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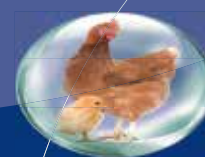
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## EDITORIAL

### *Poultry seminars and farmers*

Of late, the Indian Poultry Journalists Association (IPJA), a pack of dedicated journalists has embarked upon conducting Technical Seminars across India to educate and update the technical know-how of the Indian poultry farmers. There is no denying that in the present world the technology has made possible the rapid share and exchange of information across the world.

Headed by the vibrant IPJA President- Mr BS Rana, technical seminars have been organized in Nashik, Bhubaneswar, Patna, Ranchi and many more is scheduled for future. Knowledge is the ultimate tool that sheds our limitations and paves way for a better tomorrow. Knowledge is a source of light that wipes out the darkness of our life.

Development in any sector is impossible, if the knowledge is not shared or updated. The IPJA members take all strains to rope in the best speakers who are authority on their subject and are a store house of latest technical updates in their field. After their presentation these technical experts interact with the poultry farmers and clear their doubts.

Now let us discuss the necessity of latest information for farmers. Well unless you have the latest information, you cannot move with the times in this ever competitive world market. So knowledge sharing is a fundamental necessity for everyone in business. This knowledge sharing helps the poultry farmer to apply new techniques to augment their production as well as their earning.

*Editor*



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This way you can keep yourself updated on the latest know-how on poultry. The news and articles displayed are very informative.

Thanks  
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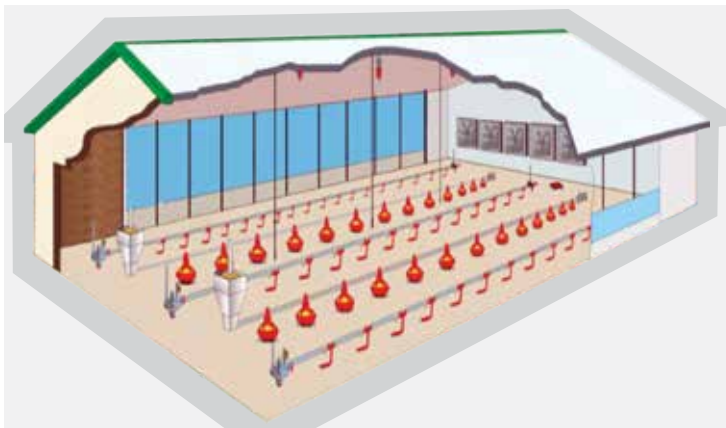
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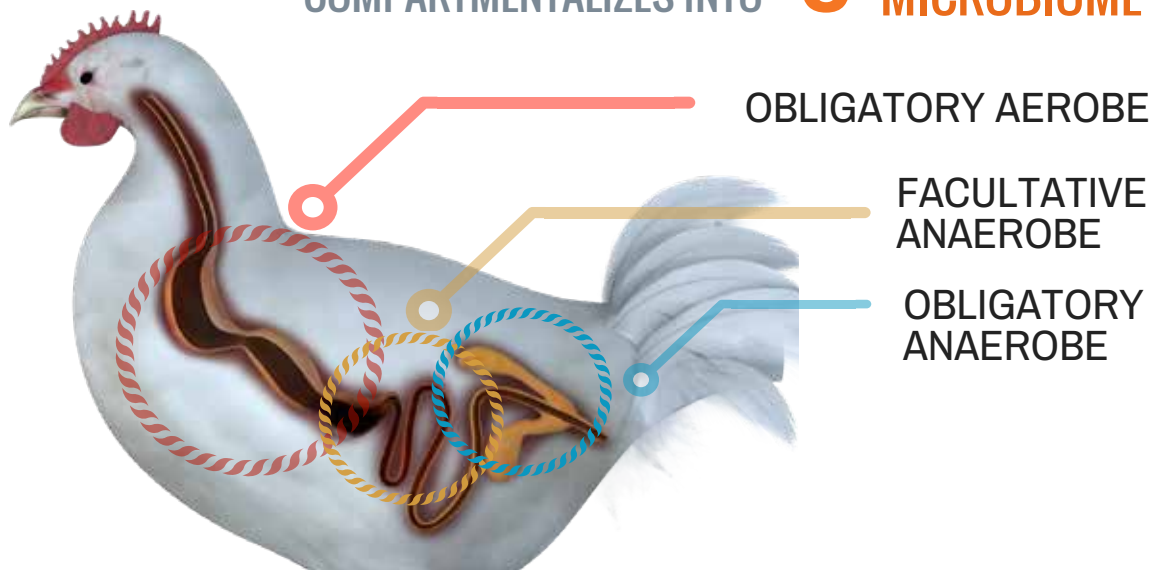
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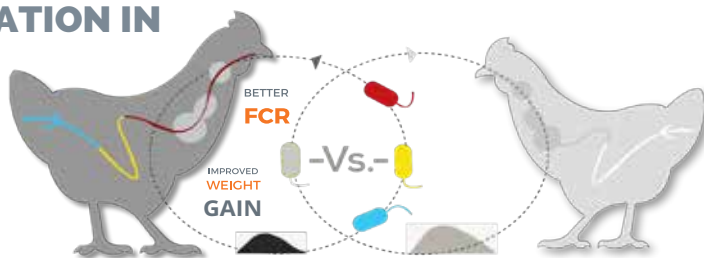


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industry and we were determined in uplifting our stakeholders and providing them with the proper tools to help grow their business. With our strong guiding principle and a will to stay true to our commitment, we now have organized over 30+ farmer meets. Our aim is to conduct 100 farmer meets to expand our nexus and helping reach the most distant farms in our country. Along with adopting and maintaining healthy farm practices, we also provide 24x7 customer support and wide range of products. All our products are manufactured using the best state of the art feed mills and undergo high levels of quality checks at every stage of the production process. Through all our products and our farmer meets we stand true to our principle of Making Good Always by providing precise nutrition by accurate formulation.

measures for the flock forms the content of the farmer meets. A variety of other topics that the discussion revolves around are the growth and health of the flock, different types of nutrition required by different breeds and farm practices evolving with the season in our country. These topics have created quite a buzz and have

driven the attention of farmers in these meets. We have seen participation of many veterinary doctors, who have guided the farmers in adopting and maintaining healthy farm practices. When we first started this initiative, we came across a lot of farmers relying on the old out-of date methods of poultry





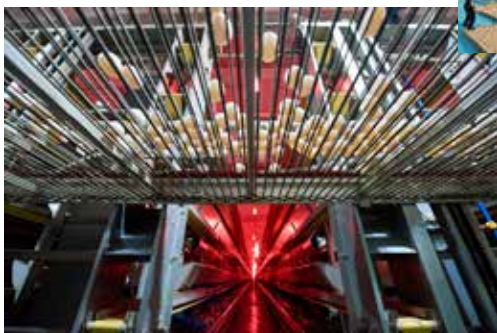


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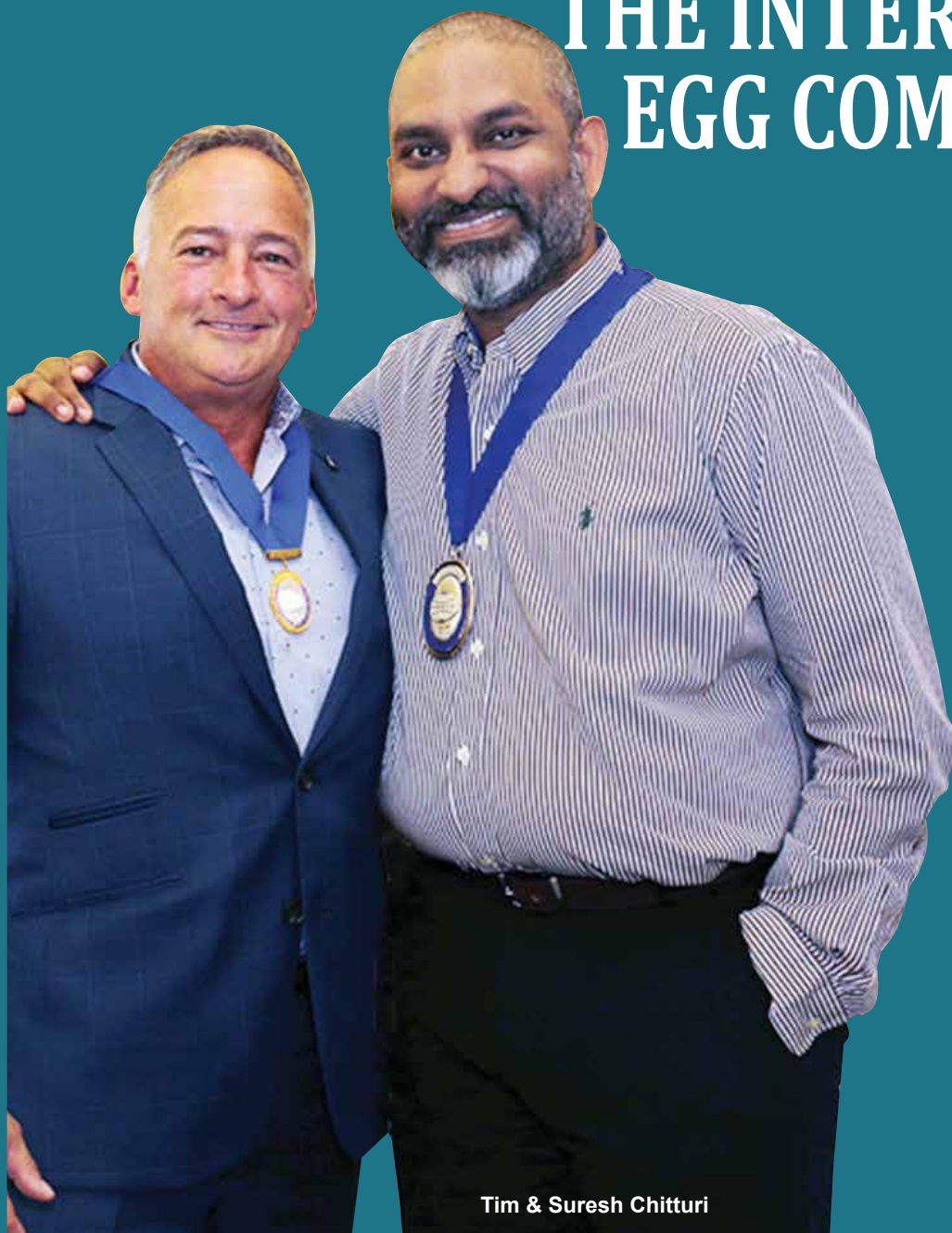


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## Hyderabad

*Suresh Chitturi, Vice Chairman and Managing Director of Srinivasa Farms, has been appointed as Chairman of International Egg Commission (IEC) on 26th September, 2019 at the IEC Global Leadership Conference in Copenhagen, Denmark.*

*Suresh will be the first chair from Asia in the history of the institution, as he assumes the role as the Chairman of IEC. He will hold the position for the next two years. His work has been recognized at a global level as he is engaged in advocacy for the poultry industry, internationally and his election into this coveted position is a proof of that.*

*Suresh Chitturi is the name to reckon with in the Indian Poultry Industry. He is the most successful and influential leader with sheer business acumen. Suresh has joined the company as Managing Director in 1990s and since then lead the group by carving his own path and diversified the company into new business areas of Feed, Chicken Processing, Broiler Integration, Mega Food Park. Under his able guidance and leadership, the srinivasa group set international benchmarks for success and became an efficient and aggressive company in the Indian poultry industry. The group witnessed a rapid growth with his vision and passion for excellence.*



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Suresh Chitturi &amp; Tim Handshake



Tim &amp; Suresh Chitturi, handover

At Srinivasa, Suresh leads the team of business executives and strongly believes in nurturing and empowering leadership on their way to success in creating value to all the stake holders.

Suresh is an inspiring speaker known for his in-depth knowledge and articulation in representing the industry. He has been widely featured in a variety of top publications and electronic media channels and has won numerous recognitions. He has been named as the “Best CEO in Poultry Award 2016” by Poultry CEOs Forum India & PF Awards 2016. He is the 2nd Indian to be the Vice-Chairman of the International Egg Commission (IEC), U.K.; Councillor for The International Egg Commission Foundation, Co-founder and Board Member of TiE Amaravati and the Vice President of All India Poultry Breeders Association. He was earlier the Chair of Confederation of Indian Industry (CII), AP State Council for two consecutive terms.

With a bachelor’s degree in engineering in IT from RV College of Engineering and an MBA from Goizueta Business School, Emory University, U.S.A, Suresh’s penchant for academic pursuits has earned him the distinction of successfully completion of ‘The President’s Programme in Leadership’ from Harvard Business School.

He is an avid reader, widely travelled and a passionate wildlife photographer.

#### About IEC

The International Egg Commission is the global network for the egg industry. It has members in over 80 countries around the world. It was established at the second International Egg Conference in Bologna, Italy, in 1964.

The London, UK-based commission has a number of goals. Among these are the fostering of international cooperation among all sectors of the egg industry, encouraging the development of better statistics and market intelligence for shell eggs and egg products, and collecting and publishing such data, and encouraging the harmonization internationally of marketing standards for shell eggs and egg products.

The IEC in fact, is the only organization that represents the global egg industry. As the global voice of the egg industry, the IEC has the responsibility to discuss industry issues as well as to maintain links with other international organizations.

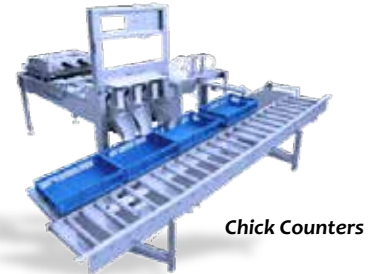
The IEC is able to act as a communication link between industry and international regulators / decision makers, and therefore takes positions on a range of issues.

IEC established International Egg Foundation (IEF) in 2014 to work as an independent charitable foundation.

The IEF’s goals are to help implement the United Nations Sustainable Development Goals and increase egg production and egg consumption in underdeveloped countries to provide undernourished infants, children and families with an independent, sustainable, high-quality protein supply. To achieve these goals, the IEF works alongside the world’s largest and most effective charitable foundations and with the world’s largest egg businesses to help ensure high-quality protein is accessible to everybody no matter who they are or where they come from.



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# NOVUS INTERNATIONAL STRENGTHENS ITS PRESENCE IN SOUTH ASIA WITH ITS NEW OFFICE AT CHENNAI

■ Chennai

NOVUS International a global leader in Methionine and feed additive solutions, with headquarters in St. Louis, Missouri, U.S., celebrates more than 20years of presence in India by opening of a new office on 25th Sept'2019 in Kosmo One, Ambattur Industrial Area, Chennai (India). Because of increased business volume and expansion

plans, NOVUS-South Central Asia office is shifted to a new and bigger space in Chennai to accommodate more head counts and resources to support its growth. The new office strengthens the presence and expansion plans of NOVUS International in South Asian animal health and nutrition market.

Through its new office in Chennai, NOVUS International will have the ability to satisfy the needs of the region. As a leader in the industry,

NOVUS International strategically selected the new location to accommodate the increase in market demands in the region.

**First Day**

We are excited about our new office in Chennai, India and are ready to enhance our footprints in South Asian Markets” said Fraudeau Francois, NOVUS International’s





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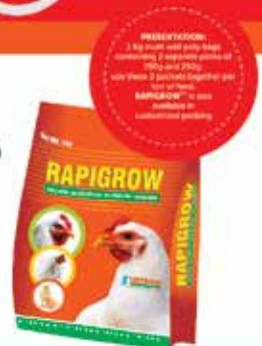
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President and CEO

To celebrate the opening of this new office, NOVUS organized an 'Open House' event on 24th and 25th Sept that is attended by over 90 customers, business partners, consultants, media persons in addition to global and Asia leadership teams of NOVUS.

"The new office demonstrates our long-term commitment to increasing our presence and serving our existing and new customers in South Asia", said David Dowell, Chief Operating Officer, NOVUS-International.

NOVUS International has significantly increased its focus and resources in South Asian markets during the last year. "South Asia is one of our primary growth markets and we'll continue enhancing our presence and offerings in the region", said Dr. Vaibhav Nagpal, Chief Commercial Office-Asia, NOVUS International.

"It's our pleasure to host our customers, business partners, NOVUS' global leadership team and colleagues from Asia Management team to celebrate the opening of our new office. We are committed to adding more value to our customers through our innovative products and solutions in the coming years", added Neeraj Kumar Srivastava, Managing Director, NOVUS-South Central Asia.



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# DSM ANNOUNCES CARLOS SAVIANI **AS** GLOBAL SUSTAINABILITY LEAD FOR ANIMAL NUTRITION AND HEALTH

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*Carlos Saviani, Global Sustainability Lead, DSM said: "DSM's Animal Nutrition and Health is achieving great success in driving the organisation's purpose-led agenda. With the growing demand for animal proteins and the growing need to improve its sustainability, I am proud to join an organisation that places a key focus on sustainable animal production through innovative nutritional solutions and technologies."*

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Royal DSM, a global science company in Nutrition, Health and Sustainable Living, today announces the appointment of Carlos Saviani as Global Sustainability Lead for Animal Nutrition and Health. Carlos Saviani will play a key role in the further development and rollout of the company's animal nutrition purpose-led sustainability strategy. He will focus on engagement with customers and associated stakeholders in the global animal protein value chain.

David Nickell, Vice President for Sustainability, Animal Nutrition and Health said: "I am pleased to welcome Carlos to our DSM Animal Nutrition and Health team. We have a growing pipeline of projects and are excited to have a new team member of Carlos' calibre join as we continue to drive our purpose-led sustainability strategy."

Based on expertise in human and animal nutrition, as well as environmental science, DSM enables sustainability in proteins: from plant-based proteins to meat, dairy, eggs and fish. This includes a focus on key challenges such as reducing greenhouse gas emissions and limiting nitrogen and phosphorous residues, while keeping the highest nutritious standards and ensuring good livelihoods.

Carlos Saviani, Global Sustainability Lead, DSM said: "DSM's Animal Nutrition and Health is achieving great success in driving the organisation's purpose-led agenda. With the growing demand for animal proteins and the growing need to improve its sustainability, I am proud to join an organisation that places a key focus on sustainable animal production through innovative nutritional solutions and technologies."

Prior to joining DSM, Carlos Saviani served as Vice President of the World Wild Fund's (WWF) Food Sustainability team, and led the organisation's efforts to promote the adoption and implementation of sustainability for meats, seafood, and dairy products by large influential companies across the animal protein value chain.

Carlos Saviani has over 26 years of professional experience in different aspects of the global livestock value chain, from managing a beef ranch to holding roles in organisations such as Genus ABS, Zoetis/Pfizer AH and Merial/Sanofi. He has also sat on the boards of the Global Roundtable for Sustainable Beef and DSM's sustainability partner, the International Egg Foundation.





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# 33RD EDITION OF SPACE 2019

## A GRAND SUCCESS - RICKY THAPER

### ■ Rennes, France:

**S**PACE 2019, Thirty-third edition of four days of "Planet Livestock" organized at the Rennes Exhibition Centre, Rennes, France from September 10-13, 2019 was a great success and boasted a cheerful and positive atmosphere. Poultry, Dairy and Aqua farmers working in all types of animal production were able to enjoy the Expo, which is aligned with the image they have of their profession as a constructive, 21st-century sector.

