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Poultry Fortune

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Poultry farming is one of the most important ways to alleviate malnutrition in rural areas providing additional income to poor families

Dr Mark Lyons, President and CEO, Alltech says, 'We must unify and take action today, for the future of agriculture and our planet. Together, we have the collective courage and impact to work together for a Planet of Plenty'

Role of fats and oils is well established in poultry feed formulations being the sources of energy, a hard reality which cannot be changed. Emulsifiers are used to improve digestibility of fats thereby improving energy efficiency. It is highly important in recent times due to increasing raw material prices and therefore final feed cost in poultry nutrition.

Dear Readers,

The July 2022 issue of ***Poultry Fortune*** is in your hands. In the news section, you may find news about ....

Novus International Inc. hosted the first in a series of informational forums titled *Gut Health Optimization in Poultry* in Kolkata and Pune on 15 and 17 June 2022. Integrators, feed millers and layer farmers along with eminent thought leaders from poultry industry took part in Novus Forums. Annafe Perino, Novus Poultry Solution Manager in Asia, explained how Novus gut health solutions are unique and help poultry producers to maximize their profit by reducing the pathogen load in the intestine. She talked about various research trials conducted to show how Novus products work in controlling pathogens in the gut and increase beneficial bacteria, highlighting Novus eubiotic solutions. Dr D. Chandrasekaran spoke on how maintaining gut health is the first priority for every nutritionist in poultry industry. Linked to better immunity, nutrient utilization, improve digestibility and overall performance, the bird's gut health is the most important factor. He said it's possible to impact gut health through the usage of non antibiotic additives, acidifiers, enzymes and protected organic acid to control many gut pathogens and improve beneficial microbes.

Harsha Chitturi received ET Excellence Award (Young Entrepreneur in Poultry industry) on 18 June 2022 at Hyderabad. ET Excellence Awards 2022 is one of the most acclaimed accolades in the industry, to celebrate the Moghuls of business, emerging entrepreneurs and talented professionals across various sectors. This recognition highlights the success, innovation, service, commitment and inestimable contributions of dynamic individuals, who through their achievements and growth have empowered the states of Andhra Pradesh and Telangana. Harsha has grown up seeing his grandfather Jagapati Rao Chitturi and father Suresh Chitturi, who are the stalwarts of the Indian poultry industry. Harsha is inspired by the family business and Srinivasa Farms' purpose to 'Provide Quality and Affordable Nutrition'. Harsha joined the business to continue the legacy.

The Alltech ONE Conference (ONE) closes with themes of innovation and resilience in Lexington, Kentucky, after a robust agenda of in-person and virtual activities and presentations. ONE welcomed nearly 2,000 international delegates in person, with an additional 5,000 participating virtually. Now in its 38th year, this world-class event brought inspiring keynote speakers and more than 100 industry leaders to the stage sharing valuable insights in live workshops and focus tracks and uncovering the challenges and opportunities in agriculture, business, health and wellness, and professional development. Dr Mark Lyons, President and CEO, Alltech said, 'We must unify and take action, today, for the future of agriculture and our planet. Together, we have the collective courage and impact to work together for a Planet of Plenty'.

Zoetis India Limited conducted Series of Technical Seminars on 'Best approach to control Mycoplasma in Poultry at Hyderabad, Bangalore and Coimbatore. Currently Mycoplasma and E. Coli are the major issues which are bothering the industry, most of farmers are losing their profits because of unprecedented level of Mycoplasma

Contd on next page

NRS GROUP

Poultry Fortune

Our Mission

Poultry Fortune will strive to be the reliable source of information to poultry industry in India.

PF will give its opinion and suggest the industry what is needed in the interest of the stakeholders of the industry.

PF will strive to be The Forum to the Stakeholders of the industry for development and self-regulation.

PF will recognize the efforts and contribution of individuals, institutions and organizations for the development of poultry industry in the country through annual Awards presentation.

PF will strive to maintain quality and standards at all times.

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and E. Coli in the farms. There are multiple options available in market to tackle these issues, but somehow the farmers are not getting a satisfactory solution. Zoetis India has tried to provide a sustainable solution in the form of various products. Mycoplasma is one of the organisms which is ubiquitous and which lowers the profits of the farmers by increasing production cost. In the current scenario and for long term benefits preventive vaccination has proven efficacy against various bacterial and viral diseases. Zoetis understands the challenges faced by the farmers & therefore they have launched a complete solution against Mycoplasma.

They took this as an opportunity and conducted seminars with the help of poultry experts and tried to provide knowledge about the best approach against Mycoplasma. Dr Bhushan Gangurde, Group Product Manager – Poultry gave an introduction. Dr S.R. Anand and Dr Anupam K.R. Srivastava. According to Dr S.R. Anand, Anti- mycoplasma drugs are not meant to provide long term solution. Continuous use of Anti- mycoplasma drug will lead to the development of resistance against Mycoplasma. He mentioned that it's only vaccine which will provide long term sustainable solution against Mycoplasma.

Union Minister of Rural Development and Panchayati Raj, Giriraj Singh reiterated that Poultry farming is one of the most important ways to alleviate malnutrition in rural areas providing additional income to the poor families and nutritional security to the poor and landless farmers. Speaking after inaugurating the Integrated Farming Unit of "Moringa and backyard Poultry" at ICAR-Directorate of Poultry Research. Giriraj appreciated the Directorate for creating such a model facility to highlight the benefits of integrated farming. He said that the Directorate is striving hard to develop suitable technologies for both commercial and backyard poultry and also in new frontier areas of Nutrition, Health and Biotechnology. The Union Minister also suggested that this model would help in reducing the feed cost and competitiveness for human food like maize and soybean.

Avitech Nutrition launched Matrix, an eggshell formula fortified with bioactive Vitamin D3. The company informed that Matrix is a scientifically formulated eggshell formula containing critical macro nutrients, organic trace minerals and bioactive Vitamin D3. The carefully selected ingredients of Matrix enhance the eggshell strength and bone matrix. Matrix is effective in improving the immune response and in increasing hatchability in breeders thereby leading to higher profitability for the farmers.

In the Articles section – *Chicken Egg Shell - A Cheap Source of Dietary Calcium for Humans,* *authored by* M. Shanmugam and S. Jayakumar, ICAR-Directorate of Poultry Research, Rajendranagar, Hyderabad, said that Egg shell considered as a waste product is a cheap source of calcium for humans. This egg shell is used in animal feeds as a source of calcium, applied in agricultural fields for pH correction of acidic soil and as biodiesel catalyst. However, most of the egg shell is wasted and as per EU egg shell is a hazardous solid waste. As per a calculation in 2016, globally approximately 110 billion tons of egg shell was wasted. Disposal of egg shell from kitchen and other egg-based food industry without further processing ends in landfill and contribute to environmental pollution and carbon footprint. The decomposition of egg shell and related contents result in release of ammonia and hydrogen sulfide with offensive odour that attracts rodents and insects.

Another article titled ***Developing enzymes to deliver Current and Future Values,*** *authored by* Dr Peter Plumstead, Senior Scientist, Danisco Animal Nutrition, informed that Microbial phytase has over taken glycanases as the primary feed enzyme type worldwide more than 70% of global poultry, pork and eggs are produced from animals fed diets containing phytase. A growing body of research evidence during the past decade has shown that enzyme preparations can be effective in enhancing lactation and growth performance in cattle. The anti-nutritive effects of phytate are highly influential on dietary amino acid and energy digestibility, raising the value of phytase to the end user beyond being just a contributor to phosphorus (and calcium) nutrition.

Article titled ***Strategies to Combat E. Coli in Poultry Farms,*** *authored by* Dr Krishna Sahoo, Global Product Manager, Proteon Pharmaceuticals, discussed that *E. coli* is a gram-negative bacterium that belongs to the intestinal microflora of livestock, including poultry. These bacteria are capable of surviving long periods outside the host and are present in almost all bird environments, particularly the litter and house dust. Opportunistic infections may occur under certain conditions (stress, weakened immune system, accompanying diseases and infections), however, pathogenic bacteria may also enter the body from the external environment. Although *E. coli* infection is commonly treated with antibiotics, a survey of commercial poultry producers found that chickens raised for eggs and meat have high levels of antibiotic-resistant bacteria. The survey found that more than half of the *E. coli* isolates were resistant to multiple drugs and nearly 60% of them contained broad-spectrum beta lactamase, an enzyme that provides resistance to beta-lactam antibiotics.

Another article titled ***Phosphatidyl choline, Lysophosphatidyl choline and PEGR together make a better fat digestion and absorption than Lecithin alone,*** *authored by* Dr Onkar Pawaskar, Managing Director and Dr Mangesh Sagar, Director – Sales & Marketing, Volschendorf Enterprise Pvt Ltd**,** said that the role of fats and oils is well established in poultry feed formulations being the sources of energy, a hard reality which cannot be changed. Emulsifiers are used to improve the digestibility of fats thereby improving energy efficiency. It is highly important in recent times due to increasing raw material prices and therefore final feed cost in poultry nutrition.

Fats and oils require special handling and storage facilities as they are prone to oxidation over time. Their fatty acid profiles, the level of free fatty acids, degree of hydrogenation and age of birds can all influence digestibility. Unlike most other ingredients fat digestion can be age dependent, since young birds have the less ability to produce bile salts and therefore to digest saturated fats. The natural emulsifiers in the body are limited due to the immaturity of the digestive system. The young birds are unable to cope with the high energy additions in feed. It makes use of external sources of emulsifiers through feed formulation an integral part of poultry nutrition so as to avoid the wastage of this expensive energy resource.

Readers are invited to send their views and comments on the news, special feature and articles published in the magazine which would be published under "Readers Column". Time to time, we shall try to update you on various aspects of Poultry sector. Keep reading the magazine Poultry Fortune regularly and update yourself. Wish you all fruitful results in your efforts.

