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From the Editor's Desk



Poultry Genetics And Breeding - A Tool In Reducing Global Food Insecurity

Poultry breeding has come a long way in the past 100 years. Consumption of poultry meat has increased significantly all over the world. Its role in addressing the issues of global food insecurity is indisputable.

The increase in consumption can be attributed to the lack of cultural and religious taboos associated with poultry meat and the relatively cheap prices of chicken meat and chicken meat products.

The cheaper prices are a result of constantly increasing productivity and efficiency over the years. The FCR (feed conversion ratio) which stood at 2.8 in 1950's where a 42-day-old broiler weighed 586gm today a broiler of the same age weighs 2900gm with an FCR of less than 1.7.

This is a result of intense genetic selection for improved feed efficiency, body weight and growth rate. Poultry breeding companies used quantitative selection practices to improve productivity and efficiency.

In the past 2 decades the selection pressure has been on breast meat yield resulting in increased overall eviscerated body weight of broilers. By 2034 broilers are expected to reach market-ready body weight of 2.34kg in 29 days courtesy genetic improvement.

Growing consumer concerns about ethical treatment of production animals have led the poultry breeding companies to identify the markers for stress in meat-type birds and help them evolve ways to cope with stressors.

Intense genetic selection for body weight, growth rate, and feed efficiency may have increased the productivity and efficiency of broiler industry, it has also inadvertently led to reduced reproductive performance, skeletal abnormalities, ascites, and increased abdominal fat, problems that can be resolved feeding, nutrition and management.

So, all the improvement in genetics a poultry breeder or farmer cannot undermine the importance of nutrition, feeding and improvement in management techniques.

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Convert Your Poultry Litter to Energy and Black Gold



Dr. Ratnesh Tiwari

Koshish Sustainable Solutions Pvt. Ltd.

Poultry is one of the fastest-growing segments of the agricultural sector in India today. As crop production alone may not solve the food difficulty of the fast-growing population of the country. Poultry production has been the appropriate answer for the fulfilment of the requirements of a balanced diet. India is now the world's third-largest egg producer, fourth-largest producer of chicken, and fifth in poultry meat production.

Poultry wastes are posing serious environmental pollution problems, through their bad odours and attract fly and rodent breeding. The appropriate utilization of its waste or by-products increases the monetary output and protects from its unwanted side effects. Inadequate approach and carelessness in the disposal of poultry litter waste will lead to the constant threat of disease ailments on poultry farms. This results in direct losses in the form of mortality and reduced productivity. Therefore, early disposal of wastes with a well-organized method is an important poultry waste management tool for raising healthy and profitable poultry farming activity. Generally, a poultry farm owner takes the litter and dumps it somewhere far away. It emits odorous gases, causing a nuisance for the surrounding

neighbourhood.

The NGT has directed Central Pollution Control Board (CPCB) to revisit the guidelines for classifying the poultry farms as green category. Poultry production is associated with a variety of environmental pollutants, including oxygen-demanding substance, ammonia, and solids, and it attracts flies, rodents, dogs, and other pests that create local nuisances and carries diseases.

An appropriate method to dispose of/management of waste is required for minimizing the risk and fetching a better advantage for the poultry industry. There are different techniques of management and disposal of poultry waste, to reuse the nutrition and avoid the risk. In this article, we will be discussing how to utilize poultry litter to produce natural energy/biogas and nutrient-rich manure.

Biogas is an environmentally friendly and one of the most efficient and effective options for renewable energy among various other alternative sources. Biogas is produced by the bio-methanation process, and the effluent from the process is rich in essential nutrients that can be utilized as a very good fertilizer. Bio-methanation is the degradation of organic materials by



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microorganisms in the absence of oxygen. It is a multi-step biological process in which organic carbon is converted mostly to carbon dioxide and methane.

The gas produced from the Biomethation of the poultry litter can be used in different aspects viz.,

Biogas used for cooking

As the price of conventional cooking gas (LPG), is constantly increasing and becoming unaffordable for the major population, The gas produced from the biogas plant can be used as an alternative and thus affordable, as the gas is produced by the digestion of poultry wastes, it is more economical and environment friendly.

Biogas to Electricity

The expenses on power used in a poultry farm are huge as they have to run boilers, and multiple numbers of fans for ventilation purposes, the major expenses on the electricity can be reduced by converting the biogas produced to electricity by installing a biogas Genset.

Biogas as CBG

If the biogas produced from the

poultry waste is considerably high, it can be further purified to CBG, which is equivalent to CNG and can be used in vehicles or filled in cylinders and sold to restaurants and other industries.

The black gold from the biogas plant

The slurry that is produced post the anaerobic digestion process, is considered black gold as it is very much rich in N, P, and K a very

good fertilizer that can be sold to the farmers.

The electricity or the CBG produced, and the sale of organic fertilizers are the most important sources of income that are expected from the biogas system.

The technology involved in biogas production is simple and can be implemented cheaply and efficiently by employing small-scale digesters that are easy to use and maintain. These biodigesters can offer benefits to all spheres of society but are more beneficial to poultry farms. They can use the gas produced for cooking, running biogas generators, and fertilizing crops with the residual waste or sell them.

Biogas plants significantly curb the greenhouse effect: the plants lower methane emissions by capturing this harmful gas and using it as fuel. Biogas generation helps cut reliance on the use of fossil fuels, such as oil and coal, the most important of its many advantages is that biogas can offer a decentralized energy solution.



For instance, a poultry farm with 50000 birds produces about 550 kWh of electricity each day, would help farm to save around Rs. 1925000/- annually. In addition, and extra annual income of Rs. 1120000/- would be generated by selling produced organic manure.

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Dr. Sharad Durge

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*Sapieence Agribusiness Consulting LLP,
Bengaluru*

Bacteriophages – The Future of Disease Prophylaxis Against Menacing Bacteria in Poultry Production

The over-use and misuse of antibiotics in animals' production and human medicine is raising the threat of antibiotic resistance. Various infections in poultry are caused by bacteria and many of them are of serious concern which has already developed resistance to many of the available drug treatments. The precious effectiveness of antibiotics and drugs can be preserved if we control their indiscriminate use. In many countries, about 80% of the important drugs/antibiotics are used as antibiotic growth promoters (AGP) feeding healthy animals in animal production. It has been found that restrictions on the use of antibiotics in food-producing animals reduced antibiotic-resistant bacteria by up to 39%. WHO strongly supports and recommends the complete ban on the use of antibiotics as a growth promoter and in the prevention of disease without proper diagnosis. Many countries have already taken the initiative to ban the use of AGP in food animals. The European Union has aggressively taken steps to ban the use of AGP in food animals and food produce since 2006. Consumers are also getting aware of their food and driving the demand for meat raised without AGP. Many food chains campaign and adopt "antibiotic-

free" policies for their animal produce supply. The natural and most effective alternatives are the only way to a sustainable solution.

Nature has developed its own produce and check system. Bacteriophages are the part of natural check system. Bacteriophages are amongst the most ubiquitous organisms on planet earth. It plays a significant role in maintaining microbial balance on the planet earth. Bacteriophages are small viruses with the ability to kill bacteria without affecting cell lines from other organisms. Because of the accurate specificity to target cells, the application of bacteriophages has been used in therapy to treat acute and chronic infections described in the disciplines of dermatology, ophthalmology, urology, stomatology, paediatrics, otolaryngology, and surgery (d'Herelle, 1931; Abedon et al., 2011; Chanishvili 2012). Scientists were passionate about phage therapy as a treatment for bacterial diseases in the pre-antibiotic era.

The roots of phage technology are lies in India. A British bacteriologist Ernest Hanbury Hankin observed that a biological principal present in the water of Ganga and Yamuna kills cholera-inducing bacteria in their

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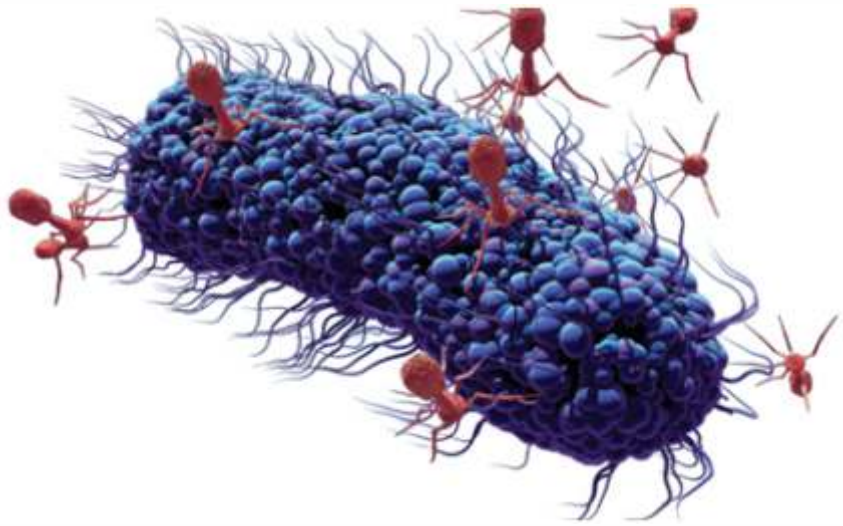
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bacterial culture. He also observed that this principal substance could pass through millipore filters (Hankin, 1896). During experiments with the vaccinia virus, Frederick Twort observed that the pure cultures of bacteria were associated with some kind of filter-passing transparent material (Twort, 1915). He found that this filterable material isolated from micrococci could not be sub-cultured but able to infect a fresh growth of micrococcus. He assumed that as that filterable transparent material was unable to grow in the absence of bacteria hence must be some part of the bacterial and called it a ferment secreted by the bacteria by Twort, at that time.

Bacteriophages are in abundance and mostly associated with the environment where there is bacterial cells exist. The population number in aquatic systems lies within the range of 10⁴ to 10⁸ virions per ml; whereas in the soil it is about 10⁹ virions per g (Weinbauer, 2004). The estimated total types of bacteriophages present on the planet are 10³² (Hanlon, 2007).

Bacteriophages are the obligatory parasites to bacteria. They use the bacterial cell as machinery to replicate. The life cycle of bacteriophages is divided into two types 1. lytic (virulent, productive), 2.



lysogenic (temperate, dormant). Some bacteriophages can perform both lytic and lysogenic cycles depending on environmental situations.

In the lytic cycle, a bacteriophage infects a live bacterial target cell, replicates therein, kills the bacterium by lysis and releases multiple or hundreds to thousands of phages. The phage protein (holin) enables the phage-encoded endolysin to gain access and hydrolyze the peptidoglycan layer and produce pores within the cytoplasmic membrane. This results in cell lysis and release of the progeny phages, which can infect other bacterial cells, thereby repeating the cycle. Most works have indicated that bacteriophages targeting Gram-positive bacteria

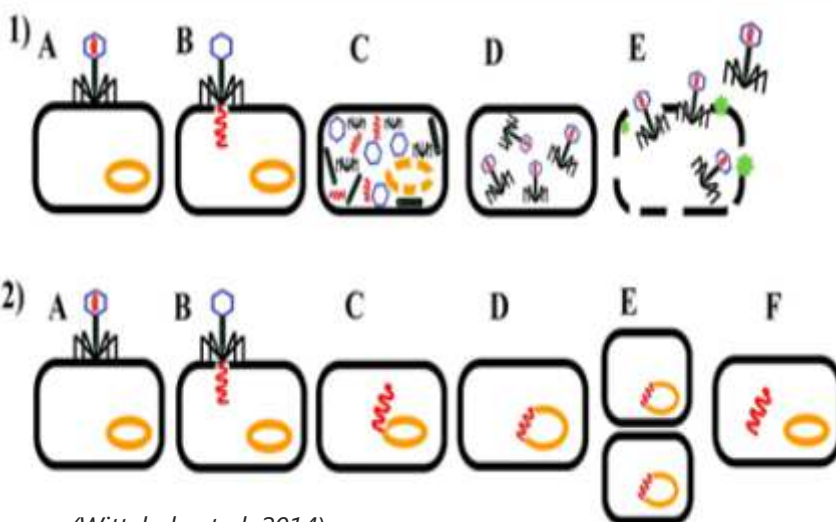
are not simultaneously effective against the Gram-negatives, it clearly indicates that they are species-specific.

In contrast, the lysogenic cycle does not lyse host cells. Instead, it leads to the integration of phage genetic material into the bacterial genome and then its transmission into new cells. The dormant phages are known as a prophages or endogenous phages. Under abnormal environmental conditions, the phage can become active and enter the lytic stage.

The life cycle of bacteriophage:

- 1) Lytic cycle. (A) Attachment (B) Penetration (C) DNA replication and protein synthesis (D) Assembly packaging (E) Lysis of host cell. Progeny phages can infect further bacterial cells and the cycle starts again.
- 2) Lysogenic cycle. (A) Attachment (B) Penetration (C) Integration of phage DNA (D) Prophage stage (E) The prophage is replicated along with the bacterial genome.

The bacterial cell divides and prophage DNA is transferred into daughter cells. (F) Sometimes the prophage can be induced to become active. The prophage DNA is excised from the bacterial genome and enters the lytic cycle.



Source: (Wittebole et al, 2014)

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Artificial Insemination In Poultry

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Abstract

Artificial insemination (AI) involves the deposition of semen into female reproductive tract manually. It starts from the collection of the semen from the male and its evaluation in terms of motility, viability and concentration followed by its deposition into female reproductive tract. Artificial insemination (AI) helps to increase poultry production by allowing for the more widespread use of genetically superior cockerels with high productive performance using. Artificial insemination (AI) is a valuable tool for improving the reproductive performance of birds, particularly broiler breeders and turkeys, where fertility is low due to excessive body weight. In 1899, Ivanov produced fertile chicken eggs using sperm recovered from the ductus deferens after killing a cock. Excellent fertility in poultry can be obtained by artificial insemination compared to natural mating. One male ejaculate can cover up to 20 female birds. Dose of semen is 100 – 200 million spermatozoa/insemination in 50 microliter volume. Sexual maturity in both male and female bird occurs at 18 weeks of age. The greatest impact of AI has been on genetic improvement and the control of venereal diseases. In order to meet demand, it is now crucial to increase the production of layers due to the sharp rise in chicken meat consumption. Currently, the AI technique is well developed in most poultry species; however, there is a need for a successful development programme of this technique in non-domesticated birds to aid in the creation of viable, self-sustaining populations of critically endangered species.

Advantages of artificial insemination in the poultry

The efficient use of males is one of the advantages of this technology over natural mating. AI is useful for controlling venereal diseases in addition to breeding. Older males with excellent performance can be used for several generations, whereas natural mating limits their useful life. Male birds with injured legs can still be used for artificial insemination. It is possible to eliminate poor fertility caused by preferential mating. Although cross breeding is very successful in natural conditions, there is some colour discrimination because some hens will not mate with a male of a different colour unless they have been reared together. In such cases, AI can aid in successful cross breeding.

Male reproductive system of poultry

Unlike most mammals, the rooster's testes function at a normal body temperature of around 41°C because the testes are located deep within the body cavity near the kidneys. Similar to the ovary in the hen, their size increases dramatically at around 18 weeks. The daily sperm production rate is approximately 100 million per gram of testicular weight, and it remains fairly constant regardless of mating or collection frequency. Males can produce sperm as early as 12 weeks of age, depending on body size and lighting programme. However, sperm from such roosters is rarely viable, and effective maturity does not occur until the birds are at least 18 weeks old.

Semen collection

In 1937 Burrows and Quinn described a non-invasive method, the abdominal massage method for collection of semen from roosters.





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The technique involves restraining the male and gently stroking the back of the bird from behind the wings towards the tail with firm rapid strokes. When the male responds with tumescence erection of the phallus, the handler gently squeezes the cloaca, extracting semen through the external papillae of the ductus deferens (vas deferens) and collecting the semen into a container. Semen is collected 4–6 times in a week. A thrice weekly frequency (alternating days) maintained the optimum output of spermatozoa, resulting in good fertility in chickens, whereas two collections per week were shown to yield better results in pekin breeder ducks.

Evaluation of semen quality

In poultry, the quality of semen is the prominent determinant of fertility and hatchability of eggs. Semen should be routinely examined for volume, color, concentration, motility, viability and morphology of spermatozoa.

1. Semen color

In general, the colour of the sperm indicates the density of the ejaculate. Domestic fowl sperm ranges from a dense opaque suspension to a watery fluid secreted by various reproductive glands. A good-quality semen sample is thick and pearly white in colour, and any other colour indicates contamination; for example, yellow and green-colored semen indicates faecal or urine contamination.

2. Ejaculate volume

The cockerel ejaculates between 0.1 and 1.5 ml, with 0.6 ml being the average ejaculate volume recorded. The average volume ejaculated with the abdominal massage technique is 0.25ml. It is critical to understand that the total number of sperm collected per ejaculation is determined by semen volume and sperm concentration (volume multiplied by concentration). This could help determine the number of insemination doses that can be prepared.

3. Semen pH

The pH of the sperm varies slightly between breeds and bird species. The optimum pH range for sperm is between 7.0 and 7.4.

4. Sperm motility

Sperm motility is an indicator of live sperm and of the quality of the semen sample. Evaluation of sperm motility is conducted with fresh and diluted semen and generally analyzed under the light microscope (100× magnification). Sperm motility is a primary determinant of fertility in domestic fowls.

5. Sperm concentration

Semen collected from domestic cockerel contains an average sperm concentration of 5000 ×10⁶ sperm/ml.

6. Sperm viability

The percentage of dead and abnormal spermatozoa in a sample should be less than 10%. The viability of sperm is determined using an eosin-nigrosin stain followed by microscopic examination.

7. Sperm morphology

Sperm cell has a head, a midsection, and a tail. The head contains the nucleus, which contains the genetic material that is the sire's genetic contribution to the offspring. The nucleus is protected by the post-nuclear cap, which covers the posterior part of the nucleus, and the acrosome, which covers the anterior part of the nucleus.

Semen diluent and preservation of poultry semen

Semen can be diluted to cover approx 5–20 hens. Most diluents include sodium glutamate, glucose, fructose, and specialized buffers to keep the pH around 7.0 and the osmolarity around 400 milliosmole. Glutamate is especially important if the semen will be stored for more than 4–6 hours. Semen should be stored at low temperatures ranging from 4–10°C for long periods of time. In terms of fertility, poultry sperm responds very

poorly to cryopreservation. There are various types of semen diluters that are commercially available. The semen may be diluted with a solution known as modified ringer's solution.

