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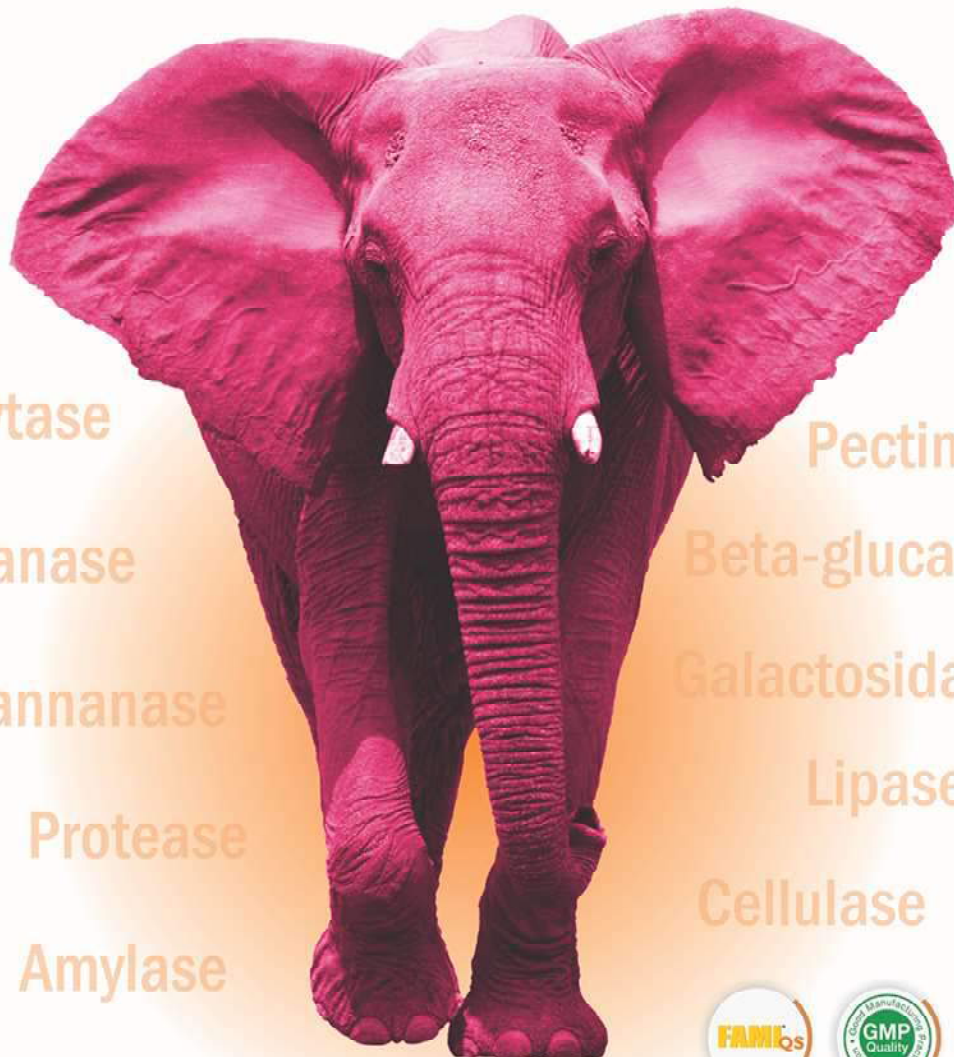
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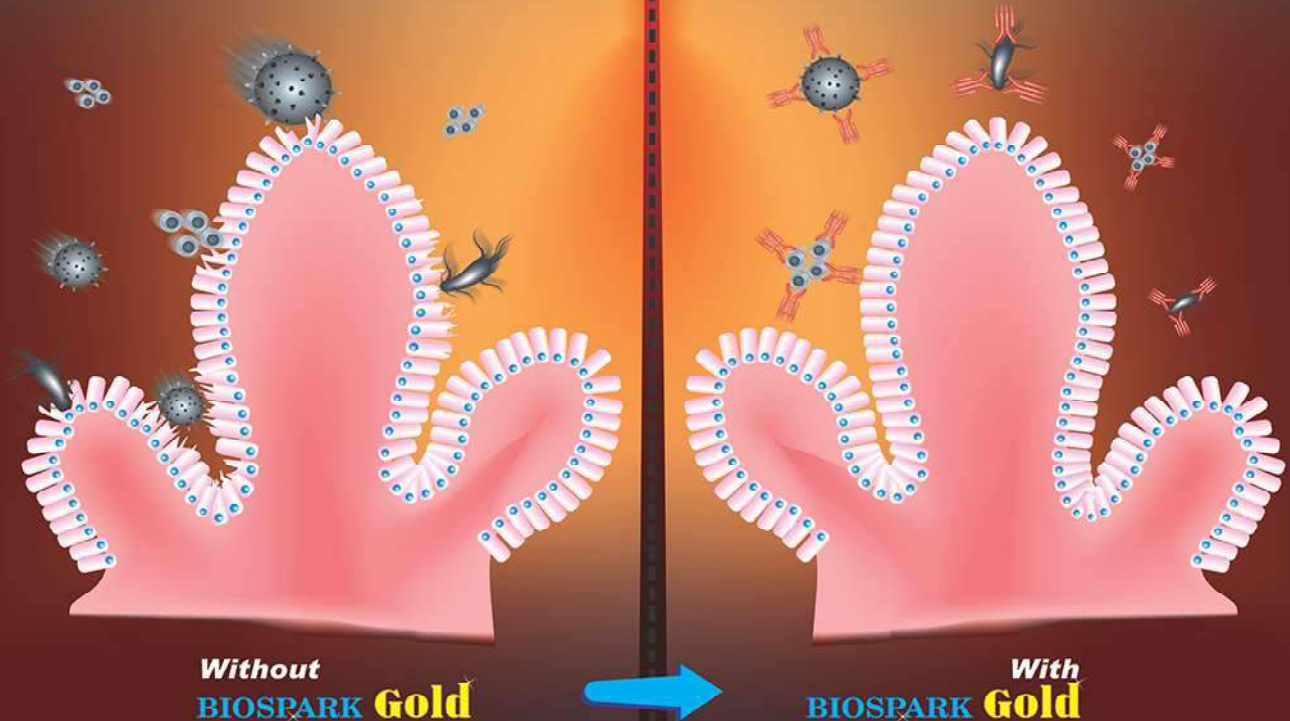
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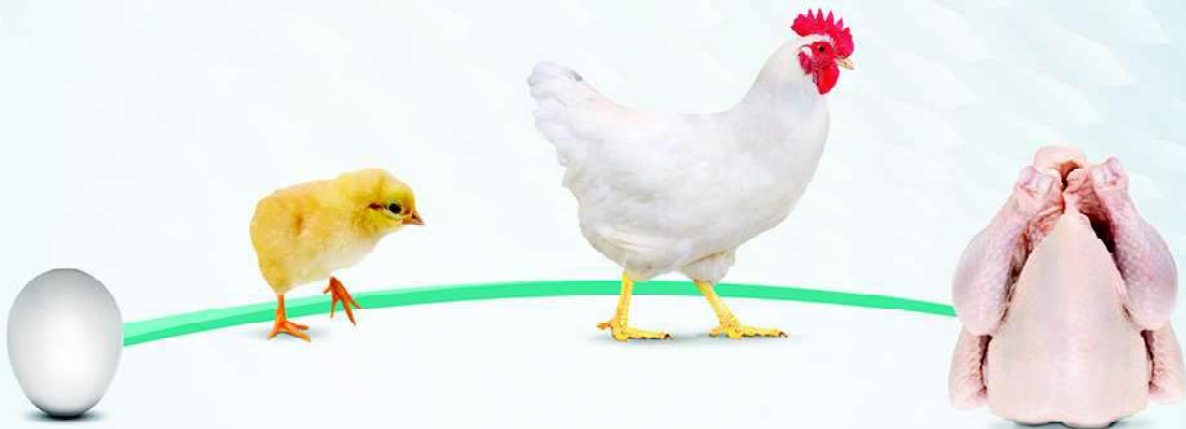
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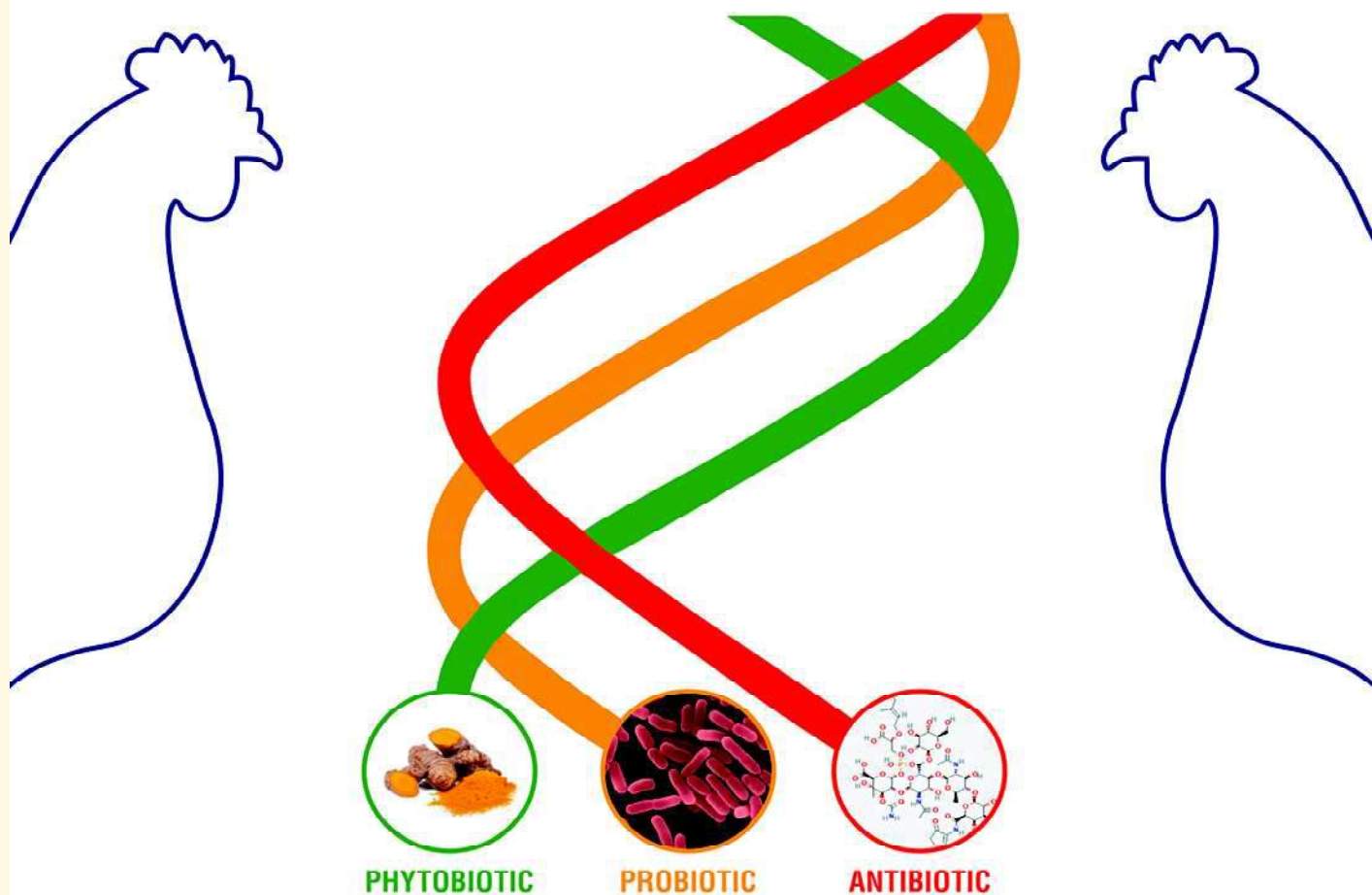
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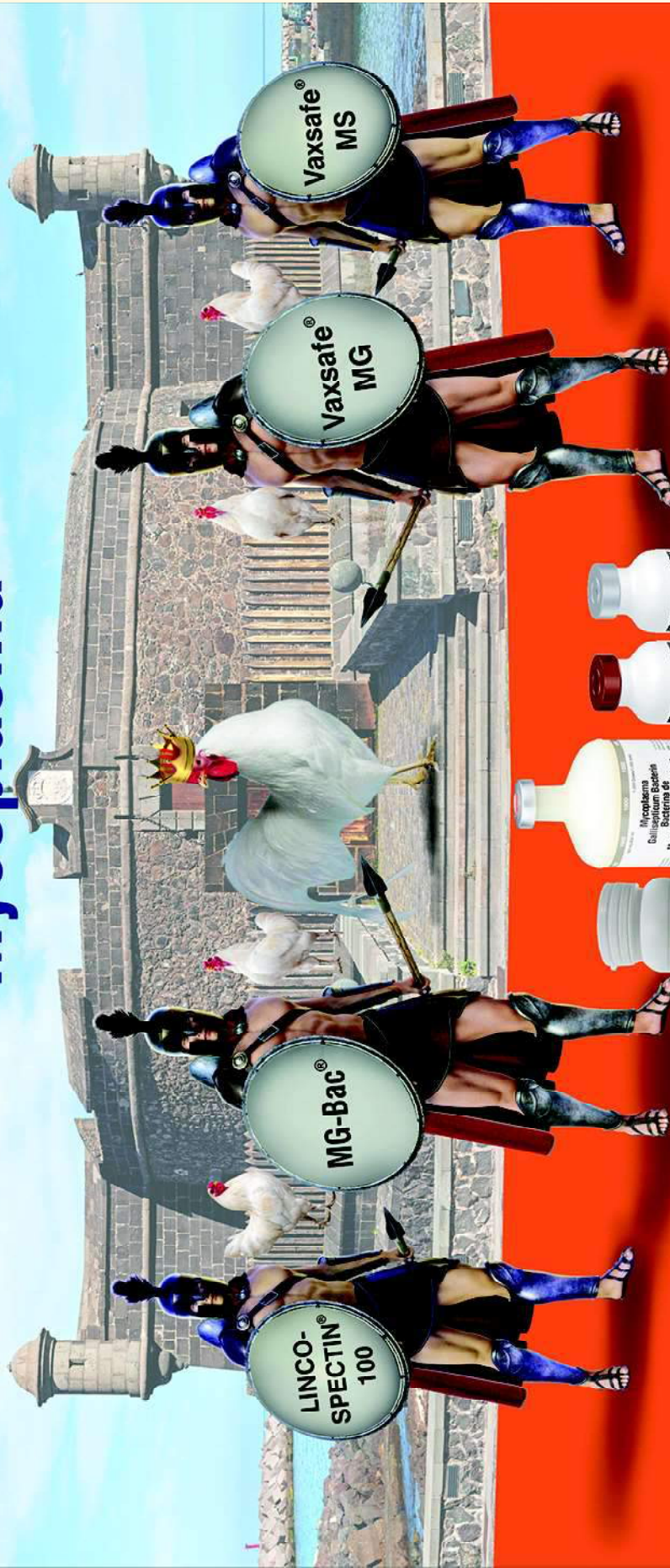
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JUN2022

