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| P. Ramesh - Head, Designing Department | Ph: 040-2761 0027, Cell : 98493 68003, 63096 77047 | |
| P.N. Nithin - Incharge - Photography | www.tezasvipublications.com | |
| K. Raghuramaraju - Publication Consultant (09440231211) | E-mail : tezasvipoultryline@gmail.com tejasvi_poultryline@rediffmail.com | |
| Printed, Published and Owned by B. Kalvan Kumar, Printed at Karshak A | t Printers, 40, A P H.B. Blocks, Vidvanagar, Hyderabad - 500 044, India | |

Printed, Published and Owned by B. Kalyan Kumar, Printed at Karshak Art Printers, 40, A.P.H.B. Blocks, Vidyanagar, Hyderabad - 500 044. India. Published at 2-1-444/16, 1st Floor, O.U.Road, Nallakunta,Hyd-44. Editor: B. Shiv Shankar.

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From the Editor's Desk......

Maze of Maize



From the time the government announced incentives of ethanol production out of maize, there has been a lot of turmoil in terms of availability prices and quality as well. The Maize is the main ingredient in the feed manufacturing and has impacted the farmer badly. The farmers are not being heard or given priority over the ethanol protection by the government, causing much pain. This has to be rectified.

The Poultry industry generally is on the growth path compared to the global Poultry, considering the growth rate and the domestic prices. There is a lot to be done in the area of increasing the consumption, branding and marketing of the Eggs and Chicken.

The recently concluded show in Hyderabad was well attended by quite a few visitors.

The global economy seems to be in turmoil, mainly connected with the ongoing wars which has affected the oil prices and food pricesglobally - the developing countries are hit hard due to this

Some of the legislations in India, which are 6 to 7 decades old and yet are politically incorrect as they target a particular community in a biased manner. The rising awareness and free media has enabled the public to bring out the facts and ask for correction- this exercise has started and will meet a logical end.

Trump's re-election will bring in a lot of changes at global level. The wars raging between Ukraine and Russia, and that of Israel and Iran are expected to be halted. The immigration laws will get tougher in the USA. The previous government's support for terrorism will be withdrawn and countries like Bangladesh and Pakistan will be subject to strict scrutiny over their human rights abuse and the atrocities on minorities. Canada has felt the pressure of the change and has rushed to the USA to appease Trump.

Electing to Trade: Policy and Market Dynamics Take Center Stage at USSEC's "CRUSH CON" in Dubai

- Ricky Thaper (www.rickythaper.com)

In 2024, the "Year of Elections," global leadership shifts are shaping new directions in trade and policy. "CRUSH CON" organised by U.S. Soybean Export Council (USSEC) at Hotel Sofitel Palm Jumeirah, Dubai, embody this year's theme, "Electing to Trade." The conference was attended by more than 100 delegates from South Asia; India, Nepal, Pakistan, Sri Lanka besides USSEC Team from Dubai and Senior Soybean Association Board Members from USA, brings into focus the connections between politics, trade and globalisation, particularly within supply chains, economic frameworks, and supplydemand factors.



The first day session opened with welcoming remarks from Mr. Kevin Roepke, Regional Director - South Asia & Sub-Saharan Africa (SAASSA), US Soybean Export Council, who introduced the key themes for conference that included Dr. Harrison Grafos, Regional Agricultural Attaché from the US Embassy, who discussed market development in the GCC, emphasizing the collaborative efforts between USSEC and USDA. Mr. Kevin Roepke said "Food inflation squeezes the middle class and erodes disposable income. The easiest way to reduce food inflation and thus improve the standards of the middle class is to lean into trade. Through trade, we can make healthier food more affordable and available to the middle class of South Asia."



Mr. Jim Sutter, the dynamic CEO of USSEC, shared insights into the soy industry's growth and USSEC's commitment to sustainable solutions in nutrition. emphasized how trade is an integral channel to provide food and nutrition security, Mr. Sutter highlighting its key benefit of moving goods from point of surplus to point of deficit. While trade helps maximize income in producing countries it provides consuming countries with availability of competitively priced products. He discussed the power of comparative advantage citing the example of Costa Rica. While Costa Rica specializes in producing bananas and coffee, the U.S. specializes in soybeans and corn. Through trade, these countries mutually benefit from high quality and competitively priced products.



Mr. Jim Sutter, CEO, USSEC presented a Special Appreciation to Mr. Kevin Roepke, Regional Director - South Asia & Sub-Saharan Africa (SAASSA).



Mr. Lance Rezac, USSEC Chair, provided a perspective on how U.S. farmers are meeting the demand for food while remaining environmentally responsible. Mr. Lance Rezac, said U.S. Soybean Export Council (USSEC) focuses on differentiating, elevating preference, and attaining market access for the use of U.S. Soy for human consumption, aquaculture, and livestock feed in 80+ countries internationally. USSEC members represent the soy supply chain including U.S. Soy farmers, processors, commodity shippers, merchandisers, allied agribusinesses, and agricultural organizations. USSEC is funded by the U.S. soybean checkoff, USDA Foreign Agricultural Service matching funds, and industry.



In a session on "US Soy Policy Needs Post-Election, Mr. Daryl Cates, Chairman, American Soybean Association (ASA), highlighted the priorities for U.S. soy in Congress's lame duck session. He emphasized the value of Market Access Program (MAP) and Foreign Market Development (FMD) funding and the potential impact of future free trade agreements (FTAs) on U.S. soybean exports.

The keynote presentation was by Mr. James Fry, Glenauk Economis. A standout keynote fireside chat, "Electing to Trade," featured former USDA Secretary Mr. Dan Glickman in conversation with Kevin Roepke, exploring how trade policies could evolve following global elections. The first day morning session concluded with the panel "Pakistan Two Years On," sponsored by the South Dakota Soybean Checkoff, where Zain Mahmood and Shahzad Ali Khan shared advancements and partnerships in Pakistan's agricultural sector. CRUSHCON Dubai and HUNGERCON Dubai continue to bring insightful dialogues, networking, and fresh perspectives toward a sustainable future.



The afternoon sessions of CRUSHCON Dubai continued to delve into the intricacies of global trade and its implications, with a focus on geopolitics, market dynamics, and sustainability. The keynote address on Geopolitical Economics featured Ms. Trinh Nguyen, Senior Economist for Emerging Asia at Natixis, who provided insights into the evolving landscape of emerging markets, particularly in Asia. Her perspectives, widely respected across international news platforms, are invaluable for understanding the region's economic pulse. In the session titled Global Oilseeds Spotlight, Mr. David Mielke, Director at Oil World in Germany, addressed the relationship between low corn and soybean prices and their potential to drive a global boom in the livestock and poultry sectors. His analysis brought forward important discussions on supply and demand dynamics in the industry.



Mr. Jaison John, Regional Head of Market Intelligence- South Asia, USSEC spoke on "How Policies Have Distorted Regional Prices for Feed Ingredients" and shed light on the complexities of trade policies that have affected feed ingredient pricing, making previously affordable sources of animal protein some of the most expensive globally. The Freight Sector Spotlight, presented by Mr. Voytek Chelkowski from Seamind Blue Ocean, highlighted the impact of freight volatility on margins. He emphasized the importance of understanding FOB versus C&F purchase decisions within the current geopolitical climate.