Artificial insemination of hens

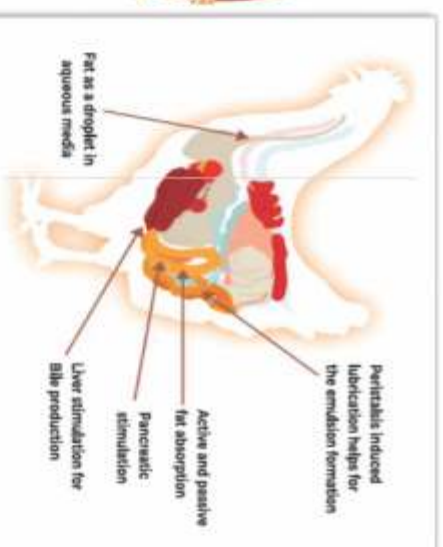
In poultry, there are two methods of semen deposition. These are the intra peritoneal insemination and vaginal insemination methods. The most reliable and successful method of inseminating poultry is to deposit the sperm directly in the mid vaginal area. The female bird is restrained first, and then pressure is applied to the left side of the abdomen around the vent. The cloaca everts and the oviduct protrudes, allowing a syringe or plastic straw to be inserted 1 inch (2.5 cm) into the oviduct and the appropriate amount of semen to be delivered. As the inseminator expels the semen, pressure around the vent is released, assisting the hen in retaining spermatozoa in the vagina or oviduct.

Timing and frequency of artificial insemination

The presence of hard-shelled eggs in the uterus of hens is uncommon in the evening. As a result, inseminations performed in the afternoon or evening are more fertile than those performed in the morning. Inseminations should be performed on two consecutive days during the first week, and then once a week thereafter as long as fertile eggs are required. Eggs are fertile after the second day of insemination and can remain fertile for two weeks or more, according to observations. If another male is to be used on the same hen in a breeding programme, it is recommended that a three-week period elapse before the second male is used.

More study is needed to determine the effects of disease, age, diet, photoperiod, and other managemental parameters on reproductive performance in domesticated birds.

LIPROVET



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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@prasad.kulkarni@biosint.co.in

LIPROVET

Accomplishing fat utilization beyond emulsification



Changing Consumption Patterns call for Increasing Processing Capacity



Ricky Thaper

Treasurer, Poultry Federation of India

“ With Domestic Demand for Frozen and Chilled Poultry Products going up, Coupled with New Export Opportunities, Indian Poultry Industry needs to step up with adequate Processing capacity meeting International Norms ”

India's poultry industry is today one of the fastest growing poultry producers in the world with production having grown four-fold over the last two decades. The shift has been gradually to large-scale commercialization, overcoming several challenges on the way. According to the National Action Plan for egg and poultry – 2022 prepared by Department of Animal Husbandry, Dairying and Fisheries, more than 80% of poultry output, particularly in the broiler segment, is today produced by organized commercial farms. Major poultry companies have vertically integrated operations which comprise 60-70% of the total poultry meat production. Thus, India has emerged as the world's third largest egg producer and sixth largest producer of broiler meat.

The poultry sector is growing at a compounded annual growth rate (CAGR) of 10.5% and playing a critical role in promoting livelihood options in rural India. Instead of rearing country birds, farmers are now increasingly rearing hybrids which yield better operating parameters and sustainable profits. Rising urban population, changing eating habits and growing penetration of quick service restaurants have all played a big role in sustaining growing demand for poultry meat. According to Basic Animal Husbandry Statistics, 2020, India's poultry meat production was

4.34 million tons, contributing more than 50% of the total meat production in 2019-20. The egg production stood at 114.38 billion in 2019-20. The global poultry market is expected to grow at a compounded annual growth rate (CAGR) of 10.1% to touch \$350.87 billion in 2022 from \$318.58 billion in 2021. By 2026, it is expected to touch \$493.21 billion, growing at a CAGR of 8.9%.

Poultry consumption is expected to grow maximum in the coming years. However we need to acknowledge that poultry processing and value addition is still at a very nascent stage in India. The share of processed chicken meat industry is only around 10% of the overall industry. This is due to the consumer preference for the live bird. This dominance of wet or live bird market limits geographical movement of output given the perishable nature of the product and limited cold storage and transportation infrastructure. The impact of our limited processing capacity is also reflected in our poultry meat exports.

As per Agricultural and Processed Food Products Development Authority (APEDA) data, in 2020-21, India exported 2,55,686 tons of poultry products valued at Rs 435 crore (\$ 58.7 million). Traditional export destinations have been Oman, Maldives, Indonesia and Vietnam. Though both the quantity



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egg production and healthy gut function

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Prevents loose droppings, pasty vent, diarrhoea and enteritis

ECONOMIC BENEFIT

Lowers mortality, improve slaughter traits and egg quality, reduces breast and claw lesions

BUILDS GUT MICROBIAL ECOSYSTEM

Inhibits pathogens colonization and promotes microbiocenosis

ENVIRONMENT PROTECTANT

Better consistency of faeces, reduced NH₃ conc. in animal houses, better animal welfare and litter quality



Feed inclusion rate

500 g per ton of feed or
as advised by the poultry
consultant

Presentation

25 kg



Watery and sticky droppings in layers have been a problem in the egg industry for years. High proportion of non starch polysaccharides (NSP) increase gut viscosity leading to pasty vent / loose droppings. High fibre in diet, change in feed, irritant effect of organic acids, chemical toxin binders, feed contaminants, dietary factors, stress due to summer or high production are also responsible for non-specific diarrhoea & dysbacteriosis and further complicating into enterotoxigenic / enteroinvasive enteritis.



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and value of the exported processed poultry products have increased during the last few years and efforts have been made to increase poultry exports from India, the trade is very small in comparison to the global trade. The global poultry market is expected to grow to \$493.21 billion in 2026 at a CAGR of 8.9%. Exports are not equitable across the globe and are concentrated in certain clusters

like Middle-East and South-East Asia..

Recently rise in demand for chicken from Singapore following the ban on exports by Malaysia could not be utilized for promotion of exports from India. Given that Singapore imports 34% was met by Malaysia alone, this can be a godsend opportunity to make further inroads into the Singapore market. Frozen chicken from the South American nation accounts for 48% of the total imports by Singapore. The US supplies 8%, while a few smaller exporting nations make up the rest 10%.

While there is a good scope of export of dressed chicken to Singapore from India and a few companies from South India which have poultry processing plants, are already in the process of exports to the island nation, we need to step up our export capacity. Value-wise, our current chicken exports are much lower compared with exports from Brazil and the US.

To do this, Indian exports need to be competitive in terms of costs as well as quality. Export viability depends on competitive cost of production and proximity to international markets. Indian chicken exports have faced difficulty in the international market because there is no low pathogenic avian influenza (LPA) vaccination. Only in December last year, the United Arab Emirates lifted a ban on importing eggs and other

poultry products from India after the Indian government gave an assurance that Indian poultry meat exports would adhere to bio-safety norms prescribed by the World Organization for Animal Health to prevent infection from bird flu.

We need to create infrastructure for slaughter house for boosting out exports. We need to have adequate processing facilities which meet international standards. The cost of the production for poultry bird is expensive compared to other countries such as Indonesia, Philippines and China. The high input costs are a major reason for this. Cost of production of our feed is higher compared to other countries such as the US, China or Brazil. Feed price constitutes around 70% of the total production cost. This apart, the seasonal nature of consumption leads to volatile demand supply trends across regions, making all calculations go awry.

Developing efficient distribution with large investments in cold chain infrastructure and proper high-capacity processing plants of international standards is the need of the hour. Integrated production, market transition from live birds to chilled and frozen products and policies that ensure supplies of competitively priced corn and soybean are keys to future poultry industry growth in India. Within the processed poultry segment, the share of frozen products is minimal compared to chilled products. Integrated poultry processing plants have hatcheries, feed mills, and primary processing facilities. This integration model ensures that farms with 5000 – 10,000 broilers capacity are insulated against fluctuations in market prices as they are assured of getting predetermined fixed prices as per the contracts.

There are a number of small poultry dressing plants in the country. These

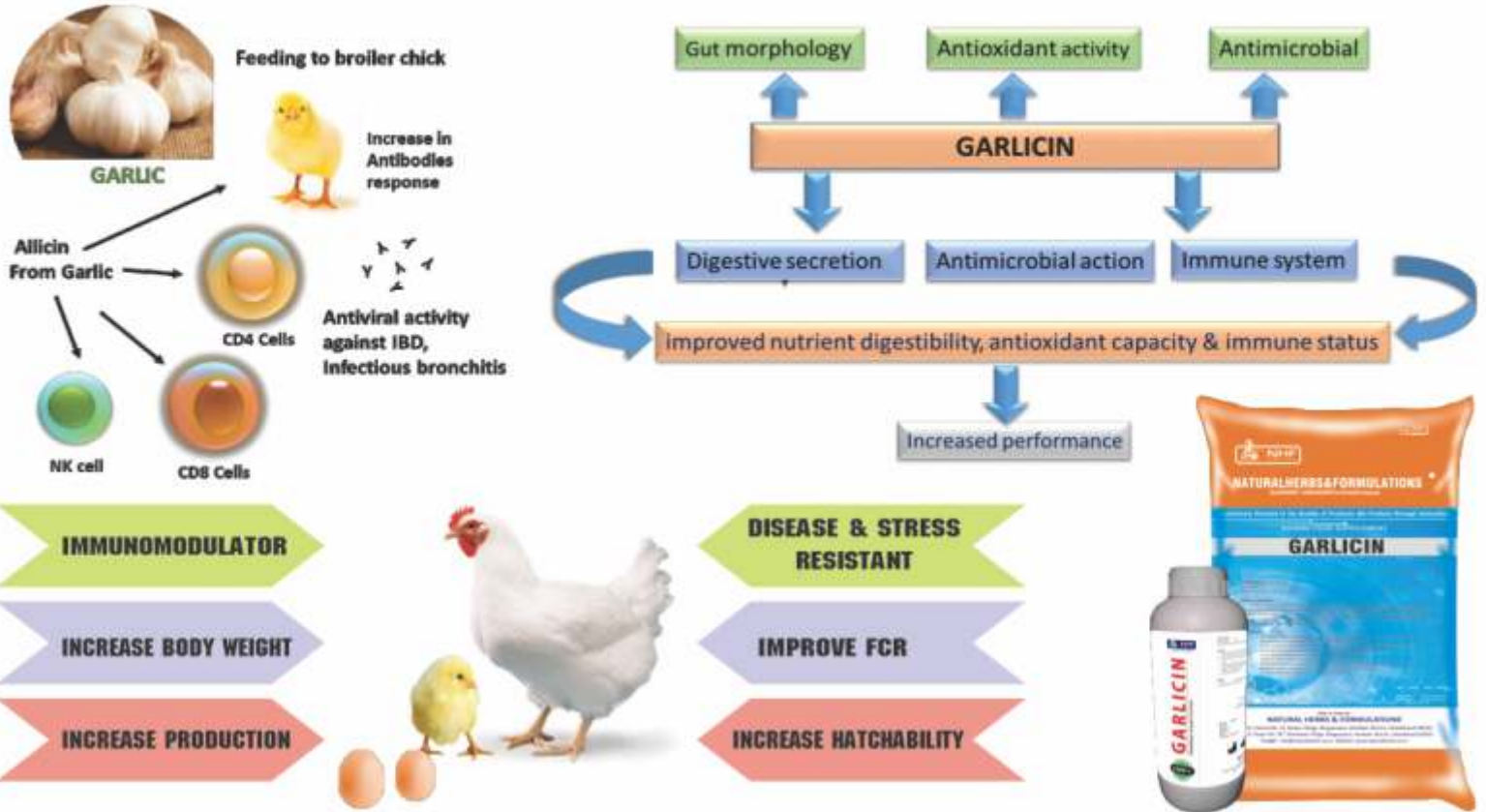
plants are producing dressed chickens. In addition to these plants, there are a handful of modern integrated poultry processing plants producing dressed chicken, chicken cut parts and other chicken products. Therefore, industry-wide, a shift towards integrated processing plants would be advantageous. Farming technologies such as climate-controlled farm houses and automated feeding lines can help improve farm productivity. Feeding, water supply, temperature and humidity control are some of the variables that require automation in poultry farming. Automatic feeding systems could reduce labour cost and improve farming level and Feed Conversion Ratio (FCR) efficiency, thus reducing overall production costs. The environmentally controlled (EC) sheds ensure bigger harvests, better feed conversion and economy both on capital and revenue investments.

The government had announced Special Livestock sector package. The poultry meat as well as egg sectors must take advantage of this financial assistance to boost infrastructure. A capital subsidy should be there on setting up EC sheds with improvement in infrastructure in the wet market that would boost demand as well as consumption.

The domestic demand for poultry and processed poultry products has shot up since the middle of 2020. There has been a huge increase in e-commerce with expansion of home delivery as a response to the Covid-19 lockdowns and change in consumer buying behavior. The Russia-Ukraine war and supply chain turmoil since the pandemic have upset many old trade links and thrown up new export opportunities. Hence, there is an urgent need for setting up of modern poultry processing plants to cater to both domestic as well as export markets.

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Coccidiosis: One of the Major Economically Important Diseases of Poultry & Its Control with

CocciCare
POULTRY FEED ADDITIVE



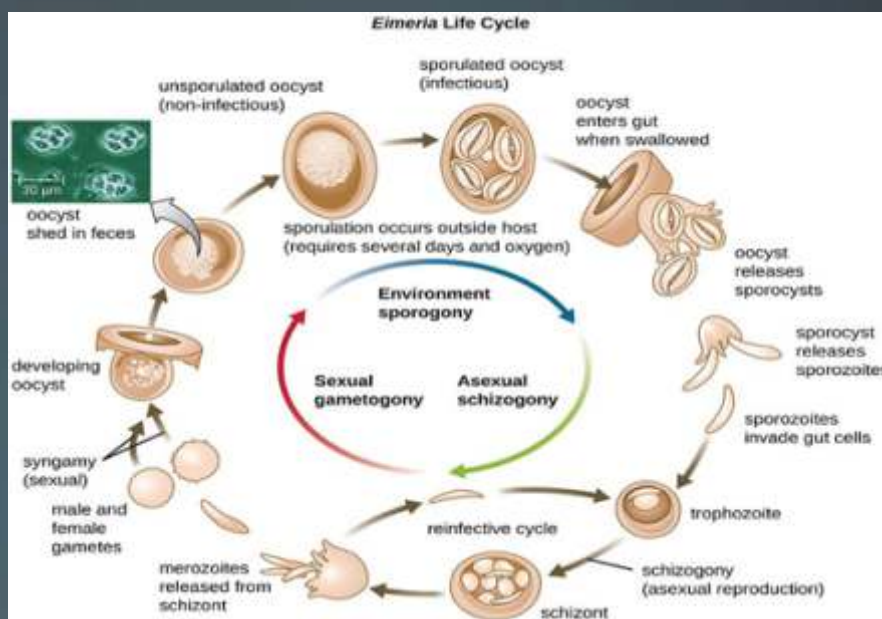
Dr. Mahesh Rajurkar, Dr. Ramdas Kambale

Rainy season is favourable for Coccidiosis. Coccidiosis is usually an acute invasion and destruction of intestinal mucosa by protozoa of the genera *Eimeria*. Clinical signs include diarrhoea, rise in temperature, inappetence, weight loss, emaciation, and in extreme cases, death. However, many infections are subclinical. Coccidiosis is an economically important disease of poultry.

Coccidiosis is a parasitic disease of the

intestinal tract of animals caused by coccidian protozoa. The disease spreads from one animal to another by contact with infected faeces or ingestion of infected tissue. Diarrhoea, which may become bloody in severe cases, is the primary symptom.

Prevention and control of disease require a careful evaluation of the entire farm and establishment of a series of biosecurity measures that allow assessing the possible challenges and



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Caring About Life, That Is Our Core Business.

GLOCREST is a global animal health venture of Krishna Group -prestigious poultry and agricultural conglomerate. Being an industry pioneer, GLOCREST & its peers, has more than half a century of combined expertise in the development and manufacturing of nutrition products. Our customers include everyone from small and large farmers, to integrations and dealers. We aim to provide them with nutritional solutions that ensure maximum animal health and performance.



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their impact on the production system. Once established, all factors determining disease can be better recognized and corrected. In general, the recommended approach is to perform a risk assessment and establish the Hazard analysis and critical control point (HACCP) principles on the poultry farm, determining the points where potential hazards could occur and biosecurity measures have to be implemented. Biosecurity involves measures at the level of environmental control and management, including elaboration of vaccination and medication programs and also application of effective cleansers, sanitizer, and disinfectants. These biosecurity measures are essential to control the diseases and reduce their economic and public health significance.

Coccidiosis is a parasitic disease of the intestinal tract of animals caused by coccidian protozoa

Prevention and Control: -

Everybody is aware that coccidiosis is self-controlling disease. However, every farmer suffers some or major economic losses due to coccidiosis. As we know Prevention is better than treatment.

Now a days Monensin – 8 % + Nicarbazin + 8% is regular control measure used by most of the farmers. However, if those novel solution fortified with Vit K3 and Curcumin extract as feed additive could have tremendous impact on control of coccidiosis.

After thorough research by GLOCREST team – the novel combo of Monensin : 8 % + Nicarbazin: 8%, Vit K3 and Curcumin has been developed a satisfying solution to address this burning issue and launched a product called **CocciCare**

InCocciare, Vit K3 is added. It prevents internal bleeding in intestine which occurs due to coccidiosis. Monensin along with Nicarbazin acts synergistically.

Explanation for the mechanism of action **CocciCare** is that the product is able to interrupt host cell invasion by sporozoites. The outer membrane of the sporozoite contains lipid rafts and a protein, flotillin-1, was identified in sporozoites of E. tenella at the apex of the cell, a region that mediates cell invasion. Monensin was found to disrupt the localization of flotillin-1 within raft structures, resulting in the loss of ability to invade host cells.

Ionophores have generally been

found to be safe in target animals receiving an approved dosage.

CocciCare @Importance of Curcumin extract - One of the natural compounds is curcumin, the extract from herbal plant Curcuma longa, known for its antioxidant and antimicrobial properties which may be effective in reducing coccidia infection in poultry. The effects of different doses of curcumin compound on growth performance, antioxidant status, and gut health of broiler chickens challenged with Eimeria species. "Curcumin addition in diet of laying hens under cold stress has antioxidant and antimicrobial effects and improves bird health and egg quality".

We recommend to use 'Cocciare' for prevention of Coccidiosis in your flocks and have peace of mind to reduce your economical losses due to coccidiosis.

For Details Please Contact : **info@glocrestpharma.com**

Website :- **www.glocrestpharma.com**

Customer Care No – 022-46007565.

