug available for Avian Malaria. But experimentally, antimalarial drugs are effective.

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

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



Acidomix DF+: An Unique Solution for Improved Productivity and Salmonella Control in Broilers and Layers.

Christian Lückstädt
Addcon Asia Ltd, India.

Organic acids have long been used in animal nutrition, usually to stabilize compound feed, but also to enhance animal performance. In poultry one of the first reports of improved broiler performance when diets were supplemented with single acids was for formic acid (VOGT et al., 1981). Later, similar effects were noticed for fumaric acid (PATTEN et al, 1988; KIRCHGESSNER et al., 1991; SKINNER et al., 1991). IZAT et al. (1990a) found significantly reduced levels of Salmonella spp. in carcass and caecal samples after including calcium formate in broiler diets. In another trial from IZAT et al. (1990b), buffered propionic acid was used to counteract pathogenic microflora in the intestine and carcass of broiler chickens, and resulted in a significant reduction in *E. coli* and Salmonella spp. The use of pure formic acid in breeder feed reduced the contamination of tray liners and hatchery waste with *S. enteritidis* drastically (HUMPHREY et al., 1988). KIRCHGESSNER et al. (1992) found significantly better feed utilization in laying hens after adding fumaric acid, but only when the feed was low in protein and methionine and cysteine. Performance enhancement was influenced by both quantity and quality of the protein. Although growth performance benefits of organic acids and their salts have been shown in numerous studies over the past half-century, the significant increase in scientific and commercial focus shifted on it only

after ban on antimicrobial growth promoters in Europe.

An important limitation, however, is that organic acids are rapidly metabolised in the foregut (crop to gizzard) of birds, which will reduce their impact on growth performance. A new molecule (sodium diformate, similar to potassium diformate) has been proven to be effective against pathogenic bacteria, including salmonella, along the whole gastro-intestinal tract (LÜCKSTÄDT et al., 2009). The reduced impact of pathogenic bacteria on the broiler, as well as the improved gut microflora, leading to a state of eubiosis in treated chickens, suggests that including sodium diformate in broiler diets will also result in improved bird performance. Several trials have also been carried out over the last half-decade world-wide that document positive effects on broiler performance.

It was therefore interesting to estimate the potential impact of sodium diformate (Acidomix DF+) in poultry production and Salmonella control through an analysis of the results of such trials.

Effect of Acidomix DF+ on Broiler Performance

This study analyzed the average impact from all studies on the effect of the additive on the performance parameters weight gain, feed efficiency, mortality, and productivity, as measured using the European Broiler Index, (EBI). EBI is calculated using the following equation:

EBI = ADG [g] × survival [%] / (10 × FCR)

The final dataset contained the results of 8 documented, negatively controlled studies, comprising 17 trials with DF+ inclusion, which ranged from 0.1% to 0.6%. Those studies were carried out between 2006 and 2012 across the world under both commercial and institutional conditions and included more than 36,700 broilers from different breeds (Arbor Acres, Cobb, Hubbard) raised to between 35 and 44 days. The above-mentioned performance parameters are expressed as percentage difference from the negative control. The results are given as mean and were statistically analysed using the t-test. A confidence level of 95% was defined for these analyses.

The average level of dietary DF+ from the dataset in all treated broilers was 0.28%. Typical dosage for DF+ in broilers ranges from 1-2 kg/tonne feed, depending on age (dietary protein level) and hygienic status of the farm. As shown in Table 1, DF+ inclusion resulted in a numerical increase in feed intake of 1.1% (P=0.22).

Table 1. Performance analysis of 17 trials with broilers, fed diets with Acidomix DF+, expressed as an average percentage difference from negative control.

Dosage	Feed intake	Weight gain	FCR	Survival	EBI
0.28	+1.1	+5.2	-4.1	+2.3	+12.4
P-value	0.22	0.0001	0.002	0.034	0.0005

The performance of broilers based on daily gain was significantly increased by 5.2% (P<0.001). Furthermore, the FCR was also significantly improved (4.1%; P<0.01). Survival was increased on average by 2.3% (P<0.05). Finally, the EBI improved significantly due to the inclusion of NDF by 12.4% (P<0.001). In broilers, improved zootechnical performance is

thought to stem from both improvements in the intestinal microflora, as a result of suppressing pathogenic bacterial species, and improved protein digestion. As often seen with other additives, hygiene challenge also plays some role in the performance observed. In the present performance analysis, a range of hygiene conditions were included, representing both university and farm trials. The average impact of DF+ inclusion on performance remained above that normally expected. It can therefore be concluded that dietary sodium diformate (Acidomix DF+) can play an important role in improving broiler production world-wide, especially in times of high raw material prices.

Effect of Acidomix DF+ on Salmonella Control

Salmonella ranks among the world's biggest threats to health. Annually, it has been estimated that cases of human salmonellosis in the United States may actually vary from 2 to 4 million (Jones, 2011). Developing and implementing effective Salmonella monitoring, reporting and control

systems is prioritised in many countries. Salmonella is often associated with poultry products, mainly chicken and eggs. Salmonella is widely distributed in nature (Winfield and Groisman, 2003) and can survive for an extended period of time on diverse materials (Humphrey, 2004). Since its discovery in the late 19th Century, more than 2,500 different

serovars have been discovered. These have emerged over the past 30 years, in parallel with the development of intensive systems of animal husbandry. In the European Union, the proportion of Salmonella and E. coli isolates resistant to ampicillin, sulfonamides and tetracycline were found to vary between 5 and 68 % in poultry, pigs and cattle. Some Member States reported a high occurrence of fluoroquinolone resistance in Salmonella isolates from poultry (5-38%), (EFSA, 2010).

The risks posed by contamination with pathogenic bacteria in the food chain can be reduced without the prophylactic use of antibiotics. Applying appropriate control measures at intervention points in the food chain can help reduce the risk of Salmonella proliferation. While Salmonella cannot be fully eradicated in poultry units, it can be controlled to minimise the risk to consumers. According to Jones (2011) Salmonella control measures in feed can be divided into three major categories: prevent contamination of the facility; measures to reduce multiplication of the bacteria in the plant; and procedures to kill the pathogen. Biosecurity plays a significant role in Salmonella control. In feed compounding, although heat treatment is effective in reducing contamination of feed leaving the feed mill, this effect does not persist during transport, storage and subsequent out-feeding. When conditions within the feed are less conducive to bacterial infection, Salmonella contamination can be reduced. The next critical control point is within the bird, where conditions for bacterial growth are optimal. Salmonella growth is optimal between 35 and 37°C, with moisture content greater than 12%

and a pH of 4.5-9.0. Jones (2011) suggests addition of chemical agents to the feed to control Salmonella. This may primarily involve the use of organic acids. Since the 1980's, reports have shown organic acids, and formic acid in particular, to be especially effective against Salmonella, when used in poultry diets. The use of pure formic acid in breeder diets reduced the contamination of tray liners and hatchery waste with *S. enteritidis* drastically (Humphrey and Lanning, 1988). By 1990, researchers in the US found significantly reduced levels of Salmonella spp. in carcass and caecal samples, after including calcium formate in broiler diets (Izat et al., 1990). Further research (Kovarik and Lojda, 2000) reported that inclusion of formic acid at 0.5% in the diet can be successfully used on farms to reduce salmonella contamination in the feed, excretion of Salmonella spp. and re-infection of chicken populations.

A number of practical considerations also need to be addressed. Pure formic acid, although it is very effective in controlling Salmonella in feed, is corrosive, hazardous, and volatile, so is difficult to handle easily and safely in the feed mill. Furthermore, pelleting may incur losses of around 15% of the acid. Often, liquid and volatile acids exert their antibacterial effects only in the feed and the birds' foregut. More recently, research has focused on overcoming these limitations to develop chemical compounds which are heat-stable, non-corrosive and yet still effective. Sodium diformate (Acidomix DF+, hereafter abbreviated as DF+) satisfies such industry requirements. An organic acid salt, it is crystalline and non-volatile,

meaning that it can be used safely in the feed mill, as well as being effective in the animal.

A UK-study evaluated the anti-Salmonella effects of DF+ in vitro, against Salmonella enteritidis (SE) S9549/07 found in broiler flocks (Wales et al., 2013). Caecal and crop samples were taken from slaughtered broilers from small-scale commercial operations. Caecal contents were used fresh; crop contents were stored at -80°C and thawed before use. Both were mixed with quarter strength Ringer's solution (crop at a 1:1 ratio; caecal contents at 1:2). DF+ was added to 20g aliquots in tubes. These were incubated in a water bath for 10 minutes at 41.5°C, after which time a 0.1ml stationary phase SE culture was added. All preparations were vortex mixed and incubated at 41.5°C. After various time intervals (1, 4 or 8 hours for crop contents; 1, 4, 9 and 24 hours for caecal contents), 5g aliquots were taken, mixed with

buffered peptone water (BPW) and prepared for Salmonella enumeration. SE counts were recorded as a log reduction, compared to the negative control.

The objective of the second study was to evaluate the effect of DF+ in broilers in vivo, on the control of bacterial contamination in the digestive tract in comparison to a negative control in-vivo (Lückstädt and Theobald, 2009). 1125 broilers were distributed in 9 batches of 125 birds each (5 batches in the treatment; control with 4 batches

only). The broilers were fed the following program: starter diet for 21 days, grower diet for 18 days and finisher diet for 3 days only. Birds were treated with 0.3% DF+. After 39 days of treatment, before the finisher feed was given, 10 birds from each of the 3 treatments were taken for further microbial analysis and were screened for Salmonella. The collected data were analysed with ANOVA by the StatisticsXL program. A P<0.05 value was considered to be a significant result.

In vitro study

Table 1 shows the log reduction in SE counts after application of sodium diformate at the manufacturer's maximum recommended dose (0.6%) to samples of crop or caecal contents; this dosage was used for the laboratory test. In practice lower dosages are used. There, and especially in broiler production the recommended dosage for an anti-

Table 2. Reduction in Salmonella enteritidis (log10) over time in crop or caecal content treated with 0.6% DF+ (after Wales et al., 2013).

	1 h	4 h	8 h	9 h	24 h
Crop contents	3	>6	>6	n.d.*	n.d.*
Caecum contents	1	1	n.d.*	2	4

Salmonella effect lies at 1-2 kg/t.

In the crop, exposure of inoculated crop contents to DF+ resulted in a log 3 reduction in SE counts after 1 hour, reducing further to >log 6 at both 4 and 8 hours. Anti-Salmonella activity in the crop, by rapidly reducing the crop pH and killing Salmonella, may be particularly suited to combating the ingested pathogen from various contamination vectors (feed, environment, litter, etc.).