SPACE 2019 brought together 1,400 exhibitors from 42 countries, and 1,05,318 visitors, including 14,706 international visitors from 122 countries. SPACE Expo was marked

by the participation of many delegations from Africa, the continent in the spotlight this year—Senegal, Cameroon, Nigeria, Mali, Guinea Conakry and Côte d'Ivoire all came to SPACE with very specific objectives of promoting poultry and livestock development in their countries. Delegation from Russia with its national agency for the development of organic agriculture; China, with a delegation led by the Vice-Governor of Shandong Province; Kazakhstan with its Vice-Minister of Agriculture and its Ambassador to France; and many more.

Mr. Marcel DENIEUL defines this SPACE 2019 Show as one of the commitment. He wants farmers to rediscover pride in their profession.



*Mr. Ricky Thaper with Mr. Marcel DENIEUL, President, SPACE*

He added that Exhibitors at SPACE 2019 unanimously praised the quality of contacts they had with visitors during the four day event.





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*At Aviagen - Ross booth, Mr. Ricky Thaper with Mr. Magnus Swalander, General Manager, Aviagen Limited, Scotland, United Kingdom*

This professionalism, in a globalised world, clearly reflected the constructive and fluid tone of this year's expo.

The official visit in the presence of Didier Guillaume, Minister of Agriculture and Food, as well as Loïg Chesnais-Girard, President of the Brittany Region, provided an opportunity for various stakeholders in the poultry and livestock sector to express their expectations regarding the future orientations of our agriculture, which is going through a period of transition. During the four-day event, SPACE facilitates interactions and networking in its mission to help farmers cope with the changes occurring in the livestock sectors.



*Mr. Ricky Thaper with Ms. Ane Marie QUEMENER, Commissaire Generale / General Manager, SPACE*

According to Ms. Ane Marie QUEMENER, Commissaire Generale / General Manager SPACE, over 33 years SPACE has become an essential event for all. Created by the leaders of the agricultural organizations, it was designed



*Mr. Marcel DENIEUL and Ms. Ane Marie QUEMENER and SPACE Team Group Photo with Innov'Space award-winners*

to be a place to meet debate and exchange ideas, for all farming related professionals.

SPACE 2019 once again showcased innovation in livestock farming thanks to 46 Innov'SPACE winners and four Top Choice awards. Sustainability, health excellence and animal welfare, digital technology and improved working conditions were the main areas addressed by these new products.

Ms. Cecile BERTHIER, Assistant Exhibition Information & International Press said that SPACE is a key event and a global forum where international exhibitors and visitors meet and share ideas. Ms. Amandine Leroux, International Officer added that for foreign visitors, visits to poultry, dairy & sheep farms and agro industrial facilities were arranged. These tours were supported by ADEPTA and Ministry of Agriculture and Fisheries.

While interacting with exhibitors, they rated SPACE as very high quality trade show. All delegates visiting SPACE Expo appreciated the arrangements at Expo by the organizers especially at the International Club which had all facilities of translators, business meetings and refreshments for the international visitors.

This event focused on Innovation- bringing together buyers and sellers of the latest technology of products and services to make trade visitors business successful. A good



*Mr. Ricky Thaper with Ms. Cecile BERTHIER, Assistant Exhibition Information & International Press and Ms. Amandine Leroux, International Officer*

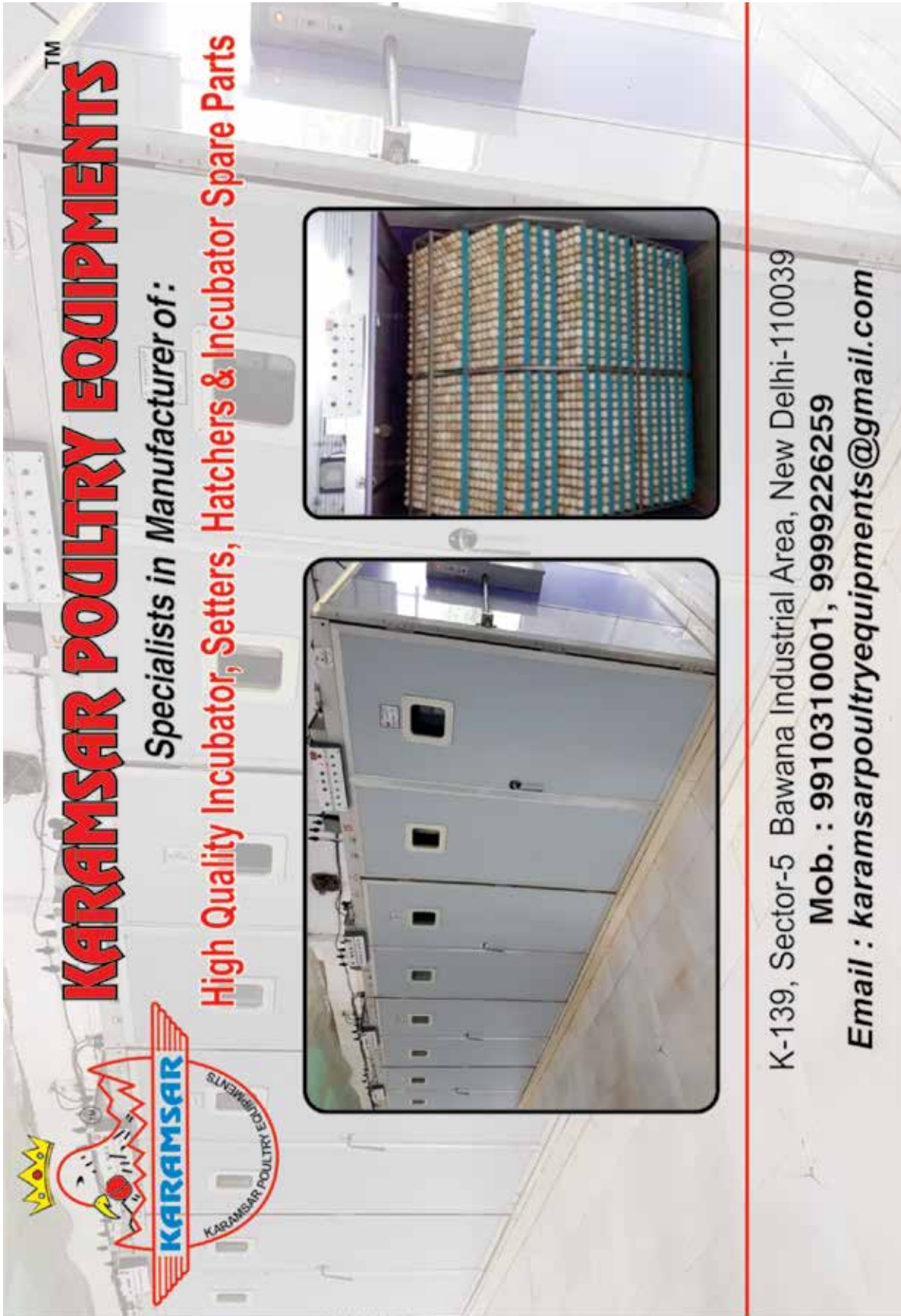
number of conferences, debates and seminars that took place during the four days gave this year's event a new dimension, as poultry and livestock farmers were able to express their needs and expectations, in line with the ambition of the creators of SPACE. This year SPACE also opened its doors to aquaculture by organising two conferences on the topic, as well as a tour of a fish farm, and by clearly identifying companies offering solutions for this sector.


The 33rd edition of SPACE concluded with an excellent record in terms of discussions and contacts, based on trust, in a spirit of construction and progress. The 34th Edition of SPACE will be organized from September 15-18, 2020 at the Rennes Exhibition Centre, Rennes, France



*Group photo at Huvepharma booth*







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# THE GREEN EGG DAY

## RAISING AWARENESS OF A PRECIOUS PROTEIN SOURCE

### ■ Bangalore

**G**REEN Egg Campaign is a flagship event of Delacon Biotechnik GmbH, Austria, was celebrated on 14th Sept 2019 at Bangalore, INDIA. The Green Egg Project is a global campaign within the framework of Delacon's Corporate Social Responsibility activities. The main aim of this project is that people especially children enjoy eating eggs, while educating them about the nutritional and health benefits of this sustainable source of animal protein, strengthen and support the local layer industry and with a global cause of feeding world with safe and sustainable food.

The Green Egg Day was organised at Govt.

Model Primary School, Govt. High School and Govt. Pre-University College campus of Kodigehalli, Bangalore. The total students attended the program were 1158 along with the 45 teaching and support staff. The chief guest of the function was Dr Mohamed Nadeem Fairoze, Former Professor and Head, Department of Livestock and Technology, Veterinary College, Bangalore. The Guest of Honour was Dr Raghavendra Bhatta, Director ICAR- NIANP, Bangalore. Ms Gina Medina, Group Leader Asia, Delacon Singapore Pvt Ltd, came specially to attend this event and meet and know the students of India. This was her maiden visit to India.

The event began with traditional folk dance of Karnataka state wonderfully performed by students of Govt. Higher Secondary School, Thindlu, Bangalore. The students and other audience were mesmerised by the stunning performance of the folk dance by the small school kids.

Now it was the turn to make students learn more about the nutritional and magic power of eggs. Prof. Nadeem elaborated the nutritional values of eggs and emphasized on the need of taking two eggs per day. He said that each student should go back to their home and ask their parents to give them at least one egg per day which will make them healthier, intelligent

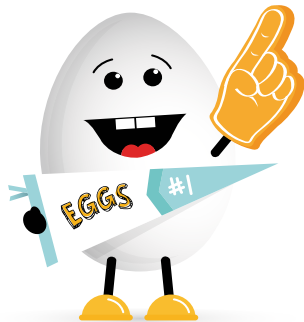


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and successful person in life. Dr Nadeem also answered the questions raised by students about the egg white and yolk. He clarified the myth of not eating yolk by most of the people, thinking that it increases the level of cholesterol in the body etc.

Dr Raghavendra Bhatta gave very impressive facts about eggs and told students that having eggs and proper nutrition can help them in overcoming the malnutrition problem and

brighten their future. Eggs helps in development of brain and eventually helps the students to score good marks in exams and succeed in life.

Mr Ramesh Kumar, Principal of PU College explained in detail about the nutritive value of eggs and requested students to refrain eating junk food and very oily food stuffs which are not healthy.

Ms Gina Medina was very happy to see the enthusiasm and participation of kids. She



interacted with students about their health, studies and culture. She also told them to ask your mother to include eggs in your meals every day.

As a support to the school for their new building, Delacon installed one water purifier with capacity of 250 litres per hour for students to get purified drinking water. Delacon also donated text books to 10 meritorious under privileged students of 1st year PU of science faculty. This will help them to secure good marks in exams and excel in their lives.

Delacon distributed pack of 6 eggs to each student so that they take home the eggs and spread the message of eating eggs regularly at home. They were also given refreshment to eat then and there. Nearly 7200 eggs were distributed on that day to students, teachers and support staff. The principal Mr Ramesh Kumar, the management of school appreciated the program and praised Delacon for selecting their school and conducting the event. It was a new and innovative program for them.

Dr Jeetendra Verma, Regional Manager Delacon conducted the program and lastly proposed the vote of thanks. Delacon acknowledges the support of Mr Seshaiiah, Sravan Poultry Farm, Anekel, Bangalore for providing the clean and fresh eggs and packing them for the occasion.





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# ILDEX INDONESIA 2019 WAS A GREAT SUCCESS

## NEXT STOP HO CHI MINH CITY, VIETNAM!

- 12,200 trade participants from 40 countries, which was a 34% increase from 9,100 trade participants in 2017
- 250 International leading companies in 10,000 sq.m. organized at a new venue, ICE BSD City, Indonesia for the first time
- 80 Business Matching successes during the 3 days of the exhibition
- 48 Conference sessions which were 12 academic sessions and 36 technical sessions
- 91 Speakers who were 18% International and 82% local
- Professional Conference attracted 2,032 local and international delegates

### ■ Jakarta, Indonesia

ILDEX Indonesia 2019, the fourth edition of the International Livestock and Dairy Meat Processing and Aquaculture Exposition, drew to a close in mid-September, having showcased 250 leading exhibitors from 25 countries and 12,200 trade participants from 40 countries. The specialist trade fair presented a variety of high technology, the latest equipment and full business solutions for the Livestock and Aquaculture industries. As there was interesting technology in all areas on display, visitors were able to get hands-on experience of the latest in livestock equipment for farming, get new ideas to develop their businesses, meet consultants to expand their businesses into the Indonesian market and also acquire knowledge from the conference sessions. Furthermore, the new zones, the Animal Live Show and Waste Management, also attracted the attention of all visitors.

The next stop will be ILDEX Vietnam in Ho Chi Minh City, Vietnam during 18-20 March 2020

and 65% of the space has already been reserved.

ILDEX Vietnam, the eighth edition of the international livestock, dairy, meat processing and aquaculture exposition, has become the leading trade exhibition in the Asia region with strong attendance and plentiful business opportunities. Livestock experts and leading exhibitors have stated that it is the best marketplace and international business platform for the Vietnamese market. The exhibition is from March 18 to 20, 2020 at Saigon Exhibition and Convention Center, Ho Chi Minh City, Vietnam, and delivers the highest quality and the greatest variety of new technology, equipment, services, and businesses with numerous high quality local and overseas trade buyers. The new theme will be 'Meat Processing'. Vietnam's livestock consumption has risen significantly over the last decade from 3.5 million tons in 2013 to 3.6 million tons in 2014, and is forecasted to

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reach 4.5 million tons in 2019. With so many of the right pieces in place, and the country's growing economy set to yield a large reward for any company that efficiently delivers what the public is already demanding, opportunities are ripe for investors with a clear-headed approach to further develop Vietnam's meat industry.

Dr. David Marks, Consultant of JEFO Nutrition INC. (International speaker) said that "This is the first time that I have attended ILDEX Indonesia and I enjoyed it very much. This is a good show with a good range of exhibitors, visitors, professional people and a good crowd of people coming to visit the exhibition. It's very professionally organized. I would encourage everybody in the poultry industry to come to the ILDEX exhibition. You will learn a lot from the exhibitors and the variety of seminars."

SittipornPraneenij B.Sc.:DVM., Senior Vice President Veterinary & Animal Health Business

Line of Charoen PokhandCo.,Ltd. (International Buyer)said that "For somebody who might not have business experience in a country like Indonesia, I would like to invite all of you to be a part of ILDEX Indonesia. This country has a different culture from the other countries in Asia. As I have worked there for 3 years, I totally confirm that you can learn a lot of things from Indonesian people. So ILDEX will be a very good exhibition for the Indonesia market."

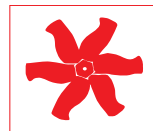
Ms. Rashidah Ibrahim, Malaysia Vaccines & Pharmaceuticals (International Buyer) said that "ILDEX is an international event for all livestock industry players to meet and explore new products, new technologies and also make business connections. This is the first time that have I visited here. I could connect with the exhibitors and industry stakeholders here and also see the potential for the future. Maybe at the next edition we will participate here again as an exhibitor."



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Panelists with Mr BS Rana

# IPJA TECHNICAL SEMINAR AT NASHIK A PHENOMENAL SUCCESS

*The Seminar began with welcome address by Mr. BS. Rana President, Indian Poultry Journalists Association. He welcomed all the dignitaries, poultry farmers and sponsors at this technical seminar and was glad to see the huge participation of around 600 poultry farmers at this venue*

## ■ Nashik

The Indian Poultry Journalists Association (IPJA) Technical Seminar organized at Hotel Express Inn, Nashik, on September 28, 2019 was phenomenal success in a sense that it witnessed a colossal congregation of delegates encompassing hatcheries, integrators and the entire Western India.

The seminar started with Ganesh Vandana and lighting of Inaugural Lamp. The delegates remembered Late Padmashri BVRao, the doyen of Poultry Industry, who deftly chiseled the very foundation of Indian poultry to amazing heights from Western India. Bigwigs of Poultry like Anil Dhumal, founder President of Indian Poultry Equipment Manufacturers Association, past President, Mr. Harish Garware, newly elected President Mr. P. Chakardhar Rao, INFAH President Dr. DK Dey, Mr. Uddhav Aher, Mr.

Krishna Gangurde, Dr. Anil Phadke, paid floral tribute to Late Dr Rao.

The Seminar began with welcome address by Mr. BS. Rana President, Indian Poultry Journalists Association. He welcomed all the dignitaries, poultry farmers and sponsors at this technical seminar and was glad to see the huge participation of around 600 poultry farmers at this venue.

He said we are indebted to, the contribution of Late Dr BV Rao, who had a dream of seeing Indian poultry at the top of the world. So to realize his dreams, we have started to educate our poultry farmers, on the latest information available across the world. Dr Rao laid the foundation of our vibrant Indian poultry decades ago, and we are trying our best to accelerate it to greater levels of accomplishment. In other words all are efforts, is a tribute to the father of

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*Anil Dhupal pays homage to Late Dr BV Rao*



*Mr BS Rana welcomes Mr Uddhav Aher*

Indian poultry-Dr BV Rao.

By implementing the latest information, the Indian poultry production will achieve great heights in terms of volume, quality and global trade. The technical seminars that we organize across India have the best speakers and we create a very convincing atmosphere for the farmers to interact with the technical experts.

Nashik is a location with immense potential and huge poultry activities in and around this area. Moreover, Maharashtra has been a hub of hectic poultry activities, since decades and has a sizable poultry contribution on the national level. This seminar shall highlight, the important aspects of poultry production delivered by the experts, he added.

Indian Poultry Journalists Association has been consistent and proud organizer of successful poultry seminars across India. Here on behalf of IPJA, he stated that, we are a non-profit organization. He stated that this year we organized such seminars at Hyderabad, Namakkal, Patna, Ranchi and Bhubaneswar, with huge farmer attendance and well appreciated by poultry fraternity. The present rise of the Indian poultry sector is due to the efforts of the private players and the government has a minimal role in it.

Apart from this, in an effort to double the agriculture farmers' income, the government has raised the MSP of the crops. This rise in MSP, has raised the price of Maize, Soybean and other cereals, and this again, is a problem for the poultry farmers, as more than 70% expenditure is made on feed.

He stated that we are totally dedicated to the cause of poultry development in India and wish to see that the poultry farmers of this country, implement the latest techniques, and information in poultry production, which is on a par with the world standards.

He said we shall felicitate the star performers of Maharashtra poultry industry and honour them for their exceptional contribution. These people are the heroes, who shape our industry and take it to greater heights.

Well, being very much aware of the limitations of the Indian poultry farmer in terms of exposure and access to latest poultry trends, we have taken this initiative, to provide them with the technical details from our side on this platform to ensure that poultry production conforms to the world standards, he added.

He stressed that to deliver quality information, IPJA has roped in the best speakers, who are masters in their domain and can enlighten the assembled gathering to boost poultry production in India. During the seminar, the farmers can get their doubts cleared by the technical experts, he added.

Mr Rana stated that India is a WTO member and so cannot check the inflow of foreign



*Mr BS Rana welcomes Mr Anil Dhupal*



*IPJA team welcomes Mr Harish Garware*

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*IPJA team welcomes Mr OP Singh and Mr Chakardhar Rao*

poultry players for long and these days, it is extremely difficult to protect the domestic industry of any sector by any country. This means that the product should be competitively priced and quality should be on a par with the world standard. Our efforts, aim to empower our farmers, to attain these two objectives.

With the passage of time, business is becoming more competitive across the world, and for survival, one has to make the desired changes. Moreover, it is a fact that the present day consumers are very health conscious and serious about the ingredient contained in the product, he added.

Consumers today are sensitive enough to discard the edible products with antibiotic residues and compromised product quality. So it is always advisable that the Indian poultry producers stick to adequate bio-security measures, Good Manufacturing Practices (GMP), Hazard Analysis at Critical Control Points (HACCP) and a lot more.

