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From the Editor's Desk

From Farm to Fork: Ensuring Food Safety in the Poultry Industry

The poultry industry faces a critical challenge in ensuring food safety. From the farm to the consumer's table, a multitude of factors can compromise the safety of poultry products. Bacterial contamination, primarily from Salmonella and Campylobacter, poses a significant threat. These pathogens can persist throughout the production chain, from farm to fork, due to factors like inadequate on-farm biosecurity, improper handling during slaughter and processing, and lapses in the cold chain during transportation and distribution.

The overuse of antibiotics in poultry production exacerbates this challenge. The emergence of antibiotic-resistant bacteria poses a serious public health threat, making infections difficult to treat. This necessitates a shift towards responsible antibiotic use, prioritizing disease prevention through improved husbandry practices, vaccination programs, and the development of alternative strategies to control infections.

Moreover, the industry must address the risk of zoonotic diseases, such as avian influenza. Implementing robust biosecurity measures on farms, including strict access control, disinfection protocols, and surveillance programs, is crucial to prevent the spread of these diseases.

Ensuring food safety requires a multi-pronged approach. This includes implementing robust biosecurity measures, minimizing antibiotic use, and prioritizing disease prevention through improved husbandry practices, such as optimizing flock management and enhancing feed hygiene.

Enhancing sanitation and hygiene protocols throughout the processing chain, maintaining the cold chain, and implementing Hazard Analysis and Critical Control Point (HACCP) systems to identify and control critical points where contamination is most likely to occur. Raising consumer awareness about safe food handling practices, including proper cooking temperatures, thorough handwashing, and avoiding cross-contamination.

Utilizing advanced technologies, such as rapid diagnostic tests, biosensors, and blockchain technology, to enhance traceability and improve food safety monitoring. Fostering strong collaboration among farmers, processors, regulators, and consumers to ensure a coordinated and effective approach to food safety.

By addressing these challenges through a combination of improved practices, technological advancements, and collaborative efforts, the poultry industry can ensure the production of safe and wholesome products for consumers worldwide.

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- Unpublished material of industrial interest, not submitted elsewhere, is invited.
- The submitted material will not be returned.
- Publisher, Printer Mr. Vishal Rai Gupta on behalf of Pixie Publication. Printed at Jaiswal Printing Press, Chaura Bazar, Karnal-132001 (Haryana).
- Published at : Anand Vihar, near gogripur railway crossing, hansi road, karnal-132001 (Haryana)
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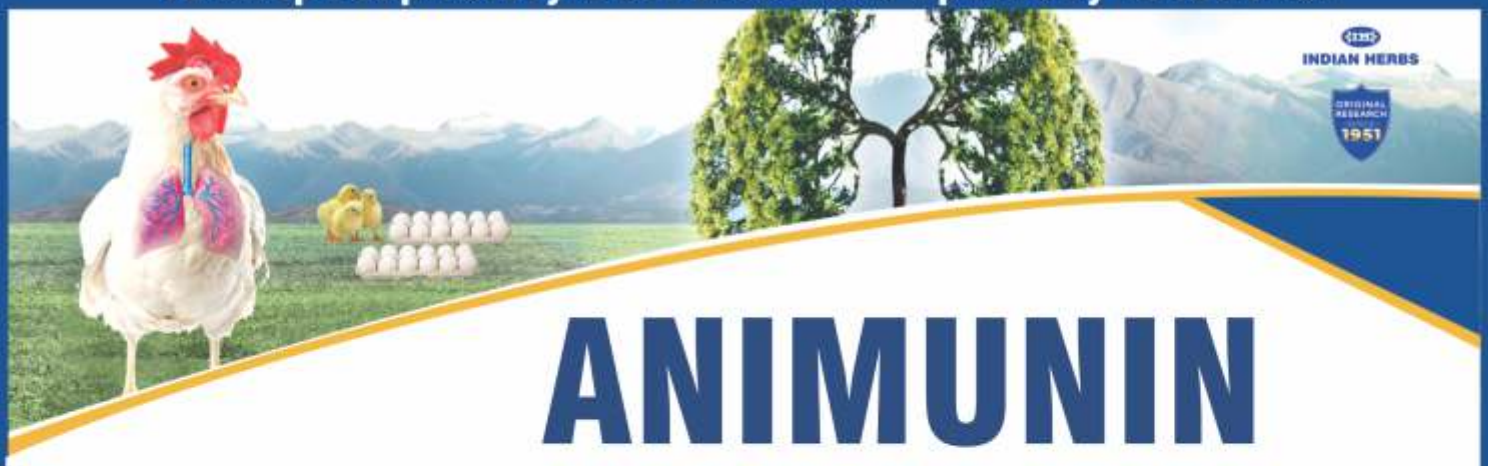

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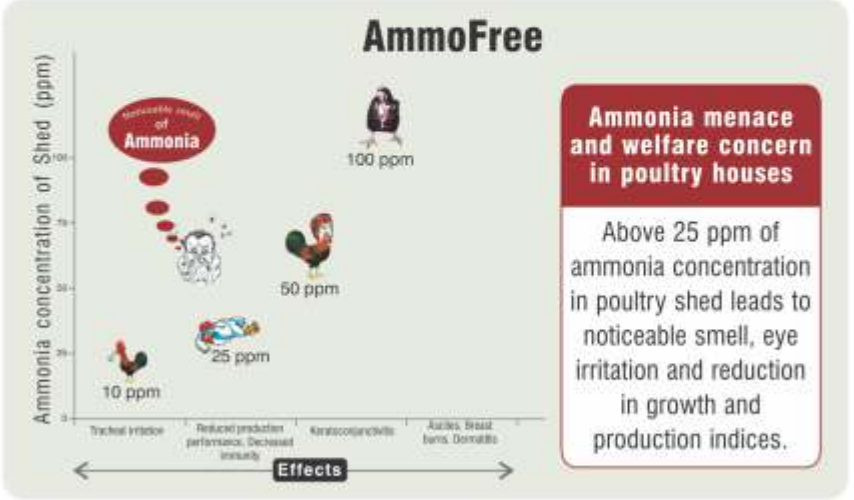

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A Deep Dive into Food Safety in the Poultry Industry

Siddhi Gupta, Parth Rai Gupta
Co-Editor

The poultry industry serves as a cornerstone of global food production, providing a vital source of protein for billions. However, ensuring the safety of poultry products is paramount to safeguarding public health. From the farm to the consumer's table, a multitude of factors can compromise food safety, necessitating a comprehensive and vigilant approach.

Key Food Safety Challenges in Poultry Production

- **Bacterial Contamination:**
  - **Salmonella:** A leading cause of foodborne illness, Salmonella can contaminate poultry at various stages, from the farm to processing. Symptoms include diarrhea, fever, and abdominal cramps.
  - **Campylobacter:** Another major concern, Campylobacter is a common cause of bacterial diarrhea. It can survive and even multiply at refrigeration temperatures, making it particularly challenging to control.
  - **E. coli:** While less prevalent in poultry compared to other meats, certain strains of E. coli, such as E. coli O157:H7, can cause severe illness, including kidney failure, especially in children and the elderly.
- **Antimicrobial Resistance:** The overuse of antibiotics in poultry production can contribute to the emergence of antibiotic-resistant bacteria. These resistant strains pose a significant threat to human health, as infections caused by them are difficult to treat.
- **Biosecurity:** Inadequate biosecurity measures on poultry farms can facilitate the spread of infectious diseases, including highly pathogenic avian influenza (HPAI). HPAI outbreaks can have devastating consequences for the poultry industry and pose a potential zoonotic risk.
- **Improper Handling and Processing:** Contamination can occur at various points throughout the poultry production chain. This includes:
  - **On-farm practices:** Poor hygiene, inadequate sanitation, and contaminated feed or water can introduce pathogens.

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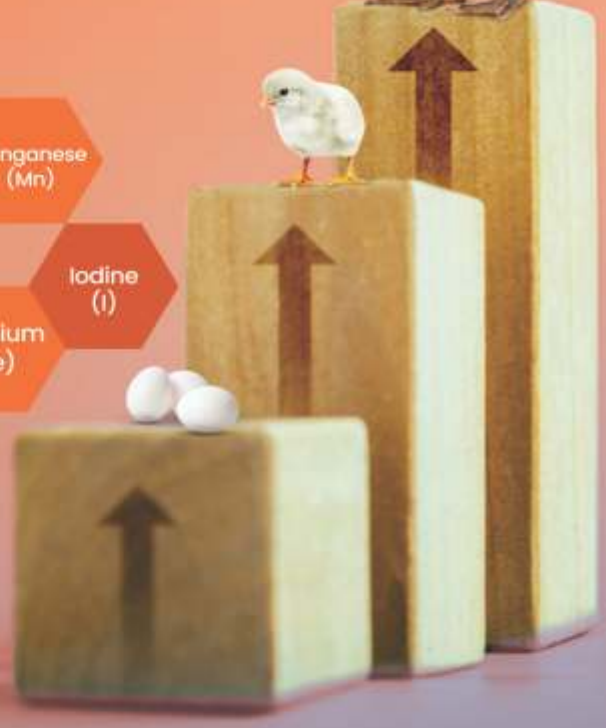

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- **Slaughter and processing:** Cross-contamination, improper chilling, and inadequate sanitation in processing plants can lead to bacterial growth.
- **Transportation and distribution:** Temperature fluctuations during transportation and storage can promote bacterial growth.
- **Retail and consumer handling:** Improper handling and preparation of poultry in homes and restaurants can also lead to contamination.

Strategies for Enhancing Food Safety

- **On-Farm Practices:**
  - **Enhanced Biosecurity:** Implementing strict biosecurity measures, such as controlled access, disinfection protocols, and rodent control, to prevent the introduction and spread of diseases.
  - **Vaccination Programs:** Utilizing effective vaccination programs to protect flocks from common poultry diseases.
  - **Responsible Antibiotic Use:** Minimizing the use of antibiotics in poultry production and prioritizing disease prevention through improved husbandry practices.
  - **Feed Safety:** Ensuring the safety and quality of feed to prevent the introduction of contaminants.
- **Processing and Handling:**
  - **Hazard Analysis and Critical Control Points (HACCP):** Implementing HACCP systems to identify and control critical points in the production process where contamination is most likely to occur.
  - **Sanitation and Hygiene:** Maintaining rigorous sanitation and hygiene protocols throughout the processing chain, including thorough cleaning and disinfection of equipment and surfaces.

- **Temperature Control:** Maintaining proper cold chain temperatures throughout the entire supply chain to prevent bacterial growth.
- **Improved Processing Techniques:** Utilizing advanced processing technologies, such as pasteurization and irradiation, to reduce microbial contamination.

- Consumer Education:
  - Raising consumer awareness about safe food handling practices, including proper cooking temperatures, thorough handwashing, and avoiding cross-contamination.
  - Providing clear and concise food safety information on product labels.

The Role of Collaboration and Innovation

Ensuring food safety in the poultry industry requires a collaborative effort involving producers, processors, regulators, and consumers. Continuous research, innovation, and the implementation of robust food safety management systems are crucial to mitigate risks and protect public health.

The Importance of Traceability

Traceability systems play a critical role in food safety by enabling the rapid identification and withdrawal of contaminated products from the market. By tracking the movement of poultry products throughout the supply chain, from farm to fork, authorities can quickly pinpoint the source of contamination and take corrective action.

Emerging Technologies

Advancements in technology are offering new tools to enhance food safety in the poultry industry. These include:

- **Rapid Diagnostic Tests:** These tests allow for the quick detection of pathogens, enabling faster response times to potential outbreaks.
- **Biosensors:** These devices can detect the presence of pathogens in real-time, allowing for immediate intervention and prevention of contamination.
- **Blockchain Technology:** Blockchain can be used to create an immutable record of the entire supply chain, enhancing transparency and traceability.

The Role of Government Regulation

Governments play a crucial role in ensuring food safety through the establishment and enforcement of regulations. These regulations cover various aspects of the poultry industry, including:

- **On-farm practices:** Standards for animal husbandry, biosecurity, and antibiotic use.
- **Processing and handling:** Sanitation standards, HACCP implementation, and inspection procedures.
- **Labeling and marketing:** Requirements for accurate and informative labeling of poultry products.

Consumer Awareness and Responsibility

Consumers also play a vital role in ensuring food safety. By practicing safe food handling habits, such as proper cooking and refrigeration, consumers can significantly reduce their risk of foodborne illness.

Conclusion

Ensuring food safety in the poultry industry is a multifaceted challenge that requires a collaborative and multidisciplinary approach. By implementing robust food safety measures throughout the entire production chain, from farm to fork, we can minimize the risk of foodborne illness and protect public health. Continuous research, innovation, and the commitment of all stakeholders are essential to achieving a safe and sustainable poultry industry.

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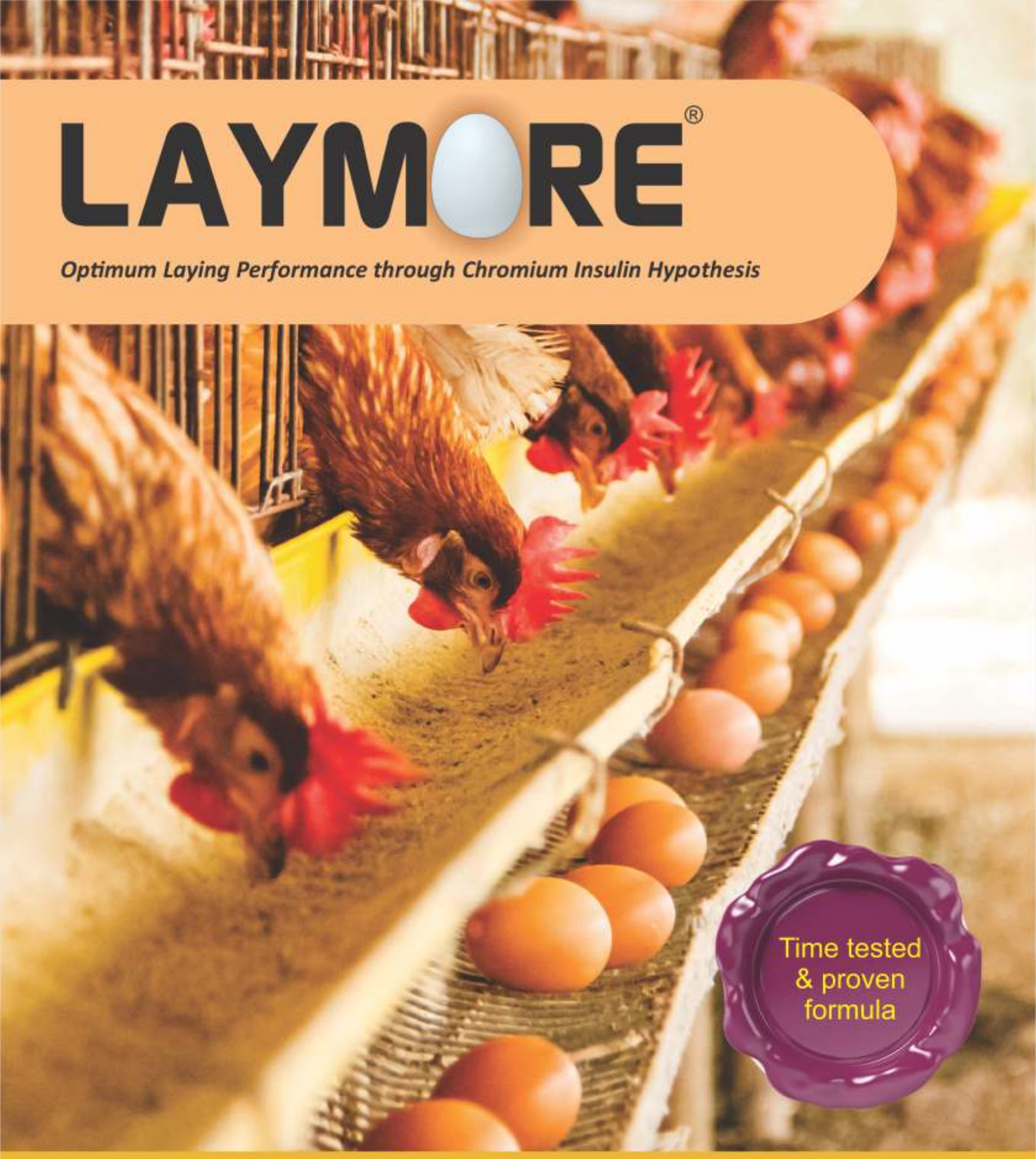

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Revolutionizing Poultry Farming in Rajasthan: The Promise and Challenges of Artificial Insemination

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Artificial insemination (AI) in poultry has emerged as a powerful tool to enhance productivity and genetic improvement in the sector. Rajasthan, with its unique agro-climatic conditions, presents both opportunities and challenges for the adoption of AI in poultry. This article explores the significance of AI, its current status in Rajasthan, the benefits it offers, the hurdles it faces, and strategies for overcoming them.

Introduction to Artificial Insemination in Poultry

Artificial insemination is a reproductive technology that involves the collection of semen from males and its manual deposition into the reproductive tract of females. In poultry, particularly in commercial broilers, layers, and exotic breeds, AI enables better control over breeding programs, ensuring optimal utilization of superior genetics and improving fertility rates. AI is widely practiced in species like turkeys, where natural mating is inefficient due to body size differences between males and females. For chickens, AI is gaining momentum as it allows better genetic dissemination, disease control, and higher productivity.

Opportunities for AI in Poultry in Rajasthan

Rajasthan offers a promising landscape for implementing AI in poultry, owing to several factors:

1. Growing Poultry Industry

The poultry sector in Rajasthan is expanding, with increasing demand for eggs and poultry meat due to rising awareness about their nutritional value. The National Egg Coordination Committee (NECC) reports consistent growth in poultry production in the state. AI can help meet the demand by improving reproductive efficiency.

2. Indigenous and Exotic Breeds

Rajasthan is home to several indigenous breeds like Aseel, known for their hardiness and adaptability. Integrating AI with improved exotic breeds can enhance productivity while preserving the genetic diversity of local breeds.

3. **Controlled Breeding Programs**

   AI allows poultry breeders to implement controlled breeding programs aimed at specific traits such as faster growth, disease resistance, and higher egg production. This is particularly useful in the arid zones of Rajasthan, where resources like water and feed are scarce.

4. **Disease Control**

   Natural mating increases the risk of transmitting diseases, which is a significant challenge in densely populated poultry farms. AI reduces this risk by eliminating direct contact between birds, thus enhancing biosecurity.

