

# Poultry Fortune

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**Trow Nutrition opens its plant in India**

**Life Line Feeds (India) establishing a name with a holistic range of poultry products**



**Dietary sodium diformate (Acidomix DF\*) in Broiler nutrition: A new approach for sustainable Poultry production**



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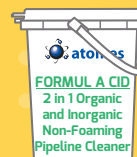
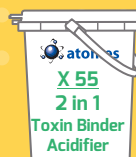
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- Editor



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## Make a resolution to be healthy and work better



**Dear Readers,**

Greetings from **Poultry Fortune** for a Happy, Prosperous and Peaceful New Year 2021 to the readers, advertisers and the well wishers. The January 2021 issue of **Poultry Fortune** is in your hands.

*I wish that all of us get organised ourselves personally and in the profession well and perform better in this New Year 2021. In order to achieve it, we need to plan and implement our daily schedule of waking up early in the morning atleast by 6 AM, have some physical exercise and yoga, have balanced diet, spend eight hours of quality time for professional works and responsibilities, and a night sleep of eight hours. If you can maintain this schedule regularly, you will not only prosper in your profession, but also can keep yourself fit and healthy physically and mentally. Check your BP, Sugar and Cholesterol levels time to time, take precautions and maintain good health. Make a resolution to keep yourself healthy and work better. I am doing it since long and please try to maintain it to keep yourself healthy and active. I wish you all the best in your performance !*

Poultry Fortune invited stakeholders in poultry industry to send their observations, views and opinion on how the industry was in the just concluded 2020 and how they see the New Year 2021 for the industry. We published views of some stakeholders in this issue and remaining will be published in the forthcoming issues of the magazine.

In the News section you may find news about – Vitamin D is a nutrient essential for bone development, skeletal health, healthy muscles and regulating the immune system, yet it is estimated that 1 in 8 people worldwide have a vitamin D deficiency or insufficiency. As one of the few natural food sources of Vitamin D, eggs can help you reach the recommended daily intake. There are lots of reasons to ensure you reach the recommended daily intake of this vital nutrient, and as one of the few natural food sources of Vitamin D, eggs can help you do it.

Trouw Nutrition, a global company in animal nutrition is now ready to serve Indian sub - continent. Trouw Nutrition, the animal nutrition division of Nutreco, launched its state-of-the-art facility in India, for the first

time to serve South Asia. Jadcherla, Hyderabad: Trouw Nutrition, the animal nutrition division of Dutch global company Nutreco, is now set with its technologically advanced, first – of – a – kind greenfield project near Hyderabad. Nutreco, with its two reputed brands, Trouw Nutrition and Skretting, is a global leader in animal and aqua nutrition bringing innovative feed specialties, feed additives, premixes and nutritional services.

Welfare concerns raised over chlorinated chicken. 21 December, 2020: Washing chicken meat in chlorinated water is a common practice in the US poultry industry, to ensure that meat has low levels of harmful bacteria, viruses and other contaminants, and is safe to eat. Meat processed in this way is not believed to pose a risk for consumers, but the approach is widely opposed in the UK and is banned by the European Union. This is because it could potentially mask poor standards of hygiene and welfare in which poultry are raised.

“Solika Energy Pvt Ltd Inaugurated the Telangana State’s first-ever Compressed Biogas Project Based on Poultry Litter” on 21 December 2020 at Hyderabad. This project exclusively uses poultry litter as the raw material and is located next to a large commercial poultry farm with over 4.5 Lakh birds. All the raw material is collected from the poultry sheds. This is the first poultry litter-based CBG project in Telangana and Solika has built this project under the

In the article section – Article titled Dietary sodium diformate (Acidomix DF+) in broiler nutrition: a new approach for sustainable Poultry production written by Christian Lückstädt, ADDCON, Bonn, Germany and Ms Sarah Mellor, Independent writer, Weinheim, Germany highlighted that Numerous reports have demonstrated how including sodium diformate in broiler diets has beneficial effects on performance by lowering bacterial pathogen load and improving nutrient digestibility. These benefits are turned into economic returns, despite the perceived increase in feed cost of using additives. It is therefore recommended for the poultry producers to include dietary acidifiers, like Acidomix DF+, into their broiler diets.

M.A.Nazeer  
Editor & Publisher  
Poultry Fortune



### Poultry Fortune

#### Our Mission

##### Poultry Fortune

will strive to be the reliable source of information to poultry industry in India.

**PF** will give its opinion and suggest the industry what is needed in the interest of the stakeholders of the industry.

**PF** will strive to be The Forum to the Stakeholders of the industry for development and self-regulation.

**PF** will recognize the efforts and contribution of individuals, institutions and organizations for the development of poultry industry in the country through annual Awards presentation.

**PF** will strive to maintain quality and standards at all times.

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## 5 signs you are not eating enough Protein

*Whether you are vegetarian, vegan or a hardcore non-vegetarian, there are plenty of natural sources of protein that you can consume to keep protein deficiency at bay.*



**15 December 2020:** Protein is a key building block of life. And while many know this fact, the price you pay for actually not including enough of this macronutrient in your diet is very high. Whether you're vegetarian, vegan or a hardcore non-vegetarian, there are plenty of natural sources of protein that you can consume to keep protein deficiency at bay. From animal products like meat and dairy, eggs, fish and seafood to plant-based proteins like whole grains, nuts, seeds, soy products and even some vegetables like spinach and peas, you have limitless options.

### Why you need sufficient protein

If you fail to add enough protein in your regular diet, your risk of adverse health outcomes can be quite high. A 2016 study published in Scientific Reports suggests that the consumption of protein triggers essential

adaptive responses in the body that regulate ingestive behaviour, energy expenditure and metabolism. Not getting enough of this nutrient can not only make you lethargic and tired but can also lead to muscle wasting and a severe form of protein malnutrition known as kwashiorkor.

### Signs you aren't eating enough proteins

Getting enough proteins in your diet is, therefore, a must. When you don't, your body is likely to draw your attention towards this major nutritional deficiency by putting out visible signs and symptoms. If you get one or more of these symptoms, it's necessary to consult a doctor immediately and modify your diet to make up for the lack of proteins. In some cases, the doctor might even recommend protein supplements to overcome the deficiency quickly and safely. The

following are the symptoms you should look out for.

#### 1. Fatigue and weakness

Protein consumption provides a lot of energy to your body and can fuel more physical activity. When you don't get enough of this vital nutrient, the exact opposite is likely to happen. Not only are you going to feel weak and fatigued, but you're also going to feel more lethargic than usual.

#### 2. Loss of muscle mass

Dietary protein is a key nutrient that helps the body build muscles. When this dietary intake is lacking, the body starts breaking down skeletal muscle to fuel itself, which leads to loss of muscle mass and, therefore, loss of strength. If not controlled in time, this can cause long-term debilitation and low quality of life.

#### 3. Increased hunger

Your body needs fuel to function and protein is one macronutrient that provides it in spades. So, when your protein intake

is inadequate or too low, your body tries to make up for it by increasing your hunger. The problem is, if you try to overcome this increased appetite with junk or processed foods, it may instead lead to unhealthy weight gain, obesity and other complications.

#### 4. Low immunity

Even a little protein deficiency can cause your immunity to take a hit. Getting infections more frequently is a sign that you may be consuming low amounts of protein in your diet. Lack of protein in a diet can also slow down the healing of wounds.

#### 5. Early ageing

A study published in the Indian Dermatology Online Journal in 2019 suggests that the effects of low protein can start to show up on your skin, nails and hair too. Thinning of hair, brittle hair and nails, wrinkled or pigmented skin and hair loss are some common early signs of lack of protein in your diet.

Courtesy: News18

## Eggs, a great natural source of vitamin D

**17 December 2020:** Vitamin D is a nutrient essential for bone development, skeletal health, healthy muscles and regulating the immune system, yet it is estimated that 1 in 8 people

worldwide have a vitamin D deficiency or insufficiency. As one of the few natural food sources of Vitamin D, eggs can help you reach the recommended daily intake.

**1 in 8 people worldwide have a vitamin D deficiency or insufficiency**



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There are lots of reasons to ensure you reach the recommended daily intake of this vital nutrient, and as one of the few natural food sources of Vitamin D, eggs can help you do it.

Vitamin D is an essential nutrient with several important functions. Also known as the 'sunshine vitamin', vitamin D is produced in your skin in response to sunlight and is also naturally produced in a small number of foods, including eggs.

#### Good Sources of Vitamin D

The best source of vitamin D is sunlight. However, enjoying foods like eggs,



which naturally contain vitamin D, as part of a healthy balanced diet can support you to meet your daily vitamin D requirements.

Vitamin D is only found in a small number of foods including:

- Egg yolks
- Oily fish
- Red meat
- Liver
- Mushrooms

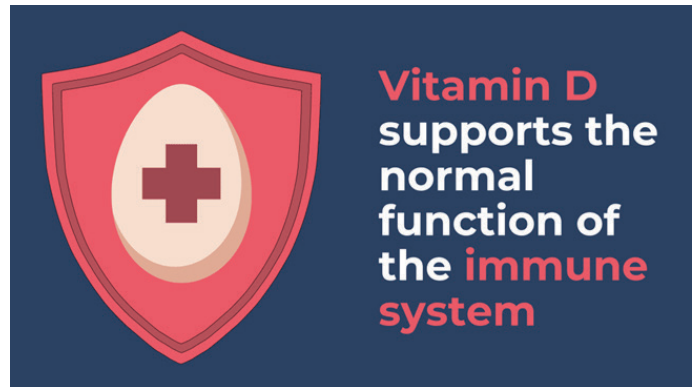
Research has found that an average serving of 2 eggs contains 8.2 mcg of vitamin D, a substantial portion of the recommended dietary intake of vitamin D [2], making them a great addition to the diet to support the intake of adequate levels of this vital vitamin.

#### Why is Vitamin D important?

One of the most important functions of vitamin D is the regulation of the amount of calcium and phosphate absorbed by the body, contributing to normal growth and development in children and maintaining our bone, teeth and muscle health as we age [3]. Vitamin D also supports the normal function of the immune system, which is the body's first line of defence against infection and disease [4].

In addition to these primary benefits, research suggests that vitamin D may also play

a role in fighting disease reducing depression and protecting against some cancers [5]. Research published in the American Journal of Clinical Nutrition suggests that vitamin D may play a role in helping to reduce the chance of developing flu [6]. While further research suggests vitamin D may play an important role in regulating



mood, with one study finding that people with depression who received vitamin D supplements noticed an improvement in their symptoms [7].

#### Vitamin D deficiency

Vitamin D is essential to bone health, and prolonged deficiencies can have a detrimental impact on the bone health of both children and adults alike, while also impacting the function of the immune system.

Without enough vitamin D, the body can only absorb 10% to 15% of dietary calcium, but when adequate levels of vitamin D are present, this figure can more than double to 30 to 40% [8]. A lack of vitamin D in children causes rickets, while in adults it causes osteomalacia [9]. Furthermore, research suggests that vitamin D deficiency may also been linked to increased risk of cardiovascular events [10] and the development of multiple sclerosis [11], rheumatoid arthritis [12] and other autoimmune

conditions [13].

Although vitamin D is commonly called the 'sunshine vitamin', in recent years studies have found that even those in sunny climates can have insufficient levels of vitamin D. Changing lifestyle factors, including spending more time indoors, sun avoidance and protection to reduce the likelihood of developing skin cancers, and pollution levels can all impact the level of vitamin D the body is able to synthesise [14]. Therefore, the consumption of foods which naturally contain vitamin D, such as eggs can support the intake of adequate vitamin levels.

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- [3] New England Medical Journal
- [4] Nutrients
- [5] British Medical Journal (BMJ)
- [6] American Journal of Clinical Nutrition
- [7] Journal of Internal Medicine
- [8] Harvard Medical School
- [9] British Medical Journal
- [10] American Journal of the Medical Sciences
- [11] Neurology
- [12] Arthritis and Rheumatism
- [13] Southern Medical Journal
- [14] Nutrition Bulletin

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## Six Food Items to Boost Children's Immunity During Winter

*In winter, children are especially vulnerable to illness. Here are six food items that can boost their immunity to protect them from the cold.*

**20 December 2020:** The months of December, January and February can be harsh on children. Illnesses such as the common cold, the flu, sore throat, chest congestions can wear them down significantly. Mentioned below are food items that can boost children's immunity to fight such illnesses and the colder months.

### Vegetables



Vegetables contain a healthy amount of antioxidants which help fight infections and reduce inflammatory reactions of our immune cells round the year. Antioxidants also fight off free radicals, which causes damage to the cells in our body as well as DNA. Broccoli, spinach, ginger, garlic and onions contain potent antioxidants which help ease illness symptoms in children.

### Fruits



We must have heard umpteen times as children that “an apple a day keeps the doctor away,” because it is somewhat true. A study by the University of Illinois, in 2010, found that soluble fibre contained in apples

can turn our immune cells “from being pro - inflammatory, angry cells to anti - inflammatory, healing cells that help us recover faster from infection”.

Apples also contain healthy doses of the molecule Vitamin C, which is said to have immunity -boosting effects provided that children receive the molecule regularly. Oranges, guava and pears also contain healthy doses of antioxidants and Vitamin C.

### Pulses



Pulses offer healthy doses of protein for countless Indians. Proteins not only help maintain and repair tissues of our body, but they also provide much - needed energy to our immune system to fight off bacterial and viral infections.

“  
**Eggs are power houses of protein, vitamins, antioxidants, minerals like Zinc, which aids our recovery from infectious ailments.**  
”

### Eggs

All essential nutrients required to create and develop a life are contained inside eggs. They are power houses of protein, vitamins, antioxidants as well



as essential minerals like Zinc, which aids our recovery from infectious ailments.

### Mushrooms



There is good news for those who love mushrooms. Several studies have found that mushrooms have medicinal properties which regulate our immune system and help fight infection and inflammation.

### Spices



Technically not foods, spices have been used for centuries in Indian households for their anti -inflammatory, anti - bacterial and anti - viral properties. Spices like turmeric, clove, cinnamon and black pepper help treat cough and cold.

*Courtesy: News18*



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# Trouw Nutrition, the global leader in animal nutrition is now ready to serve Indian sub - continent

*Trouw Nutrition, the animal nutrition division of Nutreco, launches its state-of-the-art facility in India for the first time to serve South Asia*

## Jadcherla, Hyderabad:

**Trouw Nutrition**, the animal nutrition division of Dutch global company Nutreco, is now set with its technologically advanced, first – of – a – kind greenfield project in Jadcherla

South Asian and Indian market in the past 3 years, hence, the state – of – the – art production facility in Jadcherla, Hyderabad. The company's unique 'Nutrace' programme, a food safety and quality initiative of

a total capacity of 20,000 MT / annum. Its unique 45 - meter tower ensures uniform mixing for a high - quality product to meet our customer's need. The cold store made available at the facility helps storage of vitamins and heat sensitive ingredients. Remaining true to Nutreco's commitment to sustainability, the facility also provides recycling of liquid waste for the environment safety and rain water harvesting for minimal impact on environment. The facility is expected to reach full capacity utilisation by 2025.

Dr Saurabh Shekhar, GM – South Asia, Nutreco, says, "With this new facility at Jadcherla, we would like to make our contribution to the prestigious, Atmanirbhar Bharat – 'Make in India' initiative, as well as equally focus on the development of innovative products and solutions to help customers achieve better, faster and more sustainable results,

globally". He further adds, "As an innovation - driven organization, we bring enormous operational efficiencies with lesser turn around time and better customization to meet customer needs. Telangana is centrally located and one of the most investor - friendly states. It is also a major belt for poultry and aqua with logistical access to good ports."



**Jurrien Zandbergen, Managing Director, Nutreco, Asia**

In addition, **Mr Jurrien Zandbergen**, Managing Director, Nutreco Asia said, "Asia and India are key to achieving our mission of 'Feeding the Future'. We already have plants in Japan, China, Indonesia, Vietnam and Myanmar to strengthen our presence in Asia". He further commented, "Our establishment in Jadcherla, Hyderabad is our way of reinforcing

**Contd on Page 22**



**Dr Saurabh Shekhar, Managing Director, South Asia, Nutreco**

(Hyderabad), India. Nutreco, with its two reputed brands, Trouw Nutrition and Skretting, is a global leader in animal and aqua nutrition bringing innovative feed specialties, feed additives, premixes and nutritional services. The establishment is expected to deliver superior quality minerals, vitamin premixes, mineral blends and feed safety solutions for customers in South Asia, catering to all species – poultry, dairy, aqua and pets. The virtual inauguration of this high-end industrial facility was honoured by the ambassador of Netherlands, **Mr Marten Van den Berg** on 11 December 2020.