Besides this, the demand for organic food is rapidly increasing, with each passing day. By switching over to organic poultry farming, value added processed products, our poultry producers can hope to make huge gains, as the consumer is always ready to pay for this, he added.

Apart from this, the superior quality products can also ensure huge export potential, which is yet another channel to robust earning by the company. Mr Rana thanked the dignitaries, all my IPJA members, speakers and sponsors, to have tried their best to make this event a grand



*IPJA team welcomes Dr Vijay Makhija*



*IPJA team welcomes Mr Sanjay Nargilkar*

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IPJA team welcomes Mr SK Malhotra

success.

Mr.Uddhav Aher in his Key note address presented on the current status of Maharashtra Poultry. He high-lighted that Nashik is very popular with Kumbh Mela, grapes and onion production but it is identified with Poultry now-a-days. He estimated that out of 27 crores layer population of India, Maharashtra shares at least 2.2 crores producing 1.8 crore eggs every day. While consuming 2.5 crore eggs Maharashtra faces a short fall of 40 lakh eggs, which is procured from Gujarat, Telangana and Tamilnadu. Mumbai alone consumes 1.5 Crores of eggs and rest of Maharashtra consumes

75Lakhs, he added.

Reporting on Broiler position, he claimed that Maharashtra broiler production is 11% which is 4.2 crores while India produces about 38 crore broilers. He said every month 68 lakh birds are exported to Gujarat, MP, Goa and Karnataka borders. He said 80% of farmers are under integration while 20% have independent operations. 65% of Poultry farms are located in Pune, Nashik, Sangli pockets and remaining 35% in rest of Maharashtra, he added.

Referring to consumption patterns Mr. Uddhav assessed that AP,Telangana and West Bengal have 98% non-veg consumers while



Mr BS Rana welcomes Mr Krishna Gangurde



Mr BS Rana welcomes Mr Akshay Dhumal



Mr BS Rana welcomes foreign guests



Mr BS Rana welcomes foreign guests



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Mr BS Rana presents memento to Mr Uddhav Aher

Maharashtra stays as 5th largest consumer with 60%, Gujarat 40%, Punjab 33% and Rajasthan 25% according to Industry Survey and NSSO ARPL analysis. He said Mumbai has a typical distinction with per capita consumption of 26.5 kg (live chicken) and dressed chicken 1.8 kg. Approximately 4-5 lakh birds in week days and 7-8 lakh birds on weekends whereas 12.5 lakh birds during festival days. Bombay alone consumes 1.80 crore birds every month while Pune consumes 1.5 lakh, Nashik 0.75 lakh birds and Aurangabad 0.40 lakhs per day.

Estimating the shares breed-wise Mr. Uddhav

mentioned that 84% Cobb, 12% Suguna and 4% are other breeds while next year share of other breeds is increasing by 10% more. Broiler Breeder placement is estimated to 5 crores per year all over India, 50 Lakhs come to Maharashtra, he added. Hatching Eggs requirement is 5 crores, captive production is 4 crores and approximately one crore come from Telengana and Karnataka while a shortfall of 8 lakh broiler breeders was observed in Maharashtra. Dealing with feed issues, he highlighted the maize productions for the last 3 years during Khariff production.



Mr Shashank Purohit presents memento to Dr SS Nadgauda



Mr MK Vyas presents memento to Mr Harish Garware



Mr MK Vyas presents memento to Dr Rajesh Kokje

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*Mr OP Singh moderating Panel Discussion with Mr Anil Dhumal, Mr Krishna Gangurde & Dr Anil Phadke---*

During 2016-17 maize was produced in 9.14 hectares with average production of 3 tonnes aggregating to 27.42 lakh tonnes. In 2017-18 maize was produced in 8.2 lakh hectares @ 2.5 lakh tonnes per hectare thus only 20.5 lakh tonnes were produced. In 2018-19, 31.5 lakh tonnes were produced in 8.6 hectares @ 2.5 lakh per hectare. In Rabi season also 3.4 lakh hectares, 3.3 hectares and 1.15 hectares @ 3.1, 2.7, and 1.9 lakh tonnes per hectare produced total 10 lakh tonnes, 9 lakh tonnes and 2.2 lakh tonnes produced as per Maharashtra government estimates.

He said poultry consumes 15 to 17 lakh tonnes maize, Starch requirement is 7 to 8 lakh tonnes, popcorn and others 1 lakh tonnes. Population of poultry growth is at 7% per year. Maize

production has come down to 25% due to insect infestation in 2019 Khariff season, he added

**Mr. Uddhav Aher** observed that demand for automation has increased in poultry with best performances quick return of investments within 4-5 years instead of 7-8 years in routine course of farming. He extended this credit to Gartech and Dhumal Industries in revolutionizing the poultry farming in Maharashtra. Explaining his activity in marketing tender of hygienic, fresh chicken in 5 outlets under brand "Prochicken" Mr Uddhav, presented the slide show authored by Shruti Aher.

Dr. S.S. Nadgauda made a fulfilled presentation on Feeding for Top & consistent performance. He said that it depends on biosecurity, proper vaccination and pullet



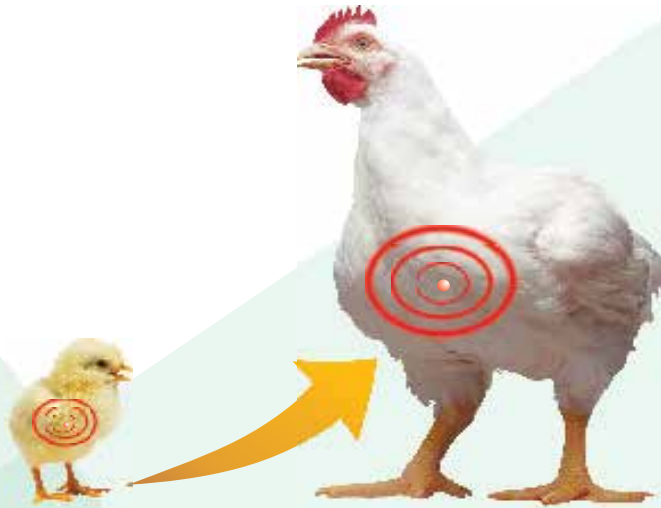
*Mr MN Rao presents memento to Mr Milind Limaye*



*Mr Amit Rana presents memento to Mr Shirish Dhopeswar*



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Mr BS Rana presents memento to Mr OP Singh



Mr NSN Murthy presents memento to Mr Chakardhar Rao



Dr Kakoli Ahmed presents memento to Dr Anand Khandwekar

growth. He cautioned that inadequate ventilation, poor feeding system and imperfect feed quality could only hamper the laying process. As automation is increasing, we find that feeding techniques are improved, wastage is arrested, labour saved and hence better results found with automated feeding farms, pellet feeding also showed better performances, he added. As body weights were abnormal, egg size is also extraordinary. We may achieve egg mass but achieving number of eggs is economic concern in India, he stated. Pre-lay diet has to be prepared carefully and 2700-2850 KCALS energy is required by birds. He said producing big size egg is also a problem as shell problems crop up and breakages are seen so egg size should be controlled. Check for E.coli contaminations frequently, get automatic scales to control body



Prof. Dr Deepashri Desai, Bombay Veterinary College presents memento to Mr Akshay Dhumal



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*Mr BS Rana felicitates Dr Anil Phadke for Outstanding contribution in Integration in Maharashtra*

weights while data collection, data processing and analysis is must for correcting the rearing, feeding and lighting systems, he added.

Mr. Harish Garware gave a presentation on –“Challenges in broiler farming.” He spoke on the adverse conditions and the best farm practices to augment broiler production. He said that with the best breeds, good feeding practices, adequate environmental conditions, optimum FCR and vigilant medication, we can obtain the best results in broiler production.

Dr. Rajesh Kokje gave a power point technical presentation. He said at 35 days, 2.2 KG body weight with 1.5 FCR and below 5% mortality

is indicative of good farming practices and added that we are not achieving this at all at farms or all batches. He said well begun is half done, so one should fully concentrate all efforts when Day Old Chicks arrive as they are very delicate and must be put in a condition so that they can sustain the temperature through space heaters and infra red brooders should be used. He stated that bird should be 1 Kg by 25th day with the first 10 to 12 days important. Along with temperature, air velocity, humidity, proper drinking and feeding system, adequate space given per cubic feet are to be properly monitored.



*Mr BS Rana presents memento to Mr Krishna Gangurde*



*Ms BS Rana presents memento to Mr Anil Dhupal*



*0401 Mr BS Rana felicitates Mr OP Singh*



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Mr MK Vyas looks on as Mr BS Rana felicitates Mr Kinn Neil



0411 Mr BS Rana looks on as Mr MK Vyas felicitates Best Consultant- Dr Dhannaji Patel

Mr. Milind Limaye of Ceva Polchem, gave a detailed presentation on Gumboro Disease which is a worldwide problem with 100% mortality on breakouts and added that Biosecurity is best way to protect from this disease and any failure would attract this disease as it is an immunosuppressive disease. He said onset of this virus follows series of problems. He stated that the vaccine given should provide protection in the presence of right number of MABS ( Maternal Antibodies)and added that any flaw in breeder vaccinations may reflect in commercial Broilers and cause huge losses. He explained about prime, Killed and booster doses

of Vaccines to be administered and presented examples of losses occurred in 2005 and 2017. He introduced the features of Transmune IBD Vaccine.

Dr. Shyam Vane on behalf of Hipra, recently launched Company, introduced their Range of Vaccines. He also explained Smart Vaccination procedures that they have introduced in India. He stressed on the vaccination schedule to be followed by the poultry farmers along with the importance of biosecurity.

Mr. Shirish Dhopeswarkar of Dhopeswar Engineering Works, Hyderabad gave a presentation on waste management and

creation of wealth from waste. He said that nowadays new challenges have rose with animal welfare issues and this could only be solved with installation of rendering plants designed differently for Breeder Farms, Layer Farms, Hatcheries etc. He made a slide show and also presented a video on Litter Management and Waste Management.

Mr. OP Singh, Managing Director, Huve Pharma India Pvt. Ltd., made a detailed presentation on Food Safety & Sustainability in Broiler and Egg Industry. It would not be possible to continue your farming the same way you have been doing, he warned . He suggested





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*IPJA felicitates INFAH team*



*Mr MK Vyas & Mr BS Rana felicitate with Best Layer Farmer Award received on behalf of Mr Santosh*

that on Animal welfare issues and future needs of new age consumers, farmers should look into the upcoming problems as consumers will be very much concerned that what growth promoters are used, whether the chicken are grown on hygienic conditions are not or was it from the farm free from pollution and as per norms of welfare and food safety regulations. He observed that for the last 50 years total food production has increased by 157%, milk production has gone up by only 98% and meat productions by 237%, while chicken has registered 270% growth and egg abnormally at 308%. He feared that Avian Influenza and low pathogenic Avian Influenza continues to be a threat connected to human health. He said diseases like mycoplasma, ND, poor gut health also cause economic losses to farmers in absence of standard operation procedures are not practiced in hatcheries and farms.

Mr OP Singh predicted that land, labour and



*Mr Purshottam and his team receive memento for Dhumal Group from Mr BS Rana*



*Mr BS Rana presents memento to Dr Jaiswal*



*Mr Anil Dhupal and Mr Rajesh Rosia receive memento on behalf of Poultry India from Mr BS Rana*



*Mr Vyas presents memento to sponsor*

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Mr MN Rao presents memento to sponsor



0431 Mr Jitendra Awasthi receives memento from Mr MN Rao



Mr Miguel Mehta receives memento from Mr MN Rao




Dr PG Phalke greets Mr BS Rana for organizing the Best Technical Seminar


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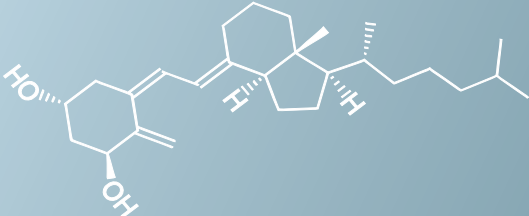
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logistics are going to be scarce. In the coming years, we should modernize our farming as protein producing Industry, he added. He said in the coming two decades there will be a growth of 45% in the world and 60% in Asia region. He stated that as per the survey by international bodies we rank as 77th place in following Food Safety and Standards though Indian poultry takes second and third positions to Eggs Productions and chicken, we are nowhere in world markets. He stated that we have not yet geared up for export markets while lack of storage and marketing facilities, always push us back. Food standardisation and certification Labs are yet to be established, he added

He said future will be driven by consumers and we have to design our products as per the tastes of consumers and cannot go on selling what we have with us. He stated that we should change ourselves to sell what consumers need and like and should be prompted by growing young urban consumers. He said that demand grows for ready to eat and ready to cook products against live and dressed chicken.

We should be careful about chemical contamination all over the country as all samples have shown that 12% prohibitive lime stone is used in feed. When they observed 16 samples 12 were caught with lead. He said all Associations should write to government on all confronting problems faced by poultry industry.

Mr. P. Chakradhar Rao, the newly elect President of Indian Poultry Equipment Manufacturers Association, made a presentation on Importance of Water in Poultry. He said birds can survive without feed also but never without water as 70 to 80% body contain water only. He stated that water plays vital role and that we should always make pure water available to birds. With sufficient number of drinkers and nipples and arrange nipples at 20 to 30 degrees height or 30 to 40 and never above 40, he added. He advised to flush the hot water from time to time and install water pipes in the sheds according to requirement of the age of the bird, size of bird 4 to 6 inches to bird's height, for Chicks 1 to 1 and ½ inch only. He cautioned that dust particles to be removed from pipe lines from time to time and sedimentation of medicine powder or anything else to be removed from time to time. He advised that nipple should be leakage free and litter should be dry.

He introduced his company as largest nipple manufacturer supplying in India and exporting to many other foreign countries as well. He reported that they have produced about 10 crores nipples and installed in countries all over the world. He said besides nipples the company



Mr Uddhav Aher delivers keynote address



Dr SS Nadgauda explains feeding for performance



Dr Rajesh Kokje explains technical details on Broiler Farming



Mr Harish Garware speaks on Broiler Farming



Dr Vane explains a HIPRA product



Mr Milind Limaye speaks on disease protection

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manufactures cages, feeding systems and also egg collection systems.

Dr. Anand Khandwekar made a presentation on Role of Gut Health in improving growth and productivity. He said that we have been constantly carrying out research and improving the bird's standard for more weight, for lesser feed intake within a stipulated time and also introducing new feed ingredients as this increases pressure on intestines. He said even the feed security norms demand better gut health and forbidding the usage of antibiotics and in the present scenario, we should understand and improve the feeding procedures.

He stated that Infections like salmonella pose a great threat to gut health and 70% bird immunity depends on gut health only and that gut integrity can only maintain productions and better health of the bird. Scientists have successfully introduced enzymes for better digestibility and utility of feed served to birds as specially designed enzymes are made available for corn-soy, wheat soy feeds, he added. He said that farmers should be in touch with nutritionists to alter their feed regime from time to time according to fluctuation in prices of feed ingredients.

The last presentation was made by Mr. Akshay Dhumal who discussed environmentally controlled houses for betterment of poultry. His slide presentation impressed the gathering as he gave an account of shed fabrication, insulation against heat, ventilation system, air flow management, humidity maintenance etc. He stressed on modern brooding and feeding systems that was put on display. He displayed modern sheds made for SKM 49 X 354Ft. sheds for 25,000 birds each. It is given to understand that EC Houses could be constructed @ Rs. 180 and Rs. 250 to 275 high cost. With evaporative cooling system, temperature within the shed could be maintained from 19 degrees to 28 degrees for ideal productions. In the EC houses broiler integration farmers earn Rs. 10 per Sq. Ft. whereas ordinary shed farmers get only Rs. 4 per Sq. Ft .

The Technical seminar concluded with the panel discussion moderated by Mr OP Singh and panel members Mr Krishna Gangurde , Mr Anil Dhumal and Dr. Anil Phadke . Dr. P G Phalke successfully conducted the seminar with his anchoring. Vice President of IPJA Mr. MK Vyas, Treasurer Mr. MN Rao, Joint Secretary Mr. Amit Rana, EC member Mr. NSN Murthy were also there in the IPJA Team. Nasik Farmers appealed the IPJA leaders to plan at least one seminar an year in a similar way as they met whole poultry fraternity of Nashik without any inhibitions and differences on a single platform.



Mr OP Singh speaks on Food Safety



Mr Shirish Dhopeswar explains Waste Management



Mr Chakardhar Rao explains the Importance of Water


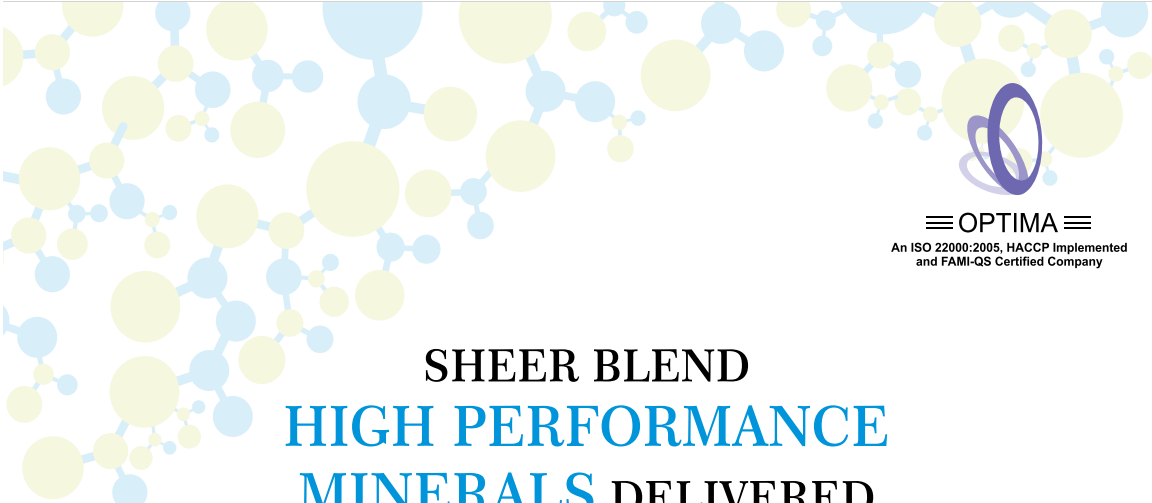


Dr Anand Khandwekar speaks on Gut Health




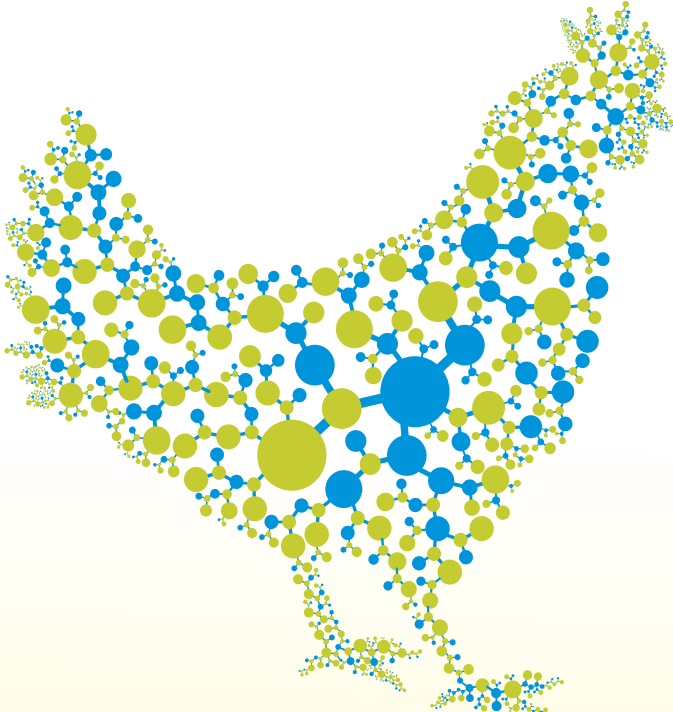
0367 Mr Akshay Dhumal explains EC House





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# PFI CONDUCTS SUCCESSFUL 31ST AGM AT COIMBATORE

## ■ Coimbatore

Poultry Federation of India (PFI) conducted its 31st Annual General Body (AGM) Meeting from September 20-21, 2019 at Hotel Le-Meriden, Coimbatore, Tamil Nadu. On September 20, 2019 the AGM meeting was successfully conducted and endorsed by the PFI members. The members passed the necessary deliberations and minutes during the meeting. Dr Pawan Kumar Agarwal gave a presentation on "Protein for all." He said protein is an essential requisite for all animals. He stated that PFI along with USSEC organizes seminar series across the country to create protein awareness among

people, wherein it is explained as to how much protein is required by a person on a regular basis to maintain good health.