5. **Climate-Adapted Breeding**

   The extreme temperatures in Rajasthan can affect the fertility and productivity of poultry. AI enables the use of semen from birds adapted to such climatic conditions, ensuring better survival and performance.

Challenges in Implementing AI in Poultry in Rajasthan

While the potential benefits are evident, several challenges hinder the widespread adoption of AI in poultry in Rajasthan:

1. **Lack of Awareness and Expertise**

   Many poultry farmers in Rajasthan are unaware of AI technology or lack the technical skills required to implement it. Training programs are limited, and there is a need for specialized personnel to conduct AI procedures.

2. **Infrastructure Limitations**

   AI requires infrastructure for semen collection, storage, and insemination, which can be costly and unavailable in rural areas. Rajasthan, with its vast rural landscape, faces significant logistical challenges in setting up and maintaining this infrastructure.

3. **Economic Constraints**

   Small and marginal

poultry farmers, who form a significant part of Rajasthan's poultry sector, may find the initial investment in AI technology prohibitive. Subsidies and government support are essential to make AI accessible to these farmers.

4. **Heat Stress on Semen Quality**

   Rajasthan's high temperatures can negatively impact the quality of semen used for AI. Proper storage facilities and cooling mechanisms are crucial but often lacking in remote areas.

5. **Cultural Barriers**

   Traditional practices in rural Rajasthan often resist modern technologies. Educating farmers and gaining their trust to adopt AI in poultry breeding requires sustained efforts.

6. **Regulatory and Ethical Concerns**

   The lack of clear regulations and ethical guidelines for AI in poultry breeding poses challenges in ensuring the responsible use of the technology.

Case Studies and Success Stories

Several initiatives in India and globally highlight the potential of AI in poultry:

- **Tamil Nadu's Poultry AI Program:** Tamil Nadu has successfully implemented AI in turkey farming, leading to improved fertility and productivity. Rajasthan can learn from such models.
- **International Examples:** Countries like the USA and Brazil have demonstrated significant success in using AI to boost poultry production. The technology has helped improve biosecurity and genetic diversity.

Steps to Overcome Challenges

To ensure the successful adoption of AI in poultry in Rajasthan, the following measures are recommended:

1. **Training and Capacity Building**

   Organize workshops and training programs for farmers, veterinarians, and technical staff to enhance their knowledge and skills in AI. Government and private institutions should collaborate to develop training modules.

2. **Strengthening Infrastructure**

   Invest in the establishment of AI centers equipped with state-of-the-art semen collection, storage, and insemination facilities. Mobile AI units can also be introduced to serve remote areas.

3. **Financial Support**

   Provide subsidies, low-interest loans, and financial incentives to small-scale poultry farmers to adopt AI. Public-private partnerships can play a significant role in funding these initiatives.

4. **Research and Development**

   Encourage research on breed-specific AI protocols, semen preservation techniques, and heat-resilient genetics suitable for Rajasthan's climatic conditions.

5. **Awareness Campaigns**

   Conduct mass awareness campaigns to educate farmers about the benefits of AI, including its economic viability, improved productivity, and disease control.

6. **Policy and Regulation**

   Develop clear policies and guidelines to regulate the use of AI in poultry, ensuring ethical practices

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Activity: 5000 FTU/g (min)
Dosage: 100g per ton of feed

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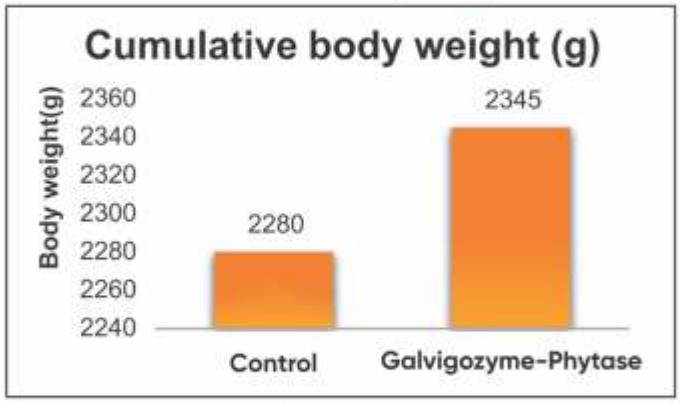
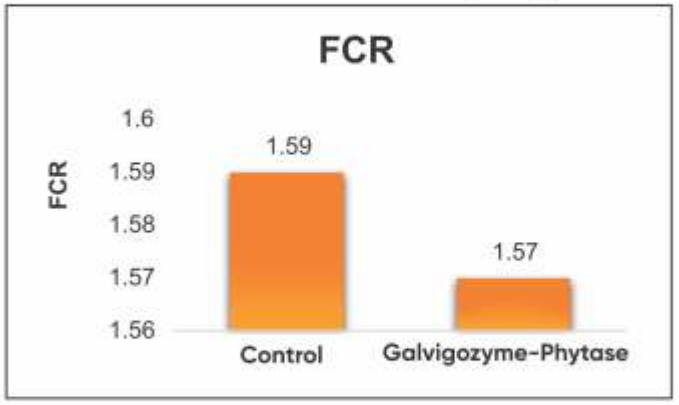


Feed Conversion Ratio (FCR):



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and standardization across the state.

Future Prospects of AI in Rajasthan's Poultry Sector

The integration of AI into Rajasthan's poultry industry has the potential to revolutionize the sector. By addressing challenges and leveraging opportunities, Rajasthan can become a leader in sustainable and efficient poultry production. AI can contribute significantly to food security, rural livelihoods, and economic growth in the state.

Conclusion

Artificial insemination in poultry presents a game-changing opportunity for Rajasthan. While challenges like infrastructure, awareness, and cultural barriers exist, targeted interventions can overcome these hurdles. With proper planning, investment, and collaboration among stakeholders, AI can unlock the full potential of the poultry industry, making Rajasthan a model state for technological advancements in animal husbandry.

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Probiotics as an alternative for antibiotics in broiler nutrition

Veerle Hautekiet & Stefaan Bekaet, Huvepharma, Belgium

In order to guarantee the sustainable long-term availability of therapeutics, the use of antibiotics is restricted in animal feed, leading feed manufacturers to search for alternatives to enhance their product quality.

Probiotics are defined as 'live microorganisms that, when administered in adequate amounts, confer a health benefit to the host'. The use of probiotics to improve gastrointestinal health and to prevent various infections has been investigated for many years.

Although their mode of action is not always completely understood, it has been demonstrated that the use of probiotics has several health benefits such as:

- Balancing the microbial gut flora via competitive exclusion.
- Preventing infections with pathogens via secretion of antimicrobial substances, enhancement of the intestinal barrier and immunomodulation.
- Protecting protein and lipids from oxidative destruction. Clearly, these properties make probiotics a willing alternative for antibiotics.

Currently, various strains of probiotics are available for use as feed additives. When selecting a probiotic, one has to take into account the fact that strains of the same probiotic species, and therefore their activity, can be different due to genetic variations. These characteristics make choosing the right probiotic for each specific situation quite challenging.

SPORE FORMING BACTERIA

Dysbacteriosis is characterised by intestinal inflammation and shortening of the small intestinal villi, resulting in clinical signs and/or a reduction of production parameters.

Currently, the list of micro-organisms used in the prevention of dysbacteriosis is varied and long. However, not all are as effective as initially anticipated.

The key characteristics of probiotics used or this purpose in particular, and in the feed industry in general, include:

- Heat-resistant during the feed pelleting process.
- Stable during the digestive process. This was not the case for the first generation of probiotics such as certain lactobacilli.

However, second generation probiotics, such as Bacillus licheniformis are incorporated in the feed as spores which makes them an interesting candidate for dysbacteriosis prevention.

UNIQUE FEED ADDITIVE

B-Act is a probiotic feed additive containing viable spores of a unique strain of Bacillus licheniformis producing bacteriocins: peptides with inhibitory effects on specific bacteria.

B-Act has a proven suppressing effect on dysbacteriosis in broilers by stabilising the gut flora, reducing gut damage and thus increasing the length of the small intestinal villi.

In a trial carried out in 50 birds, supplementation of $1.6^{*}10^{12}$ cfu Bacillus licheniformis/mton of feed from start to finish, resulted in a lower dysbacteriosis score compared to the control group not receiving B-Act (Table 1).

	Control	B-Act
Day 24	1.24	0.57
Day 31	1.13	0.48

Table 1. Dysbacteriosis score in commercial broilers on day 24 and 31.

Furthermore, B-Act inhibits the growth of Clostridum perfringens, the direct casual agent of necrotic enteritis.

This was demonstrated in a trial carried out in 400 coccidiosis vaccinated birds, which were challenged with 10^{8}cfu/bird of Clostridum perfringens at day 181 20 & 21.

Results indicated a significantly lower necrotic score in B-Act supplemented birds (dosage $1.6^{*}10^{12}$cfu Bacillus licheniformis/mton of feed) compared to the control group.

	Control	B-Act
Average weight (kg)	0.71[a]	1.01[b]
Feed conversion ratio	1.529[a]	1.413[b]
Mortality (%)	14.00[a]	4.00[b]
Average necrotic enteritis lesion score	0.45[a]	0.22[b]

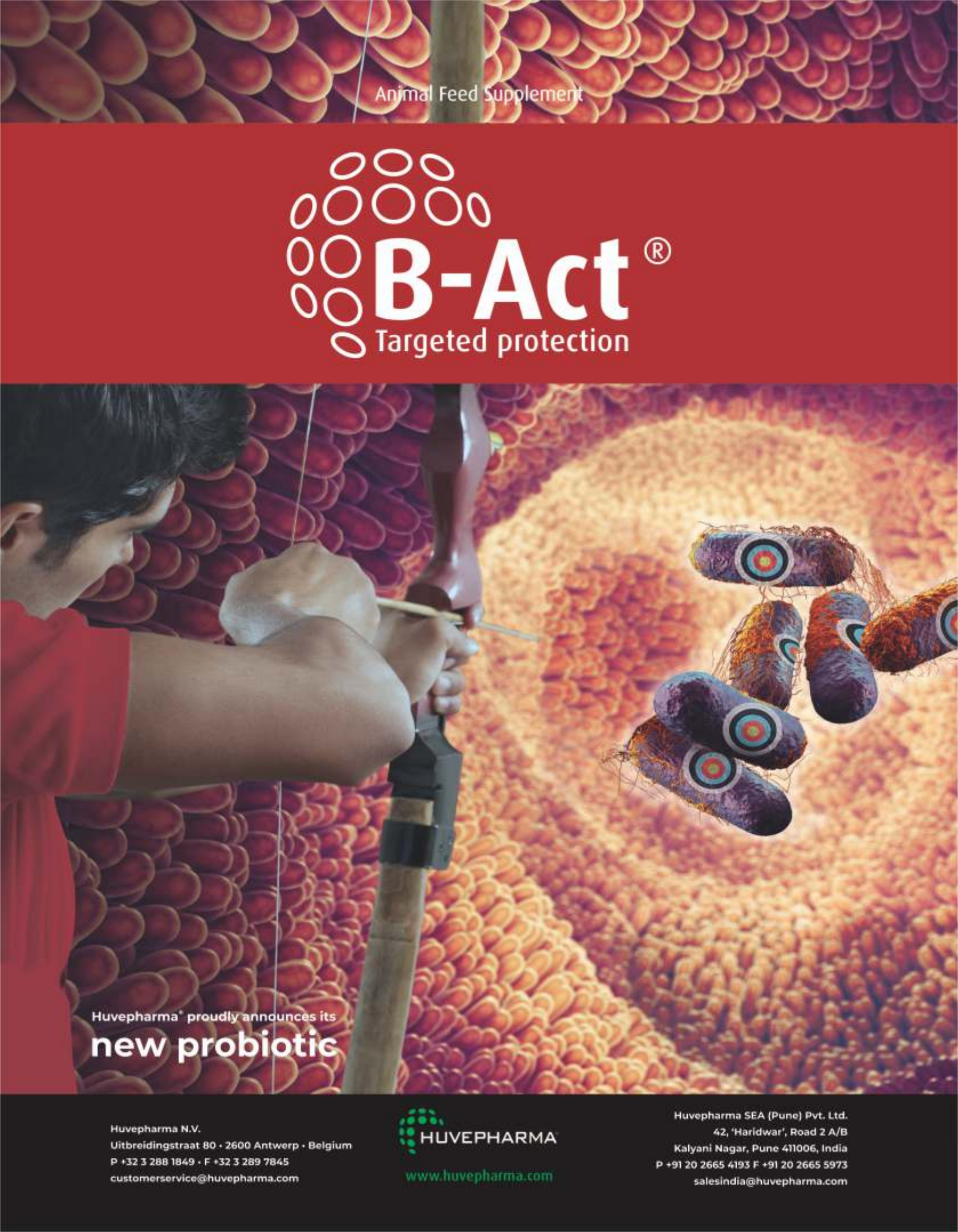

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Table 2. Average weight (kg), feed conversion ratio, mortality (%) and average necrotic enteritis lesion score in the control and B-Act group on day 22 (^{a,b} values with different superscripts within a row differ significantly, p<0.05).

Additionally, in this trial, mortality was significantly reduced in the probiotic group. Being able to influence necrotic enteritis in a positive way, supplementation of B-Act also resulted in an improved average weight and feed conversion ratio (Table 2). Besides the positive effects on dysbacteriosis and necrotic enteritis, B-Act has also been proven to reduce the percentage of lameness in bacterial chondronecrosis with osteomyelitis (BCO – Fig. 1).

In a trial, conducted in 308 broilers, feed supplementation with B-Act at $1.6^{*}10^{12}$ cfu Bacillus licheniformis/mton of feed from start to finish, resulted in a relative decrease of 66% lame birds (Fig. 1).

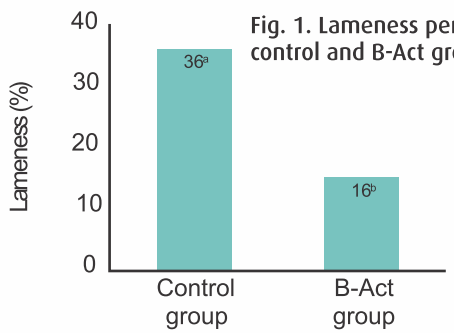

Fig. 1. Lameness percentage of control and B-Act group at day 53.

AVIAN HEALTH & PERFORMANCE PLATFORM

Evaluating all of this scientific data in daily operations is not always quick and simple. To help overcome this problem, Huvepharma has created the Avian Performance Platform, or Aviapp. The Aviapp platform allows the comparison of 47 health parameters with performance data and the benchmarking of data with other users on the platform in a specific region, country or at a global level.

Lame birds in commercial broiler production.

By using Aviapp, we evaluated the aforementioned scientific findings with data from the field. An anonymous Dataset from Aviapp, containing 4042 individual birds' data from across the UK, was selected and the association between dysbacteriosis (gut health) and femoral head necrosis (lameness) was investigated.

The results confirm the trial results and show a positive correlation between a femoral head necrosis score and the dysbacteriosis score. However, no dose-response effect of increasing dysbacteriosis everity is observed (Table 3).

Globally, Aviapp demonstrates the positive effect of B-Act use on gut health via the dysbacteriosis follow up.

Globally, Aviapp demonstrates the positive effect of B-Act use on gut health via the dysbacteriosis follow up.

Conclusion

In summary, there is strong evidence in literature and also from commercial trials, that probiotics such as B-Act boost performance and help control pathogenic bacteria, and so various diseases, in animal nutrition. These findings are also confirmed when analysing large datasets from the Aviapp platform, which is a very effective tool to follow up on health parameters and

Table 3. Contingency table with odds ratio and 95% confidence intervals, showing association between dysbacteriosis class and femoral head necrosis class.

	Femoral head necrosis class (No. of birds)		Odds ratio (95% confidence interva	P-value
Dysbacteriosis class	0	1		
0	2253 (99.6%)	9 (0.4 %)	1.00	Na
1	599 (91.5%)	56 (8.5%)	23.40 (11.51-47.58)	<0.001
2	975 (91.3%)	93 (8.7%)	23.88 (12.00-47.53)	<0.001
3	54 (94.7%)	3 (5.3%)	13.91 (3.66-52.81)	<0.001
Total birds	3881	161		

Data for femoral head necrosis is regrouped: Class 0, no femoral head necrosis and class 1, birds with positive femoral head necrosis scores were created. Dysbacteriosis scores were grouped into 4 classes, with severity increasing from no dysbacteriosis to the most severe: Class 0: scores of 0; Class 1: scores of 1 and 2; Class 2: scores of 3, 4 and 5; Class 3: scores of 6 and 7; Class 4: scores of 8, 9 and 10. No birds were found to have a score of 8, 9 or 10 therefore class 4 contained no entries.

UT-VENBIOL GOLD

MICROBIOLOGICAL FEED INGREDIENT

Bacillus subtilis DSM 32540 and
Bacillus amyloliquefaciens CECT 5940

Striving for immunized GUT, Healthy Digestion

EXCELLENT PERFORMANCE

Optimizes gut health

Prevents diseases

Enhance performance

Benefits

01 Improve gut health by supporting growth of gut friendly bacteria

02 Improve feed efficiency and Performance of the bird

03 Induces resistance to environmental transition stress impact on gut health

04 Replacement of AGP free feed production along with disease prevention

05 Higher and faster return on investment

06 The best immuno modulator and enrich appetite of bird

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

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

Dosage

UT VENBIOL GOLD
500gm/ metric ton
of feed

Composition

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

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Advances in Nutrigenomics for Sustainable Poultry Production

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Nutrigenomics is the scientific exploration of how nutrition affects an animal's genome. In this context, nutrients act as dietary signals that are detected by cellular sensors. These sensors, in turn, impact the expression of genes and proteins. Therefore, the patterns of gene expression, protein expression, and metabolite production in response to specific nutrients can be considered as "dietary signatures." Nutrigenomics aims to investigate these dietary signatures in particular cells, tissues, and organisms to gain insights into how nutrition impacts the maintenance of homeostasis., leading to changes in metabolite production. The interaction between an organism and its diet is a close and intricate physiological process, involving the coordinated functioning of multiple organ systems working together. The underlying purpose of applying nutrigenomics is to create foods and feeds tailored to match the genotypes of animals. By utilizing gene chips that contain the genetic information of animals, one can assess the impact of specific nutritional supplements and how they influence the interactions between genes in the body. The primary objective of nutrigenomics is to modify gene activity, leading to increased activation of beneficial genes while suppressing the activity of detrimental ones. This approach involves the careful selection of nutrients to finely tune the genes and DNA present in every cell and tissue of an animal. Nutrigenomics, therefore, provides a more comprehensive understanding of how genetic information is expressed and regulated by the dietary composition of feed, encompassing nutrients, micronutrients, and phytochemicals found in the feed.