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Editor & Publisher
Poultry Fortune

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Novus Knowledge Forum on Gut Health Optimization in Poultry

Bangalore: As a way to share knowledge on how gut health can impact poultry production, Novus International Inc. hosted the first in a series of informational forums titled Gut Health Optimization in Poultry in the cities of Kolkata, West Bengal and Pune, Maharashtra on 15 and 17 June 2022 respectively.

Dr D. Chandrasekaran

Kolkata and Pune are prominent poultry-producing areas in India. Both the markets consist of strongly integrated farming, commercial feed operations, and a mix of layer farms. With increases in demand for broiler meat and eggs, the challenge of getting good quality raw feed materials at a competitive price is increasing. At the same time, maintaining good gut health is an ongoing challenge for poultry producers. There are certain organic acids and essential oil complexes that have become an important tool to improve/optimize bird gut health. Novus hosted these events with an aim to provide insight on how to use these feed additives and other options to positively impact poultry gut health.

Ms Annafe Perino

The Novus Forums received an overwhelming response with over 70 attendees that included integrators, feed millers, and layer farmers, along with eminent thought leaders from the poultry industry.

The keynote speaker was Dr D. Chandrasekaran, a Retired Professor of Animal Nutrition at TANUVAS (Tamil Nadu Veterinary and Animal Sciences University). Having published more than 75 scientific articles in national and international journals, Chandrasekaran is a renowned poultry expert, nutritionist, and researcher in India and the subcontinent.

Chandrasekaran spoke on how maintaining gut health is the first priority for every nutritionist in the poultry industry. Linked to better immunity, nutrient utilization, improve digestibility and overall performance, the bird's gut health is the most important factor. He said it's possible to impact gut health through the usage of non antibiotic additives, acidifiers, enzymes, and protected organic acid to control many gut pathogens and improve beneficial microbes.

During the event, Annafe Perino, Novus Poultry Solution Manager in Asia, explained how Novus gut health solutions are unique and help poultry producers to maximize their profit by reducing the pathogen load in the intestine. She talked about various research trials conducted to show how Novus products they work in controlling pathogens in the gut and increase beneficial bacteria, highlighting Novus eubiotic solutions, AVIMATRIX feed supplement and NEXT ENHANCE 150 feed additive.

"Novus believes in providing our customers solutions with demonstrable value," Perino said. "With our unique eubiotic solutions for optimizing gut health and farm profitability, we are strategically well-positioned to serve our customers and increase their profits".

Perino explained how AVIMATRIX, Novus's premium blend of high benzoic acid concentration in embedded matrix technology helps create homogeneous dispersion and the slow and continuous release of active ingredients along the entire intestinal tract. AVIMATRIX also ensures a dustless free-flowing and non-corrosive product, which allows the active antibacterial ingredients to be delivered to the lower part of the intestinal tract.

Participants in Novus Forum on Gut Health Optimization

A view of Participants

For NEXT ENHANCE 150, Perino explained how the high level of essential oil compounds are thermo stable through a patented micro-encapsulation technology that ensures the release of active ingredients at the right site in the gut.

"This allows NEXT ENHANCE 150 to reduce pathogenic bacteria and improve gut morphology, controlling Eimeria species pathogenic bacteria and increasing beneficial bacteria in the gut. These changes help to improve the overall performance of the bird," she said.

The sessions were moderated by Reena Rani L C, Novus Senior Marketing Communication Specialist for South Central Asia. Dr Manish Kumar Singh, Novus Director of Strategic Marketing in Asia, led the event with details about Novus; sharing details about the company's foundation in feed additive products based on science and research, as well as its strong presence in India.

The event was supported by the Novus India Team including, Dr Krishnamurthy Dasappa – Sales Director, Dr Koushik De - Technical Service Director, Sukanta Nandy – National Sales Manager, Santu Nandy – Sales Manager, Dr Milind Rainchwar - Technical Service Manager, Dr Rajesh Kharvi – Product Category Manager for Asia / Pacific, Vikram Tambewagh – Sales Manager, Nilesh Sen – Sales Manager, and Anand Srivastava – Key Account Manager.

Harsha Chitturi receives ET Excellence Award (Young Entrepreneur in Poultry Industry)

Hyderabad: Harsha Chitturi received ET Excellence Award (Young Entrepreneur in Poultry Industry) from Ms Aditi Rao Hydari on 18 June at The Westin Hotel, Mindspace, Madhapur IT Park, Hyderabad.

ET Excellence Awards 2022 is one of the most acclaimed accolades in the industry, to celebrate the Moghuls of business, emerging entrepreneurs and talented professionals across various sectors. This recognition highlights the success, innovation, service, commitment and inestimable contributions of dynamic individuals, who through their achievements and growth have empowered the states of Andhra Pradesh & Telangana.

Harsha has grown up seeing his grandfather Jagapati Rao Chitturi and father Suresh Chitturi, who are stalwarts of the Indian Poultry industry. Harsha is inspired by the family business and Srinivasa Farms' Purpose to "Provide Quality and Affordable Nutrition", Harsha joined the business to continue the legacy.

Harsha Chitturi receiving ET Excellence Award (Young Entrepreneur in Poultry industry) from Ms Aditi Rao Hydari at Hyderabad on June 18.

Harsha is highly practical and possesses realistic optimism. An outside-the-box thinker strives to make the company stand out to the customers and prospects. He is a person who identifies and pursues opportunities without allowing risks to become barriers and assumes risks to start and operate the business and finds new ways to do business better. Harsha is on a mission to prove that, one can build a profitable business while helping others around it.

He has successfully ventured in the branded retail eggs segment by launching the Hello Eggs brand in the Hyderabad market successfully. Hello eggs are farm-fresh, wholesome, and packed with high protein. Hello eggs are grade AA, which are high quality eggs. The egg whites (albumen) are thick and firm, the yolks are high and round, and the shells are clean and unbroken. Harsha has ambitious plans for Hello eggs expansion across pan India by end of 2022.

Harsha is a part of the International Egg Commission's Young Egg leaders Program, which is foster's talent in the industry and grooms them in to next generation leaders.

Harsha is a graduate of Clark University, USA.

The Alltech ONE Conference closes with themes of innovation and resilience

The Alltech ONE Conference (ONE) wrapped up in Lexington, Kentucky, after a robust agenda of in-person and virtual activities and presentations. ONE welcomed nearly 2,000 international delegates in person, with an additional 5,000 participating virtually. Now in its 38th year, this world-class event brought inspiring keynote speakers and more than 100 industry leaders to the stage, sharing valuable insights in live workshops and focus tracks and uncovering the challenges and opportunities in agriculture, business, health and wellness, and professional development.

Dr Mark Lyons was joined on the ONE Mainstage for the closing session by Mick Ebeling, founder and CEO of Not Impossible Labs, and world-class blind adventurer Erik Weihenmayer.

"We must unify and take action, today, for the future of agriculture and our planet," said Dr Mark Lyons, president and CEO of Alltech. "Together, we have the collective courage and impact to work together for a Planet of Plenty™."

Lyons was joined on the ONE Mainstage for the closing session by Mick Ebeling, founder and CEO of Not Impossible Labs, and world-class blind adventurerErik Weihenmayer.

Ebeling was recently named by Fortune Magazine as one of the Top 50 World's Greatest Leaders. He is a recipient of the Muhammad Ali Humanitarian of the Year Award and is listed as one of the world's most influential creative people by The Creativity 50s. Ebeling has sparked a movement of pragmatic, inspirational innovation, and as a career producer and filmmaker, he harvests the power of technology and storytelling to change the world.

"What we do is, we start by telling the story of one person," said Ebeling. "And then, telling the story of that one person, that's what scales us to help many people."

Despite losing his vision at age 14, Weihenmayer is an accomplished climber, paraglider, skier and kayaker who never allows blindness to interfere with his passion for pursuing an

Heather White(Author, Founder and CEO, One GreenThing), ONE keynote speaker addressing the gathering

Dr Karl Dawson (Vice President and Chief Scientific Officer-Alltech Research) receivingAlltech Medal of Excellence

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exhilarating and fulfilling life. In 2001, he became the first blind person in history to reach the summit of Mount Everest. In 2008, he completed his quest to climb the Seven Summits, the highest mountains on each continent. Additionally, he has ascended dozens of major peaks, rock walls and ice climbs around the planet, including the first blind ascent of the 3,000-foot Nose of El Capitan in Yosemite National Park and the ascent of a rarely climbed 3,000-foot frozen waterfall in Nepal.

Malaysia halting chicken exports: SFA urges consumers to buy what they need, consider switching to other meats

Singapore: Following Malaysia's announcement on Monday (May 23) that it will be halting chicken exports starting June, the Singapore Food Agency (SFA) has encouraged consumers to consider switching to other meat products and buying only what they need.

Malaysia's Prime Minister Ismail Sabri Yaacob said in a Facebook post on Monday evening that the Malaysian government will be halting the export of 3.6 million chickens a month starting June 1, until the price and production of chicken stabilises again.

"The government is upset and disappointed with the actions of some companies that stopped the supply

of chicken, causing an increase in prices and shortage of supply in the market," he wrote in Malay.

In response, SFA said in a post on Facebook on Monday night that it is "closely monitoring the situation" on imports from Malaysia and working with stakeholders, such as importers, to minimise the impact on Singapore's chicken supply.

"For example, they will activate their supply chains to increase imports of chilled chicken from alternative sources, increase import of frozen chicken from existing non-Malaysia suppliers, or draw from their stocks of poultry," the agency said.

It added that while there may be a disruption to the supply of chilled chicken, frozen chicken options remain available to mitigate this shortfall.

"We strongly encourage consumers to play their part by being open to switching choices within and across food groups such — as consuming frozen chicken instead of chilled — as well as other sources of meat products," said SFA.

"We also advise consumers to buy only what they need."

The agency said that approximately 34 per cent of Singapore's chicken imports in 2021 were from Malaysia, and that almost all are imported as live chickens, which are then slaughtered and chilled in Singapore.