On September 21, 2019 the PFI activities started with the registration of the delegates and later followed by Opening Remarks by Mr Selvan Kannan. Mr Ramesh Khatri, President PFI welcomed the gathering and briefly explained the activities of the association. After this the Inaugural Lamp was lit by the dignitaries. Mr Ramesh Khatri thanked everyone for having attended the AGM.

Mr Vijay Sardana, Advisor PFI presented in exhaustive detail about the activities of PFI. He





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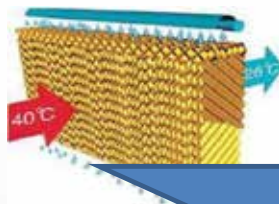


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said of the 2000 page literature available on animal welfare, just a few of them is relevant in the Indian context. He said the animal welfare is a techno-legal issue and added that this fight is between perception and facts. He stated that since this matter is sub-judicial, the reliance is more on facts and proof to convince the court. He said that our greatest weakness is that we don't of facts. He said the facts put up by NGOs are strictly applicable to European countries and their climatic conditions. He explained that the climatic condition in India is totally different as



it has a temperate climate and so the welfare norms of the western cold countries cannot be applied to India. The PFI convinced the court that Western animal welfare norms cannot be applied in India.

He further said that at times it is easy to prove what is wrong but extremely difficult to explain what is right. He said we should take the help of the technical scientists who can factually summarize and explain the rearing of poultry under Indian climatic conditions. He said that if we present wrong or half baked facts then it will be problematic for the poultry industry. He clarified that the Indian poultry scientists should now start the detail research of animal welfare

issues in India. He said we got the positive result of whatever challenges we faced till date. He aid our scientists put their best and chalked out the remedial measure in support of animal welfare issues a in India and this was presented to the government. He stated that the NGO's against whom we are fighting are financially robust with heavy funding from different sources in India and abroad, so our industry should stand united in such an adverse condition.

Mr R Lakshmanan, Managing Director, Shanthi Group, praised the sincere efforts of PFI in tackling the adverse conditions faced by the Indian poultry industry. He said fighting the NGOs on cage ban and animal welfare





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issues was not an easy task and fortunately PFI was able to present a strong case against them.

Mr B Soundararajan, Suguna Group was also all praise for the concerted efforts of the PFI in tackling various issues that inflicted a tough time for Indian poultry. He said the manner in which PFI used its manpower and resources to present its case with government and in the courts is commendable.

Dr PK Shukla, Registrar, DUVASU, Mathura, spoke on escalating feed prices. He said in the recent past there has been a surge in prices of essential cereals, especially maize and soybean which are basic feed ingredient for poultry. He was all praise for the efforts of PFI in tackling various issues like cage ban, middlemen in poultry, antibiotic residues etc which are adverse to Indian poultry.

Mr Ashok Thakur, Director, NAFED appreciated the efforts of PFI in its united fight for the welfare of the poultry industry.

Mr OP Singh, Managing Director Huvapharma stressed on the need of qualified veterinarians to tackle various poultry issues at the farm level. He said it is extremely essential to create a sense of awareness for protein consumption with the general population for a better hygiene and also

increase the per capita consumption pattern of egg and broiler meat.

Mr Mahipal Dhanda, MLA Panipat, Haryana praised the efforts of PFI in successfully handling the various adverse conditions faced by the Indian poultry industry. He requested the politicians to reign in the feed prices and make maize and soybean available to poultry farmers at affordable prices. He presented in detail on the cage ban scenario and the negative role of the NGOs. He discussed the antibiotic resistance and its detrimental effects.

Mr AKP Chinaraj, MP, Namakkal, Tamil Nadu praised the efforts of the PFI and promised all help to the poultry industry.

Dr G Ranjith Reddy, MP, Chevella, Telangana praised the efforts of PFI for the welfare of the poultry industry and asserted that he being a farmer himself knows the hardship faced by the poultry industry and will co ordinate with the government for the benefit of the poultry industry.

Dr Sanjeev Balyan, Minister of State, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India spoke cage ban, import of chicken leg and assured full support from his side by presenting the case to the government. He said that a poultry Advisory Committee should be set up along with zoning provision for Avian Influenza affected geographical area. He

said that he is always with the industry and will extend his support in future too. He also said that one more laboratory on the lines of Bhopal High Security Animal Disease laboratory should be set up in southern state.

Dr PS Mahesh, Director, CPDO gave a presentation on –“Shaping the future of Indian poultry in new millennium.” He presented an outline on what efforts should be made to witness poultry at its optimum best.

Mr Krishna Gangurde presented the current maize production, consumption and availability scenario. In a panel discussion with Dr G Dvegowda topics like- food safety, antibiotic residue, antibiotic free poultry, pollution, water management and to educate people to increase the per capita poultry consumption.

Dr AS Ranade spoke on biosecurity, sanitation, environmentally controlled houses, bird handling and a lot more. Dr SV Rama Rao spoke on layer cage management and law commission. Dr M Kadam spoke on poultry welfare issues, bird handling, bird injury during transportation, feed management, natural bird behavior and space for poultry birds at a farm. The vote of thanks was proposed by Mr Ranpal Dhanda, Secretary, Poultry Federation of India and thus ended a very successful PFI meeting at Coimbatore.





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# NOVUS® KNOWLEDGE FORUM

## ON 'RECENT DEVELOPMENTS AND UPDATES ON NUTRITIONAL STRATEGIES AND BIOSECURITY FOR COMMERCIAL LAYER FARMS' IN NAMAKKAL



### ■ Namakkal

NOVUS international organized seminars on 'Recent developments and updates on nutritional strategies and biosecurity for commercial layer farms in the city of Namakkal on 19th September, 2019.

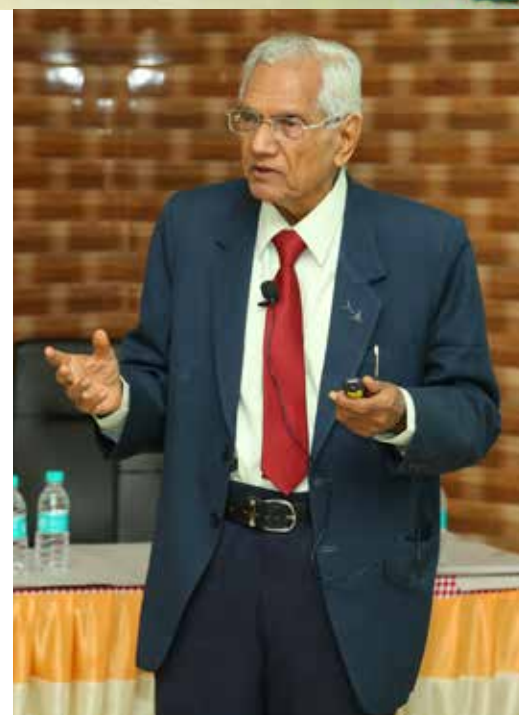
Namakkal is one of the largest eggs producing zones in India. With increase in size and number of commercial layer farms, Biosecurity and Nutrition challenges are also increasing. With the aim to answer new emerging challenges in Biosecurity and role of nutrition in improving immunity, NOVUS international tailored this seminar on Biosecurity and Nutritional management for profitable poultry production. In addition, the focus was to demonstrate the role and efficacy of NOVUS solutions in improving feed and water hygiene at the farm.

The seminar received an overwhelming response and witnessed the participation

of over 45 distinguished personalities from feed milling, farming business and eminent knowledge/thought leaders from the Namakkal poultry industry.

The key note speaker in the seminar was Dr JL Vegad, who is Retd. Professor and head of pathology at Veterinary College, Jabalpur. Dr. Vegad is an eminent scientist, thought leader and author of various books on pathology and poultry disease. He is recipient of prestigious 'Rafi Ahmed Kidwai Memorial Award' by GOI and 'Lifetime achievement award' by CLFMA for his outstanding contribution to the research in poultry pathology.

Dr Vegad talked about the biosecurity challenges posed by the new strains of pathogens and emphasized on reducing the pathogenic load inside the farm that is the main route of spread of infections. He also said that improving bird's immunity along with excellent biosecurity and farm management is the key for







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profitable poultry production.

Anand Srivastava, Zonal Head for South India and Sri Lanka briefed the audience about NOVUS International and its strong presence and foundation in feed additive products based on science and research.

“The focus of this seminar was to educate customers on the emerging biosecurity challenges and the role of nutrition to complement biosecurity strategies. I believe we have been successful. There was excellent feedback from the participants”, said Sanjeev

Khanna, Director-Sales (Poultry) for NOVUS-South central Asia.

Dr. Koushik De, head-technical for NOVUS-South Central Asia, complemented the topics discussed by Dr Vegad and explained the importance and need of feed and water hygiene. He also demonstrated the role of NOVUS solutions in managing these crucial aspects of poultry production backed by various research and on-farm trials.

“NOVUS believes in providing our customers solutions with demonstrable value. With

our unique solutions for managing feed and water hygiene and technical capabilities, we are strategically well positioned to serve our customers and increase their profits”, said Dr Manish Kumar Singh, Director-Marketing, NOVUS-South Central Asia.

The seminar ended with felicitation of Dr JL Vegad by Dr C. Balachandran, professor and head of pathology department, Namakkal Veterinary College and Dr. Ravi, Retired Professor and head of department, animal nutrition, Namakkal Veterinary College.





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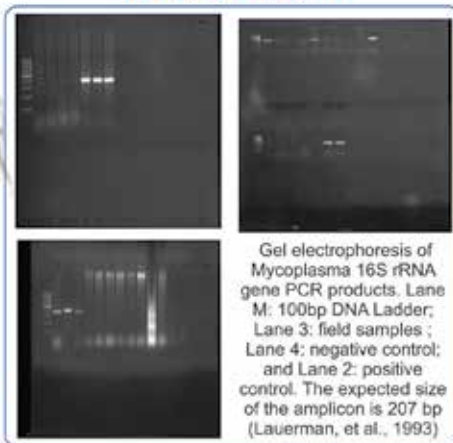
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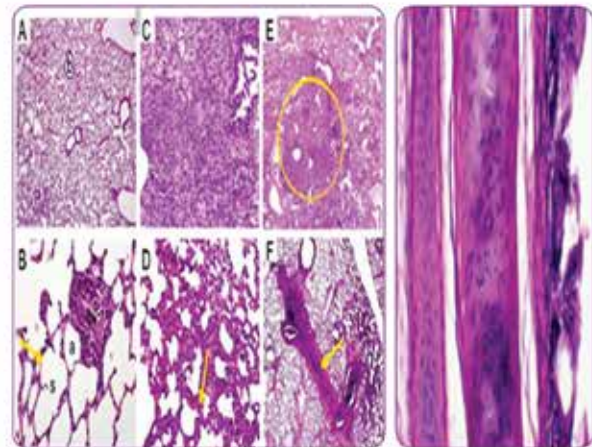
Efficacy Evaluation of Animunin® versus Tiamutin in treatment of chronic respiratory disease in the Krisbro chicks .  
The experimental study is conducted on day old broiler chicks of krishibro (PDP) obtained from ICAR DPR.



The ELISA done at different time intervals to detect the status of MG/MS in control and treated birds by Polymerase Chain reaction (PCR) of Mycoplasma



Histo morphology of brochioles in different treatment groups and trachea in Herbiotic FS treated group



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Broilers	Layers	Quantity (For 100 Birds)
0-2 Weeks	0-8 Weeks	10 ml
3-4 Weeks	9-20 Weeks	20 ml
5th Week & onwards	21-72 Weeks	40 ml

## Presentation

**Powder** : 10 kg & 25 kg  
**Liquid** : 1 Ltr & 5 Ltr

- ▶ To be given regularly in broilers, layer-chicks and growers.
- ▶ In layers to be given regularly or 15 days every month, as required.
- ▶ Double quantity is recommended for breeders & during challenging conditions (for first 10 days).

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# VAMSO SPEAKS OF MARKETABLE INNOVATION AT ICAR SPONSORED WINTER SCHOOL



■ Kolkata

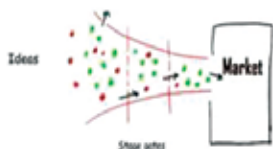
Cutting-edge technologies were discussed at an ICAR Sponsored Winter School on 'Recent Biotechnological Advances on Precision Feeding of Livestock and Poultry'. The event was organised by Department of Animal Nutrition, WBUAFS, Kolkata from 4-24th September, 2019. Around 25 distinguished veterinarians, nutritionists & scientists across India joined open-forum discussion on recent

advancements & innovations in animal nutrition. The primary objective of conducting the proposed course was to provide background knowledge and hands on training to animal & allied science specialities on recent advances in livestock & poultry feeding for higher return. The recent feed biotechnology & nano-biotechnology advances have opened up newer avenues and unprecedented opportunities to accelerate the productivity, product quality & net return to farmers without compromising the safety issues. Considering the five decades of eminent market presence of Vamso Biotech Pvt. Ltd. in the field of livestock & poultry nutrition, Dr. Arindam Chatterjee, Sr. General Manager, was called up on to speak about 'Marketable innovations' at this event.

Animal nutrition accounts for more than half of the cost of raising farmed animals. There is a huge opportunity unexploited yet because, on a global level, the current animals' performance reaches only 60-70% of their full genetic potential. Today's economy is far more dynamic and the comparative advantage is less relevant than competitive advantage which rests on "making more productive use of inputs, which requires continual innovation. The key for the next few decades will be to deliver a new model that balances innovation with sustainability. Innovation is a buzz word in the arena of commercial research especially in the field of animal nutrition today. Recent

advancements in precision nutrition has opened up new windows of opportunity for Commercial Nutritionists, Feed Manufacturers and even Farmers to bring about value added products for their customers in India and sub-continent. "Many ideas for innovations, even though may sound exciting at first, may not hit the market and eventually die at idea or concept stage of product innovation funnel. The biggest reason for early abortion of the apparently innovative ideas lies in the fact that all the ideas don't find takers in the market. It is the Marketability of an idea which boosts confidence of a commercial organization to fund research and bring about solutions which can solve real problems of customers", said Dr. Arindam. He concluded by showing how adopting a systematic Product Innovation Process, a commercial organization can bring about new products into the market at the spent of optimum resources and make the product achieve desired market share and gross margin. Innovation is important to the advancement of industry as well as society at large as it is responsible for resolving collective problems in a sustainable and efficient way. These new technologies, products and services simultaneously meet a social need and lead to improved capabilities and better use of assets and resources.

"Any organization's product innovation process starts with welcoming 'Ideas'. A robust, process driven and customer centric innovation pipeline is one of the greatest competitive advantages of today's commercial organizations"



Dr. Arindam Chatterjee  
Sr. General Manager  
Vamso Biotech Pvt.Ltd.

"Academic and commercial research work on different mandates and their very nature of priority differ to a large extent. Dr. Arindam Chatterjee showed us how marketing orientation of an innovation is the lifeline of new product development activities in business organizations operating in livestock sector."

Prof. Barun Roy  
Course Director, ICAR Sponsored Winter School  
Dept. of Animal Nutrition  
West Bengal University of Animal & Fishery Sciences, Kolkata



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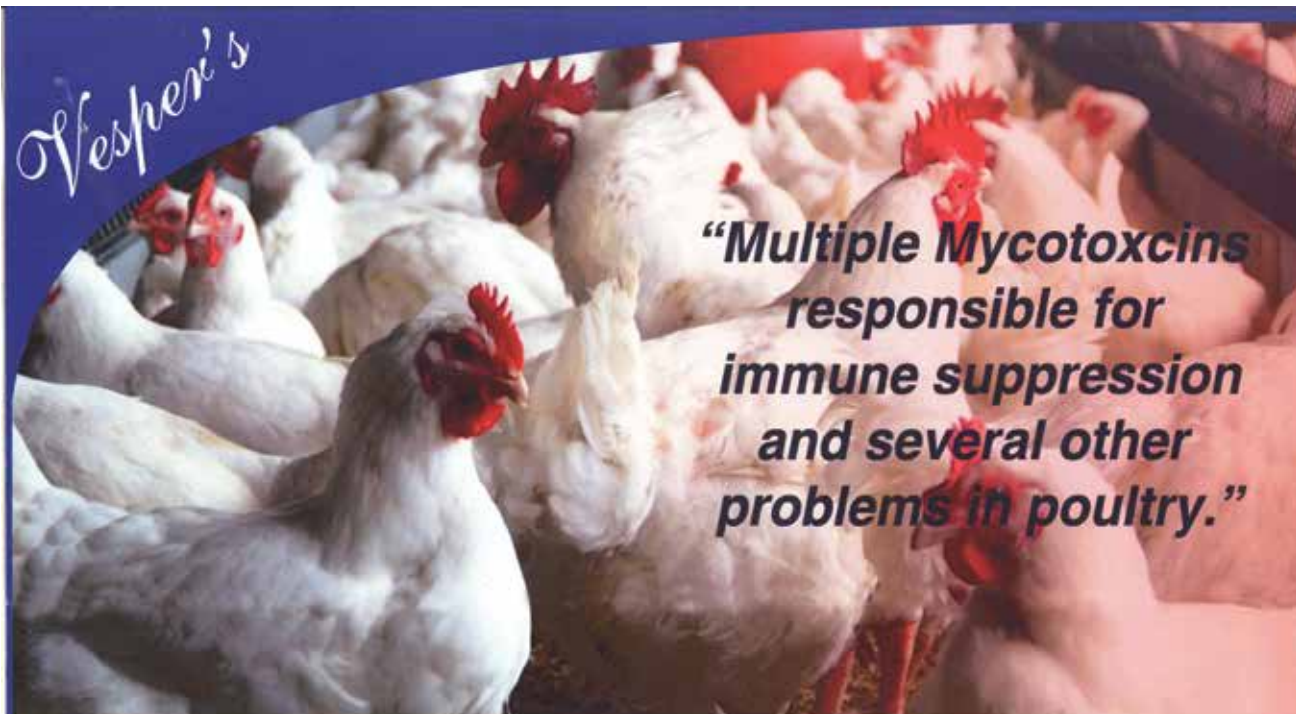
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# INDIAN HERBS CONDUCTS

## INFORMATIVE SEMINAR SERIES IN PUNE, BANGALORE AND KARNAL

### ■ Pune, Bangalore, Karnal

Indian Herbs, the pioneer & global market leader and No.1 Company in Herbal Animal Health Care Products Industry since 1951, hosted a series of Technical Seminars at Kolkata, Pune, Bangalore and Karnal from 23rd to 26th September, 2019 on its unique range of phyto-genic poultry products with message "Food Safety through Feed Safety".

