

think Grain think Feed

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Monthly Magazine for Feed Industry

**Unveiling the Hidden Power of
Trace Minerals in Animal Nutrition**

**A Violently Volatile Ride of
Indian Poultry Industry**

**Digital Disruption in Dairy,
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Zero-Waste Fuel Cells from Chicken Feathers



Image: (L-R) Professor Ali Miserez from NTU's School of Material Science and Engineering and School of Biological Sciences and NTU PhD student Mr Soon Wei Long are part of a joint research team who found a way to convert chicken feathers into a clean and sustainable material to build zero-waste fuel cells.

Feathers keep chickens warm, and they might also hold the key to creating sustainable fuel cells that can power clean vehicles. Scientists from Nanyang Technological University (NTU) in Singapore and ETH Zurich in Switzerland have found a way to convert chicken feathers into a clean and sustainable material to build zero-waste fuel cells. By extracting the protein keratin from feathers, then processing it into ultra-fine fibres known as amyloid fibrils, the researchers created a thin membrane

capable of conducting protons, which are a vital component of fuel cells. The researchers tested their feather-based membrane by assembling it in a commercial fuel cell setup. In their tests, the fuel cell could turn on an LED lamp, spin a small fan, and power a small toy car. Producing such membranes in conventional fuel cells uses toxic chemicals, known also as "forever chemicals", which are expensive and do not break down in the environment. The keratin-based

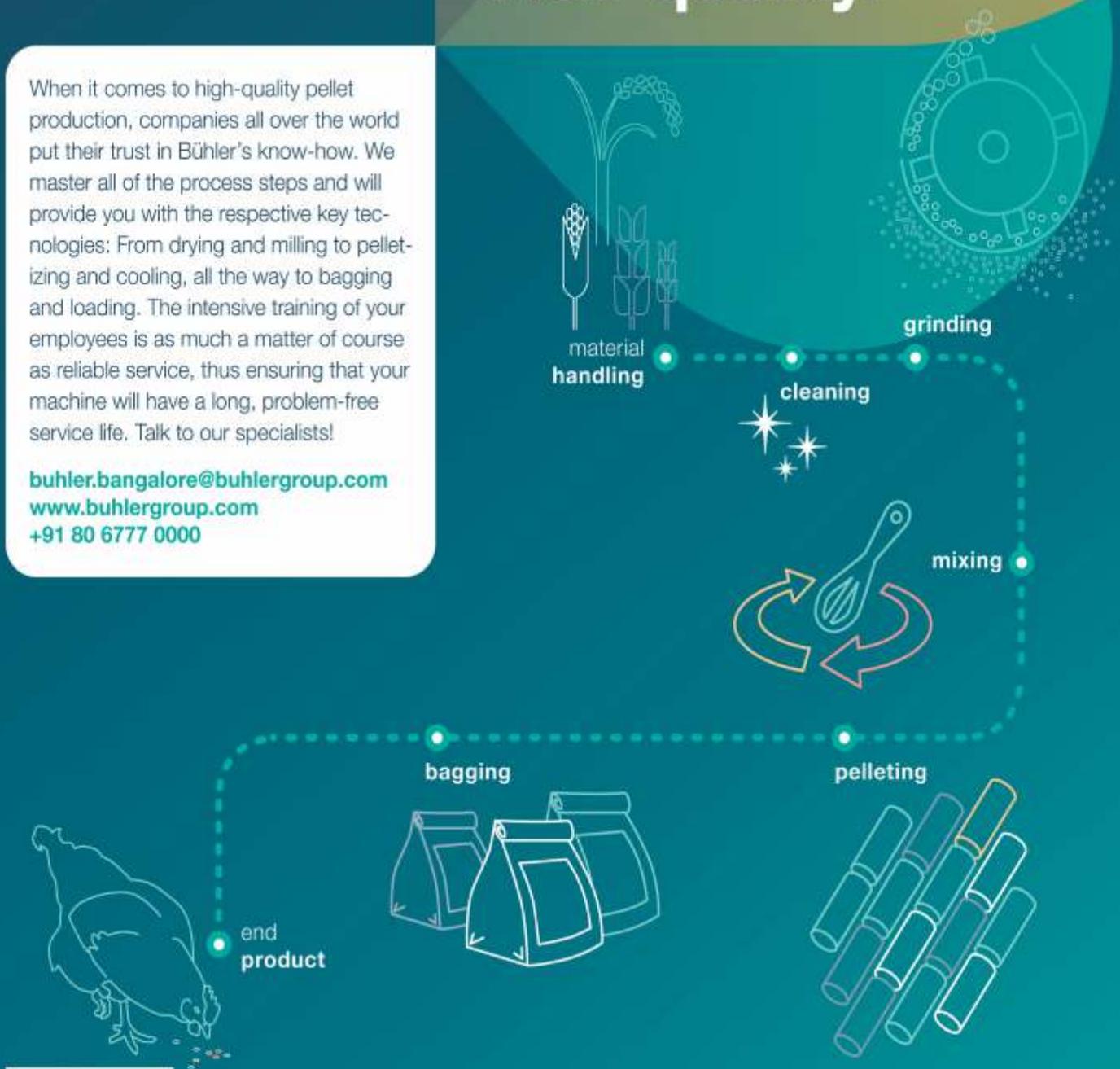
membrane developed by the NTU and ETH team is environmentally friendly as it is composed of a biological material and created in a green process that does not produce carbon emissions. The large amount of industrial chicken feather waste produced by the poultry industry means that the membrane manufactured in the laboratory could be up to three times cheaper than conventional membranes to produce.

