₹150
www.indianpoultryreview.com

INDIAN POULTRY REVIEW

THE MAGAZINE OF INDIAN POULTRY INDUSTRY | AUGUST 2024

COVER

POWER OF POULTRY

ARTICLE

Global Poultry Health by 2030 and Beyond

ANNUAL ISSUE 2024

Shalimar Group

TOTAL · NSF · sona · Matrix+ · Sona Sixer · ADYA PURE FRESH TASTY · Matrix · Total Eco · TOTAL Gold · TOTAL DAILY CHICKEN

Shalimar Group

The Group has earned its position as one of Eastern India's leading poultry Companies through decades of hard work, continuous innovation and above all enduring commitment to giving back to society the balanced nutritious food they deserve. The Group operates on a very advanced level of integration under stringent quality control measures at all levels. We are committed to continuous improvement and therefore have adopted focused research and development policies through all processes.

Parent Farms

Shalimar sources its day-old chicks from VENCOBB. Parent stock is reared by proficient individuals with scientific management processes in a world-class bio-secured environment.

Hatcheries

Shalimar's world-class hatcheries spread across India, help produce and deliver the healthiest chicks with maximum potential for balanced growth.The incubation and hatching of eggs is a precise and sensitive process designed to replicate the function of the "mother hen".

Feed Mills

Shalimar's feed mills are automated with inbuilt facilities to store maize and soya in silos for preserving good quality for a longer time. Pelleting systems, parallel mixers and grinding systems are automated through logic controls.

Commercial Farming & Enviromentally Controlled Sheds (EC)

We have our own environmentally controlled farms and we understand that when raising chickens, maintaining their body temperature is key to getting quality products. The farm is a state-of-the-art closed house with automatic feeding, drinking, temperature control systems and automatic curtain drop with three different alarm systems. In addition, there are regular training programs to educate farm workers on bio-security, vaccination and handling of birds.

Chicken Processing Unit

We are equipped with a semi-automated state-of-the-art poultry processing plant with an operational capacity of processing 10200 MT/annum at our processing plant in Burdwan, W.B, India.

Nivritti Foods Pvt. Ltd.

Nivritti Foods Pvt Ltd is an initiative by Shalimar group bring nutritious and fresh poultry products to the consumers. Our robust supply chain, FSSAI certified farms and modern processing plant facilities ensure consistent product quality. We offer a wide variety of wholesome chicken and nutritious eggs, available for purchase through our TOTAL Foodmarts, website and app, and all leading modern trade outlets.

Shalimar Nutrients Pvt. Ltd.

Shalimar Nutrients is one of the Indian Soya processors to get the prestigious certification ISO 22000:2005. The sophisticated, well-equipped production unit in Nagpur has been operational since 2013 with production facilities that are backed by strong Quality Control & R&D centres.

Nippai Shalimar Feeds Pvt. Ltd.

Nippai Shalimar Feeds Pvt. Ltd.(NSF), founded on 18th September 2013, is a joint venture between Shalimar Group of India, and Nippon Feed Manufacturing Company Limited (now known as Feed One Ltd) of Japan. Nippai was founded in 1929 as Japan's first modernised feed manufacturing company and is also currently Japan's largest feed manufacturing company.

Adya Dairy Products Pvt. Ltd.

Adya Dairy Products Pvt. Ltd is a joint venture between the Shalimar Group and The Chokhany Group. We are an integrated dairy company capable of handling over 3,00,000 litres of milk per day. Adya Dairy collects fresh milk through the VLCC (Village-Level Collection Centres) and BMC (Bulk Milk Coolers) spread across different villages of Bengal.

Registered Office:17A, B & C "Everest", 46C Chowringhee Road, Kolkata - 700071 Ph: 033 4017 9000 | Fax: 033 2288 2496
Corporate Office: 9, A. J. C. Bose Road, Ideal Centre, 2nd Floor & 5th Floor, Kolkata - 700017 Ph: 033 40543200 | 033 4023 9000
www.shalimarcorp.in

Nandu's®

Bring Home The Promise Of Freshness

60 YEARS
Of Delivering Farm-Fresh Poultry

Nandus **Safe-Meat** Promise
Zero Antibiotics | Zero Growth Promoters

40+ Stores In Bangalore

Available On

THE RIGHT BIRD FOR INDIA is the ROSS 308 AP

For More Information Contact:

Aviagen India Poultry Breeding Company Private Limited

+91 4252 233 650

info@aviagen.com

www.aviagen.com

Aviagen® India | ROSS

BREEDING SUCCESS TOGETHER

GLAMAC
COURAGE TO REACH HORIZON
ISO 9001-2015 Certified Company

Say no to AGP & HALQUINOL

Certified By NABL Lab
ANTIBIOTIC FREE

CYNKA® HBR

R & D Excellence... born with Research & Technical Trials

Antidiarrhoeal • Antimicrobial • Gut Health Modulator

- Looking for an alternative to Antibiotics (AGP) & Halquinol?
- Looking for a solution to *E.coli*, Salmonella, Digestive Disorders & Loose Droppings ?

Seeing is believing
Try CYNKA® HBR

Awarded as
"Veterinary Pharma Innovation of the year"
By The Economic Times (2024)

Highly Effective against Gut *E. coli*

25 Kg

Nature's blend for
Healthy Gut Healthy Bird

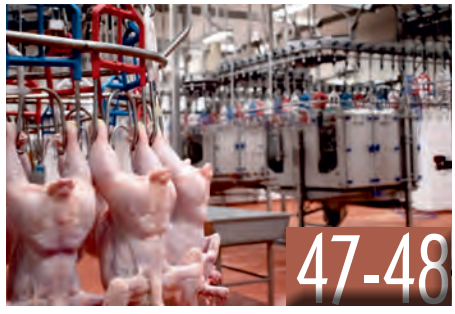
ET THE ECONOMIC TIMES
AWARD WINNER

For more information please contact:
Glamac International Pvt. Ltd.
413, Orion Business Park, 4th Floor, Kapurbawadi
Ghodbunder Road, Thane (W)- 400610, Mumbai, India.
• www.glamac.com • Email: info@glamac.com, sumon@glamac.com
• Dr. Sumon Nag Chowdhury: +91 9051512590

CONTENTS

INDIAN POULTRY REVIEW
www.indianpoultryreview.com
THE MAGAZINE OF INDIAN POULTRY INDUSTRY

Volume 59 | Issue 01 | August 2024



EDITORIAL BOARD

MANAGING EDITOR : G. N. Ghosh
EXECUTIVE EDITOR : Sanjoy Mukerji
ASSOCIATE EDITORS : Shelley Ghosh | G. G. Narayana
ADVERTISEMENT SALES OFFICE - KOLKATA
57-B, Townshend Road, Kolkata-700 025
Phone: +91 98310 24002
E-mail: sanjoy@indianpoultryreview.com
Designed by Hushframe Ideas Pvt.Ltd
Cover Courtesy: iStock

Edited and Published by G.N. Ghosh from 57-B, Townshend Road, Kolkata-700025 and printed by G.N. Ghosh at Salmoli Publication, 57-B, Townshend Road, Kolkata - 700025

Kem V 260®

Disinfectant Barrier from Microbes & Cocci

Proven Phenolic Terminal Disinfectant against Coccidia

Terminal Disinfection & Biosecurity

ANTICOCCIDIAL | ANTIVIRAL | ANTIBACTERIAL | ANTIFUNGAL

The Edit

A TALE OF TWO MARKETS

In the diverse landscape of Indian consumption, eggs and chicken have emerged as significant staples, bridging nutritional gaps across both rural and urban demographics. This rise in poultry consumption is not merely a reflection of changing dietary preferences but also of economic and social dynamics shaping modern India.

In rural India, eggs and chicken have become essential to daily diets, primarily due to their affordability and high protein content. Some state governments' introduction of free mid-day meals in schools has further propelled this trend. These meals often include eggs, providing vital nutrition to millions of children, combatting malnutrition, and promoting better health outcomes.

Urban India, meanwhile, showcases a more complex narrative. The rise of the middle class, coupled with increasing health consciousness, has led to a surge in demand for high-quality protein sources. Chicken, in particular, has become a preferred choice for urban consumers due to its versatility and lean protein benefits. The urban market also reflects a shift towards convenience, with pre-cooked and ready-to-eat chicken products gaining popularity.

Despite these positive trends, challenges remain. Ensuring the quality and safety of poultry products is paramount, especially in rural areas where infrastructure and supply chain mechanisms may be lacking. Addressing these challenges requires a collaborative effort from policymakers, the private sector, and local communities to ensure that the benefits of increased poultry consumption are universally accessible.