In caecal contents, only log 1 reduction in SE count was observed

Table 3. Results of sodium diformate (DF+) on Salmonella inhibition (% positive samples) in broiler chickens (after Lückstädt and Theobald, 2009).

Organs	Control	DF+ 0.3%
Crop (microbiol.)	20	0
Intestine (microbiol.)	20	0
Faeces (microbiol.)	25	0
Meat (serol.)	0	0

after 1 hour incubation, reducing further to log 2 reduction after 9 hours, compared to the negative control. This effect was further pronounced after 24 hours' incubation, with a reduction in SE count of log 4. Since the retention time in the hindgut of chickens is significantly longer, compared to the 'foregut' (crop, gizzard, proventriculus), the reduction in SE count after 24 hours may allow for a continuation of protection against the pathogen. The strong results with a reduction of up to 6 logs (see table above) suggest that also a lower dosage will show significant results, since it has to be mentioned that a reduction by log 2 means already 99% lower Salmonella levels. This approach was used in the in vivo study below.

In vivo study

Results of the in vivo study are shown in Table 3 (Lückstädt and Theobald, 2009). No positive samples were found for Salmonella in the crop (P=0.15) or intestine (P=0.15) at 0.2% (the recommended commercial dose in case of a suspected pathogenic challenge).

Further studies on the anti-Salmonella effect of DF+ were carried out in the Ukraine at the Animal Agriculture Institute of National Academy of Agricultural Sciences of Ukraine (2012). In that trial Cobb 500 birds were challenged with feed which contained 109 CFU/ml Salmonella

Typhimurium (strain no. 371). The trial lasted for a period of 6 weeks. Organs of birds (heart, lung and spleen) as well as intestine and manure were tested for Salmonella in birds fed with (0.3%) or without DF+. After the trial the negative control had positive samples of Salmonella in all organs, the intestine, and the manure – whereas in the DF+ treated group the Salmonella was below the detection level.

The above stated trials are in-line with experience from users of DF+ in Europe and Asia. The product is used for its anti-bacterial action, against Salmonella or E.coli, for instance in Germany, UK and Spain – or if talking about Asia, e.g. in India or the Philippines. Here, customers use the recommended dosage for the anti-Salmonella effect of 3 kg/t as long as the thread of the bacteria is present. After that, the normal broiler dosage of 1-2 kg/t of finished feed is recommended.

However, it has to be stated that the currently reduced threat with Salmonella in Europe – latest figures from the EU zoonosis report (EFSA, 2021) report only 60.000 cases of Salmonellosis in humans (which is a reduction from more than 131.000 cases in 2008 –

EFSA zoonosis report 2010) cannot be alone accounted for the use of acidifiers like DF+, but has to be seen as a combination of increased biosecurity and improved management in general, which includes however the use of additives with anti-Salmonella action.

Acidomix DF+ Helps to Improve Productivity in Layers.

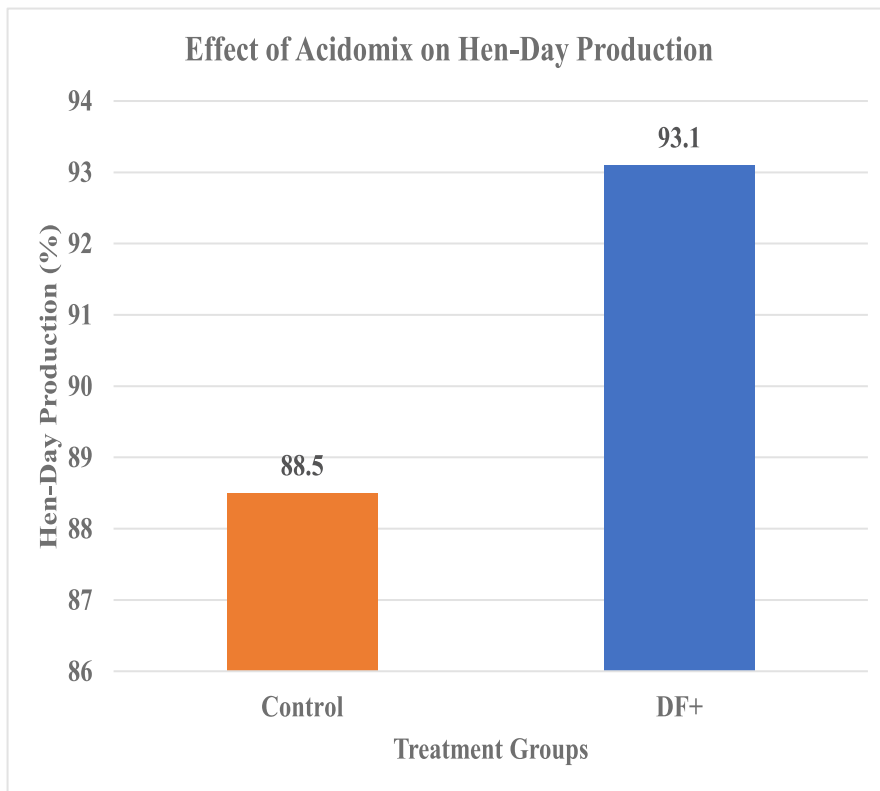
A meta-analysis on its impact on broiler performance in Eastern Europe is available. However, its impact in layer production systems there was yet to be thoroughly investigated.

This study analysed the average impact from all studies carried out in Eastern Europe on the effect of the additive on the laying rate of Lohmann Brown hens. The final dataset contained the results of 6 trials with DF+-inclusion, which ranged from 0.1% to 0.15%. The total number of layers used in the trials was more than 200,000 and the bird age ranged from 48 to 78 weeks. Results of the meta-analysis are expressed as percentage difference from the negative control. A P<0.05 value was considered significant.

The average level of dietary DF+-inclusion from the dataset in all treated layers was 0.14%. The performance of layers based on hen-day (HD) percentage was significantly increased by 5.4% (P=0.002), from 88.5% HD in the negative control to 93.1% HD in the DF+-groups. Furthermore, the uniformity was improved in the treated group (Table 4).

Table 4: Effect of Acidomix DF+ (DF+) on the hen-day percentage of Lohmann Brown hens (Meta-analysis based on 6 trials).

Control	DF+	Difference (%)	P-value	Age in weeks
88.5±2.9	93.1±1.0	5.4±2.6	0.002	59.5±10.5



Graph 1: Comparative analysis of hen-day production (%) in control and DF+ treatment groups in Lohman Brown layers.

A significant difference ($P=0.02$) in performance was noted between younger and older hens (Table 5): birds less than 55 weeks of age had only an improvement of 2.0% ($P=0.02$) against the negative control; hens above 55 weeks of age achieved a highly significant improved HD percentage of 7.7% ($P=0.007$)

Graph 2: Comparative analysis of effect of Acidomix DF+ on hen-day production (%) in young and old hens.

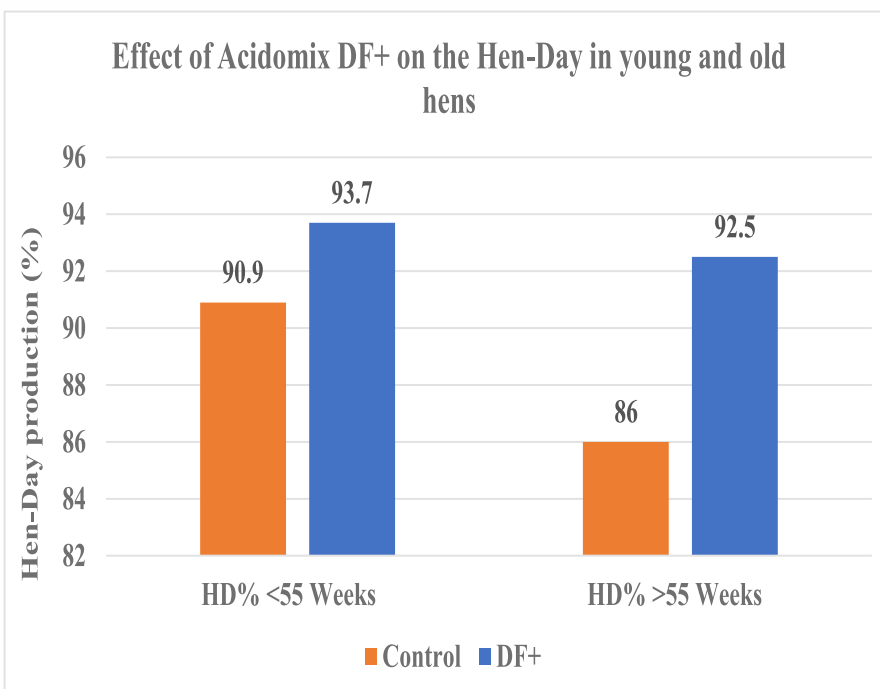
Conclusions:

Above studies clearly indicate the huge benefits of using organic acids (Acidomix DF+) in broilers as well as layers. Some of the key take aways from these studies are as follows:

- A. Inclusion of Acidomix DF+ showed significant increase in weight gain in broilers compared to control groups.
- B. Inclusion of Acidomix DF+ showed significant decline in %mortality and FCR in broilers compared to control groups.
- C. Acidomix DF+ inclusion showed significant reduction of Salmonella in crop and caeca of the birds conferring long term protection against Salmonella in vitro as well as in vivo.
- D. Inclusion of Acidomix DF+ showed significant increase in hen-day production in late lay (post 55 weeks) stage.

Table 5: Effect of Acidomix DF+ on the hen-day percentage (HD%) of young (<55 weeks) and old (>55 weeks) hens.

Age in weeks	Control	NADF	Difference (%)	P value
HD% <55 Weeks	90.9±1.1	93.7±0.8	3.0±0.9	0.019
HD% >55 Weeks	86.0±1.8	92.5±0.8	7.7±1.5	0.007




Fatty liver

over shadowing


performance

Introducing

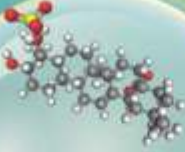
Lecithin



Lecithin
Fat Metabolism



Polyphenols
Immunity



**Flavonoids and
Triterpenoids**
Synergistic Hepatic
Action



Curcuminoids
Gut Health



Polyherbal Choline Chloride Replacer for Optimal Performance





On site production of liquid feed enzymes: a unique globally applied tool

DR. LODE NOLLET, PRODUCT MANAGER ENZYMES, HUVEPHARMA, BELGIUM

In today's animal feed production, heat treatments like extrusion and pelleting have found their way as a tool to improve animal performance by improved feed technology. However, there are also negative aspects to the use of high temperatures in feed processing such as destruction of heat sensitive additives (like enzymes).