Some Information source: Internet

Morrisons Introduces 'Carbon-Neutral' Eggs from Hens Fed Insects Instead of Soya.



Morrisons has introduced a line of "environmentally friendly" eggs produced by hens fed insects raised on food waste.

The supermarket claims to be the first to introduce a line of carbon-neutral eggs, the first product in the retailer's drive to be directly supplied by zero-emission British farms by 2030.

The hens that lay the eggs are fed a soy-free diet that includes

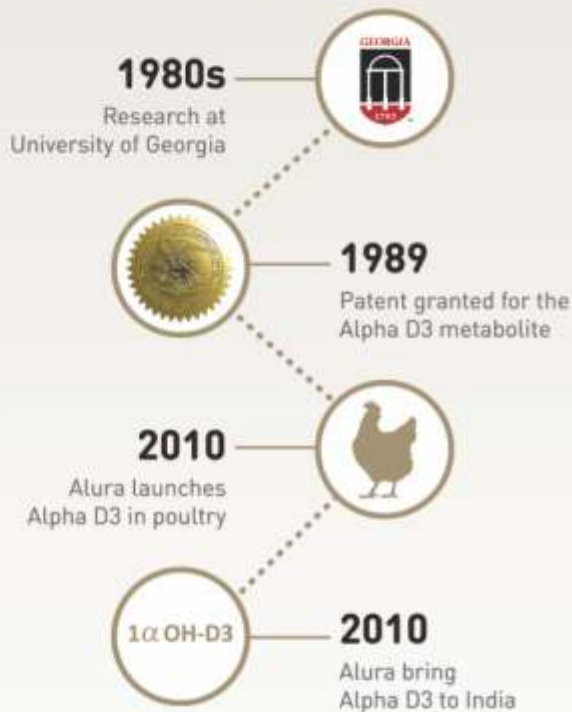
insects fed on food waste from Morrisons' bakery, fruit and vegetable sites, using an insect "mini farm" container installed on site by British start-up Better Origin.

According to the supermarket, insects are a natural part of chickens' ancestral diet and have no negative impact on egg quality, shelf life, or taste. By eliminating soya, we avoid the emissions associated with clearing forests and other land to grow the crop in places like Brazil, as well as the transportation pollution associated with shipping the feed.

According to a Cambridge University report, the production of the eggs, including the insect growing unit, food waste transportation, sourcing of locally grown grain, and hen housing and care, is carbon neutral.

Morrisons claims the product is the first to bear the British Lion Egg green stamp, indicating to customers that it has a lower environmental impact.

THE ORIGINAL ALPHA D3



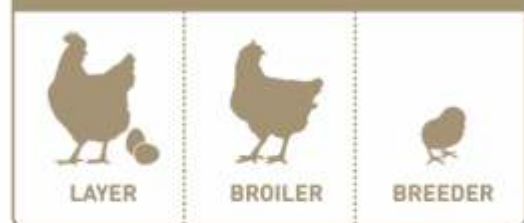
Revolutionising poultry performance since 1989

Ever since 1989, the miracle metabolite Alpha D3 has been a catalyst in helping the poultry industry attain sustainable higher production performance rates with increased profitability. Alura is the only company to have brought the original and patented vitamin Alpha D3 to market.

WHAT MAKES ALURA ALPHA D3 UNIQUE?

- Increased bioactivity in comparison to regular Vitamin D3 and other metabolites
- Improve body weight gain and FCR
- Prevents black bone syndrome
- Improves egg shell quality and maximises production of saleable eggs
- Synergetic and Complementary effects with Phytase
- Proven ROI in Broilers & Layers
- Thermostable for palletisation
- Extensively studied product dosage rates for optimum performance.

USAGE



EXTENSIVELY TESTED & VALIDATED

We are the only company to have extensively tested the efficacy of this metabolite through academic papers, clinical trials, and field tests. More than 40 published reviews in scientific journals proves Vitamin Alpha D3 produces more chicken protein, with a better quality at a lower cost.



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Significance of HLB and CMC values in Poultry Feed Emulsifiers

Dr. Srijit Tripathi, Global Technical Manager, Vetline

Introduction:

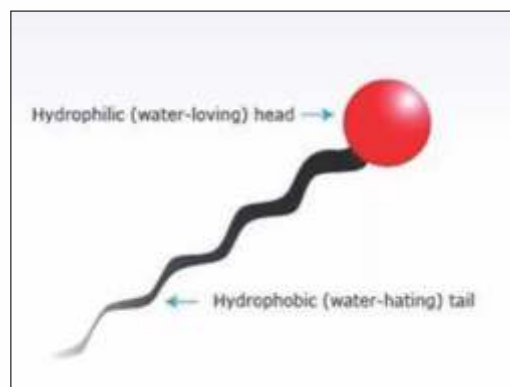
Fat/Oil makes the most essential and dense source of energy in Broiler birds that may lead to higher growth in comparatively less time. Poor emulsification and lack of lipase during the young age further decreases the metabolic activity thereby creating a need of external emulsifiers in the Poultry feed that improves the utilisation of Fat/Oil.

Emulsion:

An emulsion is a mixture of two products, for example, oil and water, that do not mix together i.e. immiscible. Adding an emulsifying agent (emulsifier) to the mixture causes the oil to be broken down into smaller particles that can then be dispersed throughout the water.

Emulsifier:

An emulsifier is a combination of hydrophilic head and hydrophobic tail that acts as a surface-active agent to reduce surface tension. The hydrophilic head makes the emulsifier soluble in aqueous medium of intestine and makes its access to the greater number of fat molecules, thereby facilitating their digestion and absorption. The emulsifiers help in improving the utilisation of oil/fat, and play an important role in performing the insufficiencies of low bile production and its recirculation in young birds. The process of Emulsification or the emulsifier action depends upon the Hydrophilic Lipophilic Balance (HLB) of the emulsifier.



Lecithin, Lysolecithin and PEGR:

Lecithin is a widely used phospholipid extracted naturally from eggs or soybean and used in various commercially used nutritional emulsifiers in poultry feed. Soy lecithin is preferred as it is cheaper in cost and is produced as a by-product of edible oil processing from water degumming step. Lecithin is not a single phospholipid but mixture of various Phospholipids and has very low HLB values. Partial hydrolysis converts lecithin as lysolecithin which is more hydrophilic having higher HLB value (up to 13). Poly Ethylene Glycol Ricinoleate (PEGR) is one of the most hydrophilic surfactant/emulsifiers. PEGR is a non-ionic nutritional emulsifier which remains stable at broader pH range and even at high temperatures thereby making it suitable for pelleted feeds. PEGR, having higher HLB values (upto 18), makes it an ideal emulsifier.



NATURAL PROTECTION

The gut and its resident bacterial flora play an important role in the development of the immune system and resistance to disease

Under natural brooding conditions chicks obtain their gut flora from their mother & the environment

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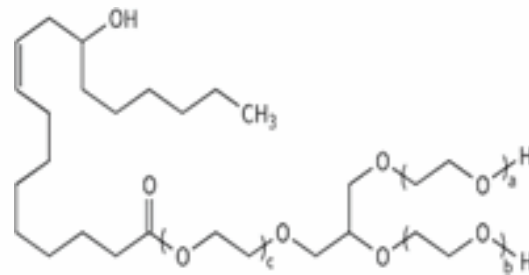


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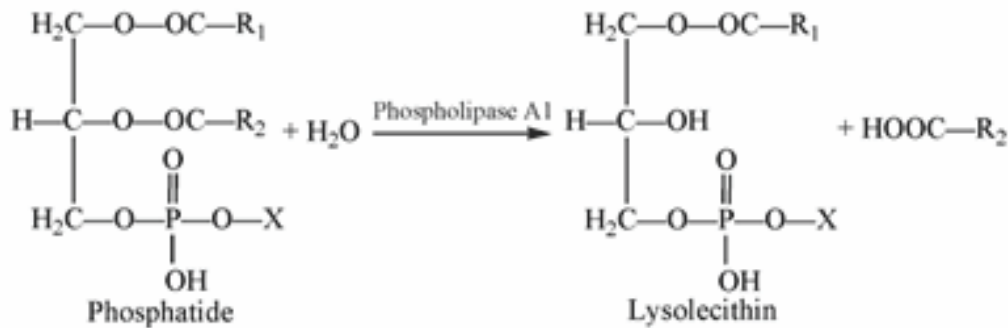
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In technical collaboration with

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Polyethylene Glycol Ricinoleate



HLB: Hydrophilic Lipophilic Balance

The concept of HLB was proposed by Griffin in 1949 and is the best-known way to select a surfactant suitable for an application.

Definition: HLB (Hydrophilic-Lipophilic Balance) is an empirical expression for the relationship of the hydrophilic and hydrophobic groups of a surfactant.

The HLB value is used as a measure of the ratio of hydrophilic and lipophilic groups.

HLB values are calculated for non-ionic surfactants, and these surfactants have numbers ranging from 0-20.

Non-ionic surfactants don't get dissociated when dissolved in aqueous medium and have a wide range of properties depending upon the hydrophilic-lipophilic balance (HLB) ratio.

The two basic emulsion types:

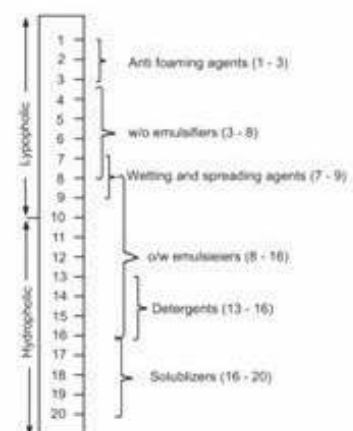
1. Water-in-oil: Water is dispersed in oil
2. Oil-in-water: Oil is dispersed in aqueous phase, most common emulsion type.

The HLB value can be used to predict the surfactant properties of a molecule:

- 1 to 3: Anti-foaming agent
- 3 to 6: W/O (water in oil) emulsifier
- 7 to 9: Wetting and spreading agent
- 13 to 16: Detergent
- 8 to 16: O/W (oil in water) emulsifier
- 16 to 20: Solubilizer

Water-in-oil emulsions require low HLB surfactants.

Oil-in-water emulsions often require higher HLB surfactants.



CMC: Critical Micelle Concentration

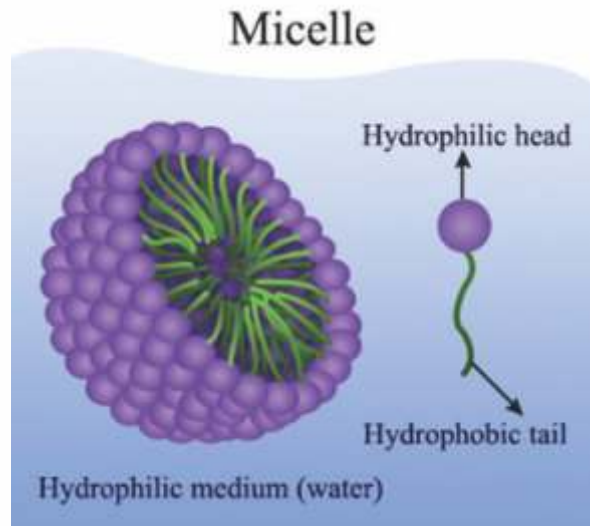
Critical Micelle Concentration is the minimum concentration of fatty acids required to form a micelle, also called as CMC.

Critical micelle concentration (CMC) is a degree to measure the efficiency of a surfactant. A low CMC indicates less quantity of surfactant is required to saturate the interfaces and create micelles.

Lipid metabolism and Micelles: Stages of Lipid Metabolism in body-

- Emulsification: (Detergent action of bile salts)
- Enzymatic breakdown: (Hydrolyzed by lipase into fatty acids and mono and di-glycerides)
- Formation of micelles: (enters into cell and re-synthesize triglycerides)

A micelle is an aggregated unit made up of a number of molecules of a surface-active material. Micelle formation is required for absorption of lipid contents in intestine. Monoacylglycerols, free fatty acids, phospholipids etc are absorbed passively and to some extent actively in enterocytes of Small Intestine (duodenum and jejunum)



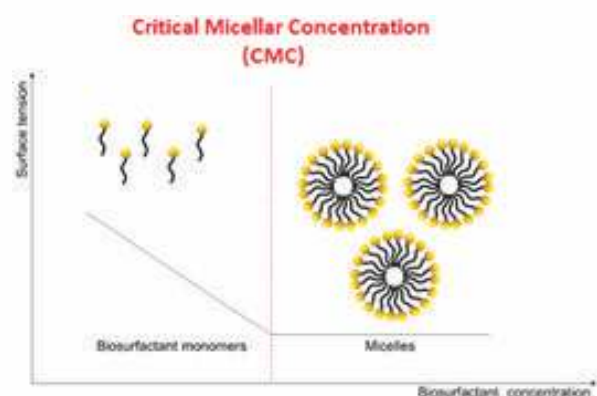
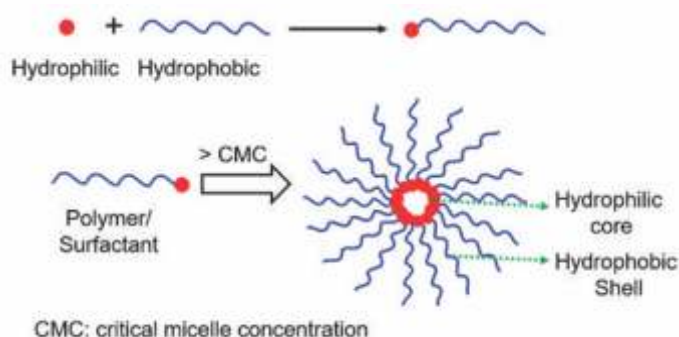
How CMC is responsible for better Emulsification?

When an emulsifier is added, the surface tension begins to decrease since more and more emulsifier molecules will be on the surface. As the surface becomes saturated, the addition of the emulsifier molecules will lead to micelle formation. This concentration point is called critical micelle concentration.

- At very low surfactant concentration only slight change in surface tension is detected.
- Addition of surfactant reduces the surface tension drastically.
- At CMC, surface becomes saturated and the further addition of surfactant/ emulsifier do not further reduce the surface tension.

CMC values provide a valuable guideline for comparing surfactant emulsification tendency.

SURFACTANT	CMC(mM)
Lyso phosphosphatidylcholine	0.02-0.2
PEGylated lipopolymers	0.008- 0.025



Supplementation of exogenous nutritional emulsifiers has proved to be extremely helpful in metabolism of oil/fat. The efficacy of emulsifiers depends upon a number of factors e. g. the type of oil used in the formulations, HLB values, CMC etc. The key role of nutritional emulsifiers is to enhance the digestibility of long chain fatty acids, particularly saturated fatty acids. Emulsifiers play a crucial role in taking care of the economic aspects in poultry feed industry as emulsifiers increase the efficiency of Fat metabolism. Metabolizable Energy (ME) of the diet is an important head and emulsifiers usage have shown better results on production performance and fat/oil digestibility. The selection of an emulsifier depends on various factors two of them being HLB and CMC. The HLB value should be used as part of the selection process, as it indicates fat and water solubility on a range from zero to 20. Lower HLB surfactants are highly fat soluble, while higher HLB value surfactants are highly water soluble. When feeding poultry, a higher number would be desirable because the environment of the gut is mostly aqueous. Lower CMC values indicate that a very low quantity of emulsifiers will lead to micelle formation thereby improving better fat metabolism in the bird's body.

An ideal oil-in-water emulsifier will possess high HLB value, low CMC value thereby leading to best emulsification and as a result better health and improved economic return (RoI) can be realised by the farmers/feed millers.

For more information, contact : srijit.tripathi@vetline.in

Cargill's India unit opens a new office in Gurugram, Haryana.

Cargill, a US food company, has opened a new headquarters for its India unit in Gurugram, Haryana, as well as a new Cargill Business Services (CBS) office in Bengaluru. According to a company statement, the event marked the 35th year of the company's operations in India.

Patricia A Lacina, Chargé d'Affaires at the US Embassy in New Delhi, along with Ross Hamou-Jennings, Cargill's APAC Chair, and Simon George, Cargill India President, officially opened the new headquarters. It became operational on August 2nd (Tuesday).

"Gurugram and Bengaluru are talent hubs in India," said Simon George, "and we have the most employees in these locations." As a result, they are the location of these newly opened workspaces. This is a significant milestone to commemorate Cargill's 35th anniversary in India and the 75th anniversary of the Indo-US partnership."

Cargill began operations in India in 1987 with a small liaison office and now has a pan-India presence in refined



oils, food ingredients, industrial specialties, grain and oilseeds, cotton, animal nutrition, and trade and capital markets.

The Gurugram office has 300 seats and is 35,000 square feet, so there is plenty of open space. According to the statement, it is also heavily invested in technology solutions to promote agility and meet customer needs.

CBS has grown to become Cargill's largest global capability centre, and it has played a critical role in unlocking Cargill's potential. The new facility, located on Bengaluru's Outer Ring Road, is two lakh square feet in size.

Managing gut health, a multi-factorial approach

Ben Dehaeck, DVM Global Product Manager Anticoccidials
And Wouter van Der Veken, Global Product Manager Probiotics, Huvepharma

With the understanding of gut health growing every day, managing it properly has become more and more of a priority. One key point has been clear since the beginning: gut health is a complex multi-factorial concept, and as such improving and maintaining it requires a holistic approach. Luckily the tools to do so have evolved as well, and new methods emerge frequently.

Two major gut health issues are coccidiosis and necrotic enteritis (NE). Although caused by different pathogens, there definitely is an interaction between the two challenges: the presence of coccidiosis is often an important predisposing factor for the development of NE. Because of this link, it is very likely that the current rise of NE problems in the field is linked to suboptimal coccidiosis control. The practical implication is that both challenges should be dealt with at the same time. However, monitoring the actual coccidiosis pressure is difficult and a challenge in itself. It is therefore crucial to have a good and validated coccidiosis control programme in place, including the use of anticoccidials and product rotation in order to maintain their efficacy.

The mentioned coccidiosis program above ties in with having a good NE control program, of which supporting gut integrity and its microbiota is a crucial part. With this goal in mind, probiotics form an interesting tool to achieve this, especially as the pressure on the use of classic antimicrobials is increasing. Depending on the strain selected, these viable beneficial bacteria are able to influence the gut and its microbiota in multiple ways.

