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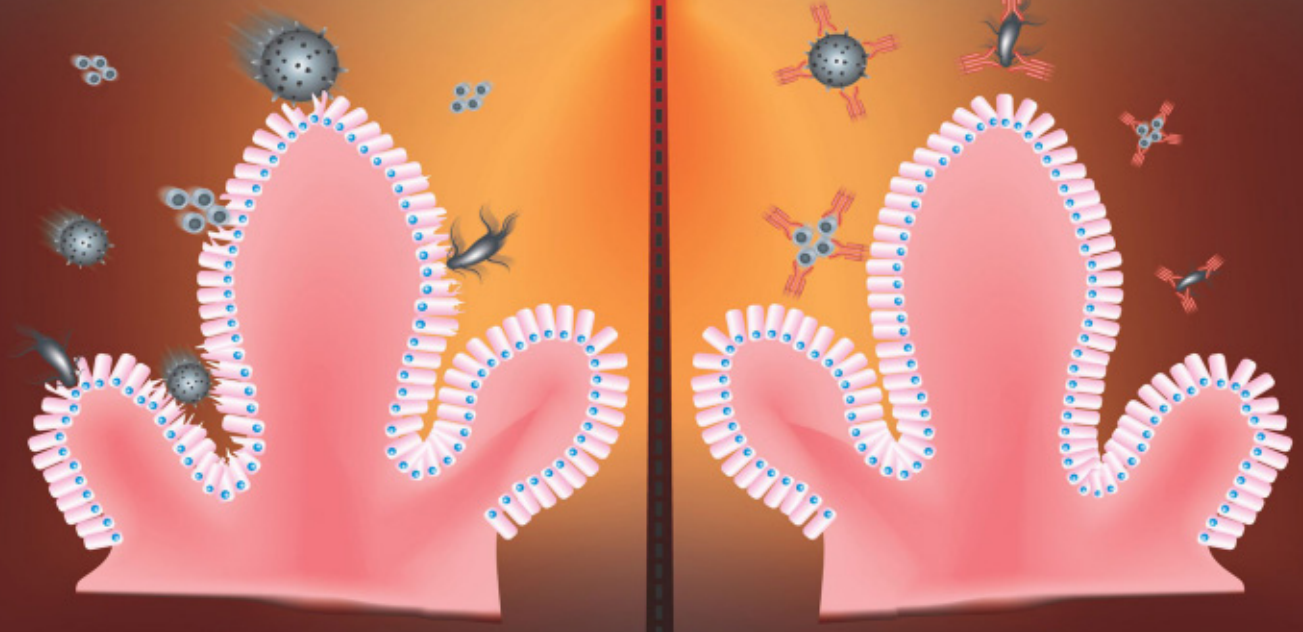

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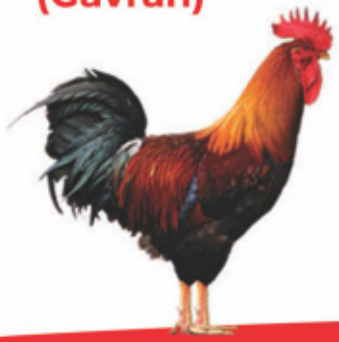

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INDEX OF ADVERTISEMENTS

Misuse of social media led to economic loss in poultry sector: A case in India during pandemic COVID-19

Rakesh Roy, Debjyoti Majumder, Suddhasuchi Das, Paramita Bhowmik, B.C. Rudra, Victor Sarkar, Adwaita Mondal

Malda Krishi Vigyan Kendra, UBKV, Ratua- 732205, Malda, West Bengal, India

Social media simply refers to the means of interaction among people in which they create, share, exchange and comment among themselves in different networks. Social media is defined as "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0 and that allow the creation and exchange of user-generated content" (Andreas and Michael, 2010). Similarly, Junco et al. (2011) defined Social media as Internet-based tools that promote collaboration and information sharing while Kabilan et al. (2010) added that it can be used in academic settings to promote student engagement and facilitate better student learning. The use of social media for development of agriculture as well as livestock sector is also very huge. It has to be acknowledged that people are getting information about many new and innovative technologies to be applicable as per their requirement. But, it cannot be ignored that farmers get partial information on some of these technologies and may experience huge loss by trialing these technologies without the help of the any experts and thereafter non-adoption of some resourceful technologies.

The impact of social media in creating awareness and marketing strategies is also very pertinent. Dan Wood, vice president of North American Operations at Potters Poultry, spoke about what social media platforms he finds work best for building brand awareness and its importance during the COVID-19 pandemic (King, 2021).

The society has also been evident of its misuse in aggressive or emergency situation which has further worsened the condition of any violent event which has compelled the administration to stop the internet service of the area. Irresponsibly sharing of fake news is the only reason for many such incidents in our country. Similar things do also happen in agriculture in general and poultry sectors in particular. The incident of linking many such diseases with consumptions of broiler chicken has become quite common these days and people share these information among their friends and families without any confirmations of the information which creates a panic against consumption of broiler chicken. The same has taken place with the incidence of pandemic COVID-19 in India. The experience of some of the farmers, retailers, broiler meat sellers and poultry associations all over India during the onset of COVID-19 is documented here.

Value of Poultry Sector in India

The poultry industry is one of the fastest growing segments of the agricultural sector today in India, and one of the world's largest producers of eggs and broiler meat. It has undergone a major shift in structure and operation over the past two decades, transforming from a backyard activity into a major industry with many integrated players in the chain. This revolution has involved a large investment in breeding, hatching, rearing and processing activities (Paleja 2020). The Indian poultry sector plays a key role in the economy with the market for its products valued at [1] 1.75 lakh crore in 2018.

Its compounded annual growth has been projected at 16.2 percent between 2019 and 2024 (Singh, 2021).

The annual growth rate through production of crops is about 1.5-2% whereas the production of eggs and broilers has an annual growth rate of 8-10% where more than 25 million farmers are in the poultry business. The poultry sector also plays a pivotal role in providing employment and nutritional security. People consume about 90 million (broiler) birds and 22.5 million eggs a week in India. The market value of India poultry sector is expected to reach ₹ 4,340 billion by 2024 (Paleja 2020).

Losses due to rumour of corona virus

Fake news linking the spread of COVID-19 to chickens has cost the Indian poultry market over ₹ 1.6 billion a day. The world's fourth biggest chicken producer now faces its worst crisis in a decade (Khandekar, 2020). As per an estimate, Indian poultry & feed sector have recorded an estimated loss of USD 236 million (₹ 1750 crore) from mid January 2020 to mid February 2020. The sectors have seen a huge drop due to fake propaganda on social media, saying that corona virus is spread through consumption of poultry products, which has been reported by various media outlets. Mumbai based Compound Feed Manufacturers Association said that India's feed manufacturers are also facing the heat of COVID-19, as poultry owners have started cancelling feed orders (Kumar, 2020).

Palladam Broiler Coordination Committee secretary K Chinnasamy reported that this was the worst time for the broiler industry in the western zone of India. Due to the rumours of corona virus, sale slumped in the past two months of January and February. The minimum price of chicken which was ₹ 80 a kg two weeks back has dropped to ₹ 70 last week, and has touched its all-time low of ₹ 28 now. (Saravanan, 2020).

V Shanmugam, a chicken stall owner in Palladam, said that the price fall in a fortnight is unmatched. The price dropped was huge (i.e., ₹ 100 a kg to ₹ 45), the price crash has been severe which he had attributed to corona virus and bird flu scare (Saravanan, 2020). In the retail markets of Palladam, the price is floating around ₹ 45-50 as against the ₹ 130 per kg a fortnight ago (Saravanan, 2020). There were a lot of fake news on social media connecting chicken and the virus which is baseless but these rumours have cut down the chicken consumption to nearly half, told in a press conference by a member of Karnataka Poultry Farmers and Breeders' Association (Anonymous, 2020).

Social media is flooded with so many rumours regarding the corono virus infection in poultry. Now the question is that, is there any degree of truth to the rumours at all? Surprisingly, yes. It is only due to the broad nomenclature. Corona virus is a group of viruses known to cause respiratory ailments. These include Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS). The ongoing pandemic is of COVID-19, caused by a new type of virus previously not known to medical experts. But many use COVID-19 and corona virus interchangeably (Khandekar, 2020). The one found commonly in chicken is an "infectious bronchitis virus". Research so far has not established any link between the corona virus found in chickens and COVID-19 in humans. "If the name of the virus is the same in both species, it creates panic," says D.D. Parkale, regional joint commissioner of the Maharashtra state animal husbandry department (Khandekar, 2020). Misinformation is proving devastating to chicken producers just at the time people may benefit from chicken meat and eggs most (Paleja 2020).

Conclusion

It is very much evident that the losses caused to poultry sector due to the rumour about consumptions of broiler chicken may cause COVID-19 is quite pertinent. But these losses could have been avoided if we would have been responsible before sharing any information and our friends, families and relatives.

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PRESS RELEASE

Northern Irish WELTEC Customer uses Biomethane as a Truck Fuel

Supermarket Chain Lidl enables Low-Emission Transport with Food Waste

The biogas plant of the Northern Irish food logistics company McCulla Transport will go live producing biomethane in July 2021 following a plant expansion by WELTEC BIOPOWER and partner companies. Copyright: McCulla Transport

At the site in Lisburn, 10 kilometres south of Belfast, 450 standard m³ of biogas will be processed into biomethane/ RNG every hour. With this amount, the logistics company can operate ten new CNG trucks, which are refueled directly at the company‘s new biomethane filling point.

The biogas plant of the Northern Irish food logistics company McCulla Transport will go live producing biomethane in July 2021 following a plant expansion by WELTEC BIOPOWER and partner companies. At the site in Lisburn, 10 kilometres south of Belfast, 450 standard m³ of biogas will be processed into biomethane/ RNG every hour. With this amount, the logistics company can operate ten new CNG trucks, which are refueled directly at the company‘s new biomethane filling point. The substrates for the production of the green fuel come from the 41 Lidl supermarkets in Northern Ireland.

Ashley McCulla, chairman of the transport company of the same name, was able to commission the first stage of his biogas plant from WELTEC BIOPOWER back in January 2017. The intention at the time was to utilise the residual materials from his own agricultural business and to create synergies through the use of renewable electricity and heat in the refrigerated warehouse at their main logistics depot. „By digesting slurry, agricultural residues and grass silage from our farm, we were able to produce green energy ourselves with a 500kW CHP plant and use it on our company premises. Ultimately, this has significantly improved our carbon footprint,“ McCulla sums up. The expansion to biogas upgrading, HGV fuel and becoming Ireland’s greenest fleet was the logical next step of this good experience with the AD plant and their network in the food industry.

As one of Northern Ireland‘s largest food transport companies with 235 employees and a cold storage facility of almost 8,500 square metres, McCulla has been supplying Lidl Northern Ireland‘s supermarkets for years. With the conversion of the biogas plant, 17,500 tons per year of food leftovers from Lidl stores will substitute the agricultural residues as substrate for the HGV fuel production.

Under the motto “Goodbye Diesel - Hello Biofuel”, the ten new bio-CNG trucks will transport Lidl food deliveries with renewable gas. „Every lorry that runs on the green fuel emits 93 percent less carbon emissions than a diesel truck,“ explains chairman Ashley McCulla. Due to the excellent eco-balance, the reduced emissions and the lower dependency on fos-

sil fuels, the deal between Lidl and McCulla is creating a positive response from all parties involved.

To ensure successful performance long-term, WELTEC BIOPOWER relied on its established components and technologies. Four pits are available for the pre-storage of the substrates. The subsequent anaerobic digestion takes place in two digesters made of stainless steel with a diameter of 23.03m, a height of 6.30m and a capacity of 2,625m³ each. The digestate is stored in a 3,432m³ stainless steel gas-tight storage tank. In order to fully exploit the energy potential of the food waste, WELTEC has equipped the 80m³ dosing feeder in combination with the MULTIMix pre-feed system. In it, food leftovers are shredded and homogenised. In addition, the Lidl waste is automatically unpacked and pasteurised at the biomethane plant.

In the course of the extension, WELTEC BIOPOWER upgraded the in-house developed LoMOS PLC-based control system. „We also retro-fitted the extra gas lines, installed a second emergency flare and ensured that all components were connected smoothly with no downstream consequences on the original plant, which since commissioning has shown some of the top performance figures in the industry“, WELTEC Sales Manager Dr. Kevin Monson explains. „Last but not least, our Biology Department guaranteed a trouble-free substrate changeover, more than doubling output from the original 500kWe plant without further investment in digestion space, by switching from grass silage and slurry to food wastes,“ adds Dr. Monson.

The biogas upgrading system comes from Pentair Haffmans. The tried and tested module separates carbon dioxide and other components of the biogas from methane using membrane technology.

This creates biomethane that is similar in its properties to natural gas, but is significantly more climate-friendly. Despite processing 450 standard m³ of biogas per hour, the 500-kilowatt CHP continues to run, because McCulla can use the electricity and heat for his headquarters and the cold store.

With the tried and tested technology package and its extensive biomethane expertise, the German biogas specialist WELTEC and their partner Pentair Haffmans is making a significant contribution to McCulla being able to lay claim to being one of the greenest transport companies in Ireland. Chairman Ashley McCulla has already announced that the sustainable transport model will be applied to his entire truck fleet over the next five years.

Company Portrait

The WELTEC Group from Vechta, Germany, has developed into a globally leading specialist for the construction and operation of biogas and biomethane plants since it was founded back in 2001. The Group designs, plans and sets up energy plants, operates them on a permanent or temporary basis, provides 24/7 service and delivers sustainable usage concepts for output flows, thereby covering the entire biogas value chain.

The establishment of individual, technically mature solutions up to a plant size of 10 MW is one of the strengths of WELTEC BIOPOWER. The high proportion of custom-developed components is a key success factor. Moreover, the use of stainless-steel technologies ensures flexible substrate input, quick and inexpensive assembly and a consistently high quality standard, regardless of the location. Following the commissioning, WELTEC‘s mechanical and biological service plays a significant role in ensuring the plant efficiency.