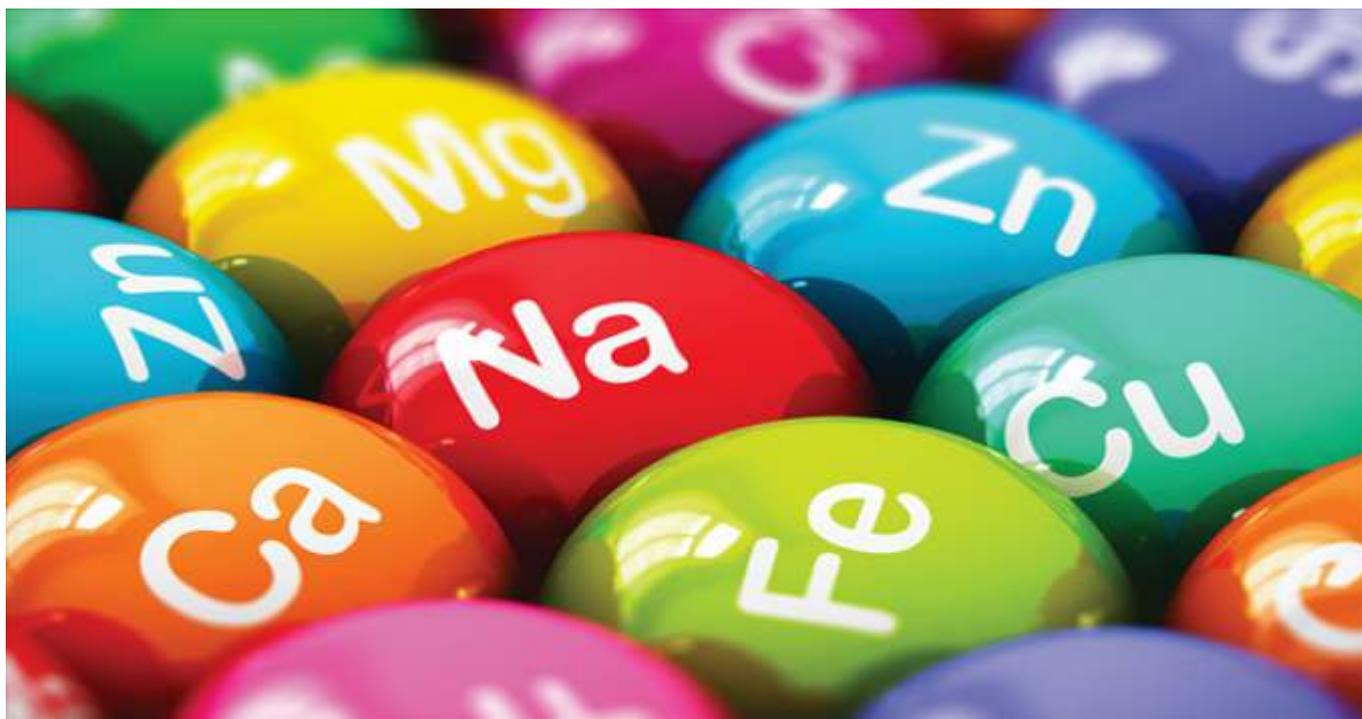
Source: Nanyang Technological University

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Unveiling the Hidden Power of Trace Minerals in Animal Nutrition

By Dr. In-sun Yu, Trouw Nutrition Global

In the intricate world of animal nutrition, the significance of supplementing trace elements like Zinc (Zn), Copper (Cu), Manganese (Mn), Iron (Fe), Iodine (I), and Selenium (Se) cannot be overstated. These elements play a pivotal role in ensuring the health and performance of livestock.

However, the basal amounts of these trace elements found in standard commercial feeds simply fall short of meeting the animals' requirements.

The key to unlocking the full potential of these vital trace elements lies in its bioavailability. Bioavailability refers to the retention of a trace element within the gut intestinal tract and is profoundly influenced by

antagonistic interactions, particularly in poultry where phytate emerges as the arch-nemesis of essential trace minerals. Phytate forms stubborn complexes with these minerals, rendering them insoluble and thus unavailable for absorption. To combat this antagonism, numerous trace mineral sources have been developed based on solubility and chemical bonding.

But that's not all; the timing and level of trace mineral delivery also come into play. This realization has led to a groundbreaking concept in trace mineral solutions – the fusion of organic and hydroxy minerals. This innovative approach has the potential to not only maintain but also elevate animal performance under various farm conditions. It's imperative to emphasize that the proper timing and dosage of trace elements are paramount for ensuring optimal animal performance.

In today's world, livestock producers face

immense challenges due to stringent governmental regulations aimed at addressing environmental concerns. The novel ideas discussed above offer a glimmer of hope, promising improved absorption and reduced trace element supplementation, all while preserving production performance.

In Bonds We Trust: How Bonding Revolutionizes Trace Mineral Bioavailability

Commonly used trace mineral sources in animal nutrition include sulfate-based and oxide-based minerals, primarily chosen for their affordability. Sulfate trace minerals form ionic bonds with sulfate ligands, readily dissolving in water at a neutral pH, but their instability leads to complexation with phytate, reducing bioavailability. Conversely, oxide minerals form covalent bonds, rendering them insoluble in neutral pH and partially soluble in low pH, further hindering absorption. To overcome these challenges, organic trace minerals and hydroxy trace minerals have emerged. Organic trace minerals shield metal centers with amino acids or proteinate ligands, limiting the formation of phytate complexes. Hydroxy trace minerals, with their unique covalent crystal structure, prevent phytate complexation and gradually dissolve at low pH, enhancing absorption. Additionally, hydroxy

minerals boast cost-effective hydroxy and chloride ligands. Comparative studies reveal that both organic and hydroxy trace minerals significantly outperform sulfate sources, with hydroxy and organic trace minerals yielding similar results. For instance, in broilers, hydroxy Zn and organic Zn show 144% and 142% improved bioavailability compared to Zinc sulfate (Figure 1).

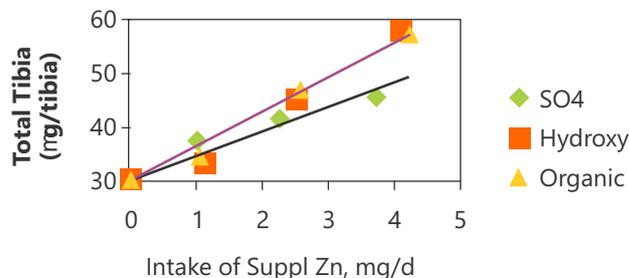


Figure 1. The tibia recovery of Zinc, of birds fed different sources of Zinc (Linear $P < 0.001$).

Precision Matters: The Power of Optimal Particle Size and Density

Particle size and density often go overlooked when selecting trace mineral sources. Ideal particle size and density minimize feed segregation and ensure proper mixability during production. These considerations are crucial, particularly for animals with low feed intake, as it guarantees that their limited consumption contains all vital nutrients, including minerals. This improved mixability can be done through a patented process (Optimize technology) of creating optimal particles that ensures particle size consistency and highly uniform. Confirmed through laser diffraction analysis, the process results in the ideal particle size (150-300 μm) with the ideal density (0.8-1.0 g/mL), whether it is zinc, iron or manganese, for improved blending/mixing, flowability, and reduce the carry-over risk.

Studies conducted with different trace element sources, such as MnSO_4 and Hydroxy Mn, indicate improved mixing in complete feeds, enhancing feed quality and nutrient distribution. This is measured through an improve coefficient of variation or CV (lower % cv indicates better mixing, Figure 2). The mixability of trace elements in a diet is of particular importance to young animals, as they have a lower feed intake and therefore more important to get all the required nutrients, especially minerals, despite the low feed intake.