In spite of the challenges the future of poultry consumption in modern India is poised for robust growth, driven by increasing health awareness and rising incomes. Opportunities abound for industry producers to innovate and expand. Emphasising quality and safety can tap into the health-conscious urban market, while enhancing distribution networks can cater to diverse rural demands. Investments in sustainable and organic farming methods can attract premium customers. Additionally, integrating technology for better supply chain management and leveraging government support for nutritional programs can further bolster growth. The poultry industry truly stands at the cusp of a transformative phase, ready to meet the diverse needs of the modern Indian consumers.

G. N. Ghosh
Managing Editor

Indian Research

Production Performance of Desi Birds Under Intensive System Rearing Practices

By
Vidyasagar*, S. Dadamani, P. Bhatambre, M .V. and M. Balure
Department of LPM, Bidar, Karnataka, Veterinary College, Bidar, KVAFSU, Bidar

Backyard systems are low input systems where native chickens play a major role. Over 45.78% increase in backyard poultry was observed (2019). Even though these native chickens are high in rearing practices, they are low in production. Present study was conducted to assess production performance of desi birds. Study was conducted in Bidar district of Karnataka, where five villages were selected and 400 eggs were collected. The eggs were hatched with 50% hatchability (25 chicks). Chicks were reared and at Grower stage female chicks were divided into three groups based on its body weight (800-100 gm. 1000-1200 gm and 1200 gm above).

Total egg production (EP), age at sexual maturity (ASM), external qualities viz, egg weight (EW), shell thickness (ST), shell weight (SW), shape index (SI) and internal quality viz., Albumen Index (AI), Yolk Index (YI) were recorded on 22nd, 34th and 42nd week of age. Significant difference was observed in age at sexual maturity and egg production ($P<0.05$) for different body weights respectively. At 22nd week, significant difference ($P<0.05$) was observed for both external and internal quality except shell thickness. At 34th week, significant difference ($P<0.05$) was observed in ST and YI.

During 42nd week no significant ($P<0.05$) difference was observed. It can be concluded that body weight plays a significant role in production performance of desi birds. External and internal quality of eggs but were highest in 1000-1200 gm and above 1200gm body weight birds.

Effect of Unconventional Feedstuff on Gut Health in Giriraja Birds

By
J. Raghuraman*[1], M. C. Shivakumar[2], H. C. Indresh[3], T. N. Krishnamurthy, Jayanaik[4]
1,2,3 Department of Poultry Science, Veterinary College, Hebbal, Bangalore, 4 Department of Livestock Production Management, Veterinary College, Hassan

An experiment was conducted to study the influence of unconventional feed stuff on gut health in Giriraja birds. A total of 300 one day old chicks were distributed into five treatment groups each consisting of four replicates with fifteen chicks each. Basal diet (T1) and the experimental diets were prepared by incorporating mulberry leaf powder at 5% (T2), moringa leaf powder at 5% (T3), sesbania leaf powder at 5% (T4) and azolla powder 5% (T5). The duration of the experiment was 8 weeks. Two birds from each replicate in different treatment groups respectively were sacrificed and intestinal contents from small intestine were taken aseptically. Samples were used for enumeration of bacteria as per spread plate method. Specific media such as MacConkey agar was used for E. coli count, whereas Lactobacillus spp. was assessed on Brain Heart Infusion agar. The bacterial counts were expressed as log10cfu/gm of sample. Inclusion of mulberry, moringa and sesbania at 5 per cent revealed significant ($P < 0.05$) reduction in E. coli count compared to control and azolla fed group whereas Lactobacillus count was significantly ($P< 0.5$) increased.

It was concluded that inclusion of mulberry and moringa at 5 per cent level was beneficial in improving gut health in Giriraja birds.

Effect of Different Methods of Probiotic Application on Broiler Performance

By
R. M. Rajpura*[1], M. M. Trivedi[2], F. P. Savaliya[3], A. B. Patel[4] and N. J. Bhagora[5]
1,2 Department of Animal Science, B.A. College of Agriculture, 3,4,5 Poultry Research Station, Anand Agricultural University, Anand

The study was conducted to find out the efficacy of different methods of probiotic application on broiler performance from 0-42 days of age in commercial broiler chicken. A total of 120-day old broiler chicks were randomly distributed into five treatment groups with four replicates in each treatment group and each replicate having six birds. The different methods of probiotic application are as : Control : no probiotic, T1: In drinking water T2: by spraying on birds T3: by beak dipping T4: through feed.