This has led to the development of tools to apply heat sensitive compounds after the heat treatment process, called Post Pelleting Liquid Application (PPLA).

To feed the PPLA system with liquid enzymes, manufacturers need to produce the enzyme as a liquid, stabilise it by adding stabilising agents and conservatives, pack it in 1000 litre Intermediate Bulk Containers (IBCs) and transport it to the feed mill, where it is stored until the IBC is connected to the PPLA system for use. This complete process requires a stable and cool environment to guarantee the concentration of the enzymes in liquid form.

Working with liquid enzymes packed in IBCs has many downsides as enzymes in liquid form tend to be less stable than dry enzymes. An example of a stability study conducted with commercial available phytases on the market is shown in Fig. 1. It can be seen that the activity of liquid phytase (in IBC) is decreasing with up to 50% when stored for 12 weeks at 40°C. Therefore, IBCs with liquid enzyme require a lot of temperature controlled storage space and cooled transport. Next to this, the manipulation of the IBCs also poses extra labour costs and often results in leakage or spillage.



One of the installed Huvematics.

WSP enzymes

The development by Huvepharma of instant water soluble enzyme powders (WSP enzymes) has opened the way to produce liquid enzymes freshly at the feed factory when needed.

With these WSP enzymes, liquid enzymes can be tailor made at the feed mill in any desired amount and concentration just prior to application with the PPLA.

For dissolving the WSP enzymes, special equipment has been developed: the Huvematic which allows the enzymes to be dissolved even in cold and hard water.

The Huvematic weighs very accurately the desired quantity of WSP enzymes & the needed quantity of water, mixes them together so the liquid enzyme is produced at the right concentration. The Huvematic can run to produce two enzymes at the same time (for example a phytase and a NSP'ase) & has enough production capacity to serve multiple PPLA lines in the same feed mill. The dry WSP enzymes are commercially available under the brand names OptiPhos, Hostazym P and Hostazym X & are packed in boxes containing two aluminium sealed bags of 10kg each.

One box containing 2x10 kg of WSP enzymes, can replace 2-3 1000 litre IBCs filled with liquid enzymes. This recent innovation by Huvepharma is new in most areas of the world, however it is already common practice for more than three years in the US where it was intensively tested.

Large broiler integrators in the US have embraced this technology to avoid inconveniences related to liquid enzymes in IBC (as described above), and can be considered as the pioneers. The initial concept in the US was initiated for the use of a liquefied phytase (OptiPhos) & led to the installation of this concept in multiple feed mills.

Due to this success, Huvepharma also extended this concept for the production and application of liquefied NSP'ase (Hostazym X) using the same formulation technology developed in their R&D laboratories.

This success encouraged Huvepharma to launch the concept of the WSP enzymes globally. In the last year, local (country) registrations of the WSP enzymes have been taken care of, as also the collaboration with multiple construction companies to support Huvepharma with the installation and maintenance of the Huvematic was established.

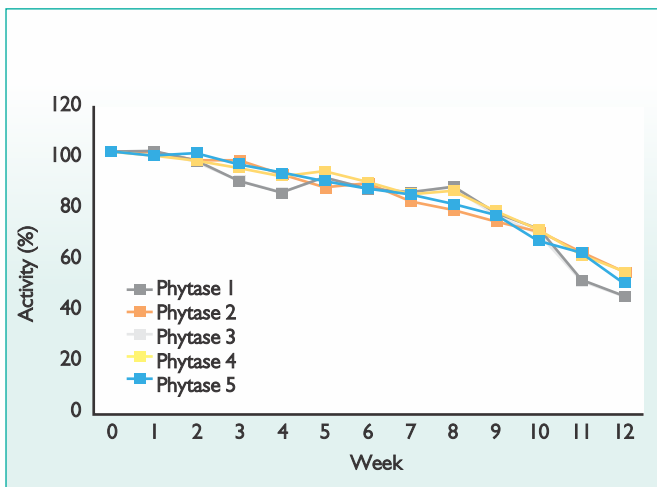


Fig. 1. Different commercial liquid phytases sold in IBCs show poor stability at 40°C indicating the need for cooling.



OptiPhos is an instant water soluble enzyme powder.

Europe was the first continent to follow the US experience with multiple operational units, while others are in process of construction and implementation.

In hot and humid areas this concept has been welcomed with a high enthusiasm. The challenging conditions like high temperatures and high humidity allow a roll-out of the concept in South-Asia, Pacific region and South America, solving the current difficulties with the IBCs, regarding stability, activity and extra labour.

At the same time, partners were found to support Huvepharma with equipment and related technical support allowing the implementation of the Huvematic concept in the large poultry integrations of that area.

Conclusion

Instant water soluble enzyme powders (WSP enzymes) are a unique tool for the production of liquid enzymes on site, offering the nutritionist flexibility and security in formulation.

Avoiding the need for IBCs, reducing waste, spoilage and labour cost has been a surplus offered to the feed mill manager.

Despite some scepticism this concept has been implemented with satisfaction in the last year worldwide and provided a solid base of experience for future new cases.

To know more, please contact Huvepharma technical team



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Venkateshwara B V Bio-Corp Private Limited Organised Series of Technical Seminars on “BV 300 Layer Management and Nutrition”.



VENKATESHWARA BV BIO-CORP PVT LTD organized series of Technical seminars in association with **Phoenix Group, Jabalpur** for commercial Layer Farmers on 17th, 18th and 20th January 2024 at Bhopal, Jabalpur and Raipur respectively. This technical seminar was attended by layer farmers of Bhopal, Indore, Jabalpur, Raipur and surrounding area.

Dr H.G Murade, DGM, Sales and Marketing, welcomed all attendees and introduced the speakers for the technical seminar.

Dr Sunil Nadgauda, DGM, Technical, explained in detail about the “**New BV 300 commercial Layers Nutrition and Management Guide**” in all aspects. During presentation he insisted more on producing quality pullets for better laying performance. The excerpts from his presentation can be summarized as below.

- BV 300 performance review over 100 weeks of age.
- Importance of body weight monitoring in rearing period and its impact on laying performance.
- Early Laying Nutrition to maximize peak production and to maintain the consistency.
- Benefits of Phase feeding – to reduce the overall egg production cost and to optimize the efficiency.
- Impact of feed toxicity on egg size, egg shell quality and immunity of the bird along with production performance.
- Importance of body weight management and lighting management in laying as well as in rearing period.
- Importance of gut health in long laying birds in egg productions. Gut health can be boosted by using gut acidifiers, probiotics and other solutions.
- Innovative premix solutions to simplify the feed manufacturing and also to avoid errors during feed production were discussed. These solutions include EggXtra 5 % composite premix and





Vannamin[®] Breeder Formula

Improves Fertility & Hatchability




- Improves hen fertility.
- Enhances male fertility.
- Upgrades egg hatchability.
- Chicks hatched have high IgG and high survival rate.

 **Guybro Animal Health Pvt. Ltd.**

2024

102/103, Peninsula Park, Veera Desai Road, Andheri (W), Mumbai -400053.

Tel.: +91 22 4054 6800 | Email: info@guybro.in

 /guybroanimalhealth |  /company/guybroanimalhealth |  /www.guybro.com





Mixblend 0.4 % premix for Layers.

Dr Sunil Bhidwale, Technical Director, Phoenix Group, presented regarding Current Disease scenario in MP and CG states and strategies to prevent and control the same. He discussed in detail regarding the causes and best possible solutions to prevent the emerging and re-emerging diseases. He insisted to follow strict biosecurity to be followed at farm to enhance the productivity

Dr Sunil Nadgauda and Dr Sunil Bhindwale answered the queries of the attendees related to the subject and other technical queries regarding layer nutrition and management.

Dr H G Murade summarized the presentations and suggested to follow the proper vaccination schedule as per the guidelines. He emphasized more on use of inactivated vaccines in laying phase.

Mr Prabhakar Iyer, CEO, Phoenix Group and Mr Pallabh Paul GM- Phoenix

Group, given conclusive remarks on technical seminar and assured the farmers regarding best possible services.

The New BV 300 layer nutrition and management guide November 2023 was launched during these seminars and copies were distributed to the layer farmers.

Mr Manish Podar, Zonal Manager proposed vote of thanks. The local Venworld Team organised these technical seminars.



Venkateshwara B V Bio-Corp Private Limited

Organised Series of Technical Seminars on “BV 300 Layer Management and Nutrition”.



VENKATESHWARA BV BIO-CORP PVT LTD organized series of Technical seminars for commercial Layer Farmers on 24th and 25th January 2024 at Talegaon (Pune Dist.) and Sangamner (Nasik Dist.)- Maharashtra respectively.

Mr Ram Ghate, AGM, Sales and Marketing, welcomed all attendees and introduced the speakers for the technical seminar.

Dr Sunil Nadgauda, DGM, Technical, explained in detail about the “**New BV 300 commercial Layers Nutrition and Management Guide**” in all aspects on 24th Jan 2024. During presentation he insisted more on producing quality pullets for better laying performance. The excerpts from his presentation can be summarized as below.

Dr Roshan Sarode presented about BV 300 nutrition and management on 25th Jan 2024 at Sangamner and discussed in detail about

nutrition and management of BV 300 to achieve better performance.

- BV 300 performance review over 100 weeks of age.
- Importance of body weight monitoring in rearing period and its impact on laying performance.
- Early Laying Nutrition to maximize peak production and to maintain the consistency.
- Benefits of Phase feeding – to reduce the overall egg production cost and to optimize the efficiency.
- Impact of feed toxicity on egg size, egg shell quality and immunity of the bird along with production performance.
- Importance of body weight management and lighting management in laying as well as in rearing period.
- Importance of gut health in long laying birds in egg productions. Gut health can be boosted by



using gut acidifiers, probiotics and other solutions.

- Innovative premix solutions to simplify the feed manufacturing and also to avoid errors during feed production were discussed. These solutions include EggXtra 5 % composite premix and Mixiblend 0.4 % premix for Layers.

Dr H G Murade presented about proper vaccination and procedures followed for developing good



HOTEL AARADHYA FARMERS MEETING

immunity. He also guided about precaution to be taken during vaccination like maintaining cold chain, correct dosage of vaccine, method of vaccination and things to do before and after vaccination.

Dr H G Murade summarized the presentations and suggested to follow the proper vaccination schedule as per the guidelines. He emphasized more on use of inactivated vaccines in laying phase.