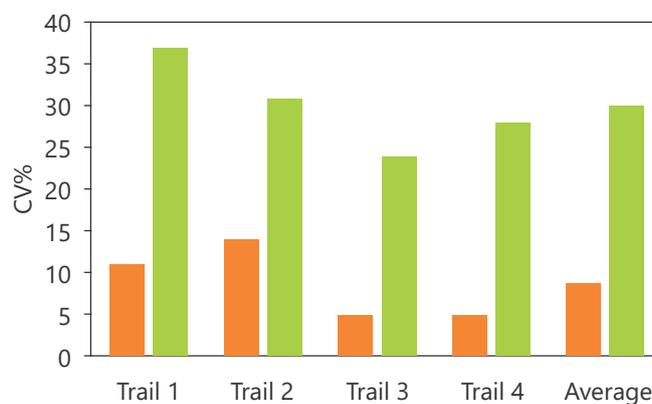


Figure 2. Coefficient of variation of Manganese within complete feeds (Hydroxy Mn and MnSO_4 shown in the blue and black color bar, respectively). 10 feed samples were analyzed per batch and difference to expected levels is determined.

Moreover, spherical particles in hydroxy minerals reduce dust potential, reducing mineral source losses during handling.

Furthermore, hydroxy minerals with spherical particles reduced “dustiness” of the product, leading to a lower dust potential (a lower number of dust potential indicates a lower loss of mineral source, see Figure 3) and this also lessens the chance inhalation of the product by workers in the feed mill or premix facility. Although a larger mineral particle size is preferred in feed or premix production, within the animal, it is the other way around. With a smaller particle size, this will lead to a larger surface area, allowing for an improved availability of the mineral.

The Strength of Synergy: The Power of Combining Organic and Hydroxy Trace Minerals

While the practice of combining different trace element sources is not new, recent developments have brought forth a game-changing concept: the 70:10 ratio of hydroxy to organic minerals. This innovation stems from the collaborative

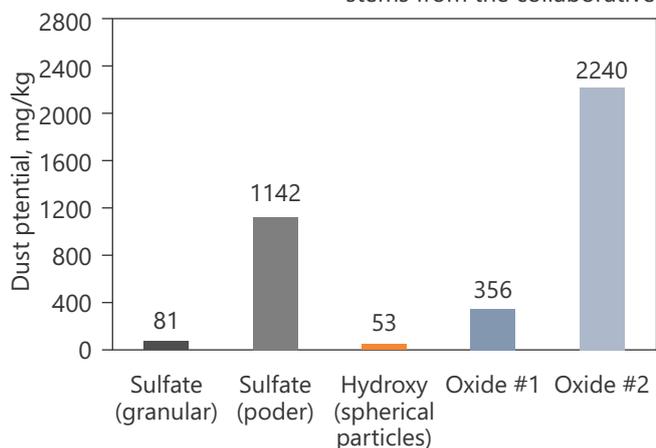


Figure 3. Dust potential of different Manganese source.

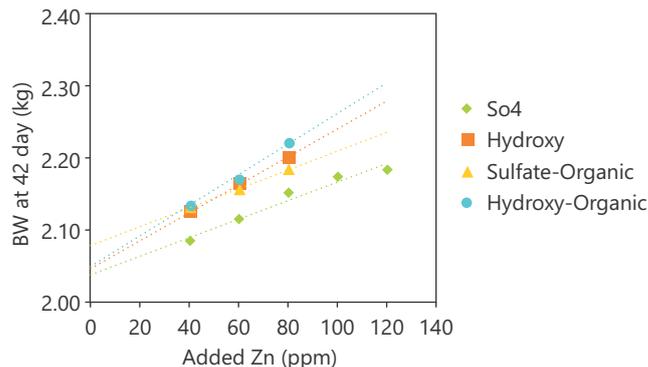


Figure 4. Effect of different zinc sources on end weight of broilers at 42 day.

efforts of leading industry experts and academic professionals dedicated to optimizing animal productivity and well-being. Research demonstrates that the combination of hydroxy and organic minerals far surpasses sulfate, hydroxy, or organic-only sources, as well as combinations of sulfate and organic minerals in terms of animal performance (Figure 4).

In another study, the results clearly showed that a combination of 70 ppm Zn from hydroxy mineral plus 10 ppm Zn from organic mineral was superior in terms of end body weight as well as improving feed conversion (Figure 5).

This synergy results from the complementary release profiles of the two technologies, allowing animals to absorb trace minerals efficiently throughout their intestinal tract. Thus, once hydroxy minerals reach the area of low pH they slowly begin to release the small molecules of soluble metals one layer at a time while organic minerals maintain their structural integrity. Given the different molecular structures of the soluble metals from hydroxy and organic minerals, their absorption is extended further down the gut intestinal tract (Figure 6).

In conclusion, the choice of a trace mineral source is

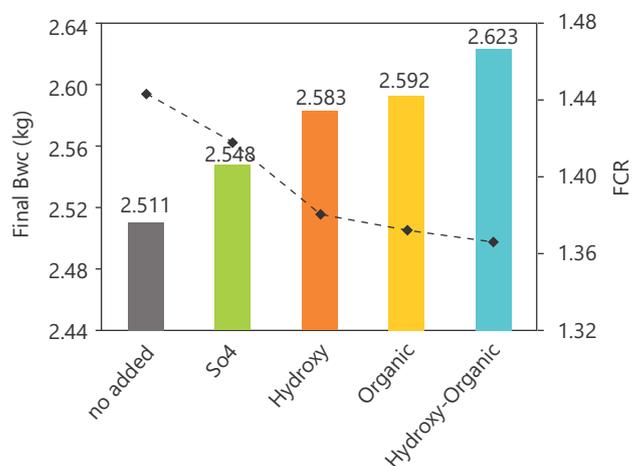


Figure 5. Effect of different zinc sources (80 ppm Zn from ZnSO₄, Hydroxy, Organic, or combination of 70 ppm Zn Hydroxy plus 10 ppm Zn Organic) on end weight ($P = 0.003$) and FCR ($P < 0.001$) of broilers. Different labels (a,b,c) indicate significant differences. $p < 0.05$ indicate significant differences.