The company also boasts a wealth of experience in the field of biogas generation and utilisation. The company‘s nine decentralised plants generate 96 million standard m³ of biogas a year. Most of it is processed to biomethane and made available to energy suppliers and petrol station operators via the public gas network. Additionally, at 16 locations in Germany– e.g. in the field of horticulture, housing construction and healthcare as well as communities – the biomethane is used for generating heat within the framework of WELTEC energy contracting.

The biogas specialist is well aware of the importance of customer and investor proximity. Accordingly, the Group‘s sales and service network spans the entire globe. The range of customers includes businesses from industries such as agriculture, food, waste and wastewater. Sofar, the 120 employees of the WELTEC Group have implemented more than 350 energy plants in 25 countries on five continents. These plants save about 485.000 tons of CO2eq a year.

PRESS RELEASE

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Avitech Know-Edge Nutrition Podcast

Avitech Nutrition recently launched the Avitech Know-EdgeNutrition Podcast. The Know-Edge Nutrition Podcast will be a series of Q&A sessions conducted by the science team at Avitech Nutrition with industry experts discussing areas of interest in the animal nutrition industry.

Episode 1 is a session with Dr. Rakesh Sikri on gut health management in poultry. Dr. Rakesh Sikri is a renowned poultry nutritionist based in northern India.

The Avitech Know-Edge Nutrition Podcast is an initiative to promote and enhance knowledge in the animal nutrition industry.

The Avitech Know-Edge Nutrition Podcast will be uploaded on the Avitech Nutrition website and You Tube. It can also be accessed through the QR code below.

Free Lance Poultry Consultant

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

His areas of expertise include:

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- Speaker in Technical Seminars.

He can be Contacted at:- **Dr. Manoj Shukla**
A-1,Gaytri Nagar,Phase-II, P.O.Shankar Nagar,Raipur, Chhattisgarh-492007
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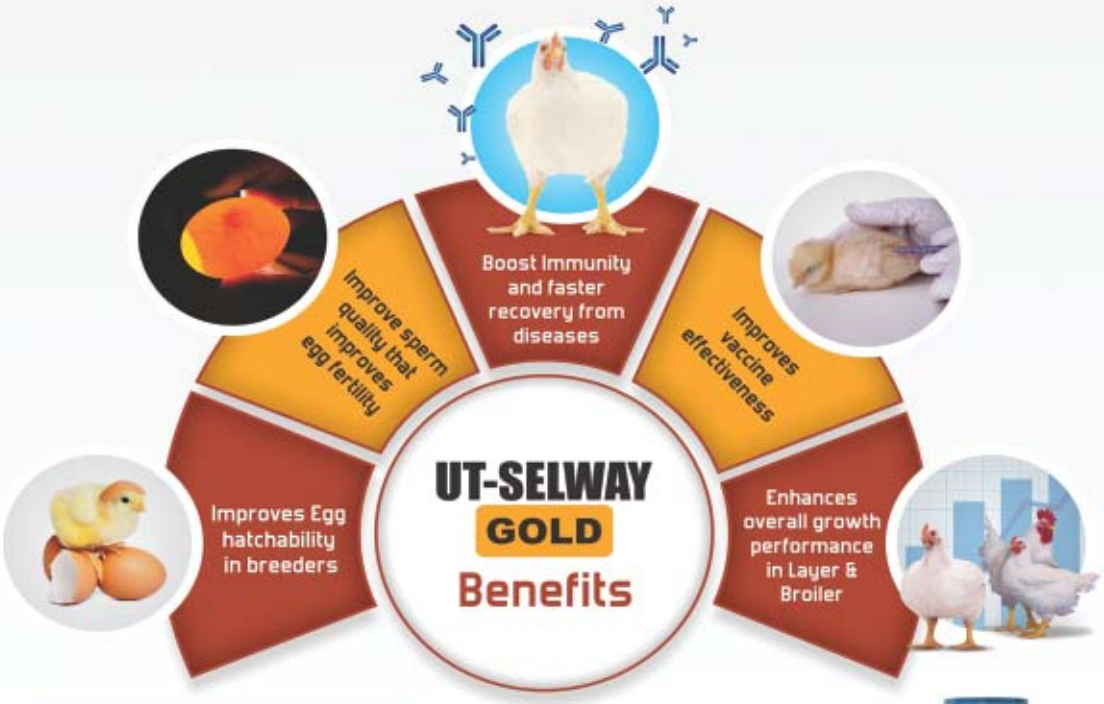

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PRESS RELEASE

Currently Trending Report: Managing raw material prices in uncertain and volatile business environments

Dr Raina Raj, Head of Marketing, Natural Remedies Pvt. Ltd.

Natural is future 2.0 is a webinar series powered by Natural Remedies Pvt. Ltd., where we invite eminent speakers across the globe to share their thoughts on the most relevant topics of the animal health industry. In the month of May, we invited Mr. Vijay Sardana, a member of the commodity derivatives advisory committee for SEBI, the Government of India as a guest speaker. His discussion was aimed at providing the poultry farming community with an insight into the unprecedented fluctuations in the prices of raw materials for the poultry feed industry especially soybean & maize in the past few months.

"Business is all about risk-taking, managing uncertainties, and turbulence" - by Gautam Adani

"Risk comes from not knowing what you are doing"

Mr. Sardana started his talk with these quotes. It is needless to say that his talk was about risk management which is the key to the growth of any organization. He pointed out that the Indian poultry industry has been able to manage issues such as feed conversion ratio (FCR) and disease control on par with the international poultry industry, but lags in financial risk management. And that it is time to change perspectives and have more informational discussions around cash flow, finance, and other business management aspects of poultry for a better resilient, sustainable and profitable future.

He emphasised the fact that any business must have an expense management strategy, revenue generation strategy, and risk management strategy, to generate profits. With his personal experiences, he explained the importance of developing one's market intelligence, through understanding people dynamics, identifying local market sensors, and developing a network of market intelligence, which would give a deeper understanding of the market and help to make more calculated decisions in their businesses. Here are some of the key questions posed by participants and their answers by Mr. Sardana.

Why is there a fluctuation in the raw material prices? What are the major domestic and international factors? How will it vary in COVID times? And how to do risk management?

Mr. Sardana suggested that the poultry owners should visualize the industry from different perspectives for a better understanding of the rise in prices. The reason for the rise in the prices could firstly be due to the imbalance in the demand and supply in the market; secondly, the competing forces who may not necessarily be in the poultry or oil industry (the major players) but from the financial business who might use commodity as an asset and stock it for a better market price; looking at it from different perspectives and not only from the poultry or oil industry will give a better understanding of the situation. The scenario is the same irrespective of the national or international market since profit maximization is the goal. A better understanding of the players in the market will help to foresee the market trends and plan a better risk management strategy.

What are your thoughts on using insect proteins, and other alternatives along with Soya to manage the cost and mitigate the sudden hike in prices?

He immediately pointed out that the free-range or backyard poultry mostly survives by consuming insects and producing higher quality eggs, so why not.

Is the Government under discussion for granting duty-free import of 1.2 million metric tons of Soybean? Will this shipment be allowed, and when during this covid situation?

Mr. Sardana mentioned that it is under serious consideration but when it will be approved is uncertain. On the other hand, he urges the poultry industry players to contact international non-GM (genetically modified) soybean meal suppliers and be prepared if at all the Government should issue such a notice. So that one has done their research while waiting for the Government notification. Also to keep a business plan ready, while looking for other resources instead of figuring things out at a later stage.

Is the use of soap sticks, glycerol, and blood meal good for a high oil and fat diet? Would it be economically viable?

Mr. Sardana suggested the poultry owners should stride carefully in these lines. Since it is a decision a nutritionist should make as several aspects need to be considered. These supplements would change the fatty acid profile of the diet. Also, its implications on FCR need to be considered. The use of low-price alternatives may need to be compensated with the inclusion of other ingredients into the formulation to keep up the nutrient requirements, finally ending up costing more.

Due to the high prices of protein sources the suppliers are adulterating the raw material with things like Melamine. What kind of negative impact would it have on the broiler and breeder's performance?

Mr. Sardana pointed to the obvious and said that the FCR would suffer. Since the poultry bird physiology doesn't consider the level of protein on the label of the packaging; all that matters to them is the amino acid profile. He advised the poultry farm owners to be cautious before signing agreements with vendors and to put up a penalty clause in it. He also urged the poultry farmers to get involved, and make personal visits to the suppliers, and do random sampling of the raw materials based on the FCR and inspect the suppliers instead of looking at the reports. He said, "Do thorough research before selecting the right vendor."

Why was there a sudden increase in Soymeal DOC (De-oiled cakes) without any speculation, this year?

According to him, there is an imbalance in demand and supply chain. He speculated the following three reasons: firstly, the forecasted production of 12.25 million ton of Soybean for this year was not accurate; The export of Soybean DOC this year was twice as compared to last year; Maybe there has been an increase in protein (Soya) based diet consumption in humans, due to the pandemic. The data for which is yet to be calculated, but can be speculated based on behaviour pattern.

The prices that we are comparing in the Indian market, are non-GM (genetically modified) Soya and in the international market is GM Soya, when will the Indian Government allow GM Soya into the market and any strategy for the future?

Mr. Sardana suggested to analyse this objectively, the cost of GM Soya in the international market last year (2020) was Rs. 26,000 per ton while non-GM Soya in India was Rs. 36,000-38,000 per ton during the season. In such a scenario if GM Soya is allowed into the Indian market, what should happen to the Indian farmers. This will have serious implications.

When will the Soya prices come down to normal?

He asked the farmers to wait for the coming season, about 5 months more. He also advised the poultry farmer to manage their business strategies accordingly, probably by placing fewer birds to reduce the pressure.

It was an insightful discussion where Mr. Sardana, started his talk with the importance of understanding the market and strategizing for risk management; he reminded the simple basics of business, the demand-supply chain; and also gave examples from his experiences in strategizing for the unknown risks that one might encounter. To watch the talk, click Natural is Future 2.0: Webinar with Mr. Vijay Sardana - YouTube

PRESS RELEASE

NOVUS

Novus Animal Nutrition India Hires Dr. Shaveta Sood as National Sales Manager for North, West & Central India

Dr. Shaveta Sood

Chennai, Tamil Nadu - June 10th, 2021 - Novus Animal Nutrition (India) Pvt. Ltd. hired Dr. Shaveta Sood as National Sales Manager – North, West & Central India. Dr. Shaveta will be responsible for sales function for North, West & Central India region reporting to Neeraj Kumar Srivastava, Managing Director – South Central Asia.

Dr. Shaveta brings with her13 years of experience working across the sales, marketing, and product management functions with companies like Vetina Healthcare, Pranav Agro, Polchem hygiene and Animal Husbandry department, Himachal Pradesh. In her last assignment she was titled Business Unit Head – Poultry Business with Vetina Healthcare. She holds a master's degree in animal nutrition from college of Veterinary and Animal Sciences, Palampur and completed Senior Management Programme with IIM, Kolkata. Dr. Shaveta, said I am delighted to be part of a wonderful Novus family and would like to express my deep gratitude. A great place with good work culture and wonderful team. I look forward to bringing my experience, skills, and network of contacts to help build on its sterling reputation.

Neeraj Kumar Srivastava, MD of Novus Animal Nutrition (India) Pvt. Ltd., said we are very excited to have Dr. Shaveta on board, with her experience, technical knowledge, and management capabilities will complement our growing team.

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Novus International, Inc. is a leader in scientifically developing, manufacturing and commercializing gut health solutions for the agriculture industry. Novus's portfolio includes ALIMET® and MHA® feed supplements, MINTREX® chelated trace minerals, CIBENZA® enzyme feed additives, NEXT ENHANCE® feed additive, ACTIVATE® nutritional feed acid, and other specialty ingredients. Novus is privately owned by Mitsui & Co., Ltd. and Nippon Soda Co., Ltd. Headquartered in Saint Charles, Missouri, U.S.A., Novus serves customers around the world. For more information, visit www.novusint.com.

For more information, contact Reena Rani L C at reena.rani@novusint.com

PRESS RELEASE

Novus Gives and Receives at this Year's PSA Awards

Poultry Science Association Names its Award Winners for 2021

SAINT CHARLES, MO (8 June 2021) – While Novus International, Inc., has been a long-time supporter of the Poultry Science Association's annual award ceremony, this year is extra special with one of the feed additive company's own named an award winner.

Vivek Kuttappan,

Andrew P. Benson

Vivek Kuttappan, Ph.D., Novus research scientist, was named recipient of the Early Achievement Award for Industry. This award recognizes the achievements of Poultry Science Association (PSA) members in the early stages of their career in the poultry industry.

Kuttappan, who has worked in poultry physiology with Novus for five years, said he was honored and humbled to receive the award.

"I joined PSA in 2009 and so many people in the organization have inspired me to keep exploring different ways that science can impact bird growth and health," he said.

Kuttappan's research at Novus focuses on broiler meat quality and poultry gut health – two areas that can directly impact the success of poultry production. Along with his research at Novus, he collaborates with academia to solve gut health challenges in antibiotic-free production and investigates non-antibiotic strategies to control necrotic enteritis, coccidiosis, and salmonella.

He holds a patent for a novel molecule to improve gut health in broilers, and his work has been included in scientific publications: 38 peer-reviewed journal articles and 57 abstracts cited by researchers worldwide. As a subject expert in solving poultry meat quality challenges, he has presented to the industry and academic institutions globally.

Kuttappan received his doctorate in poultry science from Center of Excellence for Poultry Science, University of Arkansas and a bachelor's degree and master's degree in veterinary science from Kerala Agricultural University, India.

While he's received several awards for his work, Kuttappan said this is extra special for him.

"My doctoral advisor, Casey Owens from the University of Arkansas, nominated me for the award, which was hugely validating," he said. "PSA is filled with people who really care about the poultry industry. They are glad to offer support and guidance to young and longtime professionals alike."

Each year Novus also sponsors its Outstanding Teaching Award, which goes to a top researcher educator. This year's winner is Andrew P. Benson with the University of Georgia (UGA).

Selected by a PSA committee, the Novus Outstanding Teaching Award is presented to a PSA member who has demonstrated outstanding success in the classroom as well as a dedication to professional improvement.

Since joining the faculty at UGA's Department of Poultry Science, Benson has taught several courses, including Introduction to Poultry Science and Avian Anatomy and Physiology each Fall and Spring semester.