An example of this is minimising the risk of pathogens, such as *Clostridium perfringens*. A well-known probiotic to do so is B-Act[®], which has proven its efficacy under many different conditions. The probiotic recently obtained an extension to its current European approval for use in broilers and pre-laying birds, by adding turkeys and minor avian species to the list of



registered species. The specific *Bacillus licheniformis* strain in B-Act[®] has a unique mode of action, based on the concept of competitive exclusion. This goes a lot wider than just competition for space and nutrients – even though *Bacillus spp.* are often only given credit for this. For example, its capacity to produce antimicrobial compounds should not be neglected. This unique mode of action allows the probiotic to mitigate *Clostridium perfringens* challenges efficiently, which would have otherwise led to severe NE and dysbacteriosis. Keeping this and the possibility to combine the probiotic with chemical anticoccidials as Coyden[®] (Clopidol), Coxiril[®] (Diclazuril) in mind gives B-Act[®] a competitive advantage, especially in those situations where producers might worry about not applying ionophores.

Approaching gut health and its management as a multi-factorial challenge and dealing with it in a similar fashion is the way forward. This includes using multiple products to work on the same challenge from different perspectives, ensuring various aspects of general gut health effectively.

The well-known probiotic B-Act[®] recently obtained an extension to its current European approval for use in broilers and pre-laying birds, by adding turkeys and minor avian species to the list of registered species.

Breeder Management: Importance of Uniformity and Grading



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Reaching the Peak Egg Production on time, sustaining Peak for 9 Weeks, Post Peak Egg production and to get highest Hatchability during Peak & maintaining optimum hatchability post peak are the critical task for any breeder farmer to optimize the operations & associated profitability. Among all the factors that can influence the breeder performance including hatchability, the most significant one is flock uniformity other than Nutrition, Health Management, Biosecurity & husbandry practice.

Grading is the process of shorting of all individual birds in a flock (both Male & Female separately) in to 3 sub-populations based on body weights (physiological state) so that each group can be managed back to the standard to have perfect uniformity in the whole flock at the point of Lay (POL). A uniform flock is easier to manage than a variable one; birds in similar physiological state will respond more similarly to managerial factors.

Background of Grading

There is always a natural variation in a flock, even at day old. At placement, the chick body weight in a flock should have minimum variation. As chicks grow, the variation in the flock increases further due to difference of response of individual birds to factors like vaccination, disease, differing competitiveness of feed, etc. The

increased variation reduces overall flock performance and makes the flock management much more difficult.

General Principles of Grading

Perform a 100% weighing & grading when the flock is 7 to 14 days old. This allows the chicks to be grouped by weight & feed intake, which controls competitions for feed from very early age. The subsequent 100% flock grading shall take place at 4, 8 & 12 weeks of age or when uniformity is below 65%. Bird's sub-population may be classified as Heavy, Medium & Lightweight compared to the average weight.

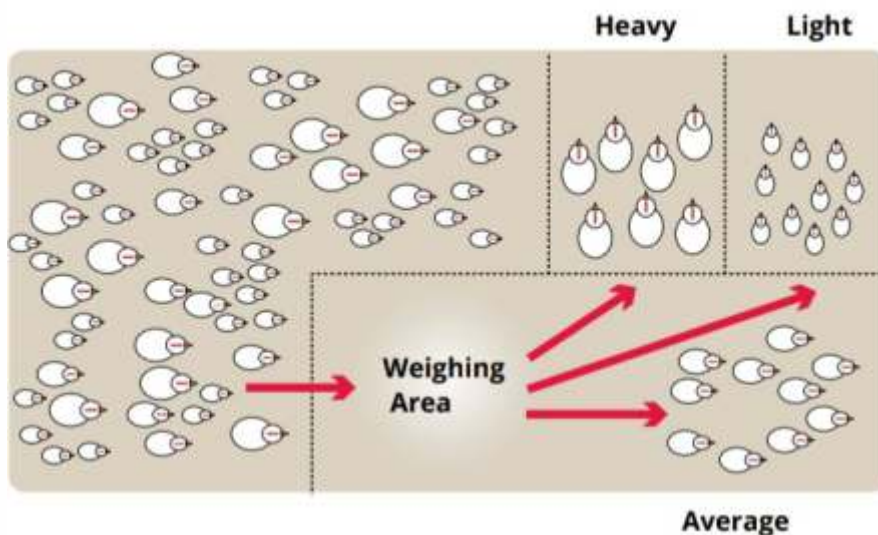
Successful grading at progressive age helps maintaining 80% plus uniformity which is dream to any breeder farm. Countries with inefficient labour cost for multiple grading process, one compulsory Grading between 21 – 28 days age help correcting uniformity issues. Males follow the same grading concepts as female, and should have 5% more uniformity than females. Please note, males represent 10% of the flock but are responsible for 50% of the offspring

Grading is based on the variation in the body weight within a flock at the specific time. A highly variable flock with a large spread of body weights around the Average will need to be divided in more sub-populations. The average minimum



1: Grading & Splitting Flock till 22nd Week





Picture 2: Grading Technique

uniformity in rearing phase shall be 70% (+/- 10% variation of the Mean), which need to be maintained constantly and shall be nearly 80% at POL. Uniformity below 70% at any stage indicates feed intake issue and need to be addressed being present at feeding time.

Grading Procedure

Depending on the uniformity 3 to 4 sub-populations may be made; Heavy, Medium, Light & Super light (if necessary). Some breeder houses have fixed pen or partitions and some houses has adjustable partitions; in both cases at least one pen shall be left empty during chick placement for Grading operation. It is better to have adjustable Partition and divide the whole house in 4 parts for Female & 4 parts for Male; with 2 parts each for medium size group (usually over 65% of total population), One part each for Heavy & Light Weight group for both Male & Female. Arrange Brooding in one part each for Male & female separately. Start grading on 8th day itself and shift them in different pen, keeping the lighter group at the entry side. With advancing age & body weight, arrange 100% grading at the end of 4, 8 & 12 weeks and give floor space accordingly in the respective pen. In case of fixed pen, calculate the floor space, no of feeder & drinker as per maximum no of birds to place after grading. Similarly, in case of adjustable pen adjust the size as per no of birds to be housed along with sufficient no of feeder & drinkers. If stocking density in a pen is not adjusted with floor space, feeder & drinker space, then grading will cause more problem.

Variation in a flock can be measured by 2 different ways:

- 1. Coefficient of Variation (CV%)** – this measured the variations of body weight within the flock, the flock with lower CV's is a less variable flock.
- 2. Uniformity%** - this measures the evenness of body weights within a flock, the higher the uniformity the less variable the flock is.

Prior to grading a sample (3 – 5%) of birds from the flock should be weighted and the variation within the flock (as measured by CV% or Uniformity%) measured. CV% or Uniformity% may be then used for grading cut-off (the No & Av Wt of the birds to be graded in each population).

The body weights from graded populations are should be plotted against target and the profiles redrawn where needed to bring the birds back on target at 63 days (9 weeks) age. Feed quantity shall be adjusted based on the deviation in body weight from target.

Grading using CV%

From each pen 2% or 50 birds, whichever is higher shall be caught randomly and taken to empty grading pen and weighted.

Table 1 gives the Grading cut-off points (% of birds to be graded in each sub-populations) according the CV% of flock. Grading is not necessary when CV% is <10.

Flock Uniformity CV%	% in Each Sub-Population after Grading			
	2 or 3 way Grade	Light%	Medium%	Heavy%
10 12	2 way Grading	<=20	80 (78 82)	0
12 14	3 way Grading	22 25	70 (66 73)	5 9
> 14	3 way Grading	28 30	58 (55 60)	12 - 15

Below is a example of 3 way Grading of adjustable pen with electronic scale:-

Body Weight at 4 Week			
Total Weighted		197	
Av Weight		446	
Deviation		0.06	
CV%		13.5	
Wt (gm)		Wt (gm)	
320	to	339	4
340	to	359	7
360	to	379	10
380	to	399	12
400	to	419	14
420	to	439	16
440	to	459	27
460	to	479	30
480	to	499	28
500	to	519	22
520	to	539	13
540	to	559	8
560	to	579	6

Flock Details	
Age	28 days
Standard Body Weight (Kg)	0.450
Actual Av Body Weight (Kg)	0.446
Total Samle (Bird No) Size	197

Considering the sample data of the flock, a 3 Way Grading is needed as below with CV%13.5:

Cut-off points and No of Birds in each sub-population		
	% of Birds	No of Birds
Light Wt Birds	24	47
Medium Wt Birds	69	136
Heavy Wt Birds	7	14

The light graded sub-population is aprox 24% of total population. Out of total 197 birds 24% or 47 birds are between 0.320 – 0.419 kg, means they are <= 419 Kg. Using the same process the cut-off weight of Medium & Heavy sub-populations can be determined. The Medium populations will be between 0.420 – 0.539 Kg body weight and Heavy sub-population will be >=0.530 Kg

Grading using Uniformity%

The uniformity of a flock is determind as the % of birds that are within a given range (ideally +/- 10%) around the average body weight of the flock. The higher the no of birds fall within this body weight range, the more uniform the flock and less grading is required (Table below). Grading is not required when uniformity is >=80%.

Grading Cut-offs when using Uniformity as Grading	
Uniformity	No of Sub-Population
65 - 80%	2 Way Grade
<=65%	3 way Grade

From the above 4th Weight Flock data 10% of Av Body weight = 0.450Kg x 10% = 0.045Kg. Therefore, + 10% of Av Body Wt = 0.446 + 0.045 = 0.491Kg And -10% of Av Body Wt = 0.446 - 0.045 = 0.401 Kg 115 Birds out of total 197 weighted are within the Average Weight range of +/-10% (0.401 - 0.491Kg), highlighted in Red colour. So, Flock Uniformity is 58% and 3 Way Grading is required. Light Wt group are those birds weight <=0.401Kg, Medium Wt group birds are >0.401Kg but <0.491 and Heavy Group are those birds >=0.491Kg

Key Issues during Grading:

- Start Grading of Male & Female simultaneously @ 2nd Week or 29th day
- A successful Grading should minimize the variability in graded flock than the original flock with the CV% shall be around 8 and Uniformity above 80%.
- Each sub-population should be re-weighted & counted to confirm the Av Body Wt and CV%/Uniformity so that projected (re-scheduled) target body weights & Feeding rates can be determined.
- Inaccurate bird counting will lead to incorrect quantity of Feed, which invite future problem
- Each sub-population should have own dedicated feeding system. Otherwise, supplementary feeding must allow even distribution of feed & adequate feeding space per bird.
- Ensure the stocking density, feeding & drinking space are consistent as per guidelines after grading; specially for the adjustable size pen.

Flock Management after Grading:

Following grading, the flock need to be managed to achieve targeted body weight in graded group in uniform & coordinated manner. Post grading management to maintain uniformity within graded pen is more important than the grading itself. The most important issue is the post grading management results in the birds converging to a common target body weight at Transfer to laying house.

Post Grading Feed Quantity should be adjusted to individual pen and graded birds body weights to bring each sub-population gradually back to the target line.

Take Home Message

- Feed level must be recalculated on a weekly basis calculating for changes in liveability.
- Feed recalculation twice a week gives excellent results specially for Light weight group where higher increase level is required.
- Feed calculation based on individual pen birds Av Body Wt & bird numbers
- Feed level should never be reduced
- Feed level for Light Wt group should remain same first week post grading owing to the fact that reduced competition from heavier birds will give a good amount extra feed to all birds.
- Weekly Feed increase will be like:
 - Smaller for Heavy Wt Bird group
 - Greater for Lighter Wt Bird group
 - Standard for Medium Wt bird group
- Never hold feed increment for any group for more than 2 weeks

Post Grading Body Weight management (up to 63 days/9 weeks):

For each population, the aim is to achieve target body Wt uniformly during which the skeletal development takes place (by 9 Wks/63 days). After 28 days age, the body Wt of each populations needs to be monitored & feed allocations adjusted as necessary to reach the body Wt target.

Management of Under Target Light Wt Population:

Where Av Body Wt of a population is more than 100gm lower than the targeted Body Wt, then the objective is to redraw the Body Wt curve so that target body Wt is achieved by 63 days. There should be no feed increase in first week after grading because reduce competition for feed will allow all birds to get more feed. Subsequent feed increase should be based on deviation from target body Wt.

Management of On Target Medium Wt Population:

The aim is to continue to keep birds on targeted Weight.

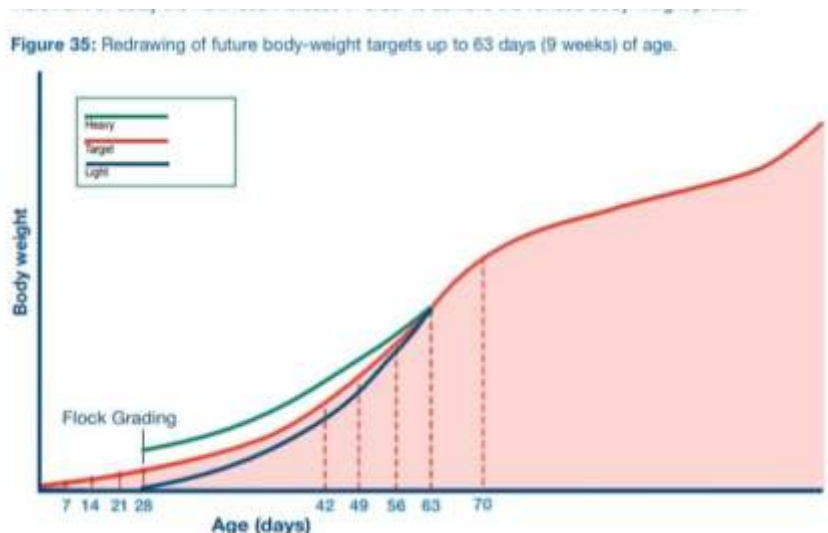
Management of Over Target Heavy Wt Population:

Where Av Body Wt of a population is more than 100gm higher than the targeted Body Wt. the objective is to redraw the body weight curve so that birds are gradually brought back to target weight by 63 days. Feed level never be reduced but may be reduced incremental quantity and increase may be one week interval until target is achieved.

Post 63 days Redrawing of future Body Weight management:

The Body weight of each sub-population should be reassessed in relation to the target. The populations with similar weight & feed consumption at this age can be combined.

Management of Under Target Light Wt Population:



Picture 3: Redrawing of Body weight Target curve up to 63 days

If some birds remain under target after 9 weeks, the body Wt target should be redrawn so that the birds can be grown to targeted body weight gradually by 105 days (15 Weeks), if not earlier. The feed quantity should be increased looking towards the new target.

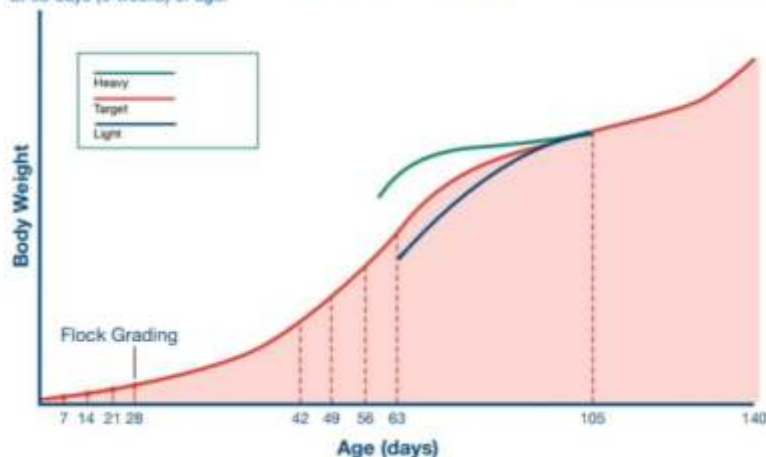
Feed level may be increased by giving a gap of one week and increment quantity may be lesser.

Take home message

- Keep on monitoring weekly Body Weight compulsorily

- May remain on Starter feed longer than suggested
- Provide a nutrient rich starter next time
- Light hours may be increased little for 3 weeks to stimulate feed intake & improve Body Wt

Figure 36: Redrawing of future body-weight targets when average body weight is below, on, or above target at 63 days (9 weeks) of age.



Underweight before 105 days, consider the following in current flock–

- Initiate the next feed increment earlier, may be mid-week and consider increasing the amount, until body weight is brought back to target.
- For example, standard increase is 5gm weekly but you want to increase 8gm, then increase 4gm at start of week and after 3 days increase again 4gm. This will help the birds to accommodate the higher increment.

Overweight before 105 days–

- Do not reduce feed level lower the current feed quantity
- Reduce next feed increase quantity, e.g 2gm instead of 4gm
- Can delay next feed increment for one week
- Check the Energy (ME) level of the feed, weather higher than recommended

Any changes made to correct the body weight uniformity issue in male or female should be done gradually, ensuring positive response in body weight gain every week

Picture 4: Redrawing of future Body Wt Target curve when Uniformity is < 80% after 63 days

Management of On Target Medium Wt Population:

The aim is to continue to keep birds on targeted Wt.

Management of Over Target Heavy Wt Population:

If birds remain overweight after 9 weeks age, the target should be redrawn so that they can be brought back to target Body Wt gradually by 105 days (15 weeks).

- After 9 weeks, redraw the target Body weight Curve of any sub-population if they are below/above to targeted body weight to bring them back on target by 105 days age.

Addressing Uniformity Problem:

If Av body Wt deviates from targeted body weight more/less than 100gm during rearing phase, reweight the sample flock. If similar data received, the following may be taken care:

Underweight before 105 days, consider the following in future flocks–



Picture 5: Grading & Splitting Flock after 16 Week

Poultry Breeding : Recent Molecular Approaches, Breeding Programmes and Selection Methods



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Advancement in science and technology has resulted in the development of poultry sector to the new heights. Genetically superior stocks having high rate of production even under environmental stress lead to the remarkable changes in poultry rearing and production (from rural farming to well organized industry within 40 years). Rise in production capacity and per bird productivity has become mainly possible due to CCPS (combined crossbred and purebred selection). Using specialized crossbreeding program, the superior purebred lines were analysed for their nicking ability, and the best nicking male and female lines were used to develop four way commercial crosses. As the molecular techniques get to be advanced, the DNA marker technology has being developed as a precise tool for evaluating genetic variability. Genome wide scan by microsatellites lead to identification of quantitative trait loci (QTL) for their use in marker assisted selection (MAS). The single nucleotide polymorphisms (SNPs) were discovered as third generation of genetic markers. Thanks to "next generation sequencing" technique that led to development of high

density SNP arrays as powerful tool for genetic analysis. Forecasting genomic estimate of breeding value (GEBV) of individual using SNPs throughout the entire genome open the way to conceptualize the "genomic selection" which evolved as the most advanced technology to revolutionize the poultry production.