Trouw Nutrition has ramped up its operations in the

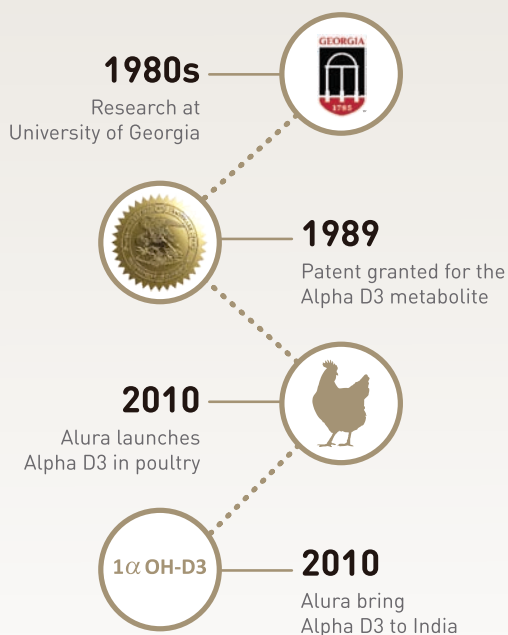
Nutreco, ensures end – to – end quality and traceability, and emphasis on feed – to – food safety. The entire manufacturing process is automated right from raw material handling to bagging at the plant so that the final product is **completely untouched by human hands**.

The plant at Jadcherla has



**Trouw Nutrition team India - Factory**

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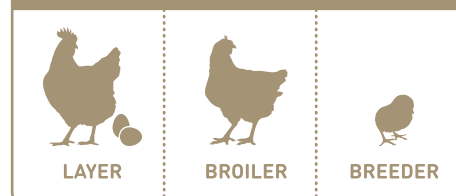
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## Compressed Biogas Project using poultry as raw material, Solika Energy inaugurated near Hyderabad

**Hyderabad:** Mr R. S. S. Rao, Executive Director of IOCL, TAPSO, along with Mr Suresh Chitturi, IEC Chairman & Managing Director, Srinivasa Farms Group inaugurated a 2.4 Tonnes per day capacity Compressed Biogas (CBG) Project at Udityal Village, near Balanagar, Telangana. This project exclusively uses poultry litter as the raw material and is located next to a large commercial poultry farm with over 4.5 Lakh birds. All the raw material is collected from the poultry sheds. This is the first poultry litter-based CBG project in Telangana and Solika has built this project under the Sustainable



*IOCL Executive Director Inaugurating Plant*

Alternative Towards Affordable Transportation (SATAT) scheme by the Ministry of Petroleum and Natural Gas (MoPNG).

The CBG produced in this project will be supplied to an IOCL outlet in Attapur, Hyderabad. Commercial sale at this outlet is expected to start from next month.

In addition to CBG, this plant will also generate around 15 Tonnes of good quality organic manure as a byproduct on a daily



*Suresh Chitturi, MD, Srinivasa Farms Pvt Ltd, Inaugurating the Plant*

basis. Mr Suresh Chitturi explained the importance of sustainable energy and how Solika plans to provide this to the local farming communities for their benefit to Mr RSS Rao, Executive Director - IOCL.



*Primary Digester & Pumping Tank*



*Collection Tank*



*Solika Plant*



*Cascade Trucks and biogas Digester*

As per Mr Suresh Chitturi, Solika has developed a unique process of ammonia reduction which results in sustained reuse of water making the biogas plant zero liquid discharge. The unique process removes and reduces all impurities like feathers, stones, sand, and also reduces high ammonical nitrogen with a help of biological culture and at the same time providing an unique solution to the poultry community.

Solika is also currently in the process of setting up the second CBG project in



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Telangana. This project is expected to have a CBG production capacity of 3.0 Tonnes per day.

#### About Solika.

Solika Energy Pvt Ltd is a Compressed Biogas company backed by Srinivasa Hatcheries, one of the leading poultry companies in India and XEMX Projects. XEMX

Projects is promoted by Himadeep Nallavadla. Solika believes that CBG will play an important role in India's energy future as it is able to help reduce fuel imports, provide a viable cleaner alternate fuel to vehicles, and provide additional sources of revenue to India's agricultural sector.



*Solika Team & IOCL Executive Director*



*Compressor & Cascade Storage Area*

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*Contn from Page 18 :*

### Trouw Nutrition, the global leader in animal nutrition is now ready to serve Indian sub - continent

our commitment to South Asia and Indian markets. This is just the beginning of our journey to gain a strong foothold here”.

like food safety, sustainable sourcing, and responsible usage of antibiotics.

Nutreco has both organic and inorganic growth plans



With 70+ manufacturing units in more than 175 locations, Trouw Nutrition caters to the entire value chain of the livestock business. As a leading animal nutrition supplier, Trouw Nutrition has been supporting farmers, integrators, and the feed industry since 1931. During its remarkable 90 years of service, Trouw Nutrition has responsibly addressed various significant environmental, societal, and public health concerns

to expand its footprint in South Asia region. Though currently the company's thrust is on B2B segment, in future it may look at the B2F segment. By doing so, Trouw Nutrition remains focused on providing responsible, cost-effective products and solutions to the customers and progressive farmers.

For more details visit us at [www.trouwnutrition.com](http://www.trouwnutrition.com) in or contact us at [customercareindia@trouwnutrition.com](mailto:customercareindia@trouwnutrition.com)



*A view of Trouw Nutrition India Production facility*



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## Welfare concerns raised over chlorinated chicken

**21 December 2020:** Washing chicken meat in chlorinated water is a common practice in the US poultry industry, to ensure that meat has low levels of harmful bacteria, viruses and other contaminants, and is safe to eat. Meat processed in this way is not believed to pose a risk for consumers, but the approach is widely opposed in the UK and is banned by the European Union. This is because it could potentially mask poor standards of hygiene and welfare in which poultry are raised. The prospect of UK imports of chlorine-washed chicken, with its accompanying welfare issues, has been raised as part of a possible US - UK trade deal after Brexit.

Industry groups such as the Royal Society for the Prevention of Cruelty to Animals (RSPCA), Red Tractor, and the British Poultry Council are opposed to chlorine-washed chicken. "Acceptance of chlorine washing by consumers would signal that we are condoning lower welfare standards," the RSPCA has said.

Alex Seguino, a Senior Lecturer and food safety expert at the Royal (Dick) School of Veterinary Studies (R (D) SVS), said: "There is little risk to the consumer from chlorinated chicken – there is more risk from drinking water, which we do every day in larger quantities".

Dr Jessica Martin, a Senior Lecturer in Physiology and Animal Welfare at the R (D) SVS, added: "A big concern is that chlorine washing allows poor practices

throughout the rearing period for chickens. "This includes birds being crammed in together with minimal ventilation and lighting. These birds are bred to eat a lot, and therefore they excrete a lot, culminating in poor quality litter for them to live on".

### Controlling food poisoning

As chlorine rinsing is prohibited in the EU, producers must tackle potential disease risks



*Chlorinated chicken could be imported to the UK as part of a trade deal with the US Denis Agati on Unsplash*

to poultry through good hygiene and welfare. Research is ongoing to prevent contamination with bacteria that lead to food poisoning, such as Campylobacter and Salmonella, for example through carcass treatments, vaccination and selective breeding.

Campylobacter bacteria are commonly found in poultry, and can quickly reach large numbers in the chicken gut, which make their way onto the surface of the carcass during slaughter.

"It is so populous in the chicken gut that small numbers sufficient to cause human infections can easily contaminate the

meat," explains Professor Mark Stevens of the Roslin Institute.

"The best approach is to prevent or reduce the colonisation of chickens by Campylobacter as they are reared, as contamination of carcasses at slaughter can be hard to avoid".

Research on the genetic make-up of broiler chickens – those bred for meat – has shown that it may be possible to breed birds with lower susceptibility to Campylobacter, while retaining commercially beneficial traits such as growth rate, efficient use

of feed and gut health. Currently there are no effective vaccines against Campylobacter, and work on this is ongoing at Roslin. "Campylobacter can spread rapidly within a flock from 2 - 3 weeks of age – there may be some maternal protection offered until this point, but research to mimic this protection with vaccines is proving challenging," Professor Stevens said. The short life of chickens bred for meat also allows limited scope for vaccines to become effective.

Research on managing Campylobacter through additives to the diet – such as probiotic bacteria – has

had limited success to date. Poultry diets are optimised for growth, which may enable Campylobacter to multiply; evidence is limited on whether different breeds are less impacted.

Keeping chickens indoors in controlled environments can limit their exposure to Campylobacter, which is found throughout the environment and can therefore affect free - range birds.

Salmonella, which is a key cause of food poisoning from poultry meat and eggs, can be controlled with vaccination but outbreaks still occur. Roslin research into the bacteria has determined the function of thousands of its genes during infection and assessed the risk of different strains, towards improved vaccine design.

### Quality standards

"Poultry producers, processors and retailers are working hard to control Campylobacter along with other hazards," said Mr Seguino. He is concerned that if the UK is forced to accept chlorinated chicken, consumers may buy it without realising its provenance.

"Supermarket shoppers may be able to choose unwashed chicken, but in food outlets and restaurants it is harder to choose," he added.

Dr Martin opposes imports of chlorine washed chicken, and would support a labelling system to help consumers make informed choices, if it were to occur. Chlorinated chicken products are not yet a reality for UK consumers, and the industry awaits developments regarding the possibility of imports from the US, and the impact on food production standards.

Dr Martin added: "My concern is

*Contd on Page 27*

## EW Nutrition hosts major virtual event for One Health – Antimicrobial Resistance

**27 November 2020:** EW Nutrition hosted the virtual event “Pledge towards Antibiotic Free Meat & Poultry”, as part of the One Health AMR campaign. The event was organized in collaboration with the Confederation of Indian Industry (CII) and Food Safety and Standards Authority of India (FSSAI).



**Dr Praveen Malik**

Several dignitaries from diverse backgrounds came together to share their experience on curbing the rising challenge of AMR and mitigating its harmful effects. The program was specifically designed for Indian audiences looking to understand the way forward in combating AMR.



**Ms Johanne Ellis – Iverson**

In its effort to reduce the use of antibiotics in animal production, EW Nutrition has long supported the Indian livestock industry with its holistic, science-backed solutions. The



**Dr Anders Miki Bojeson.**

company is committed to mitigating the risk of antimicrobial resistance through its various program-based solutions. The November event was part of its long-term vision to combat the risks associated with AMR.

The opening speech was delivered by Dr Praveen Malik, Animal Husbandry Commissioner, Ministry of Fisheries, Animal



**Prof Jaap Wagenaar**

Husbandry and Dairy. He spoke on various aspects of microbial resistance and presented India's roadmap, including the efforts which the government of India is making to address this enormous challenge.

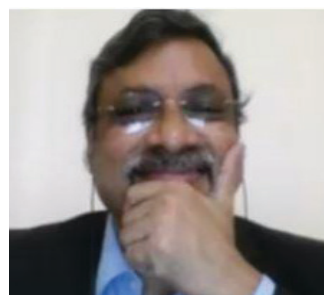
Dr Vijay Pal Singh, Joint Director, FSSAI, explained in detail the role of regulators such as FSSAI in focusing AMR-related efforts. He emphasized the practical impediments and road blocks which need to be

addressed to bring the situation under control. Ms Johanne Ellis - Iverson, Head of Group, Senior Advisor, National Food Institute Technical University of Denmark (DTU) and International Center for Antimicrobial Resistance Solution (ICARS), Denmark, was a keynote speaker. She shared novel insights on the spread of antimicrobial resistance,



**Dr Vijay Pal Singh**

as evidenced by historical data collected through various reputed sources. Prof Jaap Wagenaar, Professor of Clinical Infectiology, University of Utrecht, Netherlands, shared the reversible course of antimicrobial resistance when drastic anti-AMR measures were taken in European countries. He shared best practices in



**Arabind Das**

broiler operations in the Netherlands and highlighted various mitigation methods

employed to lower antimicrobial resistance. Dr Anders Miki Bojeson, Prof of Preventive Veterinary Microbiology, Dept of Veterinary and Animal Sciences, Denmark, shared insights on the mechanism of spread of antimicrobial resistance and the steps which can be adopted to curb this silent epidemic.



**Dr Shirish Nigam**

Dr Shirish Nigam, Regional Director, EW Nutrition South Asia, shared the EWN perspective on curbing AMR and highlighted the efforts of his organization, as well as EW Nutrition's customer-centered solutions. He also shared an interesting case study on the economic impact of AMR on the country's economy, as well as its financial implications. Mr Arabind Das, Co-Chariman, CII National Committee on Agriculture and Allied Sector, moderated the program and shared the CII's perspectives and initiatives to generate awareness on AMR. This thought-provoking event presented a great opportunity to reach a wider array of consultants, veterinarians, and policy makers. Major key stakeholders – technical consultants, university professors, farm managers, integrators etc – attended the program and took in the event's learnings to evolve in their personal and professional life.



# CPDO&TI organises online discussion forum – on Chicken Alternatives: Duck / Turkey / Guinea Fowl / Quails

5 December 2020, Hessarghatta / Bangalore: Central Poultry Development Organization & Training Institute under Government of India, Ministry of Fisheries, Animal Husbandry & Dairying, organized a one day online discussion forum – On Chicken Alternatives: Duck / Turkey / guinea Fowl / Quails.



**P. Rajeshkumar,**  
Managing Director,  
SRS Quail products

The programme was planned to impart the knowledge for entrepreneurs focused on basic management practices and business models in Duck, Turkey, Quails and Guinea fowl, and understanding the Nutrition, Disease Management and Medications etc.

**Dr Mahesh P.S.,** Joint Commissioner, GoI & Director inaugurated the programme and narrated substantial opportunities in diversified poultry sector other than chicken. Further, the choice of consumer



**Vivek Kushwaha,**  
Managing Director,  
Gayatri Organic Farms

is towards more options in poultry meat which is driving into alternate to chicken.

**Dr Abhijeet Kumar,** Farm Manager, CPDO & TI, Bengaluru illustrated the basics of duck production and management on the first session. Interesting facts about Duck Culinary options like “Peking Duck Production” a delicacy in China and South East nations which is specially done by blowing air in between skin and the body and marinated with Starch and Honey for a special preparation Peking Duck. In addition to these production of sausages, Balot, Foie gras production was briefed. Duck down feathers are being used for making lot of cosmetic preparations like jackets, pillows etc. **Dr Sonali Nanda,** Assistant Director, CPDO & TI, Bengaluru briefed the audience about management aspects and salient features of Turkey

production and specialties of turkey meat being the leanest white meat among poultry. Butter ball turkey is a special preparation prepared for Christmas across the globe and for thanksgiving everybody watches the President of America pardoning a Turkey in a Thanksgiving day.

**Dr S. Ganesan,** Assistant Director, CPDO (NR) Chandigarh, elaborated on Quail production and management. Quail breeding has been under the clutches of threat by forest act 1972, however, recent notifications from Government of India denotified Quails as restricted species under



**Shyam Sundar Chaudhary,**  
Progressive farmer,  
Rinkal Bater Farm

forest act. Quail farming is encouraged for the farmers due to easy going options shorter life cycle (6 weeks), high protein meat among poultry, preferred for anti - asthmatic and body builders. It's a preferred meat in the

winter as “Tandoori Quail”, Dr Mahesh mentioned a specific exclusive Dhaba at Ahmedabad “Quail Dhaba” selling exclusive Tandoori Quail in his Dhaba. Average consumption per person is noted to be five plates each at the cost of Rs. 100/- per plate, the Dhaba sells exclusively only quails and no other food products.

**Dr Satnarayan Swain,** Deputy Director CPDO (WR) Mumbai, briefed on management aspects of Guinea fowl production.



**Lagishetty Bhoopathi,**  
Progressive farmer,  
Telangana Turkey Farms

He noted that Guinea Fowl production is taken up mainly for fancy purpose because of their look and specific noise by guinea fowls. Dr Swain demonstrated the difference between male and female guinea fowl with reference to the size of the helmet (bone projection on the head) and wattles. Guinea Fowl egg is very hard and these birds are generally resistant to aflatoxin in the feed.

## Discussion of Entrepreneurs:

**Dr Mahesh** invited following successful entrepreneurs for a one – to – one talk on their entrepreneurial journey. Mr Vivek Kushwaha, Gayatri



# VALUE ADDED PRODUCTS OF DUCK



Organic Farms, New Delhi, Mr Lagishetty Bhoopathi, Telangana Turkey Farm, Siddipet, Mr P. Rajesh Kumar, SRS Japanese Quails Group Tirupur, TN, Mr Shyam Sundar Chaudhary, Rinkal Bater Farms, Palghar were the panelists.