Benson himself attended UGA and it's where he first found an interest in poultry science. As an outsider to the industry, Benson said it was his teachers that influenced his career path.

"I know firsthand the impact of effective teaching, so I seize the opportunity to mentor and enthusiastically teach poultry at UGA," he said.

Since arriving at UGA in 2016, he has won the student-voted departmental teaching award each year it has been offered. Outside of teaching, Benson's research focus is to improve fertility in commercial poultry.

For a full list of award winners, visit https://poultryscience.org/About-Awards-2021. Due to the pandemic, this year's award ceremony will be held virtually on July 19-22, 2021. Novus is a Gold Sponsor of the PSA annual meeting.

PSA is a professional organization consisting of educators, scientists, extension specialists, industry researchers, administrators, producers, and college students who are committed to advancing the poultry industry. Founded in 1908, PSA's member scientists have contributed through their research to the development of safer and more nutritious food product. For more information about PSA, visit www.poultryscience.org.

###

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PRESS RELEASE

Cargill's Mycotoxin Survey

Mycotoxins are secondary metabolites of molds/ fungi and has become is due to constant change in climate and inefficient storage conditions and Mycotoxin contamination is one of prominent factor for grain wastage in world& negatively impact animal health consequently. There are more than 400+ mycotoxins prevalent worldwide, but, few of mycotoxins contribute major loss for animal health. Aflatoxins, ochratoxins, trichothecenes, zearalenone and fumonisins are the mycotoxins of greatest agro-economic importance.

Some molds are capable of producing more than one mycotoxin and some mycotoxins are produced by more than one fungal species. Often more than one mycotoxin is found on a contaminated substrate. Mycotoxins occur more frequently in areas with a hot and humid climate, favourable for the growth of molds.

Mycotoxins have various acute and chronic effects on animals (especially monogastrics) depending on species and susceptibility of an animal within a species. The economic impact of mycotoxins include loss of human and animal life, increased health care and veterinary care costs, reduced livestock production, disposal of contaminated foods and feeds, and investment in research and applications to reduce severity of the mycotoxin problem.

This "Cargill's Mycotoxin Survey" captures results of 1402 samples analyse from May'20 to April'21 from all over India and highlights following points:

1. Almost 96% samples were contaminated with mycotoxins & 62% samples were above risk level.
2. Raw ingredients were highly contaminated with Aflatoxin & average contamination level was 45ppb, which is much higher than risk level of aflatoxin for poulty.
3. Fumonisin is also prevalent in India with average level of 2983ppb.
4. Broiler, layer & breeder are at medium risk for Aflatoxin contamination
5. Broilers are at higher risk for fumonisin and layer & breeder is at medium risk due to fumonisin contamination.

Cargill's Mycotoxin Survey

(May'20 -April'21)

1,402
Total Samples

1,343
Total Contaminated Samples

%Contaminated Samples

%Contaminated Samples Above Risk

Mycotoxin Analyzed	Samples	Contaminated Samples	Contaminated Samples Above Risk	Average Contaminated (ppb)	Max. Result (ppb)
Aflatoxin (total)	942	921	685	44.9	297.6
Fumonisin	155	147	79	2,983.3	18,750.0
Ochratoxin	156	143	53	43.4	464.0
T2 Toxin (total)	149	132	20	24.1	132.0
Total	**1,402**	**1,343**	**837**	**367.5**	**18,750.0**

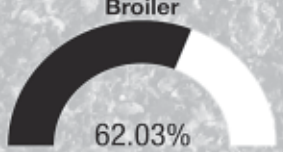
Mycotoxin Risk Assessment

Mycotoxin Analyzed	Broiler	Layer	Breeder
Aflatoxin (total)			
Fumonisin			
Ochratoxin			
T2 Toxin (total)			

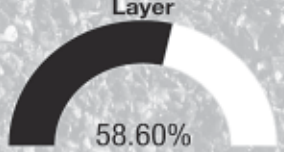
Minimum Risk | Low Risk | Medium Risk | High Risk

Percentage of samples above risk by species

Broiler



Layer



Breeder

Contact : Dr. Nidhi Madnawat, email : nidhi_madnawat@cargill.com

PRESS RELEASE

IFAJ–Alltech International Award for Leadership in Agricultural Journalism recipients announced

Kallee Buchanan of Australia and Craig Lester of Canada were recognized during the Alltech ONE Ideas Conference

[LEXINGTON, Ky.] – Alltech and the International Federation of Agricultural Journalists (IFAJ) are pleased to announce Kallee Buchanan of Australia and Craig Lester of Canada as the recipients of the 2021 IFAJ–Alltech International Award for Leadership in Agricultural Journalism. The award recognizes excellence and leadership by young agricultural journalists and was presented today during the Alltech ONE Ideas Conference.

"IFAJ shares our commitment to supporting journalists who give a voice to the farmers and producers, the innovators and change-makers, the scientists and scholars all working toward a Planet of Plenty," said Dr. Mark Lyons, president and CEO of Alltech. "On behalf of Alltech, I congratulate Kallee Buchanan and Craig Lester as the well-deserving recipients of the 2021 IFAJ–Alltech International Award for Leadership in Agricultural Journalism."

This recognition honors Alltech's late founder, Dr. Pearse Lyons, who was a passionate storyteller with a great respect for agricultural journalists. The award complements the Young Leader program that Alltech co-founded with IFAJ in 2005 in support of the mentorship and education of leaders who connect agriculture to a global audience. It's also an endeavor that aligns with Alltech's vision of Working Together for a

Planet of PlentyTM, in which a world of abundance is made possible through the adoption of new technologies, better farm management practices and human ingenuity within agriculture.

"As producers throughout the food supply chain are implementing more sustainable solutions, we are in the midst of a new era in agriculture led by science, data-driven decision-making and a passionate dedication to farming with the future in mind," said Dr. Mark Lyons. "Agricultural journalists have the ability to share these stories, and through our continued partnership with the IFAJ, we are proud to support these future leaders, who are passionate about connecting our industry to a global audience."

Kallee Buchanan started her career at a regional newspaper in 2008 before joining the Australian Broadcasting Corporation in 2009, where she has worked as a radio and digital journalist, presenter and producer, covering rural and regional issues. In 2010, she won a Queensland Media Award (Clarion) for Best Radio News Report, and in 2017 she won the radio and digital categories at the Queensland Rural Media Awards and was named the overall journalism winner. She went on to win both the Australian and the International Star Prize for Digital Media, and she won the Queensland radio category again in 2018. In 2019, she was highly commended in the Emergency Media and Public Affairs Awards for her coverage of the 2018 Central Queensland bushfires.

Kallee Buchanan of Australia is a recipient of the 2021 IFAJ-Alltech International Award for Leadership in Agricultural Journalism.

Buchanan joined the committee of the Rural Press Club of Queensland in 2016 and became its representative on the Australian Council of Agricultural Journalists (ACAJ) in 2018, eventually becoming the secretary of the ACAJ in 2019 and its president in 2020. She is passionate about elevating the issues and industries of regional and rural people and supporting agricultural media communicators in that work. She is committed to developing and retaining new voices that reflect the true diversity of communities outside of the major city centers, as well as the contributions they make to a productive world.

Craig Lester loves connecting people, ideas and resources, and he believes that there is no better place to do that than in agriculture. As president of the Alberta Farm Writers' Association, part of the Canadian Farm Writers' Federation, Lester serves in two key professional roles that are dedicated to sharing information and educating the community with local and industry information. He is a managing editor of 660 NEWS, an all-news radio station in Calgary, Alberta, and is the co-owner of Rural Roots Canada, an agriculture media production and distribution company. In his free time, he works on the family farm in Rolling Hills, Alberta.

Craig Lester of Canada is a recipient of the 2021 IFAJ-Alltech International Award for Leadership in Agricultural Journalism.

Lester is also very active as a volunteer in the community, contributing his time to the Calgary Stampede, Alberta Young Speakers for Agriculture and Ronald McDonald House. He is also on the planning committee for the 2023 IFAJ World Congress, which will be held in Alberta.

With a passion for successful succession and empowering the next generation, Lester established an agricultural scholarship and travel bursary at his alma mater, Brooks Composite High School, to support a student pursuing either agricultural-related post-secondary education or an international in-person learning experience. He is an award-winning broadcast journalist and received a diploma in broadcast news from the Southern Alberta Institute of Technology.

"In challenging times like these, reliable journalism and information is vital for farmers," said IFAJ president Lena Johansson of Sweden. "Alltech's commitment to professional development for agricultural journalists to promote eminent leaders within our organization is much-appreciated and contributes to enhancing the quality of agricultural journalism — which, in the long run, benefits the entire agricultural sector."

For more information about the IFAJ-Alltech International Award for Leadership in Agricultural Journalism, contact press@alltech.com.

Alltech is proud to partner with the International Federation of Agricultural Journalists (IFAJ) to recognize excellence and leadership by young journalists with the IFAJ-Alltech International Award for Leadership in Agricultural Journalism.

Contact: press@alltech.com

Jenn Norrie

Communications Manager, North America and Europe

jnorrie@alltech.com; (403) 863-8547

About Alltech:

Founded in 1980 by Irish entrepreneur and scientist Dr. Pearse Lyons, Alltech delivers smarter, more sustainable solutions for agriculture. Our products improve the health and performance of plants and animals, resulting in better nutrition for consumers and a decreased environmental impact.

We are a global leader in the animal health industry, producing additives, premix supplements, feed and complete feed. Strengthened by more than 40 years of scientific research, we carry forward a legacy of innovation and a unique culture that views challenges through an entrepreneurial lens.

Our more than 5,000 talented team members worldwide share our vision for a Planet of Plenty™. We believe agriculture has the greatest potential to shape the future of our planet, but it will take all of us working together, led by science, technology and a shared will to make a difference.

Alltech is a private, family-owned company, which allows us to adapt quickly to our customers' needs and maintain focus on advanced innovation. Headquartered just outside of Lexington, Kentucky, USA, Alltech has a strong presence in all regions of the world. For more information, visit alltech.com, or join the conversation on Facebook, Twitter and LinkedIn.

About the International Federation of Agricultural Journalists:

The International Federation of Agricultural Journalists, founded in 1956, is comprised of 5,000 members in 53 countries. It is the only organization in the world dedicated to global agricultural journalism. Its three pillars are professional development, youth development and global outreach. IFAJ members embrace freedom of the press. http://www.ifaj.org

BROILER LIFTING RATES FOR THE MONTH OF MAY 2021

place	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Hyderabad	122	122	127	135	140	142	144	144	144	135	126	116	116	111	111	111	104	104	104	96	90	85	78	70	70	70	72	75	75	75
Karimnagar	122	122	127	135	140	142	144	144	144	135	126	116	116	111	111	111	104	104	104	96	90	85	78	70	70	70	72	75	75	75
Warangal	122	122	127	135	140	142	144	144	144	135	126	116	116	111	111	111	104	104	104	96	90	85	78	70	70	70	72	75	75	75
Mahaboobnagar	122	122	127	135	140	142	144	144	144	135	126	116	116	111	111	111	104	104	104	96	90	85	78	70	70	70	72	75	75	75
Kurnool	122	122	127	135	140	142	144	144	144	135	126	116	116	111	111	111	104	104	104	96	90	85	78	70	70	70	72	75	75	75
Vizag	108	108	113	123	128	130	132	132	132	123	115	105	105	100	100	100	94	94	94	90	84	79	79	70	70	70	72	75	75	75
Godavari	119	119	124	134	139	141	143	143	143	134	126	116	116	111	111	111	105	105	105	100	94	89	80	70	70	70	72	75	75	75
Vijayawada	119	119	124	134	139	141	141	141	141	135	130	120	120	115	115	115	110	110	110	102	96	91	80	70	70	70	72	77	77	77
Guntur	119	119	124	134	139	141	141	141	141	135	130	120	120	115	115	115	112	112	112	102	96	91	80	70	70	70	72	78	78	78
Ongole	119	119	124	134	139	141	141	141	141	135	130	120	120	115	115	115	112	112	112	102	96	91	80	70	70	70	72	78	78	78
Namakkal	104	107	113	113	115	115	122	122	123	123	123	123	123	123	123	123	123	118	118	106	94	80	76	78	80	80	82	82	82	72

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Better Nutrition Through Biotechnologies

PRESS RELEASE

K Narender Reddy as Chief Operating Officer (COO), Natural Remedies

Natural Remedies is spreading its wings to new geographies and is growing at a rapid pace.

In the last year, we performed exceptionally well and look forward to growing at an accelerated pace in the upcoming years.

Helming this growth is no easy task, and this requires the insight and ability of a veteran in this field.

In this regard, Mr. K. Narender Reddy is being promoted as the Chief Operating Officer from his current role of Commercial Director.

Mr. Reddy has been with Natural Remedies for over 30 years and has risen to this position from being a Veterinary Sales Representative.

Mr. Reddy will be leading the organisation by building a strong culture that embodies the vision, and values that NRPL stands for.

In this new role as the COO, apart from sales, marketing, formulation & development functions, he will take care of the entire operations for providing strong customer support. He will also oversee strategic customer success and relationships in Asia Pacific and European markets. He will also spearhead the operations in the Australia, UK and US markets as Natural Remedies continues into its next phase of growth.

We wish Mr. K. Narender Reddy the very best as he takes up this monumental responsibility.

Biomin®

Mycotoxin Biomarkers: 5 Challenges in Going from Lab to Farm

By **Veronika Nagl and Konstantinos Sarantis**

Mycotoxins are well known to impair animal health and cause economic losses in livestock production. In the field, diagnosis of mycotoxin-induced disorders in animals is often challenging, as relevant feedlots are no longer available or feed analysis results are not conclusive. Driven by advances in analytical techniques, the application of mycotoxin biomarkers – assessing mycotoxin exposure directly in the animal by analyzing blood or other body fluids – is evolving at the farm level. Despite its potential, the on-field application of mycotoxin biomarkers still has major limitations. We discuss why it is currently tricky to interpret results and which aspects to keep an eye on.

• Great strides have been made in researching the applications of mycotoxin biomarkers at the farm level.

• Challenges to on-farm utilization of biomarkers include timing of sampling; species-dependent differences in mycotoxin metabolism; unknowns in the field; variability in laboratory experience; and current lack of biomarker reference values.