Selection Methods and Breeding Programmes

The selection and breeding program in poultry science has been kept on changing depending on necessity and knowledge gain during the decades (Table1).

The individual poultry flocks were analysed and the selected birds were retained and the surplus culled birds were marketed as an end product in 1940s. In 1980s, the concept of two , three , or four way crosses was adapted which revolutionized the poultry breeding for development of

Technique	Decade of Introduction (Approx.)
Massselection	1900
Trapnesting	1930
Hybridization	1940
Pedigreeing	1940
Artificial insemination	1960
Osborne index	1960
Family feed conversion testing	1970
Selection index	1980
Individual feed conversion testing	1980
BLUP breeding value estimation	1990
DNA markers	2000



the high yielding modern layer and broiler strains. The Specialized egg and meat type birds replaced dual type birds and also the purebreds were replaced by commercial hybrids as terminal cross. Specialized male and female lines both in layer stocks and broiler stocks having very different foundation genetic sources were developed in egg type stocks and meat type stocks as necessitated by negative correlations in reproduction and production (Table 2).

Breed (chosen for development of line)	Line Developed
Cornish Game	Male line for meat type
Plymoth Rock (barred, Columbian, or white)	Commercial broilers across world
Rhode Island red	Brown egg layer male lines
New Hampshire	Brown egg layer male lines
White Leg Horn	White shelled egg layers

*The modern commercial lines across the world are now a composite of the founding breeds having minor contributions from other suitable breeds.

Hence, the recent poultry breeding involves both crossbreeding program and pureline selection (PLS). Therefore, the selection in poultry breeding is combined crossbred and purebred selection (CCPS). Crossbred performance and purebred performance are considered as genetically correlated traits assuming the infinitesimal model. Based on genetic parameters like correlations and heritability values, phenotypic selection is the method that primarily followed for body weight improvement, however, the index selection (Osborne index) was employed for egg production in pure line selection (PLS). The number of traits are now included in selection program, the modern programs,

therefore, rely on breeding value estimation with animal model best linear unbiased predictor (BLUP).

Molecular Approaches

Milestone in genetics by discovery of double helical model of DNA by Watson and Crick, the molecular genetics approaches begin to revolutionize the era of poultry breeding. In 1970s, molecular genetics originated new opportunities to improve breeding programs using DNA markers linked with traits of interest. Type I (RFLPs, ESTs, and SNP) and Type II (RAPDs, micro and minisatellites, AFLP, etc.) markers were identified. As type II markers are highly polymorphic and abundant in the genome,

are more preferred, however, the use of SNPs, the third generation marker is also becoming popular in various genetic applications including :

I. QTL(quantitative trait loci) identification and genome wide scans

The genetic control of quantitative traits is expected to be distributed throughout the genome and the various regions of the genome, which control the quantitative traits of interest, were described as (QTL).

ii. Candidate gene approach

The gene with direct and large effect on the trait of interest is considered as "candidate gene"

iii. High density SNP (Single nucleotide polymorphisms) genotyping for whole genome selection

Single nucleotide polymorphisms, frequently called SNPs (pronounced "snips"), are the most common type of genetic variation among people. Each SNP represents a difference in a single DNA building block, called a nucleotide. For example, a SNP may replace the nucleotide cytosine (C) with the nucleotide thymine (T) in a certain stretch of DNA.



Egg Nutrition Facts and Health Benefits.



Dr V Rajendra Prasad
Poultry Consultant

People have eaten eggs for thousands of years. People who are sick or recovering are asked to eat eggs because right from the shell to the core, they come loaded with plenty of nutrients which are good for a healing body.

Eggs come packed with a lot of amino acids and antioxidants, which improve our health and keep our immune system functioning in the best way.

Each egg (75 calories) pack in 6 g of muscle-building protein apart from essential core vitamins like selenium (22%) and vitamin A, B, D and K. They also contain another nutrient, riboflavin.

The human body needs lysine for healthy functioning:

Benefits of lysine include:

- Helping the body absorb calcium, iron, and zinc.
 - Promoting collagen growth
 - Helping produce enzymes, antibodies, and hormones
 - Supporting the immune system.
 - Leucine may help in healing skin and bones.
 - It may increase muscle growth and lean body mass.
 - It may increase production of human growth hormone (HGH).
 - It may help control blood sugar.
 - Isoleucine may also help muscle development and lean body mass
 - It may help control blood sugar.
 - It may also boost energy and endurance.
 - It's also said to help speed healing of injured muscles
 - Eggs come loaded with zinc, which can speed up recovery and get rid of a cold.
 - The selenium present in eggs can also help promote good heart health, cut out bad cholesterol and keep lifestyle risks at bay.
- A lot of people believe that only egg whites are healthy, and skip out on eating the yolk.
 - Eggs are one of the highest natural sources of vitamin D.
 - Eggs might be able to help keep vitamin D levels high to lower the risk of Covid 19 disease, maintain strong bones and teeth, as well as lowering the risk of cardiovascular disease.
 - Egg yolks may weigh considerably high in cholesterol but they are also rich in protein and selenium,

Overall, eggs ranked as the most cost-efficient food for delivering protein, choline, and vitamin A, vitamin E, and for vitamin D.

Busy lifestyles eggs can fit into a hectic schedule.

For people who lead busy lifestyles, eating healthfully is particularly challenging.

Tight schedules filled with activities often mean eating away from home, grab-and-go snacks and skipped meals.

That is why choosing nutrient-dense foods, such as eggs, is essential.

Eggs are a good or excellent source of eight essential nutrients, including choline, selenium,

Eggs are also one of the few natural food sources of vitamin D (6% Daily Value in a large egg), a nutrient of public health concern.

Often times people see eggs as time consuming, but they don't have to be!

Eggs can be easily prepared in the microwave or batch cooked for busy weekday breakfasts.

Hard-boiled eggs are perfect for people on-the-go. Eggs can cook in just minutes!

Find easy breakfast solutions. Starting the day with a balanced breakfast that includes protein can help keep hunger at bay and help fuel a busy morning.



Recent Approaches of Poultry Breeding

Introduction

The domestication of jungle fowl marked the beginning of selective breeding of poultry. The breeds showed a range of traits, including production traits such as body size, musculature, egg production and egg color. Industrial breeding started with the hybridization of selected pure breeding lines sampled from these base breeds and continued with more and more intense further selection of the pure lines. The different breeding and selection technologies at different period of time for the genetic improvement of poultry were introduced. Techniques such as Mass selection, Hybridization, Pedigree selection, Artificial insemination, Osborne index, Family feed conversion testing, Selection index, Individual feed conversion testing, BLUP breeding value estimation, DNA markers are used over decades.

Genetic Strategies for the Improvement of Broilers

Breeders set breeding goals as a reflection of their expectations of future market demands with the ongoing changes of production and consumption trends. Broiler growth (body weight) has consistently been the prime selection trait, Family selection for livability and

eradication of egg transmitted diseases at the pedigree level may have contributed to the reduction of mortality. Indirect carcass measurements (breast muscle thickness) were applied to male selection. In direct measurements, the sib information was used in index, there is higher intensity of selection which in turn increases the rate of inbreeding. Whereas, indirect carcass measurements provide its own performance information for selection of candidates, which increase the accuracy of selection and consequently improve the genetic gain. It also reduces the rate of inbreeding.

Genetic strategies for ascites in broilers

Ascites syndrome has been a source of concern to the poultry industry. The genetic selection is the best solution for eliminating the ascites syndrome in near future. With the advent of molecular genetic research on the genetic basis of ascites, we can see the potential for the identification of genetic markers that can be used to eliminate ascites from modern commercial broilers.

Genetic strategies for heat stress in broilers

Heat stress is one of the most important environmental stressors challenging



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broiler production world-wide. With the rapid development of the poultry industry worldwide, importation of high-performance stocks to hot regions are continuously increasing. The use of improper genotypes in these regions results in large economic losses due to decreased growth rate, reduced protein gain and high mortality. Three major genes associated with heat tolerance were identified in poultry and they were naked-neck gene (Na) (reduces feather coverage), frizzle gene (F) (modify the shape of the feather) and dwarf gene (dw) (reduces body size). Among these three genes, most notable is the gene for naked neck (Na), which produces heat tolerance by reduced feather coverage thereby increasing the rate of heat dissipation. Hence, specialized breeding programs using specific indicators of adaptation to heat should be added to commercial selection programs for rapid growth to improve broiler performance in hot climates.

Genetic strategies for layer improvement

Egg production has always been the important for the selection criteria applied to egg laying stock. Egg numbers have increased from less than 270 to 340 eggs due to advancement in genetics. Traditionally part record selection was advocated as a means of shortening generation interval to increase genetic progress. Recently apart from part-production, annual production is also taken into account for selection decision. However, use of whole record will double the generation interval. In order to optimize genetic

gain/unit of time multi-stage selection is followed as it reduces the cost and efforts (by discarding inferior birds at early age) and generation interval is minimized.

Selection strategy egg production and for feed consumption

In layers improved feed conversion throughout the 20th century by selection on increased egg mass production and smaller body size. They are the most important traits involved in variation of the feed consumption. The most commonly used criteria for feed efficiency in laying hens are daily feed intake per hen, feed intake per egg, feed conversion (kg feed per kg egg mass) and egg income minus feed cost. Commercial poultry geneticists have also been selecting on residual feed consumption for improving the feed efficiency. From majority of the selection experiments from large commercial populations, it is apparent that most laying hens have a remarkable ability to adjust their feed intake to requirement. However, a significant residual component of feed intake has been shown to exist hence in recent years, because of high heritability and absence of significant negative effect on production parameters, residual feed consumption is used as selection criteria to improve the feed efficiency.

Egg quality traits and its improvement strategies

Eggshell quality traits, amount of cuticle, color of eggs, protein content of eggs, gene for vitelline membrane, traits related to aesthetics in eggs all are under selectable genetic control.

Whereas a completely separate breeding programme exists for the production of white and brown-shelled eggs. Practicing selection for egg quality will continue to be one of the most important aspects of the breeding strategy for egg-laying hens. Genetics and genomics have identified new strategies to address egg quality including the use of very high-density genotyping to allow genome wide selection which has potential benefits for measurements that can be performed in one sex.

Breeding for Diseases Resistance in Broilers and Layers

Salmonellosis, campylobacter, Marek's disease, Newcastle disease avian influenza and infectious bursal disease significantly affect the economy of the poultry sector. New opportunities have been arising in animal genomics and related technologies. With the availability of the draft chicken genome sequence, the genes that underlie the resistance loci can be identified and utilized. In recent years, advances in molecular genetics, the relationship between genes and their corresponding phenotypes, are beneficial for disease prevention and control. Most of recent strategies are now developed, combining structural, population and functional genomics approaches.

Conclusion

Genomics in poultry breeding has seen notable progress. The search for new measurements that more reliably reflect the traits which are the ultimate target of selection, whether it is reduction in bacterial contamination, resistance of the shell to damage or processing and nutritional qualities will be a major focus. In future genomics could well play an important role in supporting breeders in selection programs. This will affect the structure of breeding programs and also impact the integration of breeding in the poultry production system. The new knowledge of the molecular basis of poultry phenotypes that is generated along the way will be used to engineer and redesign the poultry genome with novel technologies, and genetically engineered poultry breeds.



Role of acidifiers to control pathogenic microorganisms and to improve the performance of birds.

Welcome to Nutrinomics...

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

Introduction

- Acidifiers are combination of organic acids. Organic acid is a chemical compound from the class of fatty acids that have a pH below 7.
- Organic acids included in feeds in order to lower the pH of the feed, gut, & microbial cytoplasm thereby inhibiting the growth of pathogenic intestinal microflora.

Decreasing the gastric [stomach] pH:-

Pathogenic bacteria [E.Coli, Salmonella, Streptococcus etc.] grow within the range of 6 to 8 pH. Their growth is inhibited when the pH falls below the range suitable for the growth.

In general, **the more acidic the pH of the medium, the greater is the antibacterial activity.** This is because acidic pH causes major damage to

Acid	Effects	Acid	Effects
Fumaric acid	Improve body weight gain in broilers. Improve feed efficiency in both broilers & Layers.	Tartaric acid	Increase in body weight gain.
Propionic acid	Increasing dressing percentage in female broilers & reduction in abdominal fat for males.	Lactic acid	Improve body weight gain and feed conversion ratio.
Malic acid	Increase in body weight gain.	Formic acid	Reduction of caecal pH & bacterial effect on Salmonella.
Sorbic acid	Improves feed efficiency.	Butyric acid	Maintain the beneficial micro flora. Increase the proliferation & maturation of intestinal cells.



Role of Organic Acid

Acidifier effectively regulates pH of the intestine. They promote growth & health of chicken by:

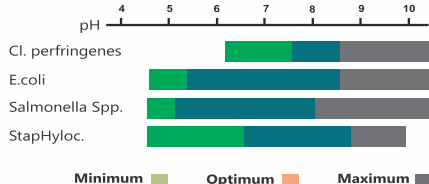
lipopolysaccharides of the outer membrane of gram negative bacteria. Acidic pH also inactivates essential enzymes at the cell surface of bacteria.



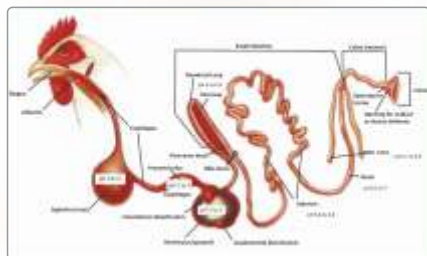
At an alkaline pH, the organic acids of the acidifiers are present mostly in a dissociated form, whereas in the acidic pH they remain mostly undissociated. In the undissociated form that they are able to enter into the bacteria, through cell membrane. This is because, by partitioning into membrane lipid bilayers, undissociated organic acid molecules interfere with the activity of membrane protein or enzymes. Thus, organic acid inhibit the growth of bacteria when concentration of the acid reaches a critical level.

Once inside the bacteria the more neutral environment within causes the organic acids to dissociate into H⁺ ions & anions. The acid anions disrupt and interfere with DNA and protein synthesis, causing bacterial death.

Favourable pH for Pathogenic Microbes



Digestive system of poultry



How Acidifier increases the digestibility of feed?

After ingestion, the feed reaches the proventriculus of the poultry...

1. Pepsin, the proteolytic enzyme of the proventriculus, is activated from pepsinogen only at low pH [2-4] in other words, the low pH activates pepsinogen. This results in better digestibility of proteins and utilisation of amino acids.

2. Acidifiers decreases the gastric pH.

A low gastric pH is also essential to control the bacterial population in the gut. Growth of harmful bacteria decreases in an acid environment, whereas beneficial lactobacilli species are more tolerant to the low pH values.

3. The low pH does not allow less fermentable substrates to pass through, **and therefore prevents the fermentation that occurs in the lower intestine. It thus inhibits growth of harmful bacteria**

Benefits

1. Acidifiers regulate pH and microbial balance of the gut.
2. It promotes digestion by activating the digestive enzymes.
3. It favour mineral absorption by creating an ideal pH in the intestine.
4. It promotes palatability of feed.
5. It enhance nutrient utilization by birds.
6. Organic Acids in the feed reduce pathogenic microorganism and as a

result there is a less stimulation of the birds immune system.

7. In poultry, Organic acids play important role in the birds growth. The acidic environment on the intestinal epithelial surface allows diffusion of the undissociated into the bacteria and enterocytes (intestinal epithelial cells) for their effect.

Field trial result in commercial broiler

Aim: To study the effect of acidifier in commercial broiler against the use of antibiotics

Location: Akrij Poultry, MIDC-Nashik

Product: **ACIPLEX™** Optimized Acidification to Amplify Growth Performance

ACIPLEX™ is an acidifier for poultry feed, based on a powerful combination of synergistically acting organic acids.

Parameters of Performance Analysis: Weekly Feed Consumption, Avg. BWG, FCR and Feed Cost.

	ACIPLEX™						CTC 15% [Antibiotic]					
	I	II	III	IV	V	VI	I	II	III	IV	V	VI
Feed (gm)	132	532	1226	1997	2977	3790	132	434	1200	2120	2936	3760
Avg. Body Wt. (gm)	160	442	860	860	1820	2087	160	435	850	1310	1780	2033
FCR	0.825	1.2	1.43	1.44	1.6	1.8	0.825	0.997	1.411	1.618	1.649	1.84
Mort. %						4.02						3.33

Trial Economics:

	ACIPLEX™	CTC 15% [Antibiotic]
Dose (Kg/Rs)	2	0.335
Rate (Rs/Kg)	110	150
Cost/Mt(Rs)	220	50.25
Feed Cost (Rs/kg)	25.22	25.05
Cost of Production/ bird (Rs)	95.58	94.18
Cost/kg BW (Rs)	45.79	46.32
Net Saving (Rs/Kg)	0.529	
Saving / bird	1.10	

*CTC - Chlorotetracycline

Conclusion:

Although the mortality in group fed **ACIPLEX™** is slightly higher than the Antibiotic treated group, but there are overall improvement in Body Weight Gain & FCR.

Thus the effect of mortality is compensated with the improvement in BWG & FCR in **ACIPLEX™** treated group.

Antibiotics decreases the Mortality, but it suppress the growth & FCR when added in Poultry Feed.