More than two hundred and fifty delegates across the country converged to hear about trends, advances and opportunities in poultry sector from Dr. Steve Leeson, Professor Emeritus, Department of Animal & Poultry Science University of Guelph, Canada. Dr. Steve Leeson chaired this series of four seminars and delivered key note address on current issues and future predictions to broiler nutrition and nutritional options for sustaining gut health in an 'AGP free production system'. The technical seminars were conducted by highly professional and strong marketing and technical team of Indian Herbs. Those present on the occasion were Mr. Gaurav Agrawal, Director, Mr. Balam Bhattacharya, Executive Vice President (Marketing & Sales) and Dr. Shivi Maini, DGM (Technical).

### Leader and Legend Come Together

The Chief Guest and Speaker of the seminars was Dr. Steve Leeson, who is a legend and is one of the most respected and followed leading poultry consultant in the world. The aim of these seminars is to provide Asian poultry industry and their technical advisers an opportunity to network with Dr. Steve Leeson who is having more than 40 years of rich experience of poultry nutrition. Also, to help poultry producers, integrators and feed producers improve productivity and profit margins with technical information on best alternatives of synthetic products and phyto-genic poultry feed supplements.

### Originality Matters – Being Original

Indian Herbs is the originator of concept of Veterinary Ayurveda. Indian Herbs was the first company to harness the rich treasure of herbs by developing phyto-genic products on modern scientific lines. It offers unique phyto-genic alternatives for synthetic products with better efficacy at lower cost which are free from side effects and residual toxicity. The focus of Indian Herbs is on Food Safety through Feed Safety. These products are useful to produce antibiotic and residue free chicken and eggs.

The Technical seminar commenced with the welcome address by Mr. Balam Bhattacharya, Executive Vice President (Mktg. & Sales), Indian Herbs. He greeted all the guests.

Mr. Gaurav Agrawal, Director had given corporate presentation on Indian Herbs and informed the participants about the activities being undertaken at R&D Centre of Indian Herbs for ensuring best quality and result oriented phyto-genic poultry products. He has also appraised the guests about the various achievements of Indian Herbs during its long journey since 1951. Today Indian Herbs is the leading company of the world which is providing the efficacious phyto-genic products on much economical prices than synthetic products.

Opening the technical session, Dr. Steve Leeson, Professor Emeritus, Department of Animal & Poultry Science University of Guelph, Canada gave a comprehensive overview of current issues and future predictions of poultry production that are impacting sustainability. He also addressed the audience about the nutritional options for sustaining gut health in an AGP-free production system.

Dr. Shivi Maini, DGM, Technical appraised the delegates about the research initiatives of the organization. Discussing about coccidiosis management strategies, Dr. Shivi shared about the in-depth research carried by

Indian Herbs R&D to cater poultry industry with a phyto-genic multistage anticoccidial product ZeeCox which is having a unique philosophy of "Resting the Ionophores to prolong the efficacy" as a part of shuttle or rotation programme. Dr. Shivi also appraised the delegates about the initiatives of the company to provide science based non-antibiotic phyto-genic products for control of respiratory pathogens (Animunin) and gut pathogens and for improving gut histomorphogenesis & innate immunity (Herbiotic FS). These trio combinations of Herbiotic FS, Animunin & ZeeCox, apart from promoting food safety also have elements of organic produce as well as animal welfare.

Dr. Shivi also appraised about the global research initiatives of organization for in-depth research on Alternate Choline supplement 'BioCholine', Natural growth promoter product 'HerBiotic FS' and 'Herbal C'. This research is focused to establish underlying mechanism of action of phyto-genic products and is based on advances scientific techniques of transcriptomics, metagenomics, gut microarray, quorum sensing etc.

Indian Herbs also hosted a cocktail reception that offered participants ample opportunity to network with Dr. Steve Leeson and one another. Delegates praised the strong conference program from the knowledgeable expert Dr. Steve Leeson who advised about future predictions in poultry nutrition, comprehensive poultry management strategies, early chick nutrition, amino acid and vitamin nutrition, new research and solutions on AGP, gut health management and Coccidiosis management. The keynote address of Dr. Steve Leeson offered delegates a plethora of innovative concepts and their practical implementation for profitable poultry production.

This megaevent was a grand success of Indian Herbs to once again showcase organizations commitment to provide the best natural & phyto-genic solutions to the industry for better poultry production and profitability.







# EAC MULLS POULTRY INDIA 2019 PREPAREDNESS

## ■ Hyderabad

**E**xhibition Advisory Committee (EAC) an organizing wing of Poultry India exhibitions held a meet at the office of Poultry India at Hyderabad on 15th October, 2019. Mr Anil Dhumal welcomed the EAC members and thanked them for attending this meeting. He thanked the EAC members' dedication which has transformed Poultry India exhibitions to such an esteemed poultry exhibition status in Asia. EAC members greeted Mr Suresh Chitturi on the IEC chairmanship and Mr Chakardhar Rao honoured him. The EAC members also



*Mr Anil Dhumal*



*Mr Chakardhar Rao*

congratulated Dr Ranjith Reddy and Mr AKP Chinaraj for the election as the member of parliament. Mr Dhumal also welcomed new EAC member Mr Sushant B Rai (Raison Nutrition) and President KPBFA.

Mr Anil Dhumal welcomed the newly elected IPEMA team which is as follows:

**Mr Chakardhar Rao- President**  
**Mr Shishirish Dhopeswar- Secretary**  
**Mr Uday Singh- Treasurer**  
**Mr Natarajan- Joint Secretary**  
**Mr Rajesh Shetty- Joint Secretary**



*Mr Shishirish Dhopeswar*

The EAC members also discussed the details of the inauguration ceremony, selection of Chief Guest, registration facility for the visitors and a lot more. After this there was confirmation of Minutes of meeting held on 26th August, 2018 by Mr Harish Garware. Mr Uday Singh (Treasurer-IPEMA) presented the financial reviews of 2018. Dr PK Shukla presented the details of the blue print of the Knowledge Day programme with the details of the speakers, participation and registration of delegates.

Mr Bahadur Ali suggested the EAC members that series of large scale Technical Knowledge sharing event should be organized across India.

He said this will update the Indian poultry farmers with the latest innovative information for best farm practices. Mr KG Anand opined that a committee of five members should be constituted to facilitate knowledge sharing on diverse poultry topics. Mr OP Singh suggested that apart from organizing Poultry India exhibition, IPEMA should concentrate on other ways for development and upgradation of poultry in India. The EAC members later discussed the stall status in the Poultry India 2019 exhibitions.



*Mr Uday Singh*

The EAC members present in the meeting were: Mr Chakardhar Rao, Mr Harish Garware, Mr Anil Dhumal, Mr Shishirish Dhopeswar, Mr Uday Singh, Mr Rajesh Sethi, Mr Natarajan, Mr Bahadur Ali, Mr Ram Reddy, Mr KG Anand, Mr Suresh Chitturi, Mr OP Singh, Mr Pradeep, Dr PK Shukla, Dr DK Dey, Mr Sushant B Rai, Mr Inayatullah Khan and Mr BS Rana.

This was followed by lunch break and thus ended the informative session on the planning of the Poultry India 2019 exhibition successfully.

## GOVT. OPTS FOR E-PROCUREMENT OF EGGS FOR MID-DAY MEAL

### ■ Vijayawada

**T**he State government has decided to opt for e-procurement of eggs to be served to schoolchildren under the mid-day meal scheme, according to Education Minister A. Suresh, Addressing a programme organised by the National Egg Co-ordination Committee (NECC) on the World Egg Day on Friday, the Minister said that nearly \$250 crore was allocated to the Education Department for district-wise procurement of eggs. The Minister asked the owners of poultry units not to compromise on the

quality of eggs for the sake of profit, as they were meant to provide nutritious diet to the children.

Minister for Women and Child Welfare T. Vanita, Minister for Animal Husbandry M. Venkataramana and A.P, State Agriculture Mission vice-chairman M.V.S. Nagi Reddy were present. The State of Andhra Pradesh celebrated World Egg Day on 11th October 2019 in Vijayawada. A meeting was arranged to enlighten the nutritive value of egg and its importance in human nutrition. Literature was distributed on preparation of food items with egg.





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\* D. Michael Fry - Department of Avian Sciences, University of California, Davis, California - Environ Health Perspect 103(Suppl 7):165-171 (1995)

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# EXCERPTS FROM THE INTERVIEW

## OF ROCKWOOL BUSINESS UNIT DIRECTOR, MR VINAY PRATAP SINGH



**1. Please narrate a brief history of Rockwool and its business?**

ROXUL ROCKWOOL India is one of the largest stone wool manufacturers in India, offering a complete range of sustainable insulation products for building envelop and industrial insulation. ROXUL ROCKWOOL Technical Insulation India Pvt. Ltd. is a part of the ROCKWOOL Group. We are in India for the last eight years and are representing a global brand established for 80 years ago with presence all around the world. Our heritage is rooted in stone wool. We're the world leader

in this field, with more than 11,000 colleagues in the Group, spread across 39 countries, with having 45 manufacturing units worldwide.

ROCKWOOL stone wool products cater to a wide range of applications because each of our product leverage the 7 strengths of stone and are suitable to meet various requirements such as thermal comfort, fire resistance, water repellence, durability, noise reduction and aesthetics. We're developing solutions to tackle the world's biggest sustainability and development problems. Our range of products reflects the diversity of the world's needs, supporting our stakeholders in reducing





their carbon footprint along the way. We have a single purpose, which is "Releasing the natural power of stone to enrich the modern living."

## 2. Explain efficacy of Rockwool products in poultry?

Regardless the type of Poultry farms, insulation is very important aspect to maintain the temperature and keep a good climate in poultry houses. Whether it is summer, winter or rains, insulation helps to maintain bird's health.

Most of the poultry farms are open and having insulation need for roof and wall. Roof insulation works as a heat barrier, which does not ingress outside heat inside the farms.

ROCKWOOL offers its best stone wool insulation products for fire protection and thermal insulation. ROCKWOOL roof insulation products like Cool 'n' Comfort, Hardrock are the best in market, creates a barrier in heat penetration. Roof deterioration starts with the leaky roof that damages interior surface, grow mould and mildew and multiple hazards which can affects bird's health. To restrain from all these aspects, highly efficient roof insulation is required to maintain thermal comfort and extent building service life.

ROCKWOOL Safe 'n' Silent Pro is designed for all type of drywall partition configurations. It is recommended to be used for drywall partition applications in poultry farms. All our products are non-combustible and can withstand temperature of over 1000 °C without melting according to DIN 4102-17. These are particularly suitable for fire protection, thermal insulation, and Water repellence.

## 3. In India do you conduct technical sessions to create awareness among farmers?

We at ROCKWOOL, conduct so many seminars and knowledge sharing session to educate people about significance of using ROCKWOOL stone wool insulation products. We understand the need of insulation, buildings and poultry farms. People are not aware what financial damages can be bare if insulation is not be used.

We have not conducted any knowledge sharing session for poultry farmer specifically yet but yes we will surely conduct in future soon as this would be really good opportunity for us to understand their needs.

## 4. Is there any new product in pipeline?

We have a range of building insulation products and our innovation in using the strengths of stone can create opportunities and help us to tackle future challenges. We have recently introduced a new product to the market for sandwich panel applications. ROCKWOOL stone wool products for sandwich panels are excellent structural core materials for factory-engineered flat and profiles panels. They are suitable for outdoor and indoor applications such as facades, roof, walls, ceilings and heavy-duty sandwich panels for wider spans or greater height. We are constantly occupied with new product development and testing, for example, discovering new product properties, matching required standards etc. Even after 80 years, as stone wool leaders globally, we know there is still so much to learn.

## 5. Where do you see Rockwool in next 10 years?

We are in India for the last eight years and are representing a global brand established for 80 years ago with presence all around the world. Our business has been growing in leaps and bounds in the past years, and we do have a strong outlook for the future to embark on a journey of sustainable business growth. We are looking forward to working with our stakeholders at different levels to provide solutions that will give them the experience to improve their way of living. ROCKWOOL is here to accomplish its purpose, which is "Releasing the natural power of stone to enrich the modern living."



# MANAGEMENT OF AMMONIA EMISSION IN POULTRY HOUSE

**Dr.G.KALAISELVI \*, Dr.M MANIMARAN**

**Assistant Professor & Associate Professor**

**Tamil Nadu Veterinary and Animal Sciences University, Chennai -51**

**kalaiselvigovindan1981@gmail.com**

***Ammonia is a pungent gas that irritates the eyes and respiratory system and can reduce re-sistance to infection in poultry. At high-enough concentrations (above 10 ppm), ammonia will reduce feed efficiency and growth while increasing mortality and carcass condemnations. The result is economic loss to the grower and integrator.***

**A**mmونيا (NH<sub>3</sub>) is an invisible, water-soluble alkaline gas, which is hazardous to the environment as well as human. Ammonia contamination may cause environmental problems such as acidification and eutrophication leads to defective vegetation systems, disrupt biodiversity and reduce water quality. Livestock manure management (collecting, storing and spreading on land) accounts for almost three fifths of agricultural ammonia emissions, while agricultural soil emissions account for two fifth. Ammonia in a poultry house comes from the birds. Unused nitrogen is excreted in poultry fecal dropping as uric acid (80%), ammonia (10%), and urea (5%). When ammonia gas is exposed to moisture, it reacts and forms a basic, corrosive solution called ammonium. This aqueous ammonium solution causes harm to birds. The ammonium corrodes the lining of chickens' respiratory tract and paralyses or even destroys the cilia of the epithelial cells of eyes and nasal mucosa. Leads to accumulation of mucus on the mucosal surface of the trachea cannot be cleared by the cilia and bacteria become trapped. Finally the bacteria reach the lungs or the air sacs and they cause infections.

The concentration of ammonia in some broiler houses may easily exceed 30-70 ppm, particularly in winter time. The EU directive (Council Directive 2007/43/EC) states that the NH<sub>3</sub> concentration should not exceed 20 ppm over any eight-hour period or 35 ppm over any ten-minute period during the poultry production cycle.

High level of ammonia in poultry house can result in poor bird performance & health and loss of profit to the grower or integrator. Uric acid & organic nitrogen (N) in the bird excreta

& spilled feed are converted to Ammonium (NH<sub>4</sub>) by the microbes in the litter. Depending on the moisture content, temperature and high pH of the litter, a portion about one-third of Ammonium will be converted into ammonia (NH<sub>3</sub>).

Ammonia is a pungent gas that irritates the eyes and respiratory system and can reduce re-sistance to infection in poultry. At high-enough concentrations (above 10 ppm), ammonia will reduce feed efficiency and growth while increasing mortality and carcass condemnations. The result is economic loss to the grower and integrator.

**The deep litter method is one sustainable method of managing chicken litter in the poultry farming that many small poultry entrepreneurs use because**

- It does not take a lot of time to manage.
- It ends up into compost manure - the high nitrogen manure is "Green".
- Devoid of cage fatigue.
- It's safe and bird enjoy natural environment to produce quality Carcass.
- Less chances of egg breakage in case of layers.

But farmers have following hurdles also as all poultry disease's primary source is pickup from career birds and litter becomes potential store house for preserving the disease and its vectors. If litter bedding is on muddy floor ammonia imitation will be much higher due to moisture contents of excreta and floor. Pathogenic bacterial, protozoan & fungal load in litter



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will be creating threat of disease incidence. Availability of required litter bedding material on desired time and increasing cost of material will be a threat. Litter mites & pest problem with old litter. Even fresh litters are source of fungal & bacterial carrier. Farmers mostly use for litter on the floor like rice husk, wood dust, sawdust, hay, straw and silicon sand material etc as per the local availability and their low economical value.

One of the most basic principal of avian digestive system is that what goes in must come out. The chemical & physical composition of litter is highly variable due to differing bird species, diets, bedding retention times and other farm management practices. Hard fiber litter materials have been demonstrated to improve gizzard development and improve feed conversion efficiency without any effect on feed intake or weight gain. Poultry litter is broadly comprised of protein, carbohydrate, lipid & fats, with carbohydrates responsible for the majority of biodegradable materials in the form of cellulose, starch & sugar and loaded with beneficial as well as pathogenic bacteria and fungus. Monitoring litter health is essential parameter of poultry flock health because most gaseous pollutant originates from the breakdown of faecal matter which intensifies with the growing ratio of moisture, temperature and pH level.

Poultry litter is re-used for succeeding broiler flocks to reduce the running cost since bedding / litter material have become costlier these days, so there will be greater environment stress and challenge to control ammonia problem. The poultry litter has an average pH of 8.0 - 9.0, this is considered a high pH or alkaline. The pH can influence the ammonia volatilization. Ammonia release from litter is minimum when litter pH is below 7; emission exceeds when pH is 8 and above. At litter pH lower than 4.6, the economically devastating bacteria like *E.coli*, *Salmonella*, *Clostridium*, and *Campylobacter* do not grow.

#### Effects of ammonia on birds' health and performance

A high concentration of ammonia in the poultry house has adverse effects on the health and performance of birds. However, it is not easy to measure the magnitude of such adverse effects. Birds are not usually exposed to a very high concentration of ammonia for long periods, unless there is poor ventilation, or birds are fed a nutritionally unbalanced diet. Recent research has revealed that many molecular changes can take place when birds

are challenged with a high concentration of ammonia, even for short periods. The presence of excessively high levels of ammonia in the air, for any length of time, will cause discomfort for the birds. Ammonia is a strong oxidative stressor that can cause inflammation. Trials have shown that high concentrations of ammonia can alter the normal organ function of animals, impair energy metabolism, induce cell apoptosis, and cause mitochondrial damage in the mucosa of the gastrointestinal tract.

Poor growth rate and performance of birds growing in high atmospheric ammonia concentrations is strongly related to the influence of ammonia on birds immunity and their intestinal histomorphology. Exposure to high ammonia concentrations negatively affects the development of the birds immune system as well as intestinal villi and mucosal proteome.

#### Ammonia management in poultry production

- Ration composition and diet management, provision of a balanced, complete diet is of the highest importance. Problems occurring due to high-performance genetics, feed formulation and medication can lead to production of wet manure causing increased ammonia and odor release alongside reduced broiler performance and feed efficiency.
- Optimize the poultry stocking density to help limit excessive moisture in the poultry house so reducing anaerobic processes.
- Adjust the ventilation rate – if ammonia levels increase, more ventilation is needed. However, this should only be in accordance with the climate and temperature of the poultry house.
- Temperature adjustments should be made relating to house climate and welfare.
- Improve nutrient digestibility. This could also be achieved by supplementing diets with additives.

Poultry dietary management is the most important preventative measure. The total amount of nitrogen within the birds' feces can be considerably reduced by formulating diets based on the birds' amino acid requirement instead of on total crude protein. As the percentage of crude protein in the diet is lowered and replaced with conventional sources of protein (e.g. soybean meal, sunflower meal) with synthetic amino acids, nutrient retention is maximized. Reducing dietary protein by 3-5% may cause a reduction of 60% or more in total nitrogen excretion from broilers and laying hens.

A well-balanced diet contains highly digestible ingredients and functional feed additives that can improve the digestibility of nutrients in the small intestine of birds. Inflammation caused by stress may dramatically decrease the ability of the birds to digest and absorb nutrients including proteins. The inflamed and unhealthy intestine is not capable of absorbing digested feed, even if the digestion has been enhanced by exogenous enzymes. Keeping the gastrointestinal tract healthy and functional during the whole growing period is key to reducing the excretion of undigested and unabsorbed feed in the feces which will in turn reduce the ammonia volatilization within the poultry house.