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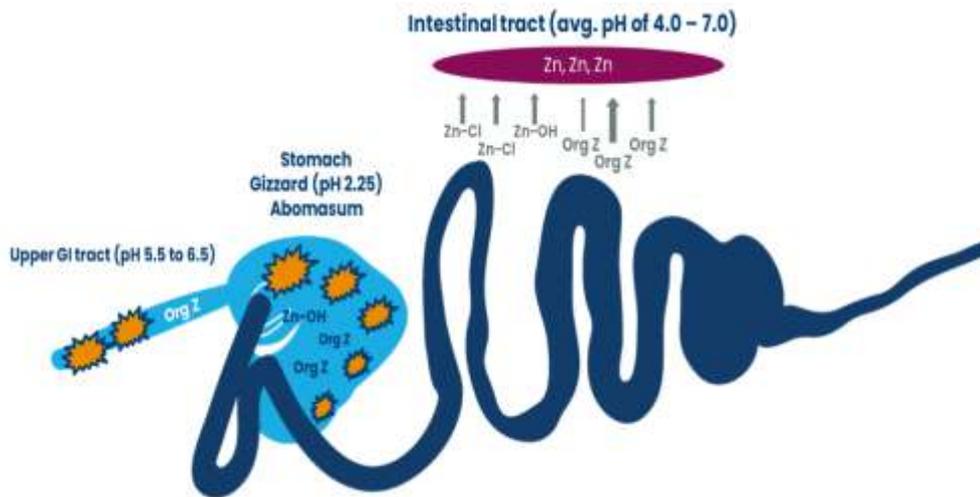


Figure 6. Illustration of the complementary release profile of the combination of hydroxy and organic trace minerals throughout the intestinal tract.

pivotal for supporting productivity, animal health, and environmental

sustainability. When choosing the right minerals, remember that the bonding

type determines bioavailability, the particle size, density and synergy between two sources enhances efficacy. The combination of organic and hydroxy trace minerals presents a revolutionary solution, offering precise trace element delivery and enhanced absorption, ultimately leading to optimal animal performance. In a world with ever-increasing challenges, these innovations provide a beacon of hope for the future of animal nutrition.

For further information, kindly write at customercareindia@trouwnutrition.com

Two Brazilian Firms Partner with Ananda Dairy for Nutritious Feed and Cattle Breed Improvement

In a boost to Chief Minister Yogi Adityanath's efforts to promote the dairy sector of Uttar Pradesh, two Brazilian companies signed a Memorandum of Understanding (MoU) with Ananda Dairy of the state. The MoU was signed in the presence of the state's Chief minister and the Ambassador of Brazil to India Kenneth Nobrega. The MoU follows comprehensive talks between the Uttar Pradesh team and officials of the Brazilian companies Ameria Pajora and BH Embrios during the roadshow held in Brazil in December 2022, it said. The two Brazilian companies will work

together with Ananda Dairy to produce nutritious animal feed and cattle breed improvement.

Welcoming the Brazilian delegation, the Chief Minister said that relations between India and Brazil have always been friendly. "There is mutual understanding, growing bilateral trade and all-round cooperation between the two countries." Bilateral trade between India and Brazil has doubled in the last two years, he said, adding that exports from India to Brazil have gone up to USD 4.5 billion in the financial year 2022-23 whereas the imports from Brazil to India

have increased to USD 7.14 billion. The chief minister said that agriculture, food processing and animal husbandry are other major focus areas of bilateral cooperation between India and Brazil.

"The cattle of Brazil and India have similar genetic heritage. Indian cattle like Gir and Kankrej exported centuries ago, have been bred to yield large quantities of milk," he observed. The minister said the MoU will provide avenues for farmers of Uttar Pradesh to increase milk production using advanced technology in nutrition and breeding of milch animals.

Source: Moneycontrol



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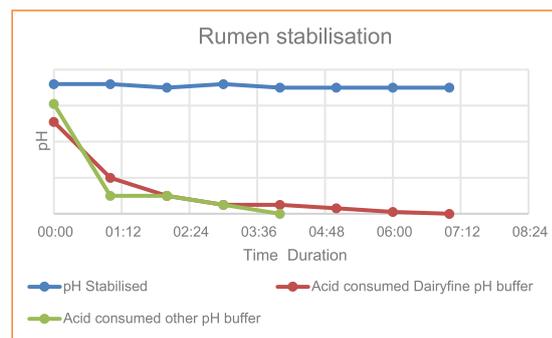
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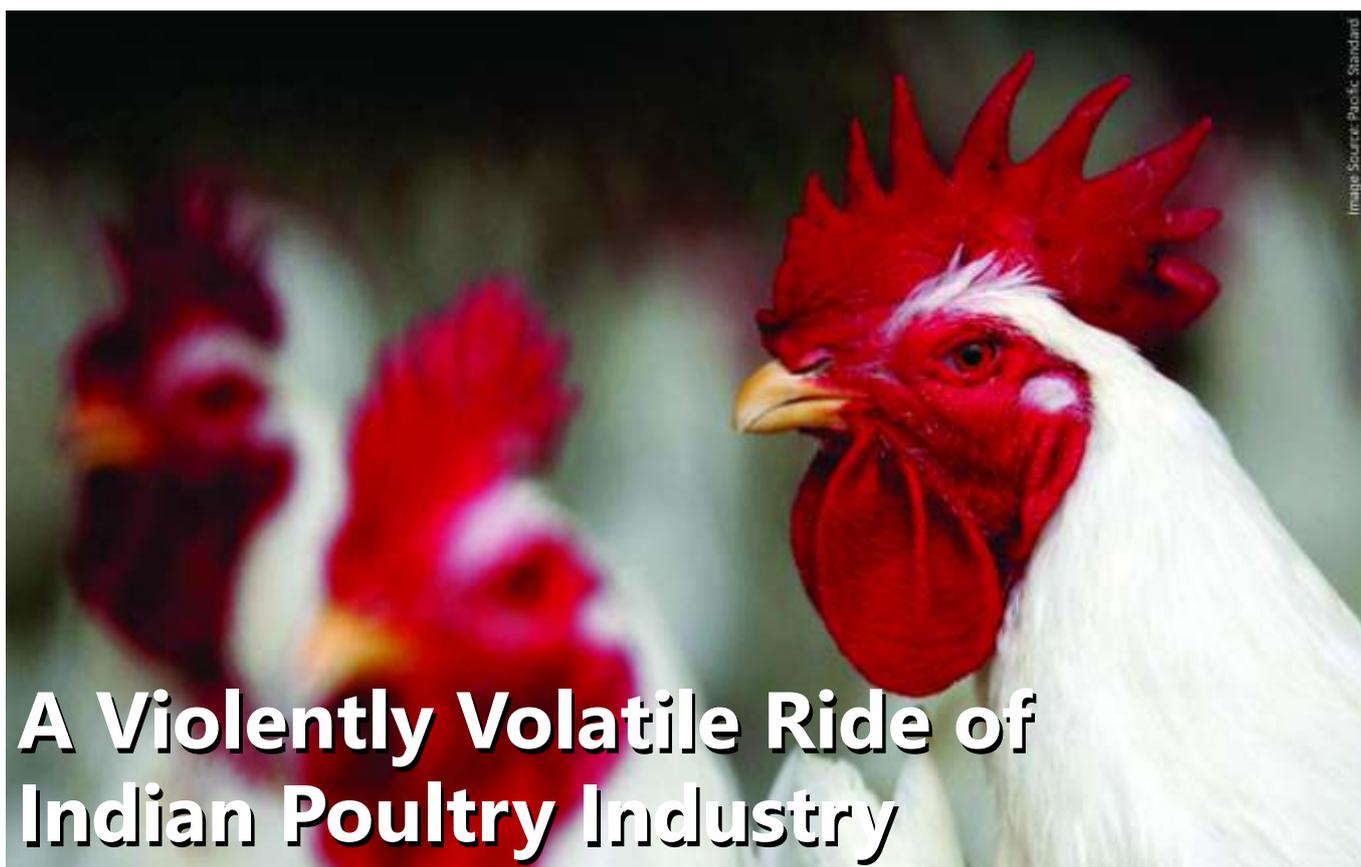