ABTL

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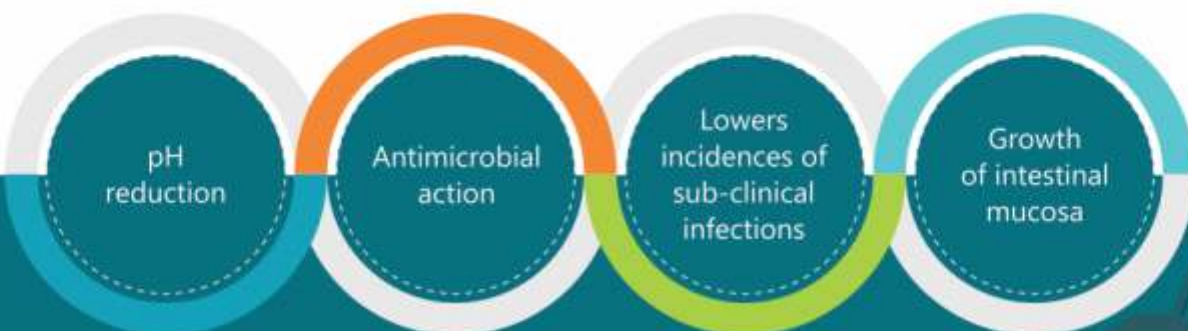
ACIPILEX™

Organic
Acids
& Salts

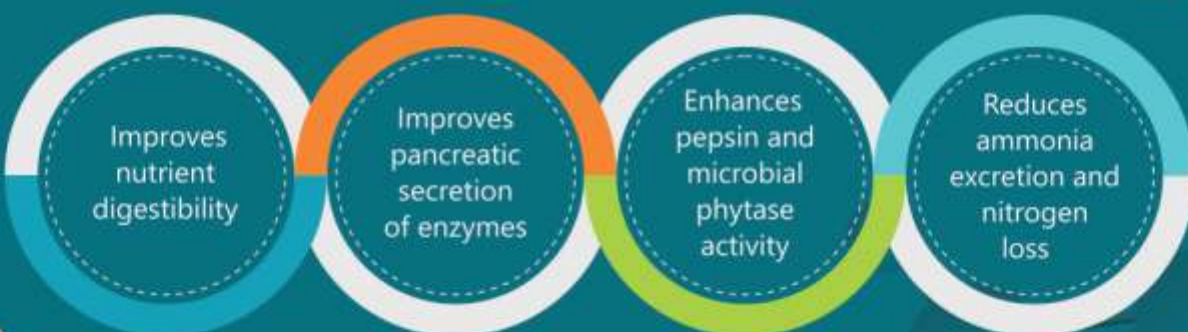
Optimized Acidification to Amplify Growth Performance

Proven Benefits:-

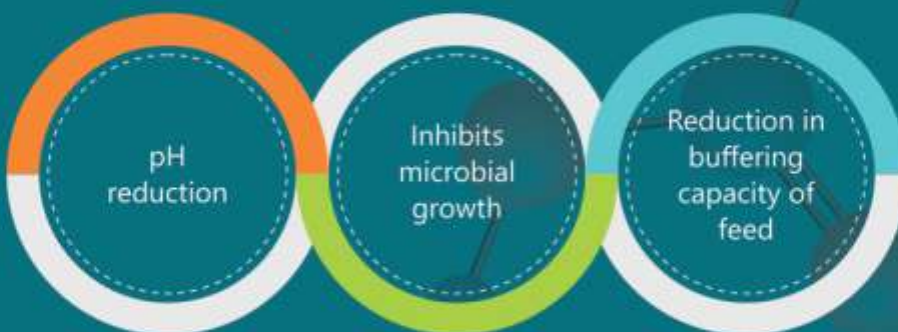
Role in Intestinal Tract



Role in Metabolism



Role in Feed Hygiene



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ENZYMES • NUTRITION • TECHNOLOGY

Sandhya Group – Together We Rise



Sandhya Group
PHOSPHORUS CHEMISTRY



At Sandhya Organic Chemicals Pvt. Ltd. the belief lies in the philosophy of 'VasudhaivaKutumbakam' - the world is one big family and a family stays together and grows prospering together. In the process making the society a better place by taking one small step at a time.

The CSR initiatives undertaken by Sandhya Group run through diverse fields like education, environment, entrepreneurship, women's empowerment etc.

Beginning right at their workplace making them value their employees foremost by acknowledging their efforts towards their work is a Norm.

Sandhya Group have been providing assistance to schools for construction and renovation, donating computers to students from economically weaker background, providing scholarships to poor students and ensuring education for as many students as they can.

They have a dedicated 'Sandhya Clinic' to spread awareness about diabetes and its treatment. The clinic is equipped with state-of-the-art machinery. Guidance and care for patients is provided to patients to regain their health by dietician and nutritionist.

A brisk walk marathon is organized to show solidarity with the patients. Training is provided to the relatives of the patients participating in the marathon to create awareness in their own circles about the disease.

Eye checkup camps are also organized to create health awareness. Sports and similar activities are also promoted by sponsoring championships and matches.





IPJA announces **Calendar of Events** **Technical Seminars**

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Event Partner	2,00,000
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* Rates are for each Technical Seminar

IPJA GLOBAL AWARD 2022

November 24 | Hotel Avasa | Hyderabad

For further details, contact :

344, Plot No. 1 & 4, Surya Saroj Apartments, HUDA Complex,
Saroornagar, Hyderabad - 500 035.

Phone : 9312700599 (B.S. Rana-President), 9391378805 (M.K. Vyas-Secretary)

E-mail : ipja.president@gmail.com





Kemin – Innovation to Cultivate a Better Tomorrow



Kemin is celebrating 61 since 61 this year as the celebration of partnership.

“While Kemin has grown tremendously in 61 years, our mission has remained: Use science at the molecular level to provide exceptional products and superior customer service while making a positive impact. As we look to the future, we stand ready to expand our mission and accelerate our ability to transform lives.”

- *Dr. Chris Nelson, President and CEO*

”

R. W. Nelson and Mary Nelson started Kemin as 'Chemical Industries' from a vacant wool barn in Des Moines east side in 1961 with 2 product lines of silage preservatives and feed flavours that were sold through the Midwest. R.W. was mixing the ingredients for animal feed in a Maytag® washer and Mary looked after the administrative side of the operation.

It has come a long way since with more than 15 manufacturing facilities worldwide, operating in more than 90 countries, with customers in 120 countries for a range of more than 500 specialty ingredients used in feed, pet food, health and food industries, nutrition and horticulture and textile markets.

Dr. Nelson joined Kemin as director of research and development in 1980 leading to a more structured approach to research and development. Nelson and his team pioneered the process of isolating and purifying the antioxidant molecule lutein for human consumption in supplements and



fortified foods. He holds 10 patents and has authored numerous peer-reviewed, published research studies. Dr. Nelson was recognized as one of the top 100 CEO Leaders in STEM (Science, Technology, Engineering, and Math) by STEMconnector at the 2013 U.S. News & World Report's STEM Solutions Summit. In 1995, Kemin innovated lutein, a carotenoid molecule from marigolds that the company had been selling into the animal feed industry for years, for human use.

Kemin Industries is a family-owned-and-operated company. R.W. Nelson serves as Chairman of the Board playing an integral role in steering the company's vision and its continued success.



"I believe work is a privilege."

– R.W. Nelson, Chairman of the Board

Mary Nelson serves as Corporate Vice President and Chair of the Kemin Charitable Contributions Committee guiding the company's corporate philanthropic giving and culture of servant leadership. The Nelsons' eldest daughter, Elizabeth "Libby" Nelson, joined Kemin as Vice President and General Counsel and has been instrumental in protecting Kemin's intellectual property and overseeing the company's regulatory affairs, audit and environmental health and safety programs worldwide. David Nelson, son of R.W. and Mary Nelson, serves on the Board of Advisors.

In 2017, the third generation of Nelson family members began taking on roles within Kemin. Kimberly Nelson, daughter of Dr. Chris Nelson, joined Kemin as a business development manager and now serves as General Manager of Kemin Nutrisurance. Lucas Nelson, son of David Nelson, has been recently promoted to the role of CEO of MedPharm, a national cannabis manufacturer and dispensary, owned by Dr. Chris Nelson. Dan Ryan, son of R.W. and Mary Nelson's youngest daughter, Molly, is a research associate in microbiology at Kemin.

"We have a responsibility to return to our community and the world a portion of what we earn from our endeavors."

– Mary Nelson, Co-founder of Kemin Industries

To R.W. and Mary Kemin is their 6th child. It is such family values that lend to Kemin its core strength. The belief is in good science and good business practices, hard work, integrity and moral obligation to improve lives.

An organization with a the bold and forward-thinking approach Kemin is creating technology at the molecular level and fostering continuous improvements in its people, processes and products. The aim is to sustainably transform the quality of life every day for 80 percent of the world with their products and services. In 2021 they announced their commitment to achieve net zero greenhouse gas emissions by 2050.



LATEST TRENDS IN NUTRITION
 AND DISEASE CHALLENGES IN BREE



“Advancia Academy” - Adisseo's Scientific Event



In Advancia & Advancia Academy events, it is Adisseo's know-how, where experts share the latest innovations and scientific knowledge with end users.

As a part of Advancia Academy, Adisseo hosted two back-to-back seminars in the cities of Haryana (Jind – Lakshya Inn) and (Karnal – Vivaan) on July 29th and 30th, 2022 respectively. North India is a very promising poultry-producing territory in India. This territory consists of integrated farming, commercial feed operations, breeder's operations, and layer farming, with the increase in demand for Broiler meat and eggs either post covid or in general, getting good quality raw material is also a big challenge for Poultry Producers. Optimizing the feed cost with the high volatility of raw material is one of the big challenges faced by all Poultry Producers. Feed formulation utilizing maximum efficacy of nutrients of raw material is an important challenge being faced by all Nutritionists. Enzymes play a very critical role to reduce the feed cost which directly helps farmers to increase their profitability.

The use of the right enzymes with the right

matrix values is very important. Apart from feed challenges due to weather fluctuations, Current disease outbreaks have made the market more challenging. In Breeder's operations, either fertility or hatching egg quality is one of the most important parameters where organic trace minerals especially hydroxy Se Methionine plays an important role. Multimycotoxin management is also one of the important aspects these days. Gut Health is the biggest challenge, and the right probiotic impact positively on gut health. To address the above-mentioned challenges, Adisseo organized two seminars and received an overwhelming response in Jind and Karnal which included Breeder farmers, Consultants, Feed millers, Nutritionists, Layer farmers along with eminent thought leaders from Industry.

Our first session on Jind was conducted on July 29th. Our external speaker was Dr.SudiptoHaldar from AgriVet, holding a Ph.D. Degree in Animal Nutrition and 22 years' experience. During the seminar at Jind, Dr. Haldar gave insights about the use of Organic Trace minerals and the key to extracting more





effect on breeder performance and progeny enhancement. Many trial studies have been discussed in the forum about the increase in egg production, hatchability, and fertility percentage. Organic Selenium for breeders, Improved hatchability and viability of newly hatched chicks, and Possible long-term maternal effect on progeny.

matrix values depends to a great extent on the stability of the enzyme product during the steps of feed processing. He showed the importance of the first and second enzymes that is **Phytase and Xylanase/NSPase in the feed formulation and the role of good phytase. He also discussed about the selection of enzymes is governed by the raw materials – for example, in wheat-based diet xylanase is a must.**

Research shows that with maize-based diets xylanase/NSPase may have tremendous effects since maize grain contains about 49% of arabinoxylans. In a maize-based diet, amylase plays a very critical role in neutralizing the negative effect of variable starch digestibility. Phytase and Xylanase complement each other. He also

discussed that an enzyme matrix does not follow the simple addition theory. It is very important to understand the undigested fraction of feed and accordingly set the formulations. He emphasized the Probiotic enzyme synergism and the characteristic of the best probiotic as non-hemolytic, prevents cell toxicity, and must not possess any antibiotic-resistant genes. He believes that Nutrition acumen is

very important when enzyme matrix values are applied, and an oversimplification may prove suicidal. It ended up with an invigorating Q&A session from the participants.

from the progeny through parents. Optimum trace minerals usage, their critical levels, and their utilization in the body. Organic minerals deliver more than inorganic ones and he emphasized the role of Selenium as a safeguard against stress and how the antioxidant system modulates by dietary Selenium. He emphasized that the most bioavailable form right now for Selenium is 2-hydroxy-4-methylselenobutanoic acid. **Its bioavailability is 28.8% higher than that of Se Yeast. He emphasized that the Selection of the right source of Se for breeding hens is important because it is this Se that after getting transferred to the eggs provides the chick embryo to fight oxidative stress. An introduction of a new stable supplemental form of Se (HMSeBA) could be considered as the next step in improving the Se nutrition in poultry.**

Our Second speaker for the day was **Dr. Amrita Dhara** having throughout the experience in the Broiler Breeder segment, commercial broilers, and hatchery operations. **He discussed the disease scenario in the Broiler breeder in Asia and breeding Hen Mortality and its infectious and non-infectious causes. He discussed the problems that are seen in North India Breeders like Sudden death syndrome, its prevention and control, and control measures to be taken to prevent LPAI.** The session ended with a note on a quick guide to making a differential disease diagnosis.

Our internal speaker, **Dr. Denise Cardoso, Ph.D. in Animal Nutrition** from France and working as Global Scientific and Technical Manager for Antioxidant solutions. Her expertise in Minerals, specifically Selenium and their role in Breeders. She discussed the free radicals in the body system and the role of Selenium in all levels of defense. She also discussed **the third-generation Pure forms and 100% bioavailability of OHSeMet as compared to Se Yeast having a bioavailability of 60%. Selisseo which is a flagship product of Adisseo has a positive**



All the presentations were appreciated by our guests for the day, eminent consultants who have joined us from Jind.

We have our second Advancia Academy program in Karnal on July 30th, where more than 65+ participants were present.

Our Guest speaker was **Dr. Sudipto Haldar** who discussed the right way to use enzymes in feed as variability in raw materials is the biggest enemy and with the right addition of enzymes, we can blunt the variations. He discussed the in-practice matrix values which are assigned to the enzymes for the least cost feed formulation. These matrix values are generated from animal studies and are typically for calcium, phosphorus, sodium, amino acids, and energy. He emphasized on the authenticity of these



Our Internal speaker for the day was **Dr.**

Marcio Ceccantini, an integral part of Adisseo for the last 21 years as Technical Support Director on Feed Digestibility and Solutions in Adisseo, France SAS. Dr. Marcio discussed the FEEDASE concept and the Feedase predictor. **He discussed the Antinutritional factors present in the feed in broilers and each 1% increase in phytate decreased the feed digestibility by 0.49%.** He also gives the relationship between the enzymatic response and substrate level. Dr. Marcio also discussed the key differences in arabinoses and xyloses of Cereal and Protein meals. He emphasized that by measuring the ANF better contribution from enzymes can be achieved. Adisseo R&D team has created NIR Calibrations about wet chemistry.

Adisseo is an important player in the feed market for the last 25 years. Rovabio strain is 100% Adisseo patented for feed and food application. Talaromyces versatilis is a fungus and strongest genome for enzyme expression. The fermentation of Talaromyces versatilis results in the production of a complex of 19 different enzyme activities including Xylanases, B Glucanases, Debranching enzymes, Cellulases, Pectinases, Proteases, and others.

In the end, he advised that it is very important to understand how to improve digestibility in feed by **evaluating the correct amount of nutrients, knowing ANFs and having good information about the carbohydrase being used, and understanding the combined and overall effect of enzymes. Thus, FEEDASE is the enzyme solution to improve feed digestibility by targeting an indigestible fraction** of raw materials.



Dr. Sujit Kulkarni, Commercial Director-Indian subcontinent for Adisseo Animal Nutrition led the event by sharing the details of Adisseo Corporate functionality, a leader in the heart of the food chain. Vision and Mission of Adisseo that says- To feed the planet in a high-quality, affordable, and sustainable way. **Adisseo's key figures are more than 1.69 bn Euros** of turnover in 2021. Adisseo is committed to R&D with 10 centers across where more than 200 people are dedicated to Research work and serving globally to more than 110 countries and 3900 customers around the world. **Key business ambition is to cross 2.5 Bn Euros very soon.** He discussed the range of solutions that Adisseo offers apart from being one of the global leaders in Methionine and Vitamins. Adisseo offers a variety of products in the feed specialty range. **We are also proud to share that we have the biggest plant in Nanjing province China.** Dr. Kulkarni also conveyed to participants that Adisseo offers sustainable solutions to minimize losses and increase profitability.

Dr. Shaveta Sood, Marketing & Specialty Business Development Manager for Indian Sub-Continent. She discussed the Adisseo R&D on Nutrition and Technology front. She discussed the



Nutritional services that Adisseo provides to the key clients which include **PNE Services** (Precise Nutritional Evaluation) for better understanding of Raw materials, NIR Services offered to feed producers, **ADICT** (Adisseo Calculator tool) to use real nutritional values in feed formulations and **Rovabio Predictor** tool (Customized tool to maximize the matrix values of enzymes). With Adisseo, a database of 135 nutrients and 82 Raw materials, equations sourcing from Feedipedia is available for Indian sub-continent Customers/ Nutritionists and Consultants. She also discussed the mycotoxin management program which Adisseo offers to their customers.

Dr. Vikas Shukla- Regional Category Manager, Adisseo discussed the role of medium chain fatty acid, FRA C12- Lauric acid in controlling pathogens and maintaining the gut balance between gram-positive and gram-negative bacteria. He also discussed the Alterion, a unique probiotic solution from Adisseo. The rest of the team leads were **Mr. Gurdeep Singh, Sales Manager North India, and Mr. Niraj Gupta, Technical Engineer- Methionine.**

Adisseo felicitates key speakers and key opinion leaders from the industry.

Adisseo is a worldwide leader in Animal Nutrition. A few important landmarks are, In 2015, Adisseo becomes the first international



company to be listed on Shanghai Stock Exchange. In 2018, Adisseo acquires Nutriad, having a varied range of products. In 2020, the creation of CALYSSO, A JV with Calysta for an alternative protein source. Adisseo Portfolio includes Methionine and a Speciality Range of Products. Adisseo serves around the World.

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NUMEGA MALAYSIA GRAND OPENING CEREMONY

Malaysia, 9th July 2022



Grand Opening of Numega Malaysia Factory

NUMEGA is an international company specializing in the research, development, production, and sales of green, safe and healthy feed and feed additives. Aims to promote the healthy and sustainable development of animal husbandry and strict value standards, and adhere to the "sustainable development" strategy of green, safety, and health. NUMEGA has established complete R&D, production, and sales in Spain, the United States, China, Vietnam, Thailand and now in INDIA with their channel partner, Qper India Pvt Ltd said by Mr. Nisarg Patel (Director Sales). The company has obtained four global invention patents, which has obtained ISO9001, FDA, and FAMIQS certifications, and has followed the HACCP food safety assurance system. "Megacid F" and "NTPB", as the company's star products, play an important role in replacing antibiotics and promoting the healthy growth of livestock.

Numega Nutrition is an international technology enterprise specializing in investment and production in the livestock industry. At present, the business involves feed additives, feed raw material trading, and producing, and the business covers more than 20 countries and regions around the world including Asia, Australia, and central and South America. The new Numega factory was built with all of NUMEGA's industrial prospects and technological innovation value, environmentally sustainable with a fully automated process, and is placed in the heart of NUSAYAJA TechPark, a world-class science, and technology park.