Zoetis India Limited conducted Series of Technical Seminar on “Best approach to control Mycoplasma in Poultry” at Hyderabad , Bangalore and Coimbatore

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

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

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

Events started with welcome note from Dr Bhushan Gangurde (Group product Manager - Poultry) followed by brief introduction of the speakers Dr S R Anand and Dr Anupam Kr Srivastava . Dr S. R. Anand was the guest speaker along with Dr Srivastava who is National technical Manager at Zoetis India Limited for all the events conducted at Hyderabad, Bangalore, and Coimbatore. Dr S. R. Anand shared his insight about current scenario of poultry industry and difficulties faced by Indian Farmers. He specifically mentioned that how Mycoplasma is slowly affecting the health of the birds and reducing the productivity. He provided insight into various options to tackle Mycoplasma by the wide usage of live and killed vaccine. According to Dr. S. R. Anand, Anti-mycoplasma drugs are not meant to provide long term solution. Continuous use of Anti-mycoplasma drug will lead to development of resistance against Mycoplasma. He mentioned that it's only vaccine which will provide long term sustainable solution against Mycoplasma. Dr S. R. Anand mentioned that Mycoplasma gallispeticum and Mycoplasma synoviae are highly prevalent in India. He shared many reports of ELISA titers showing Mycoplasma infection in the farms. In his opinion Mycoplasma gallispeticum symptoms are more visible in the forms of clinical signs

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

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

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

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

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

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Technical Seminar Participants



Question and Answer session with participants



Zoetis India (South Team)



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Ongole	121	126	131	131	136	139	142	145	148	151	154	157	157	152	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150

