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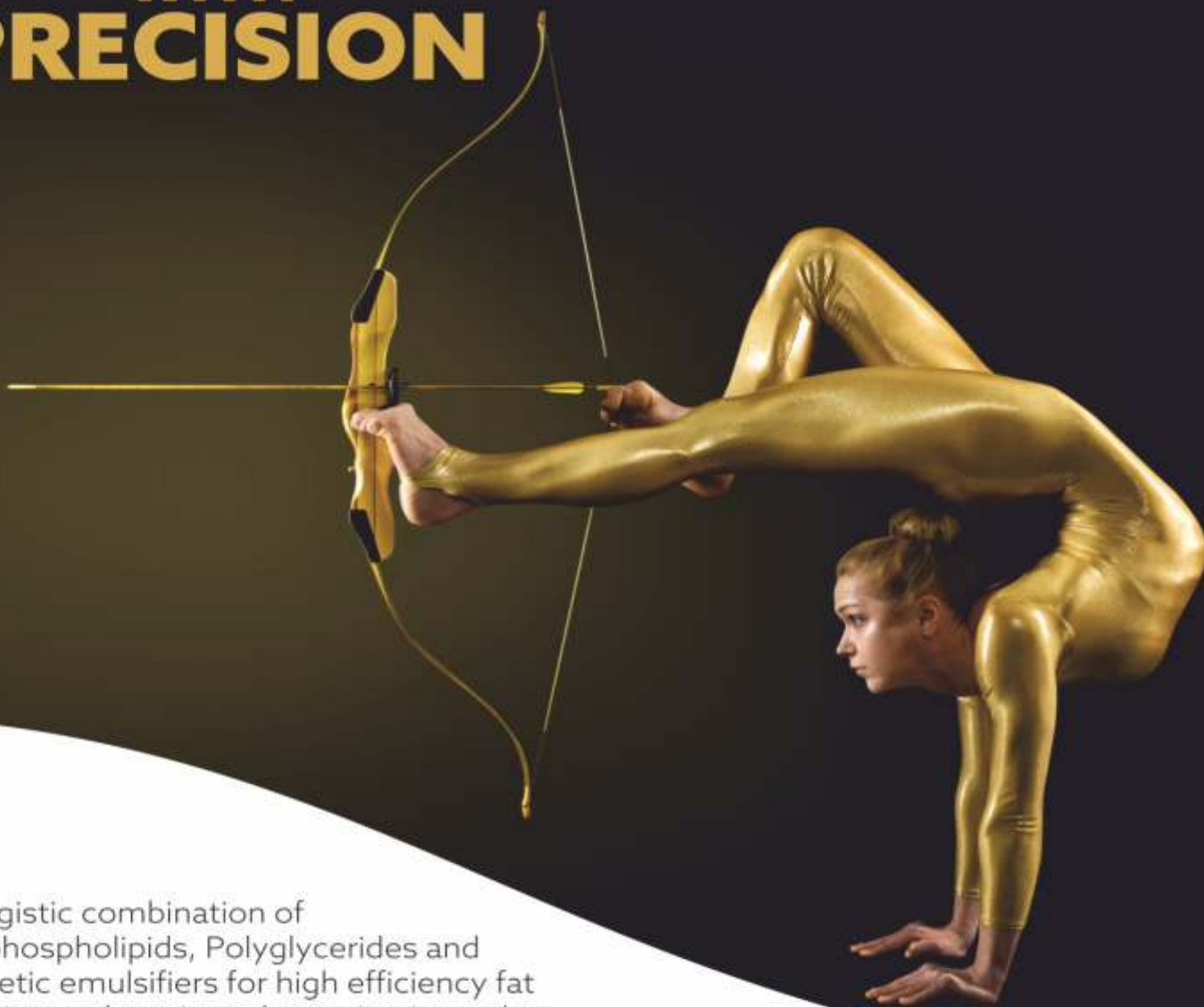
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From the Editor's Desk



Indian Poultry Industry Outlook

Since its inception, the Indian poultry industry has experienced remarkable growth, emerging as a glorious sector with growth rates of 8.51 and 7.52% in egg and broiler production, respectively. Poultry meat is the fastest-growing segment of global meat demand, and India, the world's second-largest developing country, is rapidly expanding its poultry industry.

Meat and eggs are made available to the market through channels of distribution such as traditional retail stores, business to business, or contemporary retail stores for use in food services or for individual consumption. Because of the growth of online grocery retailers in India, such as Grofers, Amazon Fresh, and Big Basket, poultry items are now available through online retail channels. As a result, the increased availability of poultry products is promoting market expansion in India.

The associations also play an important role in guiding farmers on a regular basis, raising consumer awareness and presenting industry requirements to the government, promoting egg consumption on various occasions, and so on.

The poultry industry's continued expansion may be hampered by issues with organic matter transportation, waste management, the use of green energy, disease diagnostics, and other issues. Shareholders, veterinarians, farmers, and all other stakeholders in the poultry production chain must be more involved in the current state for the industry's strategic future if it is to meet consumer demand and ensure sustainable agriculture. Improving infrastructure facilities, which will help stabilise the price of poultry products on the domestic market and make them accessible in remote areas, is one of the necessary policy actions for the poultry industry. Creating an efficient marketing channel to assist producers in receiving fair prices and increasing the availability of poultry products in remote areas.

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Art of Feed Acidification for Best Gut Health

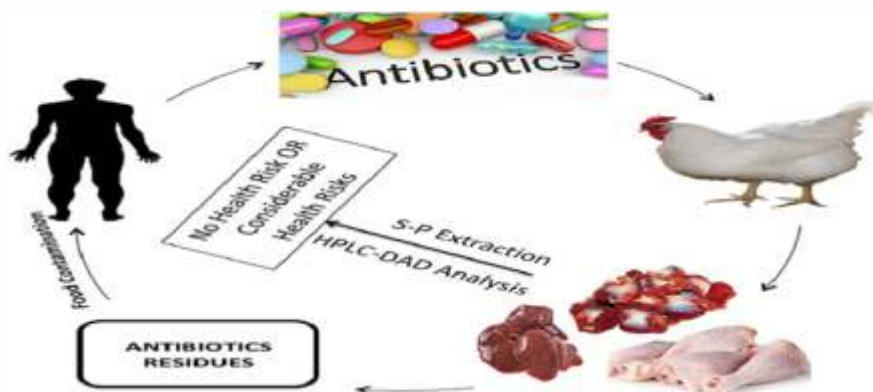
Use of acidifiers in poultry diet are very common practice now a days. Acidifiers are proven its importance as alternative antibiotic growth promotor(AGP) which may partially or fully replace AGP depending upon purpose. However, over the years designing of proper feed acidifier to get optimal result becoming an art. Therefore, use of proper combination of organic and inorganic acids along with value added ingredients like saponin which works as anti- ammonia compound could be perfect acidifier as a part of gut hygiene as well as feed hygiene.

The acidifiers could be used to favourably manipulate the intestinal microbial populations and improve the immune response, hence perform an activity similar to antibiotics in food animals in countering pathogenic bacteria. It has been observed increased feed intake,

growth, carcass yield. Acetic acid and lactic acid enhance body weight in birds. Acidifiers also improve the digestibility of nutrients and increase the absorption of minerals. The utilization of acidifiers also promotes economic benefits of higher feed efficiency, improved daily gain leading to reduction in feed costs.

To overcome problem of antibiotic residue in poultry meat and to improve feed performance GLOCREST launched unique combination of acidifier, mould inhibitor, and antifungal feed additive **Feedacid**. It contains blend of organic acid, inorganic acids, saponin- allicin, Shatavari and Thymol. **Feedacid** contains

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Malic acid - improves microbial safety regards to campylobacter.

Propionic acid - is fungicide and bactericide -control fungi and bacteria stored in grains, poultry litter, drinking water for poultry.

Feedacid helps maintaining beneficial microflora in digestive tract by antagonistic activity and competitive exclusion.

Feedacid produces several bactericidal substances that kill disease producing organism. It also makes gut acidic so useful bacteria like lactobacillus get attached to intestinal villi and prevent attachment of harmful bacteria e.g., E. coli and salmonella **Feedacid** used to favourable manipulate intestinal microbial population and immune response. It performs activity similar to antibiotic in countering pathogenic bacteria - along with blend of organic acid, inorganic acids, allicin, Shatavari, and saponin- Thymol. Their apparent actions include improved feed hygiene, lowering of gastric pH and inhibition of pathogens without affecting the

beneficial bacteria, stimulation of pancreatic secretions and energy source during intermediary metabolism, enhanced nutrient digestibility, improved growth performance and immunity.

Inclusion of citric acid in **Feedacid** at the level resulted a better productive performance and higher profits in broiler chickens. Citric acid used in **Feedacid** to promote growth by acidifying the gastrointestinal contents, improving nutrient digestibility, and reducing pathogen loads.

Role of Thymol in **Feedacid** : - It acts as Anti-bloating agent. These properties may be attributed to thymol's capability to work as antispasmodic, antioxidant, antimicrobial, immunomodulatory, and anti-inflammatory agent by suppressing harmful compounds/free radicals from interacting with cellular biological compounds, ability to alter the gut microbiota, and increasing digestion, absorption and metabolism of nutrients. It reduces concentration of ammonia in excreta and litter. Thymol -effective antioxidant for extending broiler meat quality during storage.

Asparagus racemosus (Shatavari) increases the appetite and stimulates the liver. It is

concluded that 1% Shatavari inclusion in feed can act as efficient and effective growth promoter for broilers. The root is used to prepare medicine.

Allicin is a defence molecule from garlic (*Allium sativum* L.) with a broad range of biological activities. The antimicrobial properties of Garlic have been observed when it has been used for centuries in many countries to control infectious diseases. It has been documented that garlic is effective against many bacteria that include: *Escherichia coli* (E. Coli), *Salmonella*, *Clostridium*, *Staphylococcus aureus*, *Pseudomonas*, *Proteus*, *Klebsiella*, *Micrococcus*, and *Bacillus subtilis*. Garlic supplementing chickens had an improved effect on humoral immune responses to the Newcastle disease virus.

current state of knowledge on the use of garlic in relation to their impact on growth performance, product quality, immune modulation, and feed conversion efficiency as effective poultry feed additives.

Conclusion: -Feed with perfect blend of organic and inorganic acid with saponin like allicin - Thymol is right choice maintain gut health- feed hygiene and alteration AGP.

Dose of **Feedacid** – 1 to 2 kg per ton of feed.

Contact us for Details

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Kadaknath : An Important Poultry Breed to Improve Health as well as Economy



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Introduction

The Indian poultry sector has been emerged from backyard rearing into major commercial agricultural-livestock based industry in last four decades. Consistent improvement of breeds and producing new strains along with standardized managerial practices, nutrition, disease control has contributed to growth in both egg and broiler production. The organized poultry sector contributes 70% and the unorganized sector contributes 30% to the total poultry output. Within the poultry sector the broiler sector contributes two-third and layer accounts one-third of the output. Poultry genetic diversity across world is decreasing due to commercialization of intensive broiler and layer, less attention has been paid towards indigenous chicken, due to its poor production. Backyard and small-scale poultry rearing which secures nutritional, food and economical security for small and marginal farmers is compromised due to intensive rearing system. In India, backyard poultry farming touches on social, cultural, and economic aspect of the typical rural or tribal household. In the vast majority of rural and tribal communities, keeping chicken either as indigenous breeds or crossbreeds under a scavenging system of backyard farming is still a common practise. In rural or tribal settings, the birds are raised utilising a scavenging system in small units with minimal feed supplementation, no housing, and no disease control facilities. Current scenario shows attention has shifted

to natural and healthy foods which resulted in renewed interest in native chickens. One of indigenous breed poultry is kadaknath which is famous for its unique black nutritious meat. The demand for of Kadaknath meat has increased after Corona pandemic due to the expectations of the improved immunity status of human beings. Medicinal values of kadaknath meat and egg along with high degree of resistance for disease and climatic condition attracts entrepreneurs as well as farmers. This article highlights quality of meat and eggs as well as emphasize kadaknath rearing with minimal input with high output.

Breed description

Kadaknath is an indigenous poultry breed which belongs to Dhar and Jhabua district of Madhya Pradesh. It is also known as "kalamasi" means black coloured meat. Kadaknath is famous for black colour and unique characters of meat and egg. Kadaknath have black skin, legs and feathers, purple colour tongue, comb and wattles, and grey to black coloured internal organs. Meat of kadaknath is black in colour due to deposition of melanin pigment which is called as fibromelanosis. There are 202 registered breeds of livestock and poultry in India out of which only kadaknath get geographical index. Earlier kadaknath was reared by tribals and its blood and meat were used in treatment of various disease. Kadaknath become a popular due to its meat and egg quality. Nutritive value of kadaknath makes it distinct from other poultry breeds. There



Kadaknath Female



Kadaknath Male



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are three available varieties of kadaknath which are golden, jet black and pencilled. Male and female birds have black blue plumage. Male weighs 1.5-2 kg while female weighs from 1-1.5 kg. Females start laying at age of six months and shell of kadaknath egg is light brown in colour. Females are poor layers and lay only 105-110 eggs annually in 2-3 clutches. Females are poor brooders so eggs are kept under other hens for hatching. Average weight of egg at 40 week of age is 49 grams. This breed is resistant to extreme climatic conditions and can survive in poor managemental conditions with minimal input in housing and feeding. Kadaknath breed have higher degree of disease resistance compared to other exotic breeds of fowl.

Nutritional quality of kadaknath meat and eggs

Meat of kadaknath is black in colour due to deposition of melanin pigment and called as fibromelanosis. Black meat is rich in Vitamin B complex, Vitamin C and Vitamin E, along with vitamins. Kadaknath meat contains calcium, phosphorus and iron. Kadaknath meat has lower fat content compared to commercial chicken. The cholesterol content of white leghorn meat is 218.12 mg/100gm while in kadaknath it is only 184.75 mg/100gm of meat. Meat of kadaknath contains eighteen amino acids out of which eight are essential for human body and black meat contains 24% linoleic acid compared to 21% in White leghorn meat.

Healthy eating is being considered for better immunity after global COVID-19 pandemic. Histidine containing dipeptides (HCD) are group of polypeptides which have anti-inflammatory, antiglycating and antioxidative properties. These polypeptides protect mammalian cells from oxidative damage. Consumption of these HCD improve immunity by enhancing function of cells of immune system and hence improves the immunological defence of humans against bacterial, fungal, parasitic and viral infections. These bioactive compounds are present in meat and absent in vegetarian diets. Poultry meat is rich in HCD compared to beef, pork and fish. Kadaknath meat is rich source of carnosine which have strong anti-oxidant and anti-glycating property and kadaknath meat can be suggested for treatment of various diseases.

Eggs are cheap source of protein with high biological value. Specific gravity, albumen% and shell% found higher in Kadaknath when compared to another

indigenous breed Aseel. Yolk to albumen ratio of Kadaknath eggs was lower than Aseel eggs which means low yolk% in Kadaknath eggs. This indicates that protein content of Kadaknath egg is more than Aseel egg and these eggs are beneficial to consumers which are conscious about cholesterol intake. Biochemical analysis between Kadaknath eggs and White leghorn revealed that yolk of kadaknath contain lower egg yolk cholesterol, high density lipoprotein and low-density lipoprotein.

How Kadaknath rearing can improve economic status of farmers?

Commercial poultry farming requires large economic input which is not possible for small and marginal farmers. Most of small farmers choose poultry farming as backyard or secondary activity. Extensive or free-range rearing requires less investment in food and shelter, instead of poor managemental practices kadaknath perform good in extensive system as well as semi-intensive system and due to good meat and egg quality it fetches high price in market. Egg can fetch upto Rs.12 and bird can fetch upto Rs. 500. Here economics for 100 birds is calculated to provide rough

Meat quality	Kadaknath	Commercial broiler/layer
Protein %	24-25	18-20
Fat%	1.94-2.6	13-20
Cholesterol(mg/100 gm meat)	184.75	218.12
Carnosine (breast) (mg/g of tissue)	5.46-7.11	2.11-3.39
Egg quality		
Egg yolk cholesterol (mg/g)	8.24 – 8.81	13.55
High density lipoprotein(mg/g)	1.00 – 2.39	5.58
Low density lipoprotein(mg/g)	0.04 – 0.35	7.67

Table showing comparison between quality of meat and egg of kadaknath and white leghorn.(source-NRC on Meat, Hyderabad and Kumar et al.2018)

idea about kadaknath rearing in semi-intensive system without considering cost of housing, and labour.