Notion of nutrigenomics in poultry

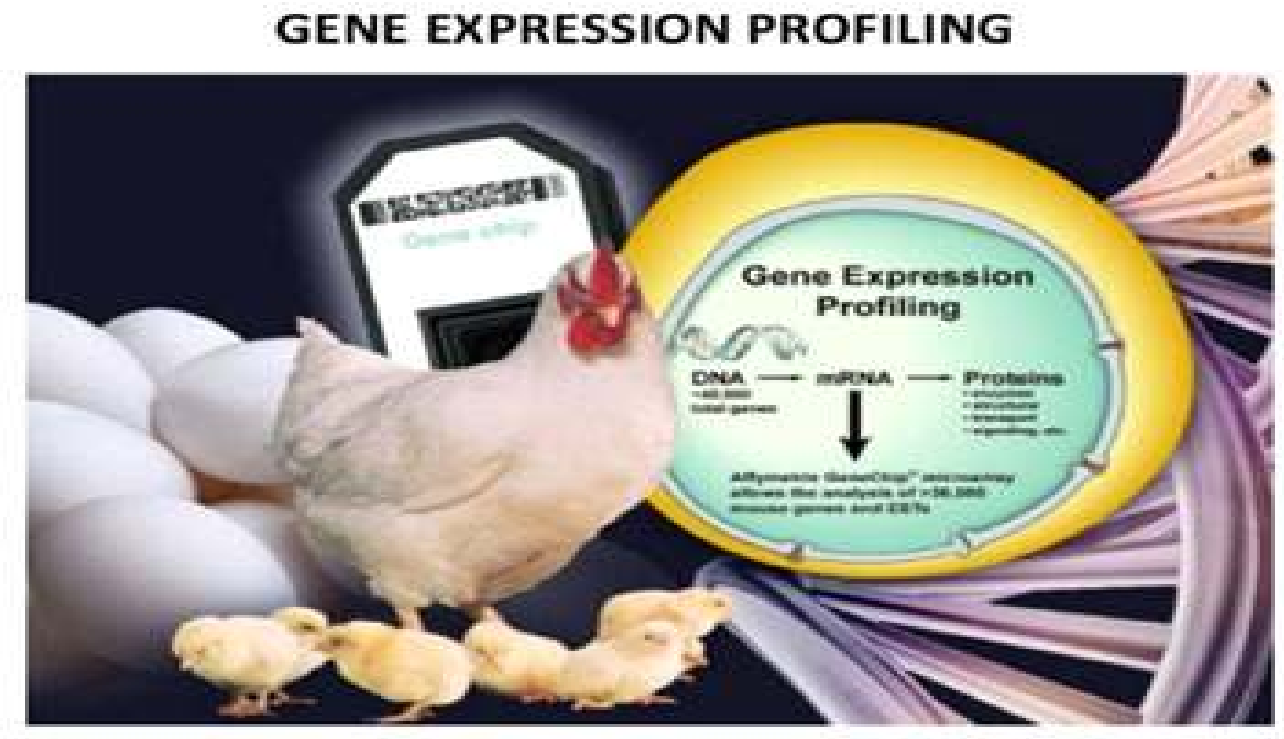
Nutrigenomics plays a vital role in poultry production by

establishing connections between nutrition and genetics in breeding programs. It aids in enhancing bird performance, optimizing feed efficiency, promoting better health, and improving meat quality. Over the past few years, numerous nutritional programs have been conducted to investigate the impact of diets during neonatal and early-life stages.

- Nicotinic acid plays a significant role in lipid metabolism in female chickens and act as a correlation between the expression patterns of hepatic genes apolipoprotein A-I (ApoA-I) and apolipoprotein B (Apo B).
- Certain bioactive substances present in feed, various trace elements and vitamins also act as crucial factors for maintaining poultry health. Vitamin E, for example, serves as a transcriptional regulator of genes involved in lipid oxidation and antioxidant expression in broiler chickens. This leads to reduced stress and improved meat quality.
- Algae-based diet can alleviate chicken stress through its positive impact on gene expression.

The gut system and the antibiotic dilemma

Transcriptomic analysis of the intestinal tissue or the intestinal mucosa leukocytes has revealed the efficacy of certain compounds on the GIT immune response and protection. Examples of such compounds include carvacrol, cinnamaldehyde, and oleoresin from Capsicum spp., as well as anethole, garlic metabolites, and turmeric. These substances can modulate the immune response and contribute to the overall health of the gastrointestinal tract in poultry. These compounds have the ability to influence the expression of genes involved in immunity and various physiological processes, such as energy and protein metabolism. This supports the idea that phytochemicals derived from plants possess immune-enhancing properties in chickens.



Prebiotics, such as yeast cell wall products, have been shown to regulate the expression of genes related to oxidative phosphorylation and other important cellular stress response genes in jejuna tissue. When compared to a common antibiotic (bacitracin), gene expression profiles in broilers supplemented with yeast cell wall products revealed activation of biological functions and pathways related to improved health and metabolism. In the research focusing on the enterocyte proteome in broilers fed Enterococcus faecium, it was discovered that there were various proteins with different expression levels associated with the immune and antioxidant systems. This finding suggests that these chickens required fewer nutrients and less energy to cope with immune and antioxidant stresses (Luo et al., 2013). These recent findings from nutrigenomics studies present promising opportunities for developing effective drug-free alternative strategies for controlling poultry infectious diseases.

Gene expression-transcriptomics

Transcriptomics provides valuable insights into gene expression patterns, but careful data analysis is essential to draw meaningful conclusions about the effects of nutrient intake on biological processes. One notable advantage of RNA seq over microarray approaches is that it does not require prior knowledge of the transcripts present in a sample. Microarrays, on the other hand, need to include known transcripts in their construction. RNA seq involves high-throughput sequencing of cDNA derived from polyadenylated RNA, and gene expression levels are quantified through transcript counting. As a result, RNA seq serves as a powerful discovery platform, identifying the majority of transcripts expressed in a given sample.

Targeted microarrays to

Table.1 Diet related gene expression in chicken

S.No.	Feed intake	Gene expression
1.	Immunomodulators (Corticosterone, ascorbic acid and 1,3-1,6 β-glucans).	Cytokine gene expression (IL receptors 4 and 15) in spleen-1β, IL-2, toll-like
2.	Comparison of organically grown feed and conventionally grown feed	49 genes were found to be differentially regulated in jejunum. Genes related to immune system (chemokine ah221, B-G protein, immunoglobulin heavy chain) were also differentially expressed
3.	Mannan-oligosaccharides in feed	Expression of 77 protein synthesis gene, including superoxide dismutase 1, lumican, β 2-microglobin, apolipoprotein A-1, fibronectin 1 etc.
4.	Poultry feed containing lead	Different gene expression in two groups: Yellow-Feathered nutrient (HN and LN) Chicken (WYFC) and White Recessive Rock Chicken (WRRC). The gene expressions of Rheb, TOR, S6K1 and 4E-BP1 in muscle were the highest in the WYFC fed with low nutrient LN diets are optimal for the long-term housing of chickens

GARLICIN Antiviral & AGP Replacer

GARLIC

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Increase in Antibodies response

Allicin From Garlic

CD4 Cells

Antiviral activity against IBD, Infectious bronchitis

NK cell

CD8 Cells

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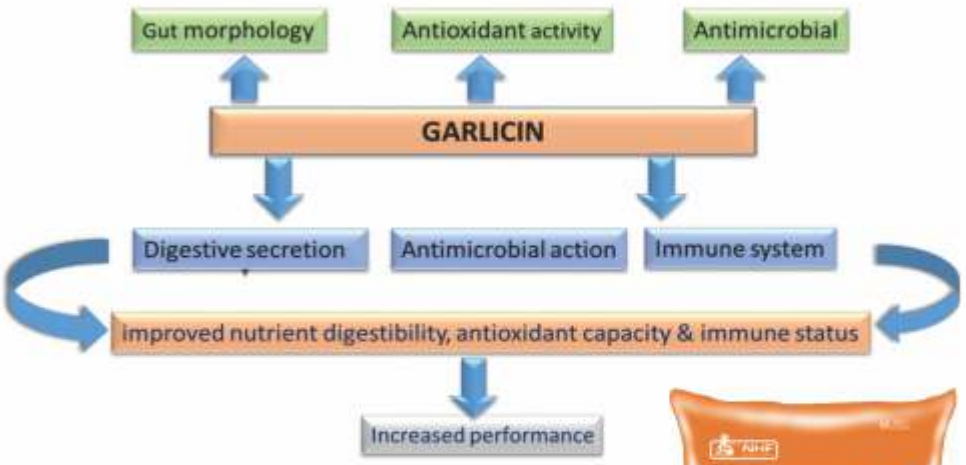

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intricate relationship between nutrition and gene expression

North Carolina State University designed a focused array with 320 carefully selected long oligonucleotides, enabling accurate measurement of key genes and pathways of interest. This customized array allows for high replication numbers, making it a valuable and cost-effective resource for investigating expression patterns in specific genes. It offers a more efficient and targeted approach to studying gene expression in the areas of interest.

By incorporating replicates in microarrays, the increased power of sample size significantly impacts the identification of differentially expressed genes, as evidenced by comparison with other analysis methods. The targeted microarray approach study allows for detection limits as low as ±7%, making it possible to identify and measure extremely small differences in gene expression. The level of accuracy achieved in measuring gene expression for this number of genes surpasses any current technology, considering the cost involved.

Conclusion

Embracing these advanced technologies and methodologies will pave the way for groundbreaking discoveries in nutritional science, leading to a more comprehensive understanding of the impact of nutrition on health and disease. As research progresses, it will be essential to continue refining bioinformatics tools and capacities to fully harness the potential of these advancements in the field of nutrition. In recent years, microarray technology has been widely used in nutrigenomics research for improving food production, quality, and safety in dairy and meat industries. This technology allows for the simultaneous screening of numerous genes, providing a comprehensive view of gene expression patterns. Additionally, it sheds light on complex regulatory interactions, such as the relationship between diet, nutrients, and genes.

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Improvement in cFCR

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Improvement in BWT in open shed

Upto 120 g

Improvement in BWT in EC shed

Upto 30%

Improvement in livability vis-à-vis antibiotic control

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

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

From Feed to Performance: the role of Gut Health in Poultry Production

Dr. Elisabeth Holl
Senior Technical Manager
Dr. Bernhard Eckel, Vice President
Dr. Eckel
Animal Nutrition (Germany)

How a healthy gut drives performance and welfare in poultry farming

Whenever animal welfare and well-being is in focus, the term "gut health" comes up as well. But what defines gut health and how can it be maintained? Surely there is more to gut health than merely the absence of gastrointestinal illness. Good digestion and absorption of nutrients are as much a sign of a healthy gut as an effective immune system and a normal and stable microbiota.

There is no doubt that animal nutrition plays an important role in maintaining the integrity of the gut. The search for advanced dietary strategies to strengthen the resilience of animals to infections and non-infectious stressors is therefore a powerful driver for the development of innovative feed additives aimed at improving gut health and animal well-being.

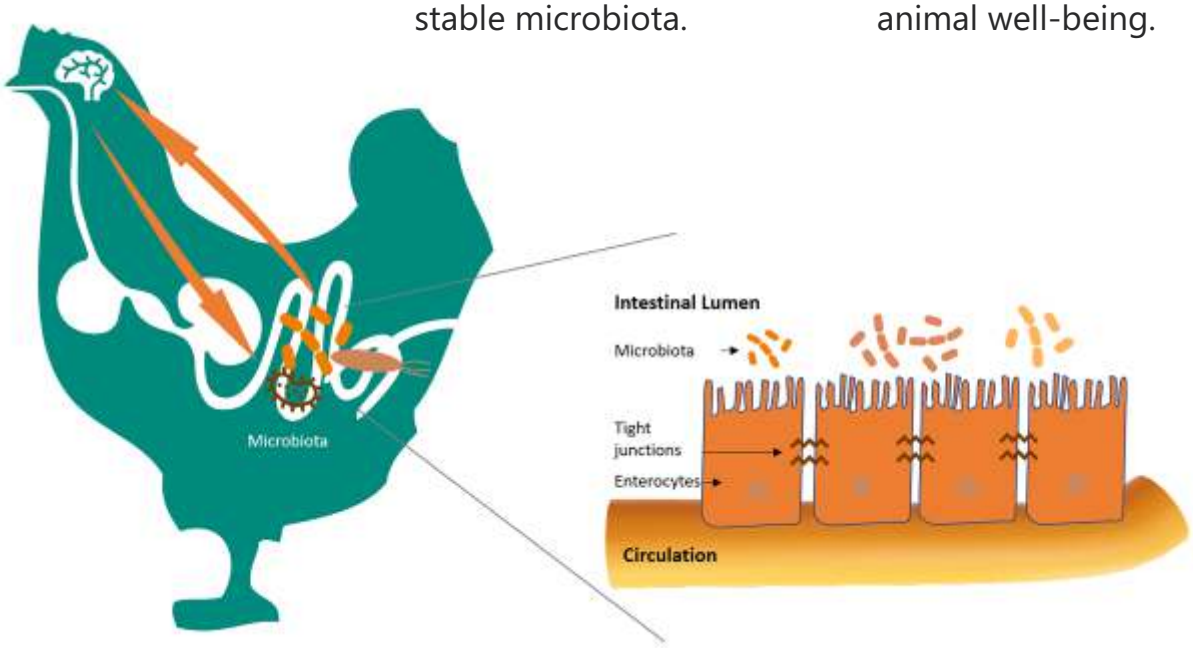

Figure 1: Gut microbiota and its metabolites communicate with the brain via several pathways, influencing animal health and well-being

The microbiota – a closer look

Many of the challenges we encounter in animal production can be related to poor gut health. Dysbiosis in poultry is often associated with poorly digested feed, diarrhoea, and wet litter, leading to footpad dermatitis, reduced uniformity of the flock and ultimately to losses in productivity. Poor eggshell quality may also be linked to gut health problems, especially in older hens which rely on an effective calcium absorption for eggshell formation.

Numerous studies describe the positive effects of a healthy and balanced gut microbiota and its metabolites on innate and adaptive immunity, metabolism, gut physiology and even animal behaviour. Stress factors such as early weaning, heat stress or diet composition may lead to a disruption of the intestinal barrier and impair the animals' resilience. Only a healthy gut with a balanced microbiota can function as a barrier between the environment and the animal and provide protection from pathogens. It is therefore important to improve and maintain this barrier function of the healthy gut to prevent harmful or toxic substances from being absorbed into the body from the environment.

How to support a healthy gut

A key factor for regular intestinal biology are short chain fatty acids like acetic, propionic, and butyric acid. They are the product of bacterial fermentation in the intestine. A high concentration of short chain fatty acids lowers intestinal pH which in turn suppresses pathogen bacteria and facilitates mineral absorption. Butyric acid improves the epithelial integrity and defence systems and decreases intestinal permeability. To optimise the effect of butyric acid in the gut, it must reach the target site. Different forms of butyric acid, either supplemented or endogenous, will have different effects in the animal, dependent on the digestive compartment they reach. Butyric acid in the stomach has an antibacterial effect and improves protein digestion. In the distal part of the intestine, it will strengthen the epithelial barrier, reduce inflammatory processes, and stimulate the production of antimicrobial peptides.

Nutrition impacts intestinal health

In other words, the more butyric acid in the hindgut, the better. How can this be achieved? Free short chain fatty acids are rapidly digested in the stomach or the crop. Supplemented butyrate must therefore be specially protected so that it reaches the distal parts of the intestine. This may be done by encapsulating the butyrate, for instance with fatty acids. However, release of the butyric acid throughout the gut needs to be well-timed and may not be optimal.

A better way to maximise butyric acid concentration in the hind gut is to stimulate the endogenous production of butyrate in the lower part of the intestine. The strategy is to make substrates – known

as prebiotics – available to specific micro-organisms, generating conversion products essential for the growth of the digestive system. Prebiotics are generally carbohydrates like fructo-oligosaccharides. They provide a useful energy source for beneficial bacteria. A different approach is the use of gluconic acid, which is structurally related to sorbitol, a slowly fermentable sugar. It is not or hardly absorbed in the small intestine of monogastric animals. Due to the microbial fermentation of gluconic acid, lactate and acetate originate as by-products. These are then converted to butyric acid by acid-utilising bacteria in the large intestine and the caecum.

PreAcid – it's all in the blend

There is a solution especially developed to improve growth and the continuous self-renewal of the intestinal mucosa. PreAcid, a multifunctional feed supplement for high-performance animal feed, contains short-chain fatty acids and the GlucoFence complex which consists of a combination of gluconate and butyrate.