A significant moment came with the SUSS Logo Signing, where Nepal joined the initiative for sustainability, welcoming five companies into the fold, including Valley Group (NP), Kosmo Feed Mills (SL), Adamjee Lukmanjee (SL), Nel Farms (SL), and Ceylon Grain Elevators (SL). Presenting this initiative were Ms. Deeba Giannoulis, Dr. Pawan Kumar and Dr. Athula Mahagamage.









The afternoon concluded with a keynote address on US Soy's Commitment to Global Nutrition Security, showcasing the dedication of senior USSEC leadership to enhancing global nutrition.



Recognizing Pioneers Making an Impact in South Asia's Protein Value Chain Each year, through its HungerCon event powered by Right to Protein, USSEC recognizes and celebrates outstanding contributors to the protein value space in South Asia.



Ms. Deeba Giannoulis, Regional Head of Corporate Affairs-SAASSA, reflected on the origins of HungerCON and the legacy of past winners who have paved the way for advancing the discourse on nutritional security. This year's esteemed 'HungerCon Award' was awarded to Dr. Soumya Swaminathan, Chairperson of the M.S. Swaminathan Research Foundation in India for her pioneering work in integrating science into health policymaking. Other notable nominations included Mr. Iqrar Ahmad Khan, Vice Chancellor, University of Agriculture in Faisalabad, Pakistan and Mrs. Vibha Ahuja, Chief General Manager, Biotech Consortium India Limited from India.



The second day of CRUSHCON Dubai 2024 brought forward insightful discussions and innovative solutions aimed at advancing sustainability and global nutrition. Ms. Deeba Giannoulis, Regional Head of Corporate Affairs-SAASSA, introduced the Soy Sustainability Assurance Protocol, showing how companies can integrate this framework to promote sustainable practices. She spotlighted businesses that have adopted the SUSS logo, signalling their dedication to eco-friendly initiatives within the soy industry.



Ms. Christelle Cordahi, Regional Human Utilization & Nutrition Consultant at USSEC, presented on the importance of incorporating diverse protein sources, both animal and plant-based, to support a balanced diet. Her insights underscored the essential role of soy in overall health.



Ms. Tori Sorensen, Chair of the SEC Global Advisory Panel, shared the impressive growth and influence of the Soy Excellence Center (SEC) worldwide, which have significantly contributed to knowledge sharing and training in the soy sector. By providing free, accessible and comprehensive training options, Soy Excellence Center empowers professionals to stay updated with the latest trends and innovations in their fields. Soy Excellence Center courses adds

tremendous value to industry workforce engaged in the protein value chain.



Ms. Tori Sorensen, Chair of the SEC Global Advisory Panel, presented the ceremonial SEC lapel pin to Mr. Ricky Thaper, Regional Advisory Council (RAC) Member, Soy Excellence Center-India.



Dr. Tom D'Alfonso, Director of Animal & Aquaculture at USSEC, highlighted the value of optimizing feed nutrient profiles, stressing that not all soy is created equal. He described how U.S. soybean meal is tailored to maximize nutritional benefits for poultry, fish, and shrimp. In an insightful session, Will McNair, Global Head of Human Utilization at USSEC, discussed the complexities of soybean oil processing. He explained how factors such as damage, maturity, and moisture levels significantly affect the quality of soy oil, emphasizing how U.S. soybeans lead in optimizing refinery operations.



The day concluded with a wrap-up by Mr. Kevin Roepke, summarizing key outcomes and insights from the sessions. He emphasized the collaborative spirit of the conference and its potential to drive positive change in the agriculture and nutrition sectors. Mr. Daryl Cates, Chairman, American Soybean Association, offered a vote of thanks, expressing gratitude to all participants and speakers for their valuable contributions and commitment to advancing global nutrition security.



The CRUSHCON Dubai 2024 has truly set the stage for dynamic and impactful discussions. These conferences are a testament to the dedication of global leaders and experts in the fields of agriculture, nutrition, and sustainability. By bringing together thought leaders, industry professionals, and innovators, the events are fostering meaningful dialogue that is shaping the future of food systems.

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The focus on sustainable practices and solutions demonstrates a strong commitment to addressing global challenges, ensuring a healthier and more secure future for all. It's inspiring to witness how these platforms continue to empower collaboration and inspire change on such a significant scale.





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STRAINS







Avitriol Plant based Bioactive Vitamin D₃

1,25 (OH)₂D₃



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Optimises Calcium -Phosphorus homeostasis



No metabolic load on liver and kidney



Improves immune response



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THE ADVANTAGES OF PLANT DERIVED 1, 25 (OH)2 D3 GLYCOSIDE OVER OTHER METABOLITES OF VITAMIN D

Introduction: -

Vitamin D is a fat-soluble vitamin critical for maintaining calcium and phosphorus balance, promoting proper bone development and eggshell integrity, supporting muscle function and modulating the immune system of animals and birds. Vitamin D is absorbed from the digestive tract and requires the presence of bile salts for absorption (Braun, 1986). Cholecalciferol (Vitamin D3), occurring in animals and Ergocalciferol (Vitamin D2), occurring in plants are the two main natural sources of Vitamin D.

Compared to cholecalciferol (Vitamin D₃), its metabolites 25 (OH) D3, 1- α -(OH) D3 and 1, 25 (OH)2 D3 are more effective because all the cholecalciferol entering the system is not converted into active metabolites. Active metabolites may directly reach the target tissue by bypassing hydroxylation in liver and kidney or both, hence have more efficacy than Vitamin D3 (Goodgame et al., 2011).

Supplementing Vitamin D metabolites in addition to cholecalciferol ensures that animals receive the active or near-active forms of Vitamin D, enhancing their ability to regulate calcium and phosphorus metabolism efficiently. This is particularly important in fast-growing species like poultry and livestock, which have high nutrient demands.

 $1,25(OH)_2D_3$ is the biologically active form of Vitamin D. It is beneficial as it bypasses the need for metabolic conversion, making it a preferred choice for supplementation. Plants in the Solanaceae family contain $1,25(OH)_2D_3$ as an active compound, and in these plants, $1,25(OH)_2D_3$ is found in glycosidic form.

Glycoside form of 1,25(OH)₂D₃ :-

1,25-dihydroxy Vitamin D3 Glycosides $(1,25(OH)_2D_3$ -gly) are the active compounds in plants responsible for their Vitamin D-like activity. In addition to these $1,25(OH)_2D_3$ -gly, plants also contain free $1,25(OH)_2D_3$, along with

25-hydroxycholecalciferol, 7-dehydrocholesterol and cholecalciferol (EFSA, 2015, Jäpelt, & Jakobsen 2013). The glycosylation pattern of 1,25(OH)₂D₃ includes a distribution of 1 to 12 hexose units per aglycone, with mono-, di-, and tri-glycosides being identified (Bachmann et al., 2013). This glycosylation forms a protective structure that serves as a natural slow-release source of 1,25(OH)₂D₃ and creates the high storage and processing stability of the active molecule (Klis, 2024).

Benefits of $1,25(OH)_2D_3$ -gly over other metabolites of Vitamin D

1,25-dihydroxyvitamin D₃ $(1,25(OH)_2D_3-gly)$ is the biologically active form of Vitamin D, and it offers several advantages over other Vitamin D metabolites like 25-hydroxyvitamin D₃ (25(OH) D₃) and 1-alpha-hydroxyvitamin D₃ (1 α (OH)D₃) due to its direct physiological roles and bypass of metabolic conversion. Here is a detailed comparison:

1. Bypasses Metabolic Activation in Liver and Kidneys



• Studies (Christakos et al., 2016; Soares et al., 1976; Stevens & Blair, 1987) have shown that animals or birds with chronic kidney disease, liver dysfunction, or advanced age, the hydroxylation of $25(OH)D_3$ into $1,25(OH)_2D_3$ is impaired. This hydroxylation is crucial for intestinal calcium absorption, and its disruption negatively affects calcium and phosphorus

homeostasis, bone quality, eggshell formation and immunity against infection.

