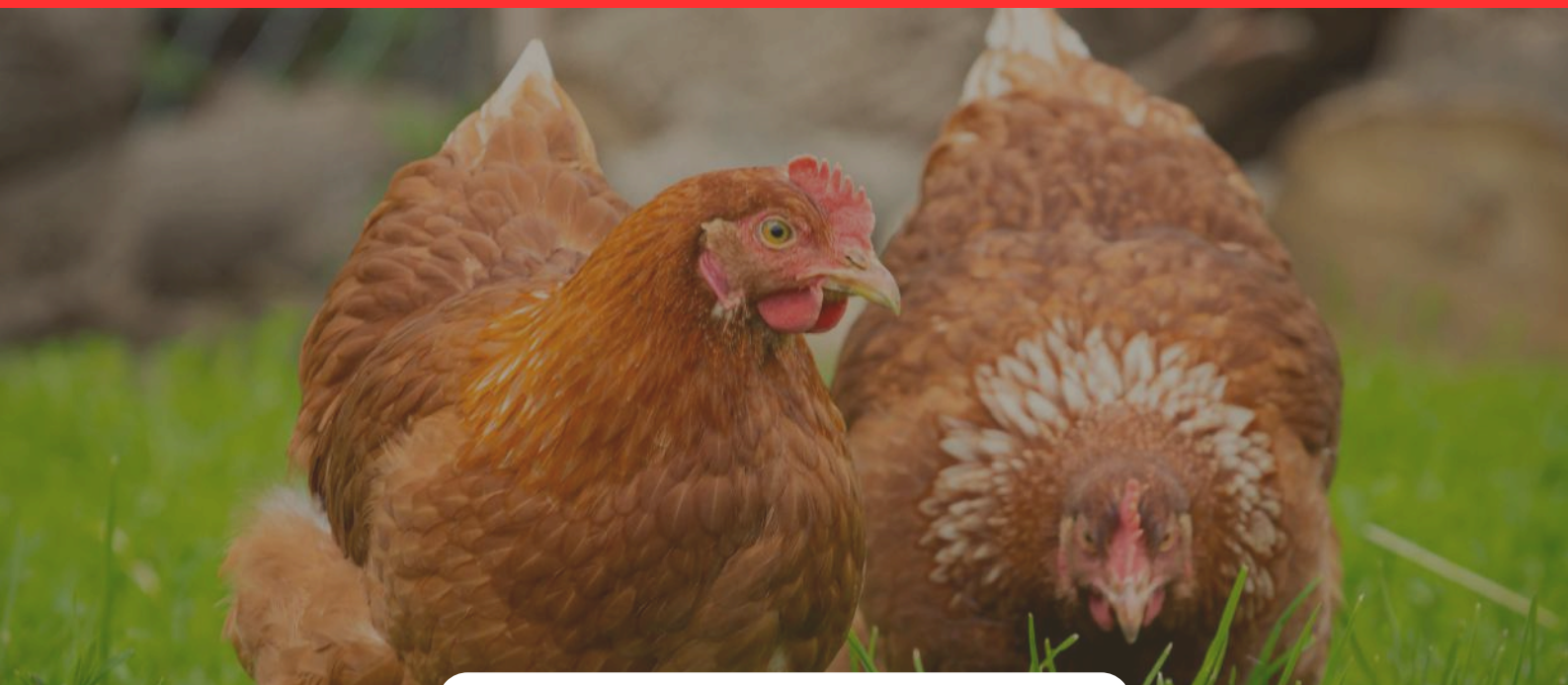
Proceedings of the 1st INTERNATIONAL Graduate Research Conference

March 22, 2025 || Saturday || Virtual Conference



HOSTED & ORGANIZED BY

Poultry Professionals Society - PPS

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1st INTERNATIONAL GRADUATE RESEARCH CONFERENCE 2025

VIRTUAL HYBRID CONFERENCE

22nd MARCH 2025

ORGANIZED & HOSTED BY

POULTRY PROFESSIONALS SOCIETY - PPS

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1st INTERNATIONAL GRADUATE RESEARCH CONFERENCE 2025

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About the Conference

The Graduate Research Conference 2025 provides a platform for graduate students, researchers, and professionals to share innovative ideas and shape the future of poultry science. Explore advancements in nutrition, health, production, genetics, sustainability, and more!

Conference Theme

"Future Directions in Poultry Science"

Key Sessions of the Conference

- Poultry Nutrition & Feed Technology
- Poultry Disease & Health Management
- Poultry Production & Management
- Poultry Genetics, Genomics & Breeding
- Poultry Products Processing & Technology

Aims & Objectives of the confernce

The 1st International Graduate Research Conference, organized by the Poultry Professionals Society (PPS), aims to foster scientific dialogue, innovation, and collaboration in the field of poultry science. This conference provides a platform for researchers, academicians, and industry professionals to share their findings, discuss challenges, and explore solutions to advance the poultry sector.

Key Objectives:

- Advance Research in poultry health, nutrition, genetics, and production.
- Foster Collaboration between academia, industry, and policymakers.
- Address Challenges in disease management and sustainability.
- Empower Young Researchers with a platform to showcase their work.
- Promote Innovation in poultry technology and sustainable practices.

HOST ORGANIZATIONS

POULTRY PROFESSIONALS SOCIETY (PPS)

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WELCOME MESSAGE FROM THE CONFERENCE CHAIR

Dear Esteemed Guests, Speakers, Colleagues, and Participants,

It is with great pleasure that I welcome you to the 1st International Graduate Research Conference, hosted and organized by the Poultry Professionals Society (PPS). This conference serves as a platform for emerging scholars, industry experts, and researchers to engage in meaningful discussions, share groundbreaking insights, and foster collaborations that will shape the future of poultry science.

We are honored to have an esteemed lineup of guest speakers, including **Prof. Dr. Woo Kyun Kim, Prof. Dr. Farina Khattak, Dr. Amit Morey, Dr. Adnan Albrubaye, Dr. Dervan Bryan, Dr. Aftab Siddiqui, Dr. Ashraf Alkhatib, Ms. Cristabel Huerta, and Mr. Lucas Schneider,** whose expertise and contributions continue to advance the field.

I extend my heartfelt gratitude to all participants for being part of this important initiative. May this conference be an inspiring and enriching experience for all.

PROF. DR. TANVEER AHMAD

Conference Chair
Director Poultry Nutrition & Academic Committee
Poultry Professionals Society (PPS)

WELCOME MESSAGE FROM THE SESSION CHAIR

Dear Honored Guests, Respected Speakers, and Esteemed Participants,

It is my privilege to welcome you to this important session on Poultry Health & Disease Management at the 1st International Graduate Research Conference, hosted by the Poultry Professionals Society (PPS). This session focuses on one of the most critical aspects of the poultry industry—ensuring the health and well-being of poultry through advanced disease management strategies, innovative research, and best practices.

We are privileged to have a distinguished panel of experts, including **Prof. Dr. Woo Kyun Kim, Prof. Dr. Farina Khattak, Dr. Amit Morey, Dr. Adnan Albrubaye, Dr. Dervan Bryan, Dr. Aftab Siddiqui, Dr. Ashraf Alkhatib, Ms. Cristabel Huerta, and Mr. Lucas Schneider,** whose insights and expertise will undoubtedly enrich our understanding of the field.

I encourage all attendees to engage actively, ask thought-provoking questions, and make the most of this opportunity to learn from our esteemed speakers.

I extend my sincere gratitude to the organizing committee for their tireless efforts in making this conference a reality. Wishing you all a fruitful and insightful session.

PROF. DR. MUHAMMAD KASHIF SALEEMI

Session Chair
Director Poultry Health Consultancy Committee
Poultry Professionals Society (PPS)

WELCOME MESSAGE FROM THE SESSION CHAIR

Dear Honored Guests, Respected Speakers, and Esteemed Participants,

It is my pleasure to welcome you to this session on Poultry Production and Management at the 1st International Graduate Research Conference, hosted by the Poultry Professionals Society (PPS). This session highlights key advancements in poultry production systems, management strategies, and sustainable practices essential for optimizing productivity and efficiency in the industry.

We are privileged to have a distinguished panel of experts, including **Prof. Dr. Woo Kyun Kim, Prof. Dr. Farina Khattak, Dr. Amit Morey, Dr. Adnan Albrubaye, Dr. Dervan Bryan, Dr. Aftab Siddiqui, Dr. Ashraf Alkhatib, Ms. Cristabel Huerta, and Mr. Lucas Schneider,** whose insights and expertise will undoubtedly enrich our understanding of the field.

I encourage all participants to actively engage in discussions, exchange knowledge, and explore collaborative opportunities that will drive progress in poultry production.

I extend my sincere gratitude to the organizing committee for their tireless efforts in making this conference a reality. Wishing you all a fruitful and insightful session.

DR. JIBRAN HUSSAIN

Session Chair
Director Poultry Production & Management Committee
Poultry Professionals Society (PPS)

WELCOME MESSAGE FROM THE SESSION CHAIR

Dear Honored Guests, Respected Speakers, and Esteemed Participants,

It is my great pleasure to welcome you to this insightful session on Poultry Genetics, Genomics, and Breeding at the 1st International Graduate Research Conference, hosted by the Poultry Professionals Society (PPS). This session aims to explore the latest advancements in genetic research, genomic technologies, and breeding strategies that are shaping the future of poultry science.

We are privileged to have a distinguished panel of experts, including **Prof. Dr. Woo Kyun Kim, Prof. Dr. Farina Khattak, Dr. Amit Morey, Dr. Adnan Albrubaye, Dr. Dervan Bryan, Dr. Aftab Siddiqui, Dr. Ashraf Alkhatib, Ms. Cristabel Huerta, and Mr. Lucas Schneider,** whose insights and expertise will undoubtedly enrich our understanding of the field.

With rapid advancements in genetic engineering, precision breeding, and bioinformatics, poultry science is evolving faster than ever. I encourage all participants to engage, exchange ideas, and contribute to the future of poultry genetics and breeding.

I extend my sincere appreciation to the organizing committee and all contributors for their efforts in making this session possible. Wishing you all an enlightening and productive session.

DR. NASIR MUKHTAR

Session Chair
Director Poultry Advisory Committee
Poultry Professionals Society (PPS)

WELCOME MESSAGE FROM THE SESSION CHAIR

Dear Honored Guests, Respected Speakers, and Esteemed Participants,

It is my pleasure to welcome you to this session on Poultry Products Processing and Technology at the 1st International Graduate Research Conference, hosted by the Poultry Professionals Society (PPS). This session focuses on advancements in poultry meat and egg processing, value addition, quality control, and emerging technologies shaping the industry.

We are privileged to have a distinguished panel of experts, including **Prof. Dr. Woo Kyun Kim, Prof. Dr. Farina Khattak, Dr. Amit Morey, Dr. Adnan Albrubaye, Dr. Dervan Bryan, Dr. Aftab Siddiqui, Dr. Ashraf Alkhatib, Ms. Cristabel Huerta, and Mr. Lucas Schneider,** whose insights and expertise will undoubtedly enrich our understanding of the field.

We are privileged to have distinguished experts with us, whose insights will provide valuable perspectives on innovations in processing techniques, food safety, and sustainability.