WORKSHOP ON GM CROPS AND ANIMAL NUTRITION

Date: July 11, 2022 • Time: 09.30 AM to 02.30 PM

Hilton and Hilton Garden Inn, Embassy Maryata Business Park,

India needs to adopt GM crops soon to increase production and lower costs, while ensuring safety: Experts



Dr. Sushanth Rai, B. President – KPFBA, delivering Welcome Address

With adoption of genetically modified (GM) crops in India having hit a roadblock, Dr. Lalitha Gowda, who is the Chair of the Scientific Panel of GM-Foods, FSSAI and member of GEAC (Genetic Engineering Appraisal Committee) said any regulation that needs to be implemented has to be first safe for human and animal consumption.

She was participating in a panel discussion on 'Making livestock industry competitive: way forward', organized jointly by the Karnataka Poultry Farmers and Breeders Association (KPFBA); the Compound Livestock Feed Manufacturers' Association of India (CLFMA); the Biotech Consortium India Ltd; and Animal Nutrition Society of India.

Thorough protocols need to be followed

Dr. Gowda said that there are well laid out

protocols in line with Codex Standards and they take time, not just in India, but in the developed parts of the world. While agreeing that GM crops had benefits, she said they had to go through proper appraisals before going commercial. Regarding processed GM derivatives for feed, she said that a simplified procedure is considered sufficient as they are not living modified organisms.

Presently in India, only Bt Cotton is allowed as GM crop, while brinjal and mustard are awaiting approvals for quite some time now.

Demand for protein will increase exponentially

Mr. Neeraj Kumar Srivastava, Chairman of Compound Livestock Feed Manufacturers Association of India (CLFMA) said India would be at the





Lighting of lamp



centre of increased meat demand and close to 50% meat is going to be produced in Asia, thus opening up enormous opportunities for the livestock sector. India is number one in milk production and millets, number two in wheat and number four in broiler production, however, the protein demand and supply to the growing population is inadequate.

India, he said, needs 25 to 30 million metric tonnes of protein of which only about 47% is supplied through internal sources. As there are limitation in increasing yield of agricultural crops, he stressed for need for GM crops to increase productivity and meet demand. India's per capita availability of livestock is low and it has one of the lowest protein consuming population. The demand for protein will continue to increase in view of the expanding middle class, with changing lifestyle patterns, urbanization and other consumer driven market trends. Though poultry numbers have grown more than 500 per cent in the last couple of years, there is need to increase output.

GM crops can overcome shortage of feed

Dr. K.C.Veeranna, Vice Chancellor, Karnataka Veterinary, Animal and Fisheries Sciences University said cost of production of livestock is going up every day as the major contributor is feed. The biggest challenge is to reduce cost of

production and make products which are rich in protein easily available. In this background, only GM crops and derivatives could help overcome shortage of feed. Stating that fodder resources were limited as land available for fodder is decreasing, there was need to utilize technologies to meet animal nutrition needs.

Dr. S.Rajendra Prasad, Vice Chancellor, University of Agricultural Science, Bangalore, said with India's population growing at a fast pace, it was urgent to focus on nutritional security of both human beings and animals. India produces 308 million metric tons of foodgrains and 329 mmt of vegetables and fruits, but this is going to be highly insufficient to meet the demands of growing nation.

Dispelling myths about safety of GM crops

Dr. Vibha Ahuja, Chief General Mnager, Biotech Consortium India Limited, said it was necessary to permit the use of GM crops and its derivatives as it would help in increasing the availability of feed and feed ingredients in India. It is imperative to make available sufficient low cost and good quality feed for sustainable growth of poultry, dairy, aqua and other livestock sectors.

On the many myths that surrounded GM crops, Ms. Ahuja reiterated that reviews by major scientific bodies and regulatory

agencies have confirmed that GM crops and the food derived from them are safe. The only difference between the GM crops and their non-GM counterparts is the proteins expressed by inserted genes. The safety of the consumption of these proteins is established based on biological properties and tests of digestibility, acute toxicity and allergenicity. Once this is done and safety established then the compositional

equivalence confirms that the GM crop / food is similar to corresponding non-GM which has been used / consumed traditionally for generations and hence no long term effects are expected to be seen based on this history of safe human use.

'More from less', not less from more' is going to be the mantra

Dr. Mahesh. P.S. Joint commissioner GoI and Director of Central Poultry Development Organisation & Training Institute said the due to climate changes, the planet is challenged by demand of protein, demand of energy, demand of population etc. and that the era of less from more is over now and that we need to work on 'more from less', referring to land availability.

Talking about GM, he wondered how people accepted milk from the cow which was eating BT cottonseed, a GM derivative, but were not ready to accept any other GM products, calling for severe



Mr Inayath Ulla Khan, Executive Secretary, KPFBA Compering the Workshop



Dr. Vibha Ahuja, Chief General Manager, Biotech Consortium India Limited Giving presentation on 'GM crops and derivatives in animal feed: Safety and nutritional aspects'



Mr. Neeraj Kumar Srivastava, Chairman, CLFMA of India addressing on 'Growth of livestock industry: Feed demand and availability'



Mr. Amit Sachdev, Regional Consultant – South Asia, U S Grains Council giving presentation on 'Global feed availability and role of GM crops'



Dr. Anjan Gosami greeting **Dr. Susil Silva**, Head, Animal Utilization – South Asia, U.S. Soybean Export Council after his session on Nutrient Value Calculator: A tool for feed quality check



extension work.

India can export to Gulf having logistical location advantage

Mr. Naveen Pasuparth, Treasurer, CLFMA of India said presently corn and soya have major inputs controlling poultry costs. Yield per acre of both crops is too low and GM is the only solution to increase yield as well as income for farmers. Excessive usage of pesticides, herbicides etc have been affecting genetic capabilities of animals which feed on such crops.

He said that there was enormous potential for exports if we could get sufficient and cost-effective inputs made available through GM technology. He talked about how India was just four hours away from Gulf and could supply easily, being logistically located hub, unlike Brazil and other South American countries which were supplying livestock to the Gulf and would be challenged by high fuel prices in the years to come.

Dr. M.S.Sheshshayee, Professor and Head, Department of Crop Physiology, University of Agricultural Sciences, Bengaluru said the mantra has been to produce more from less, more crop per drop, more grain per rain and use of GM Technologies can help in achieving the same. Talking about proteins, he said Indians get nearly 70% proteins from

cereals but that is not sufficient and contribution of livestock is immense.

Need to convince NGOs and educate farmers

Dr. Devegowda, President of Institution of Veterinarians of Poultry Industry (IVPI) said that there was urgent need to convince non-governmental organizations which are opposing GM crops and also educate the farmers on the benefits of GM. India needs GM to feed the growing population, both human and livestock.

Trade has to happen for quicker adoption of GM

Amit Sachdev, Regional Consultant, South Asia, US Grains Council, said trade needs to happen and mentioned that US and India had signed an agreement in 2021, allowing import of Alfalfa for the dairy industry. Underscoring the importance of GM crops, he said there was no other go, but to adopt as they were safe, cheaper and was going to be easily available in the world market.

Calculating nutrient value leads to improved productivity

Susil Silva, Head, Animal Utilization, South Asia, US Soybean Export Council informed about "Nutrient Value Calculator" to the participants. He explained key features of the tool and

explained how it can be used for calculating nutritional value of feed and can contribute to improved productivity.

Dr. N.K.S. Gowda, Principal Scientist, ICAR-National Institute of Animal Nutrition and Physiology also spoke about nutritional value of animal feed.

Dr. Sushanth Rai, President, Karnataka Poultry Farmers & Breeders Association said the demand for animal feed for poultry, dairy etc is growing and that soaring prices affected the sector. India needs to import soybean by September to tide over feed crisis, while there is urgency to produce more and GM was the only answer.

On the occasion, Mr. Inayath Ulla Khan, Executive Secretary, KPFBA was conferred with the Prof. G. Devegowda Poultry Science Excellence Award 2022 instituted by Pashudhan Praharee. Mr. Khan was honored for the yeomen service he has rendered to the poultry sector in general and KPFBA in particular.

Mr. Khan proposed a vote of thanks.

For details contact:

- Dr. Vibha Ahuja on 98912 44434
- Mr. Inayath Ulla Khan on 9886730997
- Mr. Naveen Pasuparth on 98450 15045



Dr. K.C. Veeranna, Vice Chancellor, Karnataka Veterinary, Animal and Fisheries Sciences University, Bidar



Dr. S. Rajendra Prasad, Vice Chancellor, University of Agricultural Science, Bangalore



Dr. P.S. Mahesh, Joint commissioner Gol and Director CPDO&TI



Panel Discussion- Session-1:

[L-R: **Dr. Vibha Ahuja**, CGM-BCIL, **Mr. Neeraj Kumar Srivastava**, Chairman-CLFMA, **Dr. P.S. Mahesh**, Joint commissioner Gol and Director CPDO&TI, **Dr. K.C. Veeranna**, Vice Chancellor -KVAFSU, **Dr. S. Rajendra Prasad**, Vice Chancellor, University of Agricultural Science, Bangalore and **Dr. Sushanth Rai.B**, President, KPFBA



Prof. G. Devegowda President, Institution of Veterinarians of Poultry Industry



L-R: **Mr. Naveen Pasuparth**, Treasurer, CLFMA of India, **Dr. Vibha Ahuja**, CGM-BCIL, **Dr. Lalitha Gowda**, Chair, Scientific Panel on GM-Foods, FSSAI, India; Member, GEAC and Former Chief Scientist, CFTRI, Mysore, **Dr. M.S. Sheshshayee**, Professor and Head, Dept of Crop Physiology, UASB, **Mr. PS Nanda Kumar**, Honble Past President, KPFBA, **Dr. G. Deve Gowda**, President, IVPI, **Dr. N. K. S. Gowda**, Principal Scientist, ICAR-NIANP, **Dr. Sushanth Ra. B**, President – KPFBA and **Mr. Inayath Ulla Khan**, Executive Secretary - KPFBA



Panel discussion: Making livestock industry competitive: Way forward

[L-R: **Dr. M.S. Sheshshayee**, Professor and Head, Dept of Crop Physiology, UASB, **Dr. Lalitha Gowda**, Chair, Scientific Panel on GM-Foods, FSSAI, India; Member, GEAC and Former Chief Scientist, CFTRI, Mysore, **Dr. N. K. S. Gowda**, Principal Scientist, ICAR-NIANP, **Dr. G. Deve Gowda**, President, IVPI, and **Mr. Naveen Pasuparth**, Treasurer, CLFMA of India]



L-R: **Mr. Neeraj Kumar Srivastava**, Chairman-CLFMA, **Prof. G. Devegowda** President, IVPI, **Mr. Inayath Ulla Khan**, Executive Secretary – KPFBA, **Mrs. Shabreen Begum Khan**, **Dr. Vibha Ahuja**, CGM- Biotech Consortium India Limited (BCIL) and **Dr. Sushanth Rai.B**, President, KPFBA



Mr. Neeraj Kumar Srivastava, Chairman-CLFMA, Garlanding Mr. Inayath Ulla Khan



Dr. Sushanth Rai. B, President, KPFBA honouring Mr. Khan with Shawl



Dr. Vibha Ahuja, CGM- Biotech Consortium India Limited (BCIL) handing over the award to Mr. Khan



EW Nutrition (South Asia) hosts Myco-Seminars 'Toxin Risk Management with Challenges in the Current Feed Raw Materials' in India



NOIDA, 14th July 2022– EW Nutrition (South Asia) has organized five seminars from 4th to 11th July 2022 under the umbrella of its 'Partners in Progress' program. Keynote speaker Dr. Duarte Diaz, Associate Professor, University of Arizona, US, shared his knowledge & experience in managing moulds and mycotoxins in raw materials and animal feeds.

The EW Nutrition team travelled to five cities viz. Hyderabad, Rajahmundry, Hospet, Coimbatore and Chandigarh to conduct its series of Myco-Seminars in the month of July 2022. Dr. Duarte Diaz, the Key Speaker, elaborated upon various factors which affect mould growth and its consequences in the feed, including nutritional losses, losses in material-specific weight, and presence of mycotoxins. He further explained how mycotoxins can cause a variety of adverse health effects and pose a serious health threat to both livestock and humans. He spoke at length about the correct method of sampling and how the sampling step is usually the largest source of variability associated with mycotoxin testing.

During the seminar, EW Nutrition also launched its 'Solis' range of mycotoxins solutions. To support customers with effective solutions in animal production, EW Nutrition offers the programs for Toxin Risk Management in poultry. In addition to innovative products, the program includes mycotoxin risk assessment with the help of Master Risk tool at the producer's doorstep.

Consultants, Breeder, Broiler, and Layer producers, Feed Millers, EW Nutrition Technical Managers, Account Managers & Sales Heads also participated in the respective seminars. The seminars were followed by a cocktail dinner & discussions.



About EW Nutrition

EW Nutrition offers animal nutrition solutions to the feed industry. The company's focus is on gut health, supported by other product lines. EW Nutrition researches, develops, produces, sells, and services most of the products it commercializes. In 50 countries, key accounts are served directly by EW Nutrition's own personnel.

For more information, please visit <https://ew-nutrition.com/>

New Breeder Book Aims To Aid In Management, Performance, And Sustainability

Novus's latest publication showcases insights and experience of industry experts around the world

SAINT CHARLES, MO (July 19, 2022) – “This book is perhaps needed now more than ever as we see the escalating increase in meat protein production and consumption worldwide.” This statement, written in the preface of a new publication on breeder production that Novus International, Inc. will release in August, highlights an industry reality – demand for safe, quality, nutritious meat protein is growing but producers face challenges.

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.

“We know in order to meet the production goals of tomorrow, each part of the industry must work together today,” said Sandrine Durox, Novus poultry solutions manager who serves as book co-curator together with Novus Executive Regional Technical Services Manager Silvia Peris and Professor Johan Buyse of KU Leuven, who served as scientific coordinator. “This book brings together the knowledge and know-how of academics, researchers, industry leaders, breeding companies, nutrition companies, veterinarians, and nutritionists to consider how each part of the broiler breeder's lifecycle can be impacted to optimize performance and

positively impact the producer and the industry.”

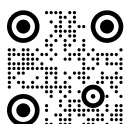
Those in the industry and academia will likely recognize the book's contributors:

Eddy Decuypere of KU Leuven, Aitor Arrazola of Perdue University, Rick van Emous and Annemarie Mens of Wageningen Livestock Research, Henk Enting of Cargill, Dinabandhu Joardar of Cargill, Edgar O. Oviedo-Rondón of North Carolina State University, Rebecca Forder of the University of Adelaide, Johan Buyse of KU Leuven, Juan Carlos Abad and Robin Jarquinof Cobb-Vantress, David Cavero Pintado and Xabier Arbe Ugalde of H&N International, and Stanislaw Budnik, Juxing Chen, Silvia Peris, Hugo Romero-Sanchez, and Mercedes Vázquez-Añón of Novus.

“It was important to have contributors from recognized academia, as well as experts from the industry and breeding companies, to properly cover the vast array of topics ranging from practical management, nutrition (quality and quantity), welfare, (epi)genetics and physiology,” Buyse said.

Novus will host the official book launch on August 8 during the World's Poultry Congress 2022 in Paris.

Presented by the France branch of The World's Poultry Science Association, the 26th annual Congress includes a five-day scientific program covering sustainability, health, nutrition, genetics, meat quality, broiler management, and





other topics on species ranging from chicken, turkey, and duck to geese, quail, pigeons, and more. The event is expected to attract more than 3,000 participants from 100 countries.

Novus is a gold sponsor of WPC 2022.

“The World’s Poultry Congress is the perfect venue to launch this book,” said Hugo Romero-Sanchez, Novus global poultry solutions executive manager. “The goal of WPC is to contribute to solving the challenges of poultry production for the benefit of the global population. This book takes that goal and focuses on the breeder sector with an emphasis on broiler breeders, which is responsible for not only maintaining the health and productivity of the parent flock but also the success of their progeny.”

Launch activities during WPC at Le Palais des Congrès de Paris are scheduled to include a seminar on excerpts from the book and an author meet & greet. Those interested in participating should visit the Novus booth at WPC (FO2) for details and to download a free digital version of the book. Hardcover versions will be available at regional launch events that Novus will host throughout the remainder of this year.

[Click here](#) to reserve a complimentary digital version of the book.

For more information about the launch event at the World’s Poultry Congress, visit www.NovusInt.com/Events.

Novus International, Inc. is a leader in scientifically developing, manufacturing, and commercializing nutrition and health solutions for the animal agriculture industry. Novus's portfolio includes ALIMET® and MHA® feed supplements, MINTREX® chelated trace minerals, CIBENZA® enzyme feed additives, NEXT ENHANCE® feed additive, ACTIVATE® nutritional feed acid, and other feed additives. Novus is privately owned by Mitsui & Co., Ltd. and Nippon Soda Co., Ltd. Headquartered in Saint Charles, Missouri, U.S.A., Novus serves customers around the world. For more information, visit www.novusint.com. ©2022 Novus International, Inc. All rights reserved.

Book reservation link: <http://www2.novusint.com/l/36552/2022-07-13/5vj9rn>

Cutline for image (attached): Novus will launch its latest publication, **Breeder Management and Nutrition: Moving the industry forward**, at World Poultry Congress 2022 in August.



Technical Seminar



IPJA Conducts a Rewarding Technical Seminar for Farmers in Karnal, Haryana

Indian Poultry Journalists' Association (IPJA) conducted its 17th technical seminar in Karnal, Haryana on 16th July 2022 in Hotel Vivaan. The technical seminar was attended by over 350 people from the Poultry fraternity, comprising Poultry farmers, breeders, integrators, Poultry equipment manufacturing companies, pharmaceutical companies, veterinarians, and traders.

All the delegates were welcomed by members of the Indian Poultry Journalists' Association.

The technical seminar started at 10.30 AM with registration. Mr. B. S. Rana, president of IPJA in his welcome address, presented the facts and figures about the poultry industry and also the problem being faced by Poultry farmers due to increasing rates of Soya and Maize. He stressed putting coordinated efforts to tide over the recent crisis being faced by the Poultry industry on several fronts right from feed to cage ban.

In his welcome address, he also spoke about the work done by IPJA in educating

the farmers by conducting technical seminars in different parts of the country. He also thanked the sponsors for their support and appealed to all the companies to come forward and support the IPJA in its selfless efforts toward the poultry farming community.

He informed the audience that the next seminar will be held in AJMER on August 20th and then in Raipur on October 8th.

Mr. B. S. Rana also said that after the forced break due to COVID 19 for the last 2 years, IPJA has again declared the 7th edition of the IPJA global Award on November 24th at Hotel Avasa in Hyderabad.

After the welcome address, IPJA also felicitated Mr. Gurdeep Singh, Mr. Ranpal Dhanda, Mr. Ramesh Khatri, Mr. P. Chakradhar Rao, Mr. Shirish Dhopeswar, Mr. Bisla, Dr. M. L. Kansal, Dr. S. K. Bhardwaj and Mr Ravi Sabarwal by presenting the flower Buckey.