Zoetis India Conducts Series of Technical Seminars at Hyderabad, Bangalore and Coimbatore

Zoetis India Limited conducted Series of Technical Seminars on "Best approach to control Mycoplasma in Poultry" at Hyderabad, Bangalore and Coimbatore.

Zoetis India (South Team)

Zoetis is a global animal health company driven by a singular purpose to nurture our world and humankind in advancing care in animals. We stand by our customers and their businesses by providing solutions across the continuum of care to predict, prevent, detect, and treat diseases. The company develops and manufactures animal-health medicines and vaccines for companion animals, dairy and poultry. Zoetis provides Vaccines, Anti-Infectives, Disinfectants, Embrex biodevices, MFA, Anticoccidials and Toxin Binders. Today, the company has over 300 product lines globally, operating in more than 100 countries.

Zoetis India is dedicated to deliver quality products for the health of Animals. The Indian poultry market size reached a value of $ 24 billion in 2021. The industry is further expected to grow at a CAGR of 8.1% in the forecast period of 2022 - 2027 and to reach a value of approximately $ 40 billion by 2027. Every industry has its own challenges. Currently Mycoplasma and E. Coli are the major issues which are bothering the industry, most of farmers are losing their profits because of unprecedented level of Mycoplasma and E. Coli in the farm. There are multiple options available in market to tackle these issues, but somehow the farmers are not getting a satisfactory solution.

Looking at the plight of the farmers and current Mycoplasma scenario, Zoetis India Limited recently conducted series of technical seminar at Hyderabad, Bangalore and Coimbatore. The topic was **"Best approach to Control Mycoplasma in Poultry"**. Zoetis India has always tried to provide a sustainable solution in the form of various products. Mycoplasma is one of the organisms which is ubiquitous, and which lowers the profits of the farmers by increasing production cost. In the current scenario and for long term benefits preventive vaccination has proven efficacy against various bacterial and viral diseases. As Zoetis we understand the challenges faced by the farmers & therefore we have launched a complete solution against Mycoplasma. We took this as an opportunity and conducted seminars with the help of poultry experts and tried to provide knowledge about the best approach against Mycoplasma.

Events started with welcome note from Dr Bhushan Gangurde, Group Product Manager – Poultry followed by

A view of Zoetis Inida Technical Seminar Participants

brief introduction of the speakers Dr S.R. Anand and Dr Anupam K.R. Srivastava. Dr S.R. Anand was the guest speaker along with Dr Srivastava, National Technical Manager at Zoetis India Limited for all the events conducted at Hyderabad, Bangalore and Coimbatore. Dr S.R. Anand shared his insight about current scenario of poultry industry and difficulties faced by Indian Farmers. He specifically mentioned that how Mycoplasma is slowly affecting the health of the birds and reducing the productivity. He provided insight into various options to tackle Mycoplasma by the wide usage of live and killed vaccine. According to Dr S.R. Anand, Anti-mycoplasma drugs are not meant to provide long term solution. Continuous use of Anti- mycoplasma drug will lead to development of resistance against Mycoplasma. He mentioned that it's only vaccine which will provide long term sustainable Solution against Mycoplasma. Dr S.R. Anand mentioned that Mycoplasma gallispeticum and Mycoplasma synoviae are highly prevalent in India. He shared many reports of ELISA titers showing Mycoplasma

Infection in the farms. In his opinion, Mycoplasma gallispeticum symptoms are more visible in the forms of clinical science but Mycoplasma synoviae is hidden enemy which is creating a problem in later stage of breeder as well as layer. Dr S.R. Anand also added that prevention is the best approach against mycoplasma spp.

Dr S.R. Anand mentioned various available option in prevention program which includes live vaccine MG-TS11/MSH against MG *(Mycoplasma gallispeticum)* and MS *(Mycoplasma synoviae)* followed by MG and MS killed vaccine program in Breeder. Dr S.R. Anand also recommended to go for clean-up program with linco-spectin 100 before introducing the live Vaccine. Dr S.R. Anand said these cleanup programs followed by live vaccine will protect the flock u and if by any chance flock get infected at an advance age due to immunosuppression then uses any suitable molecule be to treat. Vaccinated birds will show good response versus non vaccinated birds. He mentioned various test methods like ELISA, PCR to diagnosed Mycoplasma infection. After vaccination he specifically mentioned to go for DIVA PCR which will identify vaccine strain and wild strain. Dr Anand also added his personal experience with vaccines like Vaxsafe MG, Vaxsafe MS and MG-Bac and how these Zoetis vaccines are helping the farmers to reduce the treatment cost for mycoplasma. He also emphasized returns on investment after using Mycoplasma vaccine in the form of number of extra eggs in Breeder and improvement in the shell quality in the layers.

Dr Anupam K.R. Srivastava, Technical Head, Zoetis India, spoke about range of Zoetis products against Mycoplasma. He also highlighted that how clean up of Mycoplasma is very crucial before introducing vaccine. Dr Srivastava mentioned newly launched product Linco-Spectin 100 for the cleanup program in Breeder and Layer. Linco-Spectin 100 is not only effective against *Mycoplasma gallispeticum* and *Mycoplasma synoviae* but also E. Coli. Dr Srivastava pinpointed the benefits of using Vaxsafe MG and Vaxsafe MSH in breeder as well as Layer. He also recommended to use MG-Bac in Breeder for a better chick quality and to transfer the maternal antibodies to next generation. He also mentioned that how Zoetis technical diagnostics and services are providing various benefits to the customers who are using Vaxsafe MG and Vaxsafe MS, he emphasized how these customers are getting a better return on investment.

Poultry division is an integral part of Zoetis India. Since several decades Zoetis (earlier Pfizer animal health) has provided several solutions against various health issues in the form of vaccines, MFA's (medicated feed additives), Parasiticides and Anti-infective. The trust that has been bestowed by farmers that a product coming from Zoetis will be the best in best and will positively impact the birds performance. Considering this scenario and to address the issues Zoetis India conducted seminars to have fruitful discussions on current challenges in poultry. We believe that there was a strong take away messages from this technical seminars that "Vaccinated is the long-term solution against Mycoplasma in poultry".

All the technical seminars were attended by important consultants and key opinion leaders of the industry. Feedback from attending consultants and farmers was very encouraging as the topic was pertinent and discussion was very informative.

Zoetis India is very much confident that **Linco-Spectin 100, Vaxsafe MG, Vaxsafe MS** and **MG-Bac** is definitely new approach towards challenging *Mycoplasma spp*, and the combination of these will provide much sustainable and long term benefits to the farmers.

For more details on **Linco-Spectin 100, Vaxsafe MG, Vaxsafe MS** and **MG-Bac** please contact Zoetis field colleagues.

Technical Seminar Participants

Question and Answer session with participants

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Farmacy Agrovet opened at Hyderabad

Hyderabad:
The inauguration of FARMACY AGROVET was took place in Hyderabad on 18th June 2022. Farmacy Agrovet is an energetic group of passionate individuals carrying a potential and diversified exposure to Indian Poultry Industry. The promoters Mr Srikanth Mittapalli, Mr Chandrashekar Balne & Mr Raja Praveen Chetlapally holds domain expertise into core sales of poultry nutrition and health care, allied marketing, business strategy, operational efficiency and distribution business. The group's business expertise is enriched with 49 years of collective experience with senior leadership roles in highly reputed organizations like Natural Remedies, Himalaya wellness company etc. Their bench marking track record in sales and business management won the hearts of Indian poultry fraternity.

Inauguration of FARMACY AGROVET by K. Narender Reddy & D.S. Subramaniam

Farmacy Agrovet inaugural day was started with auspicious Laxmi pooja followed by formal inaugural ceremony of the office. Main office inauguration was performed by Mr K. Narender Reddy, Chief Operating Officer, Natural Remedies Pvt Ltd, Conference Hall was inaugurated by Mr D.S. Subramaniam, Managing Director, Tara Group, Promoter's office was inaugurated by Dr Rajat Mohanty, National Sales Head, Elanco India.

Team Farmacy Agrovet took this opportunity to imposingly felicitate all the Chief Guests with shawls and saplings in recognition of their contributions to poultry industry. Indian animal health & nutrition sector senior personalities like Mr S V Ramana, National Sales Manager, Natural Remedies Pvt Ltd, Dr Chockalingam, Sales Manager, Himalaya Wellness Company, Mr Srinivas Reddy, Business Head, Cargill India, Dr Manish Mohekar, Technical Head, Natural Remedies Pvt Ltd, Mr M.A. Nazeer, Editor & Publisher, Poultry Fortune, Mr M N Rao, Kokroko Publications and other key personalities from the industry witness the inaugural ceremony.

It was incidental yet blissful that the Farmacy Agrovet inaugural day was happened to be the birthday of Mr K. Narender Reddy, Chief Operating Officer, Natural Remedies Pvt Ltd and the birthday occasion was greatly celebrated by all the invitees in a grand manner with cake cutting, felicitation and garlanding.

In the inaugural interview, one the promoters of Farmacy Agrovet, Mr Srikanth Mittapalli shared the purpose of the new business as to add value to poultry industry with unique, scientific and innovative nutritional and health solutions. To begin with Farmacy Agrovet will be representing Perstorp (A Swedish conglomerate and basic manufacturers of organic acids, mold inihibitors and gut health solutions),

D.S. Subramaniam, MD, Tara Group inaugurating Conference Hall

Rajat Mohanty, National Sales Head, ELANCO inaugurating promoters office

Dignataries in the conference hall

Birthday celebrations of K. Narender Reddy, COO-Natural Remedies

Felicitation to Chockalingam - SM - Himalaya Wellness Company by K. Narender Reddy, COO-Natural Remedies

Felicitation to D.S. Subramaniam - MD, Tara Group by K. Narender Reddy, COO, Natural Remedies

part of ELANCO portfolio and Natural Remedies (An Indian multinational in Phytogenics). With this humble initiative, Farmacy Agrovet aims in serving Poultry Industry with finest quality feed additives and health care solutions. By hand picking best brands in their segments, we stand by our utmost priority of providing unique and value added solutions coupled with unparallel distribution services.