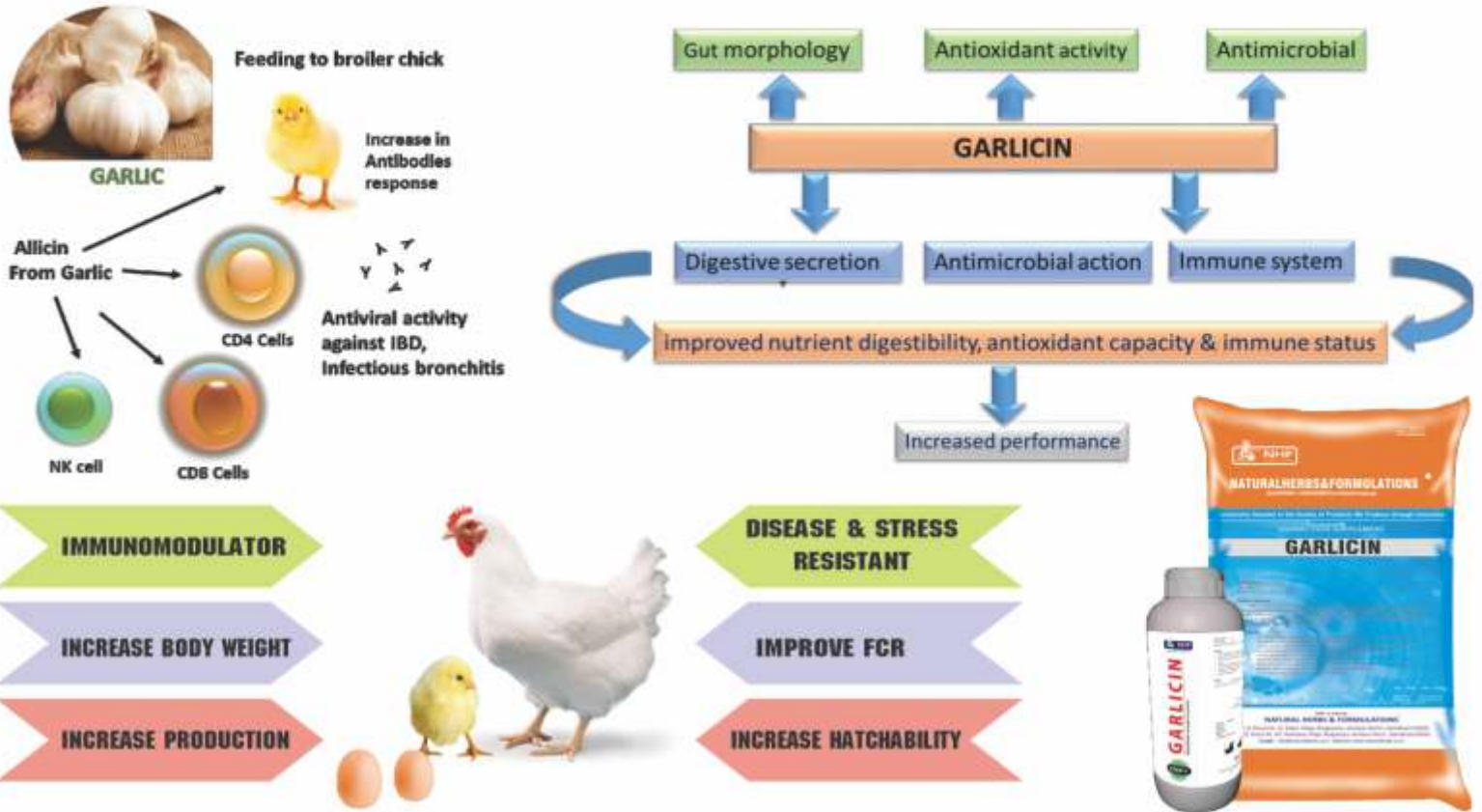
Conclusion

Poultry sector has been evolved as major industry because of increased demand of egg and meat. Eggs and meat are cheap and easily available source of protein. Kadaknath is an important indigenous breed which have good egg as well as meat quality. After global pandemic healthy eating is emphasised which increased market demand of kadaknath. Increased demand of kadaknath creates opportunity of kadaknath rearing. As kadaknath is a disease resistant and sturdy breed, it can grow in free range or semi-intensive system with minimum input and provide good output.

	Kadaknath rearing under semi-intensive system
Cost of day old chicks (1)Cost of kadaknath chicks@40rs/chick	100 x 40= 4000/-
Cost of feed upto 30 days (1)1.8 kg of feed per bird reared under intensive system with cost of feed 35rs/kg	100 x 1.8 x 35= 6300/-
Cost of rearing of birds from day 30 to 180(24 weeks) (1)20 gram feed/bird/day rearing in semi-intensive system with cost of feed 35 rs/kg	2 x 150 x 35= 10,500/-
Cost of rearing females from 24 to 64 weeks age(10 months) (1)30 gram feed/bird/day rearing in semi intensive system with cost of 40 rs/kg	45 x 10 x 40= 18000/-
Cost of vaccine, medicine, feed supplements etc@ 50 rs/bird	50x 100= 5000/-
A. Total expenses/Cost of production	43800/-
Income from sale of 6 month male birds with average body weight of 1.5 kg@ 500 rs/bird	50 x 500= 25000/-
Income from sale of eggs @ 12rs/egg	50 x 100 x 12= 60000/-
Income from sale of spent hen@100rs/hen	50 x 100= 5000/-
B. Gross income	90000/-
Net Income (B-A)	46200/-
Profit/bird	462/-

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Crude Fibre Plays a Supporting Role in Poultry Nutrition.



Dr V. Rajendra Prasad
Poultry Consultant

1. It is generally believed that fibre content of feedstuffs is associated with their bulkiness.
2. In some cases, however, there is no marked relationship between the two.
 - a) For example, although wheat bran is one of the bulkiest feedstuffs included in feed mixtures for chickens, it contains only about one third as much fibre as do sunflower seeds which are one of the less bulky feeds (9% crude fibre in wheat bran compared with 26% in sunflowerseeds.
3. Although the general opinion of poultry producers and feed manufacturers is that the fibre content of the rations should be kept below 7%, production does not appear to be influenced much by some increase to 8-10%.
4. Studies on broilers showed no adverse effects of such a level of fibre from any source on chicken growth, mortality and feed consumption. With layers, there was no effect on egg production
5. Dietary fibre is preferentially utilised by Lactobacillus and Bifidobacteria species which lead to production of lactic acid and short chain fatty acids. This results in a low pH which will maintain the normal microorganism population, thus preventing the establishment of Salmonella and other pathogens in the gastrointestinal tract.
6. The relationship of fibre content of the ration and prevention of cannibalism is not fully understood.
7. Conceivably, it may be related to the increased consumption of feed and the time occupied in eating, or to the increased utilisation of sodium and potassium with high fibre diets, as will be indicated later.
9. Fibre provides energy to bacteria in the lower gastrointestinal tract where the bacteria use nitrogen that would otherwise be excreted as uric acid for bacterial protein synthesis.
10. Because the positive use of crude fibres in general has meanwhile been recognised for many breeds of poultry, the range of the raw materials used in the feed has also been extended. Whereas maize used to be the preferred cereal, nowadays wheat is used in particular, as well as other non conventional feed sources to a limited extent and sometimes even saw dust.
11. Adequate requirements of crude fibre in poultry feed is required for the development of the digestive tract in rearing animals (e.g. pullets) in order to facilitate adequate feed intake from the start of laying activity to the peak of laying
 - stimulation of gizzard development
 - stabilisation of the intestinal flora and therefore improvement in faecal consistency (better litter quality in barn rearing.
 - fewer dirty eggs in all types of housing systems
 - prevention of digestive disorders
 - therefore reduces the tendency towards (toe and => delete) feather pecking,
 - eating feathers and cannibalism (especially with laying hens).



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Poultry Gut Health Management

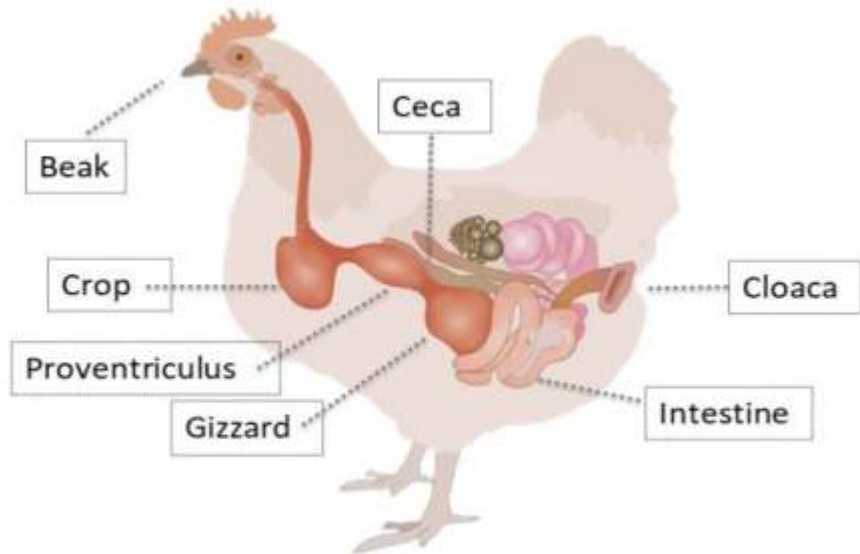
Poultry Gut

It is the very important organ which performs various functions such as digestion, absorption, enzyme secretion, immunity as protective barrier against various pathogens, assimilation of nutrients etc. thus it is very important for growth, production & performance and also for disease resistance.

The gut is separated into five distinct regions the crop, proventriculus, gizzard, small intestine (duodenum, jejunum and ileum) and large intestine (ceca, colon and rectum).

Gut Microbiota

It is a diverse community of mainly bacteria, fungi, protozoa and viruses, a broiler chicken is colonized by an estimated 600-800 species of bacteria. It plays important role in digestion & assimilation of nutrients. It also plays important role in immunity as it forms a protective barrier which lines the gut & prevents the growth of pathogenic bacteria such as Salmonella, Campylobacter, Clostridium perfringens etc.

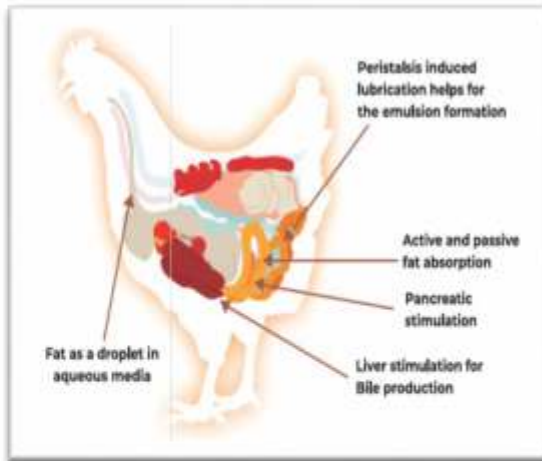


Factors affecting gut health	Losses due to poor gut health
<ul style="list-style-type: none"> • Poor gut development • Feed change & poor feed quality • Mycotoxins • Poor Biosecurity measures • Environment (temperature and ventilation) • Brooding conditions • Infections with viruses, bacteria or coccidiosis • Water quality 	<ul style="list-style-type: none"> • Decreased growth, production & performance • Higher FCR • Uneven flock size • Increased occurrence of disease outbreaks • Higher mortality rate • Early chick mortality • Decreased egg production in layers • Economic losses on veterinary aids

Indiscriminate use of antibiotics in poultry

The antibiotic has been used on poultry in large quantities to enhance production and minimizes the higher risk of infections as poultry production always challenged with various respiratory & enteric infections however the use of antibiotics in food animals poses a major risk of antibiotic residue present in the poultry products & consumed by human.





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Fat, the indispensable component of the diets despite bringing the feed texture and digestibility challenges, support the body mainly for energy & hormone synthesis that directly affects performance traits and farm profitability. Despite emulsifier helps to ease the digestion & absorption, the best poultry diets today essentially needs a comprehensive approach for the fat metabolism in the body offering homeostasis, lipotransport & effective fat utilization. Today it is essential to support fat metabolism along with hepatic-regulators, lipotropic agents and osmoregulators for supporting for effective fat utilization by the bird.

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Impacts	Effects
<ul style="list-style-type: none"> • Side effects of antibiotics • Residual effects • Colonization of antibiotic resistant bacteria • Hazardous effect on human health 	<ul style="list-style-type: none"> • Rejection of poultry products • Meat & egg quality will be deteriorate • Spreading of resistant bacteria • Immunity suppression • Increased cost of production

Poultry Gut Management & Antibiotic Free Poultry Production

Maintaining the better gut health is a key aspect of getting the best growth, performance and better FCR in poultry

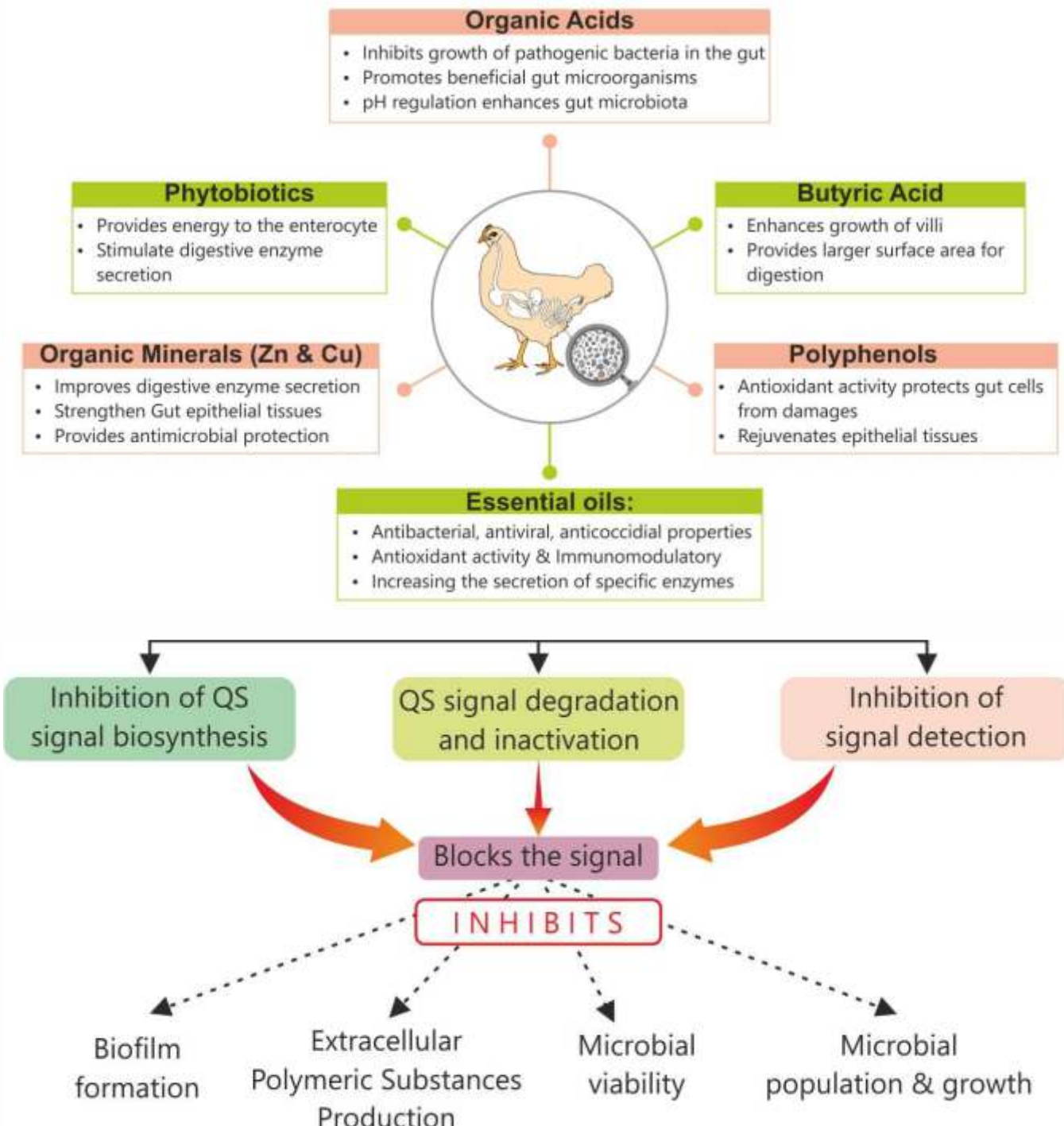
birds. There are many ways for getting better poultry gut are includes use of feed additives, supplements & other materials.