**Mr Vivek Kushwaha**, experienced entrepreneur having decades of experience in duck and turkey farming started a journey as entrepreneur with zero budget with the mandate (*Action gets out the anxiety*) under the brand name Gayatri Organic Farms in New Delhi to the present 5.5 crore turnover. In his talk, he elaborated various business opportunities in Duck Farming. He emphasized on three principles for a successful business i.e., “*planning, common sense and good quality products*”. He also suggested to the existing duck and turkey entrepreneurs for the usage of Alfalfa (Lucerne) as feed resources to cut down the cost of production. He also spoke about the regional demands and market of duck products by saying “*jo Chalta hai, wahi bikta hai*”. He claims presently as a leading supplier of duck used for the Peking dish for five star hotel cuisine across India.

**Mr P. Rajesh Kumar**, Quail entrepreneur who started his business under the brand name SRS Quail products with his two brothers Mr Suresh and Mr Satish in 2005. Their



Gayatri Organic farms

entrepreneurship began in a small way with 5000 quail chicks and custom hatching. Later they have expanded into breeding farms, premix plant, feed mill and large hatchery with a capacity 10 lakhs quail chicks production per month. They started Nandanam - 2 Quail integration with other farmers under contract farming agreement. Presently the SRS group turnover is about 100 crores. Mr Rajesh Kumar briefed in technical input keys for successful quail farming.

**Mr Lagishetty Bhoopathi** is turkey entrepreneur with a good turkey rearing experience. He started his journey in the year 2005 under the brand name “*Telangana Turkey farm*” located at Siddipet district of Telangana state. In his talk, he elaborated that his farm is running by his family members as he believes in “*ownership farming*”. He rears 1200 turkey birds in an year with 400 birds of three cycles. The cost of production of Rs 1500/- per pair and fetching a profit of 1500/- per pair. He earns annually 10 - 12 lakhs from this venture. He spoke about the importance of brooding period and suggested to the participants for seasonal brooding since turkey requires longest brooding period of 6 - 7 weeks. He claims that he supplies his end product to five star hotels, restaurants, retail outlets and dhaba. He is the inspiration of youths of



rural India i.e real India. Mr Bhoopathi acknowledged the contribution of CPDO&TI in technical support and supplying turkey day old poult for the venture.

**Mr Shyam Sundar Chaudhary** is an *Adivaisi* leader and quail entrepreneur. He started his mobile business in the name Rinkal Bater farm in cycle in 2005 with 100 numbers of quails. He is popularly known as “*Laawri wala*” (Quail = Lawwa pakshi in Marathi) in Palghar, Maharashtra. Presently, he is rearing 7000 - 8000 quails with earnings of 30,000 – 40,000/- per month. He is supplying his products to retail outlets and highway dhaba by his Mahindra Supro. Mr *Laawri wala* acknowledged the contribution of CPDO Mumbai in technical support and supplying Quails for the venture.

**Dr Mahesh** concluded the programme by interaction with the panelists and answering many queries

by the audience. He suggested to Shyam Sundar Chaudhary for branding of quail meat in the name of *Laawri wala*. Dr Mahesh assured to the panelists and participants about the consistent technical support and supply of chicks of diversified poultry. The event was well appreciated. The team CPDO&TI guaranteed to conduct such many more programmes in the coming future.

**Mr Anwar Basha**, Senior faculty of CPDO&TI executed the job of admin of conducting Discussion Forum very effectively. The other team members of CPDO&TI worked hard in making this programme successful. The entire programme was live broadcasted on CPDO&TI Youtube: CPDO&TI TRAINING for the first time. All the recordings of panelist and speakers are uploaded on the same day as a ready reference in the facebook and Youtube channels. All these recordings are uploaded on our Facebook page <https://www.facebook.com/cpdoti.bangalore> and official Youtube channel CPDO&TI TRAINING. All are requested to subscribe the channel.

Contn from Page 24 :

## Welfare concerns raised over chlorinated chicken

that if the market is opened to chlorinated chicken and other low welfare practices, the UK and EU higher welfare standards of poultry production are at risk. “The UK is one of the global leaders in animal welfare standards and protective legislation, but as always we should continue to strive in further

improvement. The US has no federal regulations to protect poultry welfare – only state guidance and recommendations. The risk of importation would affect standards overall, jeopardise poultry welfare and penalise British producers”.

Courtesy: The Roslin Institute



## Life Line Feeds (India) Establishing a name with a holistic range of Poultry Products



Trust is the primary aspect of importance for a consumer products company. Especially, when it comes to something as important as daily consumables, a manufacturer needs to stay steer clear about the quality delivered. And, a company can only be transparent about it all when it has built its facilities from scratch. Life Lines Feeds, based in Karnataka, India came into being in the year of 1985 with animal feed distribution dealership and later added table eggs and day old chicks to their list of products. Then the company entered the domain of animal feed manufacturing with the brand name “Nandan” which was followed by a poultry breeder farm in 1998. Eventually, the company moved to chicken slaughtering and chilled chicken retail outlets with the name of Life Lines Tender Chicken which has become a popular retail chicken outlet in Bangalore, Karnataka and even other parts of the state. Finally, Life Line Feeds (India) started exporting meat in 2018.

“We believe in integrity and discipline with effective management controls to manufacture quality products consistently and achieve customer satisfaction. We are committed to continuously improving our product quality through effective implementation of quality management systems that aptly complies with the statutory and regulatory



K. Kishore Kumar Hegde, Managing Director,  
Life Line Feeds (India) Pvt Ltd

requirements”, states K. Kishore Kumar Hegde, Chairman and Managing Director, Life Line Feeds (India) Pvt Ltd

“  
**We believe  
in integrity  
and discipline  
with effective  
management  
controls to  
manufacture  
quality products  
consistently and  
achieve customer  
satisfaction**  
”

### Making the Mark

Life Line Feeds (India) Pvt. Ltd, had a very organic growth along the way which is the reason why the Tender Chicken retail outlets have become so very popular not only in Bangalore, in other geographies as well. Through regular and continuous customer feedback mechanism, an extensive customer base has been built over the time of 33 years. Customer profiles spans from quality conscious poultry farmers, feed dealers to retail and institutional customers like the hospitality industry, restaurants, resorts, holiday homes, food caterers,

education institution hostels and many more.

Broiler chicks, live birds, feed, fresh chilled and frozen chicken are produced at all their facilities spread across Chikmagalur which are sold in the states of Karnataka, Kerala, Tamil nadu, Goa, West Bengal, Delhi and Bhutan. Since the company started exporting meat from 2018, vendors list have been successfully generated in the countries of USA, Denmark, Holland, Belgium, Finland, France, Malaysia and Germany. The company considers its vendors as part and parcel of the overall quality improvement process. The production and the QC division constantly interact with the vendors in improving the quality of products.

“Life Line Feeds (India) Pvt. Ltd, is having fully equipped microbiology, chemical labs and serology labs to carry out all the day to day operations in order to ensure that the final product released adheres to the global quality standards and stringent safety policies. It is our goal to produce and give our customers improved quality that meets up to the expectation of increasingly stringent consumer demands. That’s why we continue to expand the horizon of the state-of-the-art technology and increasingly set ever higher standards of quality both for ourselves and for the industry we cater to. Our quality assurance programme makes sure that quality is no accident and it takes people to care”, says the MD.

### Quality and Hygiene

To ensure the Quality of the product and Safety of the Employees, Life Line Feeds (India) Pvt. Ltd. is certified by the following

>>

## Optima Life Sciences launches Optisan - Personal Hygiene Product range

**Pune:** Covid - 19 has made everyone realise “Importance of Hygiene”. Based on currently available information Covid - 19 virus may remain viable for hours to days on surfaces made from a variety of materials.



*Vinay Kulkarni, Director, Optima Life Sciences Pvt Ltd*

**So, along with use of hand sanitiser and masks, other potential routes which may spread the germs need to be blocked.**

Realising this need, Optisan: Personal Hygiene Product range of Optima



*Vinay Kulkarni, Director, Optima Life Sciences welcoming Rajendra Pawar, Chairman, Baramati Agro Ltd. Dr D. K. Dey is also seen.*

Life Sciences Pvt Ltd was launched on Tuesday, 8 December 2020 at a grand function held at Optima's Corporate Office at Pune. Mr Rajendra Pawar (Chairman – Baramati Agro Ltd) was the Chief guest of the launching ceremony. Because of restrictions on gatherings due to COVID - 19, invitee list was restricted to Optima's employees. During his speech as a Chief Guest, Mr Rajendra Pawar briefly narrated

Optima's success story and applauded company's growth as he has seen Optima becoming a well grown tree from a small sapling planted 10 years back. He also appreciated founder director – Mr Vinay Kulkarni's hard work, persistence to create a successful enterprise Optima Life Sciences Pvt Ltd and now Optisan and wished great success for the Optisan. Baramati Agro Ltd is



manufacturing Optisan Hand Sanitisers for Optima. Product launch was followed by

- Recognition of Optima's employees for their long service in the development of Optima.
- Distribution of appointment letters / certificates to Optima's distributors.
- Planting sapling and wishing good growth of sapling and Optima's new sapling “Optisan”.

**Optisan offers scientifically developed –**

1. Foot & Surface Sanitiser.
2. Hand Sanitiser.
3. Vegetable & Fruit & Cleaner.



*Optima Life Sciences team during Optisan product launch on December 8 at Pune.*



>> International standards certifications,  
ISO 9001:2015 – Quality Management System certified by Bureau VERITAS.  
FSSC 22000: 2018 version 5 – Food Safety System certification certified by SGS.  
ISO 14001: 2015 – Environmental Management System certified by Bureau VERITAS.  
ISO 45001: 2018 –

Occupational Health and Safety Management System certified by Bureau VERITAS. Life Line Feeds (India) Pvt. Ltd, goes to great lengths to ensure that extremely high quality products are maintained throughout all the processes involved in providing their customers with quality poultry products. Emphasis is laid on ensuring that there is minimum contamination to the company's products,

right from the beginning of the process to the very end. Proper equipment, sanitation and good manufacturing process are followed diligently.

The company incorporates the idea of quality right from the beginning of the manufacturing process. They own the breeding farms that produce the hatching eggs to produce broiler chicks. Their commercial lines are developed from world class

genetic resources. “Hygiene is very crucial at Life Line Feeds. Each day, the personnel are checked for cleanliness before they take entry into the company's slaughtering unit. Every six months, all the employees need to go through a medical check-up that include blood tests for illnesses like Salmonella, Amoebiasis and Hepatitis,” concludes the Managing Director.



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What the stakeholders said about poultry in 2020 and in the New Year 2021 ?

# COVID-19 created us very good opportunity in the public perception about protein value of poultry products, which helped things improve in Poultry

*Poultry industry in India lost over INR 27,000 crores in the first four months in 2020 due to COVID-19. IEC has now taken up 'VISION 365' from its present 165 eggs global per capita consumption.*

**Poultry Fortune invited stakeholders in poultry industry to send their observations, views and opinion on how the industry was in the just concluded 2020 and how they see the New Year 2021 for the industry. We published views of some stakeholders in this issue and remaining will be published in February 2021 issue of this magazine. Excerpts of the interviews held by M. A. Nazeer, Editor, Poultry Fortune with the stakeholders through online questionnaire:**



**Chitturi Suresh Rayudu,  
Chairman, International Egg  
Commission and Managing  
Director, Srinivasa Farms Pvt Ltd**

2020 began with a very big challenge. We were already dealing with very low farm gate prices of eggs and broiler chicken, and to add to that rumours of poultry products consumption linking with occurrence of COVID-19 pandemic had badly hit poultry industry in the country, said Mr Chitturi Suresh Rayudu, Chairman, International Egg Commission (IEC) and Managing Director, Srinivasa Farms Pvt Ltd.

I think, poultry industry in India lost INR 25,000 to 30,000 crores in the first four months of 2020. Market started improving and it improved really well and I think consumers also got confidence that if you want to have very good immunity then you need to eat more poultry products like Eggs and Chicken. With that the demand came back, but production got hit in broilers for some time. Important thing here is

that COVID-19 has created us very good opportunity in the public perception about protein value of poultry products which helped things improve in the industry, he stated.

Suresh told, everybody started telling that if you want greater immunity then eat more chicken and especially eggs. People who used to buy 6 eggs or 10 eggs had switched to buy 30 eggs tray now.

Unfortunately, as an industry we are not doing anything, we are not doing any promotional works to promote egg and chicken consumption and we are not taking advantage of the situation. I believe, if we join together and take advantage and spread the positive news about our products, then the industry can be doubled in 5 to 7 years, Suresh Chitturi told.

Any negative message about COVID or any other issues can be tackled if they are by established Social Media groups like Twitter and Face Book. But other WhatsApp groups damaged heavily the things from mid-February 2020 if you consider the violence in Delhi and Bangalore and in many other places, and how our country is today, we are struggling due to the rumours, stated Mr Suresh.

As I said, the problem is that just before COVID-19 started nobody knew that what is going to happen. I think what happened was, in January the poultry players decided to increase the production of broilers and with some logic they thought they will take advantage and they decided to increase their production 20% more birds that is first thing, second thing is that when rumours started coming they did not get together and clarify to consumers that rumours are not true. Poultry industry main players did not act immediately.

I was trying, I was running around to Delhi and all that before I could make everybody realize, it took me a month and I was fighting alone for 2 to 3 weeks, and the biggest player never joined in supporting us and in conversation with the ministry at the Indian Government. I don't know how to solve this problem. The solution is clear, but nobody wants to work together.

Every doctor is saying .... if you want good immunity, eat more eggs and I also went to some channels. On World Egg Day, NECC did not do any promotional work on World Egg Day. It is the World Egg Day and not of Suresh's Egg Day. When an event happens on Eggs, everybody should support it.

Most important thing is that potential

players in the industry have to look beyond competition and work together to resolve issues and to increase consumption, and we can always compete to provide best products and services to the farmers. If egg and chicken consumption in India increases, it is good for all of us. Consumption of eggs and chicken is so low in India, he stated.

#### **World per capita egg consumption today is 165**

IEC has taken up now 'VISION 365' which means people are going to have 365 eggs per capita world over which is presently 165 eggs. World per capita egg consumption is 165 and we want to make it 365 eggs. I am talking to all the players and making almost two to three calls a week to biggest egg producers in the world and big companies like Hy-Line, Bid Dutchman and many pharma companies in poultry sector. All of them are very excited and thrilled to know about this game plan. We have to bring everybody together to create a positive message about eggs, said Suresh Chitturi.

Another thing we are working about sustainability in egg production. Eggs are more environmental sustainable animal protein so we want the world and everybody to know that how eggs are more sustainable. We have a team of scientists to talk about nutritional importance of eggs in human nutrition. We have two tasks like sustainability and nutrition. We have to make egg the No. 1 protein for human being.

Per capita egg consumption in China, Japan, Mexico and a few other countries is between 300 to 365 eggs, where as it is 75 eggs in India. Ultimately

we want every human being to eat 365 eggs annually. The time target I think to me is not very important, but at the same time we don't want to take 40 years to achieve that goal. I think it will take us 15 to 20 years to reach 365 eggs per capita consumption. By 2040 world population will be close to 8 billion people, he mentioned.

#### **Plans and programs for 2021:**

At the end of 2017 Srinivasa Farms started as a whole new venture and we started going all out in a big way. COVID-19 crisis was very tough for us but I would say now we are actually doing much better than last year and as I told you we have achieved remarkable performance on field. We have achieved 1.23 FCR in commercial broiler and nobody in the world has never heard and in ordinary open houses in Telangana we achieved best performance. It was beyond everybody's dream that this kind of performance is possible.

On Hy-Line layer side, farmers are consistently getting 400 + eggs but more importantly we have one farmer in Visakhapatnam and he gave 9.5 Kgs of feed and feed cost is very high almost 25 to 26 rupees. On an average he saved Rs 230 to 240 in feed only per bird. Farmers were shocked to see the result.

Egg shell quality even at 100 weeks age is excellent and there are no small eggs, no pullet eggs and salability has increased. Looking at these advantages farmers are now slowly coming towards us, he informed.

In layer we are looking to double in the next 2 to 3 years and in broiler we will be aggressive. On broiler we need to educate ourselves and learn, we are now quite confident with "ROSS 308 AP". Farmers are now willing to use the world class birds. The world class genetics of Hy-Line is now available in the country and Hy-Line developed Genetic Program suitable to Indian climatic conditions which is really giving amazing results. We have never seen in our 55 years of history such good performance like now, said Suresh.