Farmacy Agrovet strongly believes that its business expertise can add significant value to the poultry industry with its scientific and innovative product portfolio, supply chain and distribution expertise and value added services.

The inaugural ceremony was followed by delicious lunch and concluded with exchange of greetings and best wishes by invitees.

Economist Urges Jharkhand Minister to Make Egg Part of Midday Meals Everyday

In a bid to fight malnourishment and improve school attendance rate, Jean Dreze wrote to Jharkhand finance minister Rameshwar Oraon, urging him to make provision for one egg every day for six days a week in midday meals of schools.

Ranchi: In a bid to fight malnourishment among children and improve school attendance rate, Belgian-born economist and social activist Jean Dreze on Thursday wrote to Jharkhand finance minister Rameshwar Oraon, urging him to make provision for one egg every day for six days a week in midday meals of schools and anganwadi centres. Currently, eggs are provided twice a week in Jharkhand schools.

Mr Dreze, in his letter, alleged that provision of eggs has been repeatedly delayed or derailed by "by ill-advised attempts to float tenders for centralised procurement"

"Jharkhand's children are among the most undernourished in the world. In addition, we are in the middle of a severe crisis of low-school attendance rates. Including eggs in midday meals every day would also help to ensure regular attendance of children at schools and anganwadis," he said.

According to the National Family Health Survey (NFHS)-5 data, about 27 per cent children below five years of age are

stunted and 30 per cent underweight. More than 65 per cent of children between six to 59 months are anaemic.

"Eggs are an excellent source of protein for growing children, and they also contain essential nutrients. The nutritional benefits of eggs are well-established. Eggs are also tasty, affordable and safe," Mr Dreze, now an Indian citizen, said. Many other states, including Odisha, provide eggs in midday meals on a regular basis, he noted.

"The government of Jharkhand has already promised to provide eggs in midday meals on a daily basis. The time to redeem this promise is long overdue. The cost will be very modest, and the benefits will be immense not just for children but for the entire state," he added in the letter.

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GLOCREST Pharmaceutical opens corporate office at Mumbai

Mumbai: GLOCREST Pharmaceutical Pvt Ltd announced its new corporate office opening in Thane, Mumbai on 22 June 2022. Big thanks to all our valued customers / consultants / business partners from all India for spending their valuable time to grace this event. We look forward to much more of such events & support from our valued guests.

Inaugaration of Glocrest Pharmaceutical Pvt Ltd – Corporate office, Mumbai by Dr Ajit Ranade, Associate Dean, Mumbai Veterinary College, Mumbai. Rajesh Babu Kaparthy and Dr Ramdas Kambale helping him

GLOCREST Team: T. Mathusoothanan, Dr Ramdas Kambale, Hemendra Sengar, Dr Mahesh Rajurkar, Rajesh Babu, Nishank Kaparthy, Seema Kaparthy, Vaibhav Kadam

Dr Ranade with GLOCREST BOARD MEMBERS At time of lightening of Lamp for Inauguration

Group Photo

Dr Sanjay Dronawat passes away

Dr Sanjay Dronawat, Promoter, Yarana Feeds & Farms, Hubli passed away on 8 June 2022 due to massive cardiac arrest. Karnataka Poultry Farmers & Breeders Association [KPFBA] expressed deep and heartfelt condolences to the bereaved family.

Avitech Nutrition launches Matrix an eggshell formula fortified with bioactive Vitamin D_3

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Soyabean output likely to be below govt estimates: SEA

Industry pegs the output at 10 million tonnes against 13.83 projected by the Centre

Mangaluru: The Solvent Extractors' Association (SEA) of India feels that the soyabean crop is likely to be lower at 10 million tonnes (mt) against the government's estimate of 13.83 mt.

Atul Chaturvedi, President, SEA, in his monthly letters to its members, said the Union Ministry of Agriculture and Farmers Welfare's third advance estimate for major crops had estimated the oilseeds output at 38.5 mt. It was at 35.95 mt during the last year.

Stating that these are good tidings, he hoped that oilseed production would continue growing in the coming years. According to the government estimate, the soyabean crop is at 13.83 mt, and the rape-mustard seed crop at 11.75 mt.

The trade estimate for soyabean, as announced by SOPA, is 11.9 mt, he said, adding: "But many industry players believe the soyabean crop is much lower at 10 mt as they do not see the pressure of market-arrivals even at the current high price of soyabean."

Crop diversification

Stressing the need for crop diversification, he said the MSP-driven wheat and rice production in Punjab and Haryana has assured a ready market and reasonable returns to the farmers. But this has created huge anomalies and demand-supply mismatch. Mountains of wheat and rice are challenging the country's storage infrastructure.

Urging the need to divert some land in Punjab from wheat/rice cycle to sunflower, maize in kharif season, and to rapeseed/mustard in rabi season, he said: "We have to ensure farmers are suitably incentivised by ensuring better returns and assured market. If we can convince farmers in these north Indian states; 'Yellow Revolution' can become a reality."

In this regard, SEA would establish model farms in two districts of Punjab during rabi season to show that crop diversification to rape-mustard seed can be more remunerative than wheat.

Imported inflation

On inflation, he said, India's high dependence on imported fuel and edible oil are the primary reason. No country can have fuel security when it depends on to the extent of 85 per cent of its need. Edible oil security is also seriously compromised, with 65 per cent dependence on imports.

Mentioning that there are no quick-fix solutions to combat imported inflation that has been fuelled by easy monetary policies and geo-political issues plaguing the world, he said high prices have resulted in demand destruction to some extent which should help in bringing some sanity back in the markets.

The message of the Prime Minister for working towards aatmanirbharta in fuel and edible oils is now being acted upon in all seriousness by the concerned ministries. The thrust on biofuels, more particularly ethanol, and implementation of National Mission on Oilseeds should go a long way in reducing India's dependence on the world, he said.

Storage control order

On implementing the storage control orders, he said it gives undue powers to officers tasked with its enforcement and results in avoidable harassment. "This is contrary to Prime Minister's stated vision of improving 'ease of doing business'. It beats our imagination why edible oils are targeted when almost 65 per cent of it is imported, which is exempt. We trust and hope this draconian law is withdrawn at the earliest," Chaturvedi said.

Castor seed

According to Chaturvedi, India produces about 1.8-2 mt of castor seed and exports nearly 700,000 tonnes of castor oil and about 150,000 tonnes of castor seed derivatives, meeting 90 per cent of the requirements of the world.

He said SEA Castor Seed and Oil Promotion Council has decided to develop the Indian Castor Seed Sustainability Standard (INCASS) for products based on Indian conditions and issue the Sustainability Certificate either by SEA or its affiliated body to the castor fraternity.

He said SEA Castor Seed and Oil Promotion Council has set up a special committee to work out modalities and implement the Castor Sustainability Standard within 3-6 months.

Rice bran

He said the Union Commerce Ministry's notification dated May 5, placing de-oiled rice bran exports under APEDA shocked SEA members processing rice bran. Over the last 50 years, SEA has taken a lot of pain and effort to promote exports of de-oiled rice bran ,helping increase the overall processing and production of rice bran oil.

"We fail to understand the need for shifting de-oiled rice bran from the purview of SEA to APEDA. The change will dilute the focus and may affect the overall processing of rice bran, production of rice bran oil, and exports of de-oiled rice bran," he said.

Poultry farming is one of the most important ways to alleviate malnutrition in rural areas: Giriraj Singh

Hyderabad: Union Minister of Rural Development and Panchayati Raj Giriraj Singh reiterated that Poultry farming is one of the most important ways to alleviate malnutrition in rural areas providing additional income to the poor families and nutritional security to the poor and landless farmers.

Speaking after inaugurating the Integrated Farming Unit of "Moringa and backyard Poultry" at ICAR-Directorate of Poultry Research, here on Friday, Giriraj appreciated the Directorate for creating such a model facility to highlight the benefits of integrated farming

He said that the Directorate is striving hard to develop suitable technologies for both commercial and backyard poultry and also in new frontier areas of Nutrition, Health and Biotechnology

The Union Minister also suggested that this model would help in reducing the feed cost and competitiveness for human food like maize and soybean

He emphasised that youth should be encouraged to take up this technology through start-ups

Giriraj also suggested exploring the possibility of branding and marketing of moringa-fed chicken egg and meat. He suggested developing a low cost model for entrepreneurship development in an integrated farming system with Moringa and backyard poultry. He suggested developing a variety capable of producing about 200 eggs under a free range system.

National Institute of Rural Development and Panchayat Raj (NIRDPR) Director General Dr G. Narendra Kumar appreciated the activities of the directorate and suggested collaboration between the two organizations for the welfare and benefit of the farmers.

Earlier, in his welcome address, Dr R N Chatterjee, Director ICAR-DPR explained briefly about the various achievements and technologies developed at the directorate.

He thanked the Union Minister for extending support in developing an integrated farming unit with Moringa and Chicken at this Directorate.

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An Introduction about Dr G. Gopal Reddy:

Dr G. Gopal Reddy has more than three decades of experience in sales and marketing. He did his B.V.Sc in Bengaluru and Diploma MBA in Ireland and crafted a highly successful career as a salesperson through these eventful years. Traveled to more than 25 countries. A voracious reader, he believes that learning is a continuous process. Through his learnings, he has positively impacted many people's lives. He still attends training programs as a student.

I guarantee and assure you that 'an hour with Dr G. Gopal Reddy' will completely transform and enhance the quality of your life.