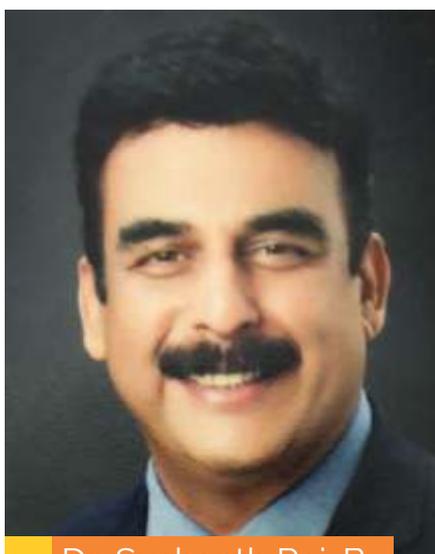
Image Source: Pacific Standard

A Violently Volatile Ride of Indian Poultry Industry

Would you please briefly introduce how the association was started and the people who headed it?

The journey of the KPFBA began in the year 1991 after initial years of struggle informally, founded by visionary leaders who saw the potential of the poultry sector and the need for a united front to drive its growth. The association was founded as the Karnataka Hatcheries Association [KHA] which was later renamed as the Karnataka Poultry Farmers and Breeders Association [KPFBA].

Many leaders have presided over the association in the past, steering us through challenging times and guiding us toward greater success. Their unwavering commitment to the betterment of the poultry industry has been instrumental in its progress.



Dr. Sushanth Rai. B

The previous presidents were:

- **Mr. David J Lobo** – DeeJay Farms
- **Mr. Nanda Kumar** – Komarla Hatcheries (Nanda Group)
- **Mr. Sriharireddy** – Lotus Farms
- **Mr. MCR Shetty** – Nutri Feeds & Farms Pvt Ltd
- **Mr. K.S Ashok Kumar** – Maa Integrators
- **Mr. K.S Akhilesh Babu** – Komarla Group
- **Dr B Sushanth Rai** – Raison Nutrition

Dr Sushanth - the first veterinarian to become the President of this august association Aug. 2019 to Oct. 2023, what milestones have the association achieved under your tenure?

There have been multiple but I would like to highlight the following three significant ones:

- 11 August 2021, when KPFBA entered a memorandum of understanding with the Karnataka Veterinary and Animal Science University (KVAFSU) in Bangalore. This collaboration led to the establishment of the KVAFSU-KPFBA Poultry Training

Centre and Diagnostic Laboratory. This state-of-the-art facility serves as a hub for poultry training, scientific research, clinical trials, disease management, and education. It aims to empower poultry breeders, farmers, and KVAFSU students. The center is poised to support field trials and research endeavors throughout Karnataka, while also nurturing partnerships with like-minded organizations.

- On 25 May 2023 KPFBA entered into a memorandum of understanding with The Indian Council of Agricultural Research – National Institute of Animal Nutrition & Physiology (ICAR-NIANP) to further collaborative research in the field of poultry sciences.
- On 25 October 2023 KPFBA entered into a memorandum of understanding with ICAR-Central Avian Research Institute (ICAR-CARI), Izatnagar, to further collaborative research in the field of poultry sciences.

The association is actively involving experts from various institutions for 360-degree growth of the poultry sector. With a steadfast focus on bridging the manpower gap in the poultry sector, KPFBA is actively engaged in training farmers, farm supervisors, managers, and entrepreneurs and inducting

programs for aspiring poultry farmers and students who are planning to pursue careers in the poultry sector.

Mr Pasuparthi, congratulations on the presidency. Please share your thoughts on the growth of the poultry industry and future plans of the association.

The last 5-year history indicates that the poultry farming profession has just not been volatile but violently volatile. Our profession carries huge responsibility for the well-being & welfare of all suppliers, bankers, vendors, independent poultry farmers, contract poultry farmers, crop agriculture farmers, and employees working in poultry companies.

This journey also made us realize & reconcile to the fact that one cannot eliminate another firm & so the importance of working together with grace, maturity, transparency & dignity making our profession respectable & profitable to all stakeholders. Profitable poultry farming comes from stable live bird prices. This builds capital reserves for the firms, which can be invested into automation, innovation & hiring the right talent.

This will help firms in creating business models that help them reach end consumers directly for higher realizations thereby further increasing the companies' stability & making poultry farming attractive & sustainable. As an

association, we have the following plans:

- Work closely with the state government, central government & FSSAI on all policy-making issues.
- Build training & orientation models with organizations like CPDO & others for a continuous supply of skilled manpower to our profession.
- Build tighter working relationships with other state poultry associations like PFI, BCC, etc across the country.
- Build good working relationships with agriculture & veterinary universities, IVPI, VIP & associations like CLFMA, Soya Processors Association, BioTech Consortium India Limited (BCIL), etc.
- Adopt more technology in data gathering, demand & supply estimations for poultry farming.

Last but not least, we as poultry experts, must invest in educating our consumers about poultry as a safe & sustainable source of protein. By investing in marketing campaigns, we must build consumer trust in our produce & dispelling myths & misunderstandings that are largely painting a negative image of our produce.



Naveen Pasuparthi

Image Source: The Fish Site



Egypt's Startup Seeking to Improve Feed Efficiency in Tilapia Sector

An Egyptian team has succeeded in developing a smart device to estimate the feed intake required for each tank on a fish farm, helping improve productivity and water quality.