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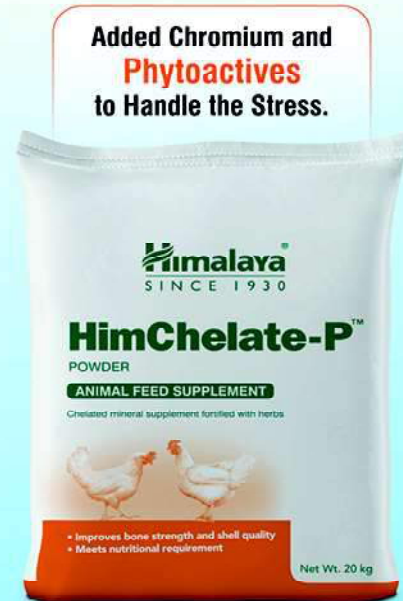


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Amelioration of Heat Stress in Poultry through Phytogetic Feed Additives

Dr. Antra Gupta¹, Arif Ashraf Kichloo², Nazam Khan³, Vikas Mahajan⁴, and Dr. Suraj Amrutkar⁵

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Introduction:

Globally, the poultry industry is gaining momentous importance among the agricultural and its associated sectors. In poultry birds, heat stress reduces the growth, reproductive performance, and egg production. Heat stress is a serious problem in poultry farming that results due to imbalance between heat of production and heat dissipation. Numerous factors which aggravate heat stress are environmental factors (sunlight, thermal irradiation, air temperature, humidity, and stocking density) and birds-related factors (body weight, feather coverage and distribution, dehydration status, metabolic rate and thermoregulatory mechanism). Absences of sweat glands in bird are making them highly prone to heat stress. There is reduced feed intake, poor appetite, impaired digestion and lowered digestive enzyme activity during high ambient temperature, thus adversely affects growth performance of birds and meat quality. It impairs intestinal morphology, digestive and absorptive capacity and increased permeability to luminal antigens and toxins. As it adversely changes metabolic status and physiological equilibrium in birds, there is aggravation of health problems and mortality rate. There is drop in egg production, reduction of egg size, poor egg shell quality apart from cannibalism, change in semen quality, bone metabolism. There is change in behavioural, physiological and neuroendocrine system which affects health and performances.

Phytogetic feed additives, known as PFAs, are substances of plant origin added to animal diets, known to have a range of bioactive properties. Herbs, spices, essential oils, and plant extracts all serve as sources for bioactive compounds, e.g.

phenols and flavonoids. They are incorporated into poultry feed to enhance their productivity through the improvement of digestibility, nutrient absorption and elimination of pathogens resident in the animal gut. Phytogetic feed additives are either available in a solid, dried and ground form or as extracts or essential oils. Usually, phytogetics vary seriously in their chemical ingredients, depending on their composition and influences of climatic conditions, locations or harvest time. Hence, differences in efficacy between phytogetic products which are currently available at the market can be attributed mainly to differences in their chemical composition.

Phytogetic feed additives containing phenolics can improve the resistance of broilers to heat stress. At the same time, several studies have reported effects on intestinal microflora when herbs and essential oils have been included in broiler diets. Herbs, spices, and various other plant extracts are being evaluated as alternatives to antibiotics and some do have growth promoting effects, antimicrobial properties, and other health-related benefits. Herbs and spices frequently used in phytogetic feed additives are Oregano, Thyme, Horseradish, Garlic, Peppermint, Cinnamon, Anise, Chili (cayenne pepper).

Benefits of PFAs:

Benefits of PFAs are cost reduction, performance and productivity improvement, health and welfare improvement, integrating new technological and management innovations, antibiotic reduction, digestibility, quality of ingredients and consistency of formulation of feeds and supplements, by-products, emissions and waste production, antibiotic reduction strategies that utilize

alternatives to provide suitable health and welfare benefits. A further literature review showed that the main advantages of PFA application can include reduced risk of enteric imbalances, improved growth performance, stimulated feed intake, increased egg production, reduction of mortality, better acceptance of feed ingredients with unpleasant taste, Improved meat quality (in terms of taste, colour or texture), improved barn-climate including reducing unpleasant odour and toxic gases, no withdrawal period in most cases, no harmful residues in animal products.

There are four major families of phytochemicals: essential oils (oregano, rosemary), saponins (yucca plant), tannins (sorghum, gallnut, tree bark) and flavonoids (citrus fruit, green tea), and their efficacy as a protective mechanism for poultry health depends largely on the plant from which they are derived. Essential oils, tannins and saponins are most commonly used in poultry production. Phytochemicals like tannins – which include tannic acid – and essential oils – which include oregano extract – have specific modes of action (MOA) similar to certain antibiotics used in poultry production.

There are two broad types of tannins: hydrolysable and condensed tannins. They have a general mode of action comprising antimicrobial activity that comes from the binding of proteins that inhibits the growth of a microbe. Condensed tannins include molecules from sorghum and grapes; whereas, hydrolysable tannins are primarily found in tree bark and gall nuts. The hydrolysable tannins are based on tannic acid and were chosen specifically for their bioactivity against poultry pathogens. Using tannins in poultry diets is a balancing act. What's most important is to maximize tannins benefits on intestinal health without impacting nutritional requirements.

Phytochemicals and herbals and their extracts and essential oils manifested appetite-stimulating, growth promoting, and immune-stimulatory activities in poultry production. A particular focus has been given to Aloe vera as natural immune-

stimulants and antioxidant agents in poultry production. Aloe vera is a tropical plant belonging to the Liliaceae family and is well-known for its therapeutic and remedial properties associated with its content of bioactive components. It has abundant amounts of polysaccharides (e.g. acemannan), which act as immune-modulatory and antibacterial agents against harmful bacteria. Aloe vera gel is resistant to high acidity in birds' intestines, which guarantees its efficacy and influence. Aloe vera gel has an antibacterial effect to kill pathogenic microorganisms by breaking down their cell walls and weakens their activity and allowing the beneficial microorganisms to show its effect on the digestion of nutrients. Aloe vera gel enhances the permeability of absorbed nutrients through the intestinal barriers. Accordingly, the potential impact of Aloe vera gel on the immune system is attributed to the enhanced local intestinal immunity. Aloe vera gel has abundant amounts of polyphenols and natural antioxidants that scavenge the overproduction of free radicals that induce lipid peroxidation and immune cells damage which can be exploited to alleviate heat stress in poultry. Additionally, the application of Aloe vera gel as feed additives enhanced the immunity of broilers and was suggested as a replacer for antibiotics.

It has been found that the plasma concentration of antioxidant vitamins such as vitamin C and E reduced and oxidative damage increased in birds during heat stress condition. Several studies have reported that administration of vitamin C alleviates the deleterious effects of heat stress on performance and metabolism of broiler chickens. In fact, vitamin C is the first line of defence against reactive oxygen species in the body. In birds, it is generally synthesized in kidneys, but its quantity is not enough during heat stress condition since the rate of its usage for scavenging of the free radicals is increased. The ascorbic acid content in lemon (*Citrus limon*) juice obtained by fruit squeezing is reported to be 54.74 mg/100 ml. It is reported that addition of lemon juice to drinking water improved

immunity of broiler chickens under heat stress condition.

Thyme has been recognized as an important phytogetic feed additive which contains thymol and carvacrol. These components have antioxidant and antimicrobial properties, which can improve the nutrient digestibility as well as immunity. Thymol and carvacrol inhibit lipid peroxidation.

Mechanisms of Action of Phytogetic Feed Additives

Phytogetic compounds have a complex mode of action, a fact which has been a big myth even for those using these substances as additives in animal feed. The vast number of phytogetic compounds and differences in the composition of PFAs that were used in the various studies make it difficult to postulate a general mode of action that is applicable to all commercial PFAs in the market. In fact, the effectiveness of plant active ingredients has often been underestimated in recent years and it is not seldom that their mode of action has been misunderstood even by companies offering such products. It is often postulated that PFAs are anti-microbial. Indeed, many secondary plant ingredients and extracts do have such properties. The in-vitro anti-microbial activity of plants and plant ingredients is well documented through scientific finding and plants themselves can respond to bacterial or viral attack for example by producing “phytoalexins”. The focus on anti-microbial effects is largely driven by the argument that PFAs are substitutes for AGPs. However, it would be inappropriate to limit the value of phytogetic substances in animal nutrition to an anti-microbial effect only. Recently, more scientific data has been generated, which enables us to better understand the effects that PFAs have in the animal. With regards to an improvement in feed conversion, increased digestibility is considered a main effect of PFAs. Parameters influenced by PFAs include the secretion of digestive juices and enzymes, a modulation of the immune system, changes in the intestinal morphology, improvements in nutrient utilization and

Table 1. List of Phytogetic Feed Additives available in India

Common name	Latin word	Parts utilised
Aloe vera	Aloe barbadensis	Leaves
Anise	Pimpinella anisum	Seeds
Caraway	Carum carvi	Seeds
Cinnamon	Cinnamomum verum	Bark
Chamomile	Matricaria recutita	Flowers
Citrus	Citrus sp.	Peel
Clove	Syzygium aromaticum	Buds
Fennel	Foeniculum vulgare	Seeds
Garlic	Allium sativum	Bulb
Ginger	Zingiber officinal	Rhizome
Melissa	Melissa officinali	Leaves
Orange	Allium cepa	Bulbs
Oregano	Origanum vulgare	Leaves
Peppermint	Mentha piperita	Leaves
Rosemary	Rosmarinus officinalis	Leaves
Sage	Salvia officinalis	Leaves
Thyme	Thymus vulgaris	Leaves
Valerian	Valeriana officinalis	Root, Rhizome

consequently, a higher level of performance. However, the above-mentioned parameters are interrelated with each other. Positive effects of PFAs on the morphology of the small intestinal tissues, for example, are postulated to increase nutrient digestibility. Furthermore, a stabilization of the intestinal microbiota results in reduced levels of microbial metabolites in the digestive tract, hence relieving the immune system and increasing energy available for muscle accretion.