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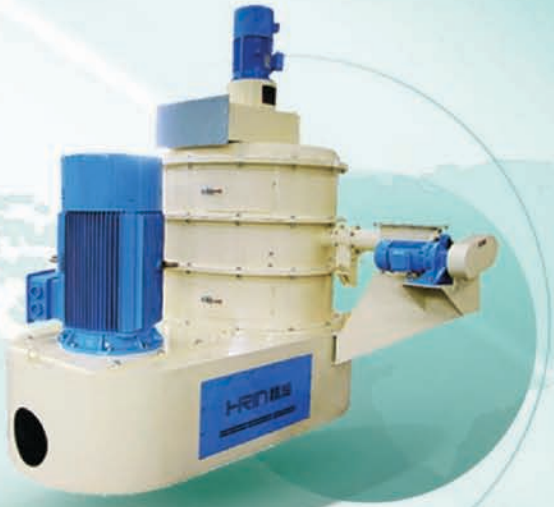

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Chicken Egg Shell - A Cheap Source of Dietary Calcium for Humans

Email: dr_shan@rediffmail.com

M. Shanmugam and S. Jayakumar
ICAR-Directorate of Poultry Research, Rajendranagar, Hyderabad - 500 030, Telangana

Highlight Points

- Egg shell considered as a waste product is a cheap source of calcium for humans
- The calcium content in egg shell powder ranges about 33-40%
- Sterilized egg shell powder can be included in the regular diet ingredients
- Utilization of egg shell will prevent it ending in solid municipal waste and resultant environmental damage

In the industrial production of chicken egg products, the egg shell is the major by-product. Of the total egg produced globally around 30% is processed in food industries with huge accumulation of egg shell. This egg shell is used in animal feeds as a source of calcium, applied in agricultural fields for pH correction of acidic soil and as biodiesel catalyst (Park et al., 2007). However, most of the egg shell is wasted and as per EU egg shell is a hazardous solid waste. As per a calculation in 2016, globally approximately 110 billion tons of egg shell was wasted. Disposal of egg shell from kitchen and other egg-based food industry without further processing ends in landfill and contributes to environmental pollution and carbon footprint. The decomposition of egg shell and related contents results in release of ammonia and hydrogen sulfide with offensive odour that attracts rodents and insects.

Calcium is an essential mineral for human body and constitutes 98% of the skeletal system. Reports from our country point to a drastic decline in the dietary intake of calcium. Higher occurrence of diseases such as beriberi, rickets, and scurvyare noticed with low calcium intake. Adult human daily requirement of calcium varies between 800-1000 mg based on the age and sex of the individual. For children the requirement is little lower. In India only around 37% of households took the recommended daily calcium levels indicating a deficit of this element in the population (Venkata et al. 2019).

The egg shell is around 10% of the total egg weight. In the egg shell powder, the calcium content ranges about 33-40%. This calcium is present in the form of calcium carbonate and is approximately 92-96% (Quina et al., 2017). The calcium is found embedded in an organic matrix consisting of protein and peptidoglycans. The average calcium content is 380mg in 1 g of egg shell. Thus, consuming one gram of egg shell powder will provide about half of the daily requirement in adults. Further, the egg shell has higher level of strontium and selenium; a lower level of fluorine or other harmful metals such as lead, cadmium, chromium and aluminum. The boron and strontium in the egg shell has been reported in the prevention of osteroporosis. Thus, egg shell has much beneficial properties for inclusion in the regular diet of humans. People suffering from osteoporosis and children in their active growth stage can consume food supplemented with egg shell powder.

Consumption of the whole egg shell powder has other advantages. It has been shown that the egg shell matrix proteins increased the calcium transport of about 64% across Caco-2 monolayer (Daengprok et al., 2003). The Caco-2 cells are human colon epithelial cancer cell line which is used as a model of human intestinal absorption of drugs and other compounds. In addition to the availability of calcium from the egg shell powder inclusion of the shell powder has been shown to reduce the absorption of fluoride. The calcium in egg shell powder binds to fluoride and prevents occurrence of fluorosis (Mulualem et al., 2021).

The calcium present in food ingredients occurs in the form of salt or complexed with other nutrients. However, after digestion, absorption of calcium happens only in cationic form. High protein content during digestion adversely affects calcium absorption. For better absorption of calcium the recommended ratio of calcium and protein is 16 mg calcium: 1g protein (Lynch Cronin et al., 2019). In piglet model representing human digestion it was reported that egg shell powder is a good source of calcium in comparison

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to casein based or soy-protein based diets containing calcium carbonate (Schaafsma and Beelen, 1999). The bio-availability of calcium present in egg shell powder is similar to the calcium carbonate supplemented in food(Arnold et al., 2021). This indicates that there is no need for any processing of egg shell power and it can be used as such in human food.

Clinical trials using eggshell powder in women with osteoporosis due to old age and in postmenopausal women indicated a reduction in pain and osteoresorption. Further it was observed that there is increase in mobility in such women and bone density.

Egg shell powder can be included in the regular diet by mixing with other food ingredients. Inclusion of the powder in food does not affect the flavor of the food, however, some changes in food texture may occur (Brun et al., 2013). To overcome this issue sieving of the egg shell powder to bring uniform smoothness is suggested. Research has shown that inclusion of egg powder in the bread spread does not affect the sensory qualities and storage stability (Kobus-Cisowska et al., 2020). Nano powdered egg shell when added to probiotic yogurt improved its sensory evaluation and shelf life (Kamel et al., 2021). Egg shells can be incorporated in calcium fortified pork sausages, calcium biscuits, roasted and ground coffee, chocolate and other homemade food products.

The main concern in the utilization of egg shell is contamination with bacteria and other microorganisms. Bacteria such as E. coli, Salmonella, Pseudomonas etc may be present on the egg shell. The probable source of contamination of salmonella on egg shell is by feaces. Disinfection of the egg shells may be done either with use of 1-2% sodium hypoclorite or boiling it in water. Boiling the egg shells for 10-20 minutes has been shown to destroy the salmonella and other microorganisms rendering the egg shell safe for consumption (Bartter et al., 2018).

A number of patents are available for egg shell crushing and powder preparation at industrial scale (Ahmed et al., 2021). At small scale or family level egg shell powder for own consumption can be made easily by following the steps listed in Fig1.The procedure described can be followed easily even in rural areas.

In conclusion, egg shell generally considered as a waste product has a huge potential as cheap alternative for commercial calcium supplements for fulfilling the dietary requirement of calcium in humans. In addition, utilization of egg shell will prevent it ending in solid municipal waste and finally in landfill that ultimately result in environmental damage and a contributor to climate change. The concept of using egg shell powder has to be persuasively communicated to the consumers so that it is adopted by them. During egg consumption when egg shell powder is also used in diet then the statement 'Egg is a complete food' will be more meaningful.

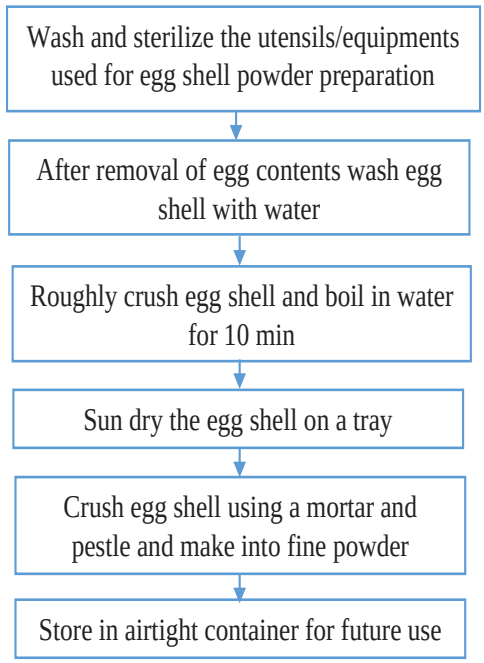

Fig 1. Preparation of egg shell powder (Bartter et al., 2018)

Developing Enzymes to deliver Current and Future Values

Ever since the use of enzymes in animal feed gained true acceptance in the late 1980s, the feed enzyme industry has had a major impact on animal feed formulation. This article looks back over the past 25 years, the development of enzymes, so far and the opportunities for the decade to come.

Email:rajeshwari.g.nair@iff.com

Dr Peter Plumstead,
Senior Scientist,
Danisco Animal Nutrition

In the late 1980s, phytase was introduced to help animal producers, principally in the Netherlands, reduce the excretion of harmful indigestible phosphorus into fresh water supplies and thereby avoid a 'phosphorus tax'. As well as avoiding legislative penalties, Dutch animal producers also enjoyed the benefits of improved absorption of phosphorus, a vital mineral for skeletal growth, and less reliance on inorganic phosphorus sources with future benefits for global sustainability. Animal producers around the world then sat up and took notice and the animal feed industry began to use feed enzymes in earnest. Around the same time, glycanases (e.g. xylanase, beta-glucanase) that cleaves the non-starch polysaccharides (NSP) in 'viscous' cereals (e.g. wheat, barley and triticale) were successfully added to the feed enzyme portfolio.

Early recognition of potential

The 1990s saw the animal feed industry increasingly acknowledge the importance of enzyme use in diets containing a range of different raw materials. Products and services were introduced that were tailored to maximise performance from specific diets containing enzymes, including those containing high levels of corn. The turn of the century saw several technical innovations, including the introduction of more bio-efficient E.Coli phytases, and the launch of more thermo-stable enzyme products. The last decade has thrown up additional challenges that producers of feed enzymes have to help animal producers meet. Population growth has soared to over seven billion people and income per capita is also escalating in certain parts of the world, driving increased demand for more protein.

Highlight Points

1. Microbial phytase has over taken glycanases as the primary feed enzyme type worldwide more than 70% of global poultry, pork and eggs are produced from animals fed diets containing phytase.
2. A growing body of research evidence during the past decade has shown that enzyme preparations can be effective in enhancing lactation and growth performance in cattle.
3. Reducing variability of feed value one of the key benefits of using well researched feed enzymes is, and will continue to be, to reduce the inherent variability in the feeding value of major feed raw materials and the resultant variability in animal performance.
4. Understanding phytate better our understanding phytate's role in animal nutrition has advancing substantially over the years. The anti-nutritive effects of phytate are highly influential on dietary amino acid and energy digestibility, raising the value of phytase to the end user beyond being just a contributor to phosphorus (and calcium) nutrition.