Substances by which we can minimize the antibiotic use & improve gut health:

Quorum sensing inhibitors:

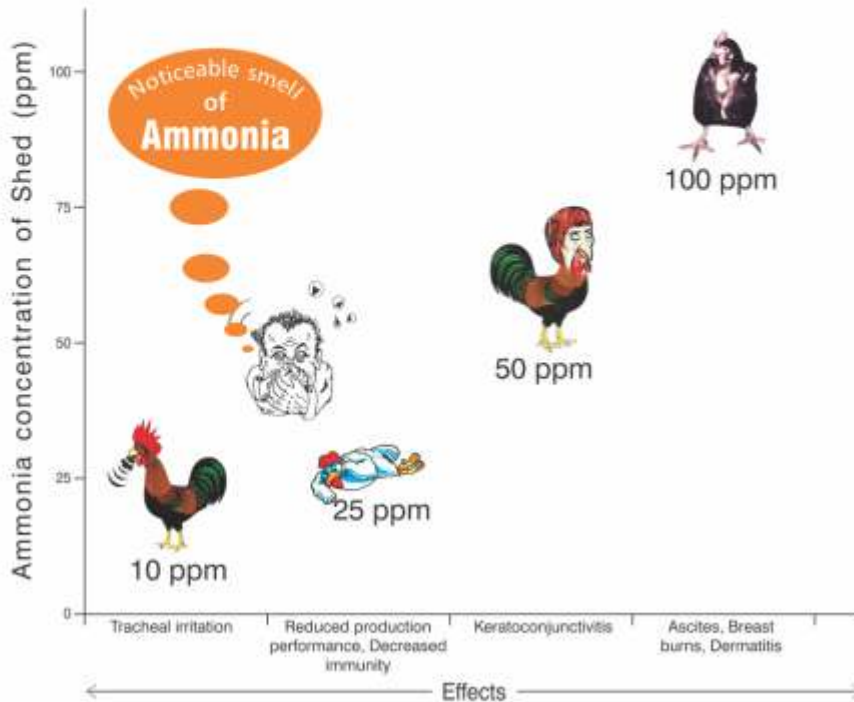
The QS has been shown to play significant roles in the regulation of virulence factors in several enteric pathogens. Therefore, disrupting QS by small molecules or QS quenching enzymes can be a promising tool to control enteric pathogens in food-producing animals.

Phytogenic substances, herbal extracts, essential oils etc. are shown to be having quorum sensing inhibitors property thus they possess strong antimicrobial property.



AmmoFree Premix

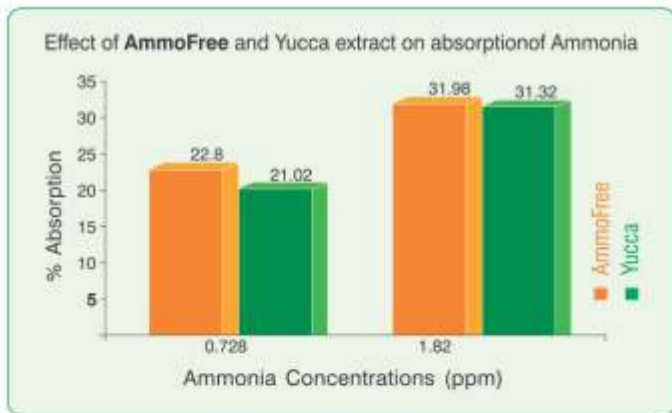
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- ▶ Noticeable smell and eye irritation
- ▶ Upto 25% reduction in growth and production

SCIENTIFIC VALIDATION



Effect of AmmoFree* at broiler farm in winter (14° - 15°C) with noticeable ammonia concentration

Group	Livability (%)	Birds showing respiratory discomfort	Faecal NH3 (g/kg dry faeces)	
			Day 21	Day 42
Control	95.00	7	3.86	3.92 (+1.55%)
AmmoFree 100g/ton	96.67	X	3.95	2.71 (-45.75%)

Trial at Commercial Poultry Farm under technical guidance of Dr. Ramu Subba Reddy

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- For enhancing the level of beneficial gut microflora and to reduce disease susceptibility especially intestinal and respiratory diseases.
- For better farm productivity and profitability.

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Current Indian Poultry Industry Outlook and Challenges



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Indian poultry industry has made a remarkable growth ever since its emergence and is arising as a glorious sector with a growth rate of 8.51 and 7.52% in egg and broiler production, respectively. The fastest-growing segment of the global meat demand is poultry meat, and India, the second-largest developing nation in the world, is seeing a rapid expansion of its poultry industry. India is the third-largest producer of eggs and chickens in the world. Now that poultry production is intensifying quickly, there are significant capacity and safety issues. The Indian Poultry Market was estimated to be valued at INR 1959.5 billion in 2022. The market is anticipated to expand at a CAGR of 8.1% between 2022, aided by the increased demand for diets high in protein, to reach a value of about INR 2,897.6 billion by 2027. Raising birds for their eggs and meat, such as ducks, turkeys, chickens, and geese, for domestic or commercial purposes is referred to as poultry. Proteins and nutrients like zinc, iron, and iodine, among others, which are necessary for the body's growth and development, can be found in plenty in poultry-based products. Through channels of distribution like conventional retail stores, business to business, or contemporary retail stores, meat and eggs are made available to the market for use in food services or for individual consumption. Poultry items are now accessible through online retail channels because to the growth of online grocery retailers in India, like Grofers, Amazon Fresh, and Big Basket etc. So, the expanding availability of poultry products is promoting market expansion in India. Due to increased wages and a greater emphasis on nutritious foods, changing consumer tastes are driving

the Indian poultry market. The region's market for poultry products has grown recently due to the increased focus on physical wellness. In addition, eggs are frequently used as active ingredients in bakery goods, and the market is expanding as a result of the growing demand for cakes and pastries. The adoption of poultry by rural households, which are engaged in supplying meat products and eggs to markets, is another factor contributing to the market expansion. Poultry is a highly vertically integrated industry in India and matches the efficiency levels of many western countries. The sector has potential as a result of a number of variables, including rising per capita income, an increase in the urban population, and declining real poultry prices. Future expansion of the poultry sector in India will depend on integrated production, the market shift from live birds to chilled and frozen goods, and regulations that guarantee supply of corn and soybeans at reasonable prices. The change from backyard poultry to large-scale commercialization over the years has been steady, with organised commercial farms producing over 70% of chicken output, especially in the broiler category. In India, farmers have switched from raising country birds in the past to hybrids, which provide better operational conditions and long-term financial success for the poultry producers. Given that consumers prefer live birds, distribution and retailing are still poorly structured despite the fact that production is largely organised.

Poultry Associations in India

There are several poultry associations in India like Poultry Federation of India (PFI), Compound Livestock Feed Manufacturers



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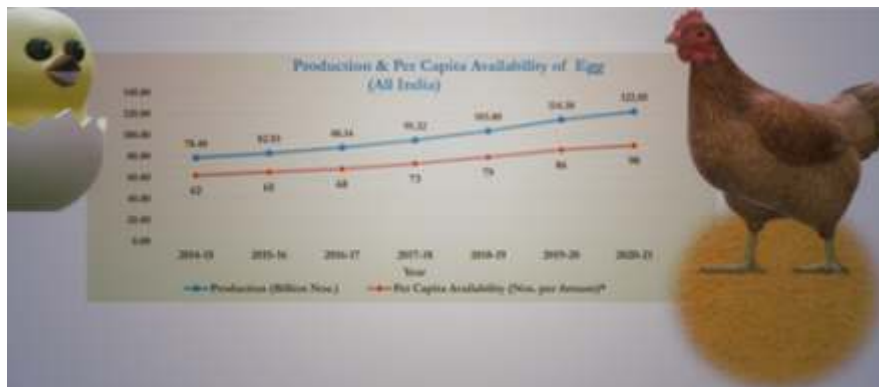
Association (CLFMA), National Egg Coordination Committee (NECC), Indian National Federation of Animal Health (INFAH), Broiler Coordination Committee (BCC) and likewise. The associations also play an important role by regularly guiding the farmers, creating awareness among consumers and presenting industry requirements to the government, promoting egg consumption on various occasions etc.

Indian Poultry Sector Statistics

India has the world's largest population of livestock. As per the Basic animal Husbandry Statistics- 2022. The total egg production in the country is 122.05 billion numbers. India ranks 3rd in the world in terms of total Egg production (Source: FAO). The egg production has increased by 6.70 % as compared to previous year. The per-capita availability of egg is 90 eggs per annum. Top 5 egg producing States are Andhra Pradesh (20.45%), Tamil Nadu (16.49%), Telangana (12.98%), West Bengal (8.60%). Karnataka (6.24%) They together contribute 64.77% of total egg production in the country. The total egg production from commercial poultry is 103.29 billion numbers and backyard poultry are 18.75 billion numbers contributing 84.63% and 15.37% of total production of egg respectively. The total meat production in the country is 8.80 million tonnes India ranks 8th in the world in terms of total Meat production (Source: FAO). The meat production has increased by 2.30% as compared to previous year. The meat production from poultry is 4.47 million tonnes, contributing about 50.84% of total meat production. The growth of poultry meat production has decreased by 2.98% over previous year. The top 5 meat producing States are Maharashtra (12.60%), Uttar Pradesh (11.79%) West Bengal (11.30%), Andhra Pradesh (10.84%) and Telangana (10.46%). Poultry sector contributes 57% of total meat production in India. As per APEDA India has exported 320,240.46 MT of Poultry products to the world for the worth of Rs. 529.81 Crores/ 71.04 USD Millions during the year 2021-22.

Challenges to Poultry Industry

- The future expansion of the poultry business is hampered by a number of reasons, including poultry immunity, health, and productivity.
- Major obstacles to the current state of the sector and its strategic future will continue to be consumer confidence, product quality and safety, product



types, and the introduction and re-emergence of diseases.

- Poultry is inextricably related to zoonotic and foodborne diseases. Foodborne and zoonotic pathogen eradication, elimination, and/or management provide a significant challenge to the poultry business.
- The risks to the general public's health from eating foods with significant antibiotic residues will also continue to be a major problem. It is crucial to understand that hens are not vulnerable to intranasal SARS-CoV-2 (COVID-19) viral infection. Nevertheless, the COVID-19 pandemic makes an impact on poultry farming's finances, transportation, and consumption. Along with these factors, it will consider the maintenance of high environmental security as well as economic, ethical, and social aspects.
- Raw material shortage is a further problem. Because of the rising cost of soybean meal, feed producers were obliged to make dietary concessions for birds.
- Another issue is a lack of human resources because there aren't enough researchers or veterinarians in the fields where their knowledge is needed.
- The Indian poultry industry is still unable to take advantage of the global market. The main issue hurting the poultry industry in India is the lack of sufficient cold storage and warehouses. The unorganised sector produces the

vast majority of the product as backyard poultry for extra revenue.

- Increasing the amount of antibiotics in poultry products has detrimental long-term effects, such as the development of drug resistance in humans. Lack of thorough regulatory authority to uphold hygiene and the licencing of businesses.
- India's per capita consumption is lower than that of other nations. With increased demand and the imposition of a minimum support price, the poultry industry's expansion can be maintained.

Conclusion

The continued expansion of the poultry industry may be hampered by issues with organic matter transportation, waste management, the use of green energy, disease diagnostics, and other issues. For the industry to meet consumer demand and ensure sustainable agriculture, shareholders, veterinarians, farmers, and all other stakeholders in the chain of poultry production need to be more involved in the current state for the industry's strategic future. The necessary policy actions for the poultry industry must include enhancing infrastructure facilities, which will help stabilise the price of poultry products on the domestic market and make them accessible in remote areas. Developing an effective marketing channel that will help producers receive fair prices and increasing the availability of poultry products in remote areas.





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Mycotoxinoses: A Silent Killer of Poultry Farm Profitability



Dr. Srijit Tripathi
Global Technical Manager, VETLINE



Mycotoxinoses in poultry is undoubtedly the most serious condition that arises due to managerial disturbances at the poultry farm. It refers to all those diseases or disorders in Poultry birds that are caused by the effects of mycotoxins produced by fungal infestations. Mycotoxinoses remains often subclinical and difficult to diagnose at an early stage. Lower levels of mycotoxins lead to chronic mycotoxicosis (carcinogenic, mutagenic, oestrogenic, teratogenic) with or without clearly manifested outward signs and clinical symptoms, but followed by a considerable reduction in growth and production, immunosuppression, and residual effect in poultry meat and eggs. Higher level of mycotoxins is responsible for acute mycotoxicosis and increased mortality rate. It is a global problem affecting the poultry farmer's profits to a greater extent. Mycotoxicosis is frequently seen at places having high temperature and humidity, or, where grains are harvested with high moisture content.

Almost 25% of world's cereal crops are contaminated with various mycotoxins. Mycotoxins lead to a great loss by reducing the production performance, immunity and health, and through increasing stress and mortality in birds.



As far as the veterinary diagnostics are concerned, below mentioned 6 characteristic points have been associated as key points of observation in Mycotoxinoses,

1. *Problem seen with unknown/unclear etiology*
2. *Situation remains neither Infectious nor Contagious*
3. *Antibiotics/Drugs are least effective*
4. *Seasonal, mostly as an outbreak in field conditions*
5. *Specific feed stuffs like corn, cereals etc*
6. *Suspected feed stuff may not reveal fungal infestation*

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There are numerous mycotoxins in the food chain that cause unwanted biological effects inside human and animal organisms upon ingestion (Bryden, 2007). Different types of mycotoxins are recognised like aflatoxins (*Aspergillus flavus*); T2 fusariotoxins (*Fusarium spp.*); ochratoxins (*Aspergillus ochraceus*); zearalenones etc. All the toxins have diverse activity and causes different types of illness in the bird but all of them lead to reduction in the bird's growth and performance. The main route of infection is by ingestion of the toxic substance by the birds. Once formed it is difficult to avoid their damaging effects on the bird and not only that they also affect the immunity of the bird and there is increased susceptibility to bacterial infections as well.

The various types of toxins responsible for mycotoxicosis in poultry have different structures, metabolism as well as actions. The level of toxicity is also variable and therefore the different toxins are to be discussed separately.

Aflatoxin (AFB1, AFB2, AFG1, AFG2):

The places where the climatic conditions are warm and humid, Aflatoxins are a major threat. But prevention must be taken in colder climates when using feedstuffs which have been imported from warm and humid countries.

Among poultry, susceptibility in ducks is the highest, followed by turkeys, broilers, laying hens and quail. Aflatoxins are hepatotoxic with fatty changes, causing hepatocyte degeneration, necrosis, and disturbed liver function. Aflatoxin interferes with vitamin D metabolism, which may cause reduced bone strength in birds. Aflatoxin negatively affects lipid and pigment absorption as they reduce bile salts production. Due to the transfer of aflatoxin into edible products and its carcinogenic effects, most countries have set upper legal limits for aflatoxin in feed.

Major Symptoms:

- Hepatic Injury
- Decreased weight gain and anorexia
- Reduced egg production
- Poor feed conversion efficiency
- Increased mortality
- Immuno-suppression with high disease susceptibility
- Reduced fertility and hatchability
- Leg weakness and relaxed wings

Ochratoxin:

Depending upon the amount and duration of exposure, ochratoxins A shows its toxic symptoms which mainly involves the kidney and liver. After getting absorbed from the system, its highest concentration can be found in the kidneys, liver and muscles. Inside the liver, ochratoxin A is hydrolysed to OT-alpha and L-phenylalanine and within 48 hours of ingestion, almost 90% of the ingested toxin is secreted. It is considered that the primary effects are perhaps connected with the activity of OTA on enzymes involved in the phenylalanine metabolism (phenylalanine-transferase, phenylalanine-hydroxylase, phenylalanine-lipo-peroxide). Another mechanism of the toxicity is based on elevated lipid peroxidation in liver and kidney microsomes (Fuchs, 1988).



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Collaboration with :



Major Symptoms:

- Reduced growth rate and egg production
- Decreased feed conversion efficiency
- Mortality due to acute renal failure
- Poor egg shell quality
- Higher incidence of eggs with blood spots
- Decreased feathering
- Polyurea with wet faeces
- Pale and grossly enlarged kidney
- Fatty liver

T-2 Toxins:

Popularly called feed refusal toxins due to its effect on birds feeding tendency which is highly suppressed. In poultry, poisoning can be visualised either as acute or chronic. The acute form, is easily diagnosed because of clear signs and symptoms. However, the chronic form due to unspecific clinical symptoms is difficult to diagnose. After ingestion, T-2 toxin is very rapidly resorbed in the lower parts of the digestive tract (before jejunum), and only one hour after the ingestion it reaches maximum concentration in the blood (Uraguchi and Yamazaki, 1978).