Phytogenics as valuable feed additives

The phytogetic feed additives may be included among supplements that are aimed to positively

affect feed quality, health of animals as well as animal products by means of their specifically efficacious substances. They can be classified into several groups: sensory additives (feed additives affecting the sensory properties of animal products), technological additives (antioxidants, substances decreasing mycotoxin contamination of feeds, etc.), zootechnical additives (immunomodulators, digestive stimulants, growth promoters of non-microbial origin, substances increasing performance or quality of animal products, etc) and nutritional additives (vitamins, minerals, plant enzymes, etc). Phytogetic additives are used mainly in the first three cases, however, a number of phytogetic additives have been demonstrated or are presumed to have more than one positive effect and cannot be strictly classified into the designated groups.

Reasons why poultry producers use phytogetics

Enhanced feed efficiency, Better uniformity, Enhanced egg production, Enhanced growth (carcass yield), Reduced medicinal costs, Less wet litter, Better meat quality, Increased feed intake, Emissions reduction (e.g. ammonia), Nutrient-sparing effect.

How to choose a PFA

There are a number of factors to consider in the decision to use a PFA, and which one to choose. In the first instance, such a decision will be helped by the availability of scientific and commercial evidence. The scientific understanding of PFAs in livestock continues to progress with the publication of new research findings. However, PFAs as feed additives are available in many different forms and formulations. Therefore, it is important to consider such evidence that relates to quality control, scientifically standardized formulations and also how a particular study relates to specific livestock sectors and production stage.

Consider that the diet supplemented with phytoadditives, which contain abundant

phytochemicals and can be used as growth promoters and antioxidants, is a satisfactorily feasible approach that has been developed to ameliorate the detrimental effects of animals under challenging conditions. Phytochemicals are bioactive compounds beneficial for growth and health, especially, phenolic compounds in plants are thought to be the major antioxidative compounds. Because of their wide application in the fields of poultry nutrition, pharmacology and agricultural industries, there is a great interest in the study of plant polyphenols for improvement of health benefits, where *Artemisia annua* could be a target plant. Phytogetic feed additives, known as PFAs or botanicals, are substances of plant origin added to animal diets at recommended levels with the aim of improving poultry nutrition and growth. PFA in the current scenario is gaining importance as it improved the growth performance in poultry. The possibility of phytogetic feed additives to promote growth in poultry is under preliminary research. Phytogetic feed additives are increasingly used in the food system; however, their mode of action is not well defined. Heat stress significantly increases birds core body temperature, water intake, and the hypothalamic expression of heat shock protein (HSP), whereas it decreases feed intake, BW, and woody breast incidence. Phytogetic feed additive “comfort” supplementation down-regulated the hypothalamic expression of HSP, reduced core body temperature, increased feed and water intake, and improved BW in HS broilers. At molecular levels, the effect of PFA-C on growth performance seemed to be mediated by modulation of hypothalamic expression of melanocortin receptor 2, arginine vasopressin, aquaporin 2, and sodium and potassium-transporting ATPase subunit beta 1 polypeptides. In summary, PFA-C supplementation ameliorates heat stress productivity losses via a potential cytoprotective effect, reduction of hypothalamic intracellular stress, and modulation of hypothalamic feeding- and drinking-related polypeptide expression.



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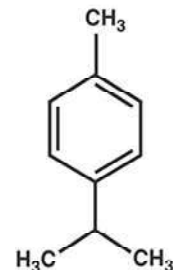
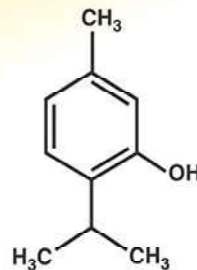
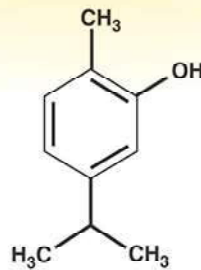


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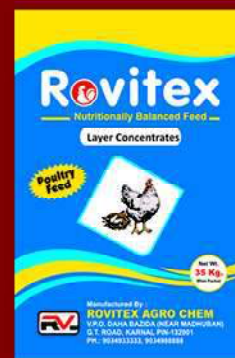
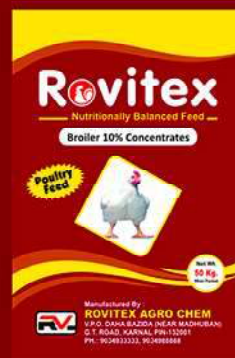
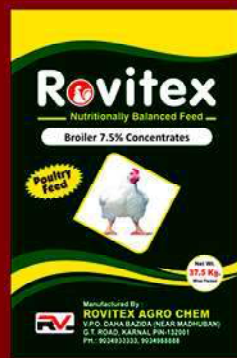
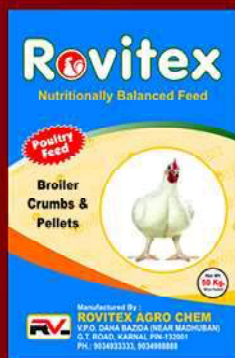
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- ❖ Broiler 7.5% Concentrates
- ❖ Broiler 5.5% Concentrates
- ❖ Broiler 3.5% Concentrates
- ❖ Broiler 2.5% Concentrates
- ❖ Broiler 1.5% Concentrates

Layer Concentrates:

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- ❖ Layer 10% Concentrates
- ❖ Layer 25% Concentrates
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Effect of Temperature and Storage Conditions on Chicken Eggs and its preventive measures

*Dr. Pallabi Das¹, Dr. Akshay R. Bariya² and Dr. Ajay S. Patel²

¹Assistant Professor (Department of Animal Nutrition), M.B. Veterinary College, Rajasthan.

²Assistant Professor (Department of Livestock Products Technology), Kamdhenu University, Junagadh, * Author: pallabidas066@gmail.com

Eggs are a cheap source of high-quality protein, essential vitamins, and minerals that are desirable for a healthy diet and a healthy life. By 2050, the world's population is expected to reach 9 billion, with the huge increase to protein needs. Global egg consumption has tripled in the past 40 years with consumer quality expectations increasing just as rapidly. But egg is a perishable food item as other livestock food and having a limited shelf life. Eggshell contain number of a porous microstructure that regulates the passage of water vapor, respiratory gases, and microorganisms between the inside of the egg and the surrounding environment. An ordinary hen's egg has more than 7500 pores, mostly at the blunt end of the egg. Prolonged storage of eggs leads to the escape of water and carbondioxide through the pores of the shell.

Number of factors that affect egg quality, shelf life, and consequently consumers' health. Environmental factors such as temperature, humidity, the presence of CO₂, and storage time are of prime importance in terms of the maintenance of egg quality. Storage time and temperature appear to be the most crucial factors that affect albumen quality. Eggs produced in farms could have good quality but because of poor handling and storage conditions in farms and in markets it could lead to losses in quality. Loss of water excessively from the egg through evaporation at a rate that is influenced by the temperature and relative humidity during the long-term storage conditions has generally been reported to be detrimental to egg quality. Some researchers have reported a decline in hatchability by as much as 5% per day after 7 d of storage. Albumen pH

increases with the loss of CO₂ from the egg. An increase in pH has been reported by extending the storage time from 2 to 30 d. Oiling of eggs within 24 h of lay has been reported to be effective in retarding albumen deterioration. The specific gravity and compression fracture strength of the eggs are also changed by storage time.