What effect does PreAcid have in the intestine? The organic acids in PreAcid inhibit pathogens and so prevent diarrhoea – still top of the list of common diseases. The prebiotic components butyrate and gluconate promote intestinal development. This has been proven in several trials, where for instance an increased production of

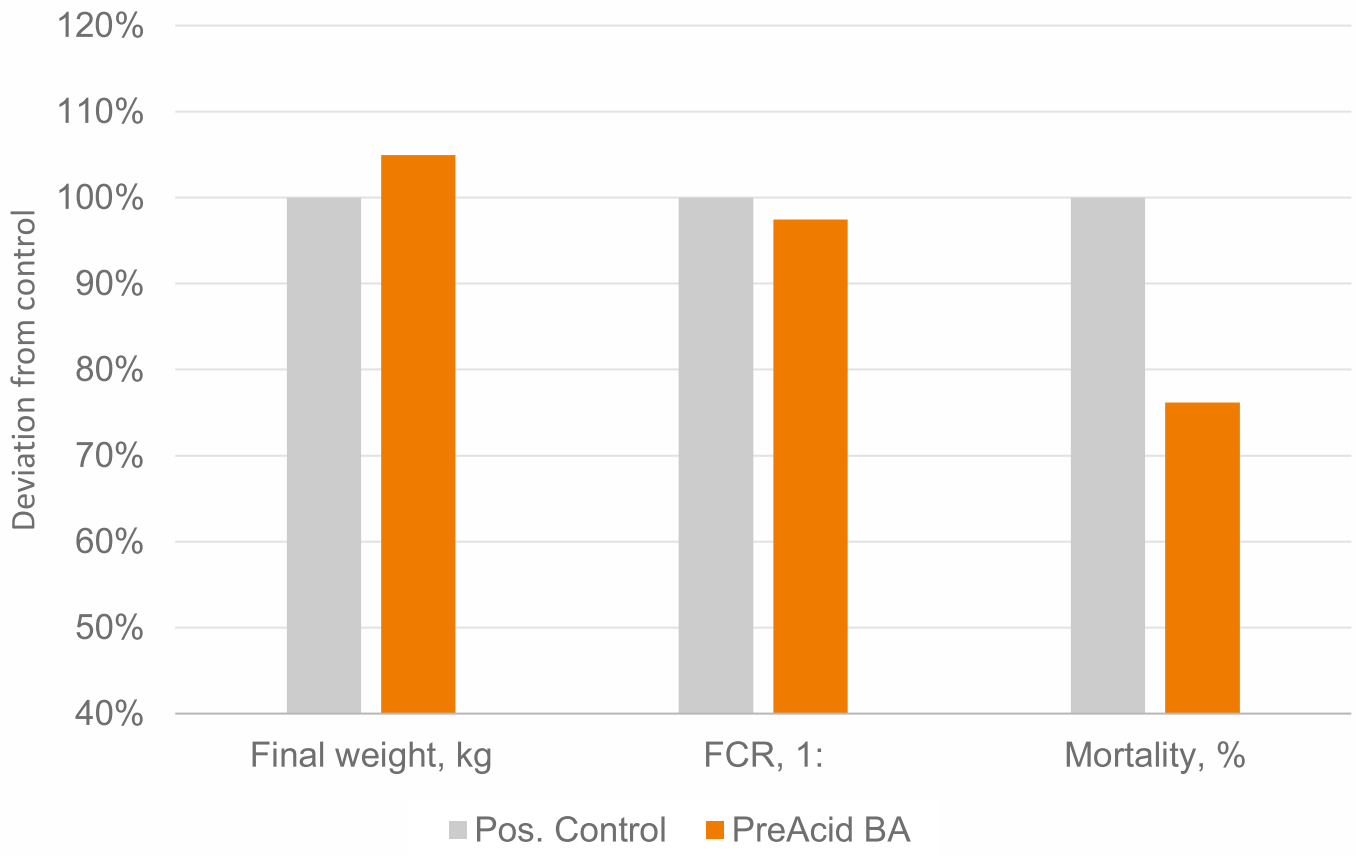

Figure 3: PreAcid improves broiler performance (Dr. Eckel field trial).

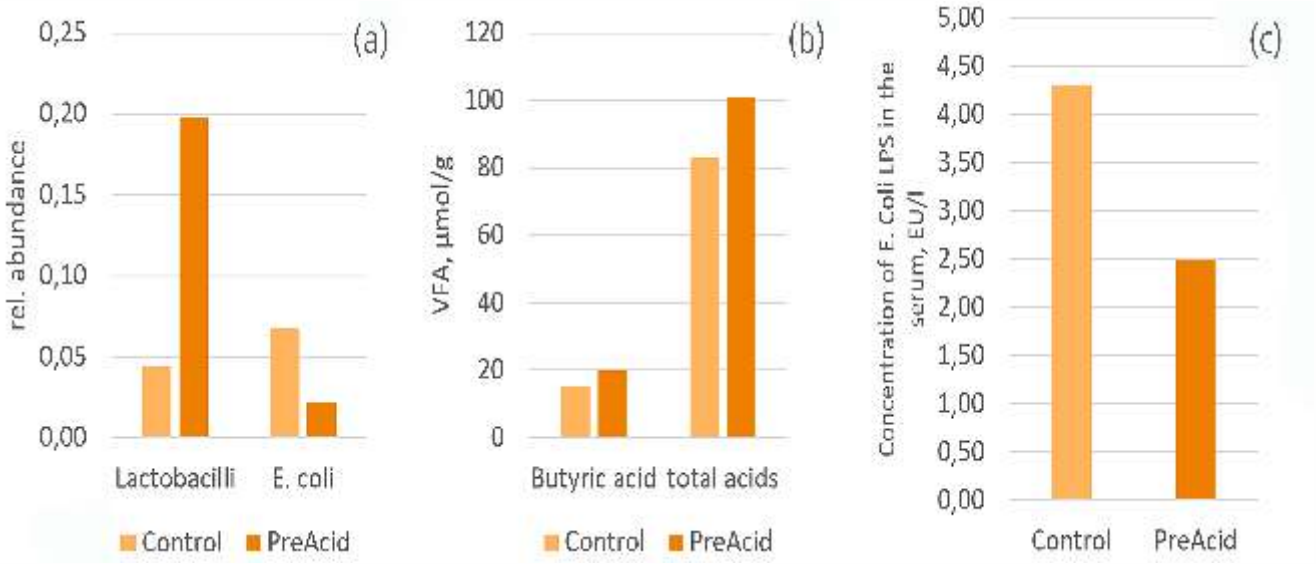

Figure 2: PreAcid concept improves microflora composition in the hindgut of broilers (a), volatile fatty acid production (b) and reduces lipopolysaccharides in the blood serum (c) (Dr. Eckel research, 2020 and 2021)

butyric and total acids and the improvement of microflora composition in the caecum of broilers could be observed (figure 2a and b). Also, PreAcid reduced the concentration of E. coli lipopolysaccharides in the blood serum of broilers challenged with E. coli and Salmonella (figure 2c). The detection of LPS in the serum in that study suggests that the negative effects of E. Coli and Salmonella on the intestinal barrier of broilers could be mitigated by the prebiotic action of the GlucoFence complex in PreAcid.

Lower mortality and higher final weight

The benefit: PreAcid is the ideal source of butyrate in animal nutrition, improving performance and productivity. In a large-scale trial with broilers comparing the effect of PreAcid with butyric acid, the PreAcid concept clearly outperformed other sources of butyric acid. The animals were allocated to two groups. The control group received fat coated butyric acid, the treatment group received PreAcid. After eight fattening rounds the result for the PreAcid group was definitive: the animals reached higher final weights and a better feed conversion ratio. The mortality was reduced by up to 24 per cent (figure 3). Furthermore, the use of PreAcid reduced feed costs per kg meat by 2.8 per cent and markedly increased meat yield.

Strong gut – strong performance

Optimising the amount of butyric acid in the hind gut will benefit both animals and producers: the antibacterial and prebiotic action improves gut health, stimulates digestion, and improves nutrient absorption and animal welfare. So for a healthy gut and optimal performance in poultry, go for the full effect of butyric acid in the intestinal tract. PreAcid's prebiotic approach with the GlucoFence will get you there!

Importance of Vaccination in Poultry

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Introduction

Vaccination plays a crucial role in the management of the health of poultry flock. Vaccinations can prevent a number of poultry diseases. Vaccination is a process in which the healthy chickens are infected in a controlled way with a dead or weakened pathogen. After the vaccination, the birds' own immune system will respond to the vaccine by activating an army of cells designed to attack and destroy the invaders before they cause damage to the bird. After the attack, several specialized immune system cells remain, called memory cells. These memory cells will remember the infectious agent to which the bird is vaccinated. If later life an encounter with the infectious agent takes place, the birds' immune system is capable of a quick "detect and destroy" of the infectious agent, resulting in protection from the disease and therefore preserving the productive health of flocks.

Vaccination procedures

There are different ways to administer vaccines to your poultry flock, it is crucial that the correct method is used for each vaccine. Several frequently used methods to administer vaccines to chickens are listed below, keep in mind to always safeguard the correct dose of the vaccine: Intramuscular injection

This method involves the use of a needle to insert the vaccine into the breast muscles of the chickens. The use of an automatic syringe can speed up the process as it makes the technique relatively easy and doesn't harm the bird. Regularly check the equipment to ensure that the correct dose is administered. Train the crew in administering the vaccine at the right position in the breast muscles. Special care must be taken to ensure that the needle does not pass through into one of the key organs. Good hygiene and proper vaccine handling procedures can prevent unnecessary contamination.

Subcutaneous injection

Very similar as the intramuscular injection, but in this case the vaccine is injected under the skin, usually at the back of the neck. Sufficient attention must be given to ensure that the vaccine is injected into the chicken (not just into the feathers).

Ocular

The vaccine is administered to the chicken's eye via an eyedropper. From here the vaccine makes its way into the respiratory tract via the lacrimal duct.

Nasal

The vaccine is introduced into the chickens' nostrils either as a dust or as a drop.

Oral

The vaccine is given in the chickens' beak. From here it may make its way to the respiratory system or it may continue in the digestive tract before entering the body.

of an adequate dose of the vaccine.

- All the water present in the drinkers and nipple lines should be consumed prior to vaccination.

Spray

The vaccine is sprayed onto the chickens, or into the air above the chickens, by making use of a suitable spray applicator, that controls the spray droplet size. The vaccine will fall onto the chickens and enters the body of other chickens as they pick at the shiny vaccine droplets. The chickens might also inhale small quantities. It is important to ensure an even distribution to all birds in the flock.

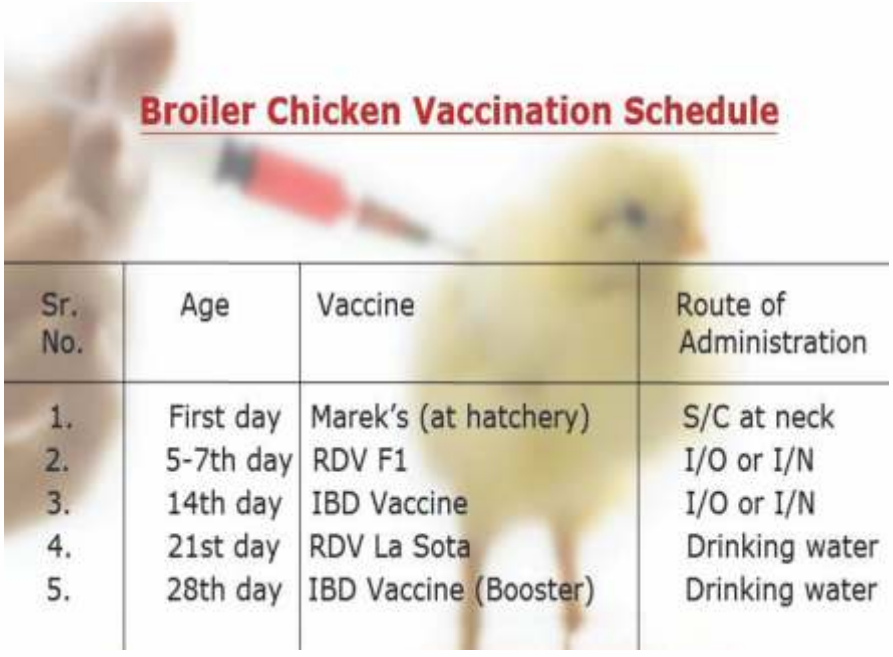
Conclusions

A well-designed vaccination program is key, but it will only be effective when combined with proper management, good nutrition and a well followed biosecurity program. The combination of these aspects will decrease the disease pressure significantly and it will therefore increase the likelihood that your flock will perform to its genetic potential.

Drinking water

Adding the vaccine to the drinking water of flock. This vaccination method is less time consuming and less stressful. The recommended technique is as follows:

- All equipment used for vaccination is carefully cleaned and completely free of disinfectants and detergents (keep in mind that live vaccines administered via the drinking water can be destroyed by disinfectants and soap).
- Only use cold, fresh and clean water (drinking water quality).
- Open the vaccine bottle under the water.
- Make sure the birds are thirsty to stimulate the intake



Broiler Chicken Vaccination Schedule

Sr. No.	Age	Vaccine	Route of Administration
1.	First day	Marek's (at hatchery)	S/C at neck
2.	5-7th day	RDV F1	I/O or I/N
3.	14th day	IBD Vaccine	I/O or I/N
4.	21st day	RDV La Sota	Drinking water
5.	28th day	IBD Vaccine (Booster)	Drinking water

Feather it's way of Processing & Utilization

Dr Nazir Ahmed[a], Dr Ajaz A Dar[b], Dr Rongsensusang[c] and Dr Malik Raies Ul Islam[d]
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Corresponding Author
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Feathers are by product of poultry, They are produced in large quantities as a by-product at poultry–processing plants, reaching millions of tons annually throughout the world, almost 40 million tonnes of chicken feathers produced annually across the globe have been incinerated or dumped with other waste material and are often considered a waste disposal leads to environmental pollution. However they have multiple uses viz: Automotive industries, packing material, insulation, household product, soil control, winter jackets, manufacture of Plastics, energy production, fertilizer and root substrate, livestock feed, diaper filling, aircraft, biodegradable composites, fabric etc. keeping in view of huge production and importance of feather there is need of utilization of latest technologies for commercial utilization of feather which will benefit poultry producers end user industries and protect environment.

Processing of feathers:

There are five steps involved in the processing of feather, by which the feathers are sanitized after that the feathers are separated and sorted according to their size, weight and use. These are;

De-Dusting:

It is the first system involved in processing of feathers in which dust and foreign particles are removed. The system consists of feeding equipment, pre-separator for course waste, de-dusting for elimination of fine dirt and fine particles and filtering system for bagging of waste material. Feathers are weighed up 500 lbs and are placed in the bale separator where they are broken apart and sent to loading silo from where they dropped into de-dusting machine and sent through a series of cycles to remove course waste and fine dust by vacuum chamber after this de-dusted feathers are sent to the loading silo of washing machine and the naturally bio-degradable material is bagged for land fill sites.

Washing System:

After de-dusting the feathers are ready for washing. This system consists of feeding equipment, washing chamber and centrifuge. The down and feathers are sent to the loading silo. Then up to 500 lbs are dropped into the washing which contains warm water, detergent and degreaser. These are added to ensure proper cleaning. The feathers are rinsed to remove chemicals applied in the washing and to remove fine

dust and residue. In the final rinsing process sanitizing agent is added to eliminate bacteria rendering the down and feathers ensure that they will stay cleaner and fresh. These feathers are sent to centrifuge which will remove the bulk of water through whirling motion. Once this is completed the feathers are sent to the loading silo of the steam dryer.

Drying System:

This system consists feeding equipment, steam dryer, cooling chamber and the filtering system and feed into the steam dryer where the temperature is raised up to 100 c for drying and sterilizing them. After drying feathers are transferred into the cooling chamber and are kept in continuous motion through air circulation in a large cylinder where they are cooled and fluffed. The find dust is removed through filter system after washing; drying and sterilizing these feathers are sent to sorting machine.

Sorting System:

This system consists of feeding equipment sorting machine and filtering system, up to 200 lbs of feathers are sent to the loading silo where a small batches are dropped into sorting machine and are separated by swiftly circulating air into the vertical chambers, the less buoyant feathers settle into compartments according to their size and weight and down accumulate in the last compartment. This process takes four hours to fully separate down and feathers. In the sorting process the fine dust and impurities are removed through a filter system. After sorting the feathers are sent for bagging.

Bagging System:

The separate down and feathers are removed from various compartments of the sorting machine which are the transferred through a vacuum system in the large bags which are located inside each bagging chamber according to quality, use etc. They are filled, after filling the bags they are removed tied and labeled.

Uses Of Feather:

- Automotive textile: Usages of Nonwoven made out of Chicken feathers are used in seats and cushioning, Interior Linings etc.
- Packing material: while transporting delicate articles from one place to another, the cartons lined with nonwovens made out of chicken feathers are placed inside as the interlining which makes sure that the articles are tightly impact at the same place , and would be transported without any damages.
- Filter property: Nonwovens made out of chicken feathers as obvious it has a very good porosity and is lighter in weight, it has a promising future in Chemical industries as it has a good resistance to milder acids and alkalies.
- Insulation: To conduct any kind of electricity one must have a conducting element like water content (or moisture). But the chicken feathers lack such elements, so they hence a very good insulating property hence they can be act as insulating materials.
- Household product: for the Nonwovens made out of Chicken feathers are very versatile in their property they are used as decorating materials in the households.
- Soil control: The nonwovens made out of Chicken feathers are very stiff and rigid where in which when placed on the soil it will restrict the eroding of the top layered soil, thereby controlling soil erosion respectively.
- Winter jackets: The nonwovens made out of Chicken feathers are used in the jackets as the interlining where in which it keeps the body very warm.

Utilization Of Feathers:

Researchers have reported that feathers have uses in animal feeds, green house industry, erosion control, upholstery, artwork, thermal insulation, paper alternatives (49 percent wood fiber and 51 percent feather fiber), lightweight structural materials, biodegradable composites, water filtration fibers, fabric (that is biodegradable), aircraft and automotive industries and diaper filling Therefore,

technologies should be developed and customized for commercial utilization of feathers for the different World (developed and developing) economies. This will benefit poultry producers, end user industries and the environment.

Manufacture of Plastics

Feathers are used in the manufacture of plastics. Plastics are of two groups, thermoplastics and thermosetting plastics. Thermoplastics are manufactured from oil and natural gas. These are expensive raw materials, therefore, research has gone into finding alternative material and processes for making plastic. Thermoplastics include nylon, polyethylene, polystyrene, polyvinyl chloride, and many other kinds. They are used to make consumer and industrial products ranging from toothbrush bristles to soda pop bottles to car bumpers. Thermoplastics need heat (or chemicals) to harden from a liquid into a final shape, and can be melted and remolded time and again.

Chicken-feather-based thermoplastics are stable in water while still maintaining strong mechanical properties. They are substantially stronger and more resistant to tearing than plastics made from soy protein or starch, and have good resistance to water (American Chemical Society, 2011). Feather-derived plastic can be molded just like any other plastic and has properties very similar to plastics such as polyethylene and polypropylene (USDA, 2009). This makes them a unique material for packaging or any other application where high strength and biodegradability are desired.

Energy Production

In the globe, man is facing two major challenges, waste disposal and the need for an abundant source of clean energy. Feathers, a byproduct of poultry processing, usually poses a disposal challenge. The perfect solution to both of these problems is to turn the waste into energy-biofuel. This energy from garbage could cut carbon emissions by 80% while replacing the need for large amounts of petroleum. Biodiesel is a fuel comprised of mono-alkyl esters of long chain fatty acids that are derived from vegetable oils or animal fats.The main problem the biodiesel industry frequently faces is the availability of cheap and abundant, high-quality feed-stock. Thus, finding alternative, non-food, feed-stocks is a priority. Through research to produce biofuels from non-food sources, it has been discovered that feather meal offers a promising feed-stock source for biodiesel production. Poultry feathers are inexpensive and abundant. Feather meal (hydro-lyzed poultry feathers) is defined as "the product resulting from the treatment under pressure of clean, undecomposed feathers from slaughtered poultry. By boiling chicken feather meal, the 12% fat content is extracted and processed into usable biofuel.