Mycotoxins – toxic secondary metabolites of fungi – are natural contaminants of foods and feeds. A plethora of mycotoxins has been identified that pose a risk for human and animal health. Due to their frequent occurrence worldwide and their toxic effects, mycotoxins require regular monitoring.

Feed analysis: well established, but still challenging

Analysis of mycotoxins in feed and food commodities represents the most traditional monitoring approach. Many different methods have been developed to detect mycotoxins in feed, ranging from time-efficient lateral flow devices to comparably more sophisticated, but also more expensive, spectrometry-based methods. For the analysis of mycotoxins addressed by regulations or recommendations, laboratories can verify the accuracy of their method via reference materials or participation in proficiency tests.

However, even the most accurate analysis method can only provide meaningful results if the **sampling procedure** has been performed correctly – a potential pitfall of mycotoxin analysis in feed. Mycotoxins are not distributed homogeneously within feedlots, but they occur in hotspots. Therefore, the sampling process is crucial to obtain a representative sample and thus meaningful information about the mycotoxin contamination. The multitude of scientific data and field reports on the relationship between mycotoxin levels in feed and negative health effects in animals facilitates

interpretation of data. Yet, under field conditions the time of sampling can be challenging the diagnosis of mycotoxicosis: feed lots might have been

exchanged between the time of sampling and the onset of clinical signs and are therefore no longer available for analysis.

Mycotoxin biomarkers: challenges in going from lab to the farm

To circumvent the above challenges, the measurement of mycotoxins biomarkers in biological matrices of animals (e.g. blood, bile, urine, feces or tissue) has evolved. The underlying concept of assessing mycotoxin exposure directly in the animal is fascinating and would allow significant advances in the diagnosis of mycotoxicosis.

Mycotoxin biomarkers can be classified into two categories: mechanisms-based biomarkers and exposure-based biomarkers. Mechanism-based biomarkers refer to a biological response caused by mycotoxins, such as alterations in protein, enzyme or gene expression levels. This is exemplified by the effects of fumonisins on the sphinganine-to-sphingosine ratio, which is currently the best-known mechanism-based mycotoxin biomarker in livestock species. Exposure-based biomarkers describe the measurement of the mycotoxin itself and/or its metabolites in biological matrices, for example analysis of aflatoxin M1 in milk. Driven by the inherent specificity of exposure-based biomarkers (i.e. aflatoxin M1 presence in milk can only result from aflatoxin B1 ingestion) and significant advances in the field of mass-spectrometry, research on these biomarkers has intensified in the last years. New analytical techniques and instruments with high sensitivity has allowed scientists to unravel the fate of major mycotoxins in animals, i.e. how rapidly they are absorbed into the blood stream or to which metabolites they are transformed in the body. The next – and probably most eagerly anticipated – step is to transfer the knowledge gained under experimental settings to farms. However, the in-field application of mycotoxin biomarkers is currently not without major limitations. With an emphasis on exposure-based biomarkers in blood, the following aspects must be considered for the in-field application of mycotoxin biomarkers.

1. THE RIGHT TIMEPOINT OF SAMPLING

First, mycotoxins represent a heterologous group of contaminants. Therefore, mycotoxins show considerable differences in their kinetic profiles, e.g., to which extent they are absorbed, how quickly they appear in the circulation and how fast they are eliminated from the body via urine or feces. In other words, a given time point might be ideal to detect one mycotoxin in blood but might be too early or even too late to catch another one. Unfortunately, the situation is complicated by the fact that the same mycotoxin can show different characteristics in different animal species. For example, for deoxynivalenol the extent of absorption as well as the time point when it reaches maximum levels in blood varies between pigs and poultry. This implies that – depending on the mycotoxin and species of interest – biomarker analysis should be planned and /or interpreted in relation to last feed intake, which is often impractical on the farm. Otherwise, biomarker analysis in blood bears the risk of underestimating mycotoxin exposure.

2. THE RIGHT BIOMARKER AND MATRIX

Usually, the concentrations of exposure-based mycotoxin biomarkers are low in blood, i.e. in the low ng/mL range. For very poorly absorbed mycotoxins, such as fumonisins, it is practically impossible to detect them in blood. Here, analysis of feces would be more promising. In addition, mycotoxins are extensively metabolized after absorption, with the respective metabolite(s) often exceeding the levels of the parent toxin in biological matrices. Hence, it is essential to identify the right biomarker for each mycotoxin, taking into account species-dependent differences in metabolism. As such, the biomarker-matrix combination should be adapted to the mycotoxin of interest and target species. Unfortunately, the kinetics of many mycotoxins have not been fully elucidated in livestock species. This impedes, for example, the

selection of suitable biomarkers for emerging mycotoxins.

3. KNOWING THE UNKNOWN

Even for major mycotoxins, such as deoxynivalenol, zearalenone or ochratoxin, factors influencing the levels of exposure-based biomarkers are poorly explored. Obviously, the amount of ingested feed (and therefore ingested toxin) affects biomarker concentrations. Consequently, sick or weak animals with reduced feed intake might show comparably low biomarker levels. There are indications that other factors, such as sex or age of the animal as well as co-exposure to other mycotoxins or feed contaminants, impact biomarker levels. Further research in this field will help explain intra-individual differences in the mycotoxin biomarker response. For example, even when exposed to the same feed lot and sampled at the same time point, individual animals of a group can show marked variations in biomarker levels. These variations currently limit the comparison of biomarker results among groups, production cycles or farms.

4. THE RIGHT LAB

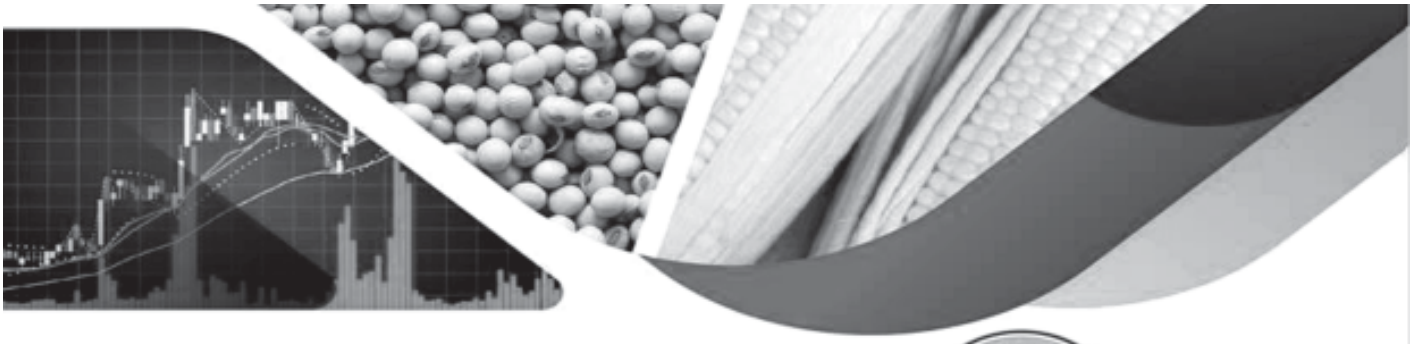
Any biological fluid or tissue represents a complex matrix, and that can interfere with the analytical measurement. In contrast to mycotoxin analysis in feed, no reference materials or proficiency tests exist for the evaluation of mycotoxin biomarker methods. Thus, the chosen analytical method and the experience of the laboratory is of utmost importance for reliable mycotoxin biomarker analysis.

5. THE RIGHT INTERPRETATION

As described, many factors need to be considered when analyzing mycotoxin biomarkers on farms. Perhaps the biggest hurdle to take is the establishment of reference values for mycotoxin biomarkers. Such reference or cut-off values are essential to interpret biomarker results adequately and to correctly deduce the health risk for animals. So far, research has failed to correlate levels of exposure-based biomarkers to clinical signs or the severity of mycotoxicosis. For example, the concentration of zearalenone and its metabolites in bile did not reflect the morphological changes in the reproductive organs of gilts.

Conclusion

As analytical methods for the assessment of mycotoxin biomarkers have become more time- and cost-effective, scientific progress in this field will hopefully accelerate. Filled knowledge gaps and availability of larger datasets might facilitate the application of mycotoxin biomarkers at the farm level in future. However, current limitations still impede the usefulness of this application.



NCDEX
NCDEX Investor (Client) Protection Fund Trust

in association with

CLFMA OF INDIA

Webinar on
Hedging price volatility of feed ingredients using commodity derivatives

WEBINAR HIGHLIGHTS

- Hedging practices in global & domestic markets
- Price risk management using commodity derivative tools
- Hedging mechanism - A case study

Date -
14th June 2021
Timings -
4:00 to 5:30 pm

SPEAKERS

Mr. Sumit Gupta
Business Head, South Asia & SE Asia, Mcdonal Pelz

Mr. Rajib Saha
Manager Derivatives Trading, ITC ABD Ltd.

Mr. Kapil Dev
Chief Business Officer, NCDEX

Ms. Rajini Panicker
VP, Commodity Head-Phillip Capital India

Mr. Neeraj Srivastava
Chairman, CLFMA

Dr. Suresh Deora
Hon Secretary, CLFMA

Dr. Sujit Kulkarni
Moderator -
MC Member, CLFMA

In case of any queries, feel free to Call us on **toll-free 1800 -266-2339**
or leave a message at **webinar@ncdex.com**

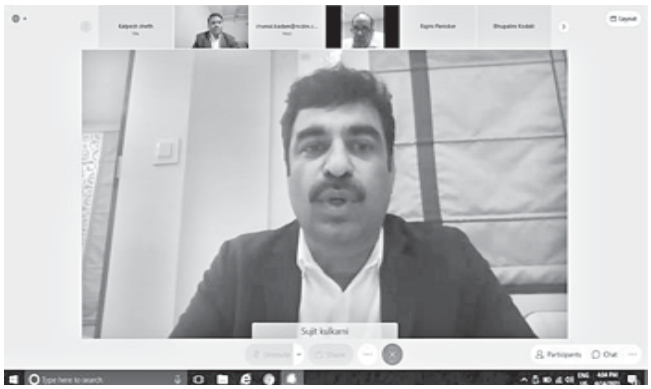
"Webinar on Hedging Price Volatility of Feed Ingredients using Commodity Derivatives"

on June 14, 2021 from 16:00 hrs to 17:30 hrs.

CLFMA OF INDIA, the apex organization and the voice of the Country's dynamic livestock industry in association with National Commodity and Derivatives Exchange **(NCDEX)** organized Webinar on hedging price volatility in feed ingredients using commodity derivatives. In the recent past, commodity prices have seen high volatility which has impacted the normal operations of business. It was thus imperative to understand how to manage this risk using the derivatives platform. The webinar was chaired by the Chairman of CLFMA OF INDIA Mr. Neeraj Srivastava. It included eminent panelists from the industry, Mr. Kapil Dev, CBO NCDEX, Mr Sumit Gupta, Business head, South Asia and South EA, McDonald Pelz, Mr Rajjib Saha, Agri derivatives Manager, ITC ABD Ltd, and Ms. Rajini Panicker from Phillip Capital. All the panelists have an average experience of more than 15 years in the industry. The event was moderated by Dr. Sujit Kulkarni, Managing Committee Member of CLFMA OF INDIA and finally the vote of Thanks was given by Mr. Suresh Deora, Hon Secretary of CLFMA OF INDIA.

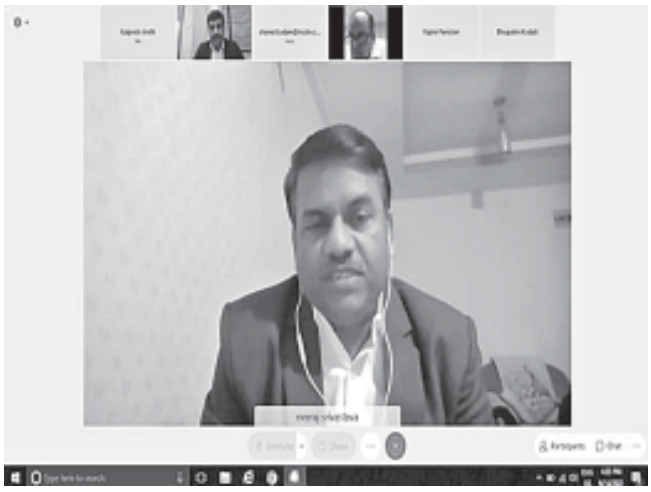
Key objective of the Webinar was to discuss on anomalous rise in prices of Soybean seed and Soybean DOC and Corn which in turn enormous production cost leads to challenging circumstances for livelihood of livestock farmers of India. Webinar highlighted on the following topics:

- Hedging Practices in Global & Domestic Markets
- Price risk management using commodity derivative tools
- Hedging mechanism – A Case Study



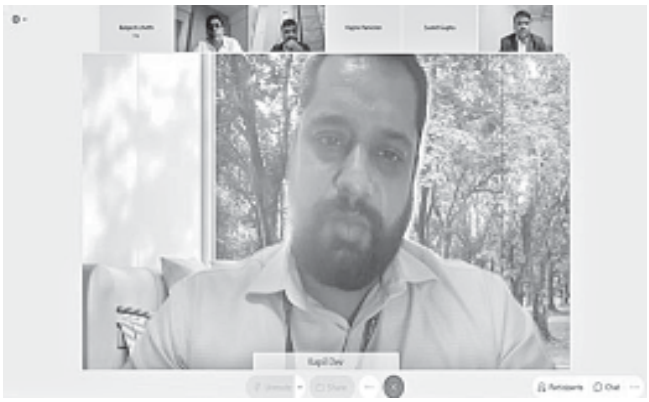
The Webinar started with a welcome address by Dr. Sujit Kulkarni, who also moderated the sessions. Dr. Sujit Kulkarni said that since last almost 3 to 4 months our industries have seen the volatility and the unusual spike particularly in Soyabean which led to increase in the feed cost.

Almost 80% price rise in Soyabean meal price was observed and there was a huge spike in soyabean seed also. So, CLFMA thought it prudent to support the Industry in this crucial time and hence arranged the webinar with NCDEX and invited the commodity market experts to deliberate the issue.