21st century

By 2020, estimates show that 70-75% of meat demand will come from Asia and Brazil, 75% of the demand for eggs will come from Asia while 60% of dairy demand will be from India, Pakistan and China, according to Rabobank.

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While the animal feed industry has become more global in its reach, local R&D and technology support need to ensure production levels will meet food security targets. The use of phytase in poultry and pig diets has also grown in response to escalating concerns over phosphorus (P) pollution from animal waste and the economic benefits derived by replacing inorganic phosphorus sources that are a depleting resource globally. The ban on the use of meat and bone meal, a major source of P, in the EU is another factor that has accelerated the use of phytase. As a result, microbial phytase has overtaken glycanases as the primary feed enzyme type worldwide. Today, more than 70% of global poultry, pork and eggs are produced from animals fed diets containing phytase.

Application of feed enzymes today

The poultry industry is the largest user of feed enzymes today and its highly integrated nature has driven a fast uptake of feed enzyme technology over the years. There is also an increasing trend in the swine, ruminant and aquaculture industries to use feed enzymes, especially at key stages of animal development. Young pigs, with an immature digestive system, particularly benefit from feed enzyme supplementation. The use of enzymes in ruminant diets was limited in the past because it was assumed that enzymes would not survive proteolysis in the rumen. However, a growing body of research evidence during the past decade has shown that enzyme preparations can be effective in enhancing lactation and growth performance in cattle. In the aquaculture industry the search for alternative protein sources to replace fish meal, plus concerns regarding the relatively low nutrient digestibility and the presence of an array of anti-nutritional factors in fish meal alternatives, has led to an increasing interest in feed enzymes and research into optimal applications.

Cost incentive

While the same basic issues of 'profit, performance and planet' are being faced by animal producers today as 30 years ago, dealing with volatility in raw material prices has been a major issue in the last few years. Today, raw materials take up more than 65% of feed production costs due to escalating crude oil prices and the impact of weather on crop yields. Feed enzyme producers have risen to these challenges, looking at how enzymes can be used to improve digestibility and performance while using less expensive, but more fibrous raw materials such as distillers dried grains with solubles (DDGS), a by-product from the bio-ethanol industry, used to replace some of the more costly feed raw materials.

Ban on AGPs

Increased production to meet growing animal protein demands has, in some countries, also coincided with new legislation around sub-therapeutic antibiotic usage (antibiotic growth promoters or AGPs). The role of a stable, resident micro-flora in the gut has long been recognized as being important to the health and performance of livestock and, until recently, the fight against some deleterious microbes was supported by the use of AGPs. However, as a result of the routine use, there was a reduced emphasis on the role that nutrition can play in establishing and directing the underlying microbiome and, at the same time, maintaining a functional, healthy gastrointestinal tract (GIT). The use of AGPs has already been banned in the EU due to concerns about antibiotic resistance and residues in meat, and more recently in Korea, with more countries likely to follow. Achieving optimal nutrition is the biggest priority in the quest for gut health and improved immunity. The interactions between nutrition and the microbial load and balance in the GIT are complex and not fully understood, but they dictate the development, morphology and functionality of the GIT, host nutrient utilisation and, ultimately, animal performance.

Next decade

So what challenges and changes do we think the next decade will bring in terms of enzyme usage? Price volatility of raw materials will remain a big issue, and dealing with the variance in feed digestibility that arises from that volatility, plus its impact on animal productivity, will be the main challenge that animal producers and the feed industry will face. It has also been well-established that changes in levels of undigested nutrient fractions contribute to undesirable shifts in the gut microbiota, with direct consequences for digestive capacity, feed conversion, and disorders associated with poor enteric health. Consequently, an important consideration when selecting enzymes to improve diet digestibility is that the specific enzymes must target substrates, including anti-nutrients in the diet, which are not completely digested by the animal's own (endogenous) enzymes. This will put increased emphasis on a better understanding of the consequences of feed enzyme use on the gut microbiota, given their clear link to digestive disorders and chronic and acute disease.

Reducing variability of feed value

One of the key benefits of using well researched feed enzymes is, and will continue to be, to reduce the inherent variability in the feeding value of major feed raw materials and the resultant variability in animal performance. Feed enzyme usage improves the degree of precision in feed formulation and helps reduce costs. It is recognised that the lower the ingredient feeding value, the greater the potential for enzyme response will be. As animal producers look to more complex diets as a means of achieving better performance at less cost, they need to take into account that factors, such as cultivation methods and harvest conditions can impact not only nutrient quality of different types of grain but also substrate levels in the raw materials, thereby influencing feed enzyme response. Understanding these interactions is crucial to maximising the value that can be obtained from feed enzyme technology in the future.

Corn-based diets

Corn, for example, is the most common feed grain but its feeding value is now much better recognised as being variable (Figure 1), sometimes equally as variable as 'viscous' grains such as wheat. The underlying causes for this variability need to be researched and established in

order to offer optimal enzyme solutions that add maximum value. In our experience corn variability is principally a function of three main factors; variations in inherent starch digestibility - the link between starch and protein in the grain - and subsequent harvest and drying conditions. All of these factors, and their interactions, can have an impact on the resultant metabolisable energy (ME) of the grain for the animal. In terms of feed enzyme solutions for corn-based diets, a combination of xylanase, amylase and protease enzymes, acting on a background of existing phytase use, is the most effective way of dealing with corn ME variability. Xylanase targets the fibrous (NSP) elements in such diets, particularly important when fibrous by-products are included in diets (e.g. DDGS), while protease improves the accessibility of starch granules to amylase (both exogenous and endogenous sources). At the same time the addition of protease can also target other anti-nutritional factors in the diet e.g. residual trypsin inhibitors and lectins in soybean meal and some other vegetable proteins, as well as increasing the digestibility of the main storage proteins themselves.

Application in poultry and pigs

Poultry producers in the USA, South East Asia, and South Africa have replaced high cost corn with lower cost wheat. Ideally, those producers would assess wheat quality and nutritional value relative to maize, and apply enzymes to accelerate performance levels. However, the metabolisable energy and digestible nutrient content of wheat can potentially be far more variable than for maize. For example, McNab (1991) found the total metabolisable energy of 72 wheat samples sourced within a single country (UK) varied by up to 8%. Also, the traditional mode of thinking has been that variable viscosity is the primary factor associated with variation in wheat feed value. However, more recent data has shown that other factors such as endosperm hardness and ash percentage were also important in wheat starch digestibility and performance of broilers (Carré and others, 2002; Pirgozliev and others, 2003).

It is also well known that phytate is not inherently well digested and that phytase application is the accepted way of positively impacting energy and amino acid digestibility. However, phytate substrate levels are frequently not considered when selecting the optimal phytase dose or assigning corresponding matrix values to the enzyme. Similarly, the energy response from 'carbohydrase' enzymes is really determined by five substrates; starch, NSP, sugars, protein, and fat, not "one size fits all". For example, undigested starch and protein account for the largest amount of substrate available in corn/soy-based diets.

But this will vary for diets that are mainly wheat based. The effect of protease enzymes on amino acid digestibility are not constant, but they have been shown to be dependent on the level of each amino acid in the diet and its inherent digestibility.

The large variation in digestibility and metabolisable energy shows that it is important to take into account not only the inherent quality of feed ingredient substrates when applying enzymes but also:

- The maturity of the digestive capacity of the animal - amylases, lipases and proteases are the main enzymes of interest here most likely in combination rather than individually
- Dietary factors affecting endogenous excretions
- PH in various segments of the GIT.

For example, pigs have a longer transit time than poultry and that gives them more time to extract the nutrients. Also the larger capacity of the gut means that pigs are less affected by digesta viscosity characteristics. This is the reason why pigs do not suffer from digestive inefficiencies attributed to dietary non-starch polysaccharides in wheat and barley. In poultry, the presence of a crop provides a balanced environment for some enzyme activation before the feed reaches the acidic environment of the proventriculus.

Some evidence suggests that the presence of a well-developed gizzard may improve enzyme responses and give poultry an edge. Only when all these factors are taken into account, we can predict meaningful, scientifically accurate matrix values against which to measure enzyme performance levels. This is a complete change as the industry has traditionally used fixed digestibility co-efficients and generally taken a 'black-box' approach to determining recommended energy contributions from enzyme products.

Understanding phytate better

Our understanding phytate's role in animal nutrition has advancing substantially over the years. The anti-nutritive effects of phytate are highly influential on dietary amino acid and energy digestibility, raising the value of phytase to the enduser beyond being just a contributor to phosphorus (and calcium) nutrition. Understanding better how the effects of varying doses of phytase interact with the effects of other exogenous enzymes being used in the diet, as well as other feed additives, will be a key focus. New phytases with enhanced bio-efficacy are continually being introduced to the animal feed sector and even after time to allow for the stringent regulatory process, will help the industry to benefit from their enhanced value.

Thermo-stability

Further development of technology in enzyme thermo-stability will give the industry more confidence in the use of steam-conditioned and pelleted feeds. These developments will come from a combination of enhanced inherent thermo-stability of the enzyme, coupled with advanced coating techniques. In this way, customers can rest assured that the claims made on enzyme products are thoroughly supported in large-scale commercial use.