Major Symptoms:

- Oral lesions
- Reduced feed intake
- Reduced weight gain and egg production
- Poor shell quality
- Reduced female fertility and hatchability of fertile eggs
- Immune suppression, reduced vaccination response
- Gizzard erosion
- Necrosis of proventricular mucosa
- Regression of ovaries
- Increased liver weight

Zearalenone:

These toxins affect the reproductive system of the body due to their oestrogenic activity. In general, the toxicity is low and the poultry birds are supposed to be resistant to such toxins.

Major Symptoms:

- Enlarged Vent
- Enhanced secondary sexual characters

T-2 Toxins:

Popularly called feed refusal toxins due to its effect on birds feeding tendency which is highly suppressed. In poultry, poisoning can be visualised either as acute or chronic. The acute form, is easily diagnosed because of clear signs and symptoms. However, the chronic form due to unspecific clinical symptoms is difficult to diagnose. After ingestion, T-2 toxin is very rapidly resorbed in the lower parts of the digestive tract (before jejunum), and only one hour after the ingestion it reaches maximum concentration in the blood (Uraguchi and Yamazaki, 1978).

Fumonisin:

Fumonisin comprises of mycotoxins produced primarily by *Fusarium moniliforme*, a fungal strain prevalent in corn crops globally. The maize crop is most commonly infected with fumonisin besides their presence in several other grains like wheat, barley, rye, oat, and millet etc. Fumonisin are comparatively heat-stable and affected only when heated above 150–200 °C.



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Major Symptoms:

- Increased mortality
- Reduced weight gain
- Increased gizzard weight

Cyclopiazonic Acid:

Cyclopiazonic acid (CPA) is a heavily substituted tetraminic acid, produced by several *Aspergillus* and *Penicillium* species. CPA has been reported to be produced by *A. flavus*, *A. versicolor*, and *A. tamarii* as well as several *Penicillium* species. CPA has been reported naturally occurring in corn and peanuts, and a type of millet (kodo) that reportedly caused a human intoxication in India. It is also possible that CPA was involved along with aflatoxins in 'turkey X' disease in England in 1960, since some isolates of *A. flavus* produced both aflatoxins and CPA.

Major Symptoms:

- Anorexia
- Diarrhea
- Pyrexia
- Dehydration
- Weight Loss
- Ataxia
- Immobility

Managing Mycotoxins:

- Use of Mycotoxin binders.
- Application of Good Manufacturing Practices and HACCP.
- Drying and storage of grains and other raw feed stuff.
- Efficient Detoxification strategies.
- Autoclaving, Pelleting and Chemical applications.

Mainly the toxin binders (organic, inorganic) and mycotoxins modifiers (yeast, bacteria, enzymes etc.) are employed to check the mycotoxicosis in the birds along with the feed mainly and has broad substrate binding capacity. In this way the binder and the toxin both are excreted by the body through manure.

Mycotoxin binding is achieved through:

Physical adsorption:

It involves weak bonding involving van der Waals interactions and hydrogen bonding

Chemical Adsorption:

It involves ionic or covalent bonding which is a stronger interaction.

A high level of inclusion of adsorbents can also affect the physical properties of the feed which might disturb feed processing steps such as pelleting as well as altering the actual diet specification. Many toxin binders can impair nutrient utilisation as they bind with the essential nutrients from the feed of the birds.

Ideal Approach:

Use of a Mycotoxin Binder in the feed formulations that has:

- Broad Spectrum of activity with Low inclusion rate
- Uniform dispersion during mixing
- Favourable thermodynamic characteristics
- Safety and efficacy in multiple animal species
- Selective Binding (Negligible interactions with vitamins and minerals)

The mycotoxin menace is indeed a major issue as far as poultry feed mill as well as farm losses are concerned. It is really a challenging task for a feed formulator or a veterinarian to minimize the impact of these harmful mycotoxins in the Poultry feed. A basic understanding regarding the occurrence and prevalence of various mycotoxins and their individual as well as additive negative effects in poultry birds has become need of the hour. Inclusion of binding agents or enterosorbents, with above mentioned attributes may be helpful towards reduced mycotoxicosis conditions. Additional supportive treatments also assist in order to control the situation and prevent the mycotoxicoses conditions in Poultry.

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Probiotics and early microbiota

Wouter Van Der Veken, Huvepharma.

The relationship between a healthy gut, the animal's microbiota and optimum performance is undeniable. Especially in the early stages, the microbiota can heavily impact the final outcome of the production process. As such, it is important to manage and support the animal's gut health as early as possible.

Probiotics – beneficial micro-organisms that are incorporated into the feed or drinking water with the goal of delivering a health benefit to the host – are a good example of an efficient management tool to do so.

It is no longer surprising that the preferred probiotic of choice should be a stable spore former with a proven and researched mode of action. Spore forming bacteria ensure product stability, as spores are robust and able to withstand environmental influences. These include, but are not limited to, high temperatures during feed processing, different pH values within the animal itself, as well as fluctuating storage conditions. Spore formers thus enhance ease of use, while ensuring product efficacy. A good example is B-Act which contains viable spores of *Bacillus licheniformis* (DSM 28710). This probiotic strain supports the birds' gut microflora both directly and indirectly, as its mode of action is diverse.

First of all, the unique strain is part of the wider *Bacillus* genus and, as such, is a strong contender for nutrients and space relative to unwanted bacteria (competitive exclusion). Secondly, *B. licheniformis* DSM 28710 is capable of producing potent bio active substances aimed at pathogen control. *Clostridium perfringens* in particular, the key pathogen in production diseases such as necrotic enteritis (NE) and dysbacteriosis, can be actively and efficiently controlled with B-Act.

PROVEN EFFICACY

The described mode of action and effects have been extensively researched. A recent study showed that *B. licheniformis* DSM 28710 exerts a strong inhibitory effect on nine *C. perfringens* strains that were isolated from NE outbreaks on commercial farms. The importance of the early microbiota cannot be underestimated in mitigating such NE outbreaks, even though these outbreaks may occur at a later stage. Ensuring a healthy microbiota from the start, and maintaining it, decreases the opportunity for *C. perfringens* to take hold and proliferate in the next stages of production. General gut health and the



related microbiota further drive performance. Laying the proper groundwork as early as possible thus equals a good start for the animal, setting it up for a high-yielding production period.

EARLY APPLICATION

To support the idea of influencing the microbiota as early as possible, the first question that needs to be answered is: how can a probiotic be used in these early stages? To put this to the test, B-Act was applied in newly-hatched chicks by gel spraying, followed by faecal spore content analysis. The trial used 160 day-old Ross broilers that were sprayed with a coloured gel solution containing the probiotic. Faecal samples were collected at two time intervals (5 and 10 hours after spraying) and analysed for the presence of probiotic *B. licheniformis* DSM 28710. All faecal samples had a blue-green colour due to the colouring agent in the gel, indicating that the gel had been ingested properly. CFU results at both time intervals showed that the birds ingested considerable amounts of probiotic B-Act via the gel, thus confirming that the probiotic can be applied via gel spraying to supplement animals from an early age.

The study confirmed that probiotic supplementation is possible even before the first feed is introduced. As such, B-Act allows producers to support their birds as early as possible, setting them up for a successful production period, from start to finish. The *Bacillus licheniformis* (DSM 28710) probiotic strain supports the birds' gut microflora both directly and indirectly, as its mode of action is diverse.

To know more, please contact Huvepharma technical team
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Outlook for Expansion of Broiler and Layer Industries in India and its Future Prospects



Dr. Munish Gangwar,
Dr. Sakshi Vaishnav, Dr. B.L Saini

Poultry industry is one of the most significant sectors of agriculture. The sector has undergone critical structural changes during the last few decades due to rapid increase in income, demand and human population, urbanisation and introduction of intensive production system, genetic improvement programmes, disease control programmes and biosecurity measures in the sector. The sector offers tremendous opportunities for poultry producers to improve farm income particularly for smallholders. Poultry market is divided into broilers and layers and expansion of these subsectors offers overall increase in profitability in near future. In this article we will see the outlook for expansion of the broiler and layer industries along with future perspective.

The outlook for the expansion of the broiler industries in India

Broiler chicken is an important sector in poultry production since it offers high-quality animal protein. Over the years, broiler meat output and demand in India have been roughly equal. In 2020, India's poultry meat production volume exceeded four million metric tonnes (5th largest poultry meat producer in the world). This was a significant rise from the previous year's total of over 1.5 million metric tonnes. India's per capita chicken meat consumption is estimated to be approximately 3.1 kilogram per year, which is lower when compared to the global average of roughly 17 kg per



year. The states of Tamil Nadu, Haryana, Andhra Pradesh, Maharashtra, Uttar Pradesh, and Telangana produce the majority of poultry meat. The Cobb breed accounts for around 65-70 percent of the broiler market. Vencobb's grandparent stock is owned by a large corporation that distributes parent stock to various integrators across India. Ross, Marshall, Hubbard, Hybro Avian, and Anak are more prominent breeds in India. In India, broilers are typically raised for 35-40 days to a market weight of 1.8 to 2.2 kg. The ratio of feed conversion for broilers has reportedly improved significantly over the years, reducing from 2.2 to 1.65. Live sale volumes of broiler meat currently account for more than 90-95 percent of the total volume of sales; processed chicken meat accounts for just around 5% of total output., but demand for processed chicken meat is expected to increase at a rate of 15%-20% per year as the middle class expands. However, because of rising feed prices and other factors, chicken prices have gradually risen in recent years. Despite this, chicken meat exports are hampered due to insufficient slaughtering and processing facilities, as well as an undeveloped cold chain.

Top leading companies leading broiler integration in India are as follows:

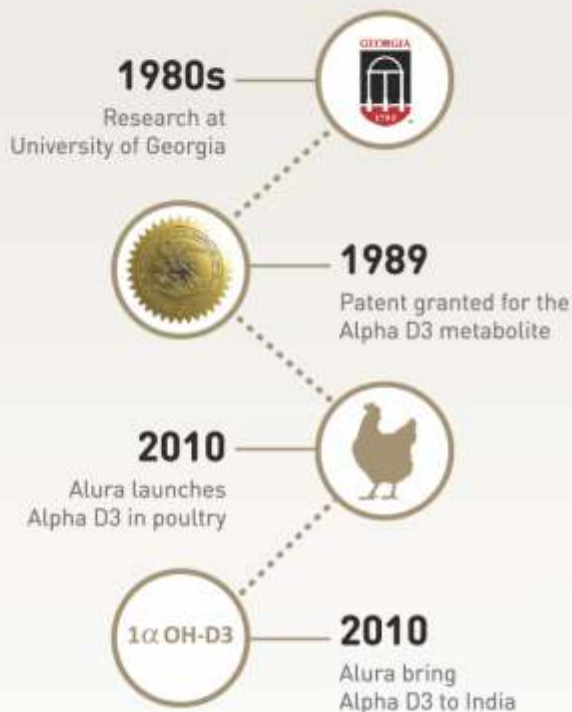
- Venkateswara Group, Pune
- Suguna Poultry Farms Ltd, Coimbatore
- Pioneer Poultry Group, Coimbatore
- Godrej Agrovet Ltd, Mumbai
- Sky Lark Group, North India
- Jafa com feed

The outlook for the expansion of the layer industries in India

Poultry eggs are an important source of high-quality proteins, minerals, and



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USAGE



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BROILER



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vitamins that help in maintaining the human diet. Commercial layer strains having excellent egg production and feed conversion efficiency are currently available. Superior chicken germplasm has been developed by both the public and commercial sectors to meet the needs of the Indian poultry industry. The major source of family income or a continuous source of income and gainful employment for farmers might depend on the size of the farm where layer (egg) farming is performed.

After China and the United States, India is the world's third-largest producer of eggs. In India, per capita, egg consumption has increased from 30 eggs per year to 86 eggs per year. Human nutritionists suggest a minimum of 180 eggs per year for a healthy adult human, indicating that the Indian poultry sector is packed with opportunities. Eggs are generally accepted in almost all communities and are widely accessible at reasonable costs across the country. India's total layer production has grown to 122 billion eggs per year. 70% of layer birds are raised in the southern states of Andhra Pradesh, Telangana, Tamil Nadu, Karnataka, and Maharashtra, and in the northern state of Haryana. Egg production is also growing in West Bengal, Uttar Pradesh, Bihar, and Chhattisgarh. The majority of layer bird farming occurs in southern India due to less variation in a seasonal climate. Backyards generated 30% of the eggs produced in India. The majority of the time, commercial layers are raised in cages. The Babcock is the most popular layer breed, accounting for around 80% of the market. Lohman, Bovans, and Hyline are some more layer breeds. In most situations, the eggs are sold in bulk without branding. Increasing domestic egg and egg product consumption is important for the layer sector to continue expanding consistently. In addition to the traditional egg dishes such boiling eggs, egg curries, omelettes, pickles, poached

eggs, and scrambled eggs, there are other commercial egg products that have promise as food items.

Main market players: A large group of poultry companies are based in and around Hyderabad. Andhra Pradesh and Telangana (erstwhile Andhra Pradesh) account for the majority of the birds and eggs produced in India. Hyderabad in Telangana is the epicenter for the poultry industry in India owing to the presence of large producers as well as the existence of organisations such as the Directorate of Poultry Research (DPR), an Indian Council Agriculture Research (ICAR) institute, and Indian Poultry Equipment Manufacturers Association (IPEMA).

The key stakeholders in the Indian poultry market are as follows:

- a) Sneha Foods Limited, Telangana
- b) Srinivasa Hatcheries (SH Group), Telangana
- c) Balaji Hatcheries, Andhra Pradesh
- d) VSN Hatcheries, Andhra Pradesh
- e) Mulpuri Group, Andhra Pradesh
- f) Venky's (VH Group), Maharashtra
- g) Suguna Foods, Tamil Nadu
- h) RM Group, Haryana.
- I) Skylark Foods, Haryana
- j) Komarla Group, Karnataka
- k) IB Group, Chattisgarh
- l) Bharati Poultry, West Bengal

Pressure on sector profitability:

The following factors determine the profitability of poultry industry:

- Costs for poultry feed are expected to remain high, which is a significant concern for the farm's profitability. High feed costs have a direct impact on production costs because they account for 60–70% of the total cost.
- The increase in the commercialization of processed chicken, egg, and meat products is affected by an improper cold chain. It is one of the reasons why poultry products cannot be transported across the nation.
- The large-scale expansion of poultry farms is also affected by power and energy shortages.
- The main disadvantage is a lack of properly trained personnel. People should participate in various programmes or courses to improve

their knowledge and abilities. There must be more government and private sector training and R&D initiatives since it is a very severe issue.

- One of the major pressures on the poultry industry is a shortage of skilled labour. It has an impact on how to handle chick, growing, and adult birds properly.
- Limited financial assistance is a significant bottleneck in poultry flock propagation.
- There is little marketing of the use of poultry products.
- Less knowledge of egg and meat consumption - more promotion through various advertising agencies is also required.
- Fewer supermarkets - A proper market is necessary to ensure that things are sold out comfortably. At the moment, there are fewer supermarkets in small cities and towns. More food selling outlets should be opened.
- Inadequate quality testing laboratory facilities.

Future prospective

Substantial development in poultry output over the last decade, along with future growth potential and favourable socioeconomic variables, has made India one of the largest rising world manufacturers in this sector. The transformation of India from a largely live bird market to a chilled/frozen market is believed to be critical for expanded involvement in international commerce, where India currently has little representation. Long-term industrial drivers will be the requirement to establish an effective distribution system with major investments in cold storage infrastructure and to increase the market acceptance of frozen chicken. Other issues, such as the increased need for enhanced infrastructure, will also play an important role in determining India's sustained position in the global poultry industry. The sector has traditionally mainly concentrated on increasing productivity, but current market demands indicate that improving distribution infrastructure, value additions, and exercising tighter control over its supply chain will be critically needed.

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Dr. K. Gajendran

M.V.Sc., Ph.D., Principal,
Suguna Institute of Poultry Management,
Udumalpet - 642 207.
Tiruppur District- Tamil Nadu

Introduction

Poultry production in India has taken a quantum leap in the last four decades, emerging from use of unscientific farming practices to commercial production systems with state-of-the-art technological interventions. Poultry Farming is a remunerative business both in rural and urban areas due to the requirement of small space, low capital investment and quick return throughout the year. It has a significant role in the eradication of malnutrition and poverty as well as eliminating un- and under-employment among the rural masses.