I encourage all participants to engage in meaningful discussions, exchange ideas, and explore new opportunities that will drive progress in poultry product processing. Wishing you a productive and insightful session.

DR. FARHAN FAROOQ

Session Chair
Director Poultry Innovation & Extension Committee
Poultry Professionals Society (PPS)

WELCOME MESSAGE FROM THE CONFERENCE SECRETARY & FOUNDER PRESIDENT PPS

Dear Esteemed Guests, Speakers, Colleagues, and Participants,

Welcome to the 1st International Graduate Research Conference, organized by the Poultry Professionals Society (PPS). This event marks a significant step in advancing poultry science through research, innovation, and collaboration.

We are honored to host distinguished experts, including **Prof. Dr. Woo Kyun Kim, Prof. Dr. Farina Khattak, Dr. Amit Morey, Dr. Adnan Albrubaye, Dr. Dervan Bryan, Dr. Aftab Siddiqui, Dr. Ashraf Alkhatib, Ms. Cristabel Huerta, and Mr. Lucas Schneider,** who will share valuable insights across key areas of poultry health, genetics, production, and processing. To my colleagues, your dedication to scientific progress is truly inspiring. I encourage active participation and knowledge exchange to drive meaningful advancements in our field.

My sincere gratitude to the organizing team, session chairs, and sponsors for making this event possible. Wishing you all a successful and enriching conference!

MR. MUHAMMAD SAYYAM AKRAM

Conference Secretary & Chief Organizer
Founder President PPS
Poultry Professionals Society (PPS

PLENARY TALKS

PROF. DR. WOO KYUN KIM

Department of Poultry Science, University of Georgia, USA
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Advancing Poultry Health and Performance: Nutritional Strategies to Combat Enteric Challenges and Optimize Growth in Broilers and Layers

ABSTRACT: One of the most common enteric diseases in poultry is coccidiosis, which has caused tremendous economic loss in the poultry industry worldwide[1]. Coccidiosis is caused by protozoan parasites, Eimeria spp., including E. acervuline, E. brunetti, E. maxima, E. necatrix, and E. tenella[2]. Eimeria spp. inhabit different segments of the intestine and start their life cycle, causing intestinal damage, hemorrhagic diarrhea, oxidative stress, inflammation, feed intake reduction, nutrient absorption impairment, and growth retardation[3–6]. Thus, identifying nutritional strategies to minimize the detrimental effects of coccidiosis and improve gut health and growth performance is important for the poultry industry. There are several potential nutritional strategies. One of them is using bioactive compounds from herbal plants as feed additives, such as tannins and Artemisia. Tannins are polyphenol compounds found in many plants, including chestnut, sorghum, fruit, and beans, and can be classified as hydrolysable and condensed forms[7]. Although tannins are considered antinutritional factors because they inhibit digestive enzyme activity and protein digestion in poultry, the proper dosage of tannins may have beneficial effects. Tannins have potential antimicrobial, antioxidant, and anti-inflammatory effects[8–9]. Thus, we evaluated the effects of different dietary levels of tannic acid (0.05%, 0.275%, and 0.5%) on growth performance and gut health in broilers challenged with Eimeria maxima[10]. During the challenge period, 0.05% and 0.275% tannic acid treatments maintained similar growth performance compared to the challenge control; however, 0.5% treatment significantly reduced growth performance. The tannic acid treatments significantly reduced oocyst shedding compared to the challenge control, indicating that tannic acid may affect the Eimeria maxima life cycle in the intestine. The 0.05% and 0.275% tannic acid groups showed reduced gut permeability, whereas the 0.5% tannic acid treatment did not show any improvement. In addition, the 0.275% tannic acid treatment significantly improved the digestibility of dry matter and organic matter

compared to the challenge control. This study demonstrates that supplementation with 0.05% to 0.275% tannic acid has beneficial effects on nutrient digestion, gut integrity, and the Eimeria life cycle in broilers challenged with Eimeria maxima. Another potential herbal supplement is Artemisia. Artemisia is an herbal plant containing artemisinin, a natural flavonoid. Artemisia has antimicrobial and antiparasitic properties; it inhibits the Eimeria life cycle, sporulation, lesion score, and oocyst shedding in broilers[11–12]. However, no studies have been conducted to evaluate the effects of Artemisia in laying hens. Thus, we evaluated the effects of Artemisia supplementation (0.5% and 1%) on laying performance and gut health in laying hens challenged with mixed Eimeria species[13]. The results showed that supplementation with 1% Artemisia increased egg production and improved feed conversion ratio compared to the challenged control. Moreover, 1% Artemisia inclusion minimized intestinal damage caused by Eimeria spp. and increased the recovery of intestinal villi. Artemisia supplementation improved intestinal integrity, as measured by gut permeability, reducing the gut permeability caused by Eimeria spp. In summary, enteric diseases like coccidiosis increase intestinal damage, inflammation, and oxidative stress and reduce feed intake, growth performance, and nutrient digestion/absorption in poultry. Thus, identifying effective bioactive feed additives to minimize the detrimental effects of enteric diseases and stimulate fast recovery is critical for sustainable poultry production.

BIOGRAPHY: Dr. Woo Kyun Kim is a professor of poultry nutrition in the Department of Poultry Science, University of Georgia. He received a BS in animal science from Konkuk University (South Korea) in 1992, a MS in poultry science from the Pennsylvania State University in 1998, and a PhD in nutritional science from the Pennsylvania State University in 2002. He has been trained as a Postdoc Fellow from Texas A & M University and University of California Los Angeles. His research has focused on functional roles of amino acids, vitamins/minerals, and feed additives on nutrient utilization, gut health, and bone health in broilers and laying hens under challenge conditions such as antibiotics free condition, nutrient imbalance, pathogen infection, coccidiosis, enteric diseases, and heat stress. He has published over 260 peer-reviewed papers and secured over $20 million in funding from USDA, NSERC, and global organizations. He has led international collaborations across 15+ countries and delivered 100+ invited talks. Additionally, he has mentored 30 graduate students (25 Ph.D., 5 M.Sc.).
He was the recipient of the University of Georgia Student Career Success Influencer Award (2024), the D.W. Brooks Award-International Agricultural and Environmental Sciences (2023), the National Chicken Council Broiler Research Award (2023), the University of Georgia-CAES Outstanding Mentor Award (2021), the PSA American Feed Industry Association Nutrition Research Award (2020).

PROF. DR. FARINA KHATTAK

Monogastric Science Research Centre, Scotland's Rural College, UK
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Prebiotics, Probiotics, and Synbiotics: Modern Approaches to Food Safety and Antimicrobial Resistance in Poultry

ABSTRACT: Antimicrobial resistance (AMR) occurs when microorganisms develop the ability to withstand drugs that once killed or inhibited them, often due to genetic mutations or acquired resistance genes. This leads to reduced treatment effectiveness and an increased risk of infections. While antibiotic resistance naturally occurs, its acceleration is driven by the misuse and overuse of antibiotics, particularly in animals. AMR has become a significant global health threat, with poultry production being one of the main contributors. Historically, antimicrobial growth promoters (AGPs) have been used in poultry to enhance performance and prevent disease, but regulatory bans on AGPs have necessitated the exploration of alternative strategies to maintain poultry health while mitigating the spread of AMR. AMR in livestock, including poultry, not only creates a dangerous reservoir for the contamination and spread of AMR genes through the environment but also poses a risk to human health. The transfer of resistant bacteria to humans through zoonosis and horizontal gene transfer allows AMR genes from zoonotic pathogens to be incorporated into the human gut microbiota. This is particularly concerning with pathogens like Campylobacter, which exhibit resistance to a range of antibiotics, including fluoroquinolones, erythromycin, clindamycin, kanamycin, and ampicillin. Effective control of common poultry-associated foodborne pathogens, such as Salmonella spp., Campylobacter jejuni, and Escherichia coli, is essential to ensuring food safety and protecting public health. In this context, the need for antibiotic alternatives has become critical, as AMR reduces the effectiveness of conventional treatments, increasing the risk of foodborne illnesses. Without intervention, antibiotic- resistant pathogens persist in poultry systems, contaminating the food supply and posing serious health risks. Non-antibiotic interventions offer a promising solution to mitigate these risks by reducing pathogen prevalence at the pre-harvest stage, thus improving poultry

product safety. Several strategies have been implemented to reduce the spread of AMR in poultry production, including enhanced antimicrobial surveillance, reduced antimicrobial usage, improved management practices, and the development of alternative antimicrobial approaches. Among these, probiotics, prebiotics, Synbiotics, and bacteriophage therapy have emerged as key alternatives. Probiotics are live microorganisms, such as Lactobacillus, Bifidobacterium, Bacillus, and Saccharomyces, that confer health benefits when administered in adequate amounts. These beneficial microbes help improve gut health by modulating microbial communities, producing bacteriocins and organic acids, competing with pathogens for nutrients, and enhancing immune responses. Research has shown that Lactobacillus species can inhibit the growth of Campylobacter spp., and reduce its virulence gene expression, ultimately lowering pathogen loads in poultry. In addition to their antimicrobial properties, probiotics also support digestion and overall poultry performance. Prebiotics, which are non-digestible compounds that selectively promote the growth of beneficial gut microbiota, include examples such as fructo-oligosaccharides (FOS), mannan-oligosaccharides (MOS), and inulin. These compounds promote short-chain fatty acid (SCFA) production, lower intestinal pH, and create an environment conducive to beneficial bacterial growth. While prebiotics do not directly target pathogenic bacteria, they indirectly reduce its presence by creating an unfavourable environment for pathogen colonization. Synbiotics, a combination of probiotics and prebiotics, further enhance gut health by providing both live beneficial bacteria and substrates to support their growth. Research indicates that Synbiotics can improve microbiota composition, boost immune function, and reduce pathogen loads more effectively than probiotics or prebiotics alone. For example, combinations of L. reuteri, E. faecium, and FOS have been shown to reduce Salmonella infections while supporting poultry growth. Other promising alternatives include bacteriophages, which are viruses that specifically target bacteria and have been shown to successfully reduce pathogenic bacteria levels in broilers. Additionally, avian antimicrobial peptides (AAPs), such as β-defensins and cathelicidins, exhibit strong antimicrobial activity against Gram-negative bacteria. Commensal bacteria- produced bacteriocins also act as natural antimicrobials, aiding pathogen control in poultry systems. Integrating these non-antibiotic strategies into poultry production can enhance food safety, reduce AMR-related risks, and promote sustainable practices. Future research should continue to optimise these approaches, investigate strain-specific interactions, and develop effective formulations to ensure their successful application, ultimately safeguarding both animal and human health.

Biography: Professor Dr. Farina Khattak earned her PhD from the University of Aberdeen, UK in 1997 and has since been extensively involved in teaching and research in Poultry Science. She is based at the Scottish Rural College (SRUC) in Edinburgh, UK, where she is in charge of the start of art poultry research facility commonly known as "Allermuir" and leads the poultry nutrition research. Dr Khattak collaborates closely with national and international poultry industry partners. Her work focuses on innovative strategies to enhance poultry nutrition, health, and sustainability. Her main area of interest are feedstuff evaluation, nutritional interventions, exogenous feed additives and host-pathogen interactions to develop nutrtional strategies for optimising poultry production, gut health, disease resistance and food safety.Through her work, she bridges academic advancements with industry needs, driving innovation, efficiency, and sustainability in the poultry sector.