“  
**Every doctor is saying ....  
if you want good  
immunity, eat more eggs  
and I also went to some  
channels.**  
”



# Post lockdown relaxation, poultry sector demonstrated strong resilience, which had ensured limiting the impact on businesses



**Dr Arun Atrey,**  
Managing Director,  
Zyudus Animal Health & Investments

**Poultry Fortune:** In your view, how was the year 2020 for Indian poultry industry?

**Dr Arun Atrey:** Before delving into 2020's, a retrospective look of poultry sector in 2019's is imperative, as the latter had paved the ominous ground for the year ahead. The economic distress in the sector began hitting the headlines during mid-Q3' 19 in tandem with the slowdown of the economy. The economic crisis during the period owes largely to the hike of prices of raw materials viz., maize and rice bran, making up to 70 - 80% of poultry feed. The resulting hike in prices of poultry feed is speculated to be the highest in last 20 years. Short rainfall in preceding year affecting agriculture production is thought to be pivotal in precipitating the crisis. Furthermore, the average

price of egg and broiler meat dropped by 20% and 25%, respectively below break-even (₹2.80 - 3.00 and ₹55 - 65 per egg and per kg broiler meat, respectively), resulting in poultry operations running on thin margins during Q4'19. With the beginning of 2020, the odyssey of economic crisis in the sector was worsened by COVID-19 pandemic plunging in a state of oblivion — at some point, while until Q3'20, the reeling sector began spurting back to life — heaved a sigh of relief!

**PF:** How was the impact of COVID-19 on Indian poultry industry in 2020?

**Dr Arun Atrey:** The impact of COVID-19 pandemic on the poultry sector was unprecedented. It began during the period Feb – Mar'20 with the rumour of poultry products as the potential source of novel corona virus. The meat and egg consumption reduced drastically by 80% to nil (in some places) throughout the country during the period. As a consequence, further reduction in egg and meat prices were recorded — ₹1.50 – 2.50 and ₹15 - 35 per egg and per kg broiler meat respectively. While the feed cost continued to be high during the period, broiler producers drastically reduced placement by 80% in Mar'20 — approx. six crore per month to compensate daily losses. Similarly, no new replacements were seen in layer sector, and farmers relied on forced moulting, resulting in 80% shrinkage of egg output in Mar'20. Overall, liquidity in the sector went into state of coma.

In Apr'20, the broiler meat and egg consumption increased to 40% — thanks to scientific insights of industry experts, and right propaganda by govt.

officials. Furthermore, the feed price drastically reduced owing to correction in Maize & DORB price by May'20 resulted lower cost of production for poultry producer. It encouraged the broiler producers to increase placement up to 12 crore per month by May'20 — 40% of total capacity. In layer sector, flocks came out of moulting and old flocks were culled/sold out. The total population estimated by May'20 was about 25 crore with an egg output of 700 crore per month — 75% of the capacity. However, the egg price continued to be low viz., ₹1.50–2.80 throughout the country in April'20. Majority of flocks were out of moulting (in production by Apr'20) exerting dramatic pressure on egg sale. Stalling of transport (inter-state) during lockdown resulted in further piling up of saleable eggs in farms/cold storages. Herein, layer sector were on liquidation spree of stocks (eggs) at extremely trimmed costs. Finally, the overall liquidity crunch affected the market until mid-May'20. The egg price went up since then, in tandem with the demand to ₹3.80 – 4.20. In broiler sector, low price continued, until mid-May'20, the price started rising steeply above break-even to ₹90 – 115/kg by end of the month. The estimated losses incurred during the period was around US\$ 4 billion.

Since Jun'20 — post lockdown relaxation, poultry sector demonstrated strong resilience, which had ensured limiting the impact on businesses by the end of September and raise the outlook for the year. Low feed cost, better realization of meat & egg prices, and higher consumption of poultry products, maintaining positive trend in elasticity of demand, had been instrumental in paving the path of recovery. Going forward, the demand of poultry products in terms of consumption is expected to have upward trajectory. However, as about 45% chicken meat and 25% egg is consumed in restaurant/hotel/social-&- official gatherings, the increase in consumption is likely to happen gradually. The present day broiler production is about 75% of the capacity — 22 crore per month, while layer replacement and egg output has reached 80% of the pre-COVID capacity

— about 700 crore per month. With this momentum shift, the reeling poultry sector is expected to spurt back to the pre-COVID level by end of Q1'21.

**PF:** How do you see Indian poultry industry in the New Year 2021? What do you suggest to be done to have better prospects and profitability in poultry sector in the country?

**Dr Arun Atrey:** In 2021, poultry production is expected to return to near - 2019 levels. Demand is expected to move in an upward trajectory with 13% volume growth in 2021 vis-a-vis 2020. However, strategic approach towards collaboration with the government is warranted in the sector as the recovery is beyond the scope of mere corrections in numbers or production capacity. The action areas should be defined aiming to shape the future of the industry in alignment with the market demand

Following principles are likely to drive and reshape the sector in 2021 —

- Consumer behaviour
- Increasing awareness for food safety
- Demand for hygiene in supply chain & delivery
- Production vs. market size

During the early stages of pandemic, many consumers prefer to cook at home and not eat in restaurants. Consumers were looking for long-lasting foodstuffs

and to engage in comfort eating. Market research on the purchasing behaviour captured the reaction of consumers to the pandemic consists of three stages — reacting by stockpiling goods, coping by maintaining social relations by virtual gatherings, and longer-term adaptation by modifying individual and societal behaviour and consumption. During the lockdown, demand has been low, and those still consuming have shown a clear preference to packaged, branded poultry products that vouch for high hygiene standards. Going forward, consumers may demand bar coding on packaging to substantiate the supply chain stages of the product. Furthermore, Millennials and Generation Z, the major drivers of domestic meat consumption, understand and demand 'food safety' and are sophisticated in their choices. Therefore, poultry producers will have additional responsibilities, to include that they adhere to and comply with food safety, biosecurity and hygiene standards in operations.

Demand for food safety will usurp shift towards poultry processing. At present, about 5% of poultry meat is sold in processed form, of which only about 1% undergoes processing into value-added products (ready-to-eat / ready-to-cook). The poultry processing industry in India was expected to expand at a CAGR of

~12% between 2018 and 2023. However, taking into consideration consumers' preference for packaged meat, this could go as high as 20%. Therefore, collective efforts are required to assess the processing requirement, recalibrate existing capabilities and launch preparation to match the demand. In the near future, poultry sector is expected to focus more on online retail, hygienic, high quality & value added products.

Roughly, urban consumers drive 60% of poultry products' consumption. Over 70% of the Indian population is non-vegetarian with majority among them classified as eggetarian. Job losses and pay cuts lowering the disposable income across these consumers, the chicken might become luxury or occasionally eaten commodity. The consumption levels have not gone up to the pre-Covid levels since hotels, restaurants and social gatherings are not fully operational. Considering the current scenario with gradual improvement of the situation, the industry is anticipated to recover by 2021.

Our industry has been put to and passed through tremendous challenges many times in the past. We have learnt during the process and came out stronger and smarter every time. I hope to see a great 2021 for the industry!

## Responsibility lies on Integrators



**Dr Jitendranath Saha,**  
General Manager – Marketing,  
Virbac Animal Health India

**Dr Jitendranath Saha:** Very grave situation as we all know Corona rumours and Covid - 19 in 1st QTR & QTR 2 affected consumption - So the Production QTR little recover with 40 - 50% capacity of production with so many problems of raw materials / end produce off take / Labour migration etc 2020 very very bad year for Industry.

**PF:** How was the impact of COVID - 19 on Indian poultry industry in 2020?

**Dr Jitendranath Saha:** Impact: As per the estimate, the COVID- 19 scare and lockdown impacted 10 lakh broiler poultry farmers and 2 lakh layer farmers, and by the end of April 2020, the losses due to the same were estimated at Rs 27,000 crores year on in total would be

100,000 crores.

**PF:** How do you see Indian poultry industry in the New Year 2021?

**Dr Jitendranath Saha:** Good, over 2020 and equal to 2019. Production capacity should be kept little lower the demand for everybody's good, responsibility lies on Integrators.

**PF:** How was the year 2020 for you as an individual in poultry sector and what are your plans and programs for the New Year 2021?

**Dr Jitendranath Saha:** 2020 very very poor (loss) - 2021 expecting better - depends on overall Industry and Covid situation.



# Overall demand in 2021 expected to be back to near 2019 levels



**Mukanjay Singh,**  
Director, Meyn India Pvt Ltd

**PF:** In your view, how was the year 2020 for Indian poultry industry?

**Please mention about Broiler segments of the industry along with Productivity, Production cost, Broiler farm gate prices, Consumption of Chicken etc.**

**Mr Mukanjay Singh:** The entire 2020 was like a roller coaster ride for Indian poultry industry which has gone through multiple challenges. The industry was already facing the challenge of higher feed prices from previous year due to lower acreage in maize production but then it was further hit hard by the series of events happened due to the arrival of COVID-19. It started in the beginning of the year when a rumor started surfacing on social media platforms attaching consumption of poultry to COVID-19 transmission. Consequently, the consumption of chicken meat and eggs has dropped severely and subsequently the prices. Adding to the misery the industry faced nationwide lockdown to contain the spread of virus which further reduced the consumption due to the collapse of logistics supply restricting the supply of feed, vaccines, medicines, and chicks etc.

However, the false scare of consumers which was associated with poultry consumption got removed completely by the end of Q2. Thanks to the extended help from trade bodies and government who were instrumental in bringing the positive awareness among the consumers helped the industry to reach the consumption level back to 70 % before COVID outbreak and set to recover by 90 % in Q1 of 2021.

**PF:** How was the impact of COVID-19 on Indian poultry industry in 2020?

**Mr Mukanjay Singh:** COVID-19 has impacted the domestic poultry industry severely. The industry incurred large net losses due to sharp decline in demand, realization, and profitability. The losses between January and March 2020 amount to USD 236 million. The sales of poultry meat went down with astonishing 80 percent, and prices for poultry meat were halved. At least 30 - 40% of the small players wiped out since they did not have enough cash to feed the business during peak of COVID since feed constitutes 80% of the input cost. Over a million small poultry farmers and over half a million persons working in the sector have become unemployed.

**PF:** How do you see Indian poultry industry in the New Year 2021?

**What do you suggest to be done to have better prospects and profitability in poultry sector in the country?**

**Mr Mukanjay Singh:** Indian poultry industry set to recover in 2021 after the setbacks from 2020. The corn feed price expected to remain low in 2021, considering increased stocks due to reduced usage this year, this factor will help support production recovery. According to the industry sources the current average live bird price is INR 85 across India and industry may recover fast if prices continue to remain firm until March next year.

Overall demand in 2021 expected to be back to near 2019 levels. That means 13% volume growth in 2021 compared to 2020. The consumer retail demand for broilers is expected to improve in 2021, while B2B demand will still take time to return to normal level.

In my opinion the full transition from informal (wet) to a formal market segment, along with consolidation and integration of the industry is pivotal to make the poultry business more profitable but more importantly sustainable. The integrators should look at a broader picture rather than falling prey to short term gains by concentrating only on live bird sale. In fact, they must concentrate on forward integration by investing into primary and further processing & value addition. It will give them the opportunity to have full control over poultry prices and from consumer point of view they will get more hygienic and quality processed chicken which will create win - win situation for both producer & consumer.

**PF:** How was the year 2020 for you as an individual in poultry sector and what are your plans and programs in the New Year 2021?

**Mr Mukanjay Singh:** Our company believes in growing but alongside with our customers and we believe in supporting them through thick and thin. In the same direction we supported our customers almost throughout the year by supplying non-stop spare parts consumables from Meyn India office based in Greater Noida. Not only that we continued providing engineering services and as we speak the team of engineers from India and Holland offices are busy at the site of Shanthi feeds from Coimbatore to expand their processing capacity from 6000 BPH to 12000 BPH.

By the end of 2021, our plan is to finish off the two biggest processing projects in the entire history of Indian poultry processing which are set to reach the staggering capacity of 12000 Birds Per Hour bestowed by our esteemed customers i.e., Shanthi Feeds and Sneha Farms.

# Industry needs to self-regulate the price of day-old chicks between 15 - 30 rupees for the benefit of farmers



**Amit Saraogi,**  
Managing Director,  
Anmol Feeds Pvt Ltd

**PF:** In your view, how was the year 2020 for Indian poultry industry? Please mention about Layer and Broiler segments of the industry along with Productivity, Production cost, Egg and Broiler farm gate prices, Consumption of Eggs & Chicken, Diseases, Feed & Nutrition, Management etc.

**Mr Amit Saraogi:** The poultry industry has seen a tumultuous year with many ups and downs. With a very successful season last year, the industry was looking forward to a fruitful season this year. Looking at the growing demands, farmers were ready with increased number of birds for the season. Unfortunately, COVID hit us early in the year and the poultry industry was one of the first to suffer the repercussions. The industry suffered tremendous losses early in the year, with farmers being forced to give away their birds almost free of cost. Consumption of egg and poultry has almost bounced back to pre COVID level in most markets. Egg rates has gone up slightly while price of chicken is more or less stable. Farm Management plays a critical role now so as to ensure proper hygiene and safety conditions. As consumers become

more conscious of the sourcing of meat and chicken, farmers need to adhere to ideal farm conditions.

**PF:** How was the impact of COVID - 19 on Indian poultry industry in 2020?

**Mr Amit Saraogi:** As you are aware, the industry had been battling unscientific and fake news since second or third week of February which led to confusion about chicken and egg consumption as it was linked to corona virus unscrupulously which resulted in significant drop in its consumption. This scenario led to surplus stock with farmers during the otherwise peak season of Holi for poultry business. Farmers were left with no option but to destroy their produce due to huge drop in demand. With no fresh produce, the demand for feed proportionately declined pushing us as manufacturers into austere losses in revenues in the month of March. The problem compounded with no seeding of fresh chicks in the same month or fresh crop for April harvesting.

The nationwide lockdown implemented to slowdown the spread of corona virus resulted in a logistics logjam and halted the entire supply chain which forms our backbone to maintain steady stock and meet market demand. This also led to difficulty in procurement of raw materials coupled with spike in maize prices which forms the most key ingredient for feed manufacturers like us.

The poultry sector employs more than 10 lakh farmers and contributes INR 1.3 lakh crore to the country's GDP directly. This entire industry has suffered a loss attuned to INR 13,000 crore / Month forcing the farmers to bankruptcy. Our Government took note of the industry's condition and announced the Rs 15000 crore Animal Husbandry Infrastructure Development Fund which provided some relief to the sector. The Government also announced reduction of import duty on maize that allowed the import of 5 lakh MT of maize at a

concessional customs duty of 15 per cent each under the Tariff Rate Quota Scheme to give boost to the poultry industry.

The industry has recovered over the months and due to high demand in households and some improvement in demand from hotels and restaurants, it may be safe to predict that sales will hit the pre - COVID levels by March 2021.

**PF:** How do you see Indian poultry industry in the New Year 2021? What do you suggest being done to have better prospects and profitability in poultry sector in the country?

**Mr Amit Saraogi:** As mentioned earlier, seeing the current market trends, we are hoping for 2021 to be a good year and process to hit pre COVID levels in the poultry industry. Consumer retails demand is expected to improve in 2021.

The farmers in contractual poultry farming are currently getting average INR 5 - 6 / kg from poultry enterprise to compensate for shed capital cost, maintenance, electricity, saw dust, etc., in addition to labour charges. This cost actually translates into INR 12 / kg. The said loss to farmer becomes unrecoverable in adverse market situations. A minimum contract growing charges is required to be fixed for farmers which includes appropriate growing charge for poultry. This will help farmer entrepreneurs and attract more people to participate in poultry farming business in rural areas. With the lack of alternate raw materials available in the market and unpredictability of other factors, it will be of great benefit to the farmers if all stakeholders of the industry unite to solve these issues and help grow this sector. The integration business model practiced in India is not the correct form. We cannot be in direct competition with farmers. In integration farming, the farmers do not reap much benefit. Real income happens when they are in open farming. Moreover, chick prices vary anywhere between Rs 5 - Rs 55. If bird prices are good in future, open farming will ensure liquidity for farmers. The industry needs to self-regulate the price of day-old chicks between 15 - 30 rupees for the benefit of farmers.

**PF:** How was the year 2020 for you as an individual in poultry sector and what are your plans and programs in the New Year 2021?