According to the ICAR Vision 2025, an increase in per capita availability of one egg or 50g of poultry meat will generate 50,000 more jobs. Similar increase in employment generation is anticipated due to acceleration in broiler production, marketing of eggs and meat processing, etc. So, increase in poultry production activities will help to generate more employment with ease both for men and women. The Indian Council of Medical Research recommends the consumption of 10.5 kilograms of poultry meat and 180 eggs per annum. The per capita availability of egg was 86 eggs per annum in 2019-20. (Economic survey, GOI 2020-21). But it is still limited relating to the population size of the country.

Growing Indian poultry sector requires trained manpower not only to man the commercial establishments but also to support the required R&D in sync with ever evolving scientific needs. In spite of rapid growth, the poultry industry suffered many setbacks in recent times due to lack of workforce. Even though India has a demographic age bonus, highly educated employees (diploma and degree holders in Poultry Science) are still very low. "Human resources and the workforce are the cornerstone of Poultry business." Lack of human resources can affect most production, financial and marketing decisions of the industry.

Genesis of Suguna Institute of Poultry management(SIPM)

Suguna Foundations, being the founder of integrated poultry business model in the year 1986 and currently the industry leader in broiler bird production, established Suguna Institute of Poultry management(SIPM) ,first of its kind in India, at Udumalpet, Tiruppur

District, Tamil Nadu in the year 2012, to disseminate scientific knowledge and techniques to the farming community and aspiring entrepreneurs by imparting education in the most conducive environment through a well-structured



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curriculum. Suguna Institute of Poultry Management is committed to provide higher education and training on scientific poultry production, poultry farming, Poultry breeder management, Hatchery and incubation techniques, feed manufacturing and disease control measures with sole aim of serving the ever-growing demand for skilled poultry science graduates required for the industry.

Courses offered

Currently SIPM offers the following degree and Diploma Programmes

- Three-year degree programme viz., BSc in Poultry Science
- Three one year diploma programmes in Commercial broiler production management, broiler breeder production and Poultry health.

All these programme are approved by the Alagappa university, Karaikudi, Tamil Nadu.

The syllabi for these programmes are industry oriented and the course is designed with the objectives of crafting human resource management professionals with technical knowledge in poultry management, feed milling technology, hatchery management, bio security of the Poultry units, developing entrepreneurial skills to unemployed youth and equipping youth with different facets of Poultry production and business management.

Hands on training and Poultry farm visits are arranged for the students during the

course utilising the facilities available with Suguna foods limited. Suguna Foods Pvt. Ltd, India's leading poultry conglomerate, has grown to become a INR 10,000 crore turnover company, over a period of 35+ years. The company's core value is its dedication to economic and social development in rural India, and it has currently empowered over 40,000+ farmers from 15,000+ villages across 18 Indian states, rewriting the destiny of thousands of farmers and creating future entrepreneurs. Suguna foods is engaged in a network of over 70 feed mills, hatcheries and a robust R&D process to fulfil the ever-increasing need for quality supplies. Thus, the graduates and diplomats passing out are expected to be responsible in the industry for the following;

- Giving suggestions for the improvement in the production of eggs or poultry meat to farmers
- Supervising the farm unit operations
- Incubation Unit management and machinery operation
- Ensuring bio security measures in the farm
- Looking after bird nutrition
- Technical assistance in diagnosis of microbial diseases and maintenance of germplasm

Campus life

At SIPM, Professional education is provided in a conducive environment with smart class rooms with multimedia

facilities. The curriculum is designed to have 40% Theory & 60% Hands on Training. Students are given projects work / in plant training to boost their self confidence to help them in future career. A unique feature of the in plant training is that students attend classes or perform/observe routine farm activities in commercial broiler, broiler breeder farms, feed mills, hatcheries, processing plants located around the college campus contracted/owned by the Suguna foods. A total of 48 Farm training for Diploma students and 144 Farm training for graduate students in 42 different farms are provided to learn from experienced farmers with support of qualified faculty. Transport facility to these farm visits are arranged by the institute With suguna being the industry leader in poultry, SIPM offers the right platform to learn about poultry and poultry allied subjects.



Smart class room



Hands on training at the laboratory



Demonstration in the laboratory



Hands on training at health laboratory



Spherometer for egg quality



Training at Nutrition Lab



Feed Mill



Practical class session



Training at Processing Plant



Training at broiler farm



Vaccination done by student at farm



Training at Hatchery



Training at Feed Mill



Hands on at the farm

In addition to specified farm visits ,students will have extra 12 inplant visits to do their own project by visiting the farms near to their native places. Guest lectures by industry professionals or industry experts are arranged whenever they visit college to share the experience.

Campus to corporate sessions for degree students will be handled by corporate professionals to explain the corporate rules and regulations

Library

Inside the campus, the Library is spacious and designed to be a quiet and its open on all working days from 9 AM to 6 PM.The Library has over 5,000 books and a large no.of National and International Poultry Journals & Magazines to keep students abreast of the latest findings and research.Separate library hour is demarcated for the students to improve their knowledge out of class hours. This will widen the scope of their knowledge to achieve higher goals.

An Open Space Amphitheatre with a capacity of 300 seating is situated at the centre of the building and it has an excellent stage to be used for all common functions / events, Graduation day, distribution of offer letters to successful students and cultural events are conducted in this amphitheatre



Amphitheatre



Graduation day



Culturals by students

Computer Labs with High End Internet Server is available for students to prepare their assignments and Project work.



Hostel facilities

There is a well furnished hostel with a capacity of 500 Beds. A contract mess providing nutritious food with steam cooking facility is run to cater to the needs of students from all over India. Purified RO and hot water for drinking and cooking purpose are available to ensure the health of students and hygiene of the hostel premises are well maintained by an exclusive house keeping department. Students are provided with ambience for indoor and outdoor games and recreational activities. Twenty acres of well-developed play field for the major outdoor games & sports like Football, Cricket, Volley Ball, Kabaddi, Hand Ball & Throw Ball is available inside the campus.

Admission contact

Suguna Institute of Poultry Management

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Opportunities for the students

1) Earn while you learn

An exclusive "Earn while you learn" programme is conducted for the final year degree students during the last semester in which students will be staying in the farm premises and

carrying out farm activities and a stipend of Rs. 5,000 per month will be given for the students for this programme

2) Agriculture Skill Council of India, Government of India (ASCI)

USA Internship: J1 Poultry program is a Cultural Exchange program, that allows international Poultry Science graduates to pursue training in the area of Poultry-Production in order to improve their advanced skills, Knowledge, methodologies and expertise. A stipend of \$ 11-12 per hour will be paid during internship for one year. Mr.Chinnammagari Devesh reddy, Mr. Akash and Mr. Anurag Gaikwad of 2017 batch have benefitted from this programme and obtained internship at IOWA state and KANSAS state of USA.



Inauguration of Skill development Programme

Admissions

Students who have secured Minimum Pass in HSC/PUC/Intermediate or equivalent or any degree with average of 50% marks are eligible for admission to degree and diploma programme. For diploma in Poultry Health, a degree in B.Tech in Poultry Technology B.Sc in Poultry Production and Business Management, B.Sc in Poultry Science and any degree in Life Science with average of 50 % marks in the degree Examinations is required.

Merit scholarship

A waiver in tuition fees up to 40% to students who secured 75% marks and above and 30% waiver for students who scored 60-74 % in qualifying examination are available at the time of admission. Early bird offer and wards of stake holders of Suguna will get 20 % concession in tuition fees. Further, additional 40% waiver in semester fees would be available to students who score 75% and above in semester examinations.

Placement

100% placements are ensured to students passed out of the Institute in Suguna foods and other allied industries. Placement opportunities in other poultry industries like Venkys, IB, Srinivasa hatcheries, CP feed, Japfa feed, Swamy Chicken, SKM Poorna chicken, Pharmaceutical companies, feed mills, diagnostic labs and biologicals are available. Apart from these Indian companies, Placements in foreign companies in Dubai, Kuwait, Oman, Sri Lanka, Bangladesh, Nepal and Kenya are also available.

Carbohydases and Intestinal Health in Poultry

Introduction

Gut health can be defined as the ability of the gut to perform normal physiological functions and to maintain homeostasis and thus supporting its ability to withstand infections and non-infectious stressors (Kogut et al., 2017). This definition explains the underlying components of gut health i.e. effective digestion and absorption of food, a stable gut microbial population, structure and function of the gut barrier, and effective function of the immune system, all of which play a critical role in gut physiology, the productivity of the animal and its well-being. Over the past two decades, this topic has gained even more interest in poultry production due to increasing demands for economic efficiency, animal welfare, food safety, reduction in environmental impacts, and a ban on or avoidance of antibiotic growth promoters (AGPs) use (Morgan, 2017). The exogenous enzymes are capable of reducing the variability in feed ingredients and enhance the feed digestibility availing more nutrients for absorption and thus reduce digesta viscosity. Recently the enzyme culture has gained immense value in poultry industry and this has led to development of more potential enzyme combinations to target specific substrates in feed and also complement to endogenous enzymes. In this article, the role of exogenous enzymes emphasizing particularly carbohydrase on gut health in poultry is mainly depicted.

Factors responsible for gut health impairment

The common aspects affecting broiler gut health are stress, exogenous infection, diet and water etc. Recently, with the advancement of exogenous enzyme study, more studies have been conducted on the impairment factors of the intestinal health of broilers focusing on phytic acid, non-starch polysaccharides (NSPs).

Non-starch polysaccharides, together with resistant starch and lignin called the dietary fiber, are found in plants especially in the endospermic cell wall of multiple kinds of seeds (Lovegrove et al., 2017). NSPs can be divided into soluble and

insoluble fractions. Soluble NSPs when fed in bulk amount increase the viscosity of intestinal contents by making viscous gels which decrease the rate of diffusion of endogenous digestive enzymes and substrates with hampered interaction at the mucosal surface (Raza et al., 2019). This increased viscosity also induces thickening of the mucous layer in the intestine (Hedemann et al., 2009) hampering the digestion and absorption of nutrients in the intestinal tract. It has been estimated that 400-450 kcal of digestible energy per kg of feed remains undigested due to the NSP contents present in corn-soybean meal diets (Cowieson, 2010). On the other hand, insoluble NSP present in the cell wall entrap starch, protein and other nutrients inside called "cage effect" and hinder the access of endogenous enzymes to digestible nutrients (Bedford and Partridge, 2010).

Carbohydases

The major barriers of the intestinal tract are mucus layer and tight junctions (TJ) of the epithelium as illustrated in Fig. 1b. Intestinal morphology (villus height, crypt depth and epithelial turnover rate) changes in response to exogenous agents, for example, presence or absence of food and pathological conditions (Gomide Junior et al., 2004). Deeper crypts indicate faster tissue turnover as they contain stem cells and considered villus factories (Awad et al., 2009). Intestinal mucins/mucous are high molecular weight glycoproteins secreted by goblet cells. In chickens, mucin-2 is observed to be extensively expressed in goblet cells of colon and small intestine (Smirnov et al., 2005). NSP have been shown to increase mucin secretion (Tanabe et al., 2006) as illustrated in Fig. 1c. Therefore, NSP lessen the digestion and absorption of nutrients through its physicochemical effect in the intestinal tract. As a result of high fiber diets, undigested/unabsorbed nutrients change in microbial populations in the gut (Bird et al., 2007; Choct et al., 1999; Mathlouthi et al., 2002). Langhout (2000) observed that dietary NSP considerably decrease beneficial bacteria while increases intestinal populations of pathogenic bacteria. Exogenous enzymes



Dr. Preeti Puspa Mohanty
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CJ Bio



improve digestion in the small intestine and reduce the amount of substrate availability for putrefactive and starch utilizing bacteria in the large intestine. Also enzymes help in the disease prevention by to reducing digesta viscosity (Pluske et al., 1997) as illustrated in Fig. 1d. Xylanase and glucanase supplementation in barley, wheat, oats, and rye based diets significantly raised caecal butyrate and acetate concentrations, but such effect was absent in hull-less varieties of barley and oats (Jozefiak et al., 2006). Degradation and solubilisation of NSP by feed enzyme increases available substrates (oligosaccharides or mono-saccharides) for microbial fermentation in the cecum (Cadogan & Choct, 2015), and results in decreased VFA/SCFA production in the ileum suggesting decreased fermentation whereas caecal fermentation markedly increased. The increment in caecal fermentation resulted an influx of xylo-oligosaccharides (XOS) which produces VFA/SCFA and energy from indigestible substrates and often leads to a healthier microflora (lactic acid bacteria, LAB) (Jia et al., 2009). Therefore, the NSP fraction supplemented with EFE represents another potential energy reservoir to increase the performance of broilers if rendered fermentable.

Xylanase is a non-starch polysaccharide (NSP) degrading enzyme which cleaves the internal β -xylosidic glycosidic linkages of linear xylan chains to xylo-oligosaccharides (Jompengmuengbout et al. 2009), resulting in a mixture of arabinose-substituted xylo-oligosaccharides (arabinoxylan-oligosaccharides, AXOS) and non-substituted xylo-oligosaccharides. As an energy source, probiotics (beneficial bacteria like Lactococcus, Lactobacillus and bifidobacterium) have significantly higher XOS utilization efficiency than pathogenic bacteria, especially bifidobacterium which is comparable to glucose in XOS utilization efficiency. Secondly, SCFAs are mainly produced by beneficial microorganism and, thirdly, SCFAs can improve pH values in gut and contribute to a suitable environment for beneficial microbes which prefer acidic environment, also serves as an energy source for intestinal epithelial cells. So, the XOS can be utilised more efficiently and it also potentiates the activity of endogenous digestive enzyme and reduces the availability of indigestible substrates for microbial growth and as a

result digesta viscosity is decreased leading to reduced microbial populations in the upper tract and there is reduced loss of endogenous amino acids through modifications to pancreatic amylase and mucin secretion (Cowieson and Bedford 2009). The prebiotic effects of XOS also include optimisation of colon function, alter the amount and ratio of SCFAs and thus providing more energy, augmenting mineral absorption, immune stimulation and increased ileal villus length (Kiarie et al. 2014). Also, researches have shown that xylanase supplementation can improve chicken immunity (Gao et al., 2007), reduce the detrimental effect of Salmonella typhimurium infection (Vandeplass et al., 2009; Amerah et al., 2012), or alleviate the intestinal mucosal barrier impairment of broiler chickens challenged by Clostridium perfringens (Liu et al., 2012).

Soybean meal (SBM) is a primary source of vegetable protein that contains 3% soluble NSP and 16% insoluble NSP (Irish and Balnave, 1993), consisting mainly of mannans and galactomannans (Slominski, 2011). Beta-mannan (β -mannan), also referred to as beta-galactomannan (β GAL), is a polysaccharide that has repeating units of mannose containing galactose and/or glucose (Hsiao et al., 2006). Although β GAL content of SBM is in relatively low concentrations, it is a concern for nutritionists due to the presence of anti-

nutritive properties (Arsenault et al., 2017). β -mannan has a molecular structure similar to some pathogens, which may trigger immune stimulation. Acemannan (β -1,4-acetylated mannan) induced the activation of macrophages via increasing the nitric oxide synthase level at transcription level as reported by Ramamoorthy et al. (1996). Karaca et al. (1995) reported that nitric oxide acts as a cytostatic effector in the removal of viral replication and is proposed to be toxic for tumor cells (Karupiah et al., 1993). The response of this complex to β -mannan containing compounds could lead to losses in dietary energy utilization. Supplementation of β -mannanase improved the utilization of dietary energy in corn-soya diet in broiler chickens (Li et al., 2010) as well as layers (Wu et al., 2005) (Saeed et al., 2019).

Conclusion

Diets with higher soluble NSP increase intestinal viscosity and reduce nutrient digestibility and have negative impact on the bird's health and performance. Exogenous NSPase enables digestion process of a broad range of dietary fibers lowering intestinal viscosity and competition between host and microbiota for SCFA in the small intestine and improve digestibility of nutrients. Therefore there is an overall improvement in intestinal health and load of pathogenic microbes.