Dr Sunil Nadgauda and Dr H G Murade answered the queries of the attendees related to the subject and other technical queries regarding layer nutrition and management.

The Technical Seminar was attended by around 190 Layer



HOTEL AARADHYA

farmers Nashik and Pune districts and surrounding area.

Dr Tushar Mahanwar, Regional Technical Manager proposed vote

of thanks. The local Venworld Team organised these technical seminars.





EGG

Daily and Monthly

Prices of January 2024

Name Of Zone / Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Average	
NECC SUGGESTED EGG PRICES																																	
Ahmedabad	636	639	642	642	642	642	630	630	630	630	605	605	605	605	605	595	585	585	585	585	585	590	590	590	590	590	590	590	590	590	570	570	605.42
Ajmer	620	620	610	610	606	606	606	606	596	580	570	570	560	560	560	560	550	550	550	568	573	573	573	563	535	535	542	542	542	532	522	570.65	
Barwala	606	606	606	606	606	580	580	580	580	580	568	568	568	568	548	548	548	548	548	560	568	570	570	570	535	535	540	540	540	540	540	566.13	
Bengaluru (CC)	615	615	615	615	615	590	570	575	575	575	565	565	565	565	565	550	550	550	550	550	555	560	565	570	570	570	570	570	570	570	570	573.39	
Brahmapur (OD)	610	610	610	610	610	610	610	585	585	585	585	580	580	580	580	573	573	550	550	550	557	567	575	578	578	563	563	563	563	553	547	547	577.42
Chennai (CC)	615	615	615	615	615	605	590	590	590	590	580	570	570	570	570	570	570	570	555	555	555	555	570	570	580	580	580	580	580	580	580	581.61	
Chittoor	608	608	608	608	608	598	583	583	583	583	573	563	563	563	563	563	563	563	548	548	548	548	563	563	573	573	573	573	573	573	573	574.61	
Delhi (CC)	645	645	645	645	640	650	630	630	620	620	620	610	610	610	600	585	570	570	570	575	595	600	600	600	600	600	600	600	600	575	560	560	605.81
E.Godavari	580	585	585	585	585	585	585	565	565	565	565	555	555	555	550	550	530	530	530	535	542	550	555	558	540	540	540	540	530	530	530	554.68	
Hospet	575	575	575	575	575	550	530	535	535	535	525	525	525	525	525	510	510	510	510	510	515	520	525	530	530	530	530	530	530	530	530	533.39	
Hyderabad	579	582	582	582	582	560	560	560	560	540	540	540	540	540	520	520	520	520	523	526	531	536	540	540	540	540	540	540	520	520	520	543.32	
Jabalpur	610	615	615	600	585	585	585	585	585	585	560	560	560	560	560	540	540	540	540	540	560	575	575	575	555	555	555	555	555	555	530	567.58	
Kolkata (WB)	650	650	650	650	650	650	650	625	625	615	615	615	605	595	585	585	585	585	610	630	630	630	600	600	600	600	600	600	590	590	590	616.29	
Ludhiana	610	610	610	610	595	595	580	580	580	580	580	580	568	568	547	547	547	547	547	547	565	569	569	569	569	535	535	539	539	539	539	567.58	
Mumbai (CC)	645	645	650	650	650	650	630	620	620	620	600	600	600	600	600	590	580	580	580	583	586	593	601	605	605	605	605	605	605	595	585	609.13	
Mysuru	615	615	615	615	615	590	570	575	575	575	565	565	565	565	565	550	550	550	550	550	555	562	567	572	572	572	572	572	572	572	572	574.03	
Namakkal	565	565	565	565	565	545	525	525	525	525	515	515	515	515	515	505	505	505	505	505	505	510	515	520	520	520	520	520	520	520	520	524.52	
Pune	650	650	650	650	650	640	620	610	612	612	612	610	605	600	600	600	590	590	585	585	590	595	603	603	603	603	603	603	603	595	590	610.06	
Raipur	600	600	600	590	580	580	565	565	565	580	560	560	560	550	550	545	545	545	545	545	555	565	565	565	550	540	540	540	540	540	540	560.32	
Surat	640	640	643	643	643	635	620	620	620	620	600	600	600	600	600	580	580	580	580	580	585	590	590	590	590	590	590	590	590	580	580	602.87	
Vijayawada	580	585	585	585	585	585	585	565	565	565	565	555	555	555	550	550	530	530	530	535	542	550	555	558	540	540	540	540	530	530	530	554.68	
Vizag	625	625	625	625	625	625	625	625	625	599	599	599	599	599	599	564	550	550	550	555	560	563	565	565	565	565	565	565	565	565	565	588.90	
W.Godavari	580	585	585	585	585	585	585	565	565	565	565	565	555	555	555	550	550	530	530	530	535	542	550	555	558	540	540	540	530	530	530	554.68	
Warangal	581	584	584	584	584	562	562	562	562	542	542	542	542	542	522	522	522	522	525	528	533	538	542	542	542	542	542	542	522	522	522	545.32	
Prevailing Prices																																	
Allahabad (CC)	671	676	676	662	652	638	619	610	610	610	610	610	610	610	610	595	586	576	571	595	619	629	629	609	595	595	595	586	581	571	562	611.87	
Bhopal	615	620	620	620	620	620	625	625	625	590	570	570	570	570	570	550	540	540	540	540	550	560	570	570	570	560	560	560	560	560	560	578.06	
Indore (CC)	600	610	615	615	610	600	600	600	590	580	570	570	560	560	550	550	550	550	550	560	565	570	570	540	540	545	545	545	545	540	569.19		
Kanpur (CC)	652	652	652	652	642	642	633	633	624	624	614	614	614	614	614	595	595	586	586	586	609	609	609	609	595	595	595	581	581	567	567	611.00	
Luknow (CC)	683	683	683	683	667	667	667	667	660	660	650	650	650	650	650	633	633	633	617	617	650	650	650	650	650	633	633	633	633	617	617	649.00	
Muzaffarpur (CC)	670	670	670	670	665	640	640	640	640	640	630	630	630	630	610	610	610	610	610	625	630	630	630	630	601	601	601	601	601	601	601	627.97	
Nagpur	600	600	600	600	600	600	600	600	590	590	577	565	565	565	540	540	540	540	540	540	540	563	563	563	555	560	560	555	565	560	530	520	567.29
Patna	670	670	670	670	665	640	640	640	640	640	630	630	630	630	610	610	610	610	610	625	630	630	630	630	601	601	601	601	601	601	601	627.97	
Ranchi (CC)	667	667	667	657	657	642	642	638	629	629	629	619	619	619	619	609	605	605	605	609	619	619	619	619	609	609	600	600	600	595	586	622.23	
Varanasi (CC)	673	673	667	667	650	650	633	633	633	633	633	630	620	620	610	610	610	610	610	617	623	623	627	627	610	597	597	597	597	590	625.06		

Venkateshwara B V Bio-Corp Private Limited Organised Technical Seminars.



VENKATESHWARA BV BIO-CORP PVT LTD organized two Technical seminars for commercial Layer Farmers on 18th at Musiri and 19th January 2024 at Thalaivasal, Namakkal. The topic discussed during seminar-

- Layer disease challenges and Vaccination updates
- The New way of Premixing and Innovative premix solutions
- Importance of water sanitation in Layer Industry.

Mr R.Murugesan, Zonal Manager, welcomed all attendees and introduced the speakers for the

technical seminar.

Dr A.Kandasamy- AGM-Technical, discussed current disease challenges in commercial layers and proper vaccination for layer. He suggested to use of updated vaccines & control of mycoplasma to ensure sufficient protection against disease problems. This will also help to achieve desired performance.

Dr Sambhaji Nimbalkar-Technical Manager, discussed regarding Premix and premixing technology. He elaborated benefits of homogenous premix and innovative premix solutions to

simplify the feed manufacturing and also to avoid errors during feed production especially premixing. The innovative solution includes Mixiblend 0.4 % premix for Layers.

Dr R. Venkatvasan – discussed importance of water sanitation. He suggested to regular monitoring of physical, microbial and chemical qualities of water. Benefits of continuous water sanitation, challenges in water sanitation and solution for this were also discussed.

Dr A. Kandasamy and Dr Sambhaji Nimbalkar answered the queries of the attendees related to the subject and other technical queries regarding layer nutrition, Vaccination and management.

The Technical Seminar was attended by Layer farmers of Musiri, Thalaivasal, Attur and surrounding areas. Local VHPL chick's sale team also helped for coordination and organization of these seminars.

Mr R.Murugesan, Zonal Manager proposed vote of thanks.





Intracare Expands Global Footprints with Launch of Indian Operations

New Delhi, 01 February 2024: **Intracare, The Netherlands** based globally renowned Animal Health Solutions Provider, is excited to announce the introduction of Intracare SEA Private Limited, marking a significant milestone in the organization's expansion strategy.

With a rich legacy of delivering innovative and highest-quality products for animal health and welfare, Intracare has chosen India as its next strategic location to serve the dynamic and growing Southeast Asian Market. The launch of Intracare SEA Private Limited underscores the company's commitment to fostering a healthier and more sustainable future for livestock in the region.

Intracare's entrance into Indian market represents a blend of cutting-edge research, advanced technology and a decade long deep understanding of the unique biosecurity challenges faced by the diverse livestock sector in the country. Intracare brings a

comprehensive portfolio of products, including hygiene solutions, nutritional supplements, and hoof care products designed to meet the evolving needs of the Indian farmers, veterinarians, and customers.

Mr. Symon de Jong, Director, Intracare Netherlands, expressed his enthusiasm about the expansion, saying, "The launch of Intracare SEA Private Limited is a strategic move to bring our world-class solutions to the vibrant Indian market. We are excited to contribute to the well-being of the animals and success of the farmers in livestock industry in India. Our team is dedicated to maintaining the highest standards of quality and innovation, aligning with values that Intracare is globally renowned for."

Intracare SEA Private Limited will operate with a commitment to sustainable practices, promoting responsible animal husbandry, reducing the usage of antibiotics, and contributing to the overall

welfare of the animals. The company aims to build strong partnership with local stakeholders, including farmers, veterinarians, authorities, and distributors, to create a positive impact on Indian livestock landscape.

About Intracare

Intracare, based out of The Netherlands, develops, produces, and supplies proven and effective veterinary medicines, biosecurity, hygiene products, nutrients and innovations for sustainable and modern livestock farming, horticulture, and aquaculture worldwide. The effect of cooperation is more than enough of sum of its parts. Our state-of-the-art R&D department develops solutions for the challenges of tomorrow. Collaborating with our people in the field, we create products that achieve sustainable growth and reduce the use of antibiotics and pesticides. And that makes us pioneers in future-proof-solutions.