DR. AMIT MOREY

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Artificial Intelligence in Poultry Production: Transforming Meat Quality Assessment and Processing Efficiency

ABSTRACT: The integration of artificial intelligence (AI) in poultry production is revolutionizing meat quality assessment and processing efficiency. Traditional evaluation methods relying on manual inspection are time-consuming, subjective, and inconsistent. AI-driven technologies offer enhanced precision, reduced processing time, and improved product quality, addressing key concerns such as woody breast (WB), white striping (WS), and spaghetti meat (SM) myopathies in broiler fillets. Machine learning (ML) models have demonstrated high accuracy in detecting and classifying myopathies. Siddique et al. (2022) utilized supervised and unsupervised ML techniques to enhance quality control measures, while Valenta et al. (2023) highlighted AI's ability to identify WS, WB, and SM concurrently, reinforcing its utility in automated defect detection. Beyond quality assessment, AI enhances processing efficiency through predictive modeling. Herron et al. (2022) demonstrated AI's role in optimizing supply chains and minimizing food losses from cold chain disruptions. AI-based bioelectrical impedance analysis (BIA) has also proven effective for real-time WB detection, offering a non-destructive alternative (Morey et al., 2020). AI applications extend to food safety and shelf-life improvements. Optical technologies, as described by Chowdhary and Morey (2020), enhance contamination detection in slaughter facilities, ensuring compliance with safety regulations. Antimicrobial interventions (Kataria & Morey, 2020) and functional ice treatments (Kataria et al., 2020) have also benefited from AI-driven optimization, improving microbial control and extending meat freshness. Meta-analytical approaches further validate AI's role in poultry research. Siddique et al. (under review) analyzed factors such as bird age, deboning time, and cooking conditions in WB severity, providing insights that can refine predictive AI models for optimized processing conditions. AI's transformative impact in poultry production is evident in

its ability to enhance efficiency, minimize losses, and improve meat quality. By leveraging AI-driven classification models, optical technologies, and predictive analytics, the industry can achieve sustainable advancements. Future research should focus on refining AI algorithms, expanding datasets, and integrating automation technologies to further revolutionize poultry processing and meet the growing global demand for high-quality poultry products.

BIOGRAPHY: Dr. Amit Morey is an Associate Professor in the Department of Poultry Science at Auburn University. He holds a Ph.D. in Poultry Science from Auburn University, an M.S. in Seafood Science from the University of Alaska Fairbanks, an M.F.Sc. in Industrial Fishery Technology from the University of Agricultural Sciences Bangalore, and a B.F.Sc. in Fish and Fisheries Science from Dr. B.S. Konkan Agricultural University, India.

Dr. Amit has extensive experience in poultry processing, food safety, and quality enhancement. Before joining Auburn, he served as an Assistant Professor (2015–2020), President of I.D.E.A. Food Industry Consultants, Inc., and Principal Scientist at Food Safety Net Services. His research focuses on woody breast myopathy, advanced detection technologies (MRI, elastography, bioelectrical impedance), and Sustained Antimicrobial Release Mechanisms (SARM) to improve poultry product quality and safety.

A member of several professional associations, Dr. Amit is also a grant reviewer for USDA-NIFA, SARE, and USDA Meat & Poultry Plant Expansion Program. He serves as a manuscript reviewer for leading journals, including Poultry Science, Journal of Applied Poultry Research, and Nature Communications. His work has been widely recognized, with media features in Food Technology Magazine, Meating Place, and international news outlets.

KEYNOTE TALKS

DR. ADNAN ALRUBAYE

Assistant professor of Poultry Science and the Associate Director of the Cell and Molecular Biology (CEMB) Graduate Program at the University of Arkansas. USA.

Corresponding Author Email: aakhalaf@uark.edu

Pathogenesis, Diagnosis, Induction, and Control of Bacterial Chondronecrosis with Osteomyelitis in Broiler Chickens

ABSTRACT: Bacterial Chondronecrosis with Osteomyelitis (BCO) lameness in broiler chicken was first reported in 1972 and has become the top economic and animal welfare issue facing the poultry industry. BCO can be caused by various bacterial species and typically starts to develop in the vulnerable joints of high body weight broilers leading to eventual lameness. Pathogens in the aerosol of chicken houses can be inhaled and or ingested by broiler chickens through diet and drinking water. A stressful condition of over-body weight broilers jeopardizes their immune system, thereby promoting bacterial translocation across epithelial lumens of the gastrointestinal or respiratory tracts to the bloodstream and eventually colonizing the growth plate of long bones causing lameness. Subclinical BCO lameness infections are widespread and can adversely impact animal well-being and meat quality. BCO lameness financially affects the sustainability of the broiler industry because of the condemnation of lame birds at the marketing age. The regular lameness rate in broiler chickens varied from 3% up to 15%, resulting in mortality rates ranging from 5% to 10%. In the early 2010s, 12.5 billion broiler chickens were estimated to experience leg problems worldwide. In 2023, the broiler production value in the United States is approximately $42.5 billion, with a regular 6% loss, it is estimated that the financial burden for the poultry industry due to this skeletal disorder is approximately $2.5 billion.

The primary focus of our research is to identify the specific bacterial pathogens responsible for BCO lameness. In addition, our group is actively investigating practical mitigation strategies. A key area of our research involves exploring the use of feed additives, such as probiotics, prebiotics, and synbiotics, to reduce the incidence of BCO lameness. Furthermore, we are at the forefront of developing a bacterial vaccine to reduce the incidence and severity of BCO lameness. Having developed a validated and novel experimental aerosol transmission induction

method that improves lameness research translatability to an industrial setting, several of his recent projects have revolved around supplements in the broiler diet that may bolster protective effects against BCO lameness etiological agents during the animal's productive life cycle. Research findings from his graduate group have offered extensive insights into the productive effects investigated supplements have on clinical BCO lameness outcomes and pathophysiological changes, including inclusion levels and timing and application methods. Currently, his research group is focusing on the investigation of the animal's internal microbiota and associated changes in different treatment groups in relation to clinical BCO lameness pathology, as well as the development of a vaccine against the disease.

BIOGRAPHY: Dr. Adnan Alrubaye is an Assistant Professor of Poultry Science and Associate Director of the Cell and Molecular Biology Graduate Program at the University of Arkansas. He earned his Doctorate in Cell and Molecular Biology after completing his Bachelor's in Veterinary Medicine and Master's in Medical Microbiology from the University of Baghdad.

Dr. Alrubaye's research focuses on preventive strategies against bacterial chondronecrosis with osteomyelitis (BCO) lameness—a major animal welfare and economic concern in the poultry industry. His work identifies BCO-causing pathogens and explores feed additives (probiotics, prebiotics, synbiotics) and bacterial vaccines to mitigate the disease. He has pioneered a novel aerosol transmission method to enhance industrial research applicability. His team also investigates gut microbiota changes and supplement efficacy in reducing BCO severity.

Dr. Alrubaye has received numerous awards, including the UA Outstanding New Faculty Advisor Award, Imhoff Award for Teaching & Mentorship, Fulbright College Master Teacher Award, and Hoyt H. Purvis Award for International Education.

DR. DERVAN BRYAN

Assistant Professor of Poultry Science, Pennsylvania State University, USA

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Protein Sources Characterization Impact on Broiler Performance and Health

ABSTRACT: This research investigates the characterization of various protein sources and their effects on broiler performance, digestive tract morphology, and caecal fermentation metabolites within an antibiotic-free production system. With growing concerns regarding the elimination of in-feed antibiotics and the necessity for alternative dietary strategies, the research explores how protein digestion kinetics and undigested protein fractions influence broiler health and performance. Protein quality is a critical determinant of broiler growth, as its digestibility affects amino acid availability, gut microbiota composition, and fermentation metabolites (Wilkie et al., 2006; Qaisrani et al., 2014). The hypothesis suggests that different protein sources affect broiler performance through variations in digestion rates, leading to changes in gut morphology and caecal fermentation metabolites.

This research is divided into in vitro and in vivo experimental phases. The in vitro study developed a digestion assay to quantify protein digestion kinetics, utilizing the Ørskov & McDonald (1979) model for data analysis. Results demonstrated variability in protein digestion rates among common feed ingredients, including soybean meal, fish meal, corn gluten meal, and porcine meal, highlighting the assay's effectiveness in evaluating protein digestion kinetics. The in vivo study assessed protein digestion extent, amino acid release along the digestive tract, and distal ileum residual protein content in Ross 308 broilers. Findings indicated significant differences in protein source digestibility, supporting previous research that protein digestion rates influence amino acid availability and muscle accretion (Boirie et al., 1997; Lacroix et al., 2006). We examined the role of indigestible protein fractions on broiler production performance and meat yield. Broilers fed diets with higher indigestible protein levels exhibited compromised growth and reduced mortality, particularly when challenged with coccidiosis vaccination. These findings suggest that dietary protein characteristics influence disease resistance, possibly by altering gut microbiota and immune function (Apajalahti &

Vienola, 2006). Morphological analyses of the digestive tract showed that indigestible protein increased the size of certain tissues, such as the pancreas and proventriculus, indicating physiological adaptations to dietary composition. Analysis of the caecal content revealed that undigested protein could influence ammonia and short-chain fatty acid levels, suggesting increased microbial fermentation of residual protein.

Our research suggested that dietary proteins are more than amino acid sources; they possess unique digestion kinetics that impact broiler growth, health, and gut microbial ecology. These findings emphasize the importance of considering protein digestion characteristics when formulating diets for antibiotic-free poultry production. Future research should explore the interaction between protein sources and gut microbiota composition to optimize poultry nutrition further. The results contribute to a growing body of literature on precision nutrition strategies, aiding the poultry industry in transitioning toward sustainable and antibiotic-free production systems (Moughan et al., 2014; Drew et al., 2004).

BIOGRAPHY: Dr. Deruan D.S.L. Bryan is an Assistant Professor of Poultry Science at Pennsylvania State University, specializing in layer and breeder production, egg production and quality, poultry management and welfare, and avian nutritional physiology and metabolism. He earned his Ph.D. in Animal Science from the University of Saskatchewan in 2018, following an M.Sc. from Dalhousie University in 2013 and a B.Sc. from Nova Scotia Agricultural College in 2011. Dr. Bryan's research focuses on enhancing the efficiency and sustainability of poultry production systems by manipulating avian physiology through dietary, management, and environmental strategies. His extension program aims to build capacity in the poultry industry by training qualified personnel, fostering leadership development, and facilitating information exchange at local, national, and global levels. His scholarly contributions include publications on protein digestion kinetics in poultry and the nutritive value of canola meal for broilers.

DR. NASIR MUKHTAR

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Comb as a Reliable Trait for Genetic Selection in Chickens

ABSTRACT: The comb, a distinct external feature in chickens, has long been associated with various physiological and reproductive traits. As an easily observable and heritable characteristic, the comb serves as a reliable indicator of genetic potential and overall health status. This study explores the significance of comb morphology in genetic selection programs, particularly in relation to production performance, fertility, and adaptability.