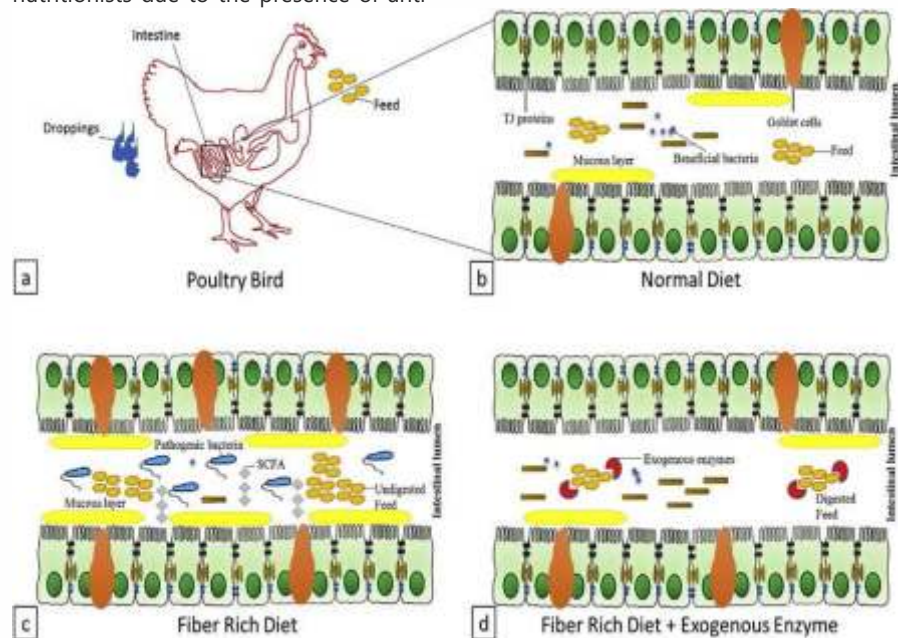


Fig 1. Fibers, EFE and intestinal health. (a) poultry bird, (b) intestinal lumen presenting normal goblet cells, TJ proteins, mucous layer, feed, beneficial cells and enterocytes, (c) intestinal lumen presenting highly viscous environment with increased mucous, undigested feed, competition of host and microbiota for SCFA in small intestine, (d) intestinal lumen presenting carbohydrases, normal mucous, beneficial bacteria and digested feed. (Adapted from Raza et al., 2019)

Role of Rural Women in Poultry Farming for Poverty Alleviation

Introduction

Poultry rearing and production are the most essential livestock activity for many poor rural people around the world, serving as a source of revenue as well as a tool for poverty alleviation. To enhance the socio-economic and nutritional status of rural residents, particularly landless or low-income households, backyard poultry is a manageable and inspiring business with a modest initial investment and high economic return. Poultry farming increases the production of vital protein sources such as meat and eggs, which raises nutritional standards and creates employment opportunities. Rural women have historically played a significant role in poultry industry and are frequently in charge of the entire process of feeding to marketing, which is different from the way of other livestock species are produced.

Rural women and backyard poultry farming

The empowerment of women through entrepreneurship training and self-employment in many socio-economic areas, such as backyard poultry, creates new prospects for raising socio-economic status of farmers. Micro-credit is an effective tool for empowering women to generate self-employment and supplemental income for women's financial management. The security, decision-making ability, and mobility of women are the primary three markers of women's empowerment in India, which are three metrics found very low level.

Status of poultry population in India

The poultry industry in India is primarily split into two sub-sectors, one having a highly organized commercial sector accounting for around 62.78% of the overall market share and the other being unorganized (backyard farming)

accounting for approximately 37.2% of the total market share. Backyard poultry is a part of the unorganized sector and is significant in improving the socio-economic and nutritional situation of the poor, which is also referred to as this group's main source of income. According to the 20th Livestock Census, All India Report, DAHD&F (2019), India has 851.81 million poultry. According to FAOSTAT production figures (2019), India ranks 3rd in egg production in the world. In the country, 114.38 billion eggs produced in 2019–20, increased from 78.48 billion in 2014–15. In 2014–15, the annual growth rate of egg production was 4.99 percent. Since then, there has been a noticeable improvement, with egg production growing by 10.19 percent in 2019–20 over the previous years. Egg availability per person was 86 eggs annually in 2019–20.

Advantages

- Poultry has good market demand and prices, is simple to handle, and requires little outside inputs.
- A good example of recycling agricultural and domestic trash is feeding backyard poultry. Particularly women come up with creative methods to reuse trash.
- Poultry farming can help rural communities combat poverty, especially among women and children. Poultry farming raises women's income and also improve their social position and power in the home.
- In contrast to extensive poultry farming, backyard poultry farming produces higher-quality eggs and meat, and the faeces of backyard fowl are utilized as a fertilizer to improve the soil's fertility. Backyard poultry farming works well with other types of farming like growing



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mushrooms etc.

- Through the empowerment of women, livestock interventions that target species within the authority of women, such as backyard poultry farming, may have a greater impact on the security of household food and nutrition. Male family members typically have numerous sources of income, but the primary source of revenue for female family members is frequently the selling of poultry products.
- As compared to intensive or semi-intensive poultry farming, backyard poultry farming decreases environmental pollution per unit of poultry produced because the main issue with these methods is environmental pollution brought on by the high bird density.

Constraints

- Inadequate transportation facilities, restricted access to market information, and a distance from markets.
- Lack of immunizations and difficulty

for women to get veterinary services.

- Limited access to information, technology, and extension services.
- Limited access to credit for purchase of high-quality feed and medicines.
- Traditionally the purview of women, poultry keeping is experiencing a change in roles and attitudes as men become aware of its economic value. This affects how much power of women have over the money made.

Recommendations and lessons

- The key to ensuring women have access to a well-organized marketing system and a higher price for their livestock goods.
- Poultry operations are more productive in areas where women are trained in latest poultry husbandry techniques and have access to services for poultry health.
- Access to loans is frequently necessary for the development of poultry in rural regions.
- In order to determine production

parameters and provide access to rewards, gender is a crucial component of a poultry project.

- Policymakers and planners need to promote and take into account the role that women play in poultry production and rural development.
- Development of rural women group based activities and small women co-operative societies in rural areas may play big role in poultry development.

Conclusion

The rural landless poor, marginal and small farmers in India have little resources and can only use poultry farming as a source of income. The rural poultry sector's growth can undoubtedly help India's fight against poverty. Backyard poultry farming is the cheapest and richest source of high-quality protein, which also aids in improving the nutritional health status of poor rural farmers. Landless, marginal and small-scale farmers in rural areas may create work opportunities around the year, it can be significantly contribute to women empowerment.



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Successful Chicken Farming Requires Analysis



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Keeping the flocks in ideal performance throughout production life is paramount importance for successful farming especially when the cost of running poultry farm is high and keeps rising. In this context, it is pertinent to prevent most of the undesired entities, If not all, from impacting upon performance of the flocks. To accomplish the purpose of revealing such issues well in advance, Success Poultry Care (previously called as 'Success Poultry Laboratories') situated at Namakkal, Tamil Nadu which stands first in the population of commercial layer chickens in India has been serving the chicken farming community since 2010. Further, the service oriented facility is taken care of by a technical person who has expertise in poultry nutrition and disease management for more than four decades. Moreover, the facility has two components: one for nutrition and another for microbiology with two separate working forces.

Points for storage of raw materials

In poultry farming, more than 80% of expenditure is incurred to ensure for feed. Hence, it is necessary to ensure the quality of feed raw material and wastage of such materials is empirically to be avoided. In feed mill, store the different raw materials in different rows. If possible, arrange rows in such a way that it gets proper ventilation. It is essential to ensure 'fair' ventilation while storing fish and related materials. When you store oil fish, do not put more than five bags in a single row. Further, if you store oil fish for long, change the position of bags in a single row. Place 'lot card' for each lot.

What are the additional tests done?

In addition to the regular analysis,

following tests are recommended for the below mentioned raw materials.

Soya oil cake: Solubility

Other cake items, dry fish and animal protein sources: Pepsin digestibility, urea, urease activity, non-protein nitrogenous compounds and ammonia.

Oil: Peroxide value and FFA

What is the difference between urea and urease activity test?

In urea test, we can determine how much urea is mixed with the material.

In urease activity test, one can find whether soya oil cake is processed properly or not.

Urea: In dry fish and related material, urea is allowed up to 0.3 to 1%. In other materials, urea should not be present at all. Similarly, leather and ammonia should be absent in all materials.

Urease activity: In soya oil cake, the range of urease activity should be from 0.025% to 0.4%.

NPN: In dry fish and related products, NPN should not be more than 0.5%. In other materials, it should be less than 0.25%.

Pepsin digestibility (PD): In cakes and other animal protein materials, PD should be in the range of 80 to 85%. In DORB, it should be in the range of 60 to 70%.

Peroxide value: It should not be there in oil.

FFA: It should be within 10% in oil.

Total viable basic nitrogen (TVBN): It is done to indicate the spoilage of fish/fish meal/meat meal/chicken meal/any other animal protein source. Microbiological analysis



Dr. N.P. RADHA KRISHNAN, B.V.Sc.,

(Regn. No. 2854)



SUCCESS POULTRY CARE

(SUCCESS POULTRY LABORATORIES)

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Uniqueness of Success Poultry Care

- * Headed by experienced poultry veterinarian
- * Both nutritional and microbiological analysis under one roof with separate work forces
- * Internationally approved protocols are being followed
- * Accurate and precise results
- * Rapid analysis
- * Communication of results through Email / Whatsapp within 24 hours
(Except Pepsin Digestibility (PD), Mold & *Salmonella* spp.)
- * Results given with interpretation and suggestion for microbiological analysis
- * Current results compared with previous results for serology
- * Analytical charges are same irrespective of sample's origin



ELISA done for the following :

- ☛ Infectious bursal disease (IBD)
- ☛ Infectious bronchitis (IB)
- ☛ Reovirus
- ☛ *Mycoplasma gallisepticum* (MG) and
- ☛ *Mycoplasma synoviae* (MS)



- For live birds, there will be two segments – sanitation and serology where sanitation and serology where sanitation includes bacterial and fungal load in water, shed & feed and serology includes antibody status against various viral infections/vaccines.
- For hatchery, determining level of sanitation in all areas and water used for maintenance of humidity.
- For commercial chick, analysis of prevailing maternal antibody level shall help in determining comprehensive vaccine schedule for commercial chicks and it also indicates health status of respective parent flock.
- Serological profiling can be done for infectious bronchitis, infectious bursal disease, reovirus, MG, MS (ELISA), Newcastle disease (HI test) and Salmonella (RPAT)
- As level of antibodies will start declining after cessation of antigenic stimuli, monthly serological profiling will clearly indicate whether the response is due to vaccine or field exposure.
- It also helps in deciding time of next vaccination thereby avoiding unnecessary vaccine inputs.
- It also helps auditing control measures followed for various infections.

Water Sanitation:

It is essential due

- To ensure water supplied for drinking is free from bacterial contamination
- To check the efficacy of water sanitizer used
- To rule out presence of biofilm in the event of effective water sanitizer used.

Following bacterial contaminants can be checked in the water at various points like water source, main tank, sub-tank, nipples in water line - beginning, middle and end.

1. Escherichia coli
2. Pseudomonas spp.

3. Staphylococcus spp. and

4. Other coliforms

Feed/Raw materials:

Presence of different harmful bacteria and mold in feed can play a major role in health status of flock. Following contaminants can be checked in feed and raw materials:

- a. Escherichia coli
- b. Salmonella spp.
- c. Clostridium spp.
- d. Staphylococcus spp.
- e. Other coliforms and
- f. Mold

Shed:

Auditing shed sanitation is useful to determine the efficacy disinfectant used for spray.

Following contaminants can be checked in shed environment by exposing relevant culture plates at

different locations.

- I. Escherichia coli
- II. Staphylococcus spp.
- III. Coliforms and
- IV. Mold

Analysing above parameters preferably every month will ensure optimum performance of the flock.

Hatchery:

Following analysis is essential to obtain optimum result from hatchery activities.

- Bacterial and fungal load in hatcher and setter by swabbing and exposing culture plates
- Bacterial load in water
- Egg break analysis
- Bacterial load in fluff and personnel's hand

These findings will help in ascertaining hygiene status of hatchery. It is expressed in A or B or C grade depending on the findings of above-mentioned analysis. Periodical assessment of hatchery sanitation is helpful in prevention of loss due to unhealthy condition of hatchery. It is ideal to check hatchery sanitation preferably every month.

Maternal antibody and bacterial contamination of yolk

Maternal antibodies play a key role in preventing infections in early part of life. At the same time, presence of high level of maternal antibodies interferes with vaccine antigens thus resulting in low vaccine response which in turn leads to suboptimal protection in chicks. Level of maternal antibodies against ND, IB and IBD determines the comprehensive schedule for vaccination against these diseases in chicks. Also the immunity level in respective parent flock will directly be reflected. It is also pertinent to screen the presence of vertically transmissible bacteria like Salmonella spp. in the yolk of newly hatched chicks.

Both of these analysis can be performed whenever required or monthly basis. Twenty no. of samples per parent flock is sufficient.

Some of other microbiological tests

Antibiotic sensitivity test (ABST)

This test is performed to find out correct antibiotic to treat the bacterial infections. Sample like heart blood swab is taken from recently died (not more than two hours) or ailing birds after sacrificing. Based on the result of ABST, one can avoid indiscriminate use of antibiotics and also unnecessary expenditure

Haemagglutination (HA) test

HA test is done for the presence of haemagglutinating viruses like ND virus and IB virus from recently died birds. Organs of choice are trachea, intestine, kidney, spleen, oviduct, faeces etc.

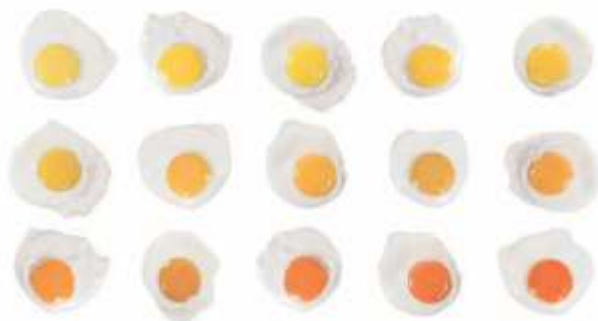
In conclusion, it is clear that many production-affecting problems are always knocking on the chicken farming enterprise. Preventing such loss-causing threats can only be possible by remaining vigilant through constant analysis of various feed raw materials and specimens in order to keep the poultry farming upright.

N.B.: The list of all the tests carried out at Success Poultry Care, Namakkal can be had from the author.

Intra Calferol - Sunny Side up

By Luca Vandi (Managing Director Intracare Italy) and Cheng Lee DVM (product manager Intracare)

'People eat first with their eyes' is an expression that has long influenced the presentation of food, but also consumer attitudes and shopping tendencies towards food. Consumers make choices on food based on their assessment of quality, which includes the visual appearance of the food itself. Parameters such as uniformity, colour intensity, and smoothness are just some of the examples that consumers use to inspect and judge the quality of a food. When it comes to eggs, one of the important sensory factors used to evaluate quality is the colour of the yolk.



Although yolk colour can be influenced by many factors, one of the determining factors for yolk colour is the health of the flock. Any disruption to the immune status, gastrointestinal or reproductive health can influence the pigment absorption from feed or deposition of pigment into the yolk, causing changes in yolk colour. Vitamin D3, a nutritional substance that has seen extensive use in laying flocks to improve skeletal and eggshell quality, also has the ability to influence yolk colour indirectly. Studies have shown that Vitamin D3 not only plays an important role in the regulation of calcium metabolism in the hen, but also has significant roles in the

modulation of the mammalian immune system, with trials reporting a robust immunomodulatory property response when fed to chickens.¹

The application of precision supplemental nutrition via the drinking water has become increasingly popular over the years to support and maintain the production of high quality eggs in older laying flocks. As feed intake is often compromised during periods of environmental and disease stress, supplemental nutrition via the drinking water can ensure continuous intake of

important and sensitive nutritional factors that supports flock health and immunity.

The influence of the mentioned supplemental nutrition on egg quality has been evaluated in an Italian field study with 22.000

Lohmann Brown hens reared in an aviary system. The aviary system consisted of 4 separate boxes. Box 2 was selected as the control, whereas Box 4 was selected as the Intra Calferol trial group. Intra Calferol, a concentrated Vitamin D3 supplement with additional chelated calcium, magnesium and phosphorus releaser was supplemented via the drinking water according to the general protocol and recommended dosage of 1L product in 1000L of water. The trial started when the birds were 69 weeks of age and continued for a duration of 12 weeks. Egg collection, lab analysis and data statistical analysis have been conducted by the Dept of Animal Nutrition of the University of Bologna.