CLFMA OF INDIA Chairman Mr. Neeraj Kumar Srivastava thanked Dr. Sujit Kulkarni for giving a very nice brief of the Webinar. He, on behalf of

CLFMA and its MC Members, welcomed all. Mr Neeraj Srivastava, in his Welcome Note stated the objectives for the webinar, wherein he highlighted the importance of commodity price risk being a financial risk driven by commodity supply and demand fundamentals. The global commodity markets are facing high volatility due to the supply and demand gaps. It is important to manage this volatility using risk management tools like Futures and Options. The webinar is organized to understand the importance of these tools for effective price risk management and protecting the bottom lines of the business.

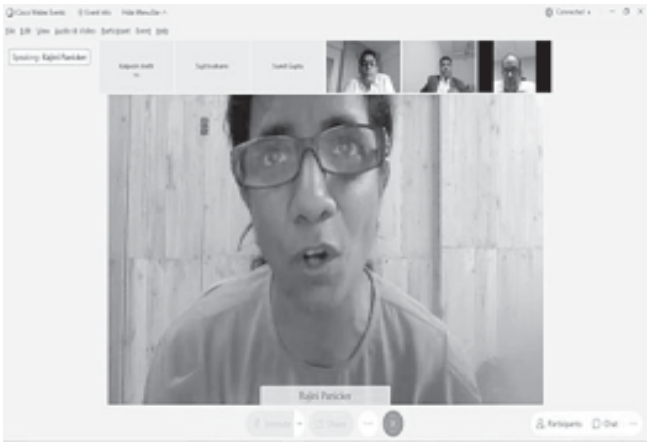


Mr Kapil Dev was the first panelist to speak on the subject. He highlighted the fact that risk is something that is unknown and uncertain. There is health risk, life risk and wealth risk. While we insure ourselves against the life and health, wealth is something that is not insured. Volatility and uncertainty is always there in business largely driven by unknown and uncertain factors. He cited some of the recent examples, droughts, Geopolitical events, biofuel push or logistical bumps like container shortages, Suez Canal blockage for recent volatility in the commodity prices. He explained that these can be effectively managed using the concept of Hedging.

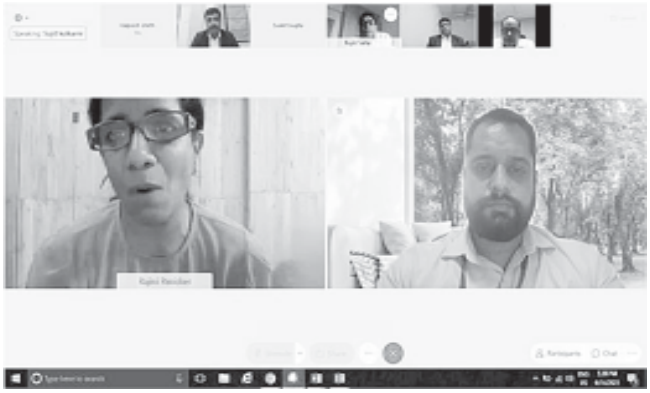
Mr Sumit Gupta was the next panelist to talk on the subject. He further elaborated what Mr.Kapil Dev had explained in his presentation. He explained the

weather patterns in terms of El Nino and La Nina periods and how these largely impact production of Agriculture commodities globally. Hi mainly focused on Corn and Soybean as these are largely used raw materials as feed ingredients. World corn production should increase to meet the rising demand. Corn prices almost doubled over last year for US farmer while the Indian Corn markets didn't see this kind of rally, this price gap has made Indian corn attractive for exports. He also highlighted the domestic scenario where demand is driven by poultry and starch industry. There has been sharp increase in production and consumption domestically. For Soybean, he stressed on the fact that while the demand was increasing the yield was constant. The demand for Soybean will continue to increase due to increasing awareness on food preferences and income growth. He mentioned that proper research and analysis of the commodity will help in taking informed price decisions.

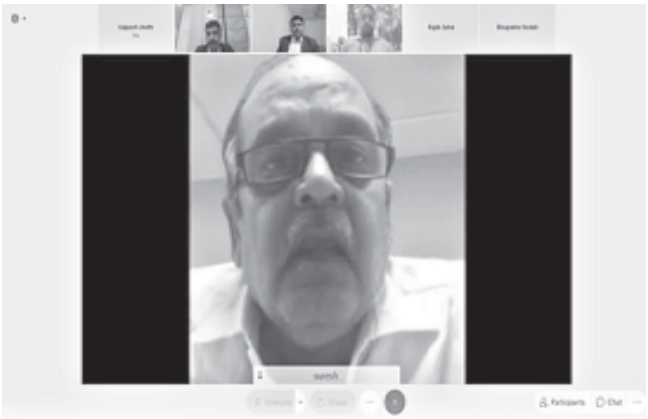
Mr. Rajib Saha continued where Mr. Sumit Gupta left his presentation and stressed more upon from a business perspective how these price volatilities impact the revenues of business. Corporates must have risk management policy to ensure that planned targets of annual sales, purchases and profitability numbers are attained to satisfy management and shareholders. It is all the more important for corporates who are into commodities as they have a number of risks including risk of change in government policies on tariffs, overseas trade, weather, currency or even hedge funds' strategies. Procurement via futures gives two-way protections, one is fixing the price and another is immunity from counterparty default. Futures also give price signals as they are reflective of what is going on in the markets both globally and domestically. He urged the participants to at least keep following the prices of futures market to get an understanding of the market fundamentals.



Finally, Ms. Rajini Panicker explained the role of a member in the ecosystem of Futures market. She highlighted how they work with various value chain participants to device customized strategies for them based on their raw material requirement. She also explained in detail the opportunity loss in Soybean if the market participants had hedged Soybean this year. This year being highly volatile, she explained the same for the last year as well, where if hedged the corporate would have saved about 4-6% in their overall procurement costs. She summarized her presentation by saying Securing raw material purchases through far-month commodity futures contracts not only gives the protection from potential rise in prices at a later date but also raises the efficiency of capital through leveraged transactions.



Webinar participants actively participated in Question and Answer session and Panelists answered their Questions satisfactorily.



Mr. Suresh Deora, Hon. Secretary of CLFMA OF INDIA concluded the webinar by thanking the panelists for their valuable inputs and the audience for participating and making the event a success. CLFMA OF INDIA will associate for more such programs for the benefit of the feed industry at large.

The event was attended by 270 participants and total registrations received were 317.

NUTRINOMICS

ABTL
ENZYMES • NUTRITION • TECHNOLOGY

Use of highly bioavailable protein and probiotics in poultry feed

Welcome to Nutrinomics...

"Nutrinomics, is the merging of the nutrition and health economics disciplines to assess the impact of nutrition on animal health and disease and to illustrate the health and economic aspects of specific changes in the daily nutrition and nutrition recommendations through the lens of cost effectiveness".

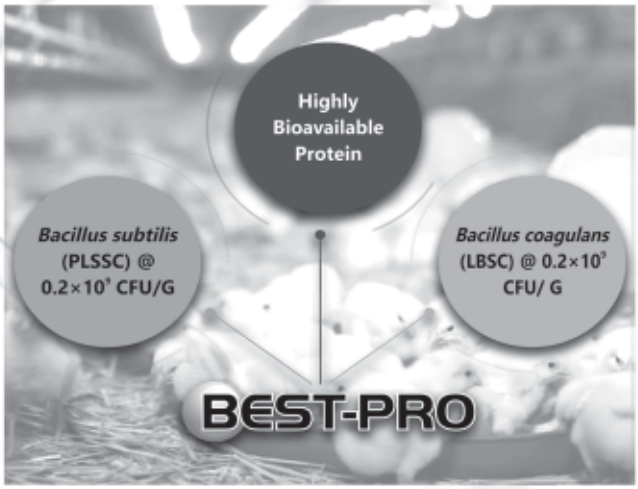
Introduction

Protein besides biologically active compound in the body exists as enzymes & hormones, also plays important role in physiology of living organisms. Soybean meal (SBM) is complete conventional protein source with well-balanced amino acids profile. On the other hand due to increase in prices of SBM, alternative sources like groundnut cake, sunflower meal, guar meal, rapeseed cake, cotton seed cake, copra meal, maize gluten, DDGS etc. are used, but they have limitations to use in rations and are poor in digestion, amino acids profile also have anti-nutritional factors.

Post hatch chicks have anatomically completed but physiologically weak GIT, limited enzymes secretion and unstable microflora resulting in inefficient feed utilization. To overcome the limitations of the immature digestive tract, limitations of protein sources and to satisfy the need of least cost ration with value addition, speciality feed nutrients are essential and need of hour, which can lead to reduce digestive stress and improve nutrient utilization during initial days of chicks.

Easily digestible & highly bioavailable protein in diet helps to save energy by reducing requirements of enzymes secretion for protein digestion. Probiotics enhances growth of beneficial bacteria and prevents colonization of undesirable pathogenic bacteria in the digestive track. Early chick feeding with bioavailable protein along with probiotics is known to have positive correlation in improving gut health, nutrient utilization, body weight gain and FCR.

About BEST-PRO



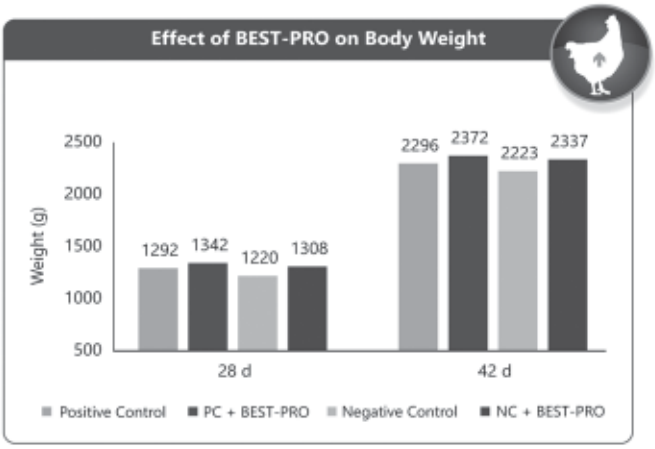
Benefits of BEST-PRO

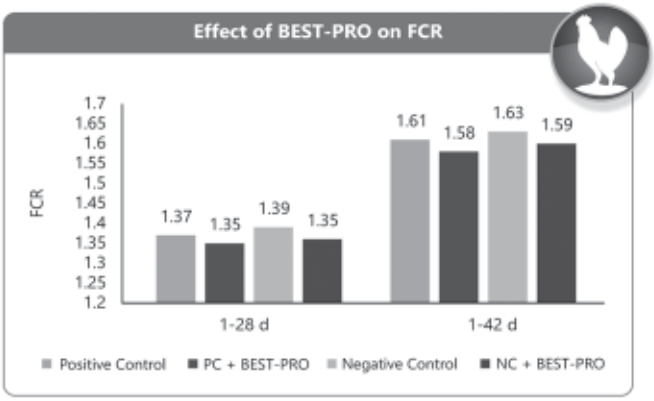
- Fulfills the nutritional gap
- Improves villus height and crypt depth
- Improves gut health & reduces digestive stress
- Improves immunity
- Helps to maintain flock uniformity
- Reduces incidence of wet litter and pasty vent
- Enhances growth performance and egg production parameters
- Increases profitability

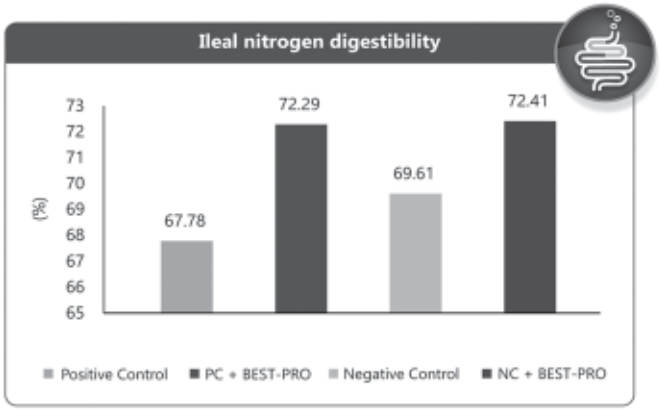
Comparative effect of BEST-PRO in broiler birds performance

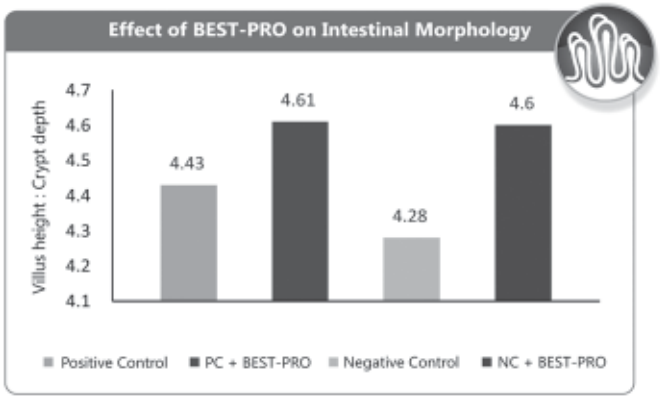
Trial was designed to study the comparative effect of BEST-PRO supplementation in broiler birds for a period of 42 days during summer season. For this trial a straight run flock of 400 Cobb 430 broiler chickens were randomly divided into four treatment groups described in table. Each group had 100 birds with isonitrogenous and isocaloric diets with same environmental conditions.

Treatment	Description
Positive Control (PC)	Conventional diet devoid of BEST-PRO.
PC + BEST-PRO	PC + BEST-PRO @ 0.5% in starter and 0.25% in grower
Negative control (NC)	Reduced soybean meal 1% in starter and 0.5% in grower phase from PC
NC + BEST-PRO	NC + BEST-PRO @ 0.5% in starter and 0.25% in grower









Conclusions

- Supplementation of BEST-PRO in pre-starter and starter diets had a significant positive impact on body weight and FCR.
- SBM substitution with BEST-PRO'S bioavailable protein and probiotics in pre-starter and starter diets improved ileal nitrogen digestibility and gut health supporting production performance of birds.