Use as Fertilizer and Root Substrates

Feather contains about 15% protein and has high potential for use as slow release nitrogen fertilizer in greenhouses and nurseries. However, the release of nitrogen from feathers is slow to be used as a fertilizer. Plants grown in substrates containing up to 30% feather fiber were of marketable qualities. Therefore, plants can be grown in substrates containing up to 30% feather fiber, reducing reliance on peat and reducing overall cost of the substrate. Therefore, feather fiber can be used at rates up to 30% with peat and perlite substrates without negatively affecting the physical properties of the substrate. However, at 30% feather fiber with peat and bark, aggregation or clumping of the feather fiber occurs during mixing of the final substrate.

Use as Livestock Feed

Feather meal is a byproduct made of ground-up poultry feathers. It is produced by heat processing (rendering-clarify or purify by melting-heat processing) at 115° to 145° C that is sufficient to kill bacteria, viruses and many other micro-organisms. The product is an aseptic protein product that is free of potential

biohazards and environmental threats. This makes feather meal safe for inclusion in animal feeds for a wide range of animal species, including fish and shrimp. Done correctly, heat processing also denatures the proteins slightly, which enhances their digestibility. Feather meal has high protein content and has a great potential as a source of protein and amino acids for animal feed. However, it has low levels of essential amino acids as well as poor digestibility. Feather meal is almost pure keratin, which is not easily degradable by common proteolytic enzymes, but can be efficiently degraded by specific proteases such as keratinase. Feather meal is hydrolyzed poultry feathers. It is rather unpalatable and should be introduced into cattle diets gradually and limited to 0.45 to 0.75 kg per head per day. In many countries, fish feeds are formulated to contain 3-7% feather meal. Crude protein in feather meal is highly digestible to fish. However, the rendering process in feather meal production is an effective method for ensuring biosecurity because processing conditions and drying denature compounds and create an unfavorable environment for viruses, bacteria and other micro-organisms to survive and grow in the product. This should assure food safety and protect human and animal health. Processing animal by-products by rendering should allow traceability of finished products for quality assurance. This can be achieved by developing HACCP programmes for the feather rendering industry. Then the rendered product will be safe for compounding animal feeds.

Other Uses

Feathers fabrics have been used in erosion control. Turkey feather fiber fabrics have similar prevention of erosion. In prevention of erosion, feather fabrics increased soil moisture content and decreased soil compaction, which are critical properties for successful ecological restoration of habitats. Geese and ducks are raised in America, Asia and Europe for their feathers (Ariel, 2012). About 50 % of the down and about 42 % of the coarser feathers of geese and ducks are used to fill pillows and blankets. Feathers are also used for making feather dusters. These are cleaning devices that remove dust from objects. Goose or duck feather are used in shuttlecock. Feather are also having various ornamental uses.

Different Uses of Feather

Maximizing Profits in Broiler Farming with Optimal

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Introduction

Management of the poultry house environment forms an essential aspects towards maximizing production performance. Generally, proper maintenance of poultry litter is seldom given emphasis. The condition of litter significantly influences birds performance and ultimately affects the economy for rearing. The litter is defined as the bedding material of around 5-6 cm height consisting of locally available materials like rice husk, coir pith, peanut hulls (or) groundnut shells, wood shavings, paper shreds, sand, crushed corn cob, chopped straw or hay, pine shavings and saw dust. These materials can be used alone or in combination to rear the birds on floor under deep litter system of management. The excreta, feathers, spilled feed and water are mixed with bedding material get further decomposed due to heat and bacterial action resulting in build - up- litter towards the end of rearing.

Importance functions of litter material:

- Absorbs excess moisture from the droppings.
- Promotes drying by increasing the surface.
- Dilutes fecal material, thus reducing contact between birds and manure.
- Insulate the chicks from the

cooling effects of the ground.

- Provides a protective cushion between the birds and the floor.

Characteristics of good litter material:

1. Ideal litter materials should absorb water and subsequently release the same to the atmosphere and minimize litter caking.
2. Helps to clean out and store/spread after rearing of birds.
3. It must be soft , light in weight and free from sharp objects.
4. It should be readily available in sufficient quantities (400 kg/ 1000 sq ft.area).
5. Most, importantly, it should be economical.
6. In addition, a bedding material must be compatible as a fertilizer or soil amendment.
7. Litter material should not be toxic and irritant.

Litter management and litter quality:

1) Litter quality mostly depends upon amount of excreta voided and litter moisture percentage, which indirectly affects bacterial proliferation and ammonia production.
2) Excess moisture in the litter increases the incidence of breast blisters, skin burns, scabby areas, bruising and downgrades.
3) Wet litter condition promotes the proliferation of pathogenic bacteria, molds and cause increased ammonia emission which is serious environmental concern affecting broiler production.

Litter height or depth levels,

Sufficient : 5 cm (2 inches)

Initial : 3 – 5 cm (1 – 2 inches)

Summer : 3– 5 cm (1 – 2 inches)

Winter : 7 – 10 cm (2.5 – 4 inches)

Initial thickness of litter should be 5 cm during summer and 7 cm during winter, whereas the final litter thickness will be ranging between 10 to 12 cm depending on season and growing period. The successful litter management mostly depends on skillful management of litter moisture during entire period of rearing. Before adding fresh litter material, remove the caked up and wet litter material. Initially the litter contains only 12% moisture. Ideal litter moisture should be maintained between 20 to 25 %. Ammonia production starts when the moisture exceeds 30%. If the moisture level of litter material exceeds 30% due to poor ventilation, high stocking density of birds, irregular stirring and damp floor, then litter will cease to function efficiently. Sometime many birds will bear “balls” made of litter materials at their claw tips. Ball formation is a sign of bad litter management. Built-up litter has a very important role in providing warmth to the

Litter material and Its Merits and Demerits:			
S.No.	**Litter material**	**Merits**	**Demerits**
01.	Paddy hulls / Husk	• Cheap • Easily available	• Young chicks may prone to litter-eating (not serious problem)
02.	Coir pith	• Cheap • Easily available • Easily decomposable • Easy to maintain. • Preferable for all season	• Young chicks may prone to litter-eating (not serious problem)
03.	Peanut hulls	• Inexpensive in peanut producing areas	• Tends to cake and crust but can be managed. • Mold growth • Increased incidence of aspergillosis.
04.	Sand	• Long term usable • De-caking quality	• More difficult to maintain suitable floor temperatures during cold weather and brooding. • Need ample time and ventilation prior to brooding to assure dryness.
05.	Crushed corn cobs	-	• Limited availability • May increase breast blisters
06.	Chopped straw, hay	-	• Considerable tendency towards caking • Mold growth
07.	Pine shavings and sawdust	-	• Preferred but becoming limited in supply hence expensive
08.	Wood shavings and sawdust	-	• Often high in moisture and susceptible to dangerous mold growth if stored improperly prior to use.
09.	Pine or hardwood chips	• Can be used successfully	• Increased incidence of breast blisters if allowed to become too wet.
10.	Processed paper	• Various forms of processed paper have proved to be good litter material in research and commercial situations.	• Tendency to form cake with increased particle size. • Top dressing paper base with shavings may minimize this problem. • Careful management essential.

birds in winter. Litter will function more efficiently on a concrete floor and it is easy for disinfection at the end of each batch. Litter material that is too dry and dusty can lead to problems such as dehydration of new chicks, respiratory diseases.

Bad litter acts as predisposing factors for several viral and bacterial diseases known to spread easily through contaminated litter. In addition, fungi may produce mycotoxicosis and aspergillosis (Brooder pneumonia). Wet litter further aggravates coccidiosis by providing the proper environment for oocysts to sporulate. Prolonged ammonia exposure 25 ppm for longer durations cause depressed growth, drop in egg production and immuno-suppression. Even at high levels (50 to 100 ppm) can result in keratoconjunctivitis (blindness), in birds and it cause irritation of eyes which may induce possible health risk to farm workers. Ammonia volatilization from poultry litter can also cause air pollution and lower fertilizer value of litter due to nitrogen loss.

Paddy Husk

Coir Pith

Pine Shavings

Wood Shavings

Groundnut Hulls

Litter Evaluation

A practical way to evaluate litter moisture is to do a simple litter squeeze test in several locations. Litter moisture should be evaluated in several location around house, but not immediately under or around drinking or feeding systems. Litter should be loosely compacted when squeezed in the hand. If the litter remains in a clump when it is squeezed in the hand, it is too wet. For optimal broiler welfare and health, litter should cover the entire floor and should be dry and friable (loose). High litter moisture (caked or clumped) may cause breast blisters, foot pad lesions, high ammonia levels, and other welfare and health concerns if not corrected.

Testing of condition of litter:

Thumb rule of estimating Litter moisture content:

1) Squeeze a handful of litter:

a. If it adheres tightly and remains in a solid ball - Too wet.

b. If it adheres slightly or breaks into pieces - Optimum.

c. If it not adheres at all and falls outs like powder - Too dry.

2) Moisture Level in Litter material:

a) If moisture level is < 25%

I. Chronic Respiratory Diseases (CRD).

ii. Eye Irritation.

iii. Other Respiratory Diseases.

b) If moisture level is 25 - 30 % - Ideal

c) If moisture level is >30 %

I. Lead to ammonia production

ii. Mould growth

iii. Incidence of breast blisters

iv. Skin burns

v. lameness

3) Ammonia Level in Litter material:

a) If ammonia level is < 25 ppm - Ideal.

b) If ammonia level is >25 ppm its leads to,

I. Irritation of eyes and nasal membranes

ii. Conjunctivitis

iii. Poor feed intake and growth rate

iv. Predisposed to diseases like

- Coryza
- Bronchitis
- Coccidiosis and Other respiratory diseases

Dry Litter

Wet Litter

Precautions for maintaining good litter condition:

- While constructing the poultry house, floor should be raised atleast 0.3 to 0.5 m (Plinth) above the ground level to avoid seepage of water.
- Concrete floor is preferred otherwise, thickness of litter has to be increased.
- Overhangs to the roof must be adequate to protect the interior of the house from rainwater.
- Proper floor space for birds to ensure normal moisture content in litter.
- Proper ventilation to remove excess moisture.
- Drinker management for good litter
- Leaky or overflowing drinkers should never be used.Drinkers must keep in horizontal plane.
- Watering channels should never overflow.
- Careful adjustment of height, water depth etc., to assure minimum spillage onto the litter.

By Reducing water spillage will:

- Save water.
- Improve bird quality.
- Improve production environment.
- Reduce ammonia release from litter.
- Reduce volume of wet manure cake.
- Extend time between litter clean outs.
- Wet or moldy litter should be replaced at once with good dry litter.
- Litter is to be racked twice (early morning and evening) daily before drinker cleaning.
- Litter should be racked several times daily to help drying and to remove caking. It is easy if this operation is done along with movement of attendants inside the pens on routine work. It also reduces compaction of litter and consequent caking.
- Slaked / Hydrated lime can be avoided which will increase litter pH, release more ammonia and favours for E. coli (most common pathogen of poultry) growth.
- If there is any cake formation in the litter, it should be removed.
- When the ammonia smell and cakey formation is found to be high, mix 50gm of Ammobion with 10L water and leave it for 1hour, Then, pour 90L of water /10,000sq.ft., mix them thoroughly and slash them uniformly in the litter.
- 1kg of Superphosphate for 1000sq.ft. to be sprinkled over the litter in the entire shed and then racked uniformly during alterative days using a racking stick.
- Spray the recommended amount of disinfectant on the litter periodically to control the pathogens and parasites in the litter.
- Regularly spray with stable ClO2 .

Conclusion:

Poultry house litter management is a process of great impact in poultry farming. Currently, several materials are used for poultry house litter, characterized by their moisture and odor absorption power. The correct management of poultry house litter is closely related to the prevention of infectious diseases such as viruses, parasites, and bacteria. In addition, it prevents chemical and inhalation injuries caused by the accumulation of ammonia in the environment. This process is of great importance since poultry excretion accumulates on the floor during the production cycle. This ensures that the poultry has a comfortable and dry floor. In addition, when the litter completes its useful life, it has other uses and opportunities for environmentally friendly management.

Poultry Health in a Changing Climate: New Challenges and Solutions

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As climate change continues to disrupt weather patterns and environmental conditions, poultry farming faces a growing array of challenges. From extreme heat and humidity to the shifting dynamics of disease transmission, poultry health is increasingly at risk. This article would explore how climate change is affecting poultry farms, the health of birds, and potential solutions to mitigate these challenges.

The Impact of Heat Stress on Poultry Health

- **Challenges:** Climate change impacts environmental conditions, including temperature and humidity, which are crucial for poultry farming. Heat stress, a significant environmental factor, affects chicken performance, including reduced feed intake, growth rate, body weight, meat quality, egg quality, egg production, semen quality, and fertility. These negative effects result in significant economic losses. Heat stress-related food safety issues have gained importance due to public awareness and scientific information.
- **Physiological Effects:** Heat stress can lead to decreased immune function, making birds more susceptible to diseases. Broilers (meat chickens), in particular, are at risk because they are bred for fast growth, which makes them more vulnerable to temperature fluctuations.
- **Solutions:**

o Cooling systems: Stressful environmental condition can be reduced by using basic designing rules to enhance poultry farming in a hot environment. For instance, the shape of housing (semi-open buildings), advances in cooling systems, such as evaporative cooling pads and fans, are becoming essential for maintaining optimal temperatures in poultry houses.

o Breeding for heat tolerance: Selective breeding programs are focusing on developing poultry strains that are better equipped to handle heat

stress. This may include selecting for birds with more efficient cooling mechanisms or better heat tolerance in their genes.

- Dietary adjustments: Farmers can modify the birds' diets by adding electrolytes and other nutrients that help combat dehydration and maintain normal metabolic functions under stress.

Shifts in Disease Patterns

- **Challenges:** Changing weather conditions are affecting the prevalence and spread of diseases. Warmer temperatures and increased humidity create ideal conditions for the development and transmission of diseases like avian influenza and Newcastle disease, which can have devastating effects on poultry populations.
- **Vector-Borne Diseases:** Climate change also affects the migration patterns of disease vectors such as mosquitoes and wild birds, which can spread pathogens to poultry populations. Additionally, flooding from extreme rainfall events can introduce new pathogens into previously unaffected areas.
- **Solutions:**
  - **Improved biosecurity practices:** Farmers are investing more in biosecurity measures—such as controlling access to poultry farms, disinfecting equipment, and controlling wild bird populations— to reduce the risk of disease outbreaks.
  - **Vaccination:** The poultry industry has increasingly turned to vaccines to prevent common diseases. New research is focusing on developing vaccines that are more effective in combating climate-driven strains of pathogens.
  - **Monitoring systems:** Using remote sensing technologies and AI-powered health monitoring systems, farmers can track bird health in real-time, detecting symptoms of disease earlier and preventing widespread outbreaks.

Water Scarcity and Quality

- Challenges: Water is essential for poultry health, and climate change is exacerbating water scarcity in many regions. Droughts and erratic rainfall patterns can lead to insufficient water supply, affecting both the birds' hydration and the availability of clean water for farm sanitation.
- **Solutions:**
  - **Water-efficient systems:** Farms are adopting more efficient water management systems, including rainwater harvesting, recycling systems, and closed-loop watering systems that minimize water wastage.
  - **Water quality monitoring:** Regular testing of water sources for contaminants is becoming a standard practice, with some farms adopting filtration or treatment systems to ensure birds have access to clean water.

Changes in Feed Availability and Quality

- **Challenges:** Climate change affects crop yields and the availability of feed ingredients such as corn and soy, which are essential for poultry diets. Droughts, floods, and extreme weather events can lead to feed shortages, price volatility, and nutritional deficiencies for the birds.
- **Solutions:**
  - **Alternative feeds**: Researchers are exploring alternative feed ingredients such as insect protein, algae, and food waste to reduce reliance on traditional crops. This not only addresses climate-induced feed shortages but also helps reduce the environmental footprint of poultry production.
  - **Precision feeding:** Advances in precision feeding—using technology to monitor the nutritional needs of individual birds—can help optimize feed usage and improve efficiency, ensuring poultry get the right balance of nutrients even if feed sources are less abundant.

The Role of Genetics in Adapting to Climate Change

- **Challenges:** As poultry farming becomes more affected by climate stressors, there is an increasing focus on breeding birds that are resilient to temperature extremes, diseases, and other environmental challenges. Traditional poultry breeds may not be equipped to withstand the shifting conditions of a changing climate.

- **Solutions:**

o **Genetic selection:** Through genetic selection, poultry farmers are breeding birds that are more heat-tolerant, disease-resistant, and better able to cope with changing environmental conditions. This may involve crossbreeding or using genetic modification (GM) to introduce specific traits.

o **Resilient breeding programs:** Researchers are focusing on identifying genes related to heat tolerance, disease resistance, and feed efficiency that can be incorporated into breeding programs, ensuring that poultry remain healthy in more extreme climates.

Extreme Weather Events and Disaster Preparedness

Challenges: The increased frequency of extreme weather events, such as hurricanes, floods, and wildfires, poses a significant threat to poultry farms. These events can cause direct damage to infrastructure, disrupt supply chains, and create conditions that favor disease outbreaks.

- **Solutions:**

o Disaster preparedness plans: Poultry farmers are increasingly developing detailed disaster preparedness plans, which include emergency cooling systems, backup power, and alternative feed and water supplies.

o Infrastructure improvements: Farms are investing in stronger, more resilient housing structures that can withstand extreme weather events, protecting both poultry and equipment.

o Insurance and government support: Many regions are introducing disaster relief programs and insurance schemes for poultry farmers to mitigate the financial risks posed by extreme weather.

The Role of Technology in Adapting to Climate Change

- Challenges: Managing the multifaceted impacts of climate change on poultry farming requires real-time data and efficient decision-making. Traditional farming methods may struggle to keep pace with the rapid changes in environmental conditions.
- **Solutions:**

o **Smart farming technologies:** The rise of smart farming—which uses sensors, data analytics, and AI—allows farmers to track environmental conditions, bird health, and production levels in real-time. This helps farmers make informed decisions about managing temperature, humidity, and health risks.

o **Climate models and forecasting:** Advances in climate modeling help farmers predict environmental changes and plan accordingly. This can include adjusting feeding schedules, cooling systems, and other variables to match changing conditions.

Conclusion:

The intersection of climate change and poultry health is a growing challenge, but the industry is responding with a range of innovative solutions. By embracing new technologies, genetic improvements, and sustainable farming practices, poultry producers can safeguard the health of their flocks while also minimizing environmental impact. The key to success in this evolving landscape will be adaptability and proactive management, ensuring that poultry farming remains resilient in the face of an uncertain climate future.