The trial set-up

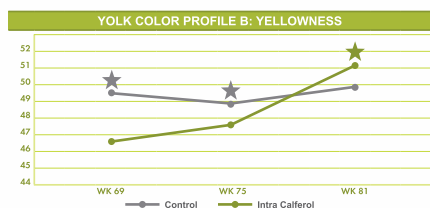
Daily egg collection generally started at 7.30am starting from box 1 to box 4 and lasted a total of about 1.5 hours. From the collected eggs, a total of 400 eggs were randomly sampled at the start of the trial (T0), after 6 weeks (T1) and after 12 weeks, at the end of the trial (T2). The colour of the yolks were evaluated based on the L*a*b* colour system (CIELAB colour space, International Commission on Illumination). This system classifies colours in terms of their lightness (L), redness (a) and yellowness (b).

Significant difference on Yellowness (b)

The Intra Calferol supplementation was clearly observed in the yellowness of the egg yolk. Although at the start of the trial (week 69), the control group showed a significantly 'yellower' yolk, a shift was seen by the end of the trial period

at week 81 and the egg yolks of the Intra Calferol supplemented group had significantly yellower yolks (figure 1).

Figure 1: Yolk colour yellowness of control



group compared to Intra Calferol supplemented group. Datapoints with an asterisk denotes significant differences.

Improved redness (a)

The results in figure 2 demonstrated that when it came to the yolk redness, even though the treatment group yolks were significantly less red at the start of the trial (week 69), the supplementation of Intra Calferol resulted in an

improved redness and thus was eventually similar to the control group in terms of redness. In short, supplementation of Intra Calferol helped the treatment group 'catch-up' to the control group.

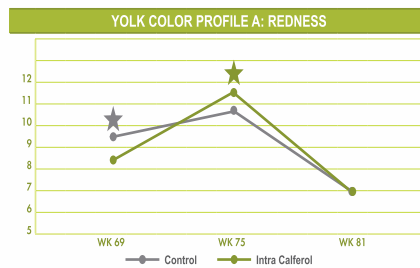


Figure 2: Yolk colour redness of control group compared to Intra Calferol supplemented group. Datapoints with an asterisk denotes significant differences.

Same Lightness (L)

The egg yolk lightness (L) for both groups showed a similar trend of increase over time with no statistical significance. However, since egg yolk redness (a) and yellowness (b) were significantly improved while lightness was similar between both groups, the improvement of the egg yolk visual quality was evaluated further based on the Delta-E gap.

Intra Calferol has closed the Delta E-gap

The Delta E quantifies the difference between two colours. Delta E is calculated on a scale from 0 to 100 (see below table 1). A low Delta E (< 1)

DELTA E:	PERCEPTION DIFFERENCE:
<1	Colors not perceptible by the human eye
1 - 2	Hardly perceptible by close observation
2 - 10	Perceptible at a glance
11 - 49	Colors are more the opposite
100	Colors are exactly the opposite

table 1: L*a*b* colour system to calculate Delta E is based on the standard formulation: $\Delta E^{*ab} = ((\Delta L^*)^2 + (\Delta a^*)^2 + (\Delta b^*)^2)^{0,5}$

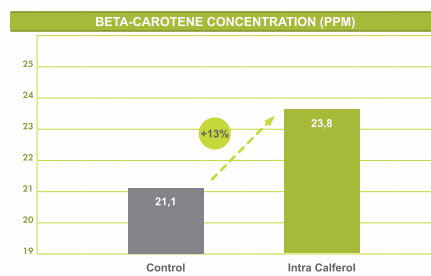


Figure 3: Mean beta-carotene concentration of 30 randomly sampled egg yolks



indicates identical colouring, while a high Delta E level of 100 indicates exactly opposite colours.

The Delta E value at T0 was 2,97 (perceptible at a glance). At T1 it already was closed to 1,82 and even further on T2 to 1,24, a difference hardly not perceptible. Intra Calferol group has clearly caught up, clearly closing the gap.

β-carotene concentrations confirm the better egg yolk colouring

Additionally to the Delta E values, the β-carotene concentration in the yolk was measured. Randomly 30 collected eggs per group were separately measured at week 81 (T2) and independently measured by the lab of a leading egg producer for β-carotene.

The improvement in egg yolk colour after supplementation with Intra Calferol could be related to the average increase of 13% in the β-carotene deposition. β-carotene is the organic pigment responsible for red-orange colouring and higher concentration of this pigment in the yolks of Intra Calferol supplemented eggs lead to a more intense, golden colour of the yolk which also reflected in the L*a*b* colour value.

In conclusion, older laying hens supplemented with Intra Calferol produced better quality eggs with more golden yolks with higher beta-carotene level. This was most likely attributed to the improved health status of the flock therefore facilitating more pigment absorption via the gastrointestinal tract and better pigment deposition in the yolk via the reproductive system.

January 2023

- 1. India Poultry Show-2023**
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Venue: Codissia Trade Fair Complex
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Country: India
Website: www.indiapoultryshow.com
- 2. The International Production & Processing Expo (IPPE) 2023**
Dates: January 24 - 26, 2023
Venue: Georgia World Congress Center
City: Atlanta
Country: USA
Website: www.ippexpo.org

February 2023

- 1. Dairy and Poultry Expo**
Dates: February 2 - 4, 2023
Venue: ICCB, Kuril Bishwa Road, Nexto 300 Ft Purbachal Express highway
City: Dhaka, Bangladesh
Country: India
Website: www.limraexpo.com

March 2023

- 1. Viv Asia 2023**
Dates: March 8 - 10, 2023
Venue: IMPACT
City: Bangkok
Country: Thailand
Website: www.vivasia.nl

May 2023

- 1. Middle East Poultry Asia 2023**
Dates: May 1 - 3, 2023
Venue: Riyadh International Convention and Exhibition Center
City: Riyadh
Country: Saudi Arabia
Website: www.mep-expo.com

2. Fieravicola 2023

Dates: May 3 - 5, 2023
Venue: Rimini Expo Centre
City: Rimini
Country: Italy
Website: www.fieravicola.com

3. Viv Rusia 2023

Dates: May 30 - June 1, 2023
Venue: Crocus Expo
City: Krasnogorsk, Moscow
Country: Russia
Website: www.meatindustry.ru

July 2023

- 1. Livestock Philippines 2023**
Dates: July 5 - 7, 2023
Venue: World Trade Center Metro Manila
City: Pasay City
Country: Philippines
Website: www.livestockphilippines.com

August 2023

- 1. The Poultry Expo @ The Livestock Expo**
Dates: August 3-5, 2023
Venue: India Expo Center & Mart
City: Greater Noida
Country: India
Email: info@pixieexpomedia.com
Website: www.pixieexpomedia.com

September 2023

- 1. Space 2023**
Dates: September 13-15, 2023
City: Rennes
Country: France
Website: www.space.fr

Indian Federation of Animal Health Companies (INFAH) Organised 11th Annual General Meeting on 24th September 2022 , at Mumbai



Indian Federation of Animal Health Companies (INFAH) held its 11th Annual General Body Meeting on 24th Sep 2022. Members met after over two years for this physical meeting held at ITC Maratha Mumbai. Emerging trends in AH sector & a pictures gallery showcasing key INFAH activities for 2021-2022 were displayed at the venue. The AGM was attended by 95 industry colleagues representing Indian animal health and nutrition industry.

On 24th Sep 2022 during the Inaugural session Dr Shirish Nigam, General Secretary delivered welcome note. Inaugural session was addressed by Chief Guest Dr. O.P. Choudhary Joint Secretary DAHDF, New Delhi. Dr. Choudhary highlighted the various initiatives undertaken by the Government towards National Livestock mission and key features of AHIDF. Dr. Choudhary also stressed on collaboration between INFAH and DADF for enhancing Animal Husbandry and Animal Health in India. Detailed presentation on AHIDF scheme was

shared by Dr. Lipi Sairiwal Assistant Commissioner, DAHDF. Dr. Umesh Chandra Sharma, President, VCI and Guest of Honor shared his vision for strengthening Veterinary Education in India and focusing on developing Animal Health Infrastructure. Dr. Sharma also stressed on need for collaboration between Industry and VCI. Dignitaries released the Annual report 2022. INFAH members had the unique opportunity of listening & interacting with Invited government dignitaries.

In the post lunch session Dr Tanweer Alam, Vice President welcomed all the delegates, Mr. Shabbir Motorwala, Mr V. Krishnan (B.S.R. Affiliates & Co) delivered presentation on the Topic of "Promotional Inputs, Benefits and Perquisites: TDS, Deducibility and GST aspects" & Mr Amit Manna shared presentation on the topic of "Ecommerce Landscape in India". Mr. Vijay Teng shared the highlights of Veterinary Code of Ethics and the draft MSVPR.

President address was given by Dr Vijay Makhija reinforcing the INFAHs motto of

Healthy Animals, Healthier India. He shared the strategic priorities of INFAH, its progress & way forward. Dr. Shirish Nigam General Secretary INFAH presented the full year activity report for 2021-2022.

Dr. P.G. Phalke, Treasurer conducted the AGM proceedings.

Three distinguished personalities Mr Mohanji Saxena, Mr KP Philip, Mr KK Unni were conferred with INFAH Awards 2022.

Special award was given to Dr. Dr P G Phalke for his contribution to Animal Health sector and INFAH. Immediate Past President Mr Vijay Teng was felicitated for his continued passion & contribution towards the INFAHs journey since the time of inception. INFAHs Subcommittee Chairman, Subcommittee members and INFAH Connect team were felicitated at the AGM for their Valuable contribution. Dr. Nitin Bhatia proposed the vote of thanks

AGM concluded on a very positive note with a resolve to continue the contribution of INFAH towards betterment of the Industry and Society.

INFAH 11th AGM 2022





Alltech Feed Manufacturer's Forum highlights feed quality optimization and mycotoxin mitigation



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Animal feed includes various raw, processed and semi-processed products that are fed to livestock and poultry. However, the quality of the raw materials being used is a rising concern due to several factors disrupting feed production. It is every producer's responsibility to pay attention to ingredient quality not only to meet the nutrient requirements of the animals but also to keep costs low. Good quality feed production demands optimum utilization of materials, machinery, people and procedures.

In response to these challenges, Alltech hosted the Feed Manufacturer's Forum in Ludhiana, on November 17, to discuss feed quality optimization and mycotoxin mitigation.

About 65 eminent poultry, dairy feed millers, consultants and farmers attended the session upon invitation and enjoyed the programme making it a great success.

Dr. Nick Adams, Alltech's global director of mycotoxin management, discussed managing mycotoxins in the feed chain in his presentation, 'Mycotoxins-Facts and Mitigation'. He asked attendees to think twice about clean feed, speaking about the importance of gut health, grain quality and highlighting the ways that Alltech 37+® mycotoxin analysis and Alltech RAPIREAD® can mitigate the negative effects of mycotoxins.

The renowned nutritionist Dr. Pradeep Mahajan captured the audience's attention with his presentation, 'Feed Ingredients: Quality and Processing'. He shared insights on different raw materials, their selection criteria, nutrient



composition, extraction process and best feed milling practices, answering to several queries of the audience.

In the final session, Dr. Lokesh Gupta, senior regional technical manager - Poultry (South Asia) presented on "Maximising nutrient digestibility and profit". He discussed the history of Alltech enzymes and shared the uniqueness of solid-state fermentation technology and its benefits in maximizing feed efficiency with greater savings.

The gathering also witnessed a special moment, as Alltech team along with Dr. Sayed Aman, managing director of India and regional director of South Asia for Alltech, launched the company's newest product in the enzyme category, Allzyme® Prime, a unique multi-enzyme complex.





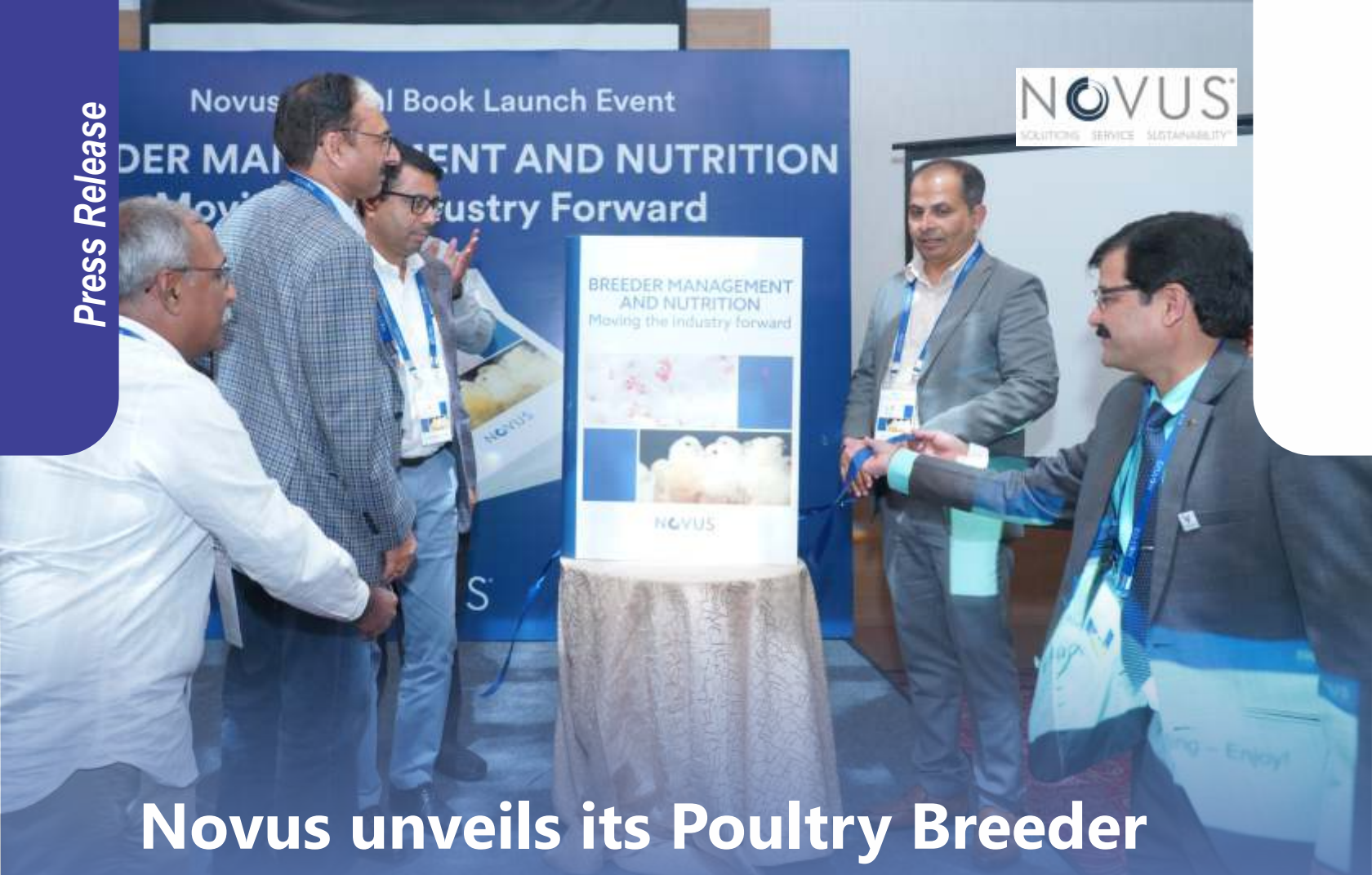
About Alltech:

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

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

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

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



Novus unveils its Poultry Breeder Manual at the Radisson Hotel in Hyderabad.

Novus International released its Breeder Management book on November 23, 2022, at the Hotel Radisson in Hyderabad. The event was attended by key customers, veterinarians, media representatives, and the Novus team.

Novus' latest publication highlights the perspectives and experiences of industry experts from around the world.

Titled, Breeder Management and Nutrition: Moving the industry forward, the book's 14 chapters were carefully curated to serve as a reference for current broiler breeder production best practices and considerations as well as to be a catalyst for new ideas in management, nutrition, and industry

sustainability.

The authors include academics, researchers, industry leaders, breeding company experts, nutrition company innovators, veterinarians, and nutritionists to consider how each stage of the broiler breeder's lifecycle can be optimised to support performance and positively impact the producer and the industry.

Novus presented gifts to all attendees and thanked all customers and business partners for their ongoing support.