**Mr Amit Saraogi:** Much like any other individual associated with the poultry sector, I too, went *Contd on Page 40*



# Focus more on online retail, hygienic, high quality food, traceability and labelling



**Abir Mukherjee,**  
Managing Director,  
Glamac International Pvt Ltd

## INDIAN POULTRY AT A GLANCE

Across the world poultry market, India ranks sixth (using FAOSTAT rankings). India is the third-largest egg producer in the world (after China and the US) and the fourth-largest chicken producer in the world (after China, Brazil and the US). The domestic poultry industry in India has made a remarkable growth ever since its inception and is presently emerging as a sunrise sector with a growth rate of 8.51 and 7.52% in egg and broiler production respectively (BAHS,

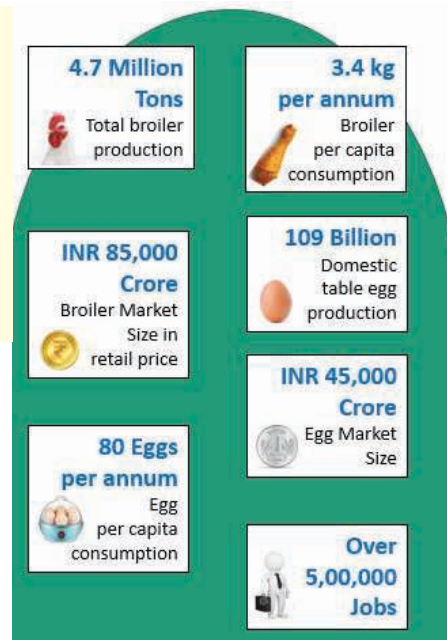
2019) as against 2.5% for agricultural crops (The Economic Survey, 2019-20). Within the poultry sector, broiler and layer segment constitutes about 65.3 and 34.7 % with the monthly turnover of 400 million chicks and 8400 million eggs respectively (ICRA, 2020). Poultry meat being the most popular meat in India, it has been receiving significant boost through investments. Latest techniques of breeding, hatching, rearing and processing have transformed the poultry sector tremendously. Popularization of hybrid poultry breeds, thanks to efforts by both government and private sectors, has brought in more profits.

The poultry sector's annual turnover is pegged at INR 1.2 lakh crore and the industry provides direct and indirect employment to over 2.75 crore people. According to the latest Livestock census 2019, the poultry population has increased in the country from 729.2 million to 851.81 million which is 16.80 percent of the rise. India consumes about 9 crore broiler birds and 2.25 crore eggs a week. Though the present per-capita availability of eggs is 80, chicken meat consumption is 3.4 kg while the ICMR recommendation is the consumption of 180 eggs and 10.8 kg

poultry meat per person per annum considering chicken and eggs are the cheapest and best source of protein. This means that the Indian poultry market is laden

Annual turnover	1,20,000 Cr.
Growth rate	6-8 % per annum
Production of broilers	400 Cr. Per annum
Production of eggs	9300 Cr. Per annum
Direct & indirect employment in poultry	2.75 Cr.
Broiler farmers	Approx. 5,00,000
Layer farmers	25,000
Hatcheries	700
Feed companies	
Farm staff and Pharma	Above 10 lakhs
Traders, Wholesalers, Retailers	
Poultry consultants	1200-1500

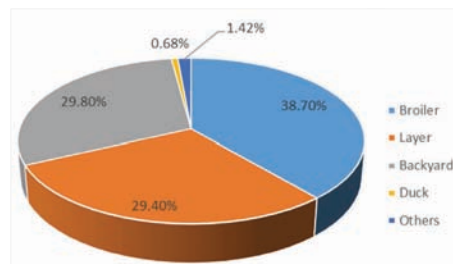
Food	Rate Rs./kg	Protien (gm)/100gm	Protien cost (Rs/gm)
Milk(buffalo)	60	4.3	1.4
Milk(cow)	50	3.2	1.56
Paneer(buffalo)	340	13.4	2.54
Paneer(cow)	340	18.3	1.86
Fish	500	19	2.63
Chicken	200	26	0.61
whole egg	95	12	0.8



with opportunities for growth.

## DISTRIBUTION OF POULTRY

### POPULATION

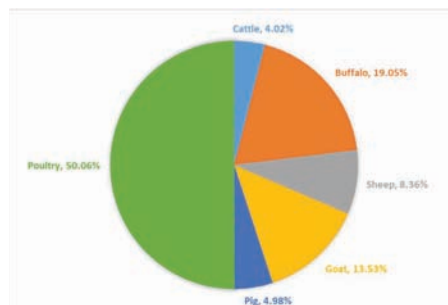


## HOW INDIA EATS

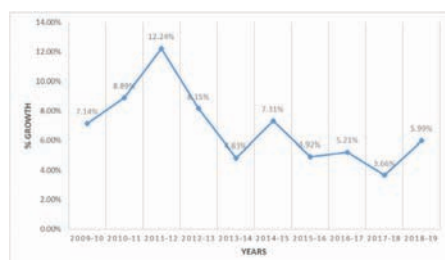


## SPECIESWISE MEAT CONTRIBUTION IN 2018-19

Poultry meat is more than 50% of the total meat production in India.



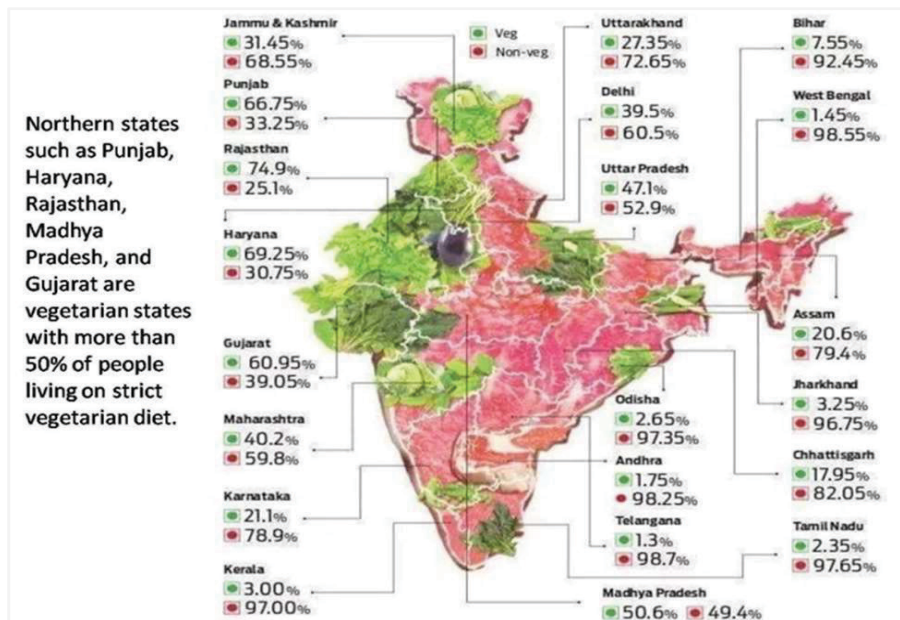
## ANNUAL GROWTH RATE OF MEAT PRODUCTION



## YEAR 2020: IMPACT OF COVID-19 ON INDIAN POULTRY INDUSTRY

Over the last one year, industry is riding a tough wave witnessing the higher feed prices due to lowered acreage in maize production followed by COVID-19 impact and lock down. Initially at the beginning of 2020 numerous misinformation and rumours that were circulated in social media about the likely spread of COVID-19 through chicken created doubts in the minds of chicken eaters. The industry incurred large net losses due to sharp decline in demand, realization and profitability. The COVID-19 driven lock down during March in the country has further accentuated the crippling poultry industry due to arrest of feed and healthcare essentials. There was drop in production by means of premature culling of breeder stocks, no AI, forced moulting, destruction of the flock, starvation and death. Nobody could able to say where the industry was heading. States like Maharashtra, Andhra Pradesh, Telangana and Odisha suffered maximum. The losses between January and March 2020 amount to USD 236 million. Many gave up and surrendered to the situation creating more panic and chaos! It was difficult for the industry to sustain such kind of losses. Thanks to central and state governments, various institutions who came forward hand in hands with the message "Eggs and chicken improve immunity" and gave their best to bring back the sector into normalcy. Soon people came out of the false rumour

Northern states such as Punjab, Haryana, Rajasthan, Madhya Pradesh, and Gujarat are vegetarian states with more than 50% of people living on strict vegetarian diet.



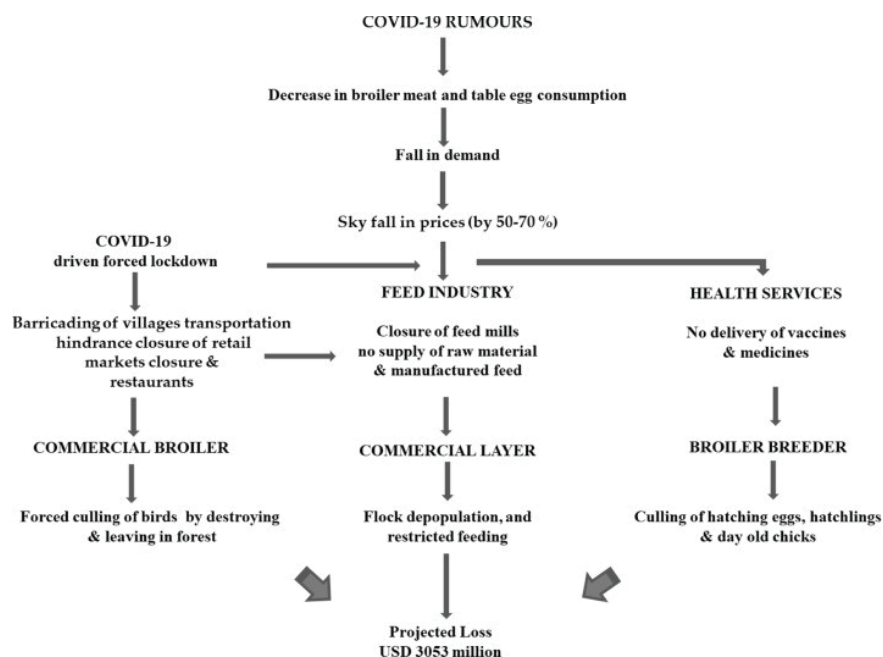
and realised that there is no relation between chicken consumption and COVID - 19. The prices of broilers and eggs had recorded a steep increase in the May months with the concurrent increase of consumption. Online sales greatly increased during lockdown, farmers and restaurants started online sales and home delivery. Customers moved towards frozen and chilled chicken. It came as a blessing in disguise

for those who persisted in the business with good homework and liquidity and are reaping the benefits of their decisions because of the corrective measures in panic and shortage created. In the near future, the sector is expected to focus more on online retail, hygienic, high quality food, traceability and labelling.

## WAY FORWARD 2021: SUGGESTIONS

Chicken meat and egg consumption in

Figure: Flow of events involved in disruption of poultry protein chain during COVID-19 pandemic and its subsequent economic fallout in India



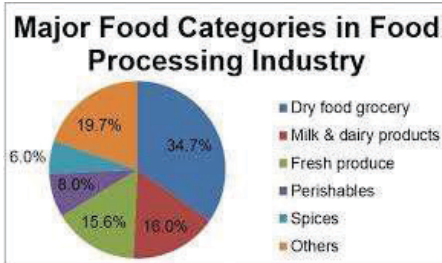
(Ref: Kolluri G., Tyagi J.S. & Sasidhar P.V.K., Research Note: Indian Poultry Industry in the Era of COVID-19: A Situation Analysis Report, Poultry Science (2020), doi: <https://doi.org/10.1016/j.psj.2020.11.011>.)



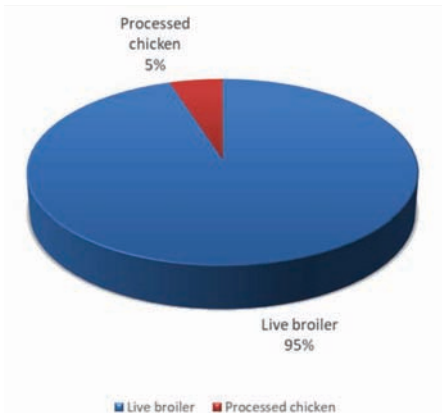
India is highly unstable in connection with the involvement of taboos, festive occasions, vegetarian population in general, purchasing power etc. Therefore, their prices are dynamic with high sensitivity to change in daily demand. COVID-19 pandemic driven economic crisis has adversely affected purchasing power of the consumers in the country. The encouraging part is per capital meat and egg consumption has an upward trend, which is a great hope for the positivity and sentiment of the industry.

A few suggestions...

- Poultry is one of the least processed foods across the food categories providing a significant opportunity. Also, we have significant export opportunity subject to developing and achieving the system driven compliances.



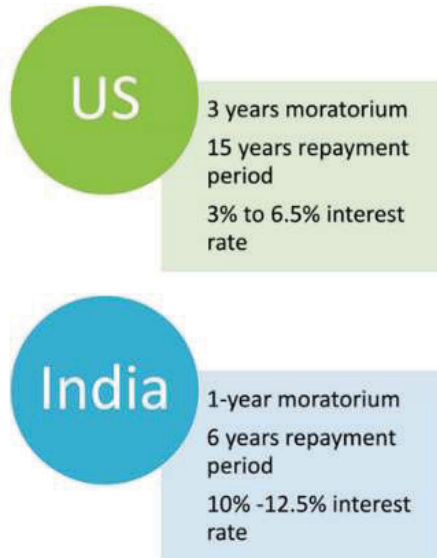
Live market sales of broiler meat constitute more than 90 to 95% due to the preference for fresh cuts (NAPEP, 2017). Opportunity to replace wet markets with processing units - the demand for the poultry meat can be increased only if the industry will produce hygienic poultry processed meat at least for the urban population and when processed poultry meat is produced then situations like COVID-19 Crisis can be avoided.



- Allow import of inputs, use of GM

crops- can reduce cost of production by 30%.

- “Atmanirbhar Indian Poultry in New Normal” for producing poultry equipment and essential supplement like amino acids can cause significant reduction in cost of production.
- Financial assistance for farmers- higher moratorium and repayment period, increased subsidies.



#### YEAR 2020 FOR GLAMAC AND WAY FORWARD 2021:

Year 2020 is a challenging year for Glamac. Glamac was launched on August 2017 and being a new entrant, it was a great challenge for us to face and excel in the already sluggish poultry market mainly from year 2019 itself. Business was affected badly in the initial COVID - 19 months of March to May 2020 along with high receivables from the market. But we started recovering

from June 2020 onwards and in spite of COVID - 19 we could able to manage our business and expected to grow around 15% at the end of FY 2020 - 21. 20% of our revenue comes from Exports but export business is still sluggish due to COVID - 19. Our CAGR is above 45%.

Glamac was awarded with “Fastest Growing Indian Company Excellence Award” by IAC (International Achievers Conference) in November 2019. We are expected to continue our growth path with growth drivers like New Aqua Division, Domestic expansion and entry into new export markets in Yr. 2021.

At Glamac, whatever we do is driven by Innovation. We’ve married core technical expertise and strong global relationships with hours of research and the result is consistent innovation. This will to innovate and change status quo drives us to strive for excellence every day. We have an experienced team at our core that have a high attention to detail thus ensuring only the best quality product goes through. Through our strong relationships with organisations worldwide, we have been able to establish strategic sourcing channels & strong customer relationship. Along with a strong product at its heart, our values lie in a deep-rooted service ethic.

Our plans and programs for the New Year 2021 is “we shall keep progressing with our core values intact”.

Abir Mukherjee, Managing Director, Glamac International Pvt Ltd, 413, Orion Business Park, 4th Floor, Kapurbawdi, Ghodbunder Road, Thane(w) – 400 610, Mumbai, India. [www.glamac.com](http://www.glamac.com)

Contn from Page 37 :

**Industry needs to self-regulate the price of day-old chicks between 15 - 30 rupees for the benefit of farmers**

along with the ups and downs of the industry. When the industry was going through one of the worst times, Anmol Feeds sent letters to Shri Giriraj Singh, Hon’ble Minister of Animal Husbandry, Dairying and Fisheries and industry bodies highlighting the plight of the industry. I feel honoured to say that the letters did cause an impact and the Government took note of the situation and announced relief for the sector. I am glad to see now that the industry is on its way to a smooth recovery. Our industries are interdependent and if

one industry performs well, the other will automatically flourish. It has been and will always be my endeavour to stand with the industry and voice their needs whenever necessary.

In the next year, we have some plans pertaining to the industry, since it is one of our main and popular sectors. We will be introducing a new range of poultry feed which will be have advanced features and benefits. At Anmol Feeds, we always aim to better ourselves and our products so that all our stakeholders are not only happy emotionally but also financially. We also plan to provide technical services to poultry farmers enabling them to generate sustainable income.

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# Dietary sodium diformate (Acidomix DF<sup>+</sup>) in Broiler nutrition: A new approach for sustainable Poultry production

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**Christian Lückstädt**, ADDCON, Bonn, Germany  
**Ms Sarah Mellor**, Independent writer, Weinheim, Germany.

Evidence of the development of antibiotic resistant strains of bacteria that are pathogenic to humans has mounted over recent decades; and the practice of using sub-therapeutic levels of antibiotics as growth promoters (AGP) in livestock production has been heavily implicated in this resistance. Worldwide, this connection has led to the erosion of consumer trust in agricultural practices that rely on this valuable medical resource. Increasingly, legislation is limiting their use. The latest news from Europe is that Denmark now imposes even stricter laws on antimicrobial use. This updated agreement, ratified by the Danish parliament, is an extension of previous agreements on animal welfare and the reduction of excessive antimicrobial use. "Stricter rules for the use of antimicrobials are part of strengthening the One-Health-perspective where animal health and human health are closely connected" (Ministry of Food, Agriculture and Fisheries, Denmark, 2012).