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EuroTier 2024 presents guiding theme “We innovate animal farming”

“We innovate animal farming” represents the theme of this year’s EuroTier, the world’s leading trade fair for professional animal husbandry and livestock management, 12-15 November, 2024, in Hanover, Germany. Organized by the DLG (German Agricultural Society), EuroTier is the central venue for international farmers, contractors, distributors and other experts from both science and practice. Core exhibition areas include animal welfare, animal health, sustainability, emission reduction, breeding, livestock management, feeding, digitalization, farm management, processing and marketing. Exhibitors will present to visitors a comprehensive overview of innovations, solutions and established standards for cattle, pig and poultry farming.

Information on sheep and goats, boarding horses, aquaculture, alternative proteins and direct farm sales round off the exhibition and technical program. The international poultry industry will be joining the World Poultry Show, once again held at EuroTier. EnergyDecentral, the international trade fair for decentralized power generation and agricultural energy, and the Inhouse Farming Feed & Food Show, DLG’s new platform for self-contained agricultural and food systems of the future, will be held parallel to the world’s leading trade fair.

Current social and political demands, greater concern both for the environment and for the welfare of animals pose challenges

for the future of livestock farming throughout the world. EuroTier will show that these challenges can best be met by the livestock industry which provides new technological solutions and modern equipment designed to further the sustainable development of this high-growth sector of the economy.

“Under the guiding theme ‘We innovate animal farming’, exhibitors at EuroTier 2024 will present a variety of ways in which new and innovative approaches and strategies can be used to improve the efficiency, sustainability and ethical standards of animal husbandry,” says Ines Rathke, Project Manager of EuroTier, describing the central importance of EuroTier for international livestock farming.

Innovation platform for the global livestock industry

As the innovation platform for the global livestock sector, the EuroTier trade fair offers a complete overview of innovations and established standards, including technical solutions for cattle, pig and poultry farming. The EuroTier trade fair portfolio covers products and services for the entire value chain for the production of animal-based foodstuffs, including complete husbandry systems, genetics, feed, climate and environmental technology, milking and cooling technology, manure removal, transportation, operating resources, accessories, processing, distribution and marketing for agricultural production.

International technical program addresses topics of the industry

Under the guiding theme “We innovate animal farming”, the DLG, together with international partners, will present a high-quality technical program with several hundred events, including conferences, on the current focus topics of the livestock sector:

- EuroTier events like the “TopTierTreff” (English: “Top animal venue”) where international dairy and beef breeding organisations present live animals,
- Autonomous and automatic systems play an increasing role in the sector. The “Barn-Robot Event” presenting feed pusher robots for cattle housing
- Interactive events will take place on the dedicated “Expert Stages” featuring talks on topics and strategies across poultry, cattle, pig, horse, decentral energy as well as agriculture and food systems.
- In the new “AI in the poultry house spotlight”, exhibitors will present innovative solutions for improving animal welfare, animal health, performance and energy efficiency in poultry production.
- A new spotlight in the pig sector focuses on the “curly tail” and presents industry solutions as well as best practice examples from a range of countries.
- The cross-species spotlight “On-farm slaughter” presents novel mobile slaughter units that

enable slaughter to take place on the farm.

- The conference program, the International Cattle & Pig Event, the International Poultry Conference, the associated Poultry Event and the Animal Health Event offer a mix of international keynote speeches, round tables, award ceremonies and subsequent get-togethers.
- The "agrifood start-ups" area presents innovative industry solutions from startup companies and is also networking area attracting investors.
- In the DLG.Prototype.Club, teams of software engineers solve technical challenges set by exhibitors and present their prototypes.

World Poultry Show returns to EuroTier 2024

Conferences and events within the World Poultry Show offer international poultry professionals a wide range of opportunities for networking and professional exchange and information. The main topics will be animal welfare and the CO2 footprint in poultry. The theme spotlight Artificial Intelligence "AI in the poultry house" will present solutions for poultry housing. The Expert Stage "Poultry" will provide information on current developments and innovations in the areas of poultry farming, animal health, feeding, management and marketing. The International Poultry Conference and the International Poultry Event round off the information and networking program.

Expanded exhibition offering for systems and components

For the first time at EuroTier,

suppliers of livestock equipment will benefit from a dedicated exhibition area at EuroTier and will present their products to manufacturers of animal husbandry machinery. Named "Supplier Industry - powered by Systems & Components", the area is aimed at engineers, buyers and system integration specialists offering feeding technology, milking systems, transport wagons, presses and mixing and dosing systems. EuroTier exhibitors can find suitable development partners in this new area. The area is a central venue for innovative solutions in the production of animal husbandry technology and is a further building block at the trade fair to represent the entire value chain in the animal husbandry industry.

Optimal complement: EnergyDecentral and Inhouse Farming

The EnergyDecentral trade fair and Inhouse Farming - Feed & Food Show, a premiere, takes place in Hanover in parallel to EuroTier. Already recognized as the leading platform for decentralized energy supply, EnergyDecentral covers the entire value chain of sustainable energy production: Resources, energy generation and smart energy. The Inhouse Farming - Feed & Food Show will be the global B2B venue for self-contained agricultural and food systems of the future. Closely networked with agricultural practice, Inhouse Farming offers practical solutions, specialist information, perspectives, innovations and business - from feed to food.

Booking a stand

Companies planning a stand should visit www.eurotier.com.

Personal contact with the DLG, the organizer, is also possible: Tel +49(0)69/ 24 788-433. Email: eurotier@dlg.org.

About DLG

With over 30,000 members, DLG (German Agricultural Society) is a politically independent and non-profit society. Drawing on an international network of experts in food and agriculture as well as subsidiary companies in nine countries, the DLG organizes over 30 regional arable and livestock exhibitions worldwide, in addition to its leading international trade fairs, EuroTier for livestock equipment, and Agritechnica for agricultural crop machinery, each taking place biennially in Hanover, Germany. Headquartered in Frankfurt, Germany, DLG informs its members of the latest advancements in practical agriculture. DLG's International Crop Production Center, a 600-hectare site located in Bernburg-Strenzfeld, Germany, conducts plot trials on crop rotations, cultivation and irrigation and practical machinery tests. DLG houses Europe's largest test center for agricultural machinery "DLG Test Center for Technology and Farm Inputs", which is located at Gross-Umstadt, Germany. DLG bridges the gap between theory and practice, as evidenced by more than 40 working groups consisting of farmers, academics, farm equipment companies and organizations continually comparing advancement in knowledge in specific areas such as irrigation and precision farming.



Our Highlights from the PDFA International Dairy & Agri Expo 2024

Thank you to all our esteemed delegates who visited our stall at the PDFA International Dairy & Agri Expo 2024.

We were blown away by the incredible response and it was truly a pleasure to connect with each and every one of you.

Thank you for your support and collaboration.





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Glimpses of the Kolkata International Poultry Fair 2024

A heartfelt thank you to all our esteemed delegates who visited our stall and made it a grand success. Your presence and support mean the world to us! We will always be grateful.





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Ensuring Quality and Transparency: OVO Farm Implements Blockchain in Egg Production



Currently, technology is being implemented in all sectors. Today, technology is widely used in the agricultural industry to improve the quality of production, including seeds, soil, manure, and other inputs. The use of cutting-edge 'Blockchain' technology in the egg industry is allowing people to learn about its quality. Balangir's 'OVO Farm' is the first in India to use this technology for egg production.

Today, ultramodern Blockchain technology is used globally to keep digital records of various products. Consumers benefit from the implementation of blockchain technology at 'OVO Farm' in Chhatamakhana village, Balangir district. When purchasing an egg crate from the market, simply scanning the QR code on the package provides access to all information about the egg, such as the production date, quality, nutritional value, and so on.

OVO Farm focuses on producing healthy eggs. So the chickens are kept in a secure environment and their health is monitored on a

regular basis. Along with that, the 'Bio Secure Zone' protocol is strictly followed. Likewise, OVO Farm has made the necessary arrangements to keep the chicks free of antibiotics. Furthermore, UV treatment, dry cleaning, candling, grading, and eco-friendly packaging methods are used to produce high-quality eggs.

"We are prioritising the use of cutting-edge technology in the production of nutritious eggs. Efforts are underway to raise egg quality to global standards. Samarendra Mishra, one of OVO Farms' two co-founders and director, stated that the eggs exported abroad are thoroughly tested.

OVO Farm, an agricultural enterprise based in Balangir, a major city in West Odisha, has grown to become one of East India's top egg producers. This farm has the capacity to produce approximately 10 lakh eggs each day. This ultramodern egg industry exists today thanks to the efforts of two Balangir entrepreneurs, Soumendra and Samarendra Mishra. This also allows more than 300 people in Balangir district to earn a decent living.

"When OVO Farms began, Western Odisha did not have a business-friendly environment. Locals travelled outside of the state in search of work. After OVO Farm went operational, we were able to

hire youth from nearby villages, and they now earn a decent living," says Soumendra Mishra, Co-founder and Director of OVO Farm.

Eggs are nutrient dense, containing high-quality proteins, vitamins, and minerals. OVO Farm sells these nutritious eggs on the market under the brand name 'Kenko'. Varieties include Hi-Pro, Brown, Immuno, Hearty, MoreOVOor', and On-Day.

It is available in a variety of modern grocery chains, as well as Kenko's exclusive outlets throughout the country. OVO Farm eggs are now being exported to both Qatar and Africa. Furthermore, OVO Farm intends to export eggs to countries such as Sri Lanka and Australia in the near future to expand their business.

Goa Farmers Benefit from ICAR-CCARI's Backyard Poultry Demonstration Session

ICAR-Central Coastal Agricultural Research Institute, Goa, hosted an interaction-cum-demonstration session for farmers from Bardez taluka today in Aldona, Goa. The purpose of the interaction was to



select beneficiaries for the NABARD-funded project "Promotion of improved indigenous backyard poultry through scientific interventions for sustainable poultry production and livelihood security in Goa".

Scientists discussed various biosecurity and healthcare measures for the prevention and management of diseases in poultry.



Farmers were given extension folders on the economic feeding of backyard poultry, duck production for coastal farmers, rural poultry farming, and incubation-hatching issues and prevention.

The programme was attended by 52 farmers from various villages in Bardez Taluka.