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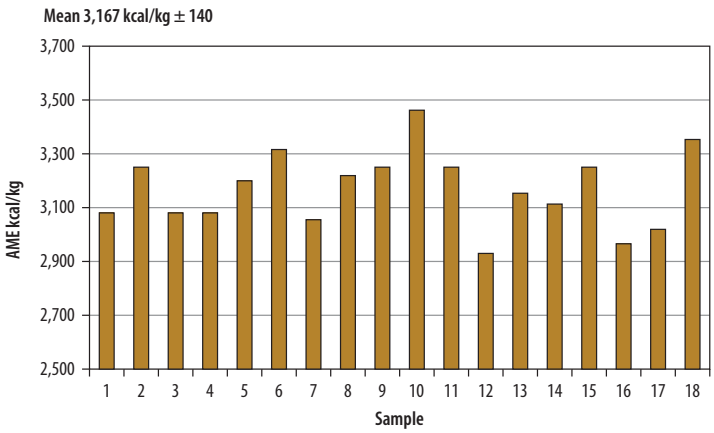
Looking forward

In future, enzyme technologies will also open up opportunities for the use of less expensive and non-conventional feed raw materials. At Danisco Animal Nutrition, bio-refinery businesses are collaborating to potentially upgrade raw materials from both first and second generation bio-ethanol processes for animal feed. Advances in this area could help reduce the dependency on the price volatility, and contribute to sustainable animal protein production. AAF

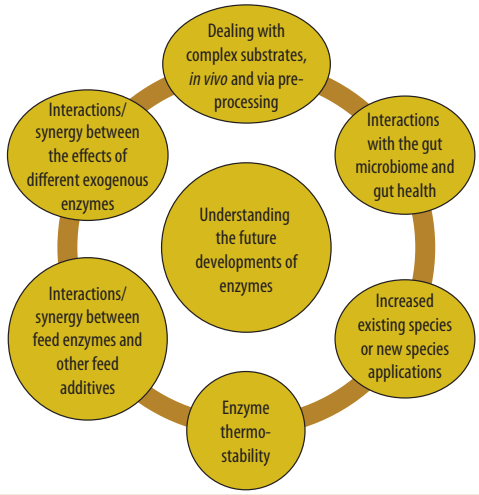
References available on request.

Figure 1 - Variability of corn metabolisable energy in broilers – 18 different US corns.



Source: Collins & Moran, 1998

Figure 2 - Key considerations for the future developments of feed enzymes.



Strategies to Combat *E. Coli* in Poultry Farms

Dr Krishna Sahoo
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What is *E. Coli* ?

E. coli is a gram-negative bacterium that belongs to the intestinal microflora of livestock, including poultry. These bacteria are capable of surviving long periods outside the host and are present in almost all bird environments, particularly the litter and house dust. Opportunistic infections may occur under certain conditions (stress, weakened immune system, accompanying diseases and infections) however, pathogenic bacteria may also enter the body from the external environment. Poultry feed & water is often contaminated with coliforms and are the most common route of infection with new serotypes. Outbreaks often occur in broilers, layers & breeders causing enteritis, affecting the fallopian tube causing inflammation and colisepticemia are the most common cause of birds' mortality.

Economic losses and estimates

The economic losses due to pathogenic *E. coli* infection can be both: direct and indirect. Weight loss, decreased egg production, increasing mortality and secondary infections affect the livestock production systems. Moreover, disinfection, cleansing, disposal, and excessive use of antibiotics can lead to additional expenses for poultry farmers. The indirect effects comprise the influence on the domestic economy, including interference with major industries, increase in antibiotic resistance and impact on other sectors.

Susceptibility in poultry farms

Not all age of birds is equally susceptible to the bacterium. When chickens are 18 to 30 weeks old, egg production is at its peak. They are still developing and their bodies are under a lot of stress, making them more prone to various infections. Laying hens that are more than one year old are also quite vulnerable. They breathe in the Avian Pathogenic *Escherichia coli*-laden dust that is quite prevalent in dried out faeces, which tend to accumulate in the layer house in most Indian poultry farms due to poor farm management practices. Pullets are susceptible when their bodies begin to produce hormones that are necessary for egg production. It is a stressful time and their immune systems are not functioning at full capacity, making them an easy target for the colonization of pathogenic bacteria such as *E. coli*. In broilers when reared in deep litter system the prevalence of *E. coli* infection increases due to more exposure to contaminated litter.

Control measures

Biosecurity measures play a key role in controlling the spread of *E. coli*. Keeping the bacteria out of the flock is not practical or possible since intestinal colonization is common

in warm-blooded animals. Fortunately, external infections can be limited through feed, water, and environmental sanitation, as well as good air quality. Pelleted feed has a lower percentage of *E. coli* bacteria compared to mash feed. Rodent faeces are a ubiquitous source of *E. coli*. Furthermore, contaminated water supply can also contain high numbers of bacteria. One of the possible way to curb the spread of pathogenic microorganisms is to chlorinate the drinking water and use closed watering systems.

Maintaining litter and air quality can greatly reduce the risk of colibacillosis infection. The damage caused to the respiratory mucosa of the flock has a direct correlation to the degree of ammonia exposure. Dust also increases the risk of an infection. The combination of ammonia and dust results in the inhalation of bacteria in high numbers, making it difficult for birds to clear them from their respiratory tract.

Treatment

Although *E. coli* infection is commonly treated with antibiotics, a survey of commercial poultry producers found that chickens raised for eggs and meat have high levels of antibiotic-resistant bacteria. The survey found that more than half of the *E. coli* isolates were resistant to multiple drugs and nearly 60% of them contained broad-spectrum beta lactamase, an enzyme that provides resistance to beta-lactam antibiotics. Broiler farms are twice as likely to be exposed to antibiotic-resistant bacterial strains compared to layer farms due to the high level of antibiotic usage. Independent farms are more likely to develop antibiotic-resistant *E. coli* than contracted farms, that are mostly owned by large producers and have to follow strict production protocols, including better veterinary care and hygiene methods. On the other hand, independent farms misuse antimicrobials.

Nalidixic acid	86 percent
Tetracycline	47 percent
Ampicillin	43 percent
Cotrimoxazole	42 percent
Ciprofloxacin	39 percent

Figure 1: Levels of antibiotic resistance

The problem will only get worse. An increase in income and an increase in demand for poultry products would cause an exponential increase in the use of antibiotics in food production. Poultry producers must take rigorous action and implement government regulations to control the massive use of antibiotics on poultry farms in India. The transition to a more sustainable way of production should also be promoted by setting up funds to subsidize biosecurity measures at farm level. Poultry farmers should switch to feed additives containing bacteriophages. Since they target specific pathogenic bacteria without affecting the host, they are the most valuable tool in the arsenal of poultry producers in the fight against multi-drug resistant bacteria. Bacteriophages are being adopted successfully by poultry producers around the world, recently introduced to the market in India by Proteon Pharmaceuticals and it is time to mainstream this solution.

The author is Global Product Manager, Proteon Pharmaceuticals, a subsidiary of Proteon Pharmaceuticals SA Poland. Proteon Pharmaceuticals focuses on precision biology for microbiome protection to improve animal and human health, increasing environmental sustainability and eliminating the unnecessary use of antibiotics.

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Phosphatidyl choline, Lysophosphatidyl choline and PEGR together make a better fat digestion and absorption than Lecithin alone

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The role of fats and oils is well established in poultry feed formulations being the sources of energy, a hard reality which cannot be changed. Emulsifiers are used to improve the digestibility of fats thereby improving energy efficiency. It is highly important in recent times due to increasing raw material prices and therefore final feed cost in poultry nutrition. Fats and oils require special handling and storage facilities as they are prone to oxidation over time. Their fatty acid profiles, the level of free fatty acids, degree of hydrogenation and age of birds can all influence digestibility. Unlike most other ingredients fat digestion can be age dependent, since young birds have the less ability to produce bile salts and therefore to digest saturated fats. The natural emulsifiers in the body are limited due to the immaturity of the digestive system. The young birds are unable to cope with the high energy additions in feed. It makes use of external sources of emulsifiers through feed formulation an integral part of poultry nutrition so as to avoid the wastage of this expensive energy resource.

Fats are of different sources and characteristics leading to differential digestibility. A higher level of FFA (usually found in several commercially available oil blends) is a major digestibility limiting factor. Due to rising feed prices use of such commercially available blends has become a common practice by several nutritionists. As is generalized the unsaturated fatty acids are easily digested as compared to the saturated fatty acids. Inclusion of more than 3% of such oils also has a negative impact on the feed production and it tends to produce low quality feed with soft pellets of low durability. The process of pelletizing feed requires the use of steam at conditioning however steam and oil have no compatibility. The emulsifiers are known to improve the feed production process by reducing the interfacial tension between two immiscible phases of oil and water leading to quality feed production.

Emulsifiers like Phosphatidyl choline, Lysophosphatidyl choline and PEGR are stable in broad pH range and at high temperatures making them most suitable for pelleted feeds. There is an excellent synergy between PEGR and naturally occurring bile salts. Phosphatidyl choline, lysophosphatidyl choline has low critical micelle concentration than lecithin and bile salts. Therefore the dose required is lesser than the other two to emulsify the same amount of fats and lipids. PEGR on its own is un-influenced by salts or minerals in the intestinal tract giving it an edge over traditional (lyso) lecithin only products. HLB (hydrophilic-lipophilic balance) is the most commonly used parameter while choosing an emulsifier. As a thumb rule the water intake of birds is twice as much as feed and therefore emulsifier with high HLB value (hydrophilic) is the natural choice while choosing a feed emulsifier. PEGR has a HLB value of 18 making it the ideal emulsifier. The energy saving effect of PEGR is highly pronounced when there is a higher FFA levels and also at a lower ratio of unsaturated/saturated fatty acids.

The availability of energy rich raw sources other than fats and oils and their day by day increasing prices is a big challenge. Emulsifiers are need of an hour and it is therefore advised to choose the emulsifiers carefully and wisely. The right combination of emulsifiers will not only have an edge over digestion and absorption of fats and oils to provide higher energy but will also be a boon to cater to low cost feed formulations over only lecithin products in the market.

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SUMMER MANAGEMENT IN POULTRY

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Highlight Points

Summer management is crucial not only to improve the performance but to gain profit in adverse conditions. So, effective use of feeding, Water, shed management brings the good health of birds and thereby profit to the farmer.

In the summer season, as the temperature increases, poultry suffers from the condition called heat stress, also known as summer stress. This is a condition of imbalance between heat generation and heat loss in the body. This condition not only brings poor performance in birds but is also responsible for huge economic losses in terms of poor growth, lowered production, and higher mortality. This condition becomes a greater challenge when coupled with a high humidity environment, making the birds even more vulnerable. According to research, poultry is most comfortable in an environmental temperature around 22-28°C (known as their thermo neutral zone). Once the temperature rises beyond this point, poultry show symptoms of heat stress: reduction in feed intake, poor growth, poor production and increased mortality.