The team behind the development came from the Faculty of Aquatic and Fisheries Sciences at Kafrelsheikh University and their goal was to develop the

device to solve problems related to feed waste and the water quality problems it can cause. The product was developed with the help of Ibn al-Nafis hatchery, is called the Smart Feed Estimation Device (SFED). This device can calculate the amount of feed required, based on the number of fish and the water temperature, thereby saving money for the farm. It also improves water quality, by reducing the amount of unconsumed feed, thereby reducing the levels of ammonia.

According to the researchers, adjusting the



feeding regime in relation to the water temperature is what makes the device so useful, as the temperature affects the metabolism of the fish. The device can also recommend the optimum percentage of protein in the feed, they say. It also allows farmers to print a daily record of the amount of feed used, helping to ascertain how much feed is left in storage and whether any has been stolen.

“With the economic conditions that the world is

going through, which resulted in high fish feed prices, we came up with the idea of making a device to determine the amount of feed needed by fish farms and reduce excess feeding,” they explain. “By changing the percentage of protein in feeds farmers can reduce their production cost,” the researchers observe. The devices can be adapted, according to the species and life stage of the fish being farmed. “Each device differs according to the type of fish and the production system, but it is easy to change the purpose of the device by adding feeding tables for the type of fish and production system. The current version we have is designed primarily for tilapia because of the great popularity of tilapia in Egypt,” the researchers explain.

According to the researchers, the device is easy to operate. “It does not require training, but a practical demonstration of how to operate it will do. Anyone can use it after practicing a few times, and the inputs required are easy to enter via the keyboard,” they say. The device is already commercially available, but the team are open to outside investment to speed up its commercialisation.

The team say that they are grateful for the help of Dr Radi Ali Mohamed, vice-dean of the Faculty of Aquatic and Fisheries Sciences at Kafrelsheikh University, who was their first supporter and advised them throughout the

design of the device. “The device eliminates waste, achieves optimal benefit from it, improves productivity, and avoids preoccupation with improving water quality, as unconsumed amounts of feed represent the cause of most water problems. Therefore, the device and subsequent development are an excellent step by promising young people to contribute to the field of aquaculture,” says Dr Mohamed.

The researchers also collaborated with other academics and WorldFish, an NGO that supports the development of sustainable aquaculture, testing their device in earthen ponds and cement tanks in a farm run by the latter. “Many experiments were carried out at the Ibn Al-Nafis hatchery and at WorldFish in the presence of our college professors, Dr Abdel Fattah Al-Sayed and Dr Ahmed Nasrallah, as well as a group of WorldFish researchers. WorldFish, found that the device was very effective,” they say.

The researchers are planning to launch the device commercially next March and say that several of them have already been pre-ordered. “We are currently in the stage of establishing a company with our own brand,” they say. In the meantime, they are aiming to add sensors for pH and oxygen, as well as reducing the size of the device.

Source: Hatch Blue



Digital Disruption in Dairy, Poultry & Aquaculture Sectors

Tarun Shridhar, Former Secretary of DAHD, Government of India, and Moderator of the session, explored the role of various digital interventions in the livestock, dairy, and aquaculture sectors. While the initiatives are commendable, evaluating their actual impact remains a crucial task. As a country, we are a giant as far as numbers are concerned whether it is dairy, poultry, or aquaculture but we are dwarfed when it comes to productivity. Despite being the biggest producer, our farmers

are among the poorest, indicating a substantial void that must be addressed and digitalization is the way forward.

Dr Nilesh Nayee, NDDDB presented on NIPAH, a system comparable to Animal Adhar, offering comprehensive details on parameters such as breed, health, nutrition, diet, and animal productivity. Currently, with over 28 crore animals and 8 crore farmers registered, the system provides information on animal location, breed, age group, etc. This data proves instrumental in tasks like vaccination and artificial insemination. The challenge lies in accessing and translating this information into effective policies. Recognizing this, NDDDB identified the necessity for BI tools to disseminate tailored information. Consequently, NDDDB, in

collaboration with the Government of India, launched the National Digital Livestock Mission, aiming to integrate the entire dairy production system.

Ravishankar Shiroor, Stellapps Technologies, discussed the entire flow of data right from farmers to the end consumer and how at every stage digitalized data can add value not only to the process but value to all the stakeholders. The strength of well-captured, accessible, and effectively utilized data lies in its ability to empower every element throughout the value chain. Twisha Upadhyay, Eruvaka Technologies, emphasized the impact of digitalization in water quality monitoring, illustrating how farmers can achieve up to a 30% reduction in diesel costs through data inputs. Additionally, she highlighted the effectiveness of digital

interventions in feed management, citing the example of shrimp weighing between 4-5 grams to 10-15 grams. The sensors capture the sound of the shrimp, aiding in determining its nutritional status and resulting in significant cost savings.

While the Indian poultry industry is well-organized and integrated, the purpose of digital technology is to provide essential information to small poultry farmers, enabling them to make informed decisions, whether related to farm management or selling their products. Suresh Chitturi, Srinivasa Farms, discussed virtually the critical factors influencing cost efficiency, such as production, disease outbreaks, food safety, and animal welfare. AI, offering real-time data, aids in early problem detection, predicts consumption patterns, and facilitates production

management according to demand. He emphasized the industry should invest in farmer education, and training, as well as supporting research and development and the startup ecosystem.

In concluding the session, Tarun Shridhar characterized digitalization as a disruptive force, urging a departure from conventional business practices. He emphasized the need to use digital interventions in the overall management and enhance the competitiveness of India's dairy, poultry, and aquaculture sectors. The session delineated digitalization's role, spanning across sectors—from breed selection to feeding, health, product, processing, and marketing. This tool is poised to assist stakeholders and policymakers in crafting policies that have a tangible impact on the last mile.



Image: (L-R) Ravishankar Shiroor, Dr Nilesh Nayee, Tarun Shridhar and Twisha Upadhyay

Rabobank Predicts Recovery in Global Poultry as Ongoing Challenges Start To Ease



Image Source: The global poultry magazine

Global poultry market growth in 2023 is expected to be slow, reaching only 1%. But global poultry markets are well positioned to gradually improve in Q4 2023 and early 2024, although the level will depend on how well-balanced they are. After a period of slow poultry consumption growth due to a weak global economy and rising prices resulting from cost increases, global demand has room for some recovery, driven mainly by lower feed costs and, therefore, lower chicken prices. Markets will stay highly price-driven, but poultry should be able to benefit from its relatively competitive pricing in many markets compared to other proteins like beef, pork, and alternative proteins.