Comb size, shape, and color are controlled by multiple genes, primarily influenced by sex hormones and environmental factors. The varying comb size in both sexes of chicken was due to different hormones of comb which helps in increase or decrease in size of comb Research indicates that larger and well-developed combs are positively correlated with higher testosterone levels, which, in turn, enhance reproductive efficiency in males. In females, comb size has been linked to early sexual maturity and superior egg production. Selection for specific comb traits can, therefore, aid in improving overall reproductive performance in both broiler and layer breeds.

Beyond reproductive advantages, the comb also plays a critical role in thermoregulation. Chickens dissipate excess body heat through their combs, making it an essential trait for birds raised in hot climates. Studies have shown that breeds with well-developed combs exhibit better heat tolerance and lower mortality rates under heat stress conditions. Selecting for comb traits can thus contribute to genetic improvement programs aimed at enhancing adaptability and resilience in different environmental conditions.

Furthermore, the comb serves as a secondary sexual characteristic influencing mate selection. Hens are often attracted to roosters with prominent, bright-colored combs, suggesting a link between comb development and genetic fitness. This preference underscores the role of comb traits in natural selection, further reinforcing its potential in breeding programs.

Despite these benefits, challenges exist in using comb traits for genetic selection. Variability due to environmental factors, such as nutrition and disease, may influence comb development.

However, advanced genetic tools, such as marker-assisted selection and genomic selection, have made it possible to identify genetic markers associated with desirable comb traits, enhancing the precision of breeding programs.

The comb is a reliable and economically significant trait for genetic selection in chickens. Its strong association with reproductive performance, thermoregulation, and mate selection makes it a valuable criterion in breeding programs. Integrating comb traits into modern genetic selection strategies can improve productivity, adaptability, and overall poultry health, ultimately benefiting both commercial and indigenous chicken populations. Further research on the genetic basis of comb development will enhance the effectiveness of selection programs and contribute to sustainable poultry production.

BIOGRAPHY: Dr. Nasir Mukhtar has twenty-four years of experience in industry, teaching, research, and administration. His research focuses on poultry nutrition, poultry science, extension, and microbiome. He has completed unique projects in collaboration with the Roslin Institute, University of Edinburgh, NOVUS USA, NOQU France, USSEC USA, and the poultry industry. He earned his Ph.D. from the University of Agriculture Faisalabad, Pakistan, and completed his post-doctorate at the Roslin Institute, University of Edinburgh, Scotland, UK. He served as the Head of the Department of Poultry Science for thirteen years and was the Officer-In-Charge of the Poultry Science Academy at PMAS Arid Agriculture University, Rawalpindi, Pakistan. Currently, he is an Associate Professor of Animal Nutrition. He has supervised 6 Ph.D. and 12 M.Phil. students and authored 6 books and 42 national and international peer-reviewed research articles. Dr. Mukhtar has completed five unique research projects in collaboration with industry and the international community. He is a life member of the World's Poultry Science Association (WPSA), a member of the British Society of Animal Science (BSAS), an accredited member of the Pakistan Veterinary Medical Council, a life member of the Zoological Society of Pakistan, a member of "Care thy Nature," a member of the Society of Development and Sustainability in Japan, a member of the American Academy of Veterinary Nutrition (USA), and a member of the American Association for the Advancement of Science (USA). He has organized eleven national and international conferences and multiple training workshops with the industry. Moreover, he is the General Secretary of the WPSA Pakistan branch and the Vice President of the Asian Pacific Federation of WPSA (Thailand). He is also the Group Leader (Global Chair) of Small-Scale Family Poultry Farming of WPSA. Dr. Mukhtar has presented his dynamic views on poultry science and animal nutrition at national and international conferences. He is a member of the editorial board of the World's Poultry Science Journal and Elsevier Guest Editor of special issue Poultry Science.

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Breeding for Excellence in Backyard Poultry of Pakistan

ABSTRACT: Pakistan ranks 12th in poultry egg production and 18th in poultry meat production in the world (https://ourworldindata.org/) demonstrating significant contribution and growth to international poultry market. Backyard poultry breeding in Pakistan plays a vital role in improving rural livelihoods, food security, and nutritional standards. Typically, birds used in backyard poultry farming have low productivity. The present study aimed at identifying key methods for improving backyard poultry in Pakistan. Overall objective of a breeding program is to enhance the genetic potential of local poultry breeds for traits of economic importance such as live body weight and egg production. Poultry germplasm suitable for the backyard production system in Pakistan can be developed through three methods. First one is the selective breeding in indigenous poultry breeds. This method is relatively slow but promises permanent improvement in productivity of birds besides maintaining and conserving uniformity in terms of true breed characteristics. The output of this system comes in the form of birds with greater growth and egg production which can be easily propagated at farmer level for widespread use. Second method involves crossbreeding of indigenous poultry breeds with high-yielding exotic breeds like White Leghorn, Fayoumi, and Rhode Island Red. In this methods, hybrid vigor or heterosis of two breeds is capitalized to achieve higher productivity in intended traits. This method requires relatively shorter time interval however future breeding of crossbreds becomes a chronic issue where loss of heterosis is often observed. Therefore, this method needs careful planning and continuous supply of purebreds for generating crossbred for onward transfer to farmers for enjoying accelerated growth and egg production. Another negative consequence of uncontrolled crossbreeding is its threat to conservation of local pure breeds of poultry as their germplasm could be diluted/mixed or in a worst case scenario might be eroded. A third method would be development of composite/synthetic breed such as UniGold and Lyallpur Silver Black (LSB) breeds which were developed for backyard poultry production in

Pakistan. However, one core issue with the composites is that balancing traits like egg production, meat yield, and disease resistance becomes difficult due to negative genetic correlations between these traits. Furthermore, biosecurity risks, economic viability, social acceptability and environmental adaptability are some other concerns that need due attention while developing composites. The proposed breeding methods/programs hold promise for transforming backyard poultry farming into a resilient and productive sector in Pakistan. The introduction of genetically improved backyard poultry using any of the methods described above has the potential to improve the productivity and profitability of rural backyard poultry farming consequently improving the income levels and food security of poor households on sustainable basis.

AUTHOR BIOGRAPHY: Dr. Ghulam Bilal is an accomplished Associate Professor of Animal Breeding and Genetics with a PhD from McGill University, Canada. With over a decade of experience in animal genetics, breeding, and genomics, he has significantly contributed to research, teaching, and institutional development.

His pioneering work includes PCR-based beta-casein testing for dairy animals, genome-wide association studies (GWAS) in goats, and breed-specific markers in cattle. He has played a key role in establishing the National Center for Livestock Breeding, Genetics & Genomics (NCLBG&G) in Pakistan, where he serves as Central Project Director.

Dr. Bilal's contributions have earned him prestigious accolades, including the Research Productivity Award from the Pakistan Council for Science and Technology. He actively consults on genetic testing, animal breeding programs, and livestock conservation strategies.

CO-AUTHOR BIOGRAPHY: Muhammad Sayyam Akram is a passionate poultry geneticist and researcher, currently pursuing a BS (Hons.) in Poultry Science at PMAS-Arid Agriculture University, Rawalpindi. His academic excellence has earned him multiple Vice-Chancellor's Talent Scholarships and the Sabir's Foundation Scholarship.

With a strong focus on poultry genetics, genomics, nutritional genetics and microbiome analysis, he has co-authored a book chapter on ethno-veterinary practices and is actively researching poultry genetic resources in developing countries. Skilled in molecular biology techniques and bioinformatics, he has hands-on experience in DNA extraction, PCR, and poultry breeding programs. Sayyam is willing to learn about CRISPR-Technology, Next Generation Sequencing etc.

Beyond research interest, Sayyam is a recognized speaker and organizer, having led seminars, international conferences/webinars, and academic events. As the Founding President of Poultry Professionals Society (PPS), Pakistan, he has collaborated with global poultry experts from the USA ,Canada, and UK.

An active member of the Poultry Science Association (PSA-USA) and WPSA-Pakistan, he aspires to revolutionize poultry breeding through genomics, disease resistance strategies, and industry collaborations, ensuring a sustainable and innovative future for global poultry production.

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Effect of Life Cycle Inventory Choices and Nutritional Variation on Carbon Footprint of Broiler Meat Production

ABSTRACT: The goal of the study is to identify the effect of life cycle inventory (LCI) specifications on carbon footprint of feed used to produce one kg of broiler meat in multi-treatment trials. A total of 384 one-day Hubbard JA787 male chicks were allocated equally to 48 pens. The pens were distributed randomly to three treatments (16 pens/treatment), high density (crude protein (ME): 23% (12.5 MJ/kg),20.4% (13 MJ/kg), 19.1% (13.7 MJ/kg) for starter grower and finisher diets, respectively), medium density (crude protein (ME): 22.3% (12.2 MJ/kg), 19.7 (12.6 MJ/kg),18.2% (13 MJ/kg) for starter grower and finisher diets, respectively) and low density (crude protein (ME): 21.6% (11.9 MJ/kg), 19 (12.1 MJ/kg),17.3% (12.4 MJ/kg) for starter grower and finisher diets, respectively). The experimental birds had free access to water and feed throughout the trial. All experimental diets were in crumb form in starter phase and in pellet form in grower and finisher phase. Two birds/pen were euthanised at the end of the trial (day 42) to obtain meat yield. Feed consumption and bird weight of each pen were recorded weekly. The carbon footprint (CF) of feed consumed by each pen was calculated and normalised for one kg meat yield. The CF of the pens was calculated using 3 open access databases (Agribalyse (ReCiPe (H) impact assessment method and mass allocation), GLFI (ReCiPe 2016 midpoint (H), mass allocation) and ECO-ALIM (CLM impact assessment method and mass allocation). The three CF datasets were combined and analysed to determine the effect of treatment, LCI database and treatment*LCI database on CF of broilers. The CF of each pen was calculated using GLFI database according to three allocation methods, mass, energy and economic. Data of the three allocation methods were combined and analysed to identify the effect of treatment, allocation method and treatment*allocation method on CF. Agribalyse dataset was used to calculated CF of each pen according to 3 impact assessment methods, ReCiPe (i), IPCC 2013 and CLM (with AI as a baseline). The three datasets were combined and

analyzed to determine the effect of the treatment, impact assessment method of LCA and treatment*assessment method on CF. There was significant effect of treatment, database and treatment*database on CF ($P < 0.001$). The CF was significantly affected by treatment, impact assessment method and the treatment*impact assessment method ($P = 0.037$). Treatment and treatment*allocation method significantly affected the CF ($P < 0.001$). In conclusion, the effect of the dietary treatment on CF depends on the LCI database, impact assessment method and method of allocation. Thus, LCI specifications should be presented in detail in broiler trials aiming at identifying of the effect dietary treatment on CF of broilers.

BIOGRAPHY: Born in Syria, Dr. Dr Ashraf Alkhtib began his research career as a Research Assistant at the Syrian Commission of Agricultural Research, following a degree in 2005 and a Master's in Sheep Nutrition in 2008. He earned his Ph.D. from Damascus University, supported by a scholarship from ICARDA. His Ph.D. research explored pistachio by-products as alternative livestock feed to enhance sustainability.

Amid conflict in 2012, he relocated to Ethiopia, shifting his focus to nutritious pulse cultivation for livestock feed. After earning his Ph.D. from Jimma University in 2017, he joined the Poultry Research Unit at Nottingham Trent University, where he now works as a Research Fellow. His research focuses on sustainable livestock production, poultry welfare, and food security, with work spanning the Middle East, Africa, and the UK.