The shift from AGP to alternatives that began in Europe has spread rapidly, as exporting countries have had no choice but to comply. A number of alternative feed additives have been investigated. Among the new, tested compounds are acidifiers. These supplements include organic acids and their salts, like diformates. Potassium diformate, for instance, the potassium double-salt of formic acid, rapidly gained formal approval as the first legal alternative for in-feed antibiotics in Europe.

Formic acid and its salts are well known to improve productivity, acting against pathogens, which decreases the pressure on the animal's immune system. Thus, more nutrients will be available for productive functions such as growth or laying; whilst acting on the feed matrix to provide optimal conditions for digestive enzymes, particularly pepsin, releasing more nutrients from the feed. The double sodium salt of formic acid, while having the same antimicrobial

## Highlight Points

Numerous reports have demonstrated how including sodium diformate in broiler diets has beneficial effects on performance by lowering bacterial pathogen load and improving nutrient digestibility. These benefits are turned into economic returns, despite the perceived increase in feed cost of using additives. It is therefore recommended for the poultry producers to include dietary acidifiers, like Acidomix DF<sup>+</sup>, into their broiler diets.

properties as formic acid, has become more commonly used in poultry production, as it is easier to handle and does not negatively affect palatability, as can the pure acid.

Thus, several trials have been carried out in order to demonstrate the effectiveness of sodium diformate (Acidomix DF<sup>+</sup>, Venky's) under various conditions world - wide.

First reports on the effect of sodium diformate in poultry nutrition appeared in 2009 (Lückstädt & Theobald) on the effect against Salmonella, Campylobacter and further gut microbiota. Later that year a paper entitled "Reducing broiler feed costs with diformate" was published by Swick & Lückstädt. Further, reports from Lückstädt, Eidelsburger and Theobald (2010) as well as Lückstädt & Theobald (2010) concentrated on the use of diformate in broilers at various dosages; and against positive and negative controls. The effect of the additive in turkey nutrition was confirmed in 2011 by Glawatz, Meyer and Lückstädt. Inclusion of the double salt into layer diets proved beneficial, especially on egg quality parameters and number of pathogens (Kühlmann *et al.*, 2012). Finally, the anti-Salmonella effect of sodium diformate was confirmed by DEFRA in 2011/12.

The benefits of incorporating sodium diformate in broiler

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Targets and eliminates specific bacteria, even those resistant to antibiotics

**Protective:**

Maintains gut bio-balance by retaining beneficial bacteria

**Probiotic:**

Enriched with Bacillus Subtillis

**Flexible:**

Compatible with all Performance Enhancers, Growth Promoters, Acidifiers, Anti-Oxidants, Minerals & Enzymes

**Stable:**

Thermostable and suitable for Pelletting

### BACTERIA IT CONTROLS

**Salmonella**

Typhimurium, Gallinarum, Choleraesuis, Derby, Dublin, Enteritidis, Pullorum

**E. Coli**

F4 (K88), F5 (K99), F6 (987P), F18, F41

**Clostridium Perfringens**

Type A, C, B, D, E

**Staphylococcus Aureus**



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diets were as well tested recently under tropical conditions in a trial conducted at the research farm of the University of Agriculture and Forestry in Ho Chi Minh City, Vietnam. The acidifier was tested (0.1% DF<sup>+</sup>) in a commercial broiler diet, against the same diet containing either no acidifier (control group) or an antibiotic growth promoter (AGP: BMD-10 at 300g/t of feed). Feed and water were available *ad libitum*. The effects of DF<sup>+</sup> on performance parameters of poultry (livestock viability, live weight, feed consumption and feed conversion), on dressing (breast meat ratio), as well as litter quality (water content, bacterial load) were examined. 288 day old birds (Cobb 500) were randomly selected and divided into 3 treatment groups with 96 chicks each. The diets were fed for 42 days. Performance data were measured at the end of the trial (Tab. 1).

Table 1: Performance-, dressing- and economic-parameters in broiler fed with or without sodium diformate (DF<sup>+</sup>)

	Negative Control	DF+ (1 kg/t)	AGP (300 g/t)
Number of birds	96	96	96
Final weight [kg]	2.264	2.324	2.345
Daily weight gain [g/d]	52.8	54.2	54.7
Daily feed intake [g/d]	109.4	103.1	110.6
FCR	2.07	1.90	2.02
Survival [%]	95.8	97.9	99.0
Breast ratio [%]	22.7	23.9	23.3
EBI	244	279	268
Cost of feed / 1kg gain*	0.72	0.66	0.71

\*calculated in US-Dollar

Overall performance in the groups with DF<sup>+</sup> was increased, even when compared to the AGP-group. The addition of 0.1% sodium diformate under the circumstances of the trial resulted in an increase of 2.6% in weight gain, while the feed conversion rate was improved by 8.2%, compared to the negative control. Furthermore, this DF<sup>+</sup>-inclusion was best according to the broiler index as well as being the most cost effective. Furthermore, birds fed with Acidomix DF<sup>+</sup> had a numerical improvement when dressed. The breast meat ratio increased by more than 5% if compared to the negative control, while the improvement compared the AGP-group was still nearly 3%. One could speculate that this was caused by the improved protein digestibility, which is often reported in conjunction with the use of dietary acidifier.

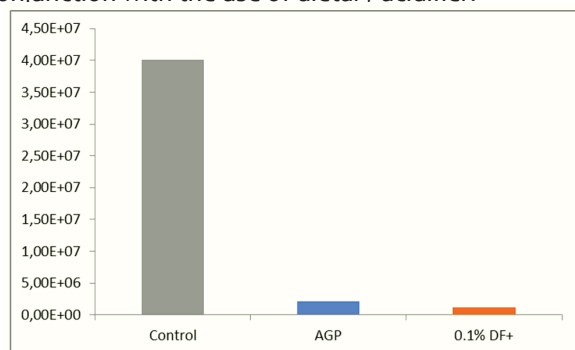


Figure 1: E.coli numbers (MPN/g) in faeces of broiler fed with or without DF<sup>+</sup>

Finally, the faecal quality and content of birds was examined. It could be stated that the litter quality - based on the moisture content, was significantly ( $P<0.05$ ) improved in birds fed DF<sup>+</sup> (tested against the negative control). Moisture content in the faecal matter was reduced by 7% (in the 0.1% DF<sup>+</sup>-dosage); while the AGP - group had only a reduction of 4% in the moisture content of faecal matter (moisture content of control litter was 57.2%). In conjunction with the improved quality of the litter is also the significantly reduced ( $P<0.05$ ) level of E.coli in the faeces (Fig. 1), which is measured as MPN (Most Probable Number). If looked at the reduction rate, one could say that the use of dietary sodium diformate reduces the E.coli load in faeces by almost 97%!

In a further study conducted at the All - Russian Scientific Research and Technological Institute of Poultry Breeding (VNITIP) in Moscow the effects of Acidomix DF<sup>+</sup> on performance parameters of poultry breeding (livestock viability, live weight, feed consumption, feed conversion ratio and digestibility of nutrients) were examined. The product was tested at a dosage of 0.1%. For comparison of alternative compounds an acid blend, consisting of mainly formic acid and lactic acid, was employed at the dosage of 0.3%. A negative control group received the basic diet without supplement. Each of the three treatment groups, 0.1% diformate, 0.3% acid-blend and negative control, consisted of 35 1- to 38 - day - old birds. On day 38 after hatching livestock viability, live weight and feed conversion ratio were determined (Table 2).

Table 2: Mean live weight and feed conversion ratio of broiler on day 38 (and % deviation from control group)

	Negative Control NC	DF+ (0.1%)	Acid blend (0.3%)
Live weight (kg)	1.937	2.044	2.021
Difference from NC (%)	-	+5.6	+4.4
FCR	1.77	1.65	1.66
Difference from NC (%)	-	-7.1	-5.4

There have been no reported mortalities during the study, which shows the quality of the trial location. Despite such a good hygienic status, addition of diformate was still found to enhance individual live weight. By the end of the experiment (day 38) broiler reached a weight gain surplus of 5.6% compared to the control group. Feed conversion ratio was also clearly improved by the use of sodium diformate (by 7.1% compared to negative control). In comparison, the triple acid-blend dosage led only to a reduction in feed conversion by 5.2%.

The present findings lead to the conclusion that addition of DF<sup>+</sup> considerably improves performance parameters of poultry by increasing live weight and improving feed conversion ratio, compared against a negative and a positive control.

Numerous reports have demonstrated how including sodium diformate in broiler diets has beneficial effects on performance by lowering bacterial pathogen load and improving nutrient digestibility, as reported above. These benefits are turned into economic returns, despite the perceived increase in feed cost of using additives. It is therefore recommended for the poultry producers to include dietary acidifiers, like Acidomix DF<sup>+</sup>, into their broiler diets.

# IMPACT OF TARP COLOR ON POULTRY LIGHTING

Technical Team of Hy-Line International

## Introduction

Around the world, many chicken farms are open sided without solid walls. These houses usually have curtains or tarps to help block the sunlight, control the temperature, adapt behavior,



improve ventilation, or a combination of reasons. Many different color curtains have been observed in use; however there is not always scientific reasoning for the color of curtain utilized. In recent years, the impact of light color, spectrum, and bulb style have been shown to impact growing pullets and laying production.

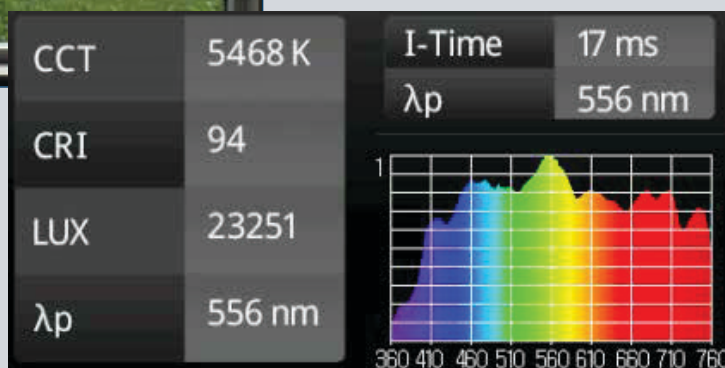
In general, research has proven that cool lights (4000–6000K) with a more blue - green color spectra help increase pullet growth, while warm lights (< 3000K) with more red - orange color spectra help increase egg production. All of the research was done with different color and different style light bulbs. Curtains act as a filter for sunlight coming into the house, and this filtered light may have an impact on pullet or layer performance.

The impact of curtain color depends on both the type of bulb used inside the house (if one is used) and the amount that the light filtering through is used for lighting the birds. The goal of this technical bulletin is to better understand the impact curtain color has on sunlight, and discuss how this might influence the flock's growing and laying performance.

## SUNLIGHT



- Bright day with a few light clouds
- May 31, 2016
- The window glass and angle of the sunlight dimmed the light from > 100,000 lux down to around 23,000 lux



10,000 K  
9,000 K  
8,000 K  
7,000 K  
6,000 K  
5,000 K  
4,000 K  
3,000 K  
2,000 K  
1,000 K

*Kelvin color temperature scale.*

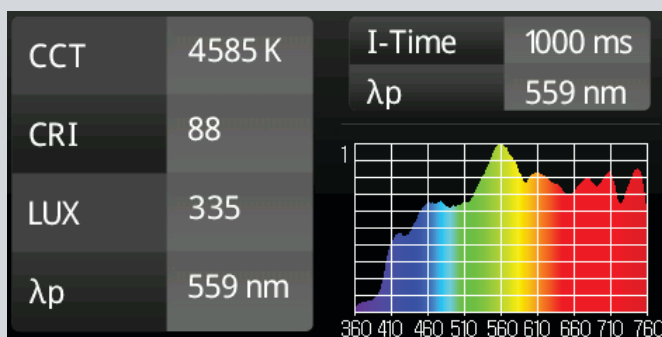
> 4000K: cool, dominant blue spectrum

3500K: neutral and balanced with red, green and blue spectra

<3000K: warm, dominant red spectrum

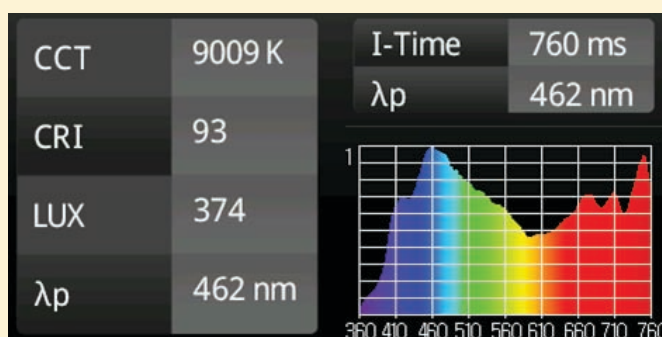


## SUNLIGHT WITH BLINDS



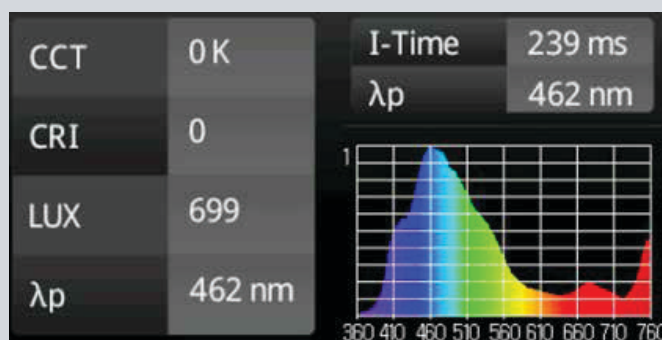
- Closing the blinds most of the way removes some of the blue spectrum
- Overall the spectrum looks very similar to sunlight
- The light intensity is 2 log lower

## SILVER/BLUE



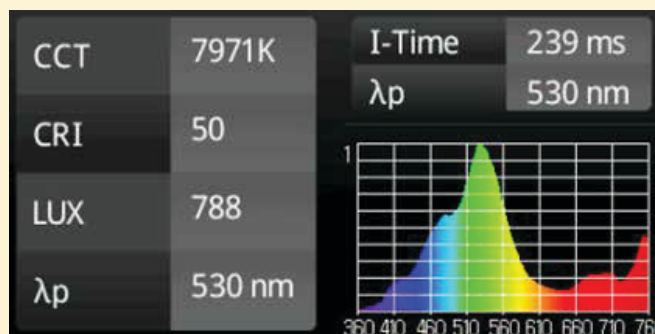
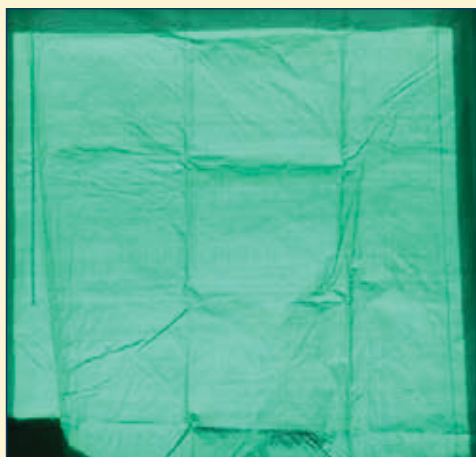
- The silver blue tarp has two peaks of light with both blue and red coming through
- Allows a full spectrum of light through while providing good dimming from the full sun
- Good tarp for layer houses or pullet houses

## BLUE



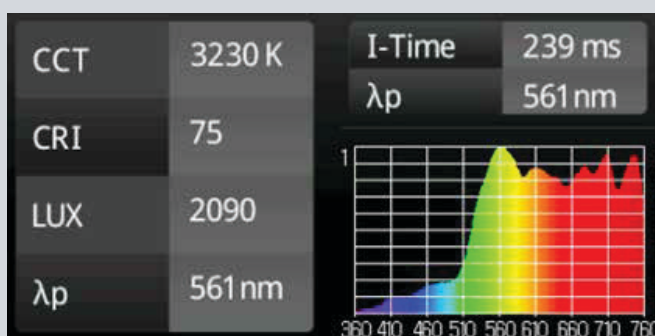
- Removes almost all of the red spectrum
- May be good for calming birds but red spectrum is vital for keeping good egg production
- Not recommended as sole light source for a layer house
- Would be excellent for use in a pullet house

## GREEN



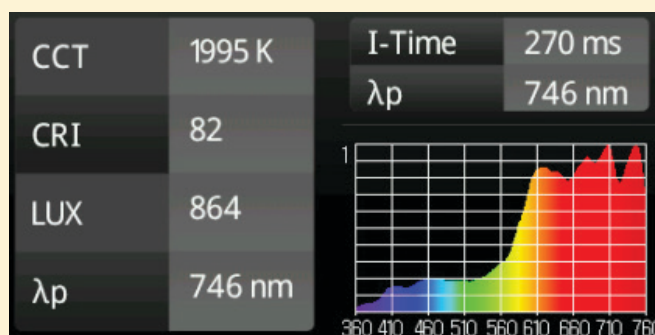
- Allows some blue spectrum and very little red spectrum
- Some yellow and orange spectrum comes through (not ideal for the sole light source of a layer house)
- Excellent for use in a pullet house

## YELLOW



- Allows full spectrum of yellow, orange, and red light through while blocking blue and part of green
- Yellow curtains were least effective at dimming the light; measured light intensity was more than twice that of any other tarp
- Would not provide enough light blocking to be used in a layer house even though the spectrum is ideal

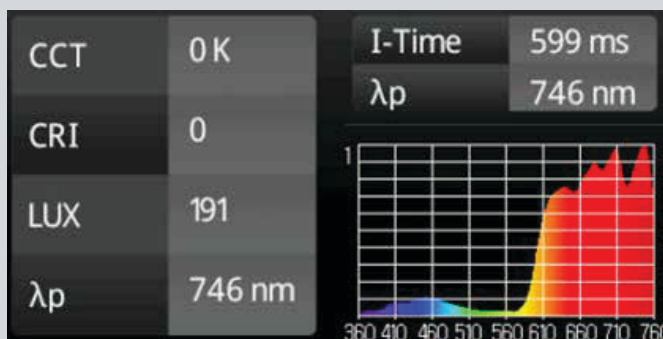
## ORANGE



- Allowed the second-most light through, but was still more than half of the yellow tarp
- The yellow tarp started allowing light to pass the curtain around 560 nm, while the orange tarp starts around 610
- Would be a good layer curtain if more light was blocked



## RED



- Red curtains provide the most dimming of incoming light
- The first peak of light is around 636 nm, which is ideal for stimulating laying hens
- The combination of light blocking and red spectrum makes this a very good tarp choice for laying hens

### Summary

The curtain color exerted a significant effect on the intensity and color spectra of incoming sunlight. This study illustrates that curtain color should be an important consideration in house design.