NATIONAL EGG CO-ORDINATION COMMITTEE

DAILY / MONTHLY EGG PRICES DECLARED BY NECC AND PREVAILING PRICES AT VARIOUS PRODUCTION CENTRES (PC) AND CONSUMPTION CENTERS (CC) JUNE 2021

Name Of Zone / Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Average
NECC Prices																															
Ahmedabad	545	545	550	555	555	555	555	555	555	555	555	555	557	559	561	561	561	530	530	533	540	545	548	548	548	548	550	552	554	556	550.53
Ajmer	488	515	530	525	515	505	495	495	495	500	502	502	502	502	502	495	490	490	500	525	525	525	510	500	500	502	507	507	507	507	505.43
Barwala	485	500	525	525	525	510	510	510	484	492	500	502	504	504	504	494	485	485	490	505	514	514	514	514	495	495	500	500	500	500	502.83
Bengaluru (CC)	545	545	545	550	550	550	550	550	550	550	550	550	550	550	550	550	550	525	510	510	515	520	525	525	525	525	525	525	525	525	537.17
Brahmapur (OD)	510	510	522	527	527	527	527	527	527	520	520	522	524	524	524	524	510	505	495	500	512	515	520	520	520	520	520	513	513	493	517.27
Chennai (CC)	535	535	535	545	545	545	545	545	545	545	545	545	545	545	545	545	545	520	520	510	510	520	520	520	520	520	520	520	520	520	532.5
Chittoor	528	528	528	538	538	538	538	538	538	538	538	538	538	538	538	538	538	513	513	503	503	513	513	513	513	513	513	513	513	513	525.5
Delhi (CC)	505	508	527	545	545	545	530	530	525	510	512	522	522	522	524	524	516	505	505	515	525	535	535	535	535	535	535	535	535	520	525.4
E.Godavari	500	502	507	512	514	514	514	514	514	505	505	507	509	509	509	509	495	490	485	490	495	500	505	505	505	505	505	498	498	498	503.93
Hyderabad	490	495	500	505	508	508	508	508	508	508	508	510	512	514	514	514	490	475	475	480	485	490	495	495	495	495	495	498	500	500	499.27
Ludhiana	482	484	514	525	525	525	510	510	501	492	492	499	501	501	501	501	496	493	484	491	506	512	512	512	506	501	501	501	501	501	502.67
Mumbai (CC)	550	550	555	560	565	568	568	568	568	568	568	568	570	572	574	574	574	550	540	535	540	545	550	555	555	555	555	555	558	-	559.07
Muzaffurpur (CC)	538	557	586	586	571	567	557	552	552	543	557	557	562	562	557	557	548	538	548	562	571	571	571	562	557	552	552	552	552	548	558.17
Mysuru	547	547	547	550	550	550	550	550	550	550	550	550	550	550	550	550	550	520	505	510	515	520	520	520	520	520	520	520	520	520	535.7
Nagpur	545	545	550	555	580	550	550	525	525	542	546	546	550	550	560	560	540	530	520	532	532	557	557	557	557	550	-	540	540	540	545.9
Namakkal	505	505	515	515	520	520	520	520	520	520	520	520	520	520	520	520	500	500	485	485	495	495	495	505	505	505	505	505	505	505	509
Patna	538	562	576	576	562	557	548	538	538	538	552	552	552	552	552	552	548	548	548	571	571	571	567	562	552	552	548	548	548	543	554.07
Pune	545	547	555	560	565	565	565	555	555	555	557	559	561	563	565	565	565	540	540	540	542	545	550	550	550	550	550	550	552	553	553.8
Ranchi (CC)	548	562	586	586	576	567	557	557	557	557	567	567	567	567	562	562	557	557	557	562	576	576	576	571	567	562	562	562	562	557	564.97
Vijayawada	510	512	517	522	524	524	524	524	524	515	515	517	519	519	519	519	505	500	495	500	505	510	515	515	515	515	515	508	508	508	513.93
Vizag	557	557	557	557	557	557	557	557	557	525	525	525	525	525	525	525	500	500	500	500	505	510	515	515	515	515	515	515	515	515	527.43
W.Godavari	500	502	507	512	514	514	514	514	514	505	505	507	509	509	509	509	495	490	485	490	495	500	505	505	505	505	505	498	498	498	503.93
Warangal	492	497	502	507	510	510	510	510	510	510	510	512	514	516	516	516	492	477	477	482	487	492	497	497	497	497	497	500	502	502	501.27
Prevailing Prices																															
Allahabad (CC)	543	548	571	571	557	548	533	533	543	548	548	548	548	548	543	533	533	529	529	548	552	552	548	543	533	538	548	548	548	543	545.17
Bhopal	510	525	535	535	545	545	545	553	530	530	530	530	530	540	540	540	540	525	525	525	535	535	535	535	535	535	-	535	535	535	534.24
Hospet	505	505	505	510	510	510	510	510	510	510	510	510	510	510	510	510	510	485	470	470	475	480	485	485	485	485	485	485	485	485	497.17
Indore (CC)	520	535	555	545	545	545	525	520	520	525	508	530	530	540	530	515	515	515	525	535	545	550	550	525	525	-	-	-	-	535	531.08
Jabalpur	514	520	540	540	540	520	520	520	520	520	525	530	532	532	532	532	517	517	507	515	530	530	530	532	532	532	-	532	532	532	526.72
Kanpur (CC)	514	524	557	557	557	557	538	524	524	524	538	538	538	538	538	538	529	529	529	529	552	552	552	552	552	552	552	552	552	552	541.33
Kolkata (WB)	560	570	580	580	580	580	580	580	580	570	570	575	575	575	575	560	550	540	540	560	570	575	575	575	575	575	575	555	555	545	568.5
Luknow (CC)	557	557	600	600	600	590	580	560	550	550	576	560	560	560	560	560	550	550	550	550	573	573	573	573	573	563	563	563	563	563	566.67
Raipur	521	526	546	546	546	546	539	530	530	530	535	540	535	542	545	545	530	530	515	520	530	540	540	540	540	540	-	540	540	540	536.1
Surat	550	550	555	560	560	560	560	560	560	560	560	560	562	564	566	566	566	535	535	538	550	555	558	558	558	558	560	562	564	566	557.2
Varanasi (CC)	550	567	583	583	573	560	550	550	550	550	560	560	560	560	550	550	550	550	550	567	583	583	573	567	567	567	583	583	573	560	563.73

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In a globalising world with a growing population, the demand for food is rapidly increasing. It is a challenge for our customers to produce enough food in a safe, healthy, animal-friendly, and sustainable manner. Healthy livestock makes an important contribution to achieving this. We support the livestock business worldwide with our products and services. The combination of diagnostics and animal health expertise is what makes Royal GD unique. It enables us to help you improve animal health by making sure you provide reliable results to your customers with, for example, our diagnostics and PTS.

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E-mail: anandanimalhealth@gmail.com, science@anandanimalhealth.com
Web : www.anandanimalhealth.com

PRESS RELEASE

Novus celebrates anniversary this month, planning for a long future

What three decades in agriculture means for the feed additive company

SAINT CHARLES, MO (June 1, 2021) – On June 6, Novus celebrates 30 years of supporting animal protein producers globally who are working to feed the world.

In 1991, Novus International, Inc. was founded with a mission "to make a clear difference in sustainability meeting the growing global need for nutrition and health." The outcome of Novus's mission statement is clear – the availability of healthy and affordable animal protein can positively impact populations, particularly when produced with regard for environmental impacts, feed costs and animal performance. Looking back at the last three decades, Novus President and CEO Dan Meagher said the company has always endeavored to offer solutions for the industry's biggest challenges.

"Achieving performance and profit goals while optimizing animal health are challenges for every producer regardless of operation size," he said. "There are many purposes for feed additives. For us, the purpose is to ensure the nutrients in raw feed are available to the animal, support the animal's gut health to optimize the nutrition it receives from the feed, and to provide the animal with what it can't get from raw feed materials to better prepare it for the health challenges it may encounter during its life. Regardless of the products we've offered over the years, focus on these objectives is how Novus helps its customers globally."

Novus's foundation began with methionine. In a joint partnership established in 1991, Mitsui & Co., Ltd., and Nippon Soda Co., Ltd., acquired the rights to ALIMET® feed supplement and SANTOQUIN® feed preservative*, creating the company with a source of methionine as its flagship product. From there, methionine solutions MHA® feed supplement and MFP® feed supplement were added to the portfolio. Novus's next innovation was the MINTREX® trace minerals line, which includes organic sources of zinc, copper and manganese bonded to the HMTBa (hydroxy methionine analogue) molecule allowing for better absorption and mineral availability. ACIDOMATRIX™ feed additive and ACTIVATE® nutritional feed acid, both offering combinations of organic acids and HMTBa, were created for the eubiotics portfolio. Other organic acids, essential oils and the CIBENZA® enzyme platform were added, as were pigment and feed quality products before being sold to EW Nutrition earlier this year. The sale was part of a re-focusing currently underway for the company: its Project Destiny strategic business transformation, which includes the goal of becoming the industry's go-to source for gut health nutrition solutions.

"Food production is changing with a strong focus on sustainability, animal welfare/health, efficiency, and other drivers directly related to gut health," said David Dowell, executive vice president and chief operating officer. "Health through nutrition has been a long-time principle in human health and Novus wants to expand our solutions in the key area of growth for our industry."

As part of the renewed focus on innovation, Novus announced its partnership with biotechnology company Agrivida Inc. to develop an innovation pipeline of products using INTERIUS™ Technology; the first in-grain-based feed additive platform commercially available to animal nutritionists and

feed formulators. Novus is also working to commercialize the flagship product GRAINZYME® PHOS phytase which uses the technology to produce the enzyme inside corn kernels, thus eliminating processes and costs in feed production.

"As a part of this industry, it's important that we're aware of the resources we use. Expressing feed additives directly inside grain is an exciting way to do more with less," said Chief Innovation Officer Al Zimmerman.

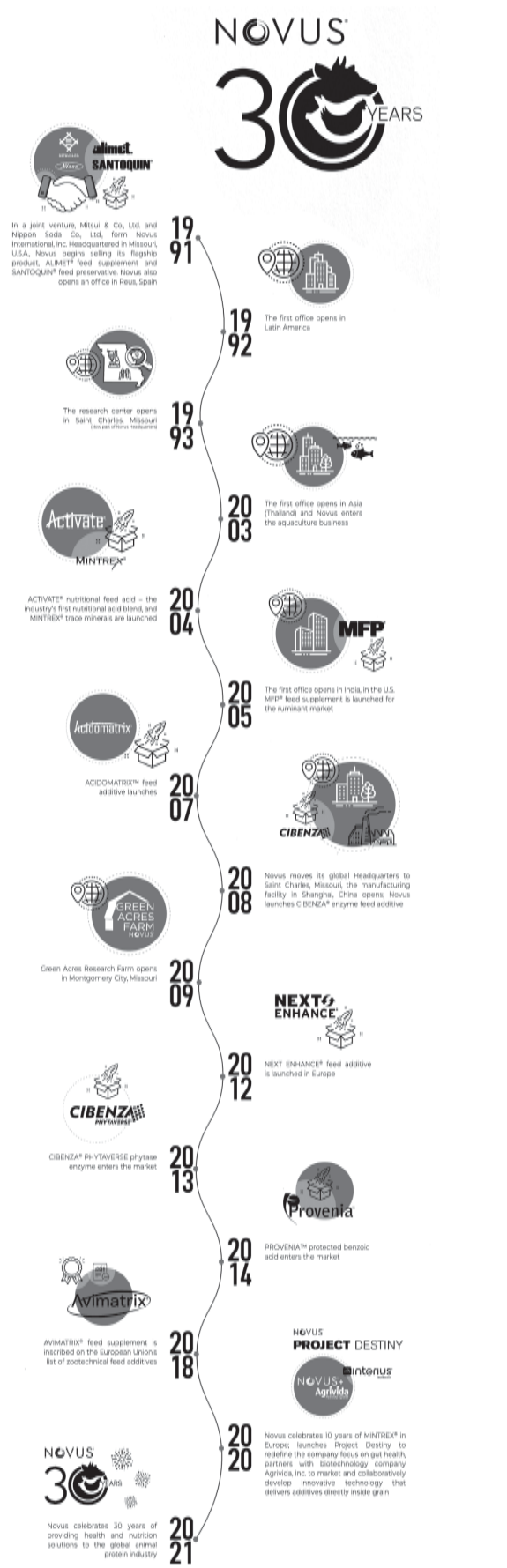
Doing more with less also applies to the company's commemoration of its anniversary. Since the pandemic is prohibiting Novus from celebrating in-person, it is taking the message to the web. During the upcoming months Novus social media followers will see video and images on what 30 years means for those closest to the company – its employees.

"There's nothing I would like more than to take a world tour to celebrate this anniversary with every employee but that's just not feasible," Meagher said. "We're having a toned-down, socially-distant anniversary instead, which is really unfortunate since the employees are the reason for Novus's success. We have hard-working, dedicated, intelligent people at every level of our company, and they each deserve a standing ovation."

Vice President and Chief Human Resources Officer Maria Burt echoed Meagher's statement on the need to celebrate all that employees have achieved, particularly during the pandemic.

"Our colleagues have gone above and beyond in so many ways throughout the pandemic. All of those challenges, coupled with big changes in our company, would have been daunting for anyone, but they have shown their commitment, ingenuity and grit through it all. They are a truly excellent group," she said.

What will the next 30 years look like? Meagher said Project Destiny is paving the way for a Novus known more for its partnerships with customers than its product line.



"There's no question that our solutions – methionine, minerals, enzymes, organic acids, essential oils – can help our customers with their operations but we want to be more than that. Our goal is for customers to look at Novus as a trusted advisor that is going to help make their business more sustainable financially and environmentally."

The new goals and direction of the company are wholly supported and commended by Novus's Board of Directors. In a statement, Tetsu Watanabe, Novus chairman of the board and senior vice president of Mitsui & Co. (U.S.A.), Inc., congratulated Novus employees on the 30th anniversary and said the Board is eager to see what comes next.

"Since its formation, Novus has been an integral part of our strategy and we have worked hand-in-hand with Novus to help 'Feed the World'," he said. "As always, we fully support the transformation and growth of Novus as it endeavors to be the provider of viable solutions for the industry. We are pleased to see that the organization is going down the right path."

Learn more about Novus at www.novusint.com.