Dr. Dr Ashraf contributions have been widely recognized, including a 2020 British Society of Animal Science Award for his research on using olive twigs as goat feed in dry climates. Passionate about mentoring, he encourages aspiring researchers to create knowledge that drives global change.

MS. CRISTABEL HUERTA

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Transforming Poultry Production: The Role of Innovative Advanced Lighting Technologies in Optimizing Poultry Growth and Welfare

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ABSTRACT: The poultry industry in Pakistan relies on energy saver bulbs, which have high costs, frequent fusing, flickering, and lack dimmable functionality. These issues reduce feed efficiency by 57%, weight gain by 10%, and increase mortality rates by up to 3%. Uneven light intensity causes a 5% rise in production losses, affecting feed intake, health, and welfare. To evaluate poultry-specific LED lighting technologies (STERNA, CORAX, PICA, BUBO) in addressing traditional lighting issues and improving poultry growth, welfare, and production efficiency. A trial at a Punjab poultry farm housed birds in 3-tiered cages (2ft x 4ft x 2ft). Six lighting treatments white (control), red, blue, green, yellow, and STERNA were applied at 15, 20, and 25 Lux. Light wavelengths ranged from white (590nm) to STERNA (580nm, 350–830 nm). The production phase spanned 17-30 weeks. Parameters included body weight, egg production, feed conversion ratio (FCR), and egg quality (Haugh unit, yolk index). Hormonal profiles and antibody titters against Newcastle Disease and Infectious Bronchitis were analyzed. A cost-benefit analysis assessed economic feasibility. LED lighting improved growth rates by 4% and reduced energy consumption by 60%. Uniform light distribution enhanced flock activity, skeletal development, and immune health. FCR improvements and superior egg quality (Haugh unit, yolk index) were observed. Positive hormonal profiles and better disease resistance indicated healthier birds. Poultry-specific LED lighting significantly enhances growth, energy efficiency, and bird welfare. Transitioning to these systems can improve productivity and profitability, ensuring sustainable growth for Pakistan's poultry industry.

AUTHOR BIOGRAPHY: Dr. Khursheid Ahmed khan serving as Head of Research at HATO Pakistan at NSTP ,NUST Islamabad Pakistan . Previously an Assistant Professor in Department of Agricultural Engineering and Technology at Ghazi University, Dera Ghazi Khan, Punjab, Pakistan. He has completed his PhD Specialization in Agricultural Biological Environment & Energy Engineering from China Agricultural University Beijing in 2018. The research interest of the author focuses on Controlled Environment Agriculture and Lighting management strategies for Poultry and livestock production. He is regular reviewer of many journals. He is friendly, helpful and polite, have a good sense of humour. He is able to work independently in busy environments and also within a team setting. He is outgoing and tactful, and able to listen effectively when solving problems. Reading books, writing, cooking, traveling, Mentoring and coaching are his hobbies.

CO=AUTHOR BIOGRAPHY: Cristabel Huerta is an invaluable figure on the HATO team as an Agricultural Lighting Advisor. With a degree in International Trade and outstanding experience as Business Development Manager, she has promoted animal welfare in Latin America and North America by providing high-quality, customized lighting solutions. Now, as a pillar of knowledge at HATO, she offers seminars and trainings globally, fostering a collaborative community. In doing so, she keeps the sector informed about the latest innovations and developments in the agricultural lighting industry. Under her motto 'Light is life,' Cristabel reflects her dedication to responsible livestock farming and believes in the transformative power of smart investments, contributing to commercial success and strong relationships in the industry.

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Advancing Poultry Welfare and Behavior: Innovations, Challenges, and Future Directions

ABSTRACT: The advancement of poultry welfare and the understanding of avian behavior is crucial for ethical food production and meeting global demand. This abstract synthesizes innovations, challenges, and future directions in this multidisciplinary field. A shift from traditional observation to data-driven approaches is underway, with Precision Livestock Farming (PLF) employing sophisticated sensor technologies for real-time monitoring.

Wearable sensors (accelerometers, gyroscopes) provide detailed data on activity, gait, and posture, enabling early detection of lameness. Non-invasive imaging (thermal, hyperspectral) offers insights into physiological states, such as inflammation, stress, and feather condition. Bioacoustic monitoring identifies vocalizations, distinguishing distress calls and enhancing welfare assessment. The application of artificial intelligence (AI) and machine learning (ML) is crucial for processing complex datasets, identifying patterns, and developing predictive models for proactive management. For instance, machine learning can predict disease outbreaks. Virtual reality (VR) and augmented reality (AR) are emerging tools for research and practical applications. VR creates controlled environments to study stressors, while AR provides farmers with real-time welfare feedback.

Despite these advancements, challenges remain. The adoption of PLF requires investment, training, and addresses ethical considerations regarding data. The interpretation of complex data requires expertise. There is a need for standardized welfare protocols. Future research should focus on non-invasive biomarkers (e.g., cortisol metabolites) and omics technologies.

Designing housing systems that cater to natural behaviors is essential, including dynamic systems. Precision feeding strategies and enhanced supply chain transparency using blockchain can improve both health and welfare. Advancing poultry welfare requires collaboration among researchers, producers, policymakers, and consumers to prioritize well-being and ensure sustainable food production.

BIOGRAPHY: Syeda Maryam Hussain, completed her PhD in Animal Production and Quality from Uni. Sao Paulo, Brazil and Poland. She started her teaching career at Uni. Agriculture Peshawar and currently is working as Assistant Professor in Department of Livestock Production and Management, Faculty of Veterinary and Animal Sciences, PMAS-Arid Agriculture University Rawalpindi. Her research specially focuses on Animal welfare, behaviour and stress models especially in managerial issues. She currently working on Red Korean Ginseng Extracts on reducing the mental stress and fatigue as induced by sleep-deprived models in Rabbits and role of Ginseng for modulating alopecia in Rabbits. Her recent project focused on raised wooden housing for improving the Goat's performance and behaviour. She is enthusiastic towards developing special welfare protocols for Animal's and Poultry in Pakistan; a Poultry hub and One of Top Dairy producer.

ABSTRACTS | E-POSTERS

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Iron-Chitooligosaccharide Affects Intestinal Permeability and Reduces Bacterial Chondronecrosis in Broiler Chickens

ABSTRACT: This study aimed to characterize the interrelationship between dietary iron type, intestinal permeability, and the occurrence of bacterial chondronecrosis with osteomyelitis (BCO) in an experimental BCO model involving wire flooring in broiler chickens. Four dietary treatments were administered to 480-day-old broiler chickens, with six replicates and 20 birds each. Dietary treatments included: Control (Fe-deficient: basal diet without iron supplement); FeSO 4 (20 mg/kg iron from ferrous sulfate); Fe-CNP (10 mg/kg from Fe-CNP (Chitooligosaccharide nanoparticles)); FeSO 4 +CNP (20 mg/kg from ferrous sulfate+100 g/Kg Fe-CNP). Results showed broiler chickens fed with FeSO 4 developed intestinal permeability compared to iron deficient (control) and Fe-CNP as an increase in plasma lactulose to mannitol ratio (L:M) (P<0.05). Moreover, the percentage of detected E.Coli and Staphylococcus spp. isolates in blood bacterial culture in the Fe-CNP-supplemented treatment were significantly decreased compared to FeSO 4 and FeSO 4 +CNP (P<0.05). Monitoring the BCO progression and mortalities showed that Fe-CNP supplementation significantly reduced total BCO mortalities throughout the experiment (P<0.05). These results indicate that iron chelating with chitooligosaccharide nanoparticles mitigated the occurrence of BCO by enhancing gut health and reducing bacterial translocation into the bloodstream in broiler chickens subjected to the wire flooring to trigger BCO incidence. Intestinal permeability and inflammation due to ferrous sulfate have been identified as associated with the incidence of BCO in broiler chickens.

BIOGRAPHY: Dr. Azam Yousefi is an Assistant Professor of Poultry Nutrition at the Department of Animal Science, Lorestan University. With a strong background in animal nutrition and physiology, Dr. Yousefi's research focuses on metabolic disorders in poultry, including ascites, bacterial chondronecrosis with osteomyelitis, and fatty liver syndrome.

Dr. Yousefi holds a Bachelor's degree in Animal Science (2006-2010) and a Master's degree in Animal Science (Nutrition of Livestock and Poultry) (2010-2012) from Shahrekord University, Iran. Their expertise spans feed formulation, evaluation, broiler nutrition, antioxidants, pulmonary hypertension, and egg production.

An active researcher, Dr. Yousefi has contributed to advancing poultry health, with recent work on iron-loaded chitooligosaccharide nanoparticles to reduce bacterial chondronecrosis with osteomyelitis in broiler chickens. With a commitment to innovative poultry nutrition strategies, Dr. Yousefi continues to explore solutions for improving poultry health, productivity, and sustainability.

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HDLBP Contributes to Goose Fatty Liver Development by Modulating Oxidative Stress and Inflammatory Responses

ABSTRACT: Goose fatty liver is a physiological fatty liver induced by carbohydrate-rich feeding, distinguished by its resistance to inflammation despite lipid accumulation. Understanding the function of HDLBP in regulating oxidative stress and mitochondrial function may reveal key mechanisms underlying its unique protective adaptation. The aim of this study is to validate the organelle-specific distribution of high density lipoprotein binding proteins (HDLBP) within cell via in-vivo and animal cell line models and its correlation with hepatic oxidative stress and inflammatory responses during the formation of goose fatty liver. For in vitro experiments primary hepatocytes isolated from 23-day-old goose embryos were transfected with an HDLBP overexpression vector. Experimental model of Fourteen 70-day-old Landes male geese divided randomly into a control group (ad libitum feed) and an overfed group (force-fed for 20 days weighing 3.72kg and 3.71kg respectively. Immunofluorescence and immunoblotting assay were used to confirm the mitochondrial localization of HDLBP (mHDLBP) and in vivo detection. Overfeeding significantly reduced the protein abundance of total cellular HDLBP (wHDLBP) and mitochondrial HDLBP (mHDLBP) (P < 0.01). In primary hepatocytes, HDLBP overexpression led to increased mHDLBP protein levels (P < 0.05), elevated oxidative stress markers, including reactive oxygen species (ROS) and malondialdehyde (MDA) (P < 0.05), and decreased mitochondrial membrane potential and antioxidant enzyme activities (T-SOD, GSH-PX; P < 0.05). Transcriptomic analysis revealed HDLBP overexpression upregulated genes involved in immune and inflammatory pathways, such as IL1R1, TNFSF10, LTC4S, NCF1, and KDR, while overfeeding suppressed their expression in vivo (P < 0.05, 0.01, or 0.001). These findings validate HDLBP influences mitochondrial function, oxidative stress, and inflammatory responses, potentially acting as a regulatory factor in goose fatty liver development. The

observed downregulation of HDLBP in fatty liver may serve as a protective mechanism against inflammation. This unique feature of geese fatty liver distinguishing physiological hepatic steatosis from pathological non-alcoholic fatty liver disease in mammals.