KVK Mon Hosts Successful Poultry Management Program for Rural Youth

Krishi Vigyan Kendra (KVK) Mon organised a six-day poultry rearing and management training programme from January 23 to January 29, 2024, in Mohung Village, Mon district. According to an update, it was carried out in collaboration with the State Agricultural Management and Extension Training Institute

(SAMETI) in Nagaland and the National Institute of Agricultural Extension Management (MANAGE) as part of the Skill Development of Rural Youths (STRY) programme. During the programme, 15 rural youths (10 males and 5 females) received training in all aspects of poultry production, such as breeds, breeding, housing, nutrition, diseases, health care management,

and routine management.

Dr. Rongsen, assistant chief technical officer (ACTO) for Animal Science at KVK Mon, served as the training's course director. On the final day, certificates were distributed to the trainees, and during the validity session, Dr. Akashe Zhimomi, senior scientist and head of KVK Mon, encouraged them to work hard and apply their new skills.



Egg Inclusion Debate Resurfaces in Maharashtra's Midday Meal Program



The controversy over including eggs in midday meals has resurfaced, with the Maharashtra government amending a government resolution (GR) that required students in the state to be served eggs once a week.

The move is met with opposition from religious organisations such as the Shree Mumbai Jain Sangh Sangathan (SMJSS), which represents the city's Jain community, and members of the Bharatiya Janata Party's (BJP) spiritual cell.

Previously, the GR allowed parents to choose whether their child would be served eggs or bananas as a substitute. However, the amended GR has removed the option of selecting between vegetarian and non-vegetarian meal options. Eggs will no longer be served in schools if 40% of the students refuse to eat them.

The GR also states that schools that receive meals from Akshaya Patra and Annamrita Foundation, charities affiliated with the International Society for Krishna Consciousness (ISKCON), will be exempt from serving eggs.

The mid-day meal scheme provides nutritious food to approximately two crore students enrolled in government-run schools. To improve the students' diet, it was decided that instead of khichdi, they would be served egg pulao, biryani, sweets, vegetables, and fruit. According to the report, the school education department made the decision to reintroduce eggs to the mid-day meal menu for the first time in 20 years.

However, following a presentation by SMJSS trustees and members to Chief Minister Eknath Shinde and School Education Minister Deepak Kesarkar on January 5, the government issued a new GR on January 24.

Evonik's Biotech Hub Joins Forces with TUM and RWTH Aachen for Antibiotic-Free Poultry Health Solution



Evonik's Biotech Hub is collaborating with the Technical University of Munich (TUM) and RWTH Aachen to create a novel bacterial consortium to strengthen chickens' immune systems and prevent pathogen colonisation of their intestinal tracts.

The goal is to improve health while reducing the use of antibiotics. Evonik is a three-year joint Chicken Synthetic Microbiota (ChiSYN) project partner and project coordinator. The total project volume exceeds EUR2 million (US\$2.2 million) and is funded pro rata by the project partners as well as the Federal Ministry of Food and Agriculture (BMEL).

The project partners' goal is to create a prototype feed additive that ensures that "beneficial microorganisms" colonise the gut of chicks. To accomplish this, bacteria that strengthen the immune system and make pathogen colonisation more difficult are chosen from a diverse population of chickens. The project partners then combine the microorganisms to form a new consortium.

"In the development of this bacterial consortium, we benefit from our gut simulation experience and the successful development of

probiotics for livestock farming," said Stefan Pelzer, head of the Biotech Hub's In Silico & Target Systems research unit. Pelzer and his team have been using the dynamic chicken gut simulation model "DAISy" since 2018. They use the findings to create new gut health products as well as disruptive, high-precision nutritional concepts that, for the first time, account for gut bacteria.

In this project, Evonik's experience in industrial biotechnology is perfectly complemented by the skill sets of its strategic partners at Aachen and Munich universities.

RWTH has many years of experience systematically collecting and investigating bacterial communities in the gastrointestinal tracts of humans and livestock, as well as isolating and characterising gut microbiota using high-throughput methods.

TUM investigates the impact of specific bacteria on the health of chickens. It focuses on the development of the chicken immune system and how it interacts with pathogens.

China's Poultry Industry Embraces Cage-Free Egg Production as Trend Accelerates

The shift towards cage-free egg production in China accelerated in 2023, with national poultry industry media outlet Ai Qin She naming "cage-free" the industry's word of the year.

In 2023, there was a significant increase in the number of egg producers switching to cage-free egg production, making 'cage-free' the buzzword of the year. The



honour was announced in Ai Qin She's annual end-of-year roundup of the most significant trends in China's poultry industry.

Dalian Luxue, one of China's largest producers of processed eggs and a supplier to numerous international and domestic retail chains, has announced the completion of its first cage-free hen house in 2023.

Cage-free egg producer. In 2023, Xinde doubled its cage-free flock from 100,000 to 200,000 hens, and it is expected to more than double again in 2024. Yongao in Shanxi increased its flock to 200,000 cage-free layers in 2023, with plans for further expansion in 2024.

Also in 2023, well-known Guangdong distributor Tudama made a strategic move into egg production, focusing solely on cage-free eggs. Tudama's cage-free hen houses will be built in four stages, with the final phase expected to result in 500,000 cage-free layers.

Happy Eggs in Beijing, Tiancheng in Jiangsu, Renjun in Jiangsu, and Xiansen in Anhui are among the companies that have increased their cage-free egg production levels in the last year.

"In 2024, several more of the company's largest traditional egg producers will begin to offer cage-free eggs for the first time, either by transforming existing barns to cage-free or constructing new hen houses, resulting in a significant growth in the availability of cage-free eggs," said Huang Mutzu, programme director at Shanghai-based consultancy Lever China, which helps producers implement cage-free production systems and connects producers with food corporates looking

Huang and Lever China wrote Commercial Cage-Free Egg Production, a technical guidebook for cage-free egg production that will be published in 2022 by the state-owned China Agriculture Press. Over the last three years, the number of companies committed to sourcing 100% cage-free eggs in China has increased from 50 to nearly 150.

Innovative Solution for Poultry Health to Reduce Necrotic Enteritis Effects

A combination of organic acid sources shows great promise for reducing the effects of necrotic enteritis while improving overall gut health.

Innovative Solutions, a division of KENT Nutrition Group, has introduced Humisyn, a synergistic blend of organic acid sources that shows great promise in helping to reduce the effects of a common disease in poultry by improving overall gut health.

In poultry, necrotic enteritis (NE) increases mortality, reduces growth performance, and leads to poor



feed conversion rates. According to estimates, this disease costs the global poultry industry nearly \$6 billion per year. Research has shown that improved overall gut health can help prevent this disease, which has traditionally been treated with in-feed antibiotics.

HumiSyn IFC4 is a free-flowing additive for poultry feed that contains a precise combination of naturally occurring organic acids and short-chain fatty acid glycerides.

HumiSyn WSC4 is a concentrated liquid supplement for poultry that can be easily administered through drinking water. It is a scientifically researched and proven combination of naturally occurring organic acids and short-chain fatty acid glycerides.

Boehringer Ingelheim Unveils poultry coccidiosis vaccine with a new name Vaxxilive Cocci 3



Boehringer Ingelheim has announced the release of Vaxxilive Cocci 3, a poultry coccidiosis vaccine formerly known as Hatchpak Cocci 3.

Vaxxilive Cocci 3 is a coccidiosis prevention tool as well as a biological alternative to

anticoagulant drugs administered in-feed. The vaccine stimulates the bird's natural immune response while causing minimal tissue damage. In short, Vaxxilive Cocci 3 is effective against coccidiosis while remaining gentle on birds.

The vaccine contains the same tried-and-true formula on which producers have come to rely, as well as three genetically stable precocious strains of the major Eimeria species that affects broilers. Precocious strains can achieve immunity faster than non-precocious strains due to their shorter life cycles.

Because precocious strains have a faster turnover rate, Vaxxilive Cocci 3 causes less oocyst production and tissue damage. The vaccine ultimately improves immunity while maintaining barrier integrity and causing minimal vaccine reactions. Furthermore, the vaccine can be used all year, allowing for better coccidiosis management with a lower risk of chemical resistance compared to protocols that alternate between vaccination,

chemical treatment, and feed additives.

Boehringer has also taken advantage of this launch to innovate its processes, significantly improving procedures to enable more consistent, high-quality manufacturing.

IPWA and COOP Launch Educational Training Modules for Poultry Welfare



The International Poultry Welfare Alliance (IPWA) is pleased to announce the release of a comprehensive suite of educational training modules to supplement its Key Welfare Indicator (KWI) Guides. These training modules, created in collaboration with Fresno State's Centre for the Optimisation of

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Poultry (COOP), seek to improve industry knowledge and promote best practices in poultry welfare.

The collaboration between IPWA and COOP demonstrates a commitment to improving poultry welfare through easily accessible and engaging educational content. The training modules cover each section of the IPWA's Key Welfare Indicator Guides, ensuring a thorough understanding of critical poultry welfare topics.

"We are thrilled to unveil these educational training modules as part of our ongoing efforts to promote the highest standards of poultry welfare globally," says Nick Wolfenden of Cargill, co-chair of the Education and Training committee at IPWA. "Seeing the IPWA membership of industry and academics come together to identify the gap, collaborate, and implement such an impactful solution has been very fulfilling."

The courses are hosted by COOP and feature premier course development software and engaging visuals, ensuring a user-friendly experience for students. The modules will be available on both the Fresno State and the IPWA websites. Four broiler-focused modules are currently available, with turkey and laying hen training modules set to be added in 2024 and translations into other languages scheduled for 2025.

"We are excited to contribute to the advancement of poultry welfare education by providing a platform for these training modules," Dr. Katy Tarrant, executive director of the COOP, said "Our collaboration with IPWA reflects our shared commitment to delivering high-quality, accessible educational content."

To learn more about the educational training modules and

how to access them, go to the COOP Academy at <https://jcast.fresnostate.edu/ifa/coop/training.html>

About COOP.

COOP was founded in 2023 in response to the growing need to align high-impact educational and research efforts with practical approaches and applications in an ever-evolving industry. Dr. Katy Tarrant leads COOP efforts, which are guided by an advisory committee, expert staff, key stakeholders, and our core values of sustainable bird-first innovation.

Cherkizovo Lab and VNIIPP Team Up to Establish New Poultry Processing Standards for Russia



A cooperation agreement between Cherkizovo Lab, part of the Cherkizovo Group, and the All-Russian Research and Development Institute of Poultry Processing Industry (VNIIPP) aims to create new national poultry processing standards.