Report summary

Improving market conditions are expected in the US, Mexico, Japan, South Africa, Indonesia, and China. However, the context in Indonesia and China will be fragile. The EU market has been strong, but high levels of fresh chicken imports are creating pressure. Brazil and Thailand face more challenging conditions and will need more supply growth discipline in oversupplied domestic markets.

Global trade is expected to stay strong in 2H 2023 after reaching a record-high 7.2m metric tons in the first half of the year, driven entirely by increased trade of raw poultry meat, while trade in processed poultry meat dropped sharply. Amid more price-driven markets,

consumers' product preferences are changing, and this trend is expected to continue in 2H 2023 and into 2024. Brazil is expected to benefit the most as a cost-price leader in raw chicken meat, while Thailand and China need to refocus on raw chicken trade, which will challenge these exporters' value position.

Government interventions driven by food security, geopolitics, and sustainability will continue to impact markets and create volatility in global trade. Avian influenza (AI) will remain an important factor that could suddenly impact global markets, from both a local supply perspective and a trade perspective, especially if Brazil's southern states are hit.

Producers should maintain focus on the operational side. Although we believe feed prices will drop slightly, operational costs are still at historic highs, and risks of further volatility exist in grain prices (due to El Niño) and in energy prices and availability. Ongoing leadership in terms of costs and procurement will remain key. Additionally, producers should fine-tune supply to changes in poultry demand related to products, distribution, and market development.

Source: Rabobank

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Image Source: Perkin Elmer



Holistic Approach to Mycotoxin Risk Management: from A to Z

Dr. Swamy Haladi from Trouw Nutrition moderated the session on Holistic Approach to Mycotoxin Risk Management: from A to Z during the recently concluded Feed Tech Expo in Pune. The session was opened with an emphasis on the need for a holistic approach for an effective mycotoxin risk management in the animal industry. He shared "The 10-point System" for effective mycotoxin risk management and it must start from optimal crop production, harvesting, storage of raw materials, feed production, feed storage, and finally managing mycotoxin toxicity within the animals. He updated the audience on the recent learnings from the

"World Mycotoxin Forum", especially the impact of climate change on the future mycotoxin profile.

Dr. Nidhi Madnawat from Cargill India gave an overview of the important mycotoxins of concern in India, their interactive negative effects on animals, and their management to minimize the risk to health, performance, and farm economics. She emphasized the fact that 85% of mycotoxins are produced in the field over which feed producers have less control. We need to adapt new technologies at the feed mills, including effective mycotoxin binders, for mycotoxin reduction. Grain byproducts are at higher risk for mycotoxin contribution and hence should be used carefully.

Rohit Gupta from TecSpec described the innovations in efficient grain management for better storage of raw materials in silos. He emphasized the importance of preparing the grains properly before storing them in



silos. Temperature, humidity, and grain quality are three main factors that affect storage of grains. Sanitation, Loading, Aeration and Monitoring (S.L.A.M.) of silos

play an important role in lowering the mold growth and the subsequent mycotoxin production. He also emphasized the importance of installing CO2 sensors in silos.

Mridu Mohanty from Buhler India emphasized the importance of various grain treatments for effective mycotoxin risk management. He remarked that only two mycotoxin-contaminated grains in 10,000 healthy grains can make a lot unfit for the purpose. Grain sieving, dust and husk aspiration, gravity separation, and optical sorting (for moldy grains) can help to reduce mycotoxin load significantly.

Manish Patil from Japfa India emphasized the need for optimal feed mill hygiene in reducing mycotoxin load in the complete feed. Mold

growth should be controlled at the levels of raw material receiving system, warehouse management system, production processes, feed mill hygiene system, and feed quality control system. Laboratories used for various analyses should be accredited and new technologies should be evaluated regularly.

Overall, an excellent event as evidenced by the number of discussions that took place during the Q and A session. One of the key questions discussed was the potential spraying of non-mycotoxigenic fungi in the field to reduce aflatoxin content in corn. Another point of discussion was the need for increased participation of Indian Scientists, University Professors, and Industry professionals at Global Mycotoxin Events.



Image: (L-R) Manish Patil, Rohit Gupta, Dr. Swamy Haladi, Dr. Nidhi Madnawat and Mridu Mohanty



Image Source: Halkali Magazine

Odisha Startup to Produce Wealth from Fish Waste

To produce wealth from the fish waste, an agro-based startup has been developed in Baleswar. Dr Siddhartha Pati, founder and Dr Debabrata Panda, co-founder, have established the agro-biotechnology firm named NatNov Bioscience in the district to generate economically viable goods from fish waste. According to them, among the seafood used globally, shellfish consumption is in great demand. The utilisation of these shellfish such as prawn and shrimp has opened a new market for the utilization of the shellfish wastes.

Shrimp processing plants produce huge amounts of shrimp and prawn shell

waste which is discarded in the environment without any treatment. Large quantities of wasted shrimp byproducts are generated every year by shrimp processing industries along coastal Odisha. These wastes comprise 30-40% by weight of the shrimp raw material, depending on the species.

The underutilization of shrimp head wastes poses a problem for the processing plants and improper disposal of these wastes contributes to environmental issues on a larger scale. In addition, shells and appendages increase the waste load and provide excessive nutrients to the adjacent bodies of water leading to enhancement of the

biochemical oxygen demand and reduces the oxygen concentration in water, they said considering the shrimp shell for the generation of high value products and aiming zero waste production, they are processed on the principles of a bioconversion, they further added.

The technology not only converts fish waste into valuables but also contributes towards Swachh Bharat Abhiyan of the Indian Government. The startup works towards the UN Sustainable Development Goals 11 and Odisha's first project support for sustainable bio- economy.

Source: Dailypioneer



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Image Source: gCaptain

GM Maize & Soybean Cultivation in China May Impact Global Grain Trade

A media article from Reuters stated that “China has approved 37 genetically modified maize seed varieties and 14 genetically modified soybean varieties, taking it close to commercial planting of GMO maize and soybeans.” This is not the first time China has made headlines about its path towards the potential commercialization of genetically modified maize and soybeans for domestic cultivation.

In June 2013, the Chinese National Crop Variety Approval Committee released two standards that cleared the path for cultivating genetically modified crops in the

country. This was the missing piece in the regulations for the commercial production of genetically modified maize and soybeans in China, as the government has two steps in these regulations, namely, a “safety certificate” and a “variety approval” before crops can be commercially cultivated. Various genetically modified maize and soybean varieties have received the safety certificate since 2019, and the missing piece was the “variety approval”, which was approved in June 2022. The recent news that the Chinese Ministry of Agriculture and Rural Affairs approved further varieties of genetically modified maize

and soybean seeds further underscores China’s determination to plant these varieties. However, commercial cultivation is not yet approved.