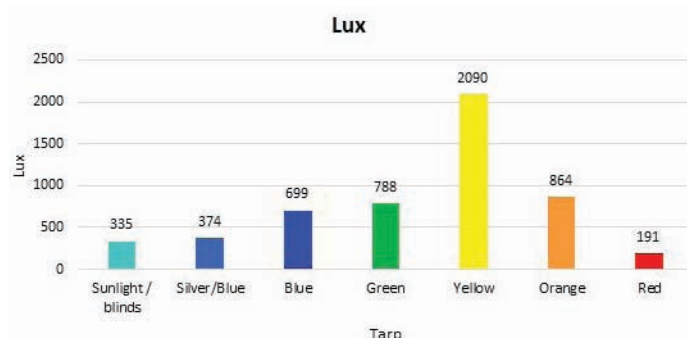
Tarp colors providing a color spectra that would benefit pullets: blue, green, silver-blue.

Tarp colors providing a color spectra that would benefit layers: orange, red, silver-blue.

We did not test white or black tarps because of the variation in materials used in production of those tarps. It would be expected that a white tarp will not block any spectra, but will create various levels of shade. A black tarp would be expected to completely block any sunlight from coming through the curtain.

Overall, it is important to understand the light dimming ability of the curtains you are using. Due to tarps differing in thickness, test a tarp with a regular light meter to see how much light is being blocked.

Additionally anticipate a logarithmic scale difference in light intensity if curtains are raised and lowered throughout the



day / week / month / year.

### Light intensity with different colored tarps.

Finally, understand the difference in light intensity between light coming through the tarp and light from the light bulbs.

If the light coming in from the tarp is far greater than what is from the light bulbs, this may have an impact on production. Furthermore, LED lights can be selected to provide a more compatible spectrum with tarp light than compact fluorescent lights (see the "Understanding Poultry Lighting" technical bulletin at [www.hyline.com](http://www.hyline.com)).

Courtesy: Hy-Line International

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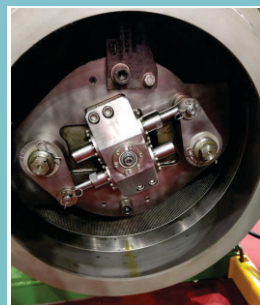


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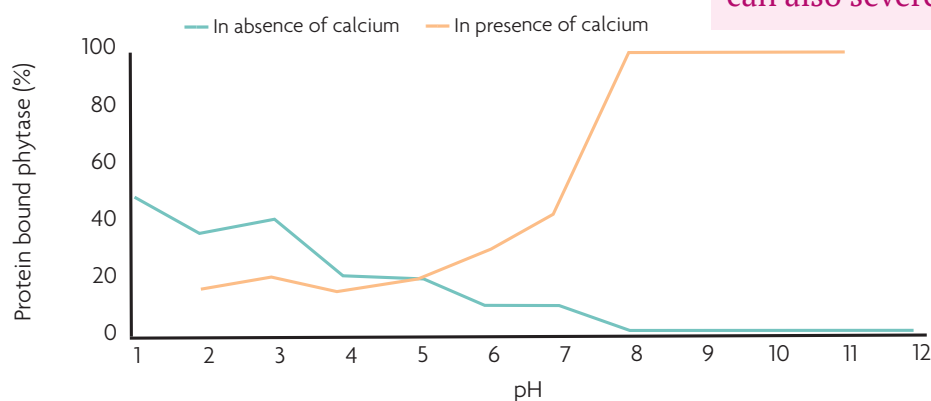


# Calcium: the double-edged sword in meeting nutritional requirements

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**Dr Ceinwen Evans, DuPont Animal Nutrition.**

Ensuring animal feed formulas meet all nutritional requirements is particularly challenging for vital mineral elements such as calcium. Essential for bone development and a key player in several metabolic paths, calcium is often added to diets with large safety margins to avoid deficiencies. But if calcium deficit poses a threat to animal growth, high calcium concentrations that are highly soluble can also severely impair productivity.



**Fig. 1. Calcium pH - dependent effect on protein - phytate binding (adapted from Prattley et al. 1983).**

Animal production strongly depends on healthy animal growth. In turn, growth and maturation rely on the normal development of the skeleton.

Bone mineralisation is dependent on a variety of elements with phosphorus and calcium being the two most important. In poultry, for instance, calcium is the highest concentration mineral in the body, representing more than one third of the total mineral body content of adult birds and one third of eggshell components.

Although mostly found in the skeleton (almost 99%), calcium also catalyses several metabolic and physiological processes including contracting heart and muscle fibres and transmitting nerve impulses

## Calcium supplementation: a tricky balance

To fulfil the nutritional needs required by the expanding livestock production sector, diets have been formulated using different types of cereal - based ingredients. Although

## Highlight Points

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providing high amounts of energy, cereals are poor in several elements including calcium, most presenting concentrations as low as 0.02% and 0.06%.

To meet calcium requirements, diet formulations usually include inorganic sources of this nutrient such as limestone and dicalcium phosphate.

As an example, in a typical corn - soy based starter diet for broilers, more

than 80% of the calcium comes from inorganic sources.

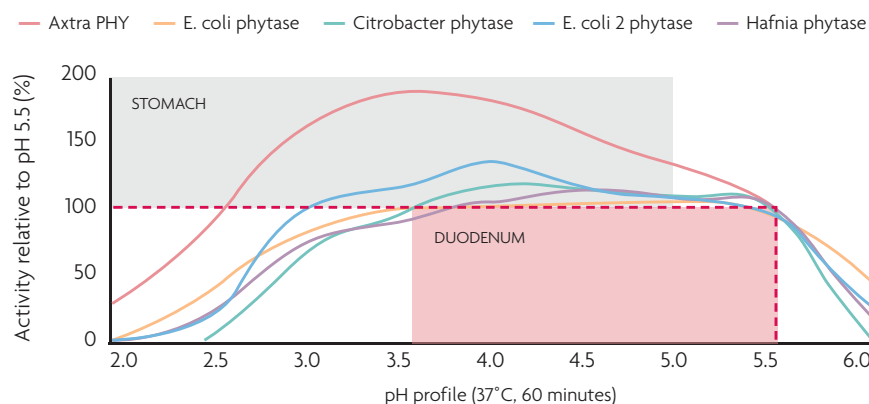
Unlike phosphorus addition, calcium supplementation is low - cost, and limestone is easily accessible. In addition, excretion of excess calcium does not explicitly cause environmental concerns. Taken together these factors often lead to over - supplementation.

## An unexpected anti - nutrient

High calcium concentrations can be as harmful as low ones: calcium deficiencies have a negative impact on growth performance, while increased concentrations have anti - nutritional effects on other important key nutrients. Of major importance is the negative effects of excessive calcium on phosphorous availability and digestibility.

Calcium has the ability to form complexes with phosphate groups in the gut, which interfere with phosphorus availability.

Phosphorus is crucial for energy mobilisation and protein synthesis but also bone development and overall



**Fig. 2. Comparative pH profile with five different phytases, including the novel Aextra PHY.**

maintenance. Its primary storage form in plant tissues is phytate, which is broken down by phytase to release phosphorus.

For animals that lack phytase, like poultry and swine, the enzyme is added to feed formulas. High dietary calcium content affects phytase effectiveness due to the formation of calcium - phytate complexes.

The high prevalence of calcium also triggers phytate to bind with protein molecules more easily, further reducing phytate availability to be hydrolysed by phytase.

Proteins usually form complexes with phytate at the low pH (<4) of the upper gastrointestinal tract but not at higher pH levels. This process is challenged in the presence of calcium that promotes protein- phytate chelation at pH >4, thereby acting as a cation bridge to promote the indirect binding of proteins and phytate (Fig. 1).

This anti - nutritional effect of calcium depends largely on its solubility, which is very much influenced by the calcium source and particle size. Limestone, the major inorganic calcium source used in poultry diets, is marketed under different particle sizes that influence calcium's solubility.

Particle size impacts the calcium-phytate binding and its consequences. Research has shown that the smaller the limestone particles, the faster they solubilise in the upper gastrointestinal tract resulting in more available calcium.

The increase in limestone solubility negatively impacts phosphorus digestibility by increasing calcium-phytate binding, making phytate less susceptible to phytase break down and reducing phosphorus release. This decline in phosphorus availability impairs animal performance. Eventually, this necessitates phosphate supplementation, which increases feed cost.

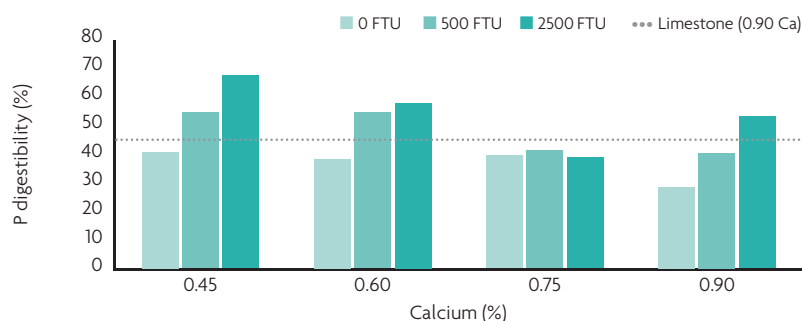
Once the calcium-phytate complexes are generated, their solubility is dependent on pH – above pH 5, phytate-calcium chelates precipitate out of the solution and phytate, therefore becomes completely inaccessible to phytase.

#### **Fighting the anti - nutritional battle with phytase**

Although all marketed phytase enzymes break down phytate,

not all phytases are the same. Enzymes with a superior pH profile will hydrolyse phytate more quickly in the upper part of the digestive tract, making it unavailable to form the anti-nutritional calcium - phytate complexes.

Aextra PHY is a *Buttiauxella* phytase with high bioefficacy and activity at low pH. This phytase acts fast in the intestinal tract, hydrolysing phytate during the early stages of digestion. The enzyme revealed an improved pH profile when compared to its competitors, performing even at very low pH levels (>2.5) (Fig. 2).



**Fig. 3. The increasing proportion of highly soluble calcium in the diet decreases phosphorus digestibility**

By cleaving phosphate groups rapidly, phytase decreases calcium-phytate binding and thereby mitigates its anti-nutritional effect on both proteins and minerals. But phytase efficiency largely depends on the size of the calcium particles found in different calcium supplementation sources. For instance, phytase addition may occur at different doses when overcoming the negative impact of highly soluble calcium (HSC) on nutrient digestibility or the effects of limestone.

The increasing proportion of HSC in the diet decreases phosphorus digestibility in groups not supplemented with phytase because the precipitation of phytate complexes is larger. To compete with the phosphorus digestibility of limestone- supplemented diets, HSC diets, therefore, require higher doses of phytase (Fig. 3).

High dietary calcium levels affect phosphorus metabolism and, therefore, animal growth performance and average weight gain. To examine the impact of phytase on counteracting the negative effects of high dietary calcium levels, Aextra PHY was tested in an in vivo trial using young birds.

An inclusion of 1000 FTU/kg of phytase slowed down the excess calcium - related decrease in performance in relation to the control feed. The results also demonstrated that higher doses of phytase may be needed to restore performance for birds fed diets containing fine limestone than for birds fed diets containing coarse limestone.

At only 500 FTU/kg, the same enzyme restored body weight gain to numbers close to that found in the positive control.

However, for diets containing fine limestone, performance was only restored with the enzyme addition at 1,000FTU/kg (Fig. 4).

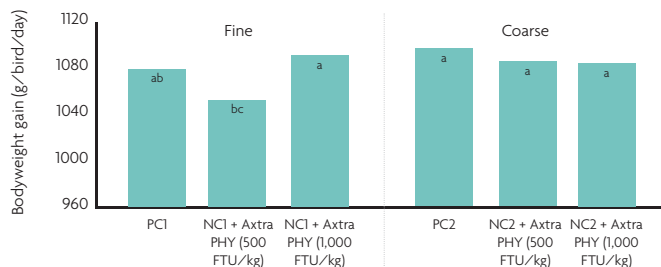
This is in line with the previously mentioned results, thereby showing that calcium particle size does influence the amount of phytase needed to counteract calcium negative effects.

#### The benefits of a fast-acting phytase and the right calcium source

A dual - action strategy can be employed to alleviate the detrimental effects of calcium over-supplementation on nutrient digestibility and growth performance. First, the addition of a fast-acting phytase promotes a timely and successful hydrolysis of phytate and avoids chelation.

What is important to note here is that a strong pH profile phytase ensures the phytate is hydrolysed swiftly in the very acidic first portion of the gut. Secondly, adjusting the amount of calcium included in diets (better calcium-to-phosphorous rates) and observing the solubility of the selected calcium source will aid improving feed quality and animal health.

One central consideration here is the grind size of the calcium supplementation. Diets containing higher calcium inclusion levels and/or more soluble calcium sources, such as HSC or coarse limestone, benefit from using a tailored phytase dose to completely remove phytate and avoid the anti - nutritional effect of phytate - calcium complexes.



**Fig. 4. Aextra PHY phytase counteracts the negative impact of limestone in starter phase broiler (1-21 days) growth performance.**

*\*the article was initially published in the International Poultry Production\**

# Time to address the Rise of Antibiotic - Resistant E. Coli in Poultry

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E. coli is part of the gut microflora in chickens, and not all of them are harmful. However, pathogenic E. coli can overwhelm the immune system of birds, causing septicemia and death. E. coli infection in poultry farms can cause significant economic losses. The weight loss results in drop in the rate of egg production, mortality and other secondary infections can deal a serious blow to the production system. Farmers have

#### Highlight Points

E. coli is part of the gut microflora in chickens, and not all of them are harmful. However, pathogenic E. coli can overwhelm the immune system of birds, causing septicemia and death. E. coli infection in poultry farms can cause significant economic losses. The weight loss results in drop in the rate of egg production, mortality and other secondary infections can deal a serious blow to the production system. Farmers have to shell out extra for cleaning, disposal and treatment with antibiotics, which is becoming increasingly ineffective due to the emergence of multidrug resistant strains. .

to shell out extra for cleaning, disposal and treatment with antibiotics, which is becoming increasingly ineffective due to the emergence of multidrug resistant strains.