During a recent visit to the Cherkizovo Research and Development Laboratory in the Moscow region, VNIIPP Director Vladislav Budrik and Lab Director Sergey Shapovalov signed the agreement.

The collaboration will focus on the development of new poultry processing standards in Russia, as well as the implementation of a technical regulation for the Eurasian Economic Union that addresses the safety of poultry meat and processed products. Future collaborative research and development efforts are expected in many aspects of poultry processing.

Cherkizovo's Lab was established in 2016 at a cost of EUR10 million (US\$10.9 million). It conducts research on a variety of educational and social projects.

More about Cherkizovo Group

Cherkizovo Group ranks among Europe's top ten poultry companies, slaughtering approximately 330 million birds per year. The company's poultry business interests include chicken meat, table eggs, and turkey meat. According to the company's website, it leads the Russian rankings in terms of total meat and animal feed output. It is the nation's second-largest producer of poultry and turkey meat.

Italian Farmers Receive €46.7 Million Assistance from EU Amid Avian Influenza Crisis

The European Commission has allocated €46.7 million in aid to Italian farmers affected by the country's successive avian influenza outbreaks.

According to the European Commission, Italy experienced 23 outbreaks of highly pathogenic avian influenza (H5) in the first few

months of 2022. The affected species included chickens, laying hens, turkeys, ducks, and Guinea fowl.

Italy responded quickly by implementing strict animal health sanitary measures, such as prevention zones around affected premises. This resulted in a decrease in hatching egg, table egg, and live animal production on farms in movement-restricted areas, as well as losses from destroyed and downgraded eggs and meat.

In response to an official request from the Italian government, the European Commission will provide €46,670,790 from the so-called Agricultural Reserve following a positive vote by member states. The amount should cover half of the expenses incurred by the Italian authorities to assist the most affected farmers.

Following EU co-financing rules, the Italian government must provide the remaining 50%. Payments to farmers must be made before September 30 of this year. According to the EU, support can only be provided to farmers in regulated zones in regions affected by bird flu epidemics who have expenses and losses that are not covered by insurance.

Ivy Farm and Fortnum & Mason Unveil World's First Cultivated Meat Scotch Egg

Ivy Farm has partnered with Fortnum & Mason to recreate the brand's scotch egg with cultivated beef mince. Making history, Ivy Farm collaborated with Fortnum & Mason to develop the "world's first"



cultivated meat scotch egg.

Ivy Farm will recreate Fortnum & Mason's famous scotch egg, a savoury treat introduced in 1738. This is a "on-off collaboration," with the lab-grown scotch eggs created exclusively for the panel discussion on the future of meat production in Fortnum & Mason's Food & Drink Studio to highlight the environmental implications of industrial farming.

The scotch eggs were made specifically for the event, and there are no plans to sell them again. Prior to the panel discussion, pre-selected attendees had the opportunity to sample the innovation before hearing from food tech companies and traditional agricultural businesses.

For those curious about the history of the traditional British dish, Fortnum & Mason claims that it was first created in 1738 as a meal for travellers heading west from Piccadilly in London. The brand has stated that it has "adapted the product in response to financial and logistical challenges" such as meat shortages during WWII, as well as adjusting over the years to meet consumers' tastes.

Fortnum & Mason is innovating again by experimenting with cultivated meat, this time looking into ways to reduce the environmental impact of its products in the future.

To create the cultured meat scotch egg, Ivy Farm took a cell sample from a farm-raised animal and

cultivated it in fermentation tanks at its 18,000-square-foot facility in Oxford. Following this, the "meat" was grown and harvested at the company's pilot plant.

Ivy Farm claims that cultivated beef mince has "a healthy nutritional profile and a more sustainable carbon footprint".

McDonald's Achieves 100% Cage-Free Egg Sourcing Goal Ahead of Schedule



In 2015, McDonald's set a 10-year goal of switching to cage-free eggs, which it has now achieved in partnership with Cargill and its egg producers.

McDonald's announced that it had met its goal of sourcing 100% cage-free eggs in the United States two years ahead of schedule. The quick-service restaurant chain established the original 10-year goal in 2015 to improve animal welfare in its supply chain, and has been working towards it ever since, in collaboration with Cargill and its egg producers.

"Our journey to move to sourcing 100% cage-free eggs in the U.S. was a huge undertaking — made uniquely possible by our owner/operators, Cargill and their egg producers, and our supply chain working together as one team," Bob Stewart, senior vice president North America chief

supply chain officer, said in a statement. "I am incredibly proud of what we achieved together and the positive impact we will continue to make on the path towards a more sustainable future."

According to the original 2015 announcement, the goal was to transition to cage-free eggs in both the United States and Canada, but this week's announcement provided no update on the status of the cage-free goal in Canada.

McDonald's stated that as part of its new cage-free commitment, hens will be housed in farms with access to perches, scratch areas and nests, and each farm will have a staff veterinarian who will attend to the chickens to ensure they receive the best possible care. Animal welfare experts and academics assisted in renovating farms and implementing new technology to ensure the chickens' welfare.

McDonald's was one of many restaurant chains to make this commitment in the 2010s, joining Burger King in 2012, Taco Bell and Dunkin' Donuts in 2015, and Denny's in 2016. While Burger King has not yet met its goal in the United States, Restaurant Brands International has pledged to be completely cage-free (for both chickens and pigs) by 2030. Taco Bell began sourcing all cage-free eggs in the United States in 2016, while Dunkin' Donuts has yet to meet its 10-year goal of becoming cage-free by 2025. Denny's has yet to meet its 10-year goal of becoming cage-free by 2026.

Zivo Bioscience's Poultry Feed Product May Enhance Broiler

Production Efficiency



Zivo Bioscience, Inc., a biotech/agtech company that specialises in algal-based product candidates, has released new results from a 42-day study that show its poultry feed product may improve broiler production efficiency. The study suggests that Zivo's product can reduce coccidiosis-induced intestinal damage in chickens, potentially providing an alternative to traditional antibiotics.

Coccidiosis, a disease caused by the *Eimeria* parasite, is a major economic burden for the poultry industry, with annual costs ranging from \$10 billion to \$17 billion. Current treatments are largely based on antibiotics or ionophores, with no significant new technologies introduced in the last 60 years.

Zivo's product candidate has been shown to not only reduce intestinal damage but also improve feed conversion ratios (FCR), an important profitability metric for poultry farms. The company's findings show that their product has a statistically significant effect on FCR when compared to untreated controls and is comparable to the market-leading commercial ionophore.

John Payne, Zivo Bioscience's Chairman and CEO, expressed confidence in the product's ability to transform the poultry industry by

improving outcomes and providing cost-effective solutions. The company expects that these findings will lead to more discussions with potential partners in agriculture and animal health sectors.

Zivo Bioscience specialises in therapeutic, medicinal, and nutritional products derived from proprietary algal cultures. Its intellectual property portfolio consists of strains, biologically active molecules, production and cultivation techniques, and patented inventions for human and animal health applications.

CP Foods Implements Innovative Compartment Scheme to Safeguard Poultry Production

Charoen Pokphand Foods Public Company Limited (CP Foods), Thailand's leading agro-industrial and food conglomerate, has actively implemented the Compartment scheme to protect its poultry production. This novel strategy ensures that CP Foods' poultry operations are free of avian influenza (AI) and Newcastle disease (ND), two major diseases endangering global poultry health.

This initiative demonstrates CP Foods' commitment to food safety and public health by ensuring that its poultry products are free of AI and ND. The company's efforts not only speed up the control and eradication of these viruses, but also emphasise the importance of food safety for both raw and cooked products.

Dr. Nion Boonprasert, DVM, Head of Avian Veterinary Service & Animal Health Diagnostic Centre at CP Foods, emphasises the company's unwavering commitment to food quality and safety throughout the supply chain. This commitment is backed up by extensive disease prevention and monitoring strategies, ranging from selecting safe raw materials for animal feed to comprehensive management of poultry farms, including breeders, hatcheries, broilers, and processing facilities, to ensure contamination-free poultry production.

CP Foods has adopted Space Safety Regulations and Standards, which aligns with NASA's food safety protocols for astronauts and demonstrates the safety and chemical-free quality of their chicken meat. This demonstrates CP Foods' innovation and leadership in sustainable food production.

The Compartment system provides proactive defence by ensuring a closed-farm environment with strict biosafety and disease surveillance standards. It includes measures to reduce avian influenza risks as well as ongoing health monitoring by veterinary specialists, which ensures both animal and consumer health through regular pathogen testing for bird flu, salmonella, and the Newcastle virus.

CP Foods' comprehensive implementation of the compartment system across its poultry farms raises Thai poultry standards by promoting knowledge transfer, contract farming, and standardised disease prevention measures. This not only increases farm yields and income stability for farmers, but it also strengthens the Thai poultry industry and economy's resilience to poultry-related outbreaks.

The compartment system's disease control strategy is built on four pillars: strict biosecurity measures, proactive bird flu surveillance, specific disease control within farms and surrounding areas, and a traceability system to monitor the food supply chain.

Furthermore, CP Foods uses advanced closed-house facilities with an evaporative cooling system, as well as AI and IoT to monitor animal health around the clock. This strategy significantly reduces disease risk by minimising human contact.

Dr. Ni-on advises consumers on safety and hygiene practices, such as avoiding sick or dying poultry for cooking, choosing certified food sources, cooking at temperatures above 70 degrees Celsius, and using separate kitchen tools for raw and cooked foods. Farm workers are also encouraged to avoid sick poultry and thoroughly wash their hands after contact.

Biotech Company Axitan UK Ltd. Appoints AI Zimmerman as New CEO

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otech company specializing in developing endolysin enzyme products as alternatives to antibiotics in animal feed, has appointed AI Zimmerman as its new CEO. Zimmerman, with a background in biotech and animal feed additives, will bring his expertise to lead Axitan's commercialization efforts. The company's founder, Kane Miller, will transition to the role of chief innovation officer to focus on expanding the technology platform and related products.

Zimmerman's experience includes working at Novus International and DuPont, where he led innovation, business development, and strategic growth initiatives in the animal feed and dietary supplement sectors. He expressed excitement about joining Axitan and collaborating with the team to advance the endolysin platform and drive commercial development, leveraging the company's early success in the livestock industry.