- The ability of glycosidic 1,25(OH)₂D₃ to bypass these steps ensures sufficient active Vitamin D levels for physiological functions.
- 2. Metabolism:
- Gly-1,25(OH)₂D₃ exhibits delayed absorption and elimination due to the slow and sustained de-glycosylation, resulting in an extended halflife (T¹/₂) of approximately 30 hours (EFSA, 2015).
- In contrast, 1α -hydroxyvitamin D3 (1α (OH)D₃) is metabolized in the liver to form 1,25(OH)₂D₃, which has a significantly shorter half-life, ranging from 6 to 8 hours (Garcia et al, 2013).
- Sustained activity of Gly-1,25(OH)₂D₃ enhances calcium metabolism, leading to improved calcium absorption and strengthening immune function.
- 3. Shelf life and stability:
- Available data show that the content of Gly-1,25(OH)₂D₃ remains stable even after extended storage periods of 12, 36, and 66 months and different conditions (4–8 °C, at 20–26 °C or at 37 °C), with no significant reduction in its potency (EFSA, 2015).
- This long-term stability offers a major commercial advantage compared to other synthetic forms such as $25(OH)D_3$ and $1\alpha(OH)$ D₃.

| | | Metabolites of Vitamin D | | | | | |
|----|-------------------------------|---------------------------|-----------------------|--|--|--|--|
| | Particulars | Plant origin | 25(OH) D ₃ | la(OH)D3 | | | |
| | | 125(OH)203 | | | | | |
| | Contraction of the Providence | | | Contracting the second second second second second | | | |
| 80 | THICPA | annen Gibber anne | 20(011) D3 | 10(011)03 | | | |
| - | | | | | | | |
| | Origin | Natural | Synthetic/Fermented | Synthetic | | | |
| | Shelflife | 24 Month | 06-24 Months | 18 Months | | | |
| 23 | | A SALES AND A STORE SHOLE | | | | | |

- 4. Safety profile and reduced risk of toxicity
- 1,25(OH)₂D₃-gly exhibit water solubility, which influences their absorption and metabolism in the body. Unlike fat-soluble vitamins, which can be stored in fatty tissues. This mechanism helps to prevent the accumulation of potentially toxic levels of Vitamin D in the body, thereby reducing the risk of hypervitaminosis D and associated

complications such as hypercalcemia.

- Thus, 1,25(OH)₂D₃-gly offers a safer profile compared to its fat-soluble counterparts, ensuring that adequate levels can be maintained without the risk of overaccumulation.
- Free 1,25(OH)₂D₃ is rapidly degraded once its physiological role is fulfilled, ensuring tight regulation and minimizing the risk of prolonged activity, which might otherwise result in adverse effects such as calcium dysregulation.
- 5. Improved Immune Function
- Gly-1,25(OH)₂D₃ has a direct immunomodulatory role as it enhances the innate immune responses by inducing antimicrobial peptides, such as cathelicidins and defensins, which are critical for fighting infections.
- 1,25(OH)₂D₃ modulates the activity of T cells and dendritic cells, promoting a balanced immune response and preventing excessive inflammation (Nunes et al., 2020).
 - Carlberg and Haq (2020) reviewed the effects of 1,25(OH)₂D₃ on immune system modulation, highlighting its role in reducing the risk of autoimmune disorders and enhancing pathogen defense.
- 6. Effect on Calcium and Phosphorus Homeostasis
- 1,25(OH)2D3 is the dominant hormonal player in regulating calcium metabolism. In conjunction with parathyroid hormone, and calcitonin it enhances the absorption of calcium and phosphorus in the intestines, which is essential for maintaining proper bone density and mineralization, eggshell formation, regulating muscle contraction, and nerve transmission.
- It directly influences calcium homeostasis by binding to the Vitamin D receptor (VDR) in intestinal epithelial cells, upregulating the expression of calcium transport proteins, such as calbindin (Lihua et al., 2022).
- Adequate levels of 1,25(OH)₂D₃ are vital for maintaining bone density and preventing fractures (Schwartz & Lizaola, 2014). Edwards

and Hardy, 1989 indicated that supplementation of 1,25 (OH)2 D3 significant decrease in the occurrence of tibial dyschondroplasia (TD) and an increase in overall bone ash compared to 25-(OH) D3. $1,25(OH)_2D_3$ directly increases the synthesis of calcium-binding proteins in the intestines, facilitating more efficient mineral uptake to prevent such conditions (Dusso et al., 2005).

- Chennaiah et al. (2004) found that supplementation with $1,25(OH)_2D_3$ resulted in significantly higher specific gravity in the eggs and improved egg production (McCoy, 2009) compared to those receiving only $25(OH)D_3$ or $1\alpha(OH)D_3$.
- 7- Phytase and 1,25-(OH)₂D₃
- Recent studies have elucidated the synergistic relationship between phytase and 1,25-(OH)₂D₃ in enhancing phosphorus and calcium utilization in poultry.
- For instance, a study by Geng et al. (2021) found that the combination of phytase and 1,25-(OH)₂D₃ significantly improved phosphorus retention and bone mineralization in broiler chickens, reducing the need for supplemental inorganic phosphorus in diets.
- Jiang et al. (2022) demonstrated that supplementing diets with phytase and 1,25-(OH)₂D₃ led to significant improvements in growth performance, and reductions in phosphorus excretion in broilers. Their findings indicate that this synergistic approach not only enhances nutrient utilization but also supports

skeletal integrity and overall health in poultry.

• The study highlighted that this combination maximizes the bioavailability of phosphorus from plant-based feed ingredients, which often contain phytate-bound phosphorus that is not readily absorbable.

Conclusion

- In conclusion, glycosylated 1,25-dihydroxyvitamin D₃ (1,25(OH)₂D₃gly) offers significant advantages over traditional Vitamin D metabolites, such as 25-hydroxyvitamin D₃ (25(OH)D₃) and 1-alpha-hydroxyvitamin D₃ (1α(OH)D₃).
- Its unique property of bypassing metabolic activation in the liver and kidneys along with slow and sustained release facilitates better bioavailability, making it beneficial for animals. This direct availability enhances intestinal calcium and phosphorus absorption, critical for maintaining bone health eggshell strength and overall mineral homeostasis.
- The extended half-life and stability of 1,25(OH)₂D₃-gly contribute to sustained physiological effects, optimizing its role in calcium metabolism and immune function while minimizing the risk of toxicity associated with excess Vitamin D.
- The synergistic interaction between 1,25(OH)₂D₃-gly and phytase further improves the bioavailability of phosphorus from feed, promoting enhanced growth performance, bone mineralization, eggshell strength, and overall health in poultry.