BIOGRAPHY: I am Aneeqa Imtiaz, a dedicated researcher in the field of Animal Sciences, committed to advancing knowledge and innovation in the industry through rigorous academic pursuits and impactful research. I earned my Bachelor's degree in Poultry Sciences from the University of Agriculture Faisalabad, Pakistan, where I built a strong foundation in avian health, nutrition, management and genetic avenues. Followed by impactful internships in renowned institutes to enhance practical knowledge. Currently, I am pursuing my Master's degree from China in the field of Animal Husbandry at Yangzhou University's College of Animal Science and Technology, mainly focusing on poultry epigenetics and production perspectives.
My journey at Yangzhou University started in 2024. My research group mainly focuses on production and disease perspectives of poultry, particularly focusing on Goose and chicken fatty liver disease. My research primarily explores chicken non-alcoholic fatty liver disease (NAFLD), a metabolic disorder that significantly impacts poultry health and productivity. I investigate the epigenetic mechanisms underlying NAFLD development to identify genetic and environmental factors influencing disease susceptibility. Additionally, I examine therapeutic interventions targeting mitochondrial function to mitigate the disease's adverse effects and improve poultry the metabolic health. By integrating molecular biology, nutritional strategies, and precision breeding techniques, I aim
to develop sustainable solutions that enhance poultry resilience against metabolic disorders. My research not only advances scientific knowledge but also provides practical applications for improving poultry productivity and welfare. With a deep passion for innovation, I am committed to contributing meaningful insights to poultry science, promoting a more sustainable and efficient future for the industry.

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Effect of dried coriander leaves powder supplementation on growth Performance and carcass characteristics in broilers

ABSTRACT: The use of antibiotics in poultry feed to promote growth is a prevalent practice aimed at enhancing production. However, the excessive use of antibiotics has raised concerns due to its adverse effects on poultry and human health. This study aimed to evaluate dried coriander leaves powder (DCLP) as a potential natural substitute for antibiotic growth promoters (AGPs), focusing on its impact on carcass traits and the growth parameters of broiler birds. For this trial, day-old broiler chicks (n = 150) were divided into five groups with complete randomization; each group had five replicates containing six chicks in each replicate. Five experimental diets were formulated as (T1) normal diet without any AGPs (negative control), (T2) normal diet with lincomycin 0.02% antibiotic growth promoter (positive control), (T3) normal diet + 1% DCLP, (T4) normal diet + 2% DCLP and (T5) normal diet + 3% DCLP. The duration of the experiment was 35 days. For carcass traits, two birds from each replicate were slaughtered at the end of the experiment. A fully randomised design was used to evaluate the data, and Tukeys test was used to compare the means. Results showed that feed intake and FCR were non-significantly (P>0.05) affected among the treatment groups. However, body weight gain was significantly highest (P<0.05) in T2 and lowest in T1 among all dietary treatments. Carcass characteristics were not significantly affected and remained the same across all treatments. However, abdominal fat was significantly (P<0.05) decreased in T5 among all the treatments. It was concluded that dried coriander leaves powder can be safely used up to 3 % as an alternate source of AGPs without compromising growth performance or any harmful effect on carcass traits.

BIOGRAPHY: My name is Muhammad Umair Saleem. I have done my Doctor of Veterinary Medicine from the University of Agriculture Faisalabad from 2017-2022. I have experience of managing dairy animals, herd health, breeding and nutrition. I have also done my Master's in Animal Nutrition from the Institute of Animal and Dairy Science UAF. My research was on the broiler starter phase to explore the effect of enzymes to maximize feed efficiency. I have experience of designing research trials, conducting field trials, collecting data and applying statistical tools in poultry birds. Now I am working as a quality control manager in a production Mill where I am responsible for the quality assurance of feed ingredients and poultry feed.

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Effects of In- ovo Feeding of Licorice on the Hatching and Post-hatch Performance of Broiler Chickens

ABSTRACT: Licorice, a phytogenic feed additive, is being explored to improve the growth and thermotolerance of broiler chickens. This study investigated the impact of In ovo feeding of licorice extract on broiler chicken hatching and post-hatch performance. Six hundred hatching eggs were purchased from a reputable farm and were incubated using the conventional protocol. On day 18 of the incubation, the eggs were divided into six groups: uninjected (CC), injected with distilled water (DW), injected with licorice solution at 3 mg (TL), 6 mg (SL), 9 mg (NL), and 12 mg (TWL). Data were collected on hatching parameters, posthatch performance, and physiological parameters and were subjected to one-way ANOVA using SAS. The results revealed that licorice extract had no effects on hatching events. However, after hatching, chicks in TWL, NL, SL and CC had better ($p < 0.05$) appearance than others. Chickens' body weight and weight gain in NL, SL, and TL were significantly higher ($p < 0.05$) than others. FCR was significantly low ($p < 0.05$) in TL and TWL. The PCV, RBC and WBC of birds in TWL were significantly higher ($p < 0.05$). Total protein was significantly higher in DW and TL. SL and TL chickens had significantly higher ($p < 0.05$) SOD and CAT levels but reduced levels of MDA and AST. Also, the rectal temperature from day 21 to 35 was significantly lower ($p < 0.05$) in the NL, SL and TL groups. Chickens in SL and TL groups had the highest ($p < 0.05$) thigh and breast muscle but less ($p < 0.05$) abdominal fat. The study concluded that licorice extract, administered at doses of 3 mg and 6 mg, improved the growth performance, physiological responses of broiler chickens raised in hot tropical environments.

BIOGRAPHY: I'm Aderanti Oni, an emerging scientist in the livestock industry. The desire to see a healthy community flamed my interest in animal science. I found that malnutrition is prevalent in my country due to the consumption of poor diets. I realised that the source of nutrition, primarily animal meat, was not readily available due to the high mortality rate caused by environmental and nutritional factors. It was a big concern for me and informed my decision to take a Bachelor's and Master's program at the Federal University of Agriculture, where these problems are tackled. My undergraduate research was on "Evaluating the effects of Monochromatic light on the growth performance of broiler chicken" and my Master's dissertation focused on "Thermotolerance acquisition in broiler Chicken through early-age thermal conditioning and antioxidant supplementation." As a young researcher, I have focused on utilising environmental factors (light and temperature) and nutritional intervention (antioxidants and Phytogenics) to improve broiler chickens performance, welfare, and thermotolerance. One of the works that stood out was using antioxidants to strengthen the thermotolerance and performance of broiler chickens, which was presented at the 2024 Poultry Society Association annual meeting held from July 15-18 in Louisville, Kentucky, USA. The quest for practical knowledge informed my decisions to farms and laboratory activities, further widening my horizons in animal nutrition. While doing this, I was active in research, attending poultry management workshops and scientific writing, which led to nine publications. I aim to gain expertise in animal nutrition and conduct impactful research in developing various feed additives and dietary supplements by exploring different plant materials, amino acids, and antioxidants to improve poultry welfare, growth, and performance.

I am committed to seeing Animal Science advance through rigorous, noble, and intensive research. I will be fulfilled if my research objectives address welfare issues in livestock production for global and continental sustainability.

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Carcass and Organ Evaluation of Broiler Chickens Administered Ethanolic Extracts of Alternanthera Brasiliana and Hoslundia Opposita

ABSTRACT: This study was conducted for eight (8) weeks to evaluate the carcass and organ of broiler chickens administered ethanolic extracts of Alternanthera brasiliana and Hoslundia opposita. The experimental design was a factorial arrangement (3x3x3) in a Completely Randomised Design (CRD) involving ninety (90) day-old Arbor Acre broiler chicks. The chickens were allotted to three (3) treatment groups of three (3) replicates with each replicate comprising (10) birds. The treatment groups were: Control (no extract administered), HOP (ethanolic extract of H. opposite administered) and ABR (ethanolic extract of A. brasiliana administered). Ethanolic extracts of H. opposita and A. brasiliana at concentrations of 50, 100 and 200mg/mL were administered to respective replicates. Phytochemical screening of Alternanthera brasiliana and Hoslundia opposite revealed the presence of tannins, saponins, phenols, steroids, terpenoids, flavonoids and cardiac glycosides. The data obtained after termination were analyzed and results revealed that the chest (highest in ABR 200mg/mL 774.53g but lowest in Control 558.37g), back (highest in ABR 200mg/mL 407.97g but lowest in HOP 50mg/mL 325.57g) and right drumstick (highest in ABR 200mg/mL 144.37g but lowest in HOP 50mg/mL 115.73g) were the carcass parameters with significant (p<0.05) differences while the heart (highest in ABR 100mg/mL 12.68g but lowest in Control 9.65g) and spleen (highest in HOP 50mg/mL 3.14g but lowest in HOP 200mg/mL 1.41g) were the only organ parameter that had significant (p<0.05) differences. It was concluded that ethanolic extracts of Alternanthera brasiliana and Hoslundia opposita are veritable sources of alternative to synthetic antibiotic growth promoters in broiler chicken production as there was no deleterious effect on their growth performance, carcass and organ characteristics. It was recommended that the medicinal plants could be further explored for more benefits in the rearing of poultry and other animals.

BIOGRAPHY: I am a graduate of Animal Production and Health from The Federal University of Technology, Akure, Nigeria. I have a strong enthusiasm for research in Monogastric nutrition. My interests include gut health modulation and microbiome management, utilization of alternative feed ingredients, and nutritional strategies for disease prevention.

I am also passionate about the One Health concept, which highlights the interconnectedness of human, animal, and environmental health. Therefore, I am open to graduate opportunities that align with my interests and skills.

MUHAMMAD MUNEEB

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Impact of Substituting Antibiotics with Probiotics and Antimicrobial Peptides on Performance, Carcass traits, litter quality, and Welfare in Broilers Challenged with Clostridium perfringens

ABSTRACT: The prohibition or limitation of antibiotic growth promoters (AGPs) in broiler production has led to an increased prevalence of enteric diseases, including necrotic enteritis (NE). Consequently, there is an urgent need to explore alternative solutions to replace AGPs effectively. This research assessed the efficacy of antibiotics, probiotics, and antimicrobial peptides (AMPs) in alleviating the detrimental impacts of NE in broiler chickens. A total of 720 one-day-old male Ross-308 broiler chicks were randomly allocated to five dietary treatments, with each group containing six replicates of 24 birds. The treatments included: (1) a negative control (NC) receiving only a basal diet, (2) a positive control (PC) challenged with Clostridium perfringens while on a basal diet, (3) CP-Ab; challenged and supplemented with AGP (Stafac 500 ® , containing virginiamycin 500g/kg) at 200 g/ton, (4) CP-Pro; challenged and supplemented a probiotic (Clostat dry ® , containing Bacillus subtilis PB6 2.2 × 10 8 CFU/g) at 200 g/ton (5) CP-LS2; challenged and fed with an AMP (Lassotide Plus ® , containing antimicrobial peptides Microcin J25 ⩾ 0.5%, and Sublancin ⩾ 0.1%) at 200 g/ton. NE was induced by administering a tenfold coccidia vaccine on day 15 (1ml/bird orally), followed by an oral gavage of C. perfringens type G (1×10^8 CFU/ml/bird; 1 ml) on days 19 and 20. The results indicated that supplementing the diets of NE-challenged birds with probiotics and AMPs significantly (P < 0.05) enhanced performance metrics. The AMP inclusion notably (P < 0.05) improved carcass traits, meat quality parameters (color, pH, water-holding capacity, and tenderness), and reduced excreta score and litter quality issues. Furthermore, footpad dermatitis

and hock burn incidence were significantly (P < 0.05) reduced in the AMP group compared to other challenged groups. The study concludes that AMPs demonstrated superior effectiveness over antibiotics and probiotics in mitigating NE-related issues, positioning them as a promising alternative to AGPs in broiler diets.