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Venkateshwara B. V Biocorp Pvt. Ltd organized Layer Farmer meetings on "Optimizing Layer Nutrition" at Shirdi and Nanaj, Maharashtra

Venkateshwara B. V Biocorp Pvt. Ltd organized layer farmer meetings on optimizing layer nutrition on 21st & 22nd Nov. 2024 at Shirdi and Nanaj, Dist. Ahilyanagar, Maharashtra. Theses meeting were attended by 160 layer farmers.

The main topic was about early chick nutrition and gut health management to optimize the egg production. It provided meaningful information about current and future challenges in layer production and management to all farmers.

The session was started by Mr. Ram Ghate –AGM, West India with warm welcome to all layer

farmers.

The technical session started with **"Early Chick Nutrition and Gut Health Management"**. The keynote speaker Dr. Sunil S. Nadgauda, DGM- Technical and Nutrition Venkateshwara B. V Biocorp Pvt. Ltd, discussed about how critical is the early chick nutrition for developing gut health and strategies to develop the digestive system in early life. He explained that development of early gut microflora is very important for chicks as the digestive tract is practically sterile environment at the time of hatching. The microflora in the gastro intestinal tract grows slowly after hatching. Also, he discussed about pullet and layer nutrition useful for improving performance with optimizing the cost.

Laying hens' productivity has changed dramatically over the last few years. The modern-day laying hen can produce 500 eggs in 100 weeks with improved feed efficiency. Preparation of good laying hen is of prime importance and needs to be considered from the chick's stage. We can produce a good laying hen by producing a good pullet. It is very difficult to produce a good laying hen out of a poor pullet.

Another important topic was "

Eggxtra 5% layer composite premixes for quality feed production". Dr. Sunil Jadhav, Manager-Technical, Venkateshwara B. V Biocorp Pvt. Ltd. discussed about the practical difficulties while preparing well balanced composite premixes at feed mill level and one stop solutions for that. He further explained that uniform homogenous mixing and dispersion of different macro and micro ingredients are very critical for quality feed production.

This technical seminar was very insightful for all layer farmers.

HUVEPHARMA®

Poultry India Exhibition 2024: Cherished Memories and Sincere Thanks to Our Distinguished Guests.

What an exceptional exhibition it has been! We are thrilled to share the outstanding success of the Poultry India Exhibition 2024 with you. The event gathered distinguished delegates from across the industry, creating a truly memorable experience.

On behalf of the Huvepharma team, we extend our deepest gratitude to all the delegates and industry colleagues who visited our stall at the exhibition. Your presence and support were instrumental in making this event a remarkable success.

It was a great pleasure to meet each one of you. We are sincerely thankful for the meaningful discussions we had and the valuable insights you provided. We also wish to express our heartfelt appreciation for your role in making this event not only successful but also unforgettable. Your presence brought vibrancy to our stall.









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Feeds

"Unveiling Phytogenic Excellence: Indian Herbs Takes The Spotlight at Poultry India Show 2024"

INDIAN HERBS, a pioneer and global market leader in the Herbal Animal Health Care Industry since 1951, made an impressive impact at the **Poultry India Expo 2024**, held at the Hitex Exhibition Complex, Hyderabad, India, from November 27–29, 2024. The event witnessed an overwhelming turnout of esteemed business partners, customers, consultants, and poultry nutritionists at the **INDIAN HERBS** stall, creating an aura of colossal magnificence, making the event a resounding success.

As the forerunner of Veterinary Ayurveda, INDIAN HERBS continues to lead with innovation, offering a wide array of phytogenic feed supplements and healthcare products. The company's holistic approach, combining 'Traditional Glory and Modern Science,' aims to transform herbalism into a dynamic, scientifically validated, evidence-based discipline. INDIAN HERBS is committed to develop science based innovative phytogenic solutions for sustainable livestock production.

Addressing Industry Challenges

During this event, we have proudly presented phytogenic product range

and innovations. Recognizing the emerging challenges in the animal industry, INDIAN HERBS showcased the range of natural alternatives in key segments such as antimicrobial growth promoters, immunopotentiators, metabolic stimulants, gut enhancers, respiratory antiseptics, anti-stress and adaptogens. These phytogenic solutions are uniquely effective due to the synergistic combination of multiple plant-derived bioactives and phyto-compounds. This approach maximizes genetic potential, promoting growth, production & performance, immunity and disease control in livestock species.

At this prestigious expo, INDIAN HERBS proudly launched GutNectar, an advanced product specifically designed to support poultry gut health. GutNectar is a Phyto-Synbiotic, a synergistic combination of phytogenics, prebiotics and probiotic. This innovative new launch reflects the company's unwavering commitment to addressing critical industry needs with science based and clinically proven solutions.

Extensive Product Portfolio and Research Excellence

With a portfolio of over 230 products for poultry, cattle, swine, equine, aqua and companion animals, INDIAN HERBS adheres strictly to quality norms and regulatory compliance. The company's core competence lies in its robust research and development efforts. Equipped with state-of-the-art R&D and QC laboratories, the company ensures product quality through herbal standardization, phyto-analytical profiling, scientific trials in collaboration with global research institutes and veterinary universities.

Global Reach and Recognition

INDIAN HERBS products are trusted by leading institutions worldwide and are successfully exported to over 50 countries across Asia, Europe, Latin America, and Africa. The company's excellence is underscored by its certification from the Export Inspection Council of India, Ministry of Commerce and Industry, making it the first herbal company to receive such recognition. Since 1986, the R&D Centre of INDIAN HERBS, approved by the Ministry of Science and Technology, Government of India, has been equipped with modern facilities for herbal product standardization and quality control.

Engaging the Poultry Industry

The INDIAN HERBS stall at Poultry India Expo 2024 attracted significant attention from our patrons, customers, feed millers, integrators, nutritionists and distributors. The technical team adeptly addressed all queries, showcasing the company's expertise and commitment to the animal healthcare industry. Visitors were particularly impressed with the recent research initiatives taken by INDIAN HERBS to validate the safety, efficacy and mechanism of action of phytogenic products on basis of advanced scientific techniques.

Commitment to Sustainability

Reaffirming its vision of sustainability and global well-being, INDIAN HERBS is dedicated to supporting the animal healthcare industry with innovative phytogenic solutions. The company extends heartfelt gratitude to its customers, patrons, scientists, and well-wishers for their unwavering support and guidance. Looking ahead, INDIAN HERBS aims to explore new business dimensions while continuing its mission to foster animal well-being through NATURE'S WAY TO ANIMAL HEALTH.

For inquiries, please contact: ihspl@indianherbs.org

Optima Life Sciences Triumphs at Poultry India 2024 with Cutting-Edge Innovations

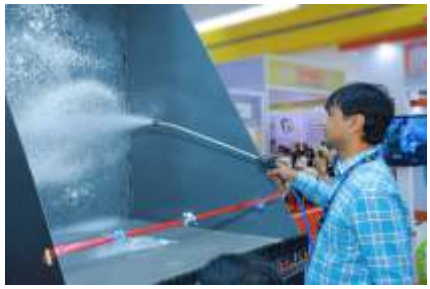
Hyderabad, India – Optima Life Sciences (OLS) Pvt Ltd, proudly announces the successful completion of its milestone participation in 16th Edition of Poultry India 2024, held from November 27 to 29, 2024, at the HITEX Exhibition Centre, Hyderabad. This year's event proved to be an extraordinary platform for OLS to unveil its latest innovations, attracting widespread interest from industry stakeholders, technical experts, and poultry professionals.

Day 1: A Grand Opening and Technological Breakthroughs

The excitement began with the inauguration of Our Stall, setting a dynamic tone for the next three days.

We introduced two revolutionary technologies that captivated attendees:

- **Launch of OLS-8-FOMAX:** A groundbreaking **foaming technology** for disinfectants that ensures effective application and enhanced farm biosecurity. Live demonstrations highlighted its practicality and efficiency, drawing significant interest.



- **Inline Moisture Sensor Technology in OPTIMIZER:** This advanced addition to our existing dosing system (OPTIMIZER) ensures **real-time monitoring and regulation of feed moisture levels,** guaranteeing consistent feed quality and nutrient retention.

The live demonstrations left visitors impressed by our commitment to solving real-world challenges in farm and feed management.

Day 2: Launch of ButyESTER Pro3

The second day was a defining highlight, featuring the much-anticipated **launch of ButyESTER Pro3,** a next-generation feed additive powered by **Gastrointestinal Environment Harmonization (GEH) Technology.**

- **ButyESTER Pro3** combines the benefits of 3 Synergistic Ingredients to harmonize gut health, enhance nutrient absorption, and boost bird performance.
- The launch event featured an engaging presentation on the science behind ButyESTER Pro3, showcasing its ability to address gut health challenges and improve overall flock productivity along with the launch of Booklet on Poultry Gut Health.

Day 3: A Celebratory Conclusion

The final day was marked by meaningful interactions and a celebration of the tremendous success achieved during the exhibition. Visitors to our stall expressed their enthusiasm for the innovations presented, leading to valuable partnerships and collaborations that promise to redefine poultry production standards.

Acknowledgments and Looking Ahead

Optima Life Sciences Pvt Ltd extends its heartfelt gratitude to all attendees, partners, and organizers of **Poultry India 2024**. Your overwhelming support and engagement have made this event a remarkable achievement.

As a leader in poultry innovation, we remain steadfast in our mission to provide **sustainable, high-performance solutions** that empower poultry producers worldwide. By prioritizing innovation, efficiency, and environmental responsibility, we continue to pave the way for a thriving poultry industry.

Stay Connected
For more information about our products and innovations, visit www.optimalife.in.
Pradeep Kumar C
DGM Marketing
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Stay tuned for announcements on upcoming events and product launches.

Born in India, Leading Globally

Natural Remedies at Poultry India Expo 2024

Natural Remedies continues to transform the poultry industry by delivering safe, effective, and consistent phytogenic solutions. With over three decades of expertise, Natural Remedies has emerged as a global leader in feed phytogenics, blending traditional knowledge with research-based science. This commitment to innovation and excellence took center stage at **Poultry India Expo 2024** - one of the world's largest poultry exhibition - where Natural Remedies showcased its mission to drive positive change in the industry.

Addressing the growing importance of phytogenics in poultry health and nutrition, **Dr. K. N. Reddy**, CEO and Director of Natural Remedies, highlighted the company's customer-centric approach. “Our focus has always been on understanding global customer needs and addressing their challenges,” Dr. Reddy remarked during a discussion on company growth at Poultry India Expo. “Today's nutritionists are paying closer attention to poultry diets to ensure optimal productivity. The industry is increasingly recognising the vital role of phytogenics in enhancing poultry health and performance. We believe phytogenics represent the future of livestock farming, offering effective, natural solutions for disease prevention and overall performance.”

Natural Remedies' phytogenic solutions are designed to support birds' immune systems, promote gut health, and enhance natural defence and productivity. Beyond improving poultry health, these solutions contribute to the industry's broader goals of sustainability and responsible farming practices.

Sustainability remains a cornerstone of Natural Remedies' mission. During the event, Sushant Datta, General Manager (Marketing), emphasised the company's dedication to integrating sustainability into every facet of its operations. “Sustainability is at the heart of what we do,” Datta shared. “Whether through our innovative phytogenic solutions or by promoting green energy, we are committed to supporting nature positively. Our flagship solution, Kolin Plus, has already reduced 1 billion tonnes of carbon emissions. Looking ahead, we are determined to become a carbon-neutral

company by 2030 through continuous innovation and strategic planning." This commitment underscores how phytogenics are more than just health enhancers - they are vital to ensuring the long-term sustainability of the poultry industry.

Natural Remedies' presence at Poultry India Expo 2024 was both impactful and engaging. The company's workshops and interactive sessions drew key customers eager to learn more about their pioneering phytogenic solutions. Srikanth Mittapalli, Vice President of Sales, reflected on the event's success: "We are both proud and humbled by the overwhelming response we received. By working closely with customers, partners, governments, and organisations, we can address the critical challenges facing the poultry industry through our phytogenic solutions." Mittapalli added, "Our mission extends beyond improving poultry health and productivity. We are committed to advancing in adding value at all possible phases throughout the bird's lifespan while ensuring our efforts contribute positively to the environment."

Natural Remedies a pioneer in animal healthcare, has over three decades of expertise in the industry. Originating in India, the company has established a global presence spanning more than 45 countries. Natural Remedies specialises in formulating innovative livestock, poultry, and aqua healthcare solutions that blend traditional knowledge derived from nature with cutting-edge scientific research.

As enablers of safe food production, Natural Remedies focuses on developing phytogenic solutions as alternatives to chemical products. These solutions are designed to be safe, effective, and reliable, prioritizing animal healthcare while promoting sustainability. The company's core value of 'Being Useful' drives its commitment to making a positive impact on the environment, aiming to create a better world for current and future generations.

Visit Website

Secretary DAHD Urges Dairy Federations to Join Circular Economy Movement; Calls for Biogas Projects at State Level to Reduce Dairy Sector's Carbon Footprint

Over 27,000 Household Biogas Plants Installed across 19 States; 1,040 Farmers Earned 11,000 Carbon Credits

India's Milk Market Stable with Low Inflation Rates in November 2024; Dairy Federations Urged to Boost Participation in Midday Meal and ICDS Programs for Greater Impact

A meeting to review the Milk Situation in the country was held under the Chairpersonship of Smt. Alka Upadhyaya, Secretary, Department of Animal Husbandry & Dairying (DAHD), Ministry of Fisheries, Animal Husbandry and Dairying on 18th December 2024 in New Delhi. The meeting was attended by representatives from National Dairy Development Board (NDDB),National Cooperative Dairy Federation of India (NCDFI) along with officials of DAHD and State Cooperative Dairy Federations Milk Unions across the country. Milk situation in the country and the progress being made by the State Milk Federations were discussed in detail during the review.

Secretary (DAHD), Smt. Alka Upadhyaya emphasized that India holds the top position globally in milk production, generating approximately 239.3 million metric tons in the year 2023-24. She emphasized that Dairy Federations should focus on enhancing milk procurement and increasing the price paid to the farmers, while also considering consumer interests. **Secretary DAHD said that the overall milk situation in the country is stable and the Wholesale Price Index (WPI) & Consumer Price Index (CPI) with the year-on-year inflation rates for milk recorded at 2.09 and 2.85 respectively for the month of November 2024. There is an adequate commodity stock of Skimmed Milk Powder, Whole Milk Powder, White Butter, and Ghee. At the same time, there has been an improvement in milk procurement and milk procurement prices over the year.** Secretary (DAHD) advised, all Milk Federations to take up active participation in the Midday Meal and Integrated Child Development Services (ICDS) programs of the Ministry of Women and Child Development (MoWCD) and the Ministry of Human Resource Development (MoHRD), as these represent the largest institutional domestic market for the dairy sector. During the meeting , the initiatives undertaken by the State Milk Federations such as Amul (Gujarat), Nandini (Karnataka), Saras (Rajasthan), and Megha (Jharkhand) were commended, and it was recommended that other Federations should undertake similar efforts. DAHD is also consistently collaborating with MoWCD and MoHRD to promote the inclusion of milk in the Midday Meal and ICDS programs. It was observed that commensurate to the production, consumption of processed dairy has increased by 20%. A detailed discussion was held concerning the strategies and initiatives required to further

enhance the processing of milk to value added products and accordingly detailed presentations was made by NDDB which also offered support to the states for evaluating projects under National Programme for Dairy Development particularly in light of evolving consumer preferences for packaged milk and value-added offerings.

During the review, a presentation on Circular Economy was made by NDDB highlighting the interventions made in the area with respect to the dairy sector. In its presentation, the National Dairy Development Board demonstrated three models of bio gas generation namely the Zakariyapura Model (The Household level biogas-based Manure Value Chain model), the Banaskantha Model (Dung based large capacity biogas plant to produce Bio CBG and Organic Fertilizer) and the Varanasi Model (Dung based large capacity biogas plant to suffice Steam and Power needs of Dairy Plant). These biogas plants are giving a boost to the circular economy by promoting sustainable green fuel energy and producing organic fertilizers. **Till date more than 27,000 household biogas plants have been installed in 19 states across the country under various schemes/ CSR initiatives/ through NDDB support etc.** Two large capacity dung based CNG/Biogas plants with a total capacity of 140 MT/Day of dung are already operationalised and another 11 plants having a combined capacity of 675 MT/Day are under various stages of being taken up.

Further the Household biogas initiative has also helped in generating carbon credits for the Dairy cooperative sector. Under first such initiative, a total of 11,000 carbon credits have been earned by 1,040 farmers, giving boost to both farmer incomes and contributing to the aim of achieving circular economy. It was also informed that NDDB has entered into an MOU with Suzuki R&D Centre India Pvt Ltd (An affiliate of Suzuki Motor Corporation). The major objective of the MOU is to jointly design, develop, implement and scale up innovative business models to efficiently utilize cow dung as a source of energy for fuelling transportation needs and as a rich source of organic fertilizer while achieving carbon neutrality.

Secretary, DAHD advised the dairy federations to work on circular economy in the dairy sector and be proactively involved in getting the benefits in consultation with NDDB. She stated that during the Department's upcoming conference on circularity in the Dairy sector, every State should come up with at least one project on Biogas to join the circularity movement. This will help in reducing the carbon footprint of the dairy sector and at the same time also help in enhancing income of Dairy Farmers. The discussion also included the use of water within the dairy value chain and approaches to ensure its efficient utilization. It was pointed out that the integration of automation could lead to a considerable reduction in water consumption at processing plants, thereby aiding the efforts of the National Water Mission and the National Action Plan on Climate Change.

Secretary DAHD concluded the meeting with remarks on the need of benchmarking in the dairy industry for bringing efficiency, reducing cost of production and the carbon footprint of the industry. The milk federations were also directed to speed up formation of cooperative societies to enhance milk procurement and bring more milk in the organized sector in order to improve the social and economic status of milk producers in India.

ICAR inks MoU with Amity Universities and Institutions

A Memorandum of Understanding was signed between the Indian Council of Agricultural Research and Amity Universities and Institutions, Noida, today at the Agricultural Education Division, Krishi Anusandhan Bhawan, Pusa, New Delhi.

Dr R.C. Agrawal, Deputy Director General (Agril Education), and Dr W. Selvamurthy, President, Amity Science Technology Innovation Foundation, signed the MoU on behalf of their respective institutes in the presence of the ADGs, senior officials of ICAR, and Amity Universities and Institutions.

Dr Agrawal provided an overview of ICAR's initiatives in Agricultural Education and stated that the MoU would mutually benefit both academia and research.

Dr Selvamurthy highlighted the achievements and ongoing initiatives of AMITY. He also lauded ICAR's contributions to food security.