Poultry Federation of India Team Meets Animal Husbandry Minister and Senior Government Officials to Address Industry Challenges and Strengthen Future Prospects



Poultry Federation of India Team Mr. Ranpal (Bittu) Dhanda, President, Mr. Ramesh Khatri, Chairman (PFI Working Group), Mr. Sanjeev Gupta, Vice President, Mr. Ricky Thaper, Treasurer, Mr. Ravinder Sandhu, Secretary and Mr. Jagdish, Office Manager met Honourable Prof. SP Singh Baghel, Union Minister of State for Animal Husbandry, Government of India to discuss the pressing challenges facing the Indian poultry industry. The PFI delegation highlighted critical issues affecting the sector, including the impact of high maize prices on broiler and egg production costs and concerns over soybean meal adulteration. They proposed liberalizing imports of GM corn and GM soybean/soybean meal to stabilize feed costs and reduce local dependency. Later PFI team held constructive discussions with Mrs. Alka Upadhya (IAS), Secretary, Animal Husbandry Department; Dr. Sanjeev Balyan, Former Union Minister of State for Animal Husbandry; Mr. Mahipal Dhanda, Education Minister, Harvana State Government, Dr. Abhijit Mitra, Commissioner, Animal Husbandry and other senior officials, including Dr. SK Dutta, Joint Commissioner, Animal Husbandry, Dr. Hansraj Khanna, Joint Commissioner, Animal Husbandry, Dr. Gagan Garg, Deputy Commissioner, Animal Husbandry and Dr. Lipi Sairiwal, Deputy Commissioner, Animal Husbandry. The team expressed appreciation for the government's support, particularly through the Animal Husbandry Infrastructure Development Fund, which has helped to boost the sector's infrastructure.

Poultry Federation of India Team extended an invitation to Minister Sir and all officials to attend PFI's 35th Annual General Body Meeting (AGM), to be held at Hotel The Leela Ambience, Gurgaon, on December 27-28, 2024. The AGM is expected to host over 600 industry participants, including farmers, breeders, feed manufactures, equipment manufacturers, pharmaceutical companies and government officials, providing a collaborative platform to address industry challenges and explore sustainable growth strategies. As the apex association for poultry farmers and allied industries, Poultry Federation of India remains committed to addressing sector challenges and working closely with government bodies to ensure a stable and progressive future for the Indian poultry industry.



POULTRY LINE, DECEMBER_2024



Free Lance Poultry Consultant

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



His areas of expertise include:

- Commercial Layer Management.
- Commercial Broiler Management
- Nutrition (Feed Formulations).
- Breeder Management.
- Sales & Marketing of Day-Old commercial Layer chicks, Broiler chicks & Poultry Feed.
- > Sales & Marketing of Broiler Breeder.
- Integration.
- Training to Field staff.
- Field Trial of Drugs & Feed additives.
- Speaker in Technical Seminars.

He can be Contacted at:- **Dr. Manoj Shukla** A-1,Gaytri Nagar,Phase-II, P.O.Shankar Nagar,Raipur, Chhattisgarh-492007 Mob.No : 09644233397, 07746013700, Res. 0771-4270230 Email : <u>drmanu69@gmail.com</u>

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





IMMEUREKA PARTICIPATION IN POULTRY INDIA EXHIBITION

XPEL ADDA

November 27, 2024 | 3:00 PM | Hall No. 5, Stall No. Y78A

IMMEUREKA was delighted to announce the much-anticipated XPEL ADDA, an engaging event tailored for professionals, enthusiasts, and stakeholders from the poultry industry. This event was held on November 27, 2024, at 3:00 PM, at Hall No. 5, Stall No. Y78A, as part of the 16th Poultry India Exhibition at the Hitex Exhibition Centre, Hyderabad.

The XPEL ADDA promised to be a platform for sharing insights, discussing innovative trends, and fostering meaningful interactions among industry leaders. With a focus on promoting growth and collaboration, attendees looked forward in the dynamic session curated to inspire and connect.

All industry members were invited to join for an insightful and interactive session at XPEL ADDA.



PERFORZA ADDA

November 28, 2024 | 3:00 PM | Hall No. 5, Stall No. Y78A

IMMEUREKA was excited to host PERFORZA ADDA, a flagship event designed to bring together the professionals and thought leaders in the poultry sector. This event was held on November 28, 2024, at 3:00 PM, at Hall No. 5, Stall No. Y78A, during the 16th Poultry India Exhibition at the Hitex Exhibition Centre, Hyderabad.

The PERFORZA ADDA aimed to provide a vibrant platform for sharing expertise, exploring cuttingedge developments, and building meaningful connections within the poultry industry. It was a mustattend event for those looking to innovate and collaborate in this evolving field.

All industry members were invited to join for an insightful and interactive session at PERFORZA ADDA





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Srinivasa Farms Makes an Indelible Mark at the Poultry India Expo 2024





Srinivasa Farms, one of India's leading integrated poultry companies, showcased its commitment to innovation, sustainability, and customer engagement at the Poultry India Expo 2024, held from 27th to 29th November 2024 at the HITEX Exhibition Center, Hyderabad.

The event, recognized as one of the largest platforms for the poultry industry in South Asia, brought together farmers, industry leaders, consultants and technology innovators from across the country. Srinivasa Farms' participation highlighted its comprehensive range of solutions across the Layer, Broiler, Feed, Soya, and Commercial Egg segments.

A Hub of Innovation and Engagement

The Srinivasa Farms stall was a hub of activity, attracting a diverse audience from across the country evincing a keen interest to learn about the company's latest advancements in poultry farming from hatching and breeding to commercial sales. With interactive displays, live product demonstrations, and technical consultations, the team provided valuable insights to both seasoned farmers and new entrants.

Speaking at the event, Mr.Suresh Chitturi, Managing Director of Srinivasa Farms, said, The Poultry India Expo 2024 has been an exceptional opportunity for us to engage with all stakeholders, understand emerging trends, and showcase our solutions tailored to meet the evolving needs of the industry. We are committed to supporting farmers with innovative products and sustainable practices that drive profitability and efficiency."

Strengthening Partnerships

Srinivasa Farms also recognized its longstanding collaboration with Hy-Line International, a global leader in layer genetics, which has been instrumental in introducing the high-performance breed - Hy-Line W-80iin the Indian market.



Acknowledgment to Poultry India Srinivasa Farms extends its gratitude to the organizers of the Poultry India Expo 2024 for providing an excellent platform to connect with industry leaders and exchange knowledge.

Looking Ahead

As the poultry industry continues to grow, Srinivasa Farms remains dedicated to driving innovation, enhancing productivity, and supporting farmers through cutting-edge technology, superior genetics, and expert technical guidance across the life cycle. For more information on Srinivasa Farms and its offerings, visit www.srinivasa.co or follow us on social media.

About Srinivasa Farms:

Established in 1965, Srinivasa Farms is a pioneer in India's poultry industry, offering a range of solutions from breeding to retail. With a focus on innovation, quality, and sustainability, Srinivasa continues to empower farmers and contribute to the growth of the poultry sector in India and beyond.



| | Average | 0 | 601.83 | 578.97 | 570.9 | 590.83 | 573.4 | 602 | 595 | 602.57 | 566.17 | 540.83 | 556 | 584.07 | 617 | 568.1 | 624.67 | 592.83 | 545.83 | 622 | 575.47 | 616.67 | 569.67 | 556.5 | 566.17 | 558 | | 623.77 | 594 | 585.67 | 621.13 | 626.57 | 630.6 | 600.97 | 630.6 | 624.33 | 619.17 |
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| d l | Name Of Zone / | | Ahmedabad | Ajmer | Barwala | Bengaluru (CC) | Brahmapur (OD) | Chennai (CC) | Chittoor | Delhi (CC) | E.Godavari | Hospet | Hyderabad | Jabalpur | Kolkata (WB) | Ludhiana | Mumbai (CC) | Mysuru | Namakkal | Pune | Raipur | Surat | Vijayawada | Vizag | W.Godavari | Warangal | Prevailing Prices | Allahabad (CC) | Bhopal | Indore (CC) | Kanpur (CC) | Luknow (CC) | Muzaffurpur (CC) | Nagpur | Patna | Ranchi (CC) | Varanasi (CC) |

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Dr. Jacqueline Hughes, Director General of ICRISAT, to Assume Role of Secretary General of the World Agriculture Forum

Director General of the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), headquartered in Hyderabad, India



Jacqueline Dr. d'Arros Hughes, outgoing Director General of the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), headquartered Hyderabad, in India, is set to

take up the role of Secretary General of the World Agriculture Forum in mid-November 2024. Her extensive career, marked by ground breaking work in sustainable agriculture, equips her to steer the Forum towards its mission.