After felicitation, the first presentation was made by Mr. Vijay Sardana who in his address, spoke about the problem faced by



Poultry industry and suggested the audience to put collective efforts to tackle the situation. He said that the time is changing and there is no scope for remaining in isolation to solve the problem. We will have to sit together and decide our future in this industry.

He further said that we had missed several opportunities which were capable of changing our fortune like export opportunities available due to the Ukraine war.

He said that still we have the option either to change ourselves from the mindset of just being the producers to be marketing experts or remain silent spectators of our business being taken over by multinational marketing companies.

Mr. S K Malhotra, M.D- Interface Pharmaceutical presented the 1st sponsor's presentation, and told the audience about his products, ruling the Indian Poultry market successfully for the last several years.

The next speaker was Dr. Ganesh Darban who spoke on Emerging and re-emerging diseases and their control. While speaking on the subject he told the gathering that the poultry industry has suffered a lot due to several prevalent diseases and new emerging diseases and told that these must be tackled on different fronts. He said that though biosecurity is important to prevent the diseases on the farm but once it has entered it needs to be effectively tackled by proper medication and vaccination. He said that timely vaccination can safeguard poultry farms from disease outbreaks.

Dr. Ganesh Darban also spoke about his company VAKSINDO and its several effective portfolios available in the market and also about the future plans of VAKSINDO and its commitment to the farming community.

The next presentation was from Dr. Devendra Hooda who spoke on the Managing Respiratory complex in Tropical Environment Condition using Available Tools.

He told the audience that before attempting to provide medication to birds it is very important to understand the bird and its behavior. The audience was thrilled to know so many things about the poultry birds, especially their respiratory capacity.

After Dr. Devendra Hooda, Dr. Dinesh Singh, representing Aviagen India, gave sponsors' presentations. His technical presentation was on "Ectoparasite of

Poultry" in which he described the losses poultry farmers are making all over the country due to these small creatures. The carrier of various lethal diseases, these parasites must be eradicated on a priority basis.

Next, the speaker was Mr. Shirish Dhopeswar, who spoke on Profitable Waste Management. He said that nowadays it's very important to make sure that disposable poultry waste is done in a responsible and sensible way to save the environment. He said that proper disposal of different kinds of poultry waste in the scientific method can help in converting poultry waste into wealth. He explained the different equipment available with Dhopeswar Engineering Works to convert poultry waste into wealth. Mr. Dhopeswar also represented Poultry India as IPEMA - Secretary and informed the audience about the much-awaited show Poultry India 2022.

After Lunch, Dr. Sulav from Provet Pharma introduces the audience to the activities and mission of Provet Pharma. He also explained the Vision of Mr. Muthu Selvan, founder of Provet Pharma have seen about the Indian Poultry and aqua Industry and how their efficient team is sourcing the information from the ground level about Feed Consumption and regulations can be vital for future predictions of the Indian Poultry Market.

Next speaker was Mr. P Chakradhar Rao, a specialist in the manufacturing of drinking nipples and other equipment in Hyderabad made a PowerPoint presentation on Water Management in Poultry. He started by informing the gathering that it's very important to provide clean drinking water to Poultry birds. Clean water can save birds from several diseases. He said that it's also very important to provide the correct quantity of water to Poultry birds because the water intake can considerably affect the digestive system of birds. He also spoke about the chakra group of companies and its presence in India and overseas.

Since Mr Chakradhar Rao is also the president of Indian Poultry Equipment Manufacturers Association which organizes the Poultry India Exhibition said that this time poultry India Exhibition will take place from 23 to 25 November and the Knowledge Day on 22nd November and invited all the gathering to visit poultry India Exhibition by staying there for all the three days to know about the latest technologies available in India.

The next sponsor's presentation was from Varsha Group Bangalore which explained their Businesses in India. Headquarters in Bangalore - India, Varsha Group has grown exponentially under the leadership of Mr. Nanjaya, Founder of Varsha Group. Dr. Somasekar of Varsha Group also explained the CSR activities including a multi-specialty hospital in Bangalore for needy people.

The last presentation was made by Dr. Someshwar Zadbuke, Vice President - Strategic Marketing, Noveltech India, on "Feeding challenges in Poultry Industry".

Mr. Ricky Thaper, Mr. Gurdeep Singh, and Mr. Ranpal Dhanda, President P.F.I also addressed the gathering and informed the gathering of the work done by the Poultry Federation of India in the field of poultry industry by regularly coordinating with policymakers in Delhi.

Event partners of this technical seminar were INTERFACE Pharmaceuticals and POULTRY INDIA, as also the gold sponsors were Vaksindo, Provet, Aviagen and sponsors were Chakra Group, Dhopeswar Engineering Works, Varsha group, NOREL, ABTL, VH group, presented with mementos and flower buckeye. Mementos and flower buckeyes were also presented to all the speakers.

IPJA also felicitated the Poultry Federation of India, All India Poultry Breeders Association, and the Indian Poultry Equipment Manufacturers Association for their outstanding contribution to the development of the poultry industry in India.

Mr. Baljinder Singh Aghi of the Aghi group and a member of IPJA was also felicitated on this occasion.

While speaking to the Senior correspondent of Karnal Breaking News, Mr. B. S. Rana, President - of IPJA, told about the problem faced by the Poultry industry and the benefit of technical seminars by IPJA. Mr. M. K. Vyas, secretary of IPJA reiterated the demand of constituting a Poultry development board for better coordination between industry and policymakers. He also appreciated the government's support in allowing 5 LMT of soya. Mr. Shashank Purohit, Joint Secretary - IPJA stressed upon working on balancing the demand and supply in different parts of the country to arrest the fluctuations in the prices of eggs and chicken. He also said that to cope up with the volatile weather, demand of the time is to convert open houses into EC houses.

A vote of thanks was given by Mr. Shashank Purohit, Joint Secretary IPJA.


 KEMIN | 61 SINCE '61


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From left R Gopalakrishnan , Chris Nelson and Suresh Mahalingam

Kemin Industries South Asia Celebrates '61 Since' 61– A Celebration of Partnership'

Chennai, Tamil Nādu-India (9th July 2022) Kemin celebrated the "61 Since '61-Celebrating Partnership"-themed anniversary, to acknowledge the essence of partnerships along with its key stakeholders in South Asia. The event took place on the 9th of July in The Leela Palace, Chennai, Tamil Nadu.

Kemin crafted the theme 'Celebrating Partnership' to acknowledge the essence of partnerships, innovations, and care for communities, which they have been practicing in association with their partners across the globe, for the past 61 years.

The invitees of the event included key customers, distributors, and media representatives from across the business units of Kemin. As keynote speakers, quite unconventionally, Kemin invited the top two business professionals, R Gopalakrishnan and Suresh Mahalingam who had served in leading capacities in the TATA group, which is the most respected organization in the Indian subcontinent for upkeeping the business values and business partnership. In addition, Kemin partnered with a group of design thinking enthusiasts who conducted a workshop in which the participants along with the Kemin team engaged in building up the Partnership Wall in a unique storytelling pattern. The participants were divided into teams and were given separate pieces of puzzle boards to color with their own creativity. At the end of the session, those pieces were assembled to build the Wall of Partnership. Thus, the workshop

gave the opportunities for the attendees to create a cohesive experience, reinforce the importance of partnership, and connect the participants of the event.

The celebration evening kick-started with a Kemin 'formulated' special mocktail, named Shirly'61 which was tossed with all the participants in the event. The evening was also graced by well-themed performing artists and musicians. They epitomized Kemin's innovation, multinational footprints, and partnership with the confluence of hip hop, flamenco, Chinese lion, Irish Folk, Bharatnatyam fusion, and Brazilian carnival styles. The audience was enthralled by the performances and the celebration.

To acknowledge the role of media in the industry, Kemin invited top media representatives from the livestock and food industries, and a press conference was organized with the panel comprising Chris Nelson (President & CEO, Kemin Industries Inc. USA); Ramesh GS (Group President Animal Nutrition & Health); R Sureshkumar (President Kemin Industries-South Asia); C Sugumar (Commercial Director-Aquasciences™); Michelle Lim (President, Kemin Food Technologies). Around 20 questions



were deliberated in this session which was moderated by Tanweer Alam(Director-Marketing).

Kemintook this opportunity to convey gratitude to all its customers and business partners for the mutual trust and confidence bestowed upon the organization for the past 61 years and is confident that this will further strengthen a strong foundation of trust with the partners in the coming decades as well.



Opening remarks- **Chris Nelson**
(President & CEO, Kemin Industries Inc. USA)



Partnership Workshop



The celebration



Building The Wall of Partnership



The Wall of Partnership



Fusion dance Cultural Program



Tossing Shirley '61



Press Meet session



Sapience Introduces Xcel시오, An Updated Version of eXolution



Sapience is pleased to announce a better and improved version of eXolution-Xcel시오 (a natural feed additive) for broilers, layers, and breeders on July 14th at Hotel Lakshaya Inn, Jind, Haryana. After years of cutting-edge research in Korea, the company has developed an advanced formulation to make Xcel시오 more potent than before.

Xcel시오 contains a more concentrated bacteriophage cocktail and is fortified with more bacillus subtilis. This new and improved formulation, designed specifically for use in poultry, is simply unmatched in terms of pathogenic bacteria control, giving complete gut control.

The evening started with the welcome address by Mr. Hari Shankar Khurana (Business Manager) followed by Dr. T. Rajaram (General Manager) and the Guest Speaker Dr. Jayaraman.

factors & bacteria affecting equilibrium. He also emphasized the strategies that farmers and breeders are using to control pathogenic bacteria.



Dr. T. Rajaram (General Manager) thanked all the customers and business partners for their continuous support.



Dr. Jayaraman highlighted the importance of Gut Health Equilibrium,

for more info visit:
Sapience Agribusiness Consulting LLP



Dr. Anupam Kumar Shrivastava, National Technical Manager, Zoetis Poultry BU, has been appointed to the Government of India's National Advisory Committee for Animal Husbandry and Dairying.

Dr. Anupam would interact and collaborate closely with the policymakers of the Government of India, and he would also have numerous opportunities to assist the Indian Government in achieving India's Vision and Direction for Animal Husbandry.



Dr. Sanjib Kumar Pratihari

M.Sc (Dairy Nutrition), & Ph.D. (Animal Science)

BDM - East Region

More than 20 years of experience as a sales & Marketing person in feed industry in different organizations, at key positions.

Also worked as a nutritionist in poultry & cattle.



Congratulations to on being appointed to the National Advisory Committee for Animal Husbandry & Dairying Sector

Congratulations to **Dr. Saurabh Shekhar, General Manager - Nutreco South Asia**, on being appointed to the National Advisory Committee for Animal Husbandry & Dairying Sector (Ministry of FAH&D, Govt. of India)



Fresh to Home expands its product line and introduces India's first clean label ready-to-fry meaty snacks.



By launching India's first clean-label Ready-To-Fry (RTF) meat snacks on its platform, FreshToHome has successfully bridged the gap between great taste and good food. FreshToHome has recently been named the world's largest fully integrated online brand in fresh fish and meat e-commerce.

Its lip-smacking assortment of crunchy snacks, which contain no preservatives or artificial additives, provides a quick and guilt-free fix for satisfying people's munching needs throughout the day. This Signature Snacks collection includes 8 chicken-based snacks made with prime cut meats and real, familiar ingredients that are ready in under 5 minutes, as well as 2 vegetarian options.

"We are proud and excited to introduce on our platform India's first clean-label Ready-To-Fry meat-based snacks, catering to the 'chotibhook' and munching needs of our consumers," said Shan Kadavil, Founder of FreshToHome. We wanted to launch snacking options that are distinct from the market because the RTF category is a huge opportunity."

"And the best approach was to launch a range that embodied the FreshToHome promise of no chemicals, no preservatives, and no shortcuts while providing a superior taste experience." Unlike most snacking brands, which have E numbers (denotes food additives) displayed inconspicuously at the back of the packaging, it is our commitment to provide our consumers with a clean label product without sacrificing quality or taste," he added.

FreshToHome's Signature Snacks also make an excellent party starter when entertaining friends and family. Crunchy

Chicken Nuggets, Chicken Chilli Garlic Fingers, Crunchy Chicken Popcorn, Crispy Chicken Chipotle Fries, Crunchy Chicken Kebab Bites, Chicken and Cheese Nuggets, Chicken Jalapeno Poppers, Chicken Burger Patty, Veg Burger Patty, and Cheese Corn Nuggets are among the products available.

Saudi Arabia intends to invest \$5 billion to achieve self-sufficiency in poultry meat production.

Saudi Arabia plans an SR17 billion (\$5 billion) investment to boost poultry production as the Kingdom strives for an 80 percent self-sufficiency rate in poultry meat by 2025, according to the Saudi Press Agency.

According to Saudi Minister of Environment, Water, and Agriculture Abdulrahman Al-Fadley, by aiming for 1.3 million tonnes of broiler chickens per year, the ministry will ensure national food security, increase local content, and create job opportunities.

This move follows an increase in poultry meat self-sufficiency from 45 percent in 2016 to 68 percent in 2022.

The Agricultural Development Fund's financing for companies seeking to expand the poultry production industry reaches 70% when cutting-edge technologies are used, according to Al-Fadley.

In a related development, Ibrahim Qassem, the director-general of MEWA's Animal Resources Services, told CNBC Arabia that the number of livestock projects in the Kingdom exceeded 980 across all regions.

However, feed prices have risen by more than 90% due to prevalent global factors, which are reflected in livestock prices, according to Qassem.

He added that the ARS had developed an initiative to investigate and combat animal diseases, reducing losses by 25 percent.

USSEC introduces Nepal's first feed label, 'Soy Fed.'

The US Soybean Export Council (USSEC),

in collaboration with Right To Protein, has announced the launch of Nepal's first feed label, 'Soy Fed,' for animal protein product producers, as part of a two-day programme.

The feed label, according to USSEC, will raise awareness about protein-rich sources and highlight its role in quality protein consumption for animals and humans.

Deeba Giannoulis, head of marketing for USSEC South Asia and Sub-Saharan Africa, said at the programme that the 'Soy Fed' label is an attempt to educate the industry and consumers about high quality protein sources for animal feed.

"The 'Soy Fed' label is our contribution to Nepal's health agenda in order to meet protein sufficiency targets. We want to educate both industries and consumers about soy as a quality protein source for animal feed, as well as make them more aware of their protein feed options," she stated.

Similarly, Pawan Kumar, USSEC's lead-Nepal, stated that soybean meals are high in protein and high in highly digestible protein. "With the introduction of the 'Soy Fed' label in Nepal, we are making concerted efforts to highlight the importance of quality protein consumption and to raise awareness about the need to know what livestock are fed," he explained.

Furthermore, Nepal Poultry Federation President Guna Chandra Bista stated that there is a shift in consumer mindsets in Nepal, where ingredient transparency and food labels help them make better and more informed choices, and that consumers have the right to know that the products they consume are safe and nutritious. Because of its superior amino acid profile and amino acid digestibility, soybean meal has a significant impact on the growth and development of livestock, poultry, and fish.



August 2022

1. Livestock Asia

Dates: 10 – 12 AUGUST 2022
Venue: MITC Complex
City: Melaka
Country: Malaysia
Email: livestockmalaysiamy@informa.com
Website: www.livestockmalaysia.com

2. Livestock Philippines 2022

Dates: August 23 - 25, 2022
Venue: World Trade Center
City: Pasay city
Country: Philippines
Email: rita.lau@informa.com
Website: www.livestockphilippines.com

September 2022

1. Victam Asia 2022

Dates: 7 - 9 September 2022
Venue: IMPACT Exhibition Center
City: Bangkok
Country: Thailand
Website: www.victamasiamy.com

October 2022

1. Sommet-elevage, France

Dates: 4 - 7 October 2022
Venue: Grande Halle Showgrounds
City: Clermont- Ferrand
Country: France
Website: www.sommet-elevage.fr

2. VIETSTOCK 2022

Dates: 12 - 14 October 2022
Venue: Saigon Exhibition & Convention Center (SECC)
City: Ho Chi Minh City
Country: Vietnam
Website: www.vietstock.org/en-us

3. The Poultry Expo @ The Livestock & Agri Expo

Dates: October 28-30, 2022
Venue: India Expo Center & Mart
City: Greater Noida
Country: India
Email: info@pixieexpomedia.com
Website: www.pixieexpomedia.com

November 2022

1. EuroTier

Dates: 15 - 18 November 2022
Venue: Deutsche Messe AG
City: Hannover
Country: Germany
Website: www.eurotier.com/de

December 2022

1. Agri Livestock

Dates: 02 - 04 December 2022
Venue: Myanmar Expo Hall
City: Yangon
Country: Myanmar
Website: www.agrilivestock.net

Editorial Calendar 2022

Publishing Month: January Article Deadline : 30th, Dec. 2021 Advertising Deadline : 3rd, Jan. 2022 Focus : Disease Prevention	Publishing Month: February Article Deadline : 30th, Jan. 2022 Advertising Deadline : 3rd, Feb. 2022 Focus : Nutrition Management	Publishing Month: March Article Deadline : 28th, Feb. 2022 Advertising Deadline : 3rd, March 2022 Focus : Vaccination	Publishing Month: April Article Deadline : 30th, March 2022 Advertising Deadline : 3rd, April 2022 Focus : Heat Stress
Publishing Month: May Article Deadline : 30th, April 2022 Advertising Deadline : 3rd, May 2022 Focus : Cold Chain Mgmt.	Publishing Month: June Article Deadline : 30th, May 2022 Advertising Deadline : 3rd, June 2022 Focus : Feed Production	Publishing Month: July Article Deadline : 30th, June 2022 Advertising Deadline : 3rd, July 2022 Focus : Layers, Cages, Eggs	Publishing Month: August Article Deadline : 30th, July 2022 Advertising Deadline : 3rd, August 2022 Focus : Genetics & Breeding
Publishing Month: September Article Deadline : 30th, August 2022 Advertising Deadline : 3rd, September 2022 Focus : Biosecurity	Publishing Month: October Article Deadline : 30th, September 2022 Advertising Deadline : 3rd, October 2022 Focus : Winter Management	Publishing Month: November Article Deadline : 30th, October 2022 Advertising Deadline : 3rd, November 2022 Focus : Environment Control	Publishing Month: December Article Deadline : 30th, November 2022 Advertising Deadline : 3rd, December 2022 Focus : Industry Outlook

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