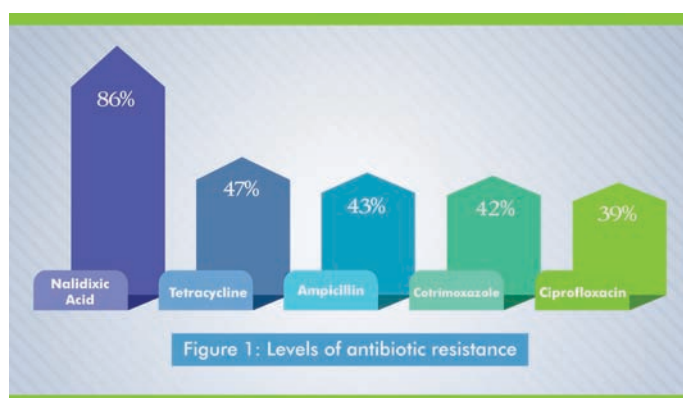


## Farm practices

Poor husbandry practices exacerbate the spread of colibacillosis. Poultry house environments have high numbers of *E. coli* due to fecal contamination. The most common infection route is the inhalation of fecal matter contaminated dust, which contains *E. coli* in large numbers. If birds do not have access to water and clean feed, and if the litter remains wet due to bad ventilation, the bacterial transmission will take place at a rapid pace via respiratory mucus and fecal contamination.

Farm practices also have a hand to play in the high levels of antimicrobial resistance in poultry farms. Birds reared in deep litter system are more exposed to fecal contamination and hence at a greater risk. Antibiotic resistant strains of *E. coli* are twice as prevalent in broiler farms when compared with layer, as they are mostly reared in deep litter system. They also have a higher prevalence of multidrug resistance and Enterobacteriaceae that produce extended spectrum beta-lactamases, which are enzymes that break down antibiotics and make them ineffective. All of these factors point to a much more indiscriminate use of antibiotics in broiler farms, which need to sustain a rapid growth of chickens over very short periods.

Nalidixic acid	86 percent
Tetracycline	47 percent
Ampicillin	43 percent
Cotrimoxazole	42 percent
Ciprofloxacin	39 percent



**Figure 1: Levels of antibiotic resistance**

At present, there is no regulation in antibiotic use in animal food production. Most small-time poultry producers use antibiotics for growth promotion rather than treatment. Antibiotics are considered more effective than sanitation or hygiene measures because untrained farm workers are not likely to follow strict biosafety measures. This should not come as a surprise as the odds of resistance is higher in independent farms. Contracted farms, which are largely owned by big players have to adhere to strict production protocols set down by the producer. Consequently, they

employ better veterinary care and hygiene methods, and use antibiotics more judiciously. Independent farms do not have a support system and have need for rapid growth for profitability in a competitive poultry market. Hence, they tend to misuse antimicrobials.

## Human transmission and risks

Antibiotic resistant strains of the bacteria can also pass on to humans who consume contaminated poultry meat. *E. coli* infections that are linked to the consumption of meat products often cause intestinal illness. Such outbreaks are carefully monitored by public health bodies and tend to receive a lot of negative media attention, which has an adverse impact on poultry sales.

The pandemic has also brought to attention the zoonotic potential of pathogens and there are enough studies that document the transmission of antibiotic resistant *E. coli* from poultry to humans. Some strains of *E. coli* have been in circulation in poultry flocks for years, and there could have been countless occasions for the strain to spillover to humans. But the possibility is potentially more dangerous now, given the increasing levels of antibiotic resistance. At a time when poultry farmers are already recovering from the production and sales losses caused due to the unfounded coronavirus scare, they cannot afford the luxury of sweeping a real problem such as this under the rug.

## How do we address it?

With increasingly disposable incomes and an increase in the demand for poultry products, antimicrobial use in food production is only likely to go up. Ideally, the government should ban the non-therapeutic use of antibiotics in livestock farming. However, even if the center bans the use of antibiotics, there is no guarantee that it will gain traction at the local level. Farmers, on their part, should follow proper feed hygiene, water hygiene and biosecurity measures to curtail the spread of pathogenic bacteria in their flock. As for the problem of multidrug resistance, they will soon be able to switch over to effective, commercially available alternatives.

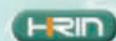
Bacteriophages are particularly effective in targeting specific bacterial cells. For the uninitiated, bacteriophages are beneficial viruses that replicate within the host to target and destroy specific bacterial species. Since phages don't infect eukaryotic cells, they are safe for use in the treatment of bacterial infections in animals & poultry. Studies have demonstrated that bacteriophage treatment was comparable to treatment with enrofloxacin. When used together, it improved the effectiveness of colibacillosis treatments. Earlier this year, a study published in *Nature* identified two phages that can effectively infect almost all strains of Shiga toxin producing *E. coli*, which can pass from animals to humans and cause severe stomach cramps, bloody diarrhea and thrombocytopenia. Both the commercially available therapeutic applications and research point to one thing – custom bacteriophages are going to be the future in the control and treatment of bacterial infections.



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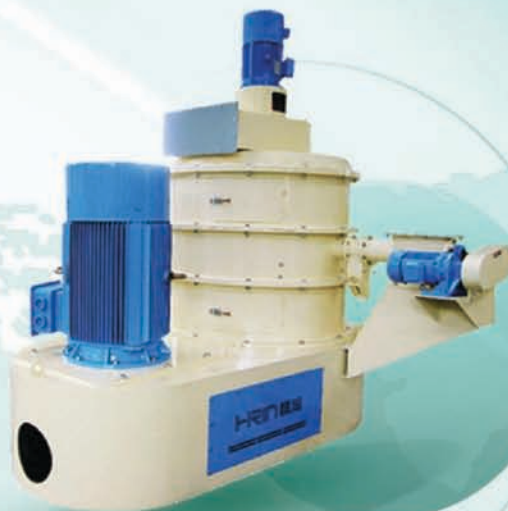


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# CONTROL OF COCCIDIOSIS IN POULTRY



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## Highlight Points

Coccidiosis in poultry is still considered as one of the main diseases of economic importance of commercial poultry reared in deep litter system. This article has highlighted the importance and methods of prevention or control of coccidiosis which is opted globally.

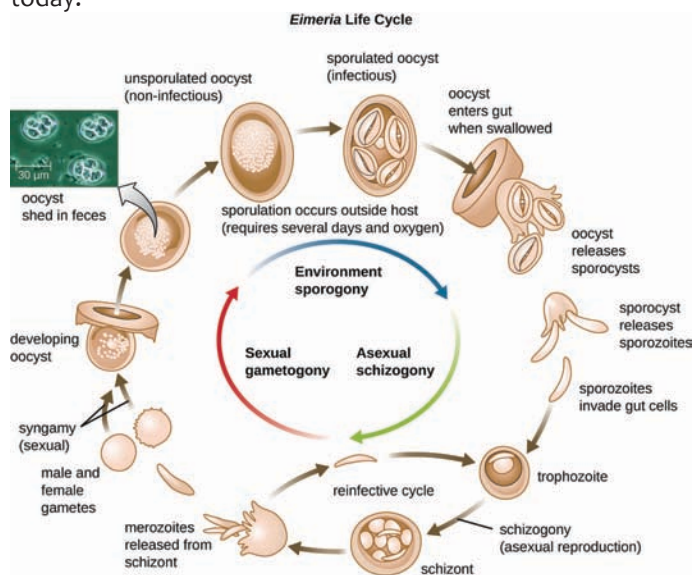
### Introduction:

Globally, the poultry industry spends significant money in the prevention and treatment of several poultry diseases. One of these diseases, avian coccidiosis, is caused by protozoan parasites of the genus *Eimeria*, developing within the intestine of most domestic and wild animals and birds. This parasite invades epithelial tissues of the intestine causing severe hemorrhagic enteritis in birds and as a result, significant economic losses. Seven species of *Eimeria* (*E. acervulina*, *E. brunetti*, *E. maxima*, *E. mitis*, *E. necatrix*, *E. praecox* and *E. tenella*) are recognized as infecting chickens. Although coccidiosis is a disease known for many years, it is still considered as the most economical important parasitic disease affecting poultry production worldwide. Coccidial oocysts are extremely resistant to environmental conditions and disinfectants. The use of several drugs, solely or in combination, has proven to be an effective alternative method in the struggle against avian coccidiosis. However, the emergence of drug resistant strains, especially after a prolonged use of a drug is a real problem. Thus, vaccines are the only preventative methods. Due to this, new alternative methods have emerged most of which are natural compounds extracted from plants or produced by microbes. Some of these compounds are antioxidants that damage the parasite, thus preventing the infection. Hence, eradication of coccidiosis from chicken houses mere by litter removal, cleaning and disinfection is not possible.

### There are two types of coccidiosis:

- Clinical coccidiosis in which the affected birds show classical symptoms of the disease such as bloody droppings and increased mortality and
- Subclinical coccidiosis, since the affected birds do not show visible symptoms of the disease but when a random sample of birds is examined, the presence of the gross lesions and the coccidia are found.

For many years coccidiosis prevention and control relied on the use of synthetic anticoccidials, commonly referred to as **chemicals**. In many cases, resistance to these drugs quickly occurred - within 1 to 3 years - and they became ineffective. Of this group, only Nicarbazin and Totrazauril remains effective today.



**Figure 1. Lifecyle of Coccidiosis**

Source: Biomin.net

Strategies to control coccidiosis in poultry

1. A major breakthrough in the prevention of coccidiosis through feed medication occurred in 1972, with the launch of the first polyether ionophore anticoccidial, monensin. This type of anticoccidial agents have been commonly referred to as ionophores, a term derived from their general chemical structure. They are the most widely used drugs for coccidiosis prevention in broilers. Each has a different mechanism of action and so no chances of significant resistance have

developed. Monensin, for example, is still used successfully more than 35 years after its introduction. The following are the different types of control programs developed over the years.

**a) Straight Program:** In this program, the same ionophore anticoccidial is used in chicks and grower stage. Commonly used in spring and summer. Straight program further categorized in **step - up program** where the concentration of the anticoccidial may be increased in the grower feed to provide maximum protection at the time of peak coccidial oocyst shedding (3 - 4 weeks) and when the concentration of the anticoccidial may be decreased in the grower or finisher feed, this is known as a **step - down program**

**b) Shuttle Program:** In this type of preventive program, a chemical anticoccidial is used with the phase -I starter feed and an ionophore anticoccidial with the phase -II grower feed. For example, Diclazuril (Chemical compound) used in 0-2 weeks of phase-I and Madhuramycin (Ionophore anticoccidial) added in 3-4 weeks in commercial broiler feeds. These minimize anticoccidial resistance because the time of exposure to the same drug is limited. Other examples of shuttle program for prevention of coccidiosis:

Monensin : Halofuginone: Diclazuril (an ideal winter program)

Salinomycin : Lasalocid - ideal for summer program

Salinomycin : Halofuginone - winter or summer program

Salinomycin : Diclazuril - winter or summer shuttle

**c) Rotation program:** In this program, one chemical type of coccidiostat used for certain period and then rotated or replaced with other ionophore coccidiostat for the similar period. Rotation of drugs may improve productivity. This is because the new drug will be effective against the buildup of coccidia that had reduced sensitivity against the previous product that had been used for a long time. An example of a rotation program (change every 4 months) would be:

- 1st rotation (May-August) - ionophore i.e. Monensin
- 2nd rotation (September-December) - non-ionophore i.e. Diclazuril
- 3rd rotation (January-April) - shuttle Monensin: Halofuginone

## 2. By Vaccination

The second method for the prevention and control of coccidiosis in broiler chickens is through the use of live non-attenuated coccidiosis vaccines. For many years, the use of live coccidiosis vaccines was restricted to broiler breeder replacements. Coccidiosis vaccines usually contain small numbers of a mixture of important *Eimeria* species such as *E. acervulina*, *E. maxima* and *E. tenella* that parasitize the duodenum, mid-intestine and ceca of the digestive tract, respectively. The introduction of better and more practical vaccination techniques, e.g. the administration by coarse-spray or gel-spray cabinet at the hatchery, has resulted in more uniform administration and better protective immunity. Use of coccidiosis vaccines has increased in broiler chickens but this remains a relatively minor use compared to anticoccidial drugs in the feed. New method of administration of live coccidiosis vaccines like the in-ovo injection method into

embryonated chicken eggs at 18 days of incubation, which allows precise individual dosing and the early development of immunity.

When live vaccines are used, their use is primarily limited to the summer, because the current vaccines contain live non-attenuated coccidia and since they induce immunity in the bird by cycling through it, the vaccines induce some lesions. These lesions stimulate active immunity but they also predispose the bird to necrotic enteritis, a fatal disease caused by *Clostridium perfringens*. So it is always suggested for using an antibiotic growth promoter in the feed with strongest anti-clostridial activity (such as virginamycin) when live coccidiosis vaccines are used.

Another important factor to consider when live coccidiosis vaccines are used is the amount of moisture of the litter. Very dry litter is undesirable because it slows down the development of protective immunity against coccidiosis in vaccinated birds.

3. The moisture and pH of the litter should be always within the standard range. The coccidial oocyst will survive well in acidic pH and litter moisture more than 25%. The sprinkle of common salt @ 2gm / sq.ft in floor litter material will reduce the moisture and also increases the pH

4. Keep the litter dry by frequent turning of litter to reduce the sporulation of the oocysts and reduce the stock density for the reduction in contribution of moisture build up by bird faeces.

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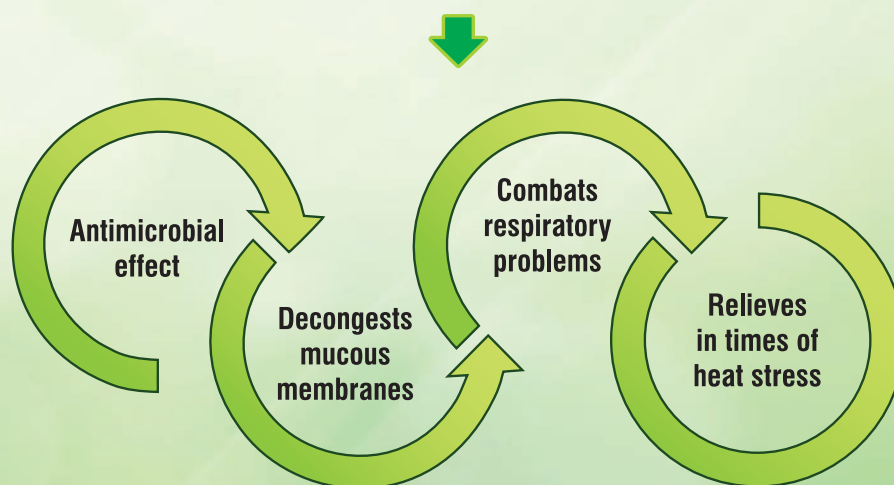
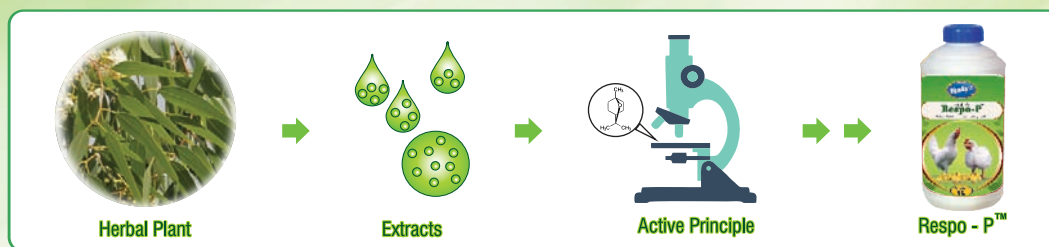
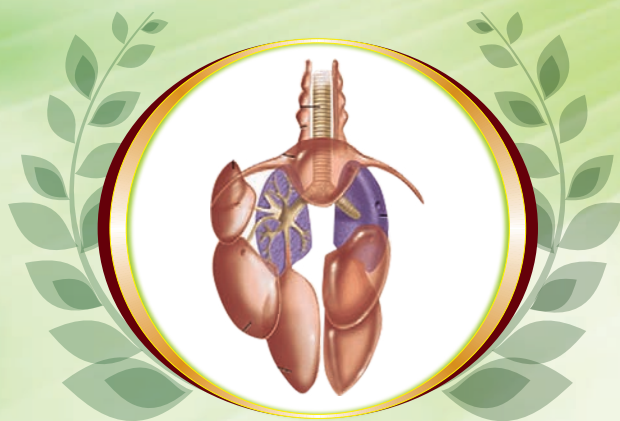
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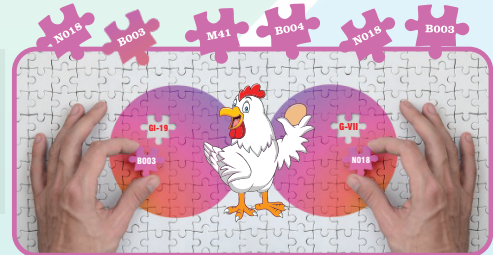
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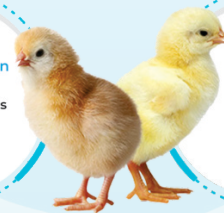
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