#### Methods of reducing ammonia production from poultry

##### Phytogenic Feed Additives (PFAs)

Phytogenic feed additives are capable of increasing the digestibility of nutrients within the gastrointestinal tract and reducing gut inflammation caused by stressors. These two important effects of PFAs may considerably increase the gut integrity of the birds. Phytogenic feed additives also modulate gut microbiota, minimizing the negative effect of harmful bacteria on the gut. Less undigested and unabsorbed nutrients will be passed to the feces from a healthy gut, which means less nitrogen excretion from the birds to the environment. Less nitrogen excretion reduces ammonia volatilization within the chicken house to a great extent.

##### Feed ingredients

In one study, the inclusion of soy hulls, wheat midds, or corn in diets for laying hen, has reduced the total ammonia emission and the rate of ammonia emission from manure reduced up to 50%. This result has been attributed here to a shift in the partitioning of nitrogen excretion from uric acid to microbial protein and a reduction in manure pH stemming from an increased content of microbially produced volatile fatty acids causing a shift from ammonia (NH<sub>3</sub>) to the more water soluble ammonium (NH<sub>4</sub>) thereby reducing ammonia emission.

##### Feed processing

Feed processing can affect nutrient availability and gas emissions. The fine grinding of feed increases the grain particle surface area and allowing digestive enzymes to breakdown the feed more easily and increase nutrient utilization. Reducing feed particle



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size from 1,000 to 600 microns increases dry matter and nitrogen digestibility by 5%-12% and lowers the amount of nitrogen in manure by 20%-24%. Excessive grinding should be avoided as it causes gut motility and health problems.

Processing of feed into uniform durable pellets also affords significant benefits. The pelleting process increases the bulk density and reduces the segregation and dustiness of the feed and reducing the losses during handling, transportation and storage. Feed conversion efficiency is much improved when birds consume pelleted rather than mash feed because it results in less feed spillage during consumption. But the heat treatment associated with pelleting improves feed digestibility by deactivating anti-nutritional factors and hence improves performance.

low, or poorly designed. In this case faecal N may increase by 1.5% for each 1% increase in feed waste and ammonia emission rate will subsequently be increased. Feeders should be designed in such a way that it is difficult for the birds to push the feed out of the feeders. In this way, the feeder height should be adjusted so that the top of the feed pan is level with the bird's neck with the feed fill level to be adjusted to only 25% of the feeder pan.

Too much water in the house also results in excess ammonia emission and poor air quality. So the nipple drinker system should be adopted for better control over water intake and wastage and also excretion of wet droppings should be avoided. The poultry diets containing drugs such as coccidiostats are associated with metabolic changes that are often associated with high water content of faeces. A change of feed ingredients will frequently overcome this problem. The dietary crude protein level should be reduced and the diet should be formulated based on amino acid requirements rather than crude protein. One extra benefit of reduced protein will be the reduced requirement for water intake because excess protein requires water as part of the excretion process. If the protein level in the diet decreases by 3% means, 8% reduction of water consumption, results in drier litter and consequently less moisture and ammonia in the air.

#### References

Miles, D.M., S.L. Branton and B.D. Lott. 2004. Atmospheric ammonia is detrimental to the performance of modern commercial broilers. Poultry Science 83:1650-1654.

#### Feed additives

There are some additives that can be added to the diet to sequester ammonia. The zeolite, a type of mineral with a porous or lattice-like structure added in the diet will bind ammonia in the faeces and prevents it from being emitted into the air.

The acidification of the diet may help alleviate the ammonia production problem. Addition of gypsum (CaSO<sub>4</sub>) or calcium benzoate or lowering the dietary electrolyte balance. The acidic diet will result in acidic manure causing ammonia (NH<sub>3</sub>) to be converted to ammonium (NH<sub>4</sub>), which is more water-soluble and not readily emitted into the air. Another way to alleviate the ammonia production problem is to prevent uricase activity in the micro-flora in poultry manure. Egg yolk antibodies are economic alternatives for administering in feed

to poultry. In order to use this dietary strategy effectively a well balanced feed formulation and a more practical way of delivering the antibodies in feed remains to be developed.

#### Phase feeding

Phase feeding allows producers to formulate diets to more closely meet the bird's amino acid and other nutrient requirements and reducing feed loss and nutrient excretion. In another study, the multiphase feeding reduced ammonia emission by 16%. In recent years some feed processing companies are able to produce up to 17 different feed phases, thereby minimizing nutrient deficiencies and excesses.

#### Minimizing feed and water wastes

Poultry will waste a significant amount of feed if feeders are overfilled, adjusted too



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# BENEFITS of CHELATED COPPER IN POULTRY DIET



*Dietary Cu is absorbed in the ileal region and then transported to liver which acts as a major store and from there to other extra hepatic tissue via ceruloplasmin. After that liver will recycle Cu to the gut through its bile secretion which will either make it reabsorbed and exhibit some gut health benefits or excreted if it's in excess which may raise some economic concern.*

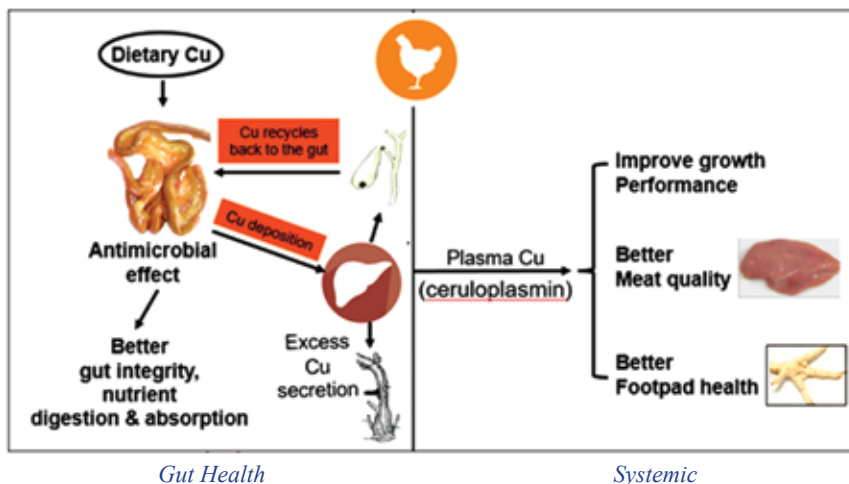
Copper (Cu) has been widely used at pharmacological levels (e.g., 125 ppm) as growth promoter in poultry. However, the mechanism by which high levels of Cu promote growth remains to be determined. It is commonly recognized that Cu exerts anti-microbial effect in the gut but there is not much direct and consistent data showing that Cu alters the population of bacterial species in birds. And copper can maintain proper body functions and obtain the optimal growth performance of poultry (Banks et al. 2004). Also, copper is a cofactor for various enzymes such as cytochrome oxidase, lysyl oxidase and Cu-Zn superoxide dismutase (Davis & Mertz, 1987). Basing on the central role in various vital proteins, deficiency and toxicity, Leeson (2009) reported that copper deficiency could cause severe health problems including growth depression, disability of bones, poor feathering and anemia. Copper additive in the diet, proved that it has a beneficial effect on weight gain, feed conversion ratio and modification of the bacterial microflora in the alimentary tract (Ruiz et al. 2000; Nys, 2001). Moreover,

Copper is also regarded as a growth promoter in the poultry aspect of breeding (Kim et al. 2011), taking into account that the use of antibiotic as growth promoters is prohibited by the European Union. However, an overdose of copper (100-250 mg/kg) can restrict the growth of chicks (Nys, 2001). Therefore, the optimal level of dietary copper should be determined.

## Mode of Action of Cu

Dietary Cu is absorbed in the ileal region and then transported to liver which acts as a major store and from there to other extra hepatic tissue via ceruloplasmin. After that liver will recycle Cu to the gut through its bile secretion which will either make it reabsorbed and exhibit some gut health benefits or excreted if it's in excess which may raise some economic concern.

Ceruloplasmin is the major copper carrying protein in blood and play major role in iron metabolism. It transport >95% of total serum Cu which again has some systemic effect.







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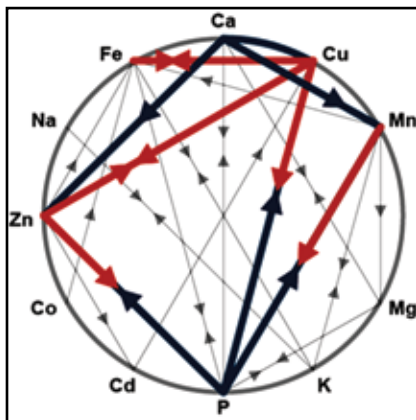
**Copper requirements in broiler chickens**

According to NRC (1994) the requirement of Cu for broiler is 5-8 mg/kg and 3-10 mg/kg according to FEDNA (2008). European Union (EU), dietary copper is supplied for poultry up to a maximum of 25 mg/kg (EFSA, 2012). Other areas of the world, including USA and Brazil, the poultry industry adds 125 ppm to 250 ppm Cu in the diets as growth promoters (Pesti and Bakalli, 1996). In SCA the typical usage is around 50-80 ppm Cu in diet.

**Advantage of Higher Cu inclusion in diet**

There is some suggested mechanism of actions by which Cu helps in performances. Copper has a direct growth promoting effect by increasing the expression of Ghrelin and feed intake related genes (Biol Trace Elem Res, 2012, 150:154-157). Higher level of copper improves gut health by decreasing the intestinal crypt depth and lymphocytes (Poult Sci, 2006, 85: 999-1007) and it also increase the intestinal lipase activity particularly in the young animals (J Anim Sci. 1996, 74:1888-1896.).

**Disadvantage of Higher Cu inclusion in diet**



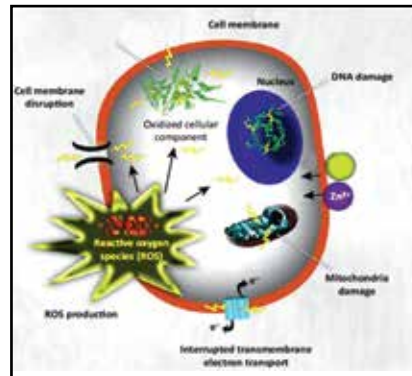
Poultry feeds as inorganic mineral salts (copper sulfate pentahydrate), are mostly excreted in the feces and are a cause of environmental concerns.

High doses of Cu may also easily chelate phytate (Cheryan, 1980) and make it non-accessible for hydrolysis by phytase or absorption in the intestine (Pang and Applegate, 2006) and it can affect the availability of other trace minerals such as zinc, Iron, P etc.

In Upper GIT and stomach where pH is very low (around 2.5) most of the molecules are opened up and start interacting with other particles and form complexes with either phosphorus or other trace minerals and when this complex reaches ileum, the major site of absorption, because of this antagonism molecules won't be available for absorption

which leads to reduced bioavailability. But a true chelated mineral (BIS Chelated) like HMTBA chelated minerals are protected from this antagonism and increase the bioavailability.

**Mechanism of toxicity of Cu against bacteria**



Cu can produce free radicals, resulting in induction of oxidative stress (i.e., reactive oxygen species; ROS). The produced ROS can irreversibly damage bacteria (e.g., their membrane, DNA, and mitochondria), resulting in bacterial death.

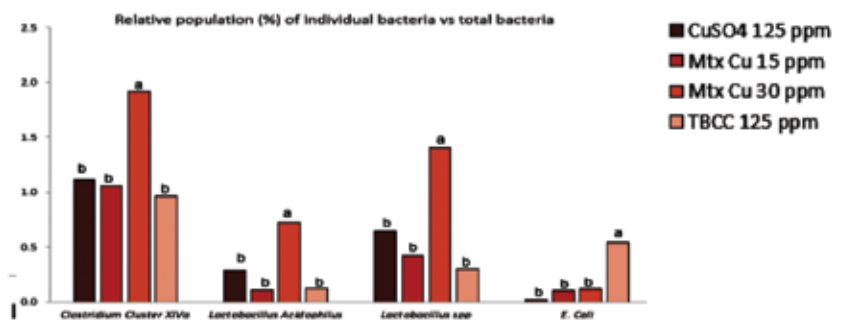
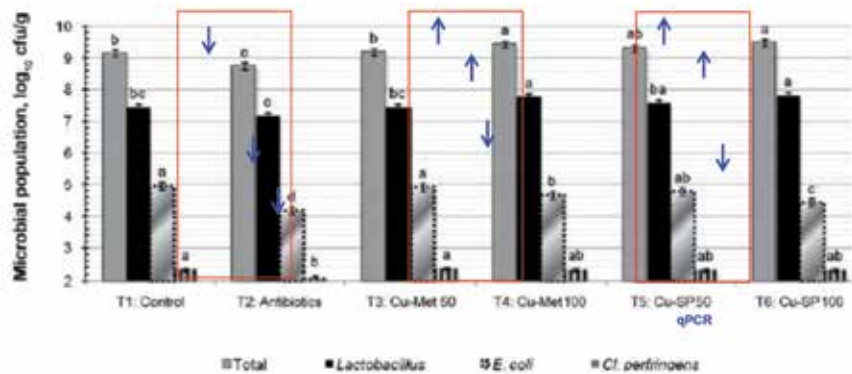
**Role of Cu in modulating Gut microbiota**

The Cu-Met was produced by reacting dl-Met and Cu sulfate and The Cu-SP was produced by reacting soybean digest and Cu sulfate. what we can see here is that antibiotic is reducing the total bacterial count and other

bacteria no matter its harmful or beneficial. But Cu in higher dose(100ppm) increasing the lactobacillus level & decrease the Ecoli level and numerically reducing the clostridium as well. The total microbiota is also significantly increased which implies that Cu is modulating the microbiota in gut rather than reducing it and shifting it towards a favorable population which is beneficial for the gut.

**Chelated Cu improved cecal microbiota**

Clostridium clusterXIVa includes many known butyrate-producing bacteria. Butyrate is a preferred energy source for colonic epithelial cells and reported to improve growth performance, intestinal digestive and absorptive capacity. Clostridium clusterXIVa been reported to down-regulate bacteria virulence and gut inflammation. Lactobacilli has been associated with beneficial effects for the host, such as: (1) promotion of gut maturation, (2) gut integrity, (3) antagonisms against pathogens, and (4) immune modulation. Lactobacilli prevent hydroxy radical production and inhibit Escherichia coli and Enterococcus growth in system mimicking colon fermentation. Lactic acid bacteria has antimicrobial activity against food borne and human pathogens by producing various inhibitory components such as organic acids, hydrogen peroxides, bacteriocins. Chelated Cu @30ppm produce significantly higher amount of Clostridium clusterXIVa and Lactobacill and lower amount of harmful







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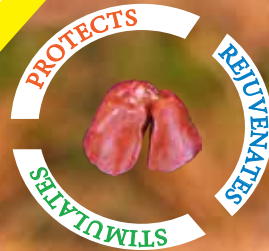
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- Anti oxidant improves immunity
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- Treats chemicals & other toxins effectively
- Rejuvenates degenerated liver cells quickly
- Stimulates liver cells for faster & better metabolic functions

**Presentation :**  
Liquid : 500ml, 1Ltr, 5 Ltr & 30 Ltr  
Feed Premix : 10kg, 25kg

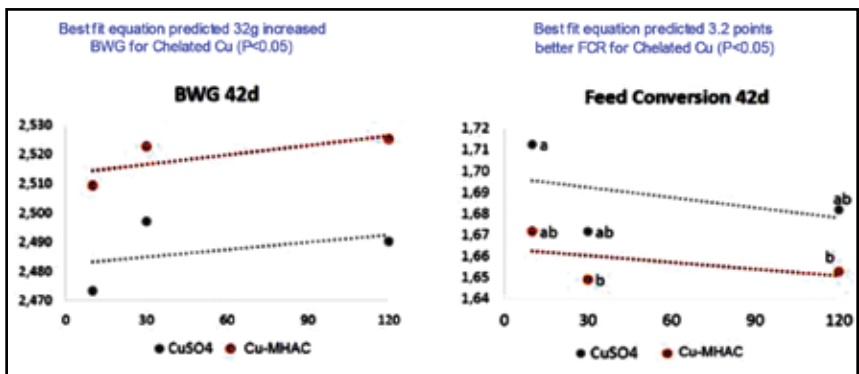
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Studies comparing different doses of Chelated Cu and CuSO<sub>4</sub> :

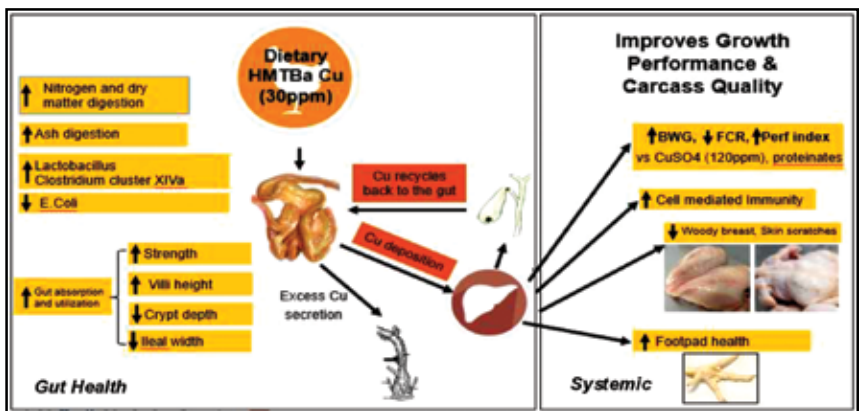
Trial 1		Trial 2		• Factorial 2 (mineral sources) x 3 (levels):		
N. birds	3,000 unsexed Cobb 500	2,800 unsexed Cobb 500		Treat	Supplemental Cu (ppm)	Source
Design	6 treats, 5 reps, 100 chicks	6 treats, 9/10 reps, 50 chicks		1	10	CuSO <sub>4</sub>
Diets	Mash: Corn-SBM-Wheat bran-DDGS based			2	30	CuSO <sub>4</sub>
Phytase	No	500 FTU's		3	120	CuSO <sub>4</sub>
Vaccination	Newcastle			4	10	Cu-MHAC
Challenges	Reused litter sprayed with water / commercial feeder space allowance			5	30	Cu-MHAC
				6	120	Cu-MHAC



bacteria like E.coli which indicates improved cecal microbiota.

Chelated Cu Local effect in Gut:

- Increased Gut Breaking Strength: chelated Cu significantly increased intestinal breaking strength in cocci challenged birds.
- Increased Villus Height & height/width ratio: Higher villi height is important as it will give more site of absorption for nutrients and we need a lower width as higher width indicates inflammation. So higher height/width ratio indicates chelated Cu improves gut integrity.
- Decreased Crypt depth & Crypt depth / villus height ratio: Chelated Cu lowers crypt depth and as a result it requires lower energy and nutrients to maintain the gut barrier function.
- Decreased Muscular layer thickness: Reduction in thickness indicates that Chelated Cu improves gut morphology and likely reduced energy and nutrient needs to maintain gut barrier function.



Studies comparing different doses of Chelated Cu and CuSO<sub>4</sub>

This is summary of two big trials with 2 (mineral sources) x3 (levels) factorial design.