**Now owned by EW Nutrition.*

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Novus International, Inc. is a leader in scientifically developing, manufacturing and commercializing gut health solutions for the agriculture industry. Novus's portfolio includes ALIMET® and MHA® feed supplements, MINTREX® chelated trace minerals, CIBENZA® enzyme feed additives, NEXT ENHANCE® feed additive, ACTIVATE® nutritional feed acid, and other products. GRAINZYME® PHOS phytase is owned by Agrivida Inc. Novus is privately owned by Mitsui & Co., Ltd. and Nippon Soda Co., Ltd. Headquartered in Saint Charles, Missouri, U.S.A., Novus serves customers around the world. For more information, visit www.novusint.com.

PRESS RELEASE

NOVUS

Trypsin Inhibitor, the hidden enemy in Soyabean Meal

Dr. Koushik De, *Director-Technical Services, SCA, Novus International*

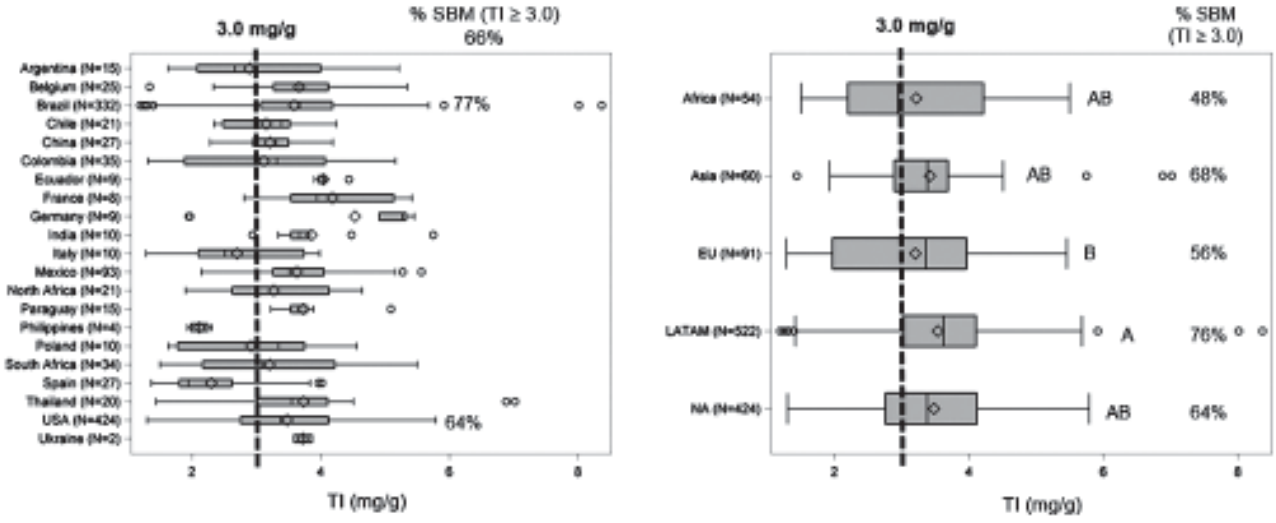
Dr. Koushik De

As global animal production has rapidly shifted towards reduced Antibiotic free, "Gut health" has become a popular expression and all-encompassing concept in the scientific community. The gastro-intestinal tract must provide a barrier function protecting against harmful environmental elements (e.g. toxins and pathogenic microbes), while simultaneously permitting appropriate nutrient absorption. Successful animal performance depends on the interplay between the intestine, microbiota, diet, and a multitude of environmental factors.

The shift to antibiotic free production or better gut health often results in the increase of soybean meal inclusion as there are limited in the number of efficacious protein sources that successfully reduce soybean meal content. Soybean meal is the most widely used major protein source in poultry production across the world. However, SBM contains various anti-nutritional factors that may affect intestinal homeostasis and impair nutrient utilization in poultry. The main anti-nutritional factors in SBM, are trypsin inhibitors (TI), oligosaccha-rides, such as raffinose and stachyose, and the antigen Glycinin, â-conglycinin and Lectins. Diets that include high levels of soybean meal contain proportionally higher anti-nutritional factors and may pose the risk of impaired performance.

Chen et al. (2016) analyzed the content of TI and Urease Activity (UA) in more than 1000 samples of SBM from all over the world and observed a high degree of variability in the reported ANF values, both within the same country and amongst different origins.

The levels of trypsin inhibitor (TI) of solvent-extracted soybean meal samples from different countries and world areas.



Chen et. al., The Journal of the American Oil Chemists' Society, 2020

The elevated variability and its potential negative impact on performance highlights the importance of knowing the content of anti-nutritional factors in SBM for poultry formulations.

In this article, we will review mainly the role of Trypsin Inhibitors (TI) in broilers.

Why Should we care about TI?

Trypsin and chymotrypsin are important digestive enzymes that are secreted by the pancreas as the inactive enzyme precursors trypsinogen and chymotrypsinogen. Trypsin activates itself via positive feedback and converts chymotrypsinogen and other inactive enzymes into their active forms. As Tis are protein in nature and one of the most anti nutritional components of SBM, they compete to bind to trypsin therefore affecting the digestion process. They have been correlated with rapid feed passage and decrease in digestibility of broilers with a relevant economic impact. The analysis is still more expensive, complex and time consuming for TI, for this reason, other parameters are commercially used as indirect SBM quality indicators, such as Urease activity and Protein solubility.

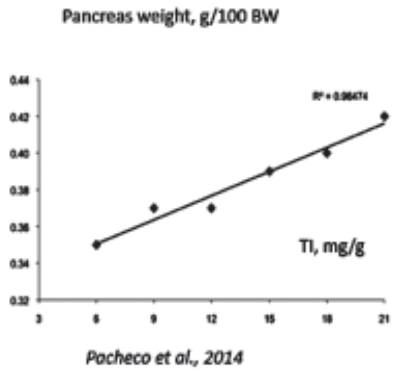
There are two types of TI present in Soya, Kunitz TI which is larger molecule & Bowman-Birk TI which is smaller molecule. But soyabean seed contain around 14% more Bowman Birk TI than Kunitz TI.

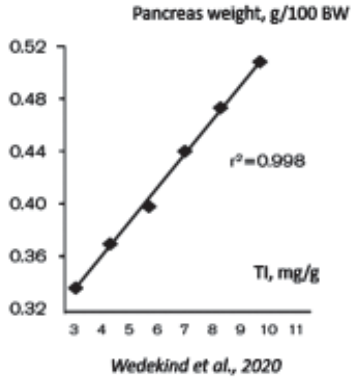
Consequence of TI for Soya Bean and bird performance:

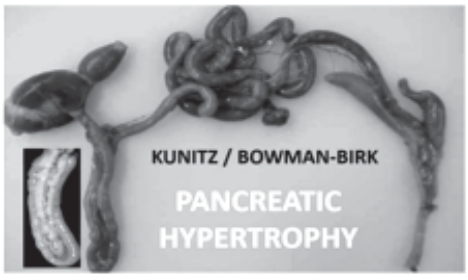
Excessive quantities of TI in feed will cause pancreatic hypertrophy leading to poor growth and decreased performance (Pacheco et al. 2014; García-Rebollar et al. 2016; Rada et al. 2017). This pancreatic hypertrophy is a compensatory modulation by the body to offset the effect of ingested trypsin inhibitors (Liener 1981; Waldroup et al. 1985).

TI also affect the nutritive value of SBM. Because of loss of endogenous protein there is reduced digestion which affects the nitrogen balance, gut viscosity resulting into reduced live weight and negative impact on feed efficiency. Palliyeguru et al. (2011) demonstrated dietary soya TI elicited an increased severity of sub-clinical necrotic enteritis. When amino acid digestibility is compromised, the ileal ingesta will have a relatively high content of undigested amino acids that pass into the large intestine and cecal tonsils, where microbial fermentation will occur. *C. perfringens*, a pathogenic agent of necrotic enteritis, needs specific amino acids and peptides for its proliferation (Nakamura et al., 1968).

Linear increase in pancreas size with increasing TI content in SB

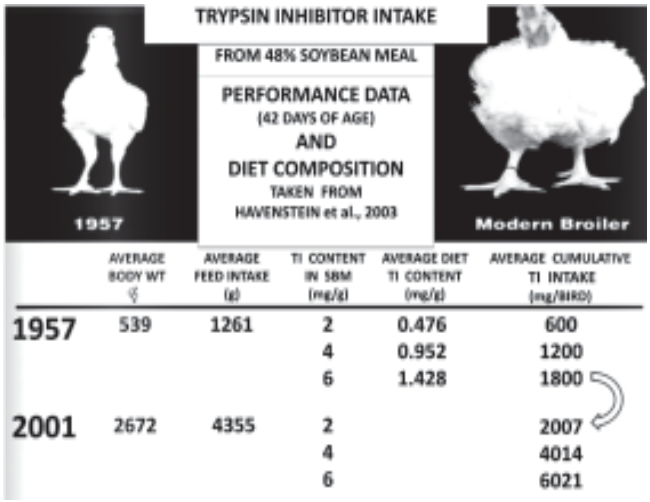






Erdaw et al., 2018: "Anti-nutrients Reduce Poultry Productivity: Influence of Trypsin Inhibitors on pancreas"

Using the Data from the simulation conducted by Havenstein et al.(2003) with "1957" broilers versus '2001" broiler it is possible to estimate the TI intake of the "1957" birds fed 1957 diets and compare it with the estimate of TI intake by the "2001" birds fed 2001 diets.



	AVERAGE BODY WT (g)	AVERAGE FEED INTAKE (g)	TI CONTENT IN SBM (mg/g)	AVERAGE DIET TI CONTENT (mg/g)	AVERAGE CUMULATIVE TI INTAKE (mg/BIRD)
1957	539	1261	2	0.476	600
			4	0.952	1200
			6	1.428	1800
2001	2672	4355	2		2007
			4		4014
			6		6021

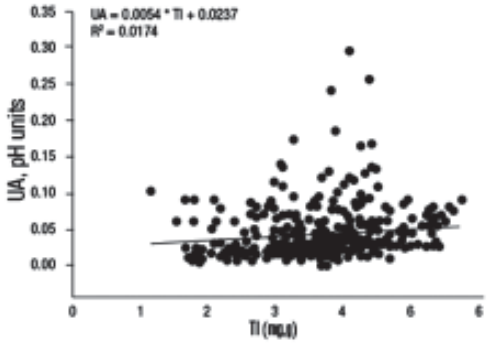
Because of improvement of modern broilers in terms of average feed intake and body weight they consume more than three times TI than 1957 birds considering the same amount of TI in SBM.

The effects of TIA are particularly strong in young animals. It has been shown that overcooking of soybean meal decreases digestibility of amino acids (Lee and Garlich, 1992; Parsons et al., 1992). The explanation for the decreased amino acid digestibility and reduced growth responses appear to be related to the Maillard reaction with cross-linking involved to a lesser extent.

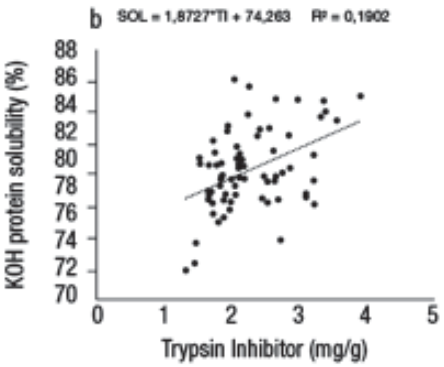
Correlation of TI (AOAC) & indirect Parameters for SBM quality:

Currently, the analytical technique most commonly used to measure soybean meal quality is protein solubility, perhaps combined with the urease test. The urease test has been used for some time as a measure of soybean meal processing. Trypsin inhibitors (TI) and urease activity (UA) are the two most relevant quality measurements for soybean products as feed ingredients for animals. TI were reported to be correlated with UA, so feed processing plants use UA as an indicator of TI in soybean meal (SBM). Chen et.al (2019) conducted a study to determine the levels of TI and UA in 414 SBM samples from 19 different countries and to validate whether TI and UA are correlated. They found that TI were poorly correlated with UA in solvent extracted SBM samples, suggesting that UA should not be used as a surrogate indicator for TI content in soybean products.

➢ 414 SBM samples / 19 countries



➢ 70 SBM samples / Brazil



Recent studies shown poor correlation between TI and Urease Activity and a better but still poor correlation between TI and solubility

Araujo et al. 2019 Chen et al. 2019

Araujo et al (2019) conducted similar study to determine the correlation of TI and KOH Protein Solubility.

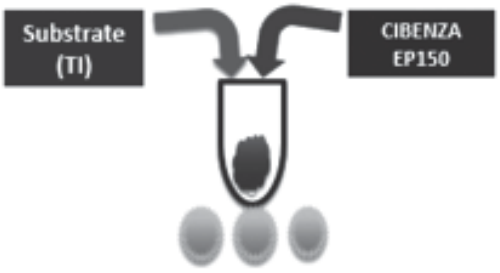
Analytical characteristics of common types of soy protein products

Product type	Unit	Soybean seeds	SBM	Enzyme treated SPC	Alcohol extracted SPC	SPI
Humidity	%	10 - 12	10 - 12	6 - 7	6 - 7	6 - 7
Crude protein	%	33 - 17	42 - 50	55 - 60	63 - 67	>85
Fat	%	17 - 20	0.9 - 3.5	2.5	0.5 - 3.0	0.1 - 1.5
Ash	%	4.5 -5.5	4.5 - 6.5	6.2 - 6.8	4.8 - 6.0	2 - 3.5
Oligosacharides	%	14	15	<1	<3.5	<0.4
Stachyose	%	4 - 4.5	4.5 - 5	<0.3	1 - 3	<0.2
Raffinose	%	0.8 - 1	1 - 1.2	<0.2	<0.2	<0.1
Trypsin inhibitor TIA	mg/g CP	45 - 60	4 - 8	1 - 2	2 - 3	<1
Glycinin	mg/g	150 - 200	40 - 70	<0.1	<0.1	<0.01
β-conglycin	mg/g	50 - 100	10 - 40	<0.1	<0.1	<0.005
Lectins	ppm	50 - 200	50 - 200	<1	<1	<1
Saponins	%	0.5	0.6	0	0	0
Phytic acid bound P	%	0.6	0.6	0.6	0.6	-

SBM = defatted soybean meal; SPC = soy protein concentrate; SPI = soy protein isolate.
Adapted from: Hansen (2003) and Peisker (2001)

How to deal with TI in SBM?