BIOGRAPHY: Muhammad Muneeb is a skilled animal nutritionist with experience in the farm animals industry. He earned a Doctor of Veterinary Medicine (DVM) degree from the Bahauddin Zakariya University, Multan (2017-2022), and subsequently completed his M. Phil degree in Animal Nutrition from the Department of Animal Nutrition, Faculty of Animal Production and Technology, UVAS, Lahore (2022-2024). Muhammad Muneeb is an active member of the World's Poultry Science Association (WPSA), and Poultry Science Association (PSA), and an accredited member of the Pakistan Veterinary Medical Council (PVMC). His research focuses on optimizing livestock nutrition to improve gut health, enhance feed efficiency, and mitigate environmental impacts. He has a strong background in poultry and ruminant nutrition, with expertise in feed formulation, and sustainable feed production. During his Master's studies, Muhammad Muneeb conducted research on broiler nutrition, exploring innovative feed additives to sustain growth performance and gut health in broilers subjected to enteric disease challenges. His passion for advancing livestock sustainability led him to expand his research interests into ruminant nutrition, particularly strategies to reduce greenhouse gas emissions from dairy cattle through dietary modifications. Beyond academia, Muhammad Muneeb has gained practical experience by working at different feed mills, research and development farms, poultry disease diagnostic labs, and commercial dairy farms, including a corporate-level mega dairy farm managing a large herd of Holstein Friesian cows. These experiences have provided him with valuable insights into the real-world challenges of the farm animal industry and the practical application of research-based feeding strategies. In addition to research, Muhammad Muneeb is actively involved in scientific writing, contributing to research papers, review articles, meta-analyses, and book chapters. His long-term goal is to pursue a research career while collaborating with the animal nutrition industry to develop innovative, science-driven solutions for sustainable livestock production. With a strong commitment to improving animal health and productivity through advanced nutritional strategies, Muhammad Muneeb aims to contribute to the future of sustainable and efficient animal agriculture.

MUHAMMAD ASNAN

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Effect of Partial Replacement of Soybean Meal with the Combination of Other Alternative Protein Sources and Multi-Exogenous Enzyme Supplementation on Broiler Meat Quality, Gut Morphology, and Tibia Mineralization

ABSTRACT: The globalization of the food value chain is growing faster, and it is critical to solve the accompanying difficulties sustainably. The poultry industry must prioritize production sustainability and low-cost protein sources to solve these issues without affecting the bird's production quality and health. Therefore, this study aimed to determine the effects of partial soybean meal replacement with other alternative sources in combination (ASC) (canola, rapeseed, guar and corn gluten meal) with and without multi-enzyme on broiler meat quality, gut morphology, and tibia mineralization. For this reason, 240-day-old broiler chicks were obtained from a hatchery and randomly assigned to thirty experimental units of eight chicks each. Starter and finisher diets were formulated with and without multi-enzyme supplementation at varied levels of ASC (0, 25, and 50%). Dietary regimens significantly affected pH and water-holding capacity (WHC). Birds on without multi-enzyme diets had higher pH and WHC in thigh and breast meat, except for thigh WHC. Intestinal length and morphology varied, with multi-enzyme treatments showing higher VH:CD. Tibia calcium % was higher with multi-enzyme, while without multi enzyme diets had greater tibia phosphorus % on days 21 and 35. The study found that ASC with multi-enzyme supplementation improved meat quality, gut health, and bone mineralization, except for tibial phosphorus. It's recommended that diets be formulated in order to replace the soybean meal to meet all nutrient requirements to support bird productivity and health.

BIOGRAPHY: My name is Muhammad Asnan, and I am from Faisalabad, Pakistan. I completed my bachelor's degree in Animal Science and interned at Jadeed Feeds, where I learned about feed formulation and poultry feed manufacturing. I earned my master's degree in Animal Nutrition from the University of Agriculture, Faisalabad. During my master's, I gained experience working under Nestlé Pakistan. My expertise lies in sustainable poultry production, and I conducted research in poultry nutrition, aiming to replace soybean meal with plant protein sources and supplement with exogenous enzymes. I have worked as an Assistant Production Manager at a well-known feed mill.

With extensive experience in poultry nutrition trials, feed formulation software, and scientific writing, I am dedicated to advancing research in animal nutrition. I have published multiple conference abstracts, book chapters, research articles, and review papers. Additionally, I was selected for a feed milling course in Bangkok, Thailand, where I had the opportunity to meet industry experts and gain valuable insights into feed milling. My passion for exploration and learning drives my enthusiasm for gaining new perspectives in my field.

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Ameliorative Effect Zinc Oxide and Copper Oxide Nanoparticles Against Salmonella Gallinarum Induced Infection in Broiler

ABSTRACT: The overuse of antibiotics in poultry farming has led to antibiotic residues in animal-derived food and the rise of antimicrobial resistance (AMR) in bacteria, threatening both public and animal health. This resistance has complicated fowl typhoid management, resulting in high mortality and food insecurity. Thus, alternative therapeutic strategies are urgently needed. The zinc oxide and copper oxide nanoparticles show promise due their strong antibacterial properties. This study aimed to investigate the antimicrobial effect of ZnO and CuO nanoparticles against fowl typhoid in broilers. One-day-old specific pathogen free population of broiler chicks (n = 90) was raised under standard management conditions. On day 10, the chicks were divided into six groups: control negative, control positive, and groups A, B, C, D. On day 19, all the groups except control negative were inoculated with Salmonella gallinarum (0.2 ml, 10 8 CFU/ml). Upon clinical signs, groups A received florfenicol (50 mg/L in drinking water), while groups B, C and D received a mixture of ZnO and CuO nanoparticles (25 + 10, 37.5 + 15 and 50 + 20 mg/kg/d, respectively). Chicks were sacrificed on days 26 and 30 for hematological, biochemical, immunological, gross, and histopathological analysis. Data were statistically analyzed using CRD with ANOVA and Tukey's test via SAS 15.1 software. The results revealed that ZnO and CuO nanoparticles has significantly (p < 0.01) reduced mortality and significantly (p < 0.05) increased serum proteins and lipids level, phagocytic activity of macrophages, lymphoproliferative response of lymphocytes, and immunoglobulins (Ig, IgG and IgM) level. The gross and histopathological analysis of spleen, thymus and bursa of Fabricius revealed reduced (p < 0.01) congestion and lymphocytic depletion. Overall, the ZnO and CuO nanoparticles have a potential to replace florfenicol in management of fowl typhoid.

BIOGRAPHY: Mr. Muhammad Atif Raza was born in a small city in South Punjab, Pakistan, where he grew up in a simple yet challenging environment. His formative years instilled in him a strong sense of resilience and determination, traits that have played a pivotal role in shaping his personal and professional development. From an early age, Mr. Raza demonstrated exceptional academic dedication, earning merit-based scholarships throughout his school, college, and university education. He completed his undergraduate degree in Veterinary Medicine at PMAS Arid Agriculture University, Rawalpindi, Pakistan, before pursuing a Master's degree in Pathology at the University of Agriculture Faisalabad, one of Asia's premier institutions. Upon earning his Master's degree, he joined PMAS Arid Agriculture University as a Research Associate/Co-Instructor, where he further developed his skills in project management and teaching.

Driven by an eagerness to expand his scientific knowledge, Mr. Raza moved to South Korea to undertake advanced training in molecular biology at Kyungpook National University. During his time in South Korea, he had the opportunity to present his research at prestigious international conferences and publish in SCI-indexed journals, which significantly enhanced his academic profile.

Currently, Mr. Raza serves as a veterinary doctor at Erika Veterinary Clinic in Male, Republic of Maldives, where he diagnoses and treats animals. Despite his clinical responsibilities, he remains passionate about molecular biology research. He is actively seeking opportunities for a Ph.D. program to further deepen his scientific expertise and contribute to groundbreaking research in the field.

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Pathological and Serological Investigation of Newcastle Disease in Poultry in Certain Areas of Jhenaidah District of Bangladesh

ABSTRACT: Poultry diseases are among the major constraints of chicken production in Uganda of which Newcastle disease (ND) is still one of the most important devastating diseases of chicken. This study was conducted from June 2017 to May 2018 to identify and describe the lesions due to ND, determine its prevalence and relate the presence of the viral antigen in tissues to the lesions in the various organs of chicken presented for disease. Chickens for necropsy in the study period were received from selected upazilas of Jhenaidah district of Bangladesh. A total of 240 chickens (Layer, broiler and sonali; 80 birds in each group) were the sample population. Necropsy was done on chicken carcasses; samples for histopathology were obtained from various organs and fixed in 10% buffered formalin. The fixed tissue samples were then trimmed and processed for histopathology. Diagnosis based on clinical and pathological findings showed that 90 (38%) birds were positive for ND. Highest numbers of birds were in broiler group (44%) followed by layer (40%) and lowest was in sonali group (29%). In the present study, in 22% of chickens antibodies titers increases against Newcastle and the HI titer in infected flocks was 8.63±0.28 and in non-infected vaccinated flocks it was 5.36±0.2. In conclusion, Newcastle disease is still among the most prevalent diseases of chicken in the study area. Clinical – pathologic findings provided some bases for ND diagnosis but are less reliable method, therefore, a more sensitive and specific diagnostic tests such as IHC, RT-PCR, in situ hybridization and other definitive tests should be used in addition to histopathology to confirm ND, so as to provide accurate and reliable advice to poultry farmers.

BIOGRAPHY: I am Dr. Md. Mustafijur Rahaman , a dedicated professional with a robust academic and professional background. I earned my Doctor of Veterinary Medicine (DVM) degree from Patuakhali Science and Technology University in Bangladesh, where I also attained a Master of Science in Veterinary Pathology. Currently, I am advancing my expertise by pursuing a Master's in Business Intelligence and Data Analytics at Atlantis University in Miami, USA. With over six years of comprehensive experience, I have cultivated proficiency in sales and marketing, business development, strategic management, and advanced analytical frameworks.