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Sand & Silica	Max.	2.5 - 3.0%
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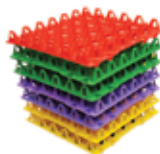
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Egg Tray



Chick Feed Tray

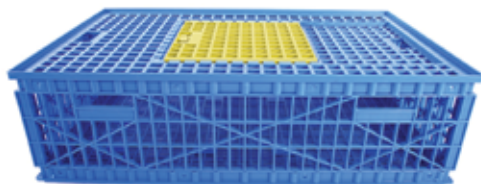


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# KAHAKI CAMPBELL



Dr.K. Ravvi Kumarr, M.V.Sc (Poultry Science), Ph.D  
Director, Central Poultry Development Organization (Northern Region)

*In Mid 1960'S 3000 numbers of Khaki Campbell ducklings were imported and housed in Regional Duck Breeding Farm at Haringhatta, West Bengal. Again in the year 1971 – 8190 Numbers of Khaki Campbell ducklings were imported from U.K. These superior egg layers were distributed in states such as Assam, Andhra Pradesh, Haryana, Jammu and Kashmir, Kerala, Orissa, and West Bengal once more. In the year 1981 -2978 number of Khaki Campbell ducklings were imported from U.K and housed in Central Duck Breeding Farm, Hessarghatta, and Bangalore.*



#### Introduction

Kahaki in India means dust color. The Khaki Campbell is perhaps the best known laying breed, named after Mrs. Campbell who towards the end of the 19th century acquired a single Indian runner due and crossed it with roven, a large meat-type French breed. She crossed a subsequent generation with wild mallards and after several generation extracted an intermediate- signed Khaki Color

Duck (Clayton 1984) K.C is hardy, tolerates high temperature and is capable for forging.

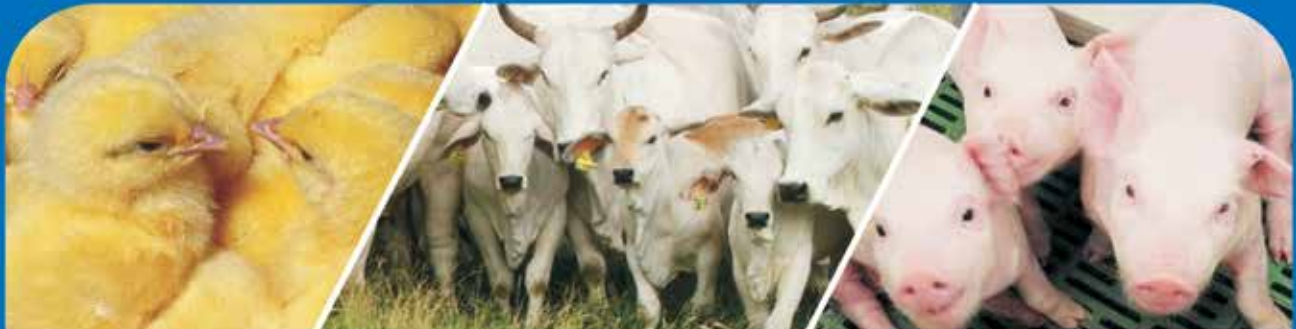
#### History

Kortlang & Kortlang Limited, Duck farm, Sandyhurst Lane, Ashford kent TN25 4PD, U.K was the only company in the world which took serious concern for development and breeding of Khaki Campbell in the world and significant progress has also been made and marketing



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● *Ducks are remarkable ability to glean and subsist on feeding material that is not used by human population or not retrievable by chicken and other domestic animals.*

● *Orvia, France has developed duckling automated sexing using camera technology to differentiate between black-eyed males and red-eyed females. At the viewing position on the conveyor belt, sexing at a rate of three birds per second is followed by automatic sorting and counting. Ducklings do not need to be handled and there is a low staffing requirement compared with more manual systems.*

● *As a consequence of domestication and intensive farming where in but few generation, its feral brooding and migratory (Flying ability) are lost forever.*

● *The West Bengal and Kerala (India) . The Nile of Egypt and Michigan (USA) Duck production has local importance in the world duck production map.*

● *85 percent global production of duck is in Asia and mainly in China.*

them to various countries including India . However, they are not active any more.

#### Introduction of Khaki Campbell in India

In Mid 1960'S 3000 numbers of Khaki Campbell ducklings were imported and housed in Regional Duck Breeding Farm at Haringhatta, West Bengal. Again in the year 1971 – 8190 Numbers of Khaki Campbell ducklings were imported from U.K. These superior egg layers were distributed in states such as Assam, Andhra Pradesh, Haryana, Jammu and Kashmir, Kerala, Orissa, and West Bengal once more. In the year 1981 -2978 number of Khaki Campbell ducklings were imported from U.K and housed in Central Duck Breeding Farm, Hessarghatta, and Bangalore.

When Khaki Campbell is fed and managed correctly it is not unusual for this breed to lay over 300 eggs per bird per year and, incidentally, they will lay well for three to four years and therefore do not require replacing as frequently as laying hens. However, a good Kahaki Campbell is not available anywhere in India as well as around the world any more. Due to In- breeding and there was no scientific selection for breeding work done in India. As well as any place in the world and they almost vanished due to mycotoxin problems. A few good number of Kahaki Campbell is available in Central Poultry Development Organization Southern Region and Training Institute and Government Poultry farm in cuttak in Odisha state and also in West-Bengal.

#### Features: Hessarghatta Khaki Campbell Duck (A profile layer)

##### Production Potential

Age at first egg	120 days
Age at 50% production	146 days
Annual egg production	300 eggs
Egg weight at 40 weeks	66 gms,
Body weight at 40 weeks	1.8 kg.
Daily feed consumption per bird	120-150 gms
Duckling mortality (0-8 weeks)	2-3%
Grower mortality (8-20 weeks)	0.2-0.5%
Adult mortality (20-72 weeks)	5.7%

**Duck Personalities:** Dr. A. Ramakrishnan , Dr. Niranjana Kalita, , Dr. K. Gajendran , Dr. A. Jalaludeen and Dr. V.D Bulbule are some of the names, who has significantly contributed

for the development of ducks in India.

#### Conclusion

Transplanting Western technology to Eastern countries resulted in complete failure even in case of Khaki Campbell. There is vagrant need to return to domestic source of knowledge and domestic breed and introduce authentic model/breed most suitable for our country. According to the Ravindran et al.,(1984) reported that the poor acceptability of khaki Campbell was due to their poor egg size and increased susceptibility to diseases compared to desi ducks.

#### Additional Duck information

Ducks are remarkable ability to glean and subsist on feeding material that is not used by human population or not retrievable by chicken and other domestic animals.

● Orvia, France has developed duckling automated sexing using camera technology to differentiate between black-eyed males and red-eyed females. At the viewing position on the conveyor belt, sexing at a rate of three birds per second is followed by automatic sorting and counting. Ducklings do not need to be handled and there is a low staffing requirement compared with more manual systems.

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● 85 percent global production of duck is in Asia and mainly in China.

● Unlike the drake of other breeds, the Muscovy male has no curl feathers in his tail. Unlike other females (Ducks), the incubation period is 36 days. Also the Ducklings are not in first full feather until 16 weeks of age, whereas the ordinary duckling is in full feather at 12 weeks.

● The Peckin duck is preferred in Asia and South Asia. Muscovy is preferred by European countries, especially France.





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# EMU ITS MANAGEMENT AND IMPORTANCE

*Emus have adapted to a variety of conditions ranging from the cold winters to the extreme heat. Emu bird lives in the grassy plains and dry open farms. Fully grown emu grow between 5 to 6 feet tall and weighing between 50 to 60 kgs. When it grows it changes its color thrice, in the beginning as it comes out of the egg up to 3 months there are stripes on its body, after 4 months it looks chocolate brown and after 1 year it again starts changing its color. The feathers on the neck fall off and neck looks bluish green. Generally 18-month-old female is capable of reproduction, however in some emus this period can extend up to 2 years, breeding occurs during winter season, breeding period is usually of 6 months (October to February in India), female mates with the male during breeding season and gives a clutch of eggs, emu generally gives eggs during evening between 5.30 to 7.00 p.m.*

Nazir .A. Bumla, Maria. A., Asif. H. Sofi. and Z. A. Kashoo  
F.V.Sc & A.H, SKUAST-K. Shalimar Campus, Srinagar,  
J&K, India. 190025.

**E**mu the second largest flightless bird under the group ratites. Emu is scientifically classified as *Dromius Noveahollandiae* along with other members of the group ostrich, kiwi and rhea, other flightless birds, and is native to Australia. Emu Framing is spread all over the world with significant population in U.S.A, China, Australia and Asian countries. Emu is becoming popular for having 98% fat free red meat and other utilities obtained by products namely, Emu oil, skin, feathers, ornamental eggs and toes. Emu farming is in developing stage in India. Andhra Pradesh started Emu farming for the first time during 1998. Later breeding flocks spread

over entire country for commercial purpose. Presently emu farming is being carried out in large scale in States of Andhra Pradesh, Tamil Nadu, Maharashtra Goa, Orissa Madhya Pradesh Karnataka and Kerala, at present there are 900 emu farms in 14 states. Since (2000) Department of Poultry Science, Veterinary College, Venkateshwara University Andhra Pradesh is doing pioneer work in the areas of research on Emu.

Emus have adapted to a variety of conditions ranging from the cold winters to the extreme heat. Emu bird lives in the grassy plains and dry open farms. Fully





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*Emu farming in India presently concentrated in Southern States with usual importance given for breeding. Farmer buys 10 to 15 pairs from a big breeder and has an option of becoming a self sustained breeder to produce chicks for sale or an integrated farmer to sell hatching eggs back to the integrator, the products sale in India is yet to take shape due to lack of awareness and non-availability of sufficient emu population. The future of this industry will be diversified into emu farming for fattening and breeding. Emus raised for fattening will be fed with different rations so that they will gain body weight at the earliest and yield all the products suitably, the preferred age for fattening is less than 24 months and ideal is 12 months. Present estimate of Emu population in India is above two lakhs. The biggest Farm is in Andhra Pradesh with 6000 Emus at one place. Vijayawada, West Godavari, Hyderabad, Chittoor and Nellore, in AP, Coimbatore, Namakkal, Erode and Hosur in TamilNadu, Gokak, in Karnataka, Pune and Nasik in Maharashtra are production belts for Emus.*

grown emu grow between 5 to 6 feet tall and weighing between 50 to 60 kgs. When it grows it changes its color thrice, in the beginning as it comes out of the egg up to 3 months there are stripes on its body, after 4 months it looks chocolate brown and after 1 year it again starts changing its color. The feathers on the neck fall off and neck looks bluish green. Generally 18-month-old female is capable of reproduction, however in some emus this period can extend up to 2 years, breeding occurs during winter season, breeding period is usually of 6 months (October to February in India), female mates with the male during breeding season and gives a clutch of eggs, emu generally gives eggs during evening between 5.30 to 7.00 p.m. Each adult emu after three years can give an average egg production of 30 eggs during breeding period, eggs are emerald green in colour weighing about 600 to 800 grams, compared to hen egg they are 10-12 times bigger, female emu may lay eggs after every 3 days, sometimes it lays eggs after 3 or 5 days. Later male sits for brooding on these eggs for a period of 52 days without food and water, chicks hatched out follow the male emu rather than female. However female continues to breed with new partners during the whole breeding season.

In large farm eggs are collected on regular basis and are stored in a cooler temperature of 60oF maximum up to one week, later they are set in incubator machines which are specially designed to hold emu eggs with a dry bulb temperature of about 96o to 97oF and wet bulb temperature of about 78o to 80oF (about 43% relative humidity) up to 48th day with regular turning mechanism every one hour, from 49th day eggs are shifted to hatcher till 52nd day, on that day chicks hatch out naturally, sometimes assisted hatch is also carried out manually by helping the chick to come out by opening the shell at the head and toe positions, normal hatchability is about 80%. Emu has a long life and lives at least for 40 years, If we look after them properly emus are capable of reproduction for at least 25 years, and can produce 32 young ones per year. So in simple terms a farmer keeps these birds, looks after them well and produces marketable goods.

#### **Housing and Feeding Management of Emu:**

##### **Chick Management:**

Emu chicks weigh about 370 to 450 grams (about 67% of the egg weight), for the first 48 to 72 hours, emu chicks are restricted to hatcher itself for absorption of egg yolk and proper drying, brooding shed would be prepared well in advance with thorough cleaning and disinfection and flooring should be covered with

gunny bags to prevent slipping of legs of young chicks, emu chicks have long legs and are very active, slippery flooring will make emu chicks to have hip dislocation resulting in irreparable damage. Arrange a set of brooder for about 25 to 40 chicks giving four sq.ft. per chick for first three weeks, provide brooding temperature of 90o F for the first ten days and 85oF till three to four weeks, provide feed and water with a brooder guard of 2.5ft height, feed starter mash for first 8 weeks, provide sufficient run space for the chicks to have healthy life. Hence floor space of 40ft x 30 ft is required for about 40 chicks with outdoor space.

##### **Grower Management (9 to 42 weeks of age):**

As emu chicks grow they require bigger size of waterers and feeders and increased floor space for run, feed the birds grower mash till 42 weeks of age. 10% Greens (carrot, papaya, cucumber) can be offered, deworm the birds once with broad spectrum anthelmatic/ ivermectin and vaccinate with R2b at 8th week and repeat at 40th week against Ranikhet disease. Provide 40ft x100 ft space for 40 birds.

##### **Breeder Management:**

Emu birds are seasonal layers and monogamous, require different nutritional requirements which are also varied during breeding season, high protein and micro nutrients are given during breeding. Because feed consumption will be reduced to fifty percent during breeding, after breeding a maintenance ration is given with low protein and low energy diet.

##### **Adult Management:**

Emus are reared in open paddocks which will have chain link fencing of 2x2 or 3x3 enclosure with 2 ft. concrete wall construction on this chain link mesh of 6 ft. ht. is erected. Night shelter is optional with usual asbestos sheet roofing of 6 to 8 ft. Feeding is given in feed troughs which are usually hung on the fence and water is given in specially designed water tank or troughs with good drainage, feeding is done twice daily and water to be provided adlib.

##### **Important Products of Emus and there utilization:**

##### **Emu meat:**

Is very important because it is about 97 to 98% fats free red meat which is similar in look to other red meats viz., beef, mutton, deer meat etc. Emu meat is rich in proteins, it contains plenty of iron vitamin B-12, hence as the modern research shows emu meat is an excellent diet for people suffering from heart



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ailments it is easily digestible very tasty and hence it serves as a very good alternative for mutton and chicken. Therefore there is a great demand for it in international market each bird can yield about 25 kg of meat.

#### **Emu Oil:**

Emu oil is semi solid white mass which is generally located all along back of bird but when it is processed and refined it is a clear liquid because of its properties such as bacteriostatic, anti-inflammatory, faster healing, and emulsifier, it is utilized for treatment of various conditions namely arthritis, skin treatment, burn injuries, hair loss etc.

#### **Emu Skin:**

Emu skin is of high quality very soft and smooth with usual yield of about 6 to 8 sq.ft. per bird which is used in preparation of leather products including apparels. The leg skin is very unique and with scales similar to crocodile skin and is being used in protective things for knives, swords and shoe top etc.

#### **Emu feathers:**

Feathers of emu bird are double quilled, attractive, soft, light and non-allergic, because of these properties. They are having high demand in the fashion, art and craft industries. Are used as feather duster, feather pad, fans, bows, masks, finishing metals prior to painting, weather-proof apparels, pillows, blazers, sweaters, jewellery and craft items.

#### **Emu egg and toe nail:**

The unfertilized eggs which are used in crafting antique mementos for sale with different carving on the shell. Emu nails are also been used as key chains, pendants in necklaces.

Emu farming in India presently concentrated in Southern States with usual importance given for breeding. Farmer buys 10 to 15 pairs from a big breeder and has an option of becoming a self sustained breeder to produce chicks for sale or an integrated farmer to sell hatching eggs back to the integrator, the products sale in India is yet to

take shape due to lack of awareness and non-availability of sufficient emu population. The future of this industry will be diversified into emu farming for fattening and breeding. Emus raised for fattening will be fed with different rations so that they will gain body weight at the earliest and yield all the products suitably, the preferred age for fattening is less than 24 months and ideal is 12 months. Present estimate of Emu population in India is above two lakhs. The biggest Farm is in Andhra Pradesh with 6000 Emus at one place. Vijayawada, West Godavari, Hyderabad, Chittoor and Nellore, in AP, Coimbatore, Namakkal, Erode and Hosur in TamilNadu, Gokak, in Karnataka, Pune and Nasik in Maharashtra are production belts for Emus.

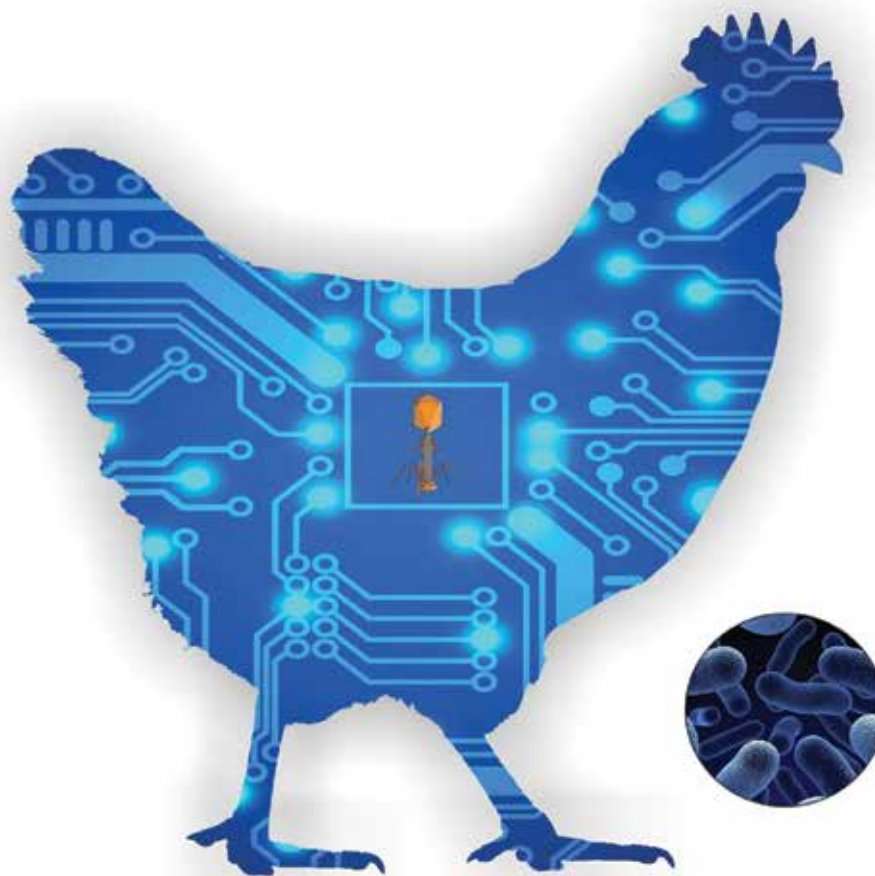
At present there are four Emu Association in India. They are Hyderabad as "Indian Emu Association", Mumbai "National Emu Association". These two associations are working at all India level, in Maharashtra level at Baramati in the name of "Maha Emu Association" and another at Pune in the name "Emu Farmer Association".





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*Salmonellosis is one of the most common foodborne bacterial infections worldwide. It is caused by host specific and non host specific Salmonella in poultry. Host specific infections include Pullorum disease and Fowl typhoid, whereas non specific include infection by Salmonella Enteritidis and Salmonella Typhimurium. Salmonella infection in poultry leads to huge economic loss. As Salmonellosis can be transmitted to humans, the presence of Salmonella in poultry and poultry products also hinder international trade. Therefore prevention and control measures are necessary to prevent significant losses caused by this disease.*

# PREVENTION AND CONTROL OF SALMONELLA INFECTION IN POULTRY

Jagmeet Kaur

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## Introduction

Salmonellosis is one of the most common foodborne bacterial infections worldwide. It is caused by host specific and non host specific Salmonella in poultry. Host specific infections include Pullorum disease and Fowl typhoid, whereas non specific include infection by Salmonella Enteritidis and Salmonella Typhimurium. Salmonella infection in poultry leads to huge economic loss. As Salmonellosis can be transmitted to humans, the presence of Salmonella in poultry and poultry products also hinder international trade. Therefore prevention and control measures are necessary to prevent significant losses caused by this disease.