The MoU outlines plans to foster a collaborative academic and research ecosystem, leveraging the strengths of both parties to drive innovation in agriculture. Key areas for future collaboration include joint research, shared facilities, faculty exchanges, and staff training. The partnership aims to enhance agricultural education and research, improve faculty competence, attract talent through scholarships from Amity Universities, and boost the quality of research output.

Input Distribution-cum-training on Poultry Farming

As part of the ongoing Krishi Samridhi Swarna Week (KSSW), an input distribution-cum-training on poultry production and its management was organized today, at ICAR-KVK Dimapur. The event, aimed to provide input distribution-cum-practical knowledge and skills in poultry farming.

Shri Visizolie Virie, Course Director and Deputy Project Director, Agriculture Technology Management Agency (ATMA) Chumukedima, underscored the importance of sustainable poultry management.

A special address was delivered by Shri Bodevi Shuya, District Agriculture Officer and Project Director, ATMA. In his address, Shri Shuya highlighted the significance of poultry farming as a crucial component of the agricultural economy in Nagaland. He emphasized the role of government schemes in promoting poultry production.

Dr Homeswar Kalita, Head, Regional Centre, ICAR-Nagaland Centre, in his keynote address urged the farmers to adopt innovative practices for better productivity and disease management.

The programme began with an ice-breaking session. The informal interaction helped in creating a collaborative atmosphere, allowing farmers to express their concerns and seek solutions to challenges they face in poultry production.

The training session provided an in-depth lecture on poultry rearing and management. Various aspects of poultry farming, including management practices, feeding systems, and disease prevention strategies. The session focused on practical tips for improving the health and productivity of poultry farms.

She also addressed common challenges faced by poultry farmers in the region. The training concluded by distributing 1080 chicks to all the participant farmers.

Altogether 34 farmers and 10 officials attended the programme.

ICAR-DMAPR Signs MoU with Kamdhenu University to Develop Ethnoveterinary Products

ICAR-Directorate of Medicinal and Aromatic Plants Research signed a Memorandum of Understanding with Kamdhenu University in Gandhinagar today to collaborate on the development of ethnoveterinary products using Medicinal and Aromatic Plants (MAPs). ICAR-DMAPR is a national leader in the research and development of medicinal and aromatic plants, while Kamdhenu University focuses on research, education, and extension in veterinary, dairy, fisheries, and allied sciences in Gujarat.

Dr N.H. Kelawala, Vice-Chancellor, Kamdhenu University, highlighted the vast potential of this collaboration in addressing critical issues related to animal health through the application of herbal products.

Dr Manish Das, Director, ICAR-DMAPR, emphasized the importance of action-oriented initiatives to ensure the direct impact of their research on the well-being of end-users.

Dr M.M. Trivedi, Director, Extension Education, Kamdhenu University, also graced the occasion.

The MoU aims to foster joint project proposals and facilitate the sharing of expertise and resources to accelerate research and product development related to the use of medicinal plants for animal health. Key areas of collaboration include the development of innovative herbal products for animal health, the promotion and sale of these products, as well as the exchange of scientific knowledge to enhance research capabilities. The agreement also emphasizes skill development, capacity building, and joint programs for students, entrepreneurs, and scientific faculty.

Cornell Sathguru Foundation Sponsored Entrepreneurship Development Programme

ICAR-National Meat Research Institute, Hyderabad organized a 5-day Entrepreneurship Development Programme on 'Clean Meat Production and Value-added meat Products Processing' from 9th - 13th December 2024. The programme was sponsored by Cornell Sathguru Foundation for Development, Hyderabad, a non-profit foundation promoted jointly by Cornell Sathguru Foundation for development to facilitate sustainable social development for enhancing capacities, knowledge creation, and promoting entrepreneurship.

The Chief Guest, Dr Raja Rajeswari, Associate Vice-President, Cornell Sathguru Foundation-Development, introduced the foundation's initiatives in fostering entrepreneurs in the agriculture sector.

Dr S. B. Barbuddhe, Director, ICAR-NMRI, emphasized the meat sector's potential, challenges, and the role of technical training in bridging gaps. He assured participants of the institute's commitment in providing technical support.

The training focused on hygienic and clean meat production, slaughtering, and dressing of poultry, sheep, and goats. It also included demonstrations on creating value-added chicken and mutton products, packaging, branding, and marketing strategies, aiming to equip participants with practical skills for a competitive edge in the industry.

A total of 17 trainees from Telangana and Andhra Pradesh participated in the training programme.

World Agriculture Forum Welcomes Dr. Tarifa A. Alzaabi, a Visionary Social Scientist and Agriculture Leader, as its Board Member

Dr. Tarifa A. Alzaabi
Director General
International Centre for Biosaline Agriculture

The World Agriculture Forum (WAF) is delighted to announce the appointment of Dr. Tarifa A. Alzaabi, Director General of the International Centre for Biosaline Agriculture (ICBA), as a member of its board. Dr. Alzaabi's exceptional expertise in sustainable agriculture, capacity building, youth empowerment, and gender equality will bring invaluable insights to WAF's mission of fostering global collaboration to address critical agricultural challenges.

With a career spanning over two decades, Dr. Alzaabi has cemented her reputation as a social scientist and global thought leader in agriculture, education, and development. As Director General of ICBA, she has led transformative initiatives aimed at addressing food security in saline and arid regions, combining cutting-edge research with innovative capacity-building programs and stakeholder collaboration.

Dr. Alzaabi is a trailblazer in bridging the gap between science and society to ensure agricultural innovations achieve tangible, sustainable global impact. A passionate advocate for inclusivity, her landmark initiatives include founding the ICBA Youth Engagement Society (ICBA YES), designed to inspire and empower the next generation of agricultural innovators. She also established the Global Alliance for Women in Agriculture (WACCA), which aims to advance women-led agricultural innovation and empower one million women worldwide, championing a more inclusive and innovative future for the sector.

Dr. Jacqueline Hughes, Secretary General of WAF, expressed her enthusiasm for Dr. Alzaabi's appointment: "Dr. Alzaabi embodies a unique combination of expertise, vision, and leadership that aligns with the values of the World Agriculture Forum. Her efforts to promote sustainable agriculture, empower women and youth, and transform saline and arid lands into productive ecosystems inspire action. We are honoured to welcome her to the WAF Board and look forward to her contributions to WAF's global mission."

Dr. Alzaabi has also played a pivotal role in advancing the UAE's agricultural innovation agenda as a member of the Ag-Tech Development Committee. Her entrepreneurial leadership has earned her global recognition, including the prestigious 2015 Businesswoman of the Year Award, presented by His Highness Sheikh Mohammed Bin Rashid Al Maktoum.

Reflecting on her appointment, Dr. Alzaabi shared: "It is a great honour to join the World Agriculture Forum as a board member. Tackling the global challenges in agriculture requires bold, inclusive, and collaborative solutions. I am committed to advancing WAF's mission of fostering innovation and sustainability in agriculture worldwide. My journey at ICBA has shown me the transformative power of empowering women and youth, adopting climate-resilient practices, and leveraging innovative research to combat food insecurity. I am eager to bring this experience to WAF's efforts and work alongside global leaders to drive meaningful, lasting impact in agricultural systems across the globe."

Dr. Alzaabi's appointment highlights WAF's dedication to promoting diverse leadership and addressing critical global challenges such as food security, climate resilience, and sustainable development. Her groundbreaking work in addressing the challenges of saline and arid environments, combined with her steadfast advocacy for inclusivity and innovation, is set to inspire impactful strategies that will shape the future of agriculture on a global scale.

About the World Agriculture Forum

WAF is a global platform connecting diverse stakeholders to drive sustainable agricultural development through policy advocacy, trade facilitation, and technology-driven solutions. WAF unites governments, farmers, agribusinesses, experts, and development institutions to bridge implementation gaps and drive sustainable agriculture and food systems transformation towards a resilient, food-secure future. With a strong focus on collaboration, innovation all along the value chain, and public-private partnerships, WAF is committed to transforming agriculture worldwide.

GrainsWorld Conference 2024: Strengthening Global Collaboration and Resilience in the Grains Sector

The Grains World Conference 2024 commenced with a grand opening ceremony, where an esteemed panel of dignitaries symbolized hope and collaboration in the global grains sector through the ceremonial lighting of the lamp. Distinguished representatives from various countries and organizations gathered to mark the beginning of this key global agricultural event.

The conference was officially inaugurated by a distinguished panel of leaders, including H.E. Mariano Agustin Caucino (Ambassador of Argentina), Mr. Marcelo Schunn Diniz Junqueira (Vice President, SRB), Shri Pasha Patel (Former Member of Maharashtra Legislative Council), Ms. Ariana Guedesde Oliveira (Foreign Affairs Advisor for the State of Mato Grosso to Asia), Mr. Deepak Pareek (Convenor, GGPC), and Mr. Ashwani Bakshi (CEO, ICFA).

The dignitaries emphasized the importance of building resilient agricultural systems, fostering international trade, and ensuring food security amidst challenges like climate change, geopolitical tensions, and market volatility.

The first day of the conference featured a series of engaging discussions, panels, and networking opportunities addressing key global agricultural challenges and opportunities. Experts discussed critical issues affecting the agriculture and grains market, including the urgent need for government intervention to improve market liquidity, the role of modern technologies like remote sensing to tackle data gaps, and the impact of logistics and currency depreciation on price volatility.

Panelists also highlighted the challenges small landholdings present to food security, and the urgent need to balance land scarcity with increasing yields. Insights into global food assistance programs and the role of surplus nations in ensuring food security were also shared by Shri Siraj Hussain, Former Secretary, Department of Food and Public Distribution and Ms. Shweta Saini, Acrus Policy Research. On the other hand, Mr. Arvind Betigeri from the United Nations World Food Programme highlighted successful food assistance efforts.

Delegates discussed India's achievements in agricultural production and the road ahead for global trade participation. Experts like Mr. Arnaud Petit, International Grains Council, discussed India's standing in the global market, and Dr. Azam Pasha, Maalexi, called for improved logistics and financial ecosystems for export hubs. Mr. John Mulongoti, Permanent Secretary from Zambia, noted the country's leadership in seed production and intra-African trade.

The role of digitalization in agriculture was also discussed, focusing on how AI, drones, and remote sensing technologies can help farmers increase productivity, reduce inefficiencies in the supply chain, and promote more effective decision-making in agricultural practices.

In a high-level roundtable, industry leaders and policymakers explored ways to enhance collaboration between governments and the private sector to create more efficient and sustainable agricultural ecosystems.

The day wrapped up with a prestigious award ceremony that recognized outstanding contributions to the agricultural sector. Awards were presented to organizations and individuals who have demonstrated leadership, innovation, and a commitment to advancing sustainable and inclusive agricultural practices.

Zydus Animal Health Withdraws from Investment in Mylab Discovery Solutions

As part of its decision to withdraw from its investment in Mylab Discovery Solutions Private Limited, Zydus Animal Health & Investments Limited (ZAHL) is selling its interests in the diagnostics company to Rising Sun Holding Private Limited, which is controlled by Adar Poonawalla. This sale is being processed as part of the company's withdrawal from the venture. It was once estimated that the deal would be for 106 crores of rupees.

Rising Sun Holdings, an investment company led by Adar Poonawalla of the Serum Institute, sold 6.5 percent of Mylab Discovery Solutions to Zydus Animal Health in June 2023. Zydus Animal Health then purchased the ownership portion of Mylab Discovery Solutions. Following the completion of the purchase by Zydus Animal Health, this new development has occurred more than a year later. It was estimated that the sale was worth 106 crore.

During the meeting that took place today, which was recorded as taking place on December 16, 2024, the Board of Directors of ZAHL granted its permission to the disinvestment of Sale Shares. This approval was given in line with the terms and conditions of the Share Purchase Agreement (SPA). "After that, ZAHL, RSHPL, and Mylab have all signed the termination deed," Zydus Animal Health announced to the financial markets with regard to the termination of the agreement.

There were no reasons presented for the termination of employment. The original transaction was regarded as the first of its type due to the fact that it brought together a pharmaceutical business, a diagnostics company, and a vaccine manufacturer.

After the termination deed was signed, Zydus Animal Health has said that it is expected that the termination would be finalised within fifteen working days. This is the time frame that has been provided.

Futuristic Approaches to Animal Health and Welfare Discussed at Birsa Agricultural University Alumni Meet

Animals should get healthcare services and be treated with the same seriousness, empathy, and compassion as humans, according to Dr. Raj Kumar, the Director of the RIMS. Animal health cannot be considered in a vacuum; they have the same rights with respect to clinical facilities, diagnostic tools, and sickness prevention.

During a symposium and alumni meet on "Futuristic approaches for

animal health, management, and welfare: challenges and opportunities" held on Friday at Birsa Agricultural University's College of Veterinary Science & Animal Husbandry, he emphasised the value of collaborations and synergistic relationships between researchers from various branches, policymakers, governments, and bureaucrats in order to improve animal welfare.

According to him, the world's first animal hospital was established by King Ashoka of Patliputra and had facilities for diagnosis, treatment, quarantine, and shelter. He said that when India's borders were at their widest, the most glorious moment was during the reign of Lord Buddha.
The alumni meet, he says, is a time for rejuvenation and a special opportunity to catch up with old friends from school and childhood, to remember wonderful times associated with the alma mater, and to have fun.

Dr. SC Dubey, the vice-chancellor of BAU, underlined the need of human, animal, plant, and ecological health medicine professionals working together for the health, happiness, and overall well-being of all living things and the planet.

According to him, the World Health Organisation (WHO) has recommended that a protocol for international standards be followed in the process of inquiry and diagnosis in order to ensure that the findings are accepted at the global level. He said that the presence of exotic diseases and pests is causing India a lot of problems. "Traditional wisdom is the basis of modern science," the venture investor said, adding that the agricultural community would benefit more from a harmonic fusion of the two.

In his keynote address, Dr. DK Singh, a former Principal Scientist in the Division of Veterinary Public Health at the Indian Veterinary Research Institute in Bareilly and an RVC alumnus, discussed "Brucellosis in India: diagnosis and control approach."" A book called "30 Iconic Vets" and a collection of research papers on the symposium's subject were also made public in connection with the event.

As the Dean of Veterinary Medicine, Dr. Sushil Prasad, was addressing the guests earlier, he said that the buildings that make up Ranchi Veterinary College and RIMS were constructed simultaneously in the early 1960s. He claims that there are now 32 professors at the institution, down from 105. He said that BAU is the only agricultural university in the country with the power to appoint new professors, according to the State Public Service Commission. Conversely, the other colleges in the nation are in charge of their own hiring procedures.

The dean of the Department of Veterinary Medicine and the event's organising secretary, Dr. Praveen Kumar, proposed a vote of thanks. Both Dr. Pragya Priya Lakda and Dr. Vishakha Singh were anchors of the show. About 350 former students are participating in the event.

Assam to Become Potential Exporter of Fish, Poultry, and Dairy Products, Says Fisheries Minister

The state administration, headed by Chief Minister Himanta Biswa Sarma, aims to make Assam self-sufficient in terms of fish, poultry, and dairy production, according to a statement made on Saturday by Krishnendu Paul, Minister of Animal Husbandry and Veterinary, Fishery, and Public Works (PMGSY).

Paul spoke to the media following the distribution of the "No Dues Certificates" under the Assam Microfinance Incentive and Relief Scheme AM-FIRS (phase III, part II), the relief DBT to Cachar flood victims in 2022 and 2024, and funds for the Pradhan Mantri Formalisation of Micro Food Processing Enterprises Seed Capital scheme in the Cachar district. He stated: "The government, led by the

chief minister, aims to achieve self-reliance in fish production.

onsequently, a strategy has been devised to raise fish production to a maximum of 7 lakh metric tonnes by 2030. Using the waterbodies and wetland regions is our goal, and we will be discussing this with the Department of Forests.

Furthermore, he said that Assam intends to become a possible exporter of fish, poultry, and dairy products in the future, with the goal of potentially exporting these goods to other countries as well as outside. The Fisheries Minister brought to mind the Chief Minister's promise before to the 2021 elections to help debtors who had taken out loans but were unable to pay them back because to the Covid-19 pandemic. According to the Minister of Fisheries, the Chief Minister has fulfilled his pledge to help the populace.

Regarding the Assam Microfinance Incentive and Relief Scheme (AMFIRS), it should be noted that 1,834 recipients received "No Dues Certificates" (phase III, part II). Furthermore, more than one lakh beneficiaries who were impacted by the floods that struck Cachar in 2022 and 2024 received relief DBT in the amount of Rs 46 crore. Additionally, 354 recipients received cash from the Pradhan Mantri Formalisation of Micro Food Processing Enterprises Seed Capital initiative.

Earlier, Mridul Yadav, the District Commissioner of Cachar, took use of the occasion to give the welcome address and outline the event's goals. He was informed that on December 16th, the DBT would be extended. The State administration has been commended for its efforts by the Members of Legislative Assembly (MLAs) of Silchar, Udharbond, and Dholai, Dipayan Chakraborty, Mihir Kanti Shome, and Nihar Ranjan Das, respectively. They have also conveyed their optimism that, under Minister Paul's direction, the Barak Valley and other Assamese areas can discover fresh prospects for growth in the days ahead.

NABARD and KVK Zunheboto Distribute Poultry Equipment to Support Farmers' Livelihoods in Nagaland

At the chicken incubator distribution event that was organised by Krishi Vigyan Kendra (KVK) Zunheboto and Nagaland University (NU) on November 27 at the KVK conference hall in Lumami, five incubators that were supported by NABARD Dimapur were distributed to farmers from five different villages. Through the cultivation of poultry in backyards, the project intended to encourage the development of sustainable livelihoods.

A news statement was issued by KVK, Zunheboto, and NU. According to the Principal Scientist and Head of the Department, Dr.

Rakesh Kumar Chaurasia, the principal guest of the program, Dr. Abemo, the Registrar of Nagaland University, asked the participants to put in a lot of effort in order to transform the program into something more important. In addition to that, he urged them to make use of the incubator in order to raise high-quality chicks on their farms.

During his speech, he emphasised the need of distributing the technology to other communities and applauded the work that KVK has made to promote sustainable chicken farming in the five villages. In addition to that, he expressed gratitude to DDM NABARD for making the trip from Kohima to visit the fields of the farmers and participate in the poultry incubator distribution program.

In order to enhance the socio-economic circumstances of the farmers, he strongly recommended that NABARD Dimapur, in conjunction with KVK Zunheboto, continue to organise such initiatives in the future.