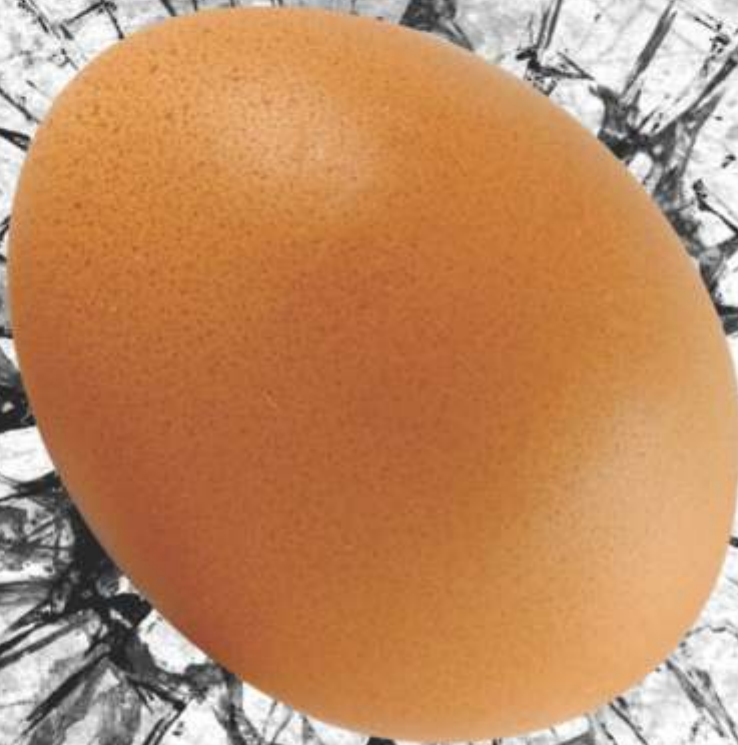
Axitan's innovative approach involves incorporating endolysins into animal feed to target and eliminate pathogens traditionally controlled by antibiotics. The company converts endolysins into nutrient-rich products that offer performance benefits to livestock farmers while mitigating pathogens. Axitan has demonstrated the ability to express endolysins in microalgae and is working on delivering solutions for both gram-negative and gram-positive pathogens. The company aims to create solution stacks for monogastric and aqua markets and expand its platform to other species.

Overall, Axitan is focused on leveraging its expertise in endolysin technology to provide sustainable and effective solutions for animal health and nutrition, with Zimmerman's leadership expected to drive the company's commercial success in this innovative field.

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Editorial Calendar 2024

Publishing Month: January Article Deadline : 28th, Dec. 2023 Advertising Deadline : 30th, Dec. 2023 Focus : Opportunities and Challenges	Publishing Month: February Article Deadline : 28th, Jan. 2024 Advertising Deadline : 30th, Jan. 2024 Focus : Budget	Publishing Month: March Article Deadline : 26th, Feb. 2024 Advertising Deadline : 28th, Feb. 2024 Focus : Disease Prevention	Publishing Month: April Article Deadline : 28th, March 2024 Advertising Deadline : 30th, March 2024 Focus : Summer Stress Management
Publishing Month: May Article Deadline : 28th, April 2024 Advertising Deadline : 30th, April 2024 Focus : Cold Chain	Publishing Month: June Article Deadline : 28th, May 2024 Advertising Deadline : 30th, May 2024 Focus : Nutrition	Publishing Month: July Article Deadline : 28th, June 2024 Advertising Deadline : 30th, June 2024 Focus : Biosecurity	Publishing Month: August Article Deadline : 28th, July 2024 Advertising Deadline : 30th, July 2024 Focus : Sustainability
Publishing Month: September Article Deadline : 28th, August 2024 Advertising Deadline : 30th, August 2024 Focus : Egg Production & Processing	Publishing Month: October Article Deadline : 28th, September 2024 Advertising Deadline : 30th, September 2024 Focus : Processing & Packaging	Publishing Month: November Article Deadline : 28th, October 2024 Advertising Deadline : 30th, October 2024 Focus : Winter Stress	Publishing Month: December Article Deadline : 28th, November 2024 Advertising Deadline : 30th, November 2024 Focus : Food Safety

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ASTICON - SDS[®]

FOR EFFECTIVE CONTROL OF ASCITES
AND SUDDEN DEATH SYNDROME

BIOSINT[®]
NUTRITIONAL INNOVATIONS



KEY BENEFITS

ASTICON-SDS helps in

- Effectively controls the accumulation of fluid in the abdominal cavity
- Improving the cell health and energy function;
- Acts as a free-radical scavenger and cellular antioxidant
- Effectively controls SUDDEN DEATH SYNDROME
- Assists in promoting general health and well being.

MODE OF ACTION

ASTICON-SDS serves as an important antioxidant to protect biological membranes against peroxidative damage in tissues and sub-cellular fractions, improves the bird's cardiac muscle function significantly and acts as a trigger to activate energy liberation in deteriorating mitochondria, thereby reverse the fluid accumulation in the abdomen.

COMPOSITION

Alpha Lipoic Acid, Resveratrol, Mecobalamine, Folic Acid and Betaine Anhydrous.

INCLUSION LEVELS

1g/25 birds and 400g/MT of feed.

PRESENTATION

5Kg and 25Kg poly-coated paper bags

SHELF LIFE

3 years from the date of manufacture

BIOSINT[®]
NUTRITIONAL INNOVATIONS

For Further Details

BIOSINT NUTRACEUTICALS,

Factory : 19, Polupalli SIDCO Industrial Estate, Pillanakuppam PO, Polupalli Village, Krishnagiri - Hosur Highway, Krishnagiri - 635 115. TN, INDIA.

Corporate Office : 37, Krishna Nagar, KK Pudur 4th St, Coimbatore - 641 038.

Telefax : +91- 422 - 2430275, Mobile : 094435 17258

e-mail : info@biosintnutraceuticals.com, www.biosintnutraceuticals.com

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Feeder with Cone Extension and Grill



Jambo Male Parent



Male Parent



Jambo Feeder with Cone Extension



Female Parent Feeder



Male Parent Feeder



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Pan Feeding



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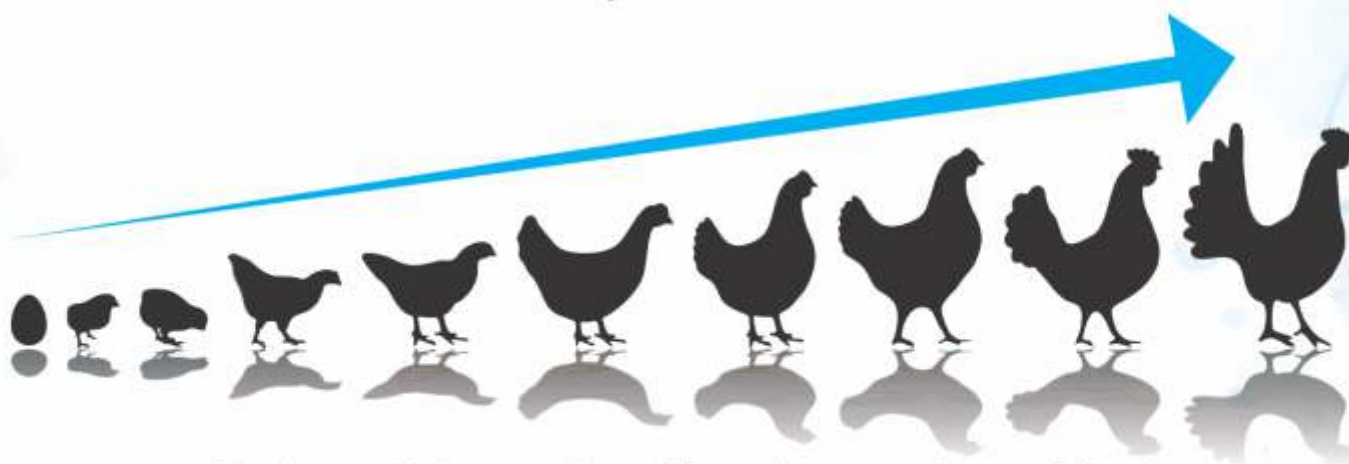
GUPTA AGRO INDUSTRIES

Gupta Agro Industries Gali No. 1 Anand Vihar under
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GROWLINE

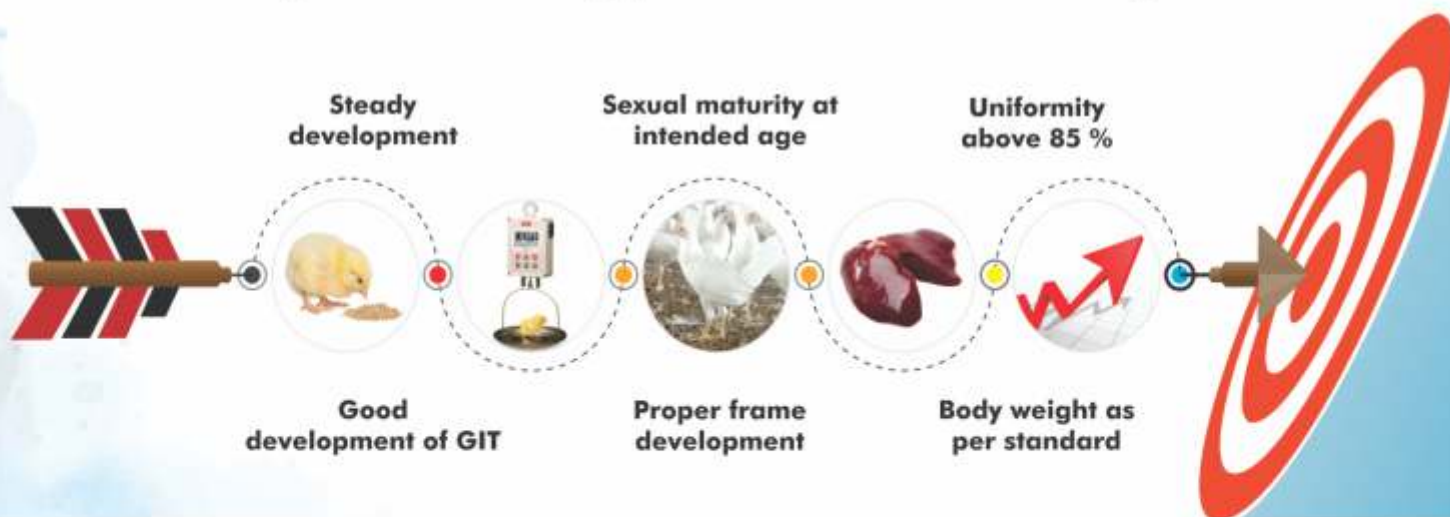
To achieve the growing period targets in commercial layers...

Growing phase in layers determines the productive efficiency of the birds...



Body weight and uniformity are the critical factors for better performance

Targets in Growing phase of commercial layers -



For further information please contact :

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