The temperature and relative humidity of storage, as well as the gaseous environment, interact with the fertile egg over time during storage affect the success of incubation either negatively or positively. This interaction occurs both above and below the "physiological zero", at which embryonic metabolism is minimal. The pH of albumen at oviposition (expulsion of the egg from the oviduct to the external environment) is about that of blood (7.6), which rises to as much as 9.0 to 9.5 with long-term storage. Storage of eggs in carbon dioxide increased the number of early dead embryos in eggs held 7 d but increased embryo survival in eggs held 14 d. During storage, egg albumen and yolk components may alter and deteriorate egg quality. The main factors directly associated to egg deterioration are temperature and relative humidity conditions, besides manipulation and storage time. An intense transformation occurs 72 h after posture, the dense layer becomes liquid and consequently albumen loses its quality. Therefore, less time between laying and preservation methods is required. The longer the storage time, worse will be the egg internal quality because carbon dioxide transfer through egg shell is favoured by temperature and humidity. Unlike external quality, the internal quality of eggs starts to decline as soon as they are laid by hens. Thus, although factors associated with the management and feeding of

hens can play a role in internal egg quality, but egg handling and storage practices also have a significant impact on the quality of eggs reaching consumers.

Prevention Measures:

For Table Eggs:

- One of the more effective means of improving the food safety of eggs consumed by the public is to cool the eggs soon after they are laid.
- Collect the eggs frequently from the barns where the hens are housed and placed in cold storage. Cooler temperatures during storage not only slow bacterial growth, but also the loss of water from the pores of the shell and from the albumen to yolk. The increase in albumen pH that occurs during extended storage is slowed by the use of a storage temperature of 4°C (39°F).
- Cold storage preserves eggs for 6 to 9 months, with a particularly increased shelf life with subcooled storage at -1.5 °C.
- Modified atmosphere packing increase eggs internal quality up to 28 days.
- Oiling the shells of washed eggs to seal the pores is an additional preventive method to minimize water loss from the albumen.

For Hatching Eggs:

- Hatchery is having notable distance from breeder farm hence both the breeder farm and the hatchery should have egg storage facilities.
- Hatching eggs from breeder flocks are collected frequently, and placed in cold storage with humidification following lay for the same reasons as given for table eggs, but also for the purpose of stopping embryonic development.
- Use of plastic flats during collection to be used during incubation. Advantage of the plastic flats, compared to fiber flats is that former one result

in a more rapid cooling of hatching eggs in the storage room, as the perforations allow for better air movement through the trays.

- The washing of eggs can be brushless and common sanitizers include chlorine and quaternary ammonium may be used.
- During collection, hatching eggs laid on the floor are separated from nest laid eggs as they are more soiled and carry a heavier bacterial load.
- Storage temperatures for hatching eggs are higher than table eggs. Temperature and relative humidity recommendations for the Storage of Hatching chicken Eggs should be 13–19 °C (55–67°F) with Relative Humidity 75 %.
- During transport from the breeder farm to the hatchery, the environment of the truck is maintained similar to the conditions described for the storage cooler and the temperature of the truck should be 18°C (65°F) with a relative humidity of 60–70%.
- If eggs are for prolonged storage then slightly higher relative humidity should be implemented during storage to benefit hatchability.
- For short-term storage of chicken hatching eggs, temperatures of 18°C (64°F) and 15°C (59°F) for 2- and 8-day storage of chicken eggs, respectively, are recommended for optimum hatchability.

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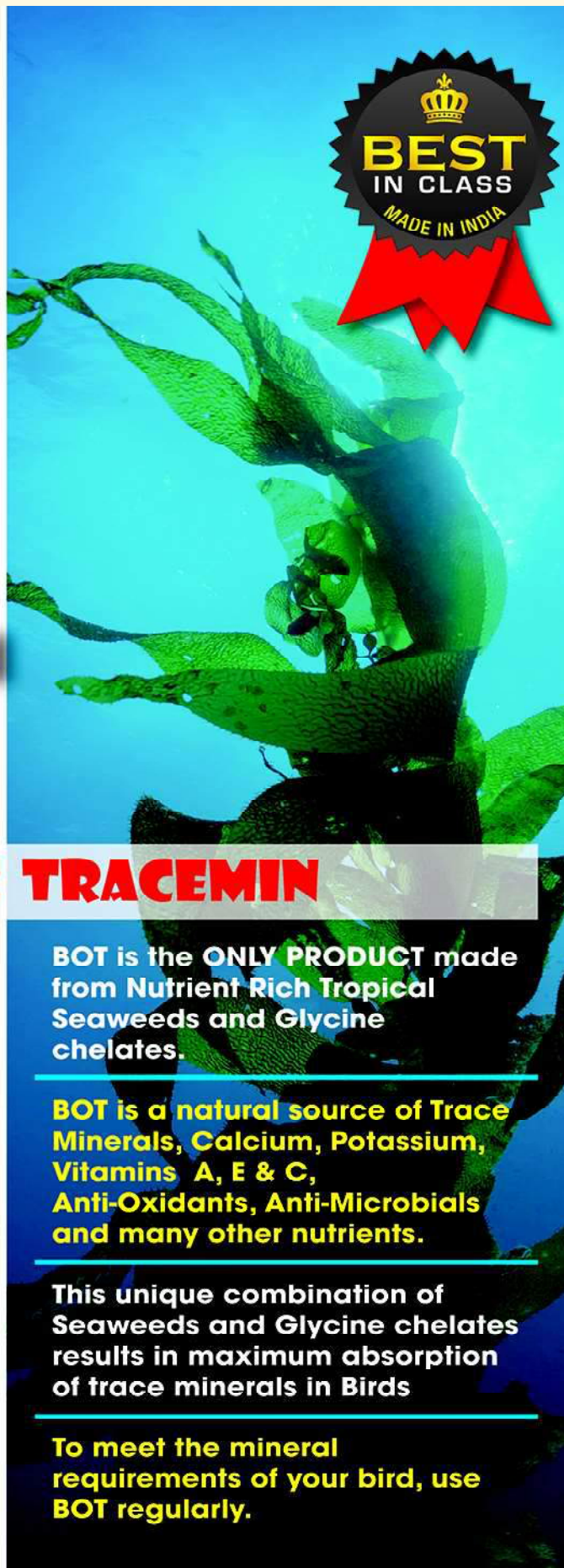
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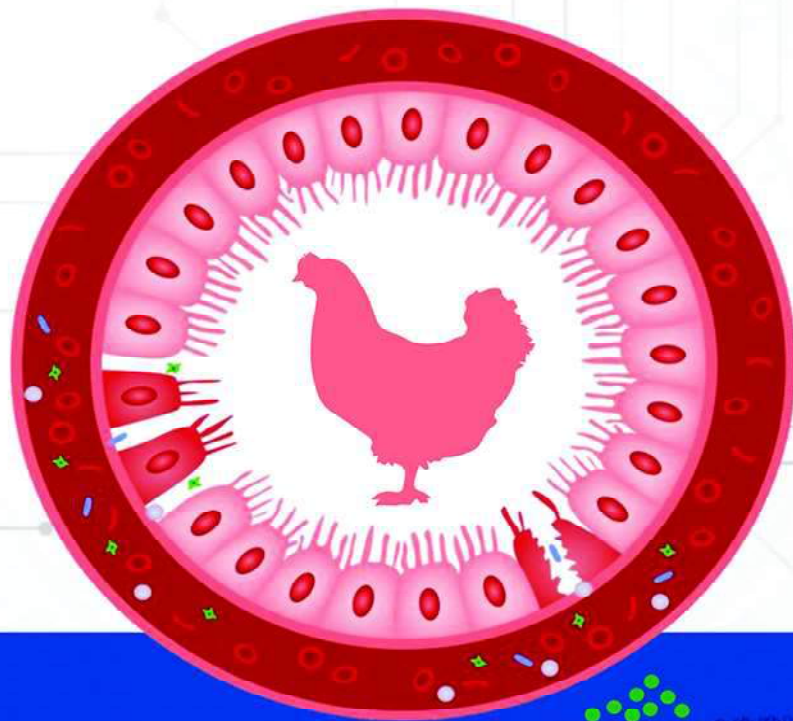


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animal species	feeding direction	Mixing rate
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	Mycotoxin level	
	No detection of mycotoxins or +12% moisture	0.5 kg/ton of feed
	Up to 100 PFB	1 kg/ton of feed
	From 100 to 500 PFB	2 kg/ton of feed
	+500 PFB	3 kg/ton of feed
	Above level	2 kg/ton of feed

remarks
In highly contaminated feed, it is advisable to combine the product with a bacteriocidal fungicide in order to prevent mycotoxin and generate its effect. Store in a cool, dry place away from the light. Use reserved exclusively for the manufacture of poultry feed. Not for medical use. Animal feed supply - feed only.