In general, birds are susceptible to high environmental temperature due to an absence of sweat glands, their full body of feathers, their higher body temperature, and the fatty nature of the birds. This heat or summer stress not only brings lowered performance in poultry but also leads to immune suppression issues, which can result in disease outbreaks and cause heavy mortality. This is mainly due to an absence of sweat glands in poultry making it impossible for them to dissipate heat. In this, males are found to be more prone to heat stress than females.

Ultimately, heat stress causes acid-base disequilibrium, or the inability to cool the body to maintain normal body temperature. Panting allows birds to release heat through an evaporative cooling kind of method, but high humidity coupled with high temperature causes insufficient panting to control body temperature resulting in heat stress.

Behavioural, neuro endocrinal, and physiological changes are observed in birds during heat stress. Behavioural changes can include decreased feed intake, increased water intake, panting, less walking, and elevated wings. Physiological changes include oxidative stress, acid-base imbalance, and respiratory alkalosis. Internally the bird may experience decreased protein digestion and absorption, increased metabolic disorders, increased chances of disease prevalence, and fertility issues. Production challenges can include reduced feed intake, poor feed conversion ratio, reduced body weight, impaired meat & egg quality and as mentioned before, increased mortality.

Summer poultry management

The following steps can help birds combat heat stress

1. Housing management
2. Water management
3. Feed management
4. General management

Water management is crucial in heat stress management. In summer, water consumption goes up 3-4 times feed intake. So, a good quality water supply is essential. A water hygiene process must be followed because bad bacteria can prevail rapidly under poor conditions, which will lead to disease conditions. Water pipelines must be cleaned well and flushed with organic acids or hydrogen peroxide periodically. Treat water with a quality water acidifier and sanitizer. In general, try to make the water pH in acidic conditions (5.5-6). As feed intake is less during times of increased temperatures, nutritional water acidifiers should be used to help combat heat stress.

Housing management can be divided into two parts, inside shed management and outside shed management.

1. Thatching of the roof with green grass or agricultural waste can help reduce shed temperature. Paddy straw can be used for this purpose.
2. Whitewashing the roof with lime helps mitigate the temperature inside the shed.
3. Applying sprinklers above the shed.
4. The use of gunny bags on the side walls (grill) of the shed over which drip water is set.
5. Allowing trees to grow near the shed to provide shade on the shed.
6. Prohibit wild birds, which can carry diseases like Avian Influenza, from entering the shed.

7. Provide 4-6 feet of roof overhang to protect birds from direct sunlight.
8. Provide ridge ventilation to help remove hot air from inside the shed.

Inside the shed

1. Use of fans.
2. Use of a fogger.
3. Provide a continuous supply of cool water (if not possible, periodically flush the water to provide cooler water for birds).
4. Reduce litter thickness (ideally around 400-450 grams per square foot).

Feeding Management

Research shows feed intake is reduced by 1.25% with every 1° rise in temperature. Further, it is observed that there is a decline in feed intake by almost 5% with every degree rise in temperature from 32-38° C. Knowing this it's best practice to feed a good quality feed during times when heat stress can occur.

1. 1Feeding should be done during the cooler hours of the morning or evening but too much gap in feeding time is not advisable.
2. Increase the number of feeders and drinkers during feeding time to reduce competition among birds.
3. Adding antioxidants is shown to be helpful to reduce stress and improve feed consumption while maintaining or improving body weight gain. (Vitamin E, Vitamin C, Selenium).
4. A high-energy diet should be provided during summer because birds lose more energy while panting.
5. Energy in feed should be supplemented with oil rather than grain because fat has the lowest heat increment value compared to carbohydrates and protein.
6. Feed consumption is reduced in summer. To overcome nutritional and productive losses it is suggested to supplement the diet with 10-15% more amino acids, vitamins, and minerals rather than increasing the protein level directly.
7. Increase calcium and phosphorus levels to overcome thin eggshells more often seen during summer due to respiratory alkalosis (more carbon dioxide is lost due to panting).
8. Instances of viral challenges increase during this time as immunosuppression is common. Fumaric acid is shown to have good antiviral properties and can help to reduce viral challenges. A combination of coated benzoic acid and fumaric acid as an acidifier (as AVIMATRIX® feed supplement) can help to reduce stress and improve the performance of the flock.
9. MINTREX® chelated trace minerals, a supplement of organic trace minerals zinc, copper, or manganese, and methionine source HMTBa are shown to help heat stress conditions. HMTB a molecules undergo absorption through diffusion, which doesn't require energy. Thus, using minerals with HMTBa can reduce heat stress during summer and help improve performance.
10. Essential oils have a broad range of action from being immunomodulators to performance enhancers. Adding essential oils - especially thymol and carvacrol – to the diet can help mitigate summer stress challenges and improve meat yield and overall performance.
11. Use of MOS and B Glucans during heat stress conditions is convincing due to the possibility to reverse or compensate physiological alterations induced by heat stress and by restoring immune function and promoting robust inflammatory responses.
12. The addition of ammonium chloride, potassium chloride, and/or sodium bicarbonate has shown improved performance in broilers by improving water quality and feed intake.
13. Probiotics can be used to help control the corticosterone level and the excessive release of pro-inflammatory agents. Lactobacillus-based probiotics enhance goblet cell count in the duodenum and jejunum of heat-stressed broilers thereby improving the feed conversion ratio.
14. Since a hot humid climate favors the growth of mould/ fungi in feed the consistent use of an antifungal is recommended.

General Management

1. The depth of litter should be 2-3 inches on the floor.
2. 10% extra floor space should be provided in summer. Bird overcrowding only contributed to heat stress and must be avoided.
3. Shifting, transportation, debeaking, and vaccination should take place during the night or cool hours in the morning.
4. Birds severely heat stressed may be dipped in cold water for 2-3 minutes to provide relief. Be sure to keep their head and neck above the water level.
5. Use foggers in the shed, which can reduce the shed temperature up to 5-10°C depending on the quality of the fogger.

The house should be situated away from other buildings to facilitate the free movement of air.

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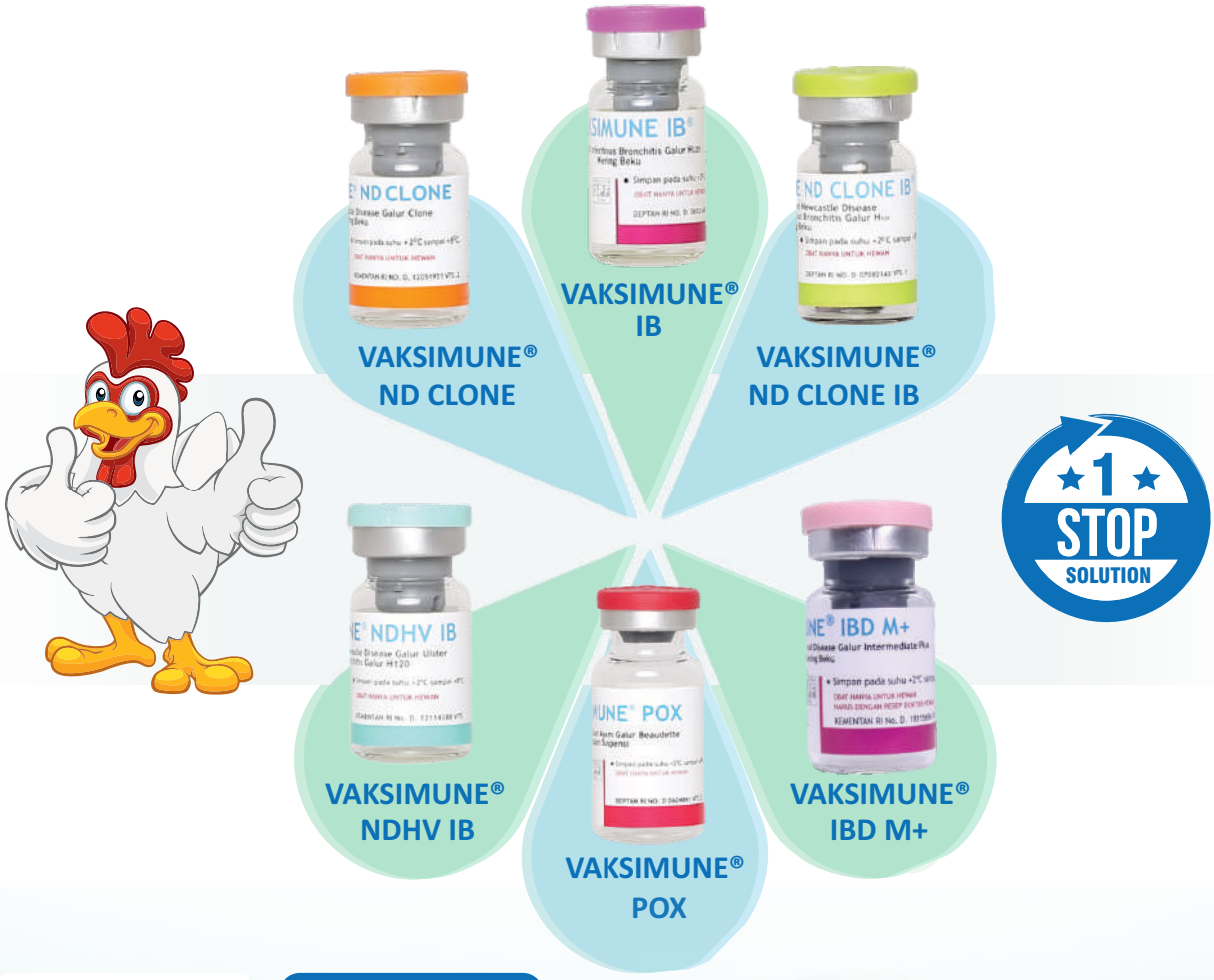

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