To learn how to download a digital copy of Novus's book Breeder Management and Nutrition: Moving the industry forward, visit www.novusint.com



About Novus:

Novus International, Inc. is a leader in scientifically developing, manufacturing, and commercializing nutrition and health solutions for the animal agriculture industry. Novus products include bis-chelated trace minerals, enzymes, organic acids, essential oils, liquid, and dry methionine, and gut health products for poultry, swine, and ruminants. For more information about Novus, visit www.novusint.com





Carus Laboratories Launches its Poultry Vertical at the Poultry India Expo 2022



The 14th Poultry India Expo, also known as South Asia's largest Poultry event, was held from November 23rd to November 25th, 2022 at the Hitex Exhibition Centre in Hyderabad. Carus Laboratories Pvt. Ltd. also participated as an exhibitor in this event, showcasing need-based innovative solutions to visitors.

Carus was represented at this event by Dr Arun Pilani (Managing Director) and Mr Jitender Pilani (Director), as well as the poultry team, which included Mr Avinash Kharat (GM), Dr Sumit Chauhan (Product

Manager), Dr Prashant Pathak (Assistant Technical Manager), Mr Jitender Kajal (DSM), and Dr Amit Kumar Pandey (GM, International Business). This event provided a comprehensive forum for learning about the poultry industry, feed equipment, technology, breeders, egg farming, poultry nutrition, animal health, and international poultry production.

Carus is already a trusted name in the livestock industry for its innovative animal healthcare products; now, through this exhibition, the company is

taking the next step by launching the Poultry division. It was a fantastic opportunity for the company to meet and discuss new market opportunities with major feed millers, poultry farmers, and consultants from all over India.

Clients from Nepal, Bangladesh, Sri Lanka, Zambia, and Muscat also visited their booth and appeared to be interested in their solutions.

Carus received an overwhelming response at this event, with over 3000 people visiting its booth.





Fine Organics is Offering Green and Bio-based Solutions to Ensure The Poultry Industry's Future and Sustainability



The 14th Poultry India Expo, South Asia's largest poultry event, was recently held from the 23rd to the 25th of November at the Hitex Exhibition Centre in Hyderabad. Because Fine Organics Industries Limited, Mumbai was a first-time exhibitor, this event was especially memorable for them. Fine Organics is widely recognised as a "Solution Provider" in a variety of industries, including food, polymers, bakery, plastics, and inks, to name a few.

Following the successful launch of Animal Health related feed supplements in the European market, Fine Organics is expanding its base and roots in the domestic Indian market as well. Though the Indian market is difficult to penetrate,

they have built bridges between their company and their end customers through proper marketing, ethical practises, and technical services.

Fine Organics provides green and efficient solutions through their well-known and globally accepted oleochemistry, which is a true need of the future.

Mr. Jayen Shah (CEO), Mr. Shrinivas Sawant (VP), Dr. Akshay J. Wankhade (Field Officer), Dr. Parth A. Sutar (Technical and Marketing Manager), Mr. Sameer Gupta (RSM-North), Mr. Ajay Garg, and Mr. Laxman (Distri) represented Fine Organics at this event. The company already has a diverse range

of feed supplements in its dairy and poultry divisions and is actively involved in new developments with the assistance of its technocrats and state-of-the-art "R and D Centre" in Mahape, New Mumbai. It was a fantastic opportunity for the company to meet with Veterinarians, Consultants, Farmers, Feed Manufacturers, and Distributors not only from India, but also from other countries.

The focused area of discussion was to know the future of the poultry industry, the current problems and to provide them a better solution with the help of Green Chemistry. The response at the booth was great as the visitors wanted to see and to know something which is different from the traditional.



GLIMPSE FROM THE POULTRY INDIA EXHIBITION 2022 AT HITEX, HYDERABAD.



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EVERLASTING MEMORIES FROM POULTRY INDIA EXHIBITION-2022.



Looking back I can say that the Poultry India Exhibition was a very successful exhibition. Glad to meet our esteemed customers/ stakeholders /friends after a long time. I'd like to thank everyone who made it memorable with an everlasting experience.

"A moment lasts for a second but the memories live on forever".
Mr. Sumit Sipany - Product & Marketing Executive, ABTL.



Alltech India Hosts Poultry School in Karnal, Haryana

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The Alltech India team recently organized a Poultry School in Karnal, Haryana, on Saturday, November 19, to share the latest studies, innovative solutions and best feed milling practices with its poultry customers. The event was a great success, with 70 major poultry producers, feed millers and market leaders actively participating.

Dr. Nick Adams, Alltech's global director of mycotoxin management, presented on 'Mycotoxins-Facts and Mitigation' discussing on managing mycotoxins in the feed chain. He asked attendees to think twice about clean feed, speaking about the importance of gut health, grain quality and highlighting the ways that Alltech 37+® mycotoxin analysis and Alltech RAPIREAD® can mitigate the negative effects of mycotoxins.

The renowned nutritionist Dr. Pradeep Mahajan captured the audience's attention with his

presentation, 'Feed Ingredients: Quality and Processing'. He shared insights on different raw materials, their selection criteria, nutrient composition, extraction process and best feed milling practices.

In the final session, Dr. Lokesh Gupta, senior regional technical manager - Poultry (South Asia) discussed on 'Maximizing nutrient digestibility and profit'. He presented the history of Alltech enzymes and shared the uniqueness of solid-state fermentation technology and its benefits in maximizing feed efficiency with greater savings.

The gathering also witnessed a special moment, as Alltech team along with Dr. Sayed Aman, managing director of India and regional director of South Asia for Alltech, launched the company's newest product in the enzyme category, Allzyme® Prime, a unique multi-enzyme complex.





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Indian Broiler Production: A way into the Future



On November 23, leading experts from the Indian broiler industry discussed promising innovations and the future of production at an expert seminar on »Phytogenics in broilers — your better alternative for more profit«. The event was hosted by German additive company Dr. Eckel Animal Nutrition and took place in the course of Poultry India at Hyderabad.

Dr Chandrasekar Seenivasan, recently

appointed Sales Manager Phytogenics South Asia at Dr. Eckel Animal Nutrition, welcomed the guests to the event held at the Trident Hotel, Hyderabad. Afterwards, Dr Bernhard Eckel elaborated on pioneering animal nutrition and the optimal support in poultry nutrition. The Vice President of Dr. Eckel Animal Nutrition particularly emphasised the increasing importance of phytogenic additives for successful animal nutrition: »If we want to successfully meet the growing demand for high-quality proteins, phytogenics are our most important ally«, Dr Eckel emphasised. After all, they are the only way to meet profitable animal production with animal health and resource responsibility in the face of the challenges posed by climate change and

antibiotic resistances.

»It is a pleasure and a privilege to be able to discuss our vision for the future here. I am impressed and delighted by the commitment of broiler producers in India to produce sustainable and safe food,« says Bernhard Eckel. The evening culminated in a dinner and cocktail hour at the hotel's restaurant. Dr. Eckel Animal Nutrition thanks all participants and contributors for the successful event.



About Dr. Eckel

Dr. Eckel Animal Nutrition: quality, modern animal nutrition made in Germany. The company was founded by Dr agr. Antje Eckel in 1994. The start-up has developed into an international hidden champion in the field of innovative feed additives for livestock and aquaculture.

Dr. Eckel is regarded as a pioneer in the industry. The products, distributed worldwide, combine commercially successful animal nutrition with animal welfare. Repeatedly acclaimed by the research sector and industry, Dr. Eckel's products make a major contribution to sustainable food production.

More than 90 employees from 20 countries—highly qualified experts in agricultural science, veterinary medicine, microbiology, chemistry and pharmacy—research and work towards making animal nutrition healthier, more successful and more sustainable. More than 10 per cent of our revenue is invested in innovation every year. Numerous prizes for innovation, funding from the European Regional Development Fund and the State of Rhineland-Palatinate among others, and lively dialogue with international research institutes are ample testimony to the reputation that Dr. Eckel has earned through its constant leadership position. Antje Eckel herself has been commended for her entrepreneurial work several times. Minister Peter Altmaier appointed her to the advisory board of the Federal Ministry for Economic Affairs and Energy in 2018.

Projections

This press release may include projections based on current assumptions and forecasts made by the management of Dr. Eckel Animal Nutrition GmbH & Co. KG. Various risks—both known and unknown—uncertainties and other factors may cause the actual results, financial situation, development or performance of Dr. Eckel Animal Nutrition GmbH & Co. KG to differ significantly from the estimates provided here. Such factors include those described by Dr. Eckel Animal Nutrition GmbH & Co. KG in published reports. Dr. Eckel Animal Nutrition GmbH & Co. KG shall accept no liability whatsoever for updating such projections and adjusting them to future events or developments.



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Many NAMSTE'S and Smiles After 2019.

International Health Care Limited (PVS Group) gathered number of clients with smiles, satisfactions and expectations in south Asia's largest expo – Poultry India 2022.

International Health Care Limited (PVS Group) met many poultry farmers, customers, veterinarians, consultants, distributors and almost all people who belong to the industry. International Health Care Limited (PVS Group) has shown strong presence in this event. The Poultry India is the south Asia's largest poultry show, many local and international companies exhibited in this show and present their products and services. All in all, the event was a great success for IHCL (PVS Group) after COVID-2019.

International health care limited (PVS Group) is one of the largest manufacturer and exporter for poultry, veterinary and aqua health care products having excellence, experience and expertise for over 30 years. The poultry India show is an ideal and regular platform for PVS clients and end users to know more about the PVS Group. Dr.

Seshaiah V. Pamulapati -Chairman and Managing Director met all business partners, poultry farmers, poultry integrators, industrial stalwarts and explained about company's future road map. PVS Group is having larger production capacities of health care products in its existing manufacturing plants i.e., 125 tons in powder, 48000 ltrs in liquid, 0.8 tons in bolus and 21 KL in probiotics-all capacities are per shift. Apart from this existing facilities PVS Group recently expanded manufacturing facilities over in 15 acres area in Mallavalli (near Vijayawada) to meet future demand and supply. According to Dr PVS the upcoming production facilities in Mallavalli are ready with its full-fledged capacities, by adding these new facilities in to existence, PVS Group will become the largest manufacturer in India in poultry/veterinary/aqua health

care industry.

Mr. Arun Pamulapati -Director and Dr. Ajit Jadhav -General Manager welcomed all visitors and explained about company's manufacturing facilities and company's core products. PVS Group had showcased important poultry products- METABO, EGGRON, PROTOX-SPECIAL, GAINBRO, RELAX-DS, RENIL etc.

Always Poultry India is one of the best events for PVS Group to meet all people from the industry. As a one-stop solution in the manufacturing, customers strongly believe in PVS Group in terms of quality production and transparency in business. IHCL (PVS Group) all staff together shared and exchanged the knowledge with the all visitors and were remarkable at representing the company in the event of Poultry India-2022



Mankind Pharma Ltd. Participated as an Exhibitor in South Asia's Largest Poultry India Expo 2022 @ Hitex Exhibition Complex, Hyderabad on 23rd- 24th- 25th Nov' 2022 to Demonstrate our Selfless Commitment and Service to Poultry Industry.



We showcased our advanced & innovative range of feed and water supplement products meant for poultry farm management namely Acidifier (Acidapure Powder & Liquid), Haematinic (Ferikind-P liquid), Ovulation inducer and egg quality enhancer (Ovulanta-P), Disinfectants (Brutagerm liquid & Virobrut Powder), Toxin Binder (Toxyover), etc. to help poultry

stakeholders optimize performance and achieve focussed goals and mark our presence at global level.

We got good foot-fallof approx. 600 delegates and clients consisting of poultry doctors, farmers, distribution partners at our booth Y 40A, Hall no. 5 and all visitors appreciated our presence & contribution.

Leading regional and international poultry industry experts came together on single platform on "Knowledge day Technical seminar " on 22nd of Nov. 2022 to share their Intelligence and experience to provide insights for those working in many sectors of this vast industry.





HimFlora – The Next Generation Synbiotic



Himalaya Wellness Company is a science-based organization, established with the vision to bring wellness in every home and happiness to every heart, while maintaining sustainability. Himalaya is a contemporary Ayurveda brand that offers head-to-heel range of wellness products enriched with the goodness of herbs characterized by trust and healthy lives. Himalaya is a leading global herbal health and personal care organization with close to 500 products and presence in more than 100 countries. The Research and Development center of Himalaya Wellness Company is accredited by the Department of Science & Technology, Government of India. A highly proficient and expert scientific R&D team is behind the proven efficacy of Himalaya products. The R&D facility of Himalaya is an OECD-GLP certified facility. Himalaya is an ISO 14001:2004 certified organization for environmental control for land, water, and air pollution. Himalaya is certified with BS OHSAS 18001-2007 for occupational health and best safety management practice. We strictly adhere to principles of highest standards such as ICH-GCP guideline, Declaration of Helsinki, etc. Himalaya is certified with Food Safety System Certification 22000:2010-SGS. The

Animal Health Division of Himalaya Wellness Company has four dedicated verticals, viz. Livestock, Poultry Companion Care and Aqua to cater the special need of each segment. We provide comprehensive solution for Immunity, Fertility, Productivity, overall health and well-being of animals. Our team is present all over India with a vision to work towards well-being of animals. To counter the possible threat of antimicrobial resistance (AMR), Himalaya has launched the next

generation synbiotic "HimFlora".

HimFlora is a unique blend of

- Four strains of Bacillus species as probiotics (B. subtilis, B. coagulans, B. polymyxa and B. pumilus)
- Polysaccharides from ginger spent act as prebiotics and
- Phytoactives from turmeric extract and ginger.

HimFlora is the first of its kind product to have prebiotics from herbs fortified with phytoactives.

All the three components of **HimFlora** work in tandem and synergistically to

- Inhibit harmful bacteria, increase surface area of intestine
- Protect the gut through anti-inflammatory properties, and
- Enhance digestive enzyme production.

These properties improve digestibility and nutrient bioavailability for the birds which in turn results in

- Improved body weight
- Improved feed conversion ratio
- Improved liveability and
- Improved European production efficiency factor in broilers.

In layers, **HimFlora** helps improve

- Feed conversion ratio
- Improve egg production
- Improve hen house egg production
- Improve immunity and
- Improve liveability of birds.

HimFlora is a comprehensive gut health solution ensuring improved gut health through anti-bacterial, anti-inflammatory, enhanced digestion, improving nutrient bioavailability in poultry broilers, layers and breeders.

"Providing sustainable solutions for well-being and productivity of animals"



Activin is the scientifically designed micro-nutritional bundle of nutrients that successfully modulate aging and stress related effect on the fertility of the flocks. The product assures the micro nutrient supply to the male and female birds that are critical for the reproductive performance to achieve optimal fertility of the flock.

ACTIVIN

Facilitating fertility



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E-mail : biosint@gmail.com | Web : www.biosint.co.in

For technical details of product, trials you can connect Dr Prasad Kulkarni, Director , Biosint Nutraceuticals
@prasad.kulkarni@biosint.co.in

Editorial Calendar 2023

Publishing Month: January Article Deadline : 30th, Dec. 2022 Advertising Deadline : 3rd, Jan. 2023 Focus : Winter Disease Management	Publishing Month: February Article Deadline : 30th, Jan. 2023 Advertising Deadline : 3rd, Feb. 2023 Focus : Health & Nutrition Management	Publishing Month: March Article Deadline : 28th, Feb. 2023 Advertising Deadline : 3rd, March 2023 Focus : Vaccination & Immunization	Publishing Month: April Article Deadline : 30th, March 2023 Advertising Deadline : 3rd, April 2023 Focus : Summer Management
Publishing Month: May Article Deadline : 30th, April 2023 Advertising Deadline : 3rd, May 2023 Focus : Cold Chain Management	Publishing Month: June Article Deadline : 30th, May 2023 Advertising Deadline : 3rd, June 2023 Focus : Feed Production	Publishing Month: July Article Deadline : 30th, June 2023 Advertising Deadline : 3rd, July 2023 Focus : Layer Farming	Publishing Month: August Article Deadline : 30th, July 2023 Advertising Deadline : 3rd, August 2023 Focus : Genetics & Breeding
Publishing Month: September Article Deadline : 30th, August 2023 Advertising Deadline : 3rd, September 2023 Focus : Biosecurity Practices	Publishing Month: October Article Deadline : 30th, September 2023 Advertising Deadline : 3rd, October 2023 Focus : Winter Breeding Management	Publishing Month: November Article Deadline : 30th, October 2023 Advertising Deadline : 3rd, November 2023 Focus : Environment Control	Publishing Month: December Article Deadline : 30th, November 2023 Advertising Deadline : 3rd, December 2023 Focus : Industry Outlook

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- ✓ Lowest Feed Cost

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Suguna Country Chicken Feed



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