A concise report on the program was delivered by Dr. Rakesh Kumar Chaurasia, who is the Principal Scientist and Head of the organisation. He made the observation that sixty farmers from five different villages had been given one hundred birds apiece, in addition to a month's supply of feed, feeders, and drinkers at their disposal.

It was brought to his attention that as part of the initiative, every town would be provided with an egg incubator that had the capacity to hold 230 eggs. This would ensure the long-term viability of the project as well as the continued proliferation of Rainbow Rooster birds.

Chitubeni Krocha, who is the District Development Manager for NABARD Kohima, urged farmers to turn the poultry project into an entrepreneurial endeavour in order to achieve success. In order to enhance their nutritional security and produce extra revenue, she encouraged female farmers to raise chicks for the purpose of producing meat and eggs, as well as to sell their products in the local market.

Namakkal Poultry Industry Faces Crisis After Oman and Qatar Impose Egg Import Restrictions

The abrupt decision made by Oman to prohibit importing Indian table eggs, citing worries over biosecurity, has caused the poultry business in Namakkal to experience a wave of shockwaves. Due to the prohibition, a cargo worth Rs 15 crore that originated from Namakkal has been stuck in the middle of its journey, resulting in a significant issue for chicken producers in the area.

The move follows closely on the heels of Qatar's decision to impose

weight limitations and prohibit the issuance of import licenses for Indian eggs, citing concerns over the quality and safety of the eggs. The poultry sector in Namakkal, which is a key egg producing centre in Tamil Nadu, has been dealt a heavy setback as a result of the twin blows.

A number of countries, including Oman, Qatar, Dubai, Abu Dhabi, Muscat, Maldives, and Sri Lanka, are among the destinations that Namakkal exports eggs towards. The amount of eggs exported from India has significantly decreased from 11.4 crore to barely 2.6 crore by the month of June. Oman alone is responsible for fifty percent of India's egg exports.

Because of the activities taken by Oman and Qatar, the situation has become a source of worry for the poultry workers in Namakkal. Exporters have expressed their fear that the egg export trade has drastically decreased as a result of these actions. Thousands of individuals in Namakkal who are working in the poultry sector have expressed concerns about their ability to maintain their livelihoods as a result of the situation.

The National Egg Coordination Committee reports that the decrease in egg exports has led to a large loss of money for poultry farmers in Namakkal. This loss of revenue has been a consequence of the reduction in egg exports. It has been requested by the committee that the Centre take action on the matter and find a solution to the problem as soon as possible.

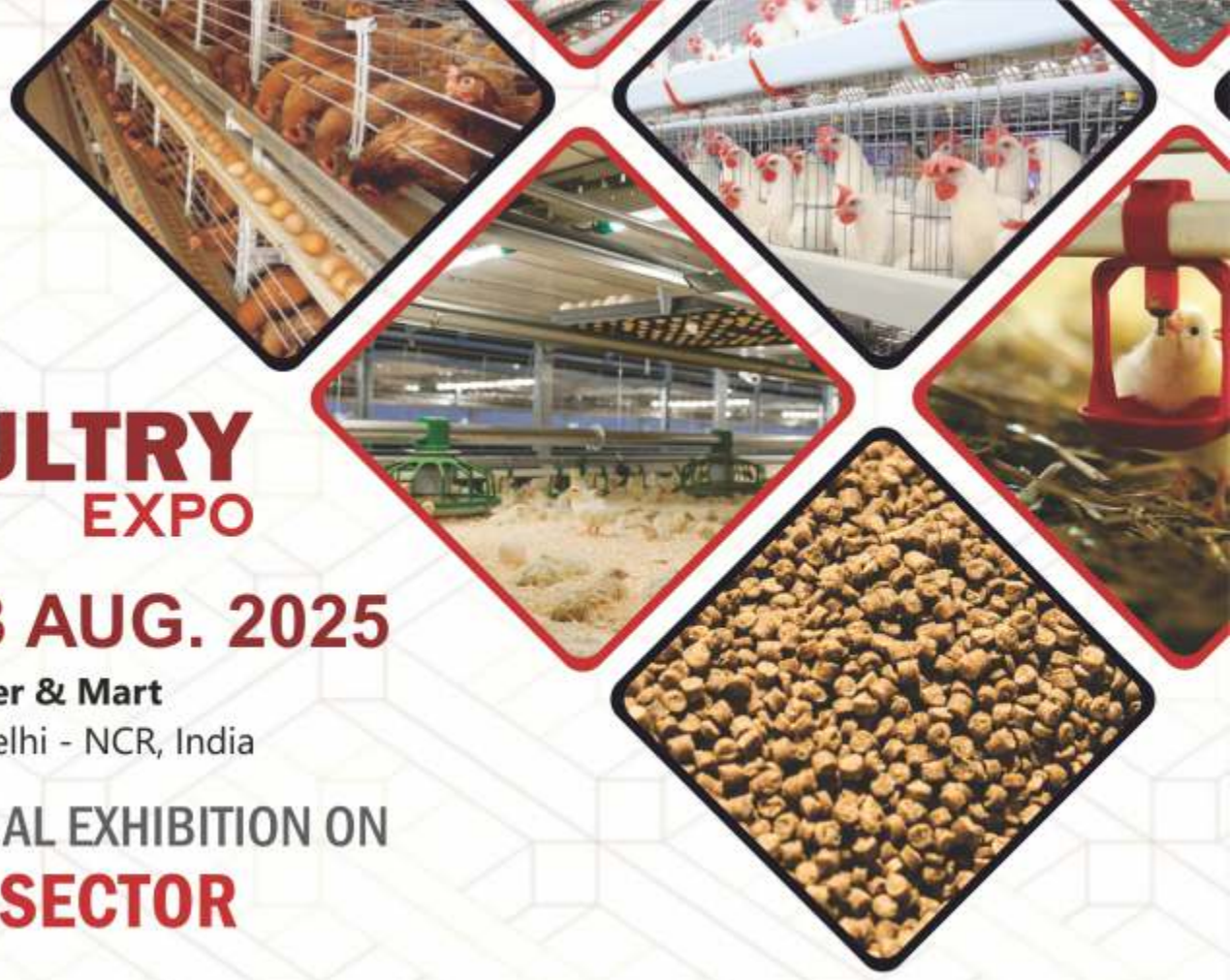
KRN Rajesh Kumar, a member of the DMK, has brought up the matter in Parliament and urged the central government to discuss the matter with authorities from Oman and Qatar in order to find a solution. There have been increasing losses for exporters as a consequence of the restriction, since containers have been unable to move from the Sohar port. Kumar pointed this out.

The Central Government has been strongly encouraged to discuss the topic with the government of Oman and find a solution to the problem as soon as possible. It is the hope of the poultry business in Namakkal that the crisis, which has put the livelihoods of thousands of people in the area in jeopardy, would be resolved as quickly as possible.

New Poultry Units Inaugurated in Kamrup as Part of Assam's Poultry Sector Initiative

An awareness and cum input distribution event was held on December 23 in the Bongsor-Gandhmow cluster in the Sualkuchi region of the Kamrup district of Assam. This program was organised by the State Innovation and Transformation Aayog, the Government of Assam, and the Directorate of Research (Veterinary), Assam Agricultural University, Khanapara on behalf of the Assam Agricultural University. Dr. Mihir Sarma, the Principal Investigator of Samriddhi poultry phase II, was the one who first proposed the program and provided a comprehensive description of the whole project.

The Vice-Chairman of SITA, Narayan Chandra Borkataky, addressed the gathering and emphasised the need of maintaining a consistent effort on farming and preserving money for the future growth of the chicken sector. In addition to this, he



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advised the farmers to improve their skills by participating in the training that was offered by the AAU in Khanapara.

In order to boost egg production, Dhruba Prasad Baishya, who is also the Co-Vice Chairman of SITA, advocated for the promotion of self-employment via chicken farming. The increased production of eggs contributes to the improvement of the nutritional state of the family as well as the improvement of the economics of the home.

During his address, Dr. Probodh Borah, who is the Director of Research (Veterinary) at Ashoka University in Khanapara, strongly encouraged farmers to engage in scientific poultry production in order to empower women and provide opportunities for self-employment.

In order to bring the initiative to a close, Vice Chairman Narayan Chandra Borkataky inaugurated two new poultry units. Dr. Rafiqul Islam, an assistant professor in the poultry science department, and Dr. Sadananda Payeng, an assistant professor in the department of extension education, were also present at the session. Additionally, beneficiaries and officials from SITA were present.

Olam Agri Purchases Senegal's Second-Largest Chicken Feed Manufacturer Avisen for €17 Million

Olam Agri, a global corporation specialising in the food, feed, and fibre industries in developing economies, recently completed the purchase of Senegal's second-largest chicken feed manufacturer, Avisen SARL, which significantly boosted the country's animal feed industry growth.

On a willing-buyer, willing-seller basis, Olam Agri, which is 64.5% controlled by the Singapore-based Olam Group, paid €17 million ($18.4 million) for Avisen, "due to the business performance and prospects of Avisen, as well as the capabilities and synergies between Olam Agri and Avisen."

Founded by two veterinarians, Avisen is a 24-year-old business that has grown to become one of Senegal's largest animal feed providers. More than 100,000 tonnes of feed may be produced annually at the purchased company's feed manufacturing plant in Rufisque.

According to a study on Senegal's poultry value chain commissioned by the Netherlands Enterprise Agency (NEA), the country's rapidly expanding poultry industry is partially the reason Olam Agri is interested in growing its presence there. This trend began in 2005 when Senegal stopped importing poultry products and the private sector there became more dynamic and improved production models.

Eight large enterprises dominate the feed milling industry in Senegal, producing between 50 and 800 tonnes of chicken feed per day. The Forum for Agricultural Research in Africa (FARA) estimates that the market is dominated by Sedima, Olam, NMA Sanders, and FKS Mills, with an annual volume of 300,000 tonnes.

According to Sharad Gupta, head of Olam Agri's Integrated Feed & Protein division, "Avisen has established a stellar reputation in Senegal because of the superior quality of its products, effective distribution system, and field teams offering technical guidance to

poultry growers."

"We will be able to further improve the quality and cost-effectiveness of feed in the Senegalese market by combining Avisen's local market knowledge with Olam Agri's global commodity sourcing networks, strong manufacturing, and formulation expertise," he said.

The firm is moving on with its investment plan in West Africa, which focusses on "investing in proven businesses having strong market positions" as well as enhancing and growing the company's animal feed and protein capabilities in the area.

"This acquisition is in line with Olam Agri's strategy to invest in established companies with dominant market positions and to enhance and broaden its animal feed and protein capabilities," the company said.

With an eye towards profitable expansion and exceptional returns, Olam Agri said that Africa is one of the regional markets in which it is dedicated to "execute its strategy of scaling up its global origination and trading operations while investing in value-added destination processing across Africa and Asia."

The current development of a soybean crush processing plant in Kwara State, Nigeria, is one of Olam Agri's most recent investments in West Africa. In order to support "the development of the local soybean value chain to enhance productivity of local farmers," the business anticipates that the 250,000-ton facility will be put online in the second half of 2024 and integrated with Olam's current animal feed facilities.

Gupta said that Olam Agri would "make necessary investments to grow our feed volumes" and that the firm will use the robust expansion of Senegal's poultry industry to create and deliver high-quality feeds in the future.

Editorial Calendar 2025

Publishing Month: **January** Article Deadline : **28th, Dec. 2024** Advertising Deadline : **30th, Dec. 2024** Focus : **Opportunities and Challenges**	Publishing Month: **February** Article Deadline : **28th, Jan. 2025** Advertising Deadline : **30th, Jan. 2025** Focus : **Budget**	Publishing Month: **March** Article Deadline : **26th, Feb. 2025** Advertising Deadline : **28th, Feb. 2025** Focus : **Disease Prevention**	Publishing Month: **April** Article Deadline : **28th, March 2025** Advertising Deadline : **30th, March 2025** Focus : **Summer Stress Management**
Publishing Month: **May** Article Deadline : **28th, April 2025** Advertising Deadline : **30th, April 2025** Focus : **Cold Chain**	Publishing Month: **June** Article Deadline : **28th, May 2025** Advertising Deadline : **30th, May 2025** Focus : **Nutrition**	Publishing Month: **July** Article Deadline : **28th, June 2025** Advertising Deadline : **30th, June 2025** Focus : **Biosecurity**	Publishing Month: **August** Article Deadline : **28th, July 2025** Advertising Deadline : **30th, July 2025** Focus : **Sustainability**
Publishing Month: **September** Article Deadline : **28th, August 2025** Advertising Deadline : **30th, August 2025** Focus : **Egg Production & Processing**	Publishing Month: **October** Article Deadline : **28th, September 2025** Advertising Deadline : **30th, September 2025** Focus : **Processing & Packaging**	Publishing Month: **November** Article Deadline : **28th, October 2025** Advertising Deadline : **30th, October 2025** Focus : **Winter Stress**	Publishing Month: **December** Article Deadline : **28th, November 2025** Advertising Deadline : **30th, November 2025** Focus : **Food Safety**

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EGG
Daily and Monthly
Prices of November 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	Average
NECC SUGGESTED EGG PRICES																															
Ahmedabad	590	590	590	590	590	590	590	595	595	595	595	595	575	580	585	590	595	595	600	605	605	610	620	625	625	625	625	625	630	635	601.83
Ajmer	535	535	535	537	545	551	570	555	558	558	558	550	550	550	560	575	585	585	589	590	601	615	617	621	624	624	624	624	624	624	578.97
Barwala	524	524	524	526	536	542	546	548	550	550	550	550	550	553	555	565	571	574	579	581	596	606	609	614	617	617	617	617	617	619	570.90
Bengaluru (CC)	585	585	585	585	585	585	585	585	585	585	585	585	585	585	585	585	585	585	585	585	585	590	595	600	605	610	610	610	610	610	590.83
Brahmapur (OD)	545	545	545	545	545	545	560	570	570	570	570	560	550	550	550	570	570	575	575	575	580	592	600	600	605	605	605	610	610	610	573.40
Chennai (CC)	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	610	610	610	610	610	610	602.00
Chittoor	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	603	603	603	603	603	603	595.00
Delhi (CC)	550	550	550	558	563	570	580	580	580	580	580	580	580	580	590	600	608	608	615	615	630	640	640	650	650	650	650	650	650	650	602.57
E.Godavari	550	550	550	550	550	550	560	560	560	560	560	560	540	540	545	550	560	565	565	565	570	580	585	590	595	595	595	595	595	595	566.17
Hospet	535	535	535	535	535	535	535	535	535	535	535	535	535	535	535	535	535	535	535	535	535	540	545	550	555	560	560	560	560	560	540.83
Hyderabad	540	540	540	540	540	545	550	555	555	555	555	555	520	525	530	535	540	545	550	555	560	565	570	575	580	585	590	590	595	600	556.00
Jabalpur	570	570	570	550	562	562	570	575	575	575	575	575	565	565	565	568	580	585	585	585	585	610	610	610	610	614	614	614	614	614	584.07
Kolkata (WB)	600	600	570	570	570	600	620	625	625	625	625	605	595	585	590	610	610	610	595	590	620	645	645	645	645	645	650	665	665	665	617.00
Ludhiana	525	525	525	525	527	540	548	548	548	550	550	550	550	550	553	555	570	573	573	579	579	600	605	605	615	615	615	615	615	615	568.10
Mumbai (CC)	605	610	610	610	610	615	615	620	620	620	620	605	605	605	605	605	615	620	625	625	625	630	640	645	650	655	655	655	660	660	624.67
Mysuru	587	587	587	587	587	587	587	587	587	587	587	587	587	587	587	587	587	587	587	587	587	592	597	602	607	612	612	612	612	612	592.83
Namakkal	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	545	550	555	560	565	565	565	565	565	545.83
Pune	606	606	606	606	606	611	611	615	615	615	615	615	600	600	600	600	610	620	630	630	630	630	635	640	645	651	651	651	655	655	622.00
Raipur	560	561	561	551	551	560	560	570	570	565	555	555	545	545	555	560	575	585	585	585	585	600	600	605	605	610	600	600	600	605	575.47
Surat	605	610	610	610	610	610	610	610	610	610	610	600	590	590	595	600	615	615	615	615	615	625	630	635	640	640	640	640	645	650	616.67
Vijayawada	555	555	555	555	555	555	565	565	565	565	565	565	535	535	540	550	565	575	575	575	575	580	585	590	595	595	595	600	600	605	569.67
Vizag	550	550	550	550	550	550	550	550	550	550	550	550	525	525	530	535	545	550	550	550	555	565	575	580	585	585	585	585	585	585	556.50
W.Godavari	550	550	550	550	550	550	560	560	560	560	560	560	540	540	545	550	560	565	565	565	570	580	585	590	595	595	595	595	595	595	566.17
Warangal	542	542	542	542	542	547	552	557	557	557	557	557	522	527	532	537	542	547	552	557	562	567	572	577	582	587	592	592	597	602	558.00
Prevailing Prices																															
Allahabad (CC)	605	605	595	595	600	610	614	614	600	600	600	600	600	604	610	619	629	633	633	629	633	643	648	652	652	657	657	657	657	662	623.77
Bhopal	580	580	580	570	560	560	560	580	580	580	580	570	570	570	575	585	590	605	605	605	605	610	620	620	630	630	630	630	630	630	594.00
Indore (CC)	580	580	560	560	560	570	570	575	575	570	565	565	560	570	575	580	590	590	590	590	590	600	605	610	610	615	615	615	615	620	585.67
Kanpur (CC)	595	595	595	595	595	614	614	614	614	595	595	595	595	595	595	614	624	624	624	624	633	643	643	657	657	657	657	657	657	662	621.13
Luknow (CC)	567	577	583	583	593	593	614	614	614	614	614	607	607	607	610	620	620	627	633	633	650	657	657	667	667	673	673	673	677	626.57
Muzaffurpur (CC)	585	585	585	585	595	600	605	610	610	610	610	610	600	605	610	625	630	633	640	640	655	665	670	675	680	680	680	680	680	680	630.60
Nagpur	580	595	595	595	595	585	585	585	601	601	601	601	570	570	580	585	590	590	605	605	605	615	625	610	625	625	625	625	625	635	600.97
Patna	585	585	585	585	595	600	605	610	610	610	610	610	600	605	610	625	630	633	640	640	655	665	670	675	680	680	680	680	680	680	630.60
Ranchi (CC)	586	586	586	586	595	600	610	610	610	610	610	610	600	600	610	619	629	629	629	633	638	643	648	657	667	667	657	667	667	671	624.33
Varanasi (CC)	583	573	573	573	583	590	597	600	607	607	607	607	600	600	610	617	623	623	623	623	627	637	650	657	667	667	667	657	660	667	619.17

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