Dr. Hughes has over 30 years' experience in agricultural research for development and is highly regarded for her leadership in tackling the pressing global challenges of food insecurity, sustainable agriculture, and rural development in some of the world's most vulnerable regions.

Trained in the United Kingdom, Dr. Hughes holds a PhD from Reading University and began her career with postdoctoral work before working with national partners in Ghana. Throughout her career, Dr. Hughes has held international leadership positions in prestigious agricultural institutes across Africa and Asia, equipping her with a profound understanding of the unique challenges faced by these regions.

A distinguished plant virologist, Dr. Hughes has strong interests in remote sensing, digitalisation, and gender equity. She continues to champion the integration of modern technologies, plant quarantine best practices, and the ethical use of intellectual property to enhance agricultural outcomes. Dr. Hughes believes in both working locally for global impact and working globally for local impact.

As Director General of ICRISAT, Dr. Hughes adeptly led the Institute through the global pandemic, achieving significant milestones despite unprecedented challenges. Under her leadership, ICRISAT was honoured with the Africa Food Prize

2021 and welcomed the Honourable Prime Minister of India, Narendra Modi, at the Institute's 50th Anniversary celebrations in 2022. Dr Hughes further strengthened ICRISAT's influence as a leader in dryland agriculture in 2023, actively participating in the agriculture meetings of the G20 Summit held in New Delhi and serving as co-Chair of the International Steering Committee for the United Nations' International Year of Millets.

Rudy Rabbinge, Chairman of the World Agriculture Forum, remarked: "Dr. Hughes brings to the World Agriculture Forum a wealth of experience and a commitment to agricultural innovation that is critical to achieving our mission. Her proven ability to deliver impactful results, her deep understanding of the international agricultural landscape, and her vision for sustainable intensification will strengthen the World Agriculture Forum's position as a leader and partner in addressing food and nutrition security worldwide."

As Secretary General, Dr. Hughes will focus on strengthening alliances and advancing innovative solutions in agriculture, ensuring the World Agriculture Forum is well-positioned to address the evolving needs of the sector globally. Her appointment is a testament to WAF's commitment to bringing visionary leaders on board.

About the World Agriculture Forum

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

For more information, please contact: R. Sophia, Media Coordinator World Agriculture Forum info@worldagricultureforum.com



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BIOTECH

National Chicken Day



Under the leadership of Mr Vasanthkumar C Setty, Convenor, Pan India Broiler Coordination Committee, has organised a National Chicken Day on 16th November 2024 in fond memory of Padmasree Dr B V Rao for the fourth consecutive year.

Mr. Vasanthkumar C. SettyHe informed that about 900 shops displayed the banners of National Chicken Day and provided discounts on chicken with free eggs for promotion of chicken consumption and said that the response from the customers were overwhelming.

He appreciated the efforts of West Bengal,



Chhattisgarh, Maharashtra and Karnataka and felt that but for their support the event would not have been a grand success. He further said that the Assam Association and North India Broiler with Venkys India

Mr. Madhan Mohan Maity also joined in the celebrations and made it a memorable one. He made a special mention about Mr. Madhan Mohan Maity Gen. Secretary, WBPF, who has promoted National Chicken Day in a gigantic manner.

He also appreciated the support of Poultry Journalists throughout the year by publishing the promotional activities of chicken consumption so far and expect their gesture in future too.











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- Layer Farmer, Namakkal, India

POULTRY LINE, DECEMBER_2024

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"The Dutch & Indian Poultry" at Hotel Novotel, Hitex Exhibition Center

The Dutch have a long history of cooperation in Poultry with INDIA. The breed Bovans, Pasreform, De Heus, Trouw Nutrition and about 35 Other companies are active in India.

Many business people from the Dutch and Indian side, along with key personalities, and Media were present during a very interesting presentations for the audience.



Mr. Michiel Van Erkel, The Agriculture Counsellor with several Speakers Which was very well moderated by Mr. Selvan Kannan.

The Session was followed by a Networking Dinner Reception

The Following Speakers at the session -

Precision Feeding & Farming in Poultry

- Mr Gerry Oude Elferink, Director -Nutrition Support of De Heus India

Artificial Intelligence (AI) & Poultry- The Future

- Dr Anurag Jena, General Manager of Alpha Feeds

Atmanirbhar Bharat & PUM -Mr Leon Husson, PUM

Mr Selvan Kannan , Value Consultants, has played very effectively the role of Moderator.



Topics of Technical Seminar during India Poutry Expo 2024 held at Belagavi

We publish here under the topics of technical seminar held at the 25th edition of India Poultry Expo 2024 at Belagavi North Karnataka

Date: October 8, 2024

Topic: Achieving One Health from Water Health

- Dr. Santosh Ire, Director, Animal Health Pvt. Ltd., Secretary, Vets In Poultry (VIP)

Dr. Ire emphasized that water is a significant cause of illness in both humans and animals. Clean water consumption can resolve 50% of the problems faced by poultry farmers. He stressed the importance of every minute in ensuring the healthy growth of chickens.

Dr. Ire emphasized the necessity of talking to the birds. This can be interpreted as a reflection of our upbringing, where we grew up listening to Grandma's stories in which all creatures birds, animals, trees—could speak. It implies that in earlier days, people had such intimacy with these creatures that they were able to understand their meanings. Now, somewhere, the link is missing, and the demand of the day is to reconnect and move forward.

Current Challenges in Maintaining Water Quality in Poultry:

- Lack of comprehensive solutions.
- Reliance on traditional disinfection methods.
- Casual approaches by many stakeholders.
- Cost concerns leading to the acceptance of poor quality.
- Absence of standard protocols or guidelines.
- Variability in water sources and supply systems.
- Inconsistent water quality parameters across geographical regions.
- Irregular testing of water samples.
- Lack of a mechanism for ongoing assessment of the effectiveness of solutions.

Available Solutions for Water Treatment:

Sand filters

- Reverse osmosis (RO)
- Water softeners
- UV treatment
- Ozone treatment
- Chlorination
- Acidifiers
- Other methods

Dr. Ire pointed out that many of these methods leave significant impurities in the water, complicating management. Some processes remove essential minerals, while others reintroduce them at an added cost, making them financially burdensome for consumers. The discussion raised the question: What is the optimal solution for ensuring water quality in poultry farming?

Dr. Ire explained about the BooM-OX safe water filter for poultry, detailing how it works at each stage and its advanced, user-friendly features that alert users to quality changes.