The timing for wide-scale commercial release is still unclear, although some speculate it could be closer as China’s aims to boost its crop yields as part of the food security drive. The area plantings for the recently approved varieties are still reasonably small, estimated at 267,000 hectares.

China has no aversion to genetically modified crops. Currently, China imports genetically modified maize and soybeans but prohibits domestic cultivation of the

crops, and the current regulatory developments signal a potential change. The change in regulations would potentially lead to an improvement in yields.

China's maize yields are not particularly poor, although the country has not approved the genetically modified seeds for commercial release. In its current production methods, China's maize yields are comparable with South Africa, the United States, Argentina and Brazil, which have long adopted genetically modified seeds. Thus, it is a suspicion that adopting genetically modified seeds will further lift the yields. Furthermore, in countries like the United States, Brazil and Argentina, amongst others, genetically modified seeds have had additional benefits such as lowering insecticide use, more environmentally friendly tillage practices and crop yield improvement. If future crop yield improvement assumption holds, then China's maize and soybean import dependence could lessen. China is one of the world's largest maize and soybean importers. The country accounted for 11% of global maize imports and 62% of the world's soybean imports in the 2022/23 marketing year. The forecast volumes for the 2023/24 marketing year remain roughly unchanged. Therefore, given China's significance in imports, an improvement in domestic production of

maize and soybeans in future would have notable implications for global grains trade and prices. A reduced volume of China's soybeans and maize imports in the global market would mean downward pressure on global prices.

Implications for the African continent
Beyond the global price implications, African countries, which have long resisted cultivating and importing genetically modified crops, should keep a close eye on these developments. South Africa is the only exception that has embraced genetically modified crops since the 2001/02 season. The country has also enjoyed improvements in yields and is now a leading producer of grains in the region. Notably, although the yields are also influenced by improved germplasm (enabled by non-genetically modified biotechnology) and improved low and no-till production methods (facilitated through herbicide-tolerant genetically modified technology), other benefits of genetically modified seeds include labour savings and reduced insecticide use as well as enhanced weed and pest control. Hence, with the African continent currently struggling to meet its annual food needs, using technology, genetically modified seeds, and other means should be an avenue to explore to boost production. Many African

governments should reevaluate their regulatory standards and embrace technology.

South African farmers and agribusinesses should also closely monitor the developments in China. The increase in production in other parts of the world, specifically in maize, where South Africa is a net exporter, could bring increased competition and downward pressure on prices in the medium term. Some of South Africa's key maize export markets are South Korea, Japan, Taiwan and Vietnam, and all have proximity to China.

Source: Agricultural Economics Today

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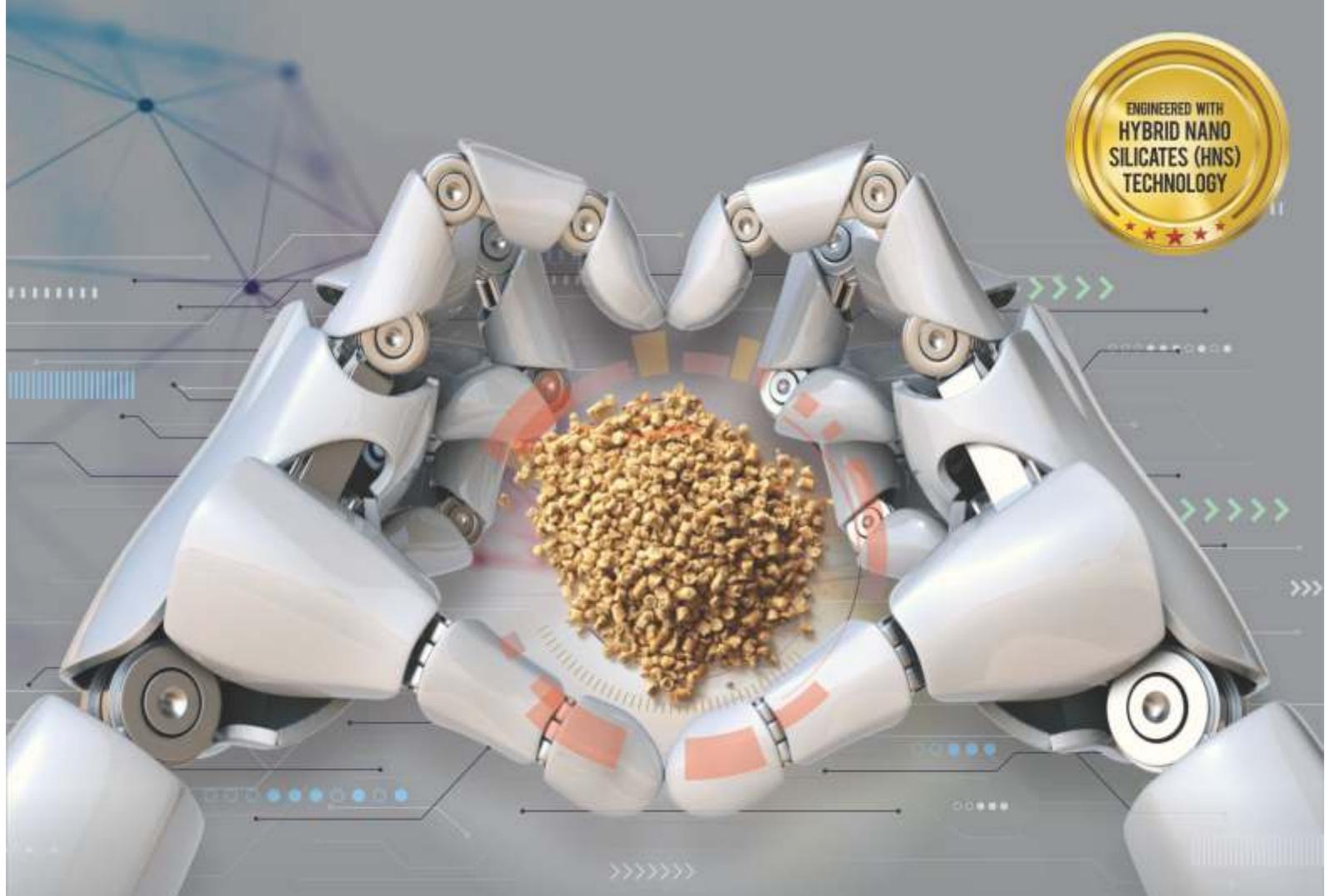
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