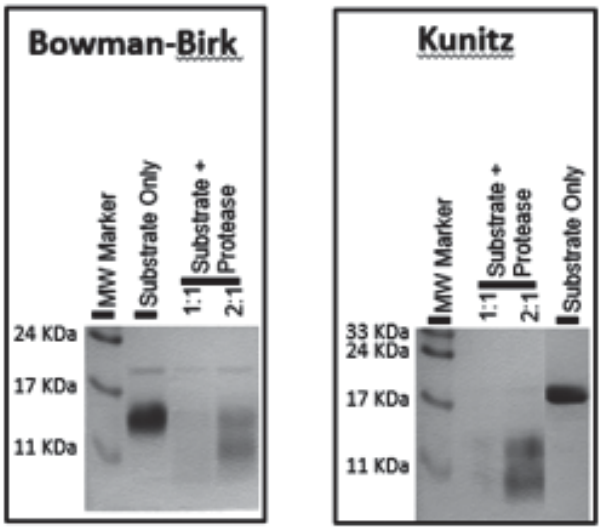
Soybean meal (SBM) is the most important source of dietary protein for poultry. Although TI is reduced by heat treatment, overheating has a negative impact on protein quality and amino acid digestibility. Exogenous Protease enzymes can improve digestibility of feedstuffs, lower feed costs and improve animal performance. Proteases



TI: CIBENZA EP150	Trypsin inhibitor (µg) - substrate	CIBENZA EP150 (µg)
1:0	15	0
1:1	15	15
2:1	15	7.5

THE UNIVERSITY OF SYDNEY

Liu 2013



In vitro degradation of TI with CIBENZA EP150
KDa = molecular mass of the TI

CIBENZA® EP150 can destroy almost all trypsin inhibitors present in soyabean meal (at 1:1 ratio) and destroy substancially even in higher concentración (2:1) of TI as well

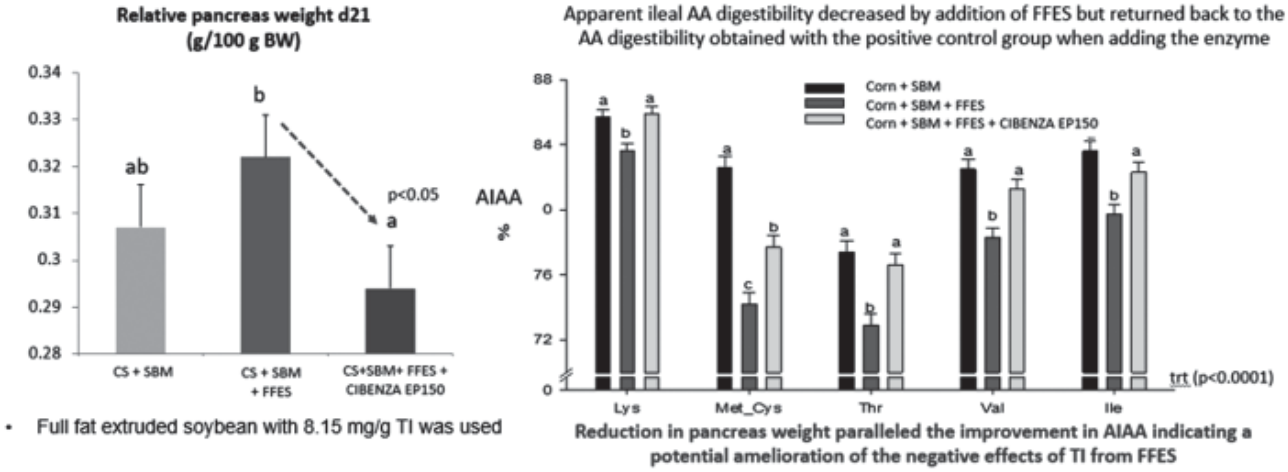
improve animal performance and nutrient digestibility by decreasing digesta viscosity, improving endogenous enzyme activity and decreasing pancreas weight (Bedford and Classen, 1993; Bedford and Schulze, 1998; Erdaw et al., 2017a,b; Yan et al., 2017).

As mentioned earlier the determination in the laboratory of the TI content of SBM and its relationship with AA availability is tedious and time-consuming and provides inconsistent results. Also, the traditional processes of treating SBM can't remove the anti-nutritional factors to a safe level. Therefore, use of exogenous protease is very effective in reducing the deleterious effect of TI in SBM. *Liu et al.,* in 2013 conducted a study wherein they used a protease enzyme (Cibenza EP150) with different levels of TI and found that protease enzyme was able to destroy almost all trypsin inhibitors (both Bowman-Birk & Kunitz TI) present in soyabean meal (at 1:1 ratio) and destroy substancially even in higher concentración (2:1) of TI as well.

Wedekind et al., in 2020 showed that addition of exogenous protease (Cibenza EP150) in a diet containing FFS(with TI 8.15mg/g) improved the amino acid digestibility and at the same time reduce the pancreas weight also indicating a potential amelioration of the negative effect of TI from FFS.

Conclusion:

There are lot of scientific evidences on the negative effect of soybean trypsin inhibitors in chickens. They can not only adversely affect the productive performance of chickens but can also impair their intestinal health. The beneficial responses of protease are likely due to decreases in endogenous amino acid losses, but in vitro evidence also demonstrates the ability of protease to hydrolyze Bowman-Birk and Kunitz-trypsin inhibitor proteins. Thus, there might be both direct and indirect mechanisms whereby amino acid digestibility is improved with proteases and so is the bird's performances.



Wedekind et al., 2020

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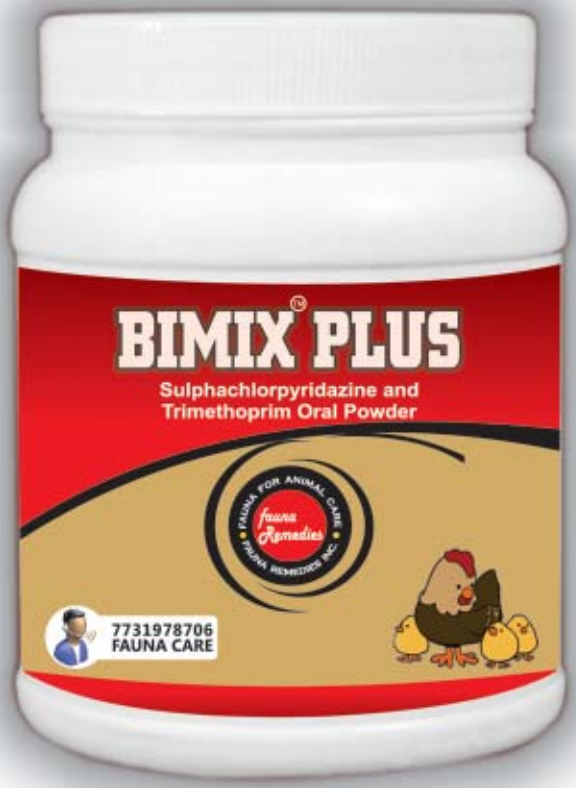

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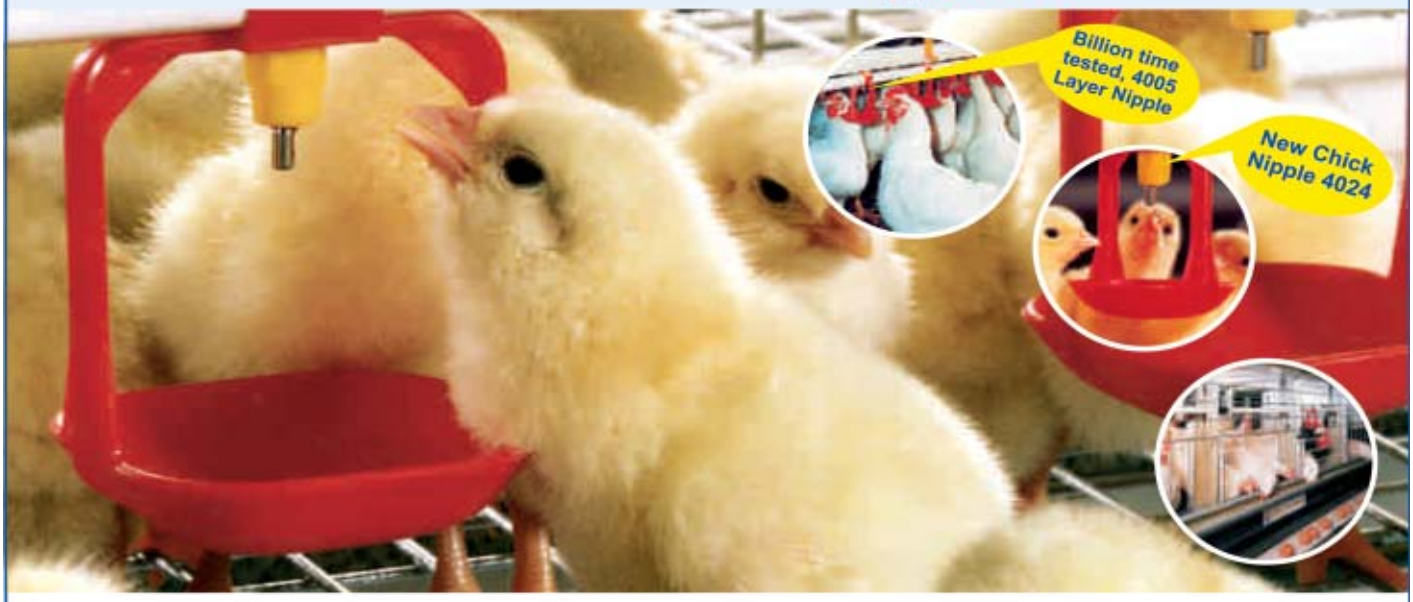

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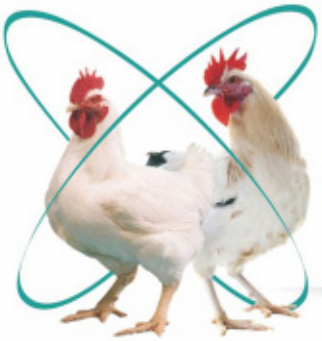

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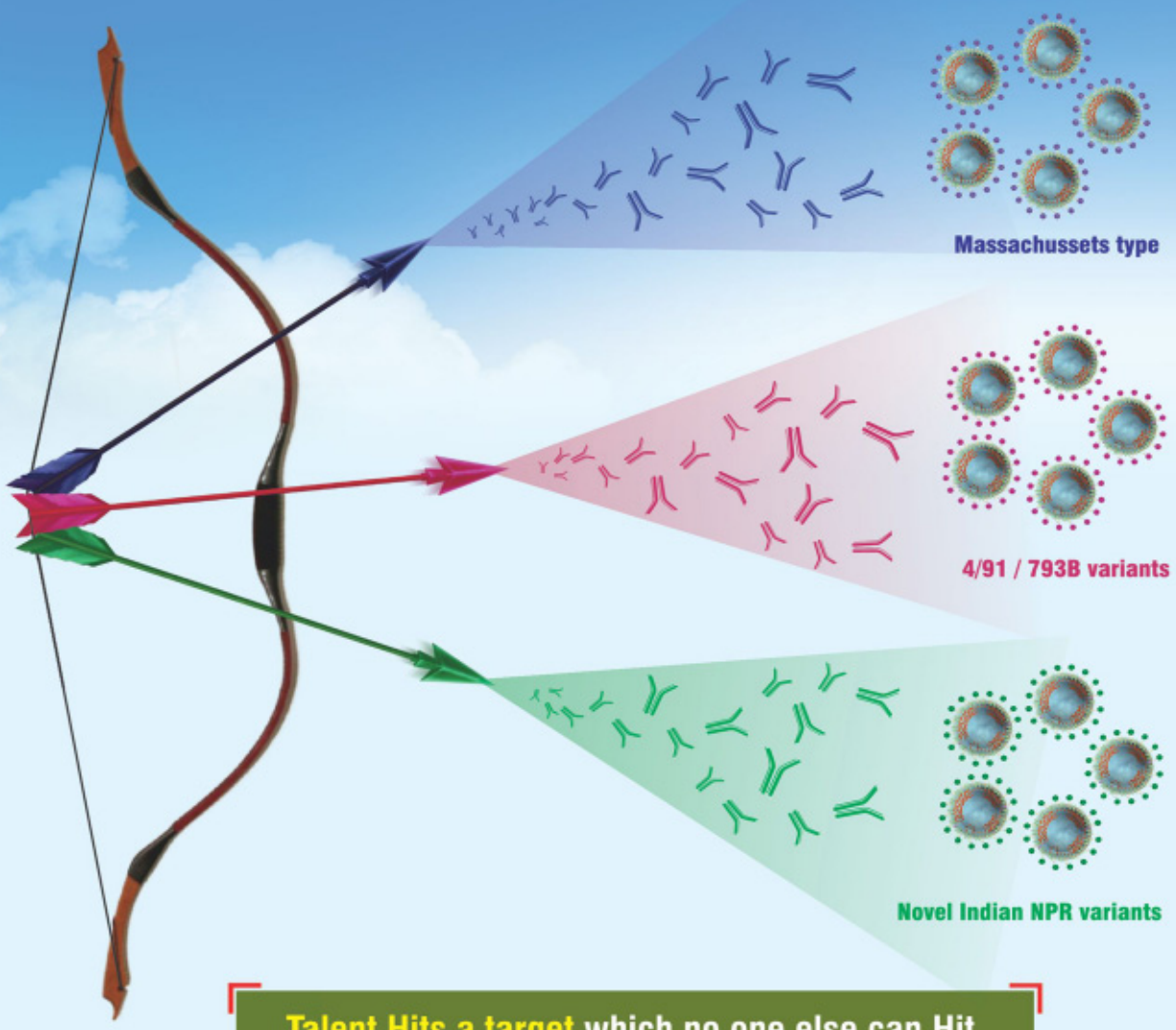

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