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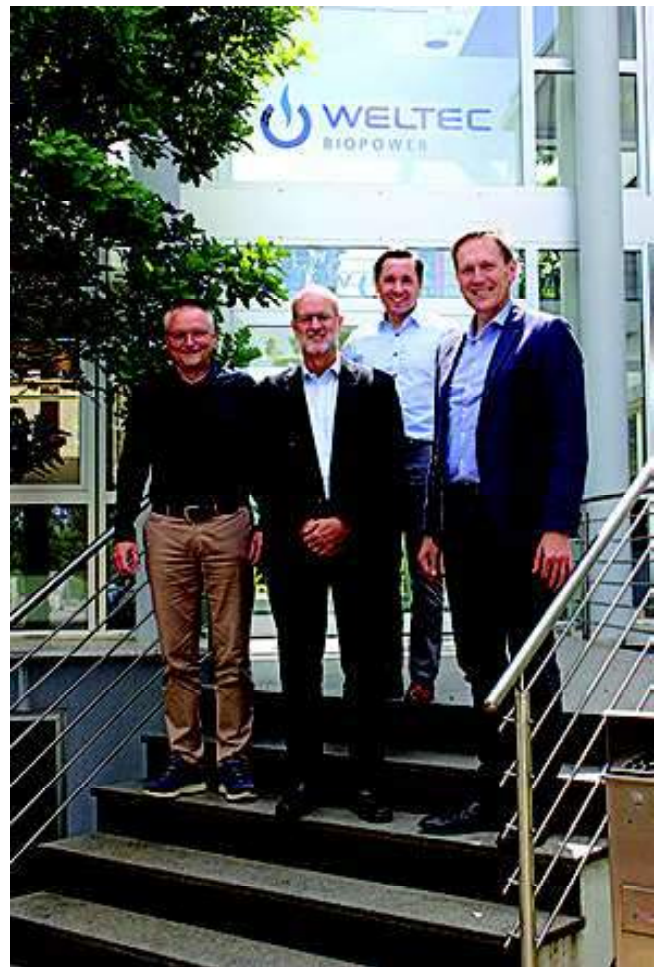
PRESS RELEASE

Biogas Specialist WELTEC BIOPOWER and Enscope Bundle Competencies in Australia Tapping the Great Potential for the Development of Green Energy Down Under

In May 2022, WELTEC BIOPOWER, the world's leading specialist in the establishment and operation of biogas and biomethane plants, signed a cooperation agreement with the Australian company Enscope. The partners' common goal is to offer complete solutions from the plant drafting stage to the turnkey rollout in Australia. „With Enscope, whose offices are based in Perth, Brisbane, Melbourne and Darwin, our market position in Australia will become much stronger. The cooperation constitutes a sound foundation for the further expansion of our activities and efficient growth”, says Vladimir Bogatov, who is responsible for the sales operations of WELTEC BIOPOWER in the Asia-Pacific region.

In Australia, there is an enormous potential for developing green energies from renewable organic sources”, emphasises Kane Ramsay, President of Enscope. Furthermore, the newly elected Federal Government has a stated policy of a cut in carbon emissions of 43% by 2030 when measured against 2005 levels, a significant increase over the previous Government's policy of a cut of between 26 and 28%. Various industry leaders and several State Governments are also calling for mandated Renewable Gas Targets in Australia's gas distribution networks. These policies are very supportive of a large scale ramp up in Waste to Energy and Renewable Gas Projects over the coming years.

Accordingly, the range of interests and project targets of WELTEC and Enscope includes multiple aspects such as the reduction of costs for the disposal of organic waste, the development of



Left to right: Wolfgang Bokern (Plant Construction Manager WELTEC), Kane Ramsay (President of Enscope), Vladimir Bogatov (Sales Manager Asia-Pacific WELTEC), Hajo Schierhold (Head of Sales WELTEC).

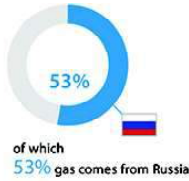
energy income sources by addressing the demand for energy sources (gas, power, heating and cooling) and the reduction of greenhouse emissions – or a combination of all of these aspects.

Recognising the rapidly shifting community sentiment in Australia and the aspirations of our



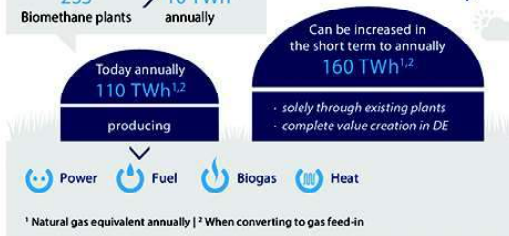
Using own energies instead of Russian natural gas The importance of biogas in achieving import independence

914 TWh
annual natural gas
consumption in Germany in
the last 5 years



9,692 > 100 TWh^{1,2}
Biogas plants annually

233 > 10 TWh¹
Biomethane plants annually



1/3
of Russian natural gas could
be replaced by own biogas



Source: www.weltec-biopower.com

basis, provides 24/7 service and delivers sustainable usage concepts for output flows, thereby covering the entire biogas value chain.

The establishment of individual, technically mature solutions up to a plant size of 10 MW is one of the strengths of

traditional, long-standing natural gas based customers Enscope is proud to partner with WELTEC for the safe, efficient and reliable application of globally leading technologies within the Australian market”, adds Kane Ramsay. „WELTEC and Enscope both look back on a history of more than 20 years of successful project development in the energy and biogas sectors around the globe. Our strategic cooperation will provide the activities on the Australian bioenergy market with substantial impetus” predicts Vladimir Bogatov of WELTEC BIOPOWER.

Australia is not the only place where renewable energy sources are gaining in significance; in Germany, too, the topic is attracting increased attention. The war in Ukraine is now forcing countries to reach their climate goals faster, to get prepared for a potential discontinuation of the supply of Russian natural gas and to close any resulting supply gap as quickly as possible. In the medium run, Germany could deliver 160 TWh of biomethane from its existing biomethane and biogas plants alone – enough to replace about a third of the imported Russian natural gas. (See enclosed chart)

Company Portrait

The WELTEC Group from Vechta, Germany, has developed into a globally leading specialist for the construction and operation of biogas and biomethane plants since it was founded back in 2001. The Group designs, plans and sets up energy plants, operates them on a permanent or temporary

WELTEC BIOPOWER. The high proportion of custom-developed components is a key success factor. Moreover, the use of stainless-steel technologies ensures flexible substrate input, quick and inexpensive assembly and a consistently high quality standard, regardless of the location. Following the commissioning, **WELTEC’s** mechanical and biological service plays a significant role in ensuring the plant efficiency.

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

The biogas specialist is well aware of the importance of customer and investor proximity. Accordingly, the Group’s sales and service network spans the entire globe. The range of customers includes businesses from industries such as agriculture, food, waste and wastewater. So far, the 120 employees of the **WELTEC** Group have implemented more than 350 energy plants in 25 countries on five continents. All in all, the biogas specialist ensures annual savings of around 530,000 tons of CO_{2eq}.

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

(Dr Onkar Pawaskar & Dr Mangesh Sagar)

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

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

known to improve the feed production process by reducing the interfacial tension between two immiscible phases of oil and water leading to quality feed production.