Why BooM-OX:

- Very stable
- Highly soluble, like Despines
- pH independent
- Lower CT value and fast action
- Acts as a steriliser (kills all organisms, including bacteria, viruses, algae, and fungi)

How It Works:

- BooM-OX penetrates the cell wall and destroys the RNA of the cell.
- It causes the oxidation of amino acids in the organism.
- BooM-OX kills microorganisms even when they are inactive.
- It removes biofilm.

Competitive Benefits:

 The only FDA-approved product in the market, ensuring product safety and quality consistency with certifications such as GMP, WHOGMP, ISO, and HALAL.

- Highest purity of over 99%, with no other DBPs except for fractions of sodium sulphate and sodium chloride.
- Optimum safe concentration of 7.5% with minimal explosion hazards for better economy.
- Proven performance in over 3,000 poultry farms in India, including as an air disinfectant.

Interaction: All doubts and queries from the farmers were addressed with satisfactory clarification.

Topic:Effective Control of Diseases in Commercial Broilers in Belgavi and Adjoining Areas.

- Dr. S. R. Anand, Director, Anand Animal Health Pvt. Ltd.

Dr.Anand emphasized the impact of environmental factors on disease prevention.

Major Causes:

- Ventilation
- Air Quality
- Ammonia Levels
- Chemical Exposure
- Temperature
- Humidity

He highlighted the importance of maintaining spacious, congestion-free environments to ensure sufficient air exchange, allowing for comfortable breathing for the chickens.

Major Infectious Diseases:

- Newcastle Disease
- Infectious Bronchitis (IB)
- Infectious Laryngotracheitis (ILT)
- Low Pathogenic Avian Influenza (LPAI)
- Mycoplasma Gallisepticum (MG)

Immunosuppressive Diseases:

- Gumboro Disease
- Chicken Anemia Virus (CAA)
- Marek's Disease
- Leukosis
- Salmonella
- Mycotoxins

Newcastle Disease Overview:

- Causative Organism: Paramyxovirus
- Affected Age Groups: All ages.
- Systems Affected: Respiratory, intestine, ovary.
- Economic Consequences: Severe mortality and reduced egg production.
- Incidence: Nationwide

Basic Understanding of Newcastle Disease:

- 1. Vaccines are rarely ineffective.
- 2. Vaccination can occur during an outbreak.
- 3. Multiple serotypes and several pathotypes of the virus exist.
- 4. Mild and intermediate strains are used for immunization.
- 5. Killed vaccines and vector vaccines are also available.
- 6. The vaccine virus can interfere with field viruses and replicate during an outbreak.

Mortality and Morbidity:

- Sudden mortality is observed in chickens younger than six weeks and those just four days old.
- Mortality typically ranges from 2% to 40%, particularly in younger birds.
- Some outbreaks have reported mortality rates as high as 80%.
- Cull rates can increase in affected flocks, typically remaining below 10%.
- Post-mortem Lesions:Pictorial description of the below mentioned factors.
- Swollen liver, yellow and mottled with petechial hemorrhages and ecchymosis.
- Hemorrhages in skeletal and heart muscles.
- Pale kidneys and bone marrow.
- Thin, low-viscosity blood.
- Small bursa and spleen.
- Microscopically, basophilic intranuclear inclusions are observed.

Prevention: Avoiding stress and vaccinating against Infectious Bronchitis (IB) in breeders and commercial flocks is essential for controlling diseases. The presentation included detailed

pictographic descriptions, complemented by • Occurs at 2-3 weeks of age humorous analogies, which made the seminar more engaging.

Managing Chronic Topic: Respiratory Disease (CRD) in Broilers.

-Dr. Dhirendra Kumar, President, Vesper Group, Bengaluru.

Dr. Kumar began the seminar with a humanitarian approach, demonstrating empathy by attempting to lift a heavy bag to understand the pain faced by workers. He also collected eggs from the lower tiers to appreciate the challenges before addressing the manager regarding collection issues. His goal is to avoid unnecessary prescriptions and focus on relevant clinical factors for farmers. Dr. Kumar began his consultations after five years at Venkateshwara Hatchery, driven by a noble intention to solve the problems faced by farmers.

Dr.Dhirendra's Slides:

Broilers Management and CRD (Chronic Respiratory Diseases): Characteristics and transmission factors, such as contact within the flock, carriers, droplets, and fomites, are significant in transmission between farms and within flocks, with 35% of transmission occurring vertically.

Factors:

- Stress conditions
- Vaccine stress
- Recovered birds can be infected for life
- Severe cold and sudden weather changes
- Young birds are severely affected
- Poor ventilation, overcrowding, damp litter
- Ammonia irritation to respiratory mucous membranes during winter

Clinical Signs:

- Nasal discharge, coughing, gasping, sneezing
- Razer blade-like breast
- Shaking of the head
- Low FCR due to decreased intake
- Poor carcass quality and weight gain

- Mixed infections with E. coli, ND, IB, ILT, IC Pathogenesis:
- · Enters through the respiratory tract and conjunctiva via infected embryos
- Localizes in the respiratory tract epithelium
- Causes irritation and damage to the tracheal tract
- Affects the sacs of the lungs
- · Leads to secondary bacterial infections and viral infections
- Causes bacterial septicemia

Post Mortem Findings:

- Sinuses coated with turbid mucus
- Excess mucus in the trachea •
- Cheesy material in the bronchi
- Consolidation spots in the lungs
- Air sacitis; cloudy air sacs with large amounts of exudate
- Parlhepatitis, pericarditis, salpingitis
- Pale and flabby muscles

Control Measures:

- Maintain a mycoplasma-free flock (10,000 birds, 35% infection * 145 chicks = 1.5 crore)
- Medicate breeders to eliminate transmission
- Purchase mycoplasma-free chicks
- Avoid movement of people and materials
- Implement biosecurity measures
- Use systemic antibiotics when necessary
- Bury carcasses
- Incineration

Vaccination Protocol:

- 1-3 days: ND killed variant vaccine (0.25 ml in the neck region only)
- 5-6 days: B1 or F strain eye drop only
- 13-14 days: IBD intermediate plus eye drop only
- 24-28 days: Lasota in water if keeping birds beyond 35-42 days of age

CRD Management:

• If it occurs, it should be treated rather than

treatment is often ineffective.

- Mortality and financial losses are cumulative. Cleaning of the Shed:
- Multilevel control is needed.
- 1-5 days: yolk sac infection
- 10-12 days: leg weakness
- 18-23 days: kidney issues, coccidiosis, CRD, weather-related issues, E. coli
- 28-35 days: liver issues, calcium issues, viral issues
- Keep data and analyze it to minimize agewise issues in the next flock.
- is about management • Farming and prevention-not just treatment. A day's loss is 74 g/bird, costing Rs. 4-85.

Good Management Practice (Broiler)

- Dr. Krishna Paul, Komarla Agrovet, Bengaluru Target:
- 1. First-week body weight: 200 g
- 2. Crop Score (within 24 hours): 90-100%
- 3. Weight at 35 days: 2 kg
- 4. Livability: 96%
- 5. Feed Conversion Ratio (FCR): 1.4

Targets are achieved by 80% of the farmers.

- Shed Selection and Construction of the Ideal Farm:
- Location: Ideal for production and marketing centers.
- Orientation: East-west direction.
- Access: Road facility for convenient transportation.
- Water Quality: Hardness below 250 PPM and pH 6-8.
- Structure: Breadth of 25 ft ± 5 ft, with a minimum elevation of 4-6 inches above ground level.
- Biosecurity: Foot bath and mortality pit with disinfectant.
- Feed Room: Essential for storage.
- Water Tanks: Two tanks (one for medication and one for drinking water) with a capacity of 500 L per 1,000 sq. ft.

just controlled. After three weeks, prior . Curtains: Both outer and inner curtains for temperature control.