MARIA JAMIL

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Enhancing Poultry Health: Bacillus Licheniformis as a Defense Against Mycotoxins and Necrotic Enteritis in Broiler Chicks

ABSTRACT: Mycotoxins negatively impact intestinal cell viability, eradicate beneficial bacteria and expose birds to intestinal infections such as necrotic enteritis. In this study, 280 day-old broiler chicks were divided into eight groups (A-H). Group A served as the control, group B was supplemented with B. licheniformis (1 x 10 6 CFU/kg of feed), group C was fed mycotoxin-contaminated feed (150 ppb each of aflatoxin B1 and ochratoxin A), group D was infected with C. perfringens (3 x 10 10 CFU/ml), group E was co-challenged with mycotoxins and C. perfringens, group F received mycotoxin-contaminated feed with B. licheniformis supplementation, group G was infected with C. perfringens and supplemented with B. licheniformis, group H was co-challenged with mycotoxins and C. perfringens with B. licheniformis supplementation. Duration of experiment was 35 days. The study aimed to assess the protective role of B. licheniformis against mycotoxins and necrotic enteritis infection. Parameters such as body weight and feed intake were significantly decreased in groups C, D, E and H compared to the control group A, while groups B, F and G showed no significant differences from the control. The relative weights of the liver, kidney and intestine were highest in group E, whereas groups B, F and G were similar to the control. Erythrogram parameters (TEC, Hb and PCV) were significantly lower in group E, followed by groups C, D and H. Leucogram values were highest in group D and lowest in group C, followed by groups E and H. Erythrogram and leucogram values for groups B, F and G did not differ significantly from the control. Hepatic and renal biomarkers were significantly higher in groups C, D, E and H compared to the control. Serum protein levels (total protein and albumin) were significantly lower in group E, followed by groups D, C and H, while groups B, F and G were similar to the control. These results indicate that B. licheniformis reduces the susceptibility to necrotic enteritis in broiler birds initially exposed to mycotoxins, when these stressors are presented individually.

BIOGRAPHY: Dr. Maria Jamil holds a Doctor of Veterinary Medicine (DVM) degree (2010-2015), M.phil in Pathology (2015-2017) and Ph.D in Pathology (2019-2024) from the University of Agriculture Faisalabad. She is currently serving as a Research Associate in the SINDER-UAF project

Her research expertise spans mycotoxin contamination and detoxification strategies, poultry diseases—including bacterial (necrotic enteritis) and viral infections (Avian Influenza, Infectious Bronchitis, and Fowl Adenovirus)—as well as the application of probiotics and phytochemicals in disease prevention and gut health improvement. Dr. Maria Jamil is dedicated to advancing innovative approaches for poultry health management through multidisciplinary research.

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Mycobacteriosis in Homing Pigeon: A Case Report

ABSTRACT:

This case describes mycobacteriosis in Homing Pigeon (Columbia Livia Domestica). Three years old female was kept as a pet bird. Clinical history, necropsy findings, microscopic examination and specific staining for acid fast bacteria (Ziehl-Neelsen stain) are the confirmatory processes for its diagnosis. Clinical signs included anorexia, weight loss, muscles atrophy and coelomic distension. The main gross findings during necropsy included mottled pale and enlarged liver and spleen, white and grey military nodules on the mucosal surfaces of different gastrointestinal organs. The main microscopic findings on histopathology revealed infiltration of macrophages and giant cells containing Mycobacteria in various organs. Granulomatous inflammation in gastrointestinal organs and diffused anthracosis in lungs were also observed. Confirmatory diagnosis was done by Ziehl-Neelsen staining of all tissues showing a large number of acid fast bacilli colonies in free form and in macrophages. The purpose of this report was to highlight the zoonotic importance of Mycobacterium tuberculosis and confirmatory diagnosis with Ziehl-Neelsen stain.

BIOGRAPHY: Dr. Muhammad Nasir Bhaya is an accomplished Assistant Professor in the Department of Pathology at the Faculty of Veterinary Science, University of Agriculture Faisalabad, Pakistan. Born on March 3, 1993, Dr. Nasir has established himself as a leading expert in veterinary pathology.

Dr. Nasir's academic excellence is marked by several prestigious scholarships and fellowships. He holds a Doctor of Veterinary Medicine (DVM) degree from the University of Veterinary and Animal Science, Lahore, Pakistan. He then pursued his PhD in Veterinary Pathology from Afyon Kocatepe University, Afyonkarahisar, Türkiye, as a Türkiye Burslari scholarship holder. Additionally, Dr. Nasir was an Erasmus intern at the University of Warmia and Mazury, Olsztyn, Poland, and a recipient of the Erasmus scholarship.

Throughout his academic and professional journey, Dr. Nasir has received numerous awards and recognition for his outstanding performance. He is a proud recipient of the Exemplary Student Award and has been awarded individual university scholarships. Dr. Nasir has also been honored with the David Thompson Foundation's scholarship.

Dr. Nasir's research focuses on various aspects of veterinary pathology, including oncology, toxicology, histopathology, immunohistochemistry, and anatomical pathology. His work aims to contribute to the advancement of veterinary Pathology and improve animal health.

As an Assistant Professor at the University of Agriculture Faisalabad, Dr. Nasir is committed to teaching, research, and service. He is an active member of various professional organizations and participates in national and international conferences to share his expertise and stay updated on the latest developments in his field.

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Assessment of Antitoxic Potential of Acetylcysteine Against Ochratoxin-A Induced Gross and Histopathological Alterations in Poultry Birds

ABSTRACT: The poultry industry has been facing the problem of mycotoxins in poultry feed for many decades and it is mainly due to contamination of agricultural commodities by fungus. The aim of this study was to investigate the mitigating effectiveness of acetylcysteine against ochratoxin-A (OTA)-induced gross and histopathological changes in broiler birds. A total of 100-day-old birds were divided into five equal groups (A-E), each consisting of 20 chicks. Group A served as the negative control, while group B was fed OTA at 200 ppb through contaminated feed. Acetylcysteine (AC) at a dosage of 100 mg/kg was administered to Group C. Group D received OTA at 200 ppb along with AC at 100 mg/kg. Group E was treated with OTA at 200 ppb and a commercial toxin binder at 2 g/kg. The study lasted for 42 days. The OTA-treated group exhibited reduced feed intake and body weight gain, along with adverse clinical signs compared to the other groups. Histopathological examinations of thymus, bursa, kidney, and liver tissues in the OTA group revealed significant cellular degeneration, inflammation, and necrosis. However, birds in treatment Group D showed varying degrees of protection against OTA-induced toxic effects when supplemented with acetylcysteine. Histopathological analysis of the treatment group demonstrated less severe pathological alterations compared to the OTA control group. These findings suggest that acetylcysteine has potential as a protective agent against OTA-induced toxicity in broiler birds.

Exploring Pumpkin Seeds' Potential in Mitigating Ochratoxin-A Induced Pathological Effects in Broiler Birds

ABSTRACT: This study was planned to evaluate the ochratoxin induced immunopathological effects and mitigation potential of pumpkin seeds. A total of 140-day-old birds were divided into seven equal groups (A-G). Group A was designated as a negative control. Groups B was given 200 ppb of ochratoxin through contaminated feed. Group C and D were treated with two doses of pumpkin seed i.e. 2mg/kg and 4mg/kg, respectively. Group E and F were provided with ochratoxin (200 ppb) in conjunction with pumpkin seeds with a dose of 2mg/kg and 4mg/kg. Group G was positive control in which a commercially used toxin binder (2g/kg) was given to birds. The trial duration was 42 days. Birds in group B were clinically depressed, anorexic and reduced body weight gain was recorded. These parameters were comparatively better in group D and F which indicates the mitigation potential of pumpkin seeds. Immunological parameters such as lympho-proliferative response against phytoheamagglutinin-P, antibody titers formed against sheep red blood cells and heamagglutination inhibition antibody titers against New Castle disease virus were significantly higher in E and F group as compared to B group while carbon clearance assay to determine the in-vivo phagocytic potential was significantly higher in group B. Microscopically, the bursa of Fabricius of B group revealed increased inter-follicular spaces, depletion of B cells and cavities in epithelium and thymus shown severe congestion along with lymphocytic depletion. These microscopic signs were less pronounced in both the organs of E and F group. Hence, the study concluded that pumpkin seed has mitigation potential to reverse the OTA induced pathological changes in birds.

Phytobiotics And Their Diverse Impacts on Poultry Farming

ABSTRACT: Phytobiotics, derived from plant sources, play a pivotal role in modern poultry production by offering a natural and sustainable alternative to conventional feed additives. One of their primary contributions lies in promoting gut health, as phytobiotics support the development of a balanced and beneficial gut microbiota, thereby enhancing nutrient absorption and digestive efficiency. Additionally, these bioactive compounds possess immunomodulatory properties, stimulating both innate and adaptive immune responses in poultry. The antioxidant activity of phytobiotics is well-established, helping neutralize free radicals and reduce oxidative stress, ultimately contributing to overall bird health. Beyond their antioxidant function, phytobiotics also exhibit antimicrobial properties, offering an alternative to antibiotic growth promoters and aiding in the mitigation of pathogenic bacteria in the gastrointestinal tract. Notably, phytobiotics contribute to improved poultry performance parameters, including growth rates and feed conversion ratios, while simultaneously addressing concerns related to antibiotic resistance. Moreover, their adaptogenic properties assist in stress reduction, allowing poultry to cope with various stressors effectively. As the poultry industry increasingly emphasizes sustainable practices, the eco-friendly nature of phytobiotics, derived from plant-based sources, further positions them as valuable components in promoting overall poultry health and well-being. However, it's essential to emphasize that phytobiotics should be integrated into poultry health management plans under the guidance of a veterinarian, ensuring evidence-based practices and the well-being of the flock.

BIOGRAPHY: Dr. Muhammad Imran is working as an Assistant Professor in the Department of Pathology. He did his DVM in 2014 and M. Phil in Pathology in 2017 from the Faculty of Veterinary Science, University of Agriculture Faisalabad (UAF), Pakistan. He was awarded with a silver medal from Pakistan Veterinary Medical Association in 2014 and the University of Agriculture Faisalabad in 2015 due to his outstanding academic performance in DVM. He completed his Ph.D. in June 2021 in Molecular Pathology from Huazhong Agricultural University, Wuhan, China. He has published 18 research papers in well-reputed international journals having a cumulative impact factor of 38.

Currently, he is involved in the teaching of undergraduate and postgraduate courses. He is also performing his duty in Diagnostic laboratory, Department of Pathology, UAF as a pathologist. He is also actively involved in research activities and at the same time supervising M. Phil and PhD students.

CLOSING REMARKS & RECOMMENDATIONS

The 1st International Graduate Research Conference 2025 has served as a dynamic platform to explore innovations, challenges, and future trends in poultry science. This conference has brought together graduate researchers, industry experts, and academic scholars to discuss and exchange ideas in key areas of poultry science.
With insightful sessions on:

- Poultry Nutrition & Feed Technology
- Poultry Health & Disease Management
- Poultry Genetics, Genomics & Breeding
- Poultry Production & Management
- Poultry Products Processing & Technology

We believe that the discussions and research presented will contribute significantly to shaping the future of the poultry industry and addressing global challenges in sustainability, innovation, and technology integration.

Recommendations & Future Directions:
As we move forward in advancing poultry science, the following recommendations are key:

- Strengthening academia-industry linkages
- Encouraging interdisciplinary research
- Expanding global collaborations
- Implementing sustainable poultry farming practices
- Leveraging technology (AI, IoT, big data analytics) for smart poultry management and production efficiency.

We encourage all stakeholders to actively work towards these recommendations to pave the way for a progressive and sustainable poultry industry.

Acknowledgments:
We express our deepest gratitude to:

- Keynote Speakers & Session Chairs – for their insightful contributions and expertise.
- Organizing Committee – for their dedication in making this conference a success.
- Industry Collaborators & Sponsors – for their valuable support.
- Graduate Researchers & Participants – for their enthusiasm and commitment to advancing poultry science.

For further collaboration, research inquiries, and future conference updates, please reach out to:
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