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

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

NATIONAL EGG CO-ORDINATION COMMITTEE

DAILY / MONTHLY EGG PRICES DECLARED BY NECC AND PREVAILING PRICES AT VARIOUS PRODUCTION CENTRES (PC) AND CONSUMPTION CENTERS (CC) JUNE 2022

Name Of Zone / Day	NECC SUGGESTED EGG PRICES																														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Average
Ahmedabad	460	460	460	460	463	466	468	470	472	475	477	480	483	485	483	490	490	490	490	490	493	495	510	525	535	540	545	550	552	552	493.63
Ajmer	414	414	414	414	418	429	430	432	433	435	438	449	450	450	450	452	454	456	458	462	490	511	513	513	522	523	523	523	523	505	460.83
Banwala	410	410	410	410	414	419	422	427	429	429	432	438	440	440	442	445	447	449	451	455	480	500	503	503	512	517	517	517	517	517	454.53
Bengaluru (CC)	495	495	495	495	495	495	500	500	505	505	510	510	515	520	520	525	525	525	525	525	525	525	530	535	545	550	555	560	560	560	520.83
Brahmapur (OD)	485	485	485	485	485	495	495	495	495	495	497	503	503	503	503	488	488	490	490	495	500	510	520	530	535	540	540	540	540	503.93	
Chennai (CC)	505	505	505	505	505	505	505	505	515	515	525	525	525	535	535	535	535	535	535	535	535	535	550	550	560	570	580	580	580	533.33	
Chittoor	498	498	498	498	498	498	498	498	508	508	518	518	518	528	528	528	528	528	528	528	528	528	543	543	553	563	573	573	573	526.33	
Delhi (CC)	445	445	440	430	430	430	439	442	446	448	448	451	455	460	460	460	465	470	475	475	475	478	502	524	525	538	543	543	543	473.67	
E.Godavari	460	460	460	460	460	460	460	462	464	466	469	473	473	473	473	473	473	473	473	476	481	491	501	511	516	521	521	521	521	479.93	
Hyderabad	456	456	456	456	456	458	460	462	465	468	471	474	477	480	482	482	482	482	482	482	482	482	495	505	515	520	525	529	531	485.03	
Ludhiana	408	410	410	410	410	416	419	422	427	429	435	435	441	441	441	445	448	451	453	453	463	488	502	502	504	515	518	518	518	452.43	
Mumbai (CC)	516	516	516	516	516	516	518	520	522	525	528	531	534	537	540	542	542	542	542	542	542	542	555	565	575	580	585	590	590	590	542.5
Muzaffarpur (CC)	476	471	471	471	471	481	481	486	488	488	488	495	495	495	495	500	500	509	509	510	514	536	548	557	562	562	576	576	576	511.93	
Mysuru	497	497	497	497	497	500	503	503	507	507	512	512	517	522	522	525	525	525	525	525	525	525	532	537	550	555	560	560	560	522.63	
Nagpur	480	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	470	516.77	
Namakkal	480	480	480	480	480	485	485	485	485	490	495	495	505	505	505	510	510	510	510	510	510	510	520	520	535	550	550	550	550	507.33	
Patna	467	462	462	467	467	481	476	481	481	486	486	490	490	490	490	490	490	490	490	490	490	490	490	490	490	490	490	490	490	507.67	
Pune	520	520	520	520	520	520	520	520	522	525	530	533	535	537	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	540	543.13
Ranchi (CC)	481	476	471	467	467	476	481	486	500	500	500	505	505	505	505	505	514	514	514	524	524	548	548	557	562	562	581	581	581	576	517.2
Vijayawada	460	460	460	460	460	460	460	462	464	466	469	473	473	473	473	473	473	473	473	473	476	481	491	501	511	516	521	521	521	479.93	
Vizag	460	460	460	460	460	460	465	465	465	470	475	475	475	475	475	475	475	475	475	475	475	475	475	475	475	475	475	475	475	475	482.67
W.Godavari	460	460	460	460	460	460	460	462	464	466	469	473	473	473	473	473	473	473	473	473	473	473	473	473	473	473	473	473	473	473	479.93
Warangal	458	458	458	458	458	460	462	464	467	470	473	476	479	482	484	484	484	484	484	484	484	484	484	484	484	484	484	484	484	484	487.03

Prevailing Prices																															
Allahabad (CC)	457	457	457	457	457	462	467	471	471	471	471	471	486	490	490	490	495	495	500	510	514	524	543	552	552	562	562	562	562	500.33	
Bhopal	450	450	450	450	460	460	460	467	470	472	475	475	480	495	495	495	495	495	495	495	500	510	520	530	535	540	550	550	550	540	493.63
Hospet	455	455	455	455	455	455	460	460	465	465	470	470	475	480	480	485	485	485	485	485	485	485	485	490	495	505	510	515	520	520	480.83
Indore (CC)	435	435	435	435	435	450	460	460	460	460	465	470	470	470	470	470	470	470	475	475	485	510	530	535	545	545	545	545	530	483.33	
Jabalpur	455	455	455	455	455	461	466	471	475	477	482	486	490	492	493	495	498	500	502	504	507	511	523	533	538	541	544	544	544	496.53	
Kanpur (CC)	443	443	443	443	443	443	443	443	443	443	443	443	443	443	443	443	443	443	443	443	443	443	443	443	443	443	443	443	443	443	475.87
Kolkata (WB)	525	525	525	525	525	525	525	525	530	530	535	537	542	542	542	542	542	545	545	545	545	555	565	575	585	590	590	590	590	549.23	
Luknow (CC)	476	476	467	467	467	467	467	473	473	473	473	473	483	483	483	483	483	483	483	483	483	483	483	483	483	483	483	483	483	502.67	
Raipur	460	460	460	460	463	468	480	480	482	484	486	488	500	502	503	503	503	503	503	503	503	508	515	530	540	545	548	553	555	555	503.17
Surat	475	475	475	475	475	480	480	480	490	490	495	500	500	505	510	515	515	515	515	515	520	520	530	540	550	560	565	570	572	572	513.13
Varanasi (CC)	476	476	467	467	467	476	476	476	476	476	476	483	490	493	493	493	493	493	493	493	493	493	493	493	493	493	493	493	493	493	507.93

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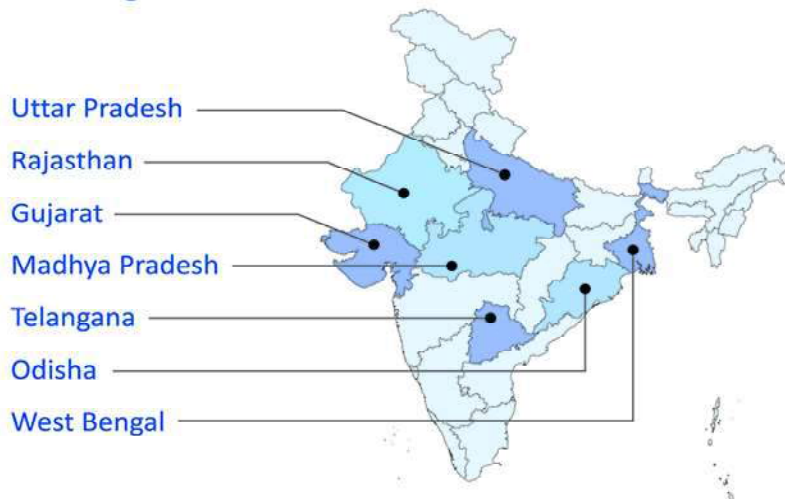


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How to Boost Growth in Broilers

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Introduction: Broilers are raised purely for meat purpose and achieve marketable weight very early by 35-42 days. This is an account of their fast growth, high feed efficiency, good body conformation and early feathering. Due to extremely fast growth rate of today's high performing broiler, its proper management has critical. In broiler production business, volume is necessary to get profit.



Suraj Amrutkar

But margin is so small to producers. Hence, producer must be aware of the many factors that affect the cost of production. Although each factor exerts only a minor influence, but the combined effect of all factors becomes phenomenal. Broilers are usually marketed at a live weight between 1.5-2 kg, usually between 4-6 weeks of age.

All-In-All-Out System:

The most practical program for broiler rearing has been the use of the all-in-all-out system, in which only one age of broiler is on the farm at the same time. All the chicks are started on the same day and later sold on the same day after which there is a period when no birds are on the premises. This lack of birds, breaks any cycle of an infectious disease and the next group of birds has a clean start with no possibility of contacting a disease from older flocks on the farm.

Size of operation:

Broiler growing units have become larger as automation has made its way into the industry. Certainly one person can easily care of 50000 birds with little difficulty. In some instances, one caretaker has handled over 100000 birds with some extra

help during the first week due to high labour requirement.

Open sided House:

These houses are open at least one half of the front and back of the house. At high summer temperature, window should be 75-80% open. Usually, there are curtains that can be rolled up and down over the opening.

Floor space requirement:

Allow one square foot of floor per broiler, if you intend to raise the birds up to 5 weeks (or up to 1 kg weight). Floor space must be increased if you plan to keep the birds for a period of time after 1 kg of weight. When birds are heavy, provide about 2 square feet per bird. crowding the birds usually results in more culls, uneven growth, a lower

1-10 days	3 chicks / square feet
11-20 days	2 birds / square feet
21-32 days	1 bird / square feet

average body weight, poor feed conversion, more feather picking and cannibalism, decreased market value, more disease and higher mortality.

Reducing floor space will causes:

- Decrease feed consumption
- Decrease the growth rate
- Decrease the feed efficiency
- Increase mortality
- Increase cannibalism
- Increase the incidence of breast blisters
- Increase the percentage of bird with poor feathering

- Increase the condemnations at the processing plant
- Increase the house ventilation requirement

Depth and length of the house:

The width of the poultry house should be maximum 30 feet for proper cross ventilation and the length of the poultry house may be of any length, there is no restriction of length.