## Pullorum Disease

Pullorum disease is a septicemic poultry disease caused by gram negative bacteria Salmonella Pullorum. Previously known as Bacillary white diarrhoea.

It causes disease in young chickens within first 2-3 weeks of age. Disease is less common in adult chickens, if present, mortality is high but there are no clinical signs frequently. The transmission of disease occurs through oral route or through navel/

yolk. It can also be vertically transmitted. Recovered hen typically passes on the bacteria to one third of her eggs.

## Clinical findings

- Affected birds appear weak
- Huddle near a heat source
- Have characteristic white pasted vent
- Anorectic
- Birds may die shortly after hatching
- Sometimes they make shrill chirping and peeping sounds

## Gross lesions

These are seen in chronic conditions, but are mostly absent in peracute cases. There will be yolk sac retention, enlargement and congestion of liver, spleen and kidneys. Sometimes caseous cores may be seen in caeca.

## Fowl Typhoid

The causal agent is Salmonella Gallinarum. It is also transmitted vertically. Horizontal transmission occurs by feco-oral route or by egg eating. S. Gallinarum can cause disease in birds of any age, but has a tendency to spread among growing or mature flocks. Chickens are mostly affected

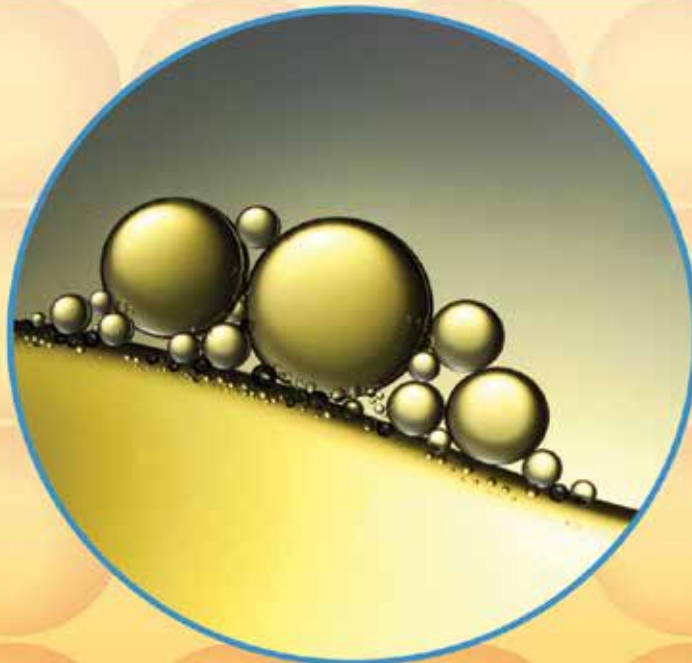


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*Fowl paratyphoid is a non-host specific infection of poultry which is responsible for Salmonella-food poisoning in humans. Salmonella enteritidis and Salmonella typhimurium are non-host specific Salmonella of poultry. Transmission occurs directly from infected birds, contaminated environments or infected rodents. Infected birds remain carrier. Management and environmental factors that cause stress to the birds compromise bird's ability to resist infection and increase vulnerability in developing clinical disease*

but it can affect other poultry birds also viz., turkey, game birds, sparrows, parrots and guinea fowls.

#### Clinical findings

- Depression
- Ruffled feathers
- Inappetance
- Yellow diarrhoea
- Reluctance to move
- Death of birds occur in upto 90% of cases

#### Gross lesions

On post-mortem examination, bronzed enlarged liver with small necrotic foci or congestion was found. Other lesions include engorgement of kidneys and spleen, anemia and enteritis. Yolk sac retention may also occur, with yolk sac appearing creamy or caseous.

#### Fowl Paratyphoid

Fowl paratyphoid is a non-host specific infection of poultry which is responsible for Salmonella-food poisoning in humans. Salmonella enteritidis and Salmonella typhimurium are non-host specific Salmonella of poultry.

Transmission occurs directly from infected birds, contaminated environments or infected rodents. Infected birds remain carrier. Management and environmental factors that cause stress to the birds compromise bird's ability to resist infection and increase vulnerability in developing clinical disease.

Clinical findings: Mortality is seen mostly in the first few weeks of age.

#### The main symptoms of the disease are:

- Depression
- Poor growth
- Weakness
- Diarrhoea
- Dehydration
- Droopy wings
- Constant chirping noises
- Wollen joints
- Purplish colored comb and wattles

#### Gross lesions

Lesions include enlarged liver with necrosis, unabsorbed yolk sac and enteritis with necrotic lesions.

#### Diagnosis of Salmonella: Diagnosis can be made from

- History

- Clinical signs
- Necropsy
- **Isolation and identification of organism:** Isolation of Salmonella is mainly done from intestinal tract and its contents. However, ovary, spleen, liver, yolk sac, heart, kidney, gall bladder, joint, fluid/pus and eyes can also be cultured as a part of post-mortem examination. Direct plating on Brilliant Green, MacConkey and on non-selective agar can be done.
- **Serological tests:** Standard serological tests like tube and rapid plate agglutination tests can be performed.

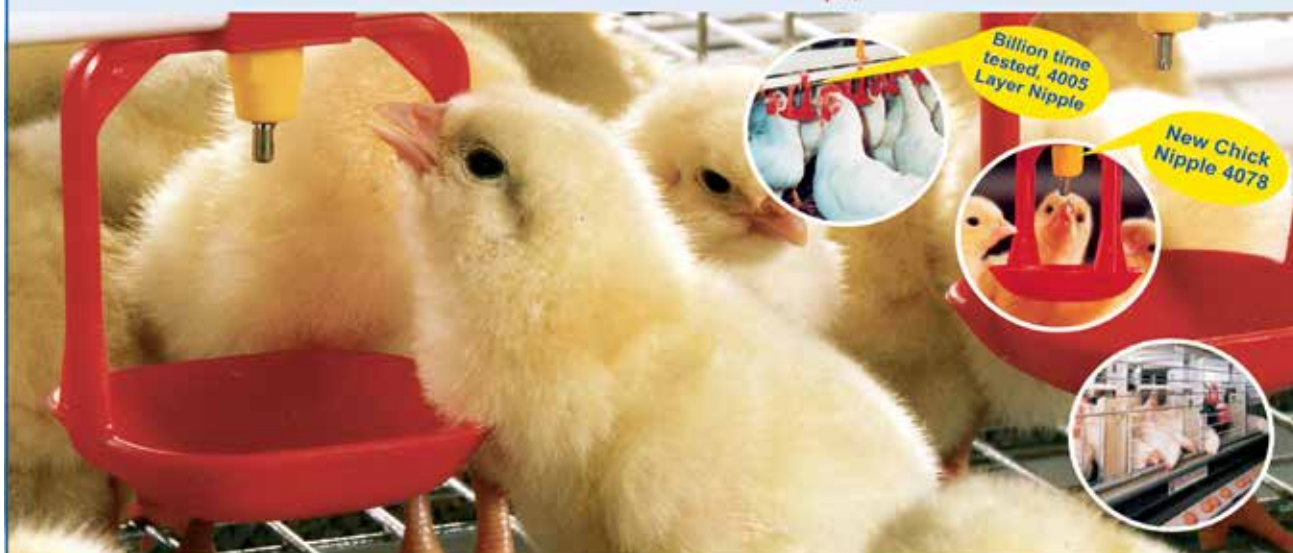
#### Prevention and Control

- Eggs should be cleaned and disinfected or fumigated before hatching.
- Day old chicks should be bought from Salmonella-free breeder flocks in which no evidence of Salmonella has been detected.
- Chlorinated drinking water should be given to birds ideally, if not provide water from a clean drinking source.
- Monitor the Salmonella status of poultry feed because feed contaminated with Salmonella is known to be a source of infection for poultry. Heat treated feed with or without addition of other bactericidal or bacteriostatic treatments are recommended.
- **Vaccination:** In some areas, vaccines both live and attenuated have been used to control the infection. Vaccination can be used as an overall Salmonella control programme.
- Depending upon animal health, and risk assessment, culling is an option to manage infected breeder and layer flocks. Infected flocks should be destroyed or slaughtered and processed to minimise human exposure.
- Litter of infected birds should not be reused. Used poultry litter, carcass and other contaminated farm waste should be transported and disposed off in safe manner to prevent direct or indirect contact of humans, livestock and other to Salmonella.
- Proper care should be taken in cleaning and disinfection of the poultry house and equipment.
- If disease is introduced, control should focus on eradication of disease through isolation and destruction of contaminated flocks, proper disposal of carcass and disinfection of fomites.



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# IMMUNE RESPONSES OF POULTRY

## TO RANIKHET (NEWCASTLE) DISEASE VIRUS

Dr. K.L. Revappa, Dr. S.K. Maini, Dr. Suresh Sharma,

Vaccine Division, Vesper Pharmaceuticals, Soladevanahalli, Bengaluru - 560 107.

### Introduction

*Despite the advances made in the diagnosis of and vaccination for Newcastle disease since it was first described in 1926, the disease continues to negatively impact poultry producers by infecting birds worldwide.*

*Newcastle disease (ND) ranked as the fourth most important disease in terms of the number of livestock units lost for poultry species behind highly pathogenic avian influenza, infectious bronchitis, and lowly pathogenic avian influenza. While humoral immunity from vaccination is critical to ND control, another important aspect, that is not a new concept, but is often neglected, is the differences in resistance to ND due to genetic variation..*

Genetic resistance to ND has been observed with various lines within the breed of chickens and turkey and among breeds of chickens and ducks. It is important to note that each Newcastle disease virus may be better adopted to grow in one species versus another, like what is seen with PPMV-1 (Pigeon NDV) strains in chickens.

While improving genetic resistance to ND through breeding more resistant strains appears to be feasible, logistically it is very difficult due to the involvement of multifactorial components. Perhaps when the efficiency of producing transgenic birds is improved more disease resistance breeds can be used for this purpose.

### Innate immune response to NDV (Newcastle disease virus) Infection in poultry.

The innate immune response comprises factors that exist prior to the advent of infection, and are capable of exclusion or rapid response to microbes. The primary components of innate immunity of poultry are (1) physical and chemical barriers, such as feathers and skin, epithelia and production of mucus; (2) phagocytic cells, including macrophages and natural killer cells; (3) Complement proteins and mediators of inflammation; and (4) cytokines. Overall, the innate immune response to virus infection is an immediate reaction designed to control and inhibit virus growth and spread, and aid in developing pathogen-specific protection through the adaptive immune response.

After the infection, the virus is first recognized by host sentinel proteins, including TLR (toll-like receptors) and NOD (nucleotide-binding domain oligomerization domain proteins), proteins producing rapid signaling and transcription factor activation that lead to production of soluble factors, including interferon and

cytokines, the mediators of innate immune response, designed to limit and contain viral replication.

NDV of low virulence stimulates a lower innate immune responses compared with virulent NDV (VNDV) that induces significantly higher levels.

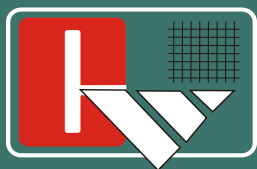
Antibody response to infection and Vaccination with NDV

In addition to bio-security and culling of infected birds, vaccinations are critical component to control ND. International and national vaccination control policies will depend on the factors affecting the sector or poultry production, while keeping with the OIE regulations (OIE, 2012).

The goal of vaccination is always sterilizing immunity, however, that has not yet been achieved with NDV Vaccines. At best, NDV vaccines induce an immune response that reduce or completely prevents clinical disease and mortality from ND, decreases the amount of VNDV shed into the environment, and increases the amount of virus needed to infect the vaccinated bird.

Mass application of live vaccines is often used due to the lower cost and faster application time compared to having to administer individual vaccines to each bird of a flock. The lentogenic B1, and Lasota vaccine strains of low virulence are commonly used worldwide, and can provide protection against VNDV if the vaccines are viable, administered correctly to healthy birds and time is allowed for an appropriate immune response to develop prior to the challenge virus. Unfortunately, conditions in the field are often less than optimal with mass application potentially reaching as little as 53% of the flock when the route of administration is spray and 60% when the route is through the drinking water.





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Inactivated vaccines are often administered to layers and breeders to provide long lasting high antibody titers that can be passed to offspring to provide maternal immunity.

Because all NDV are in one serotype any NDV (avirulent) strain can be used as a vaccine and all vaccines should prevent clinical disease and death from ND. However, some studies have demonstrated that vaccines formulated with strains more similar to the challenge virus can decrease the amount of challenge virus shed in oropharyngeal swabs from vaccinated birds and potentially decrease the number of birds that shed virus.

In the chicken, IgM, IgY (avian IgG) and IgA antibodies are produced as part of the immune response. Antibodies are detected at the site of infection and in the blood starting at six days after infection or live virus vaccination and peaks 21-28 days after infection.

Antibodies neutralize the ND virus particles by binding and preventing attachment of the virus to the host cells.

Approximately 30% of the IgY and 1% of the IgM and IgA antibodies present in the hen's plasma will passively transfer to the offspring to provide maternal immunity and if the NDV antibody levels are high enough can provide protection until the levels fall below a protective level.

Herd immunity is another beneficial consequence of a successful vaccination programme as it provides some protection to suboptimal – vaccinated or unvaccinated birds in an otherwise well vaccinated flock. However, this outcome is only achieved with ND when greater than 85% of the flock have haemagglutination inhibition (HI) antibody

titers greater than 8 after two vaccinations. Field results suggest that only birds with HI titers greater than 16 after multiple vaccinations will survive VNDV challenge as 66% of the flock succumbed with titers less than that more commonly, HI levels of 32 or higher are what are typically thought of being protective.

#### Cellular immunity induced by NDV

Cell-mediated immunity (CMI) is specific adaptive immunity mediated by T lymphocytes and has been suggested to be an important factor to the development of protection in chickens vaccinated against NDV and contribute to viral clearance.

The subsets of T-lymphocytes, including cytokine – secreting CD4+ T helper cells, and CD8+ cytotoxic T lymphocytes (CTL), constitute the principle cells of the CMI response. Unlike antibody measurement via ELISA or HI, testing for CMI is more labor intensive and requires more skilled procedures.

Cell-mediated stimulation following NDV infection is detected as early as 2-3 days post infection. More recent studies also confirmed CMI responses to NDV may be detected shortly after vaccination with a live NDV vaccine.

The results of research indicate that the antibodies (HI antibodies) are the key modulators of protection, but that CMI likely continues to decrease viral shedding through target killing of NDV infected cells.

Studies have compared CMI responses between birds receiving live versus inactivated NDV vaccines. Results indicate that CMI derived from Inactivated NDV vaccines take longer to develop and are not as robust as that from Live vaccines.

The virulence of the virus appears to play a role in CMI stimulation. It has been demonstrated that an earlier and shorter CMI induced by a less virulent NDV vaccine strain, compared to stronger and longer CMI mediated by a more virulent vaccine strain. Further the more virulent strain persisted longer in the bird and therefore was able to increase magnitude and duration of CMI.

To conclude, NDV specific antibodies remain the primary mechanism of protection against virulent NDV, the contribution of CMI are important considerations in the face of field challenge.

As New vaccine strategies are employed to protect poultry against VNDV it appears obvious that combining both arms of the adaptive immune response provide the best protection of birds and decrease the risk of transmission to susceptible birds.

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Day	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Ahmedabad	449	449	451	453	455	457	458	458	458	460	460	462	464	464	464	464	464	430	430	400	402
Ajmer	396	396	396	396	400	402	402	402	404	404	404	404	406	402	402	402	395	390	390	-	-
Banglore (CC)	419	419	419	419	419	419	419	421	421	423	423	425	425	425	425	425	415	405	395	385	
Chennai (CC)	415	415	415	415	415	415	415	415	415	415	415	420	420	420	420	420	420	420	410	400	400
Chittoor	408	408	408	408	408	408	408	408	408	408	408	413	413	413	413	413	413	413	403	393	393
cochin	410	410	415	415	415	420	415	415	415	410	410	415	415	415	415	410	410	410	410	400	395
Delhi (CC)	408	408	408	408	408	410	412	412	412	412	412	414	416	419	419	419	419	419	410	405	400
E.Godavari	420	422	422	422	422	422	422	422	422	422	422	422	422	422	422	422	422	405	395	395	390
Hyderabad	404	405	406	407	407	407	407	407	408	409	410	411	411	411	411	411	390	390	370	370	370
Miraj	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mumbai (CC)	458	458	460	462	462	462	462	462	462	464	464	464	466	466	466	466	466	445	445	425	425
Mysore	422	422	422	422	422	422	422	422	424	426	426	429	429	429	429	429	429	419	412	400	392
Nagapur	405	405	400	405	405	405	400	400	400	400	-	-	-	-	-	-	-	390	383	-	-
Namakkal	400	401	401	401	401	403	405	407	409	411	414	415	415	415	415	415	415	400	400	400	400
Pune	452	452	453	454	454	455	455	455	455	457	457	457	457	457	457	457	457	447	440	420	420
Punjab	390	383	383	384	384	384	398	398	398	398	398	398	398	400	-	-	-	-	-	-	-
Vijayawada	420	422	422	422	422	422	422	422	422	422	422	422	422	422	422	422	422	405	395	395	390
Vizag	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	400	400
W.Godavari	420	422	422	422	422	422	422	422	422	422	422	422	422	422	422	422	422	405	395	395	390
Warangal	406	407	408	409	410	410	410	410	410	411	412	413	414	414	414	414	414	393	393	373	373

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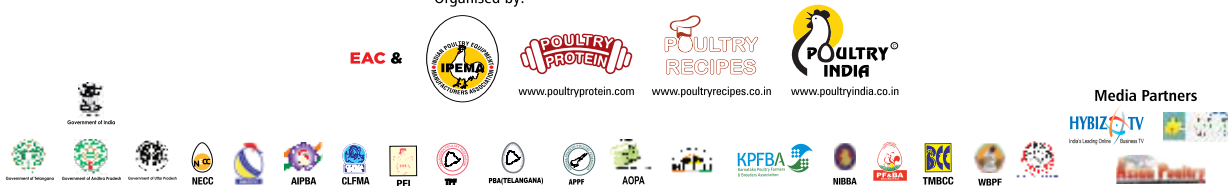
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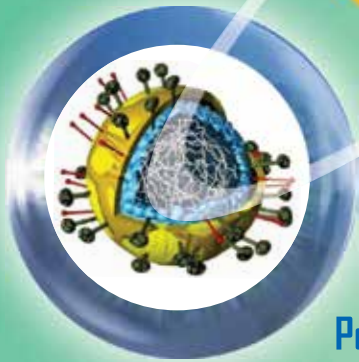
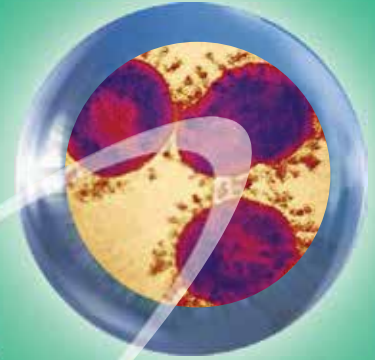


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