- Pipeline Flushing: Clean the pipeline with 10% H2O2 (Hydrosafe). Clean the water tank with washing detergents or bleaching powder. Clean all equipment with detergents. Remove scales and deposited salts in the drinker using acid (HCI).
- Equipment Cleaning: Clean equipment outside the shed.
- Feeder and Drinker Cleaning: Regularly clean feeders and drinkers.
- Disinfection: Burn debris from the shed and premises. Fog the shed for disinfection.
- Water Sanitization: Ensure water is thoroughly cleaned using a good descaling agent with effective sanitizing activity. Always use a quality water sanitizer and rotate them. Avoid water sanitization one day prior to and during live vaccination.
- · Whitewashing: Use lime, formalin, and CuSO4 for sanitization.

Equipments:

- One cone and grill auto feeder for 35 birds
- One chick drinker for 35 birds
- One jumbo drinker for 35 birds
- One coal heater for 300 birds
- Three fans for every 5,000 sq. ft.
- One chick feeder for 35 birds
- Additionally, the seminar explained drum brooding, litter management, ventilation, lighting, and humidity and temperature requirements.
- Litter Management: Litter management is a crucial aspect of poultry house management that directly affects final carcass quality.

Important Functions of Litter:

- Absorbs moisture.
- Dilutes bird excreta.
- Minimizes contact between birds and manure.
- Provides insulation from hot and cold floors.

Normal dry litter should maintain a minimum moisture content of 10-12%. Excess moisture can lead to breast blisters, skin burns, and carcass condemnation at processing plants. High moisture in litter contributes to elevated ammonia levels in sheds, leading to respiratory issues, foot pad burns, eye burns, skin irritation, decreased feed consumption, reduced weight gain, increased disease susceptibility, and blindness.

Cross Ventilation and Air Movement: A double curtain made of HDPE is an efficient method for controlling noxious gases like ammonia and carbon monoxide produced by coal heating. The upper curtain should be used to release noxious gases outside the shed while allowing fresh air to enter. The movement of curtains should be adjusted based on the climatic conditions of various geographical areas.

Topic: Toxicity- A big Challenge In Poultry Farming.

- Dr. Manoj Shukla, Consultant Raipur.

Dr. Manoj Shukla presented a very interactive lecture with beautiful analogies making the farmers very attentive.

- Aflatoxins
- Bacterial Toxins
- Chemical Toxins

Drug Toxicity

Toxin Hazards

- About 500 types of fungi identified which are Aflatoxin Producers.
- In India about 75% grains are infected with Aflatoxins.
- In India: Aflatoxin :81%, Zearalenone:12%, DON: 14%, T2:1%, Fumosins:88%, OTA 76%, Permitted Level (PPB) : Aflatoxin : 20, ZEA: 50, DON 150, T2:50, FUM : 500, OTA : 10

Mycotoxin Analysis

Pictorial Demonstrations of the organs of the affected chicken.

Control

- Prevention Is Better Than Cure-
- A nice pictorial demonstration of the following factors.
- 1. Effective mycotoxinmanagement in feed.
- 2. Focus on raw material purchase.
- 3. Proper storage of feed and feed ingredients.
- 4. Usage of fresh feed.
- 5. Being careful in rainy season.
- 6. Being careful in summer and winter seasons.
- 7. Avoidance of self over medication.

POULTRY INDIA EXPO PHOTOS



Avian Excretory System Dr. Suraj Amrutkar1, Dr. Suhas Amrutkar2 and Dr. Bharti Dehmukh3

Dr. Suraj Amrutkar1, Dr. Suhas Amrutkar2 and Dr. Bharti Dehmukh3 1. Assistant Professor, Dept. of L.F.C., F.V.Sc.& A.H.,SKUAST-J, Jammu 2. Assistant Professor, Dept. of Animal Nutrition, PGIVAS, Akola, MAFSU, Maharashtra 3. Assistant Professor, Dept. of AGB, College of Veterinary Science., GADVASU, Ludhiana

Introduction:

The avian kidney contains both cortical or reptilian and medullary or mammalian nephrons. The kidney filters up to 11 times the total body water daily. Approximately 95% of this volume is reabsorbed by tubular reabsorption, which likely results from a change in the rate of filtration and/or the rate of reabsorption. These changes can result because of the antidiuretic hormone arginine vasotocin. The urinary concentrating ability generally varies inversely with body mass; however, birds can concentrate their urine, often at 2 to 3 times the osmolality of plasma. Further concentration of urine may occur by retroperistalsis.

The excretory system in the domestic fowl consists of the two kidneys, each with a ureter that carries the urine produced by the kidneys to the cloaca where it leaves the body. When the kidneys are diseased or damaged and unable to carry out their functions efficiently, the animal becomes debilitated and death often occurs quickly. The primary function of the kidneys is eliminative that is they excrete the body wastes and excess water and solutes.

Its functions in the domestic fowl are to:

- 1. Maintain the electrolyte balance
- 2. Maintain the water balance

3. Eliminate metabolic wastes, particularly nitrogen products of metabolism (except carbon dioxide)

The Kidneys:

The avian urinary organs consist of a pair of kidneys and the ureters, which transport urine to the urodeum of a cloaca. There is no urinary bladder, though the cloaca may serve as its functional equivalent in some species and circumstances. The avian kidney lies within a cavity formed by the ventral surface of the synsacrum. The mass of two kidneys represents approximately 0.8% of body mass in birds. The external appearance of avian kidney is elongated and trilobed, with anterior, middle and posterior division.

The two reddish-brown kidneys of the domestic fowl, each generally with three lobes, are found immediately behind the lungs on each side of the vertebral column and closely associated with it. A relatively straight, narrow tube called the ureter, leaves the medial border of the each kidney and opens into the cloaca adjacent to the deferent duct of the male or the oviduct of the female. The ureter connects to many funnel shaped structures from each lobe of the kidney.

The kidney, on close inspection consists of the renal cortex and the renal medulla. A microscopic examination of a section of kidney will show that it consists of a large number of renal tubules, or nephrons, each divided into cortical and medullary parts.

Birds have two types of nephrons. A small number of mammalian type nephrons with a Loop of Henle (used to help concentrate the urine) found in the renal medulla and a much large number of reptilian type nephrons without the Loop which are located in the renal cortex. The renal tubules extract the constituents of the urine from the blood that flows through the kidney. A renal tubule or nephron is composed of the:

- Renal corpuscle which consists of a close network of blood capillaries almost enclosed in a capsule, called Bowman's capsule. It is here that the necessary very close association with the blood occurs.
- Proximal convoluted (spiral–like) segment leading from Bowman's capsule.
- The loop of straight tubule called the loop of Henle (only in the mammalian type nephrons)
- Distal convoluted segment
- Collecting tubule that the urine into the ureter for elimination from the body.

Like almost all birds, the domestic fowl does not have a bladder as is found in most mammals and amphibians. The urine leaves the ureters and enters the cloaca where it is moved by reverse peristalsis into the large intestine, which permits excess water to be re-absorbed before elimination. This re-absorbed water is available for use by the bird and, to some extent, offsets the limited ability of birds to concentrate their urine as efficiently as mammals. The urine is in a thick pasty form with a very low water content but high in uric acid from nitrogen metabolism. It is usually passed as a paste and is deposited as a whitish or cream cap on some faecal stools.