Floor:

The many locations, concrete floors are a requisite to good house condition. However, where the soil is dry, porous and sandy, many broilers house are built so that the soil serve as floor.

Selection of chicks:

The chicks should be purchased from a reputable hatchery. The qualities of good broiler chicks are:

- Fast growth
- Good livability
- Good fleshing
- Fast feathering
- Uniformity
- Ability to convert feed into meat efficiently (*i.e.* good Feed Conversion Ratio)

Growth and Feed relation:

The growth of birds depends upon the level of a balanced protein in their diet along with other nutrients. The absence of optimum level of protein and amino acids, the growth is retarded and birds may need a longer time to reach the marketable weight. Higher protein diets are fed during the first two weeks as pre-starter phase. Growing broiler strains of chickens are approximately 67% efficient in the retention of dietary protein. Feeding of the high protein prestarter diets is beneficial since it gives a stimulus for the early growth of the broilers

and it does not cost much because of very small feed intake during the first two weeks. Enhancement of energy level of the diet in the finishing stage, accompanied with a decrease in protein content causes the broiler chicken to consume more calories than it can use for growth. This excess energy will be converted into body fat, thereby producing the desired body finish for the market broiler.

Minerals and vitamins:

The minerals and vitamins that critical in practical diets are calcium, copper, iodine, iron, manganese, phosphorus, sodium and zinc. Vitamins are choline, folic acid, pantothenic acid, pyridoxine, riboflavin, vitamin A, Vitamin D₃ and Vitamin E.

Table 1. Requirement for chicken Feed

Sr. No.	Characteristic	Broiler Starter Feed	Broiler Finisher Feed
1	Moisture , Percent by mass, Maximum	11	11
2	Crude Protein (N x 6.25), percent by mass, Minimum	23	20
3	Crude Fiber , Percent by mass, Maximum	6	6
4	Acid Insoluble Ash , Percent by mass, Maximum	3	3
5	Salt (NaCl) , percent by mass, maximum	0.6	0.6
6	Calcium (Ca) , percent by mass, Minimum	1.2	1.2
7	Available Phosphorus , percent by mass, Minimum	0.5	0.5
8	Lysine , Percent by mass, Minimum	1.2	1.0
9	Methionine , percent by mass, Minimum	0.50	0.35
10	Metabolizable energy , (Kcal/kg), Minimum	2800	2900

Preparation of broiler House:

The shed should be thoroughly cleaned, disinfected before chicks are arrived. Two days before the arrival of chicks, litter (saw dust, padding husk) should be spread evenly on the floor with 2-4 inches

thickness. Place a newspaper on the litter in the brooding area. Place brooder and brooder guard in brooding area. Place properly cleaned and disinfected feeders and drinkers. Make all electrical connections and check on the functioning of brooders. Check the correct temperature is being obtained under the brooder. Brooding unit should consist of four 60 Watt bulbs suspended 6 inches above the floor, and a brooder guard of 5 feet radius along with 4 drinkers and 4 trays for feeding. This unit meant for 250-300 chicks. After all the work is completed, the entire shed should be disinfected using fine spray of a good disinfectant. The night before the chicks arrived; sugar, electrolyte, vitamins, acidifier and probiotic solutions may be prepared for giving in the very first drinking water.

Management of the day old chicks:

As soon as chicks arrive, check their conditions. Place the chicks in the brooder gently. Place all weak chicks in separate brooder. Chicks should receive fresh water only, and no feed, or several hours when first placed in the brooder. Adding sugar (sucrose) to the first water improves growth and viability. If chicks are under stress when delivered to the farm, water soluble vitamins and electrolytes may also be added to the water. Ensure that the chicks are drinking the sugar and electrolyte solution. Teach a few chicks to drink water by dipping their beak. Check the chick comfort.

Temperature requirement for the chicks are as follows:

Period	Temperature
I st week	35°C
II nd week	32°C
III rd week	29°C
IV th week	26°C

The chicks behavior is very important in determining the temperature. Make small gaps (at least 6 inches) in the side curtains on the upper side, but ensure that there is no direct wind or draft that will chill the chicks. Three hours after placing the chicks in the brooder, when most of them have had watered; then sprinkle the maize grit on the

newspaper and also keep it on the paper tray. Ensure that the chicks are eating. Constant 24 hours monitoring is very essential for the first few days. Prevent overcrowding and dusty environments. This will lead to respiratory diseases. On the 6th day, paper can be removed and feed be given in the tray of feeders. On the 7th day, brooder guard can be removed and the area is enlarged to provide more floor space. Increase the height of brooder to about 1-1.5 feet from the floor level. However, this will depend on weather conditions. Introduce more chick feeder (3-4 per 100 birds). Brooder can be removed by about 3rd week in winter when the feathering is complete. In summer, they can be removed much earlier (within one week). Take the body weights at the end of the first and second week to assess the flock performance.

Check the birds activity and behavior daily:

Remove weak, overweight birds to a separate pen. Provide additional vitamins and growth promoters to these birds. Grading of birds can be done between 10-14 days. As the bird grow older, ventilation becomes very important. Keep the curtains, only if necessary, but full. If the air current or flow is strong, put curtains up to 4 feet from the side walls. Starter Mash should be given up to 21 days (550-600g body weight). After this, finisher mash is given till marketing. Remember always to keep the water fresh and cool. Clean drinkers daily. Debeaking is not necessary in broilers.

Don't waste feed:

Feed wastage should be minimum. For that always fill the feeders 2/3 capacity. Proper feeder has used to used in broiler farm.

Light management:

Light adjustment is used in the broiler house to increase growth, improve feed efficiency, decrease mortality and reduced electricity cost. It is advisable to provide continuous light (23 hours light: 1 hour dark per day) during the entire cycle. After two week, the light can be dimmed to reduce the activity of the birds. Thus, the weight gain is higher.

Isolation:

The broiler growing farm should be isolated. The building is best enclosed with a tight fence and with locked on all entrance gates. Beware of feed and other supply trucks entering the enclosure.

Vaccination:

The immune system of the chick is not fully mature at hatching. Therefore, the bird ability to immunologically respond to an infectious agent is limited. The chick does receive some passive immunity against diseases from its mother in the form of maternal antibodies. However maternal antibodies do not protect the chicks very long. They decrease as the chicks own immunological system develops. Therefore, broilers are routinely vaccinated to provide protection from infectious diseases. However, vaccination should be carried out keeping in view the disease prevalent in that area. The chicks must be vaccinated against Ranikhet disease with F1 strain or Lasota within the first week. It is generally not necessary to vaccinate against fowl pox unless the disease is prevailing in the area.

Mortality:

High mortality during the first 7 days is usually related to a hatchery or breeder flock problems. High mortality after 7 days is usually related to disease or management problems. A typical

Table 2. Suggested broiler vaccination schedule

Days	Vaccine	Route
6-7	Ranikhet disease (F1 or B1)	Eye drop or Nasal drop
10-12	Gumboro Intermediate	Drinking water
18-21	Lasota	Drinking water
24-30	Gumboro Intermediate	Drinking water

mortality pattern begins with 1% in the first week, decreasing to 0.5% in the second week followed by relatively low mortality during 3rd and 4th week and then gradually increase from 5 week to market. In many cases, early mortality is associated with dehydration, starve-out and infections introduced at hatchery, whereas much of the late mortality is caused by growth related factors such as leg problems, ascites and sudden death syndrome.

Conclusion:

Poultry farming is the easiest establishing and profitable business worldwide. Farmers can improve the broiler growth by providing proper nutrition, good management and selecting high growth strain of chicks. Improving feed efficiency is usually associated with helping broiler chickens grow faster. While it is essential to boost nutrient delivery to broiler chicken and balance the ratio between energy and amino acid intake.

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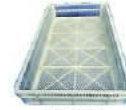
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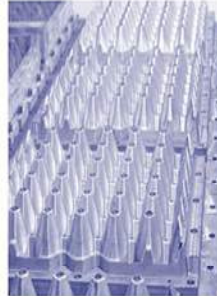
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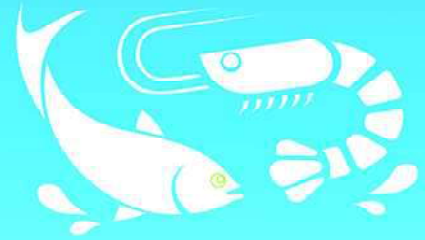
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