When the kidneys are not functioning as efficiently as normal, or sometimes when a very high protein diet is provided, there will be large quantities of uric acid in the blood and the system may be unable to cope. The kidney tubules are likely to swell with accumulated urate deposits and when this happens, the white lines are clearly visible on the surface of the kidneys. The accumulation may lead to damage of the kidney cells which leads to nephritis. The high concentration of uric acid in the blood may result in filtration through the capillary walls which leads to visceral gout, which is when a whitish deposit is found on the surface of many visceral organs.

Function of the ureters:

The ureters of birds are surrounded by smooth muscle which normally possesses tone and is capable of peristalsis. The ureters act to "milk" the urine from the kidneys, but they also offer significance resistance to the flow of urine. Because the ureters are direct extensions of the collecting ducts, the ureteral resistance may influence the rate of fluid flow through the nephron. Urine flows from the ureters into the coprodeum, colon and ceca, where it may be modified.



Table.1. Typical normal values of some regulated osmoregulatory variables:

| Total Body water | : | 60-70ml/ 100gm body mass |
|-----------------------------|---|----------------------------|
| Extra cellular fluid volume | : | 20-25ml/100 gm body mass |
| Plasma volume | : | 3.5-6.5ml/100 gm body mass |
| Plasma osmolarity | : | 320-370 mosmol/kg water |
| Plasma Na+ | : | 150-170 meq/litre |
| Plasma K+ | : | 2-5 meq/litre |
| Plasma uric acid | : | 0.1-1 mmol/litre |

Clinical Management of Avian Renal Disease:

Treatment of avian renal diseases relies on supportive care, such as fluid therapy and nutritional support. Analgesia and adaptations of the environment are indicated in cases of renal disease associated with painful joints. Other treatments vary with the etiology and may include systemic antibiotic, antifungal therapy, vitamin-A supplementation or chelation therapy.

- o Fluid therapy is one of the most important treatments in cases of kidney disorders in birds. The choice between oral, subcutaneous, intravenous, and intraosseous routes depends on the patient and its needs.
- Elevated dietary protein alone does not seem to be the underlying etiology of gout in all avian species because diets as high as 70% protein failed to induce gout in adult cockatiels.
- o The efficacy of allopurinol remains controversial in avian medicine and its use has not been reported in many avian species.
- o Surgical procedures, such as nephrectomy or renal transplantation, are not advisable in birds owing to the anatomic constraints of the avian kidney.
- o No effective therapy is recognized in birds with renal neoplasia.

As in mammals, avian renal disease may be classified as acute or chronic. Acute renal failure results from an abrupt decrease in renal function, often caused by an ischemic or toxic insult. Chronic kidney disease is characterized by loss of functional renal tissue owing to a prolonged and usually progressive disease process. Causes of kidney disease may be classified as prerenal, renal, postrenal, or of mixed origin. A prerenal
origin is characterized by hypoperfusion of the kidney. Conditions that commonly lead to the development of prerenal hyperuricemia include dehydration, hypovolemia, and congestive heart failure.

Renal origin of kidney disease refers to an intrarenal process, leading to a dramatic decrease in the glomerular filtration rate. In birds, a decrease in glomerular filtration rate can either be a sign of renal disease or an appropriate physiologic response to water restriction. Causes of renal disease in the avian patient include infectious nephritis, hypovitaminosis-A, heavy metal intoxication, and renal neoplasia.

Postrenal hyperuricemia occurs when there is a disruption of the integrity of the urinary tract or an obstruction of urine outflow (e.g., urolithiasis).

The treatment of avian renal disease relies on supportive care such as fluid therapy and nutritional support. Analgesia and adaptations of the environment are indicated in cases of renal disease associated with painful joints or spinal nerve compression. Other treatments vary with the underlying etiology and may include systemic antibiotics, antifungal therapy, vitamin A supplementation, chelation therapy, and agents to lower uric acid levels such as allopurinol. Potentially nephrotoxic drugs should be used with extreme caution in patients with renal disease. Additionally, drugs that are excreted through the kidney may fail to reach therapeutic plasma levels in polyuric birds or reach toxic levels if drug excretion and elimination are impaired.

General therapy for renal diseases:

Fluid Therapy:

As in mammals, fluid therapy constitutes one of the most important treatments in cases of kidney disorders in birds. Uric acid is eliminated by active tubular secretion and water is needed to flush the suspension through the renal tubules. Without regular removal by diuresis, urates can accumulate within the kidneys.

Fluid type is selected based on results of biochemical analyses, evaluation of blood electrolytes, glucose, and acid–base status. When these values are not known, a balanced isotonic crystalloid solution, such as lactated Ringer's solution may be used for rehydration and hemodynamic support.

Route of administration

Depending on the clinical circumstance, fluids can be administered by oral, subcutaneous, intravenous (IV), and/or intraosseous (IO) routes. Fluids are often administered by mouth by gavage with liquid oral nutrition. This route is generally safe and adequate for avian patients that are not in shock or debilitated. In birds with mild dehydration, fluids can also be provided subcutaneously. Subcutaneous fluids can be administered in the inguinal, interscapular, or axillary regions. Volumes as great as 20 mL/kg may be administered in 1 location. Subcutaneous fluids are easily delivered using a butterfly needle, which allows the animal to move without the needle being pulled out. Practitioners unfamiliar with avian anatomy should beware of the thin skin and the presence of abdominal air sacs close to the inguinal region. Thus, it is key to remain steady during the procedure and to firmly hold the leg in extension to avoid inadvertent coelomic puncture. Fluids given subcutaneously and by mouth are poorly absorbed if hypovolemic shock is present.

Dietary protein:

Renal lesions, such as gout, have been associated with excess dietary protein in birds, but only under specific conditions. In 1 study, a 42.28% protein diet fed to 18-day-old broiler chicks for 15 weeks induced multiple renal abnormalities, primarily nephrosis and visceral gout.

In another study, diets high in urea were linked to outbreaks of nephritis in poultry, however, cockatiels (Nymphicus hollandicus) fed high dietary protein (up to 70%) for 11 months did not develop renal lesions. The cockatiels were able to upregulate enzymes associated with amino acid catabolism and uric acid synthesis. Of note, these cockatiels received a gradually increasing protein concentration in their diet over 3 weeks. Uric acid increased linearly with dietary protein levels, but remained within normal limits in these birds, indicating that hyperuricemia is specific of renal disease or severe dehydration in granivorous avian species. Because the nutritional requirements vary among avian species, it is unknown if these conclusions can be extrapolated to other birds.

Unlike carnivorous birds, granivorous species have low requirements for dietary amino acids and seem to be able to conserve amino acids by tight regulation of amino acid catabolism. Frugivorous birds have lower rates of nitrogen loss compared with granivorous birds and, thus, even lower dietary protein requirements. A safe recommendation is that birds with hyperuricemia should not consume diets with protein levels greater than what is considered normal for the given species.

Conclusion:

The main organ of the excretory system is the kidney. The functional unit of the kidney is nephron. The functions of the excretory system are to excrete water and metabolic wastes to regulate the acid base balance in the birds body. The primary component of poultry waste is uric acid, the major end product of protein utilization. Uric acid is a white paste substance. Poultry waste is comprised of urine and feces. These are not separate.





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