Probiotic application was given to the birds in each treatment group on first two days of every week i.e. on 1st, 2nd, 8th, 9th,15th, 16th, 22nd, 23rd, 29th, 30th, 36th and 37th day. Total 12 times probiotic was given to the birds. Probiotic was given @0.25 g/replicate on 1st, 2nd, 8th, 9th day and @ 0.50 g/replicate on 15th, 16th, 22nd, 23rd, 29th, 30th, 36th and 37th day. Each gram of probiotic product contains TVC on NLT 12x109 (12 Billion) CFU of : Bacillus coagulans, B. Subtilis, Lactobacillus, acidophilus, L. deldreuckii, L. plantaraum, Streptococcus thermophiles, Exteococcus faecium, Bifidobacterium bifidum and Saccharomyces boulardii.

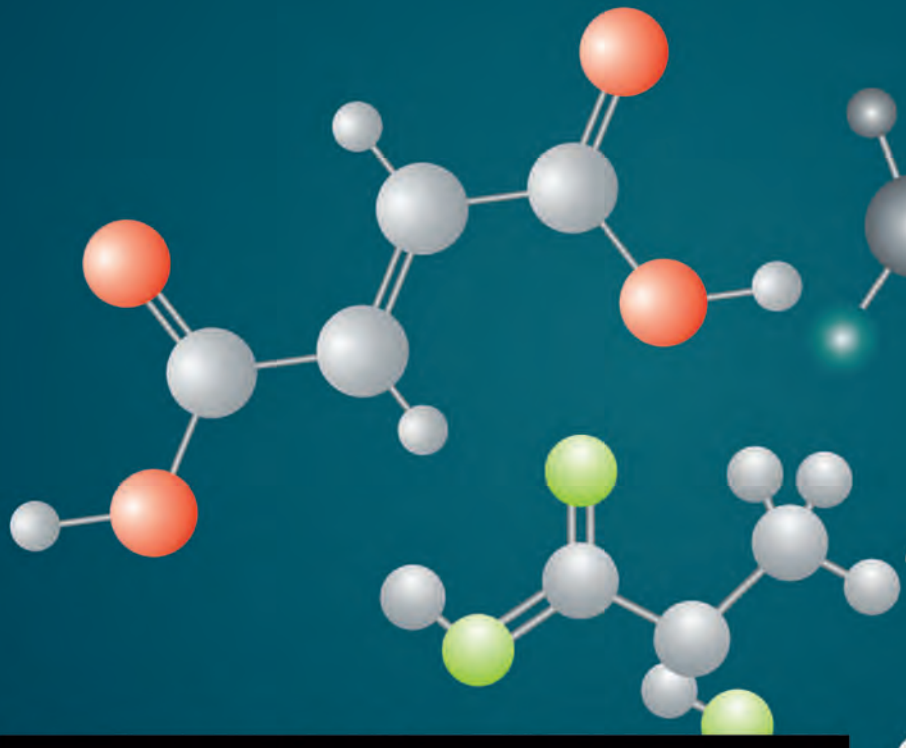
The results of experiment indicted that probiotic application showed significant (($P< 0.05$) effect on body weight at 3rd, 5th and 6th week of age. At 3rd week of age T2, T3 and T4 showed significantly ($P<0.05$) highest body weight (1764.60g and 2437.12g respectively) was observed in a group supplied probiotic through feed (T4) followed by probiotic spray on birds (T2). Significant ($P<0.05$) effect on Feed Conversion Ratio (FCR) was observed at 4th, 5th and 6th week of age. At 6th week of age, significantly ($P<0.05$) better FCR (1.58) was observed in T4 followed by probiotic spray of birds T2, 1.65). Average mortality was 1.67% during the experimental period which was within permissible limit.

The overall results of the experiment indicated that probiotic application through feed (T4 group) showed better final body weight (at 6th week of age) and Feed Conversion Ratio (FCR) as compared to other methods of probiotic application and control.

Source: XXXVII Indian Poultry Science Association Conference, November 2022

ACIPLEX™

Optimized acidification to amplify growth performance



A synergistic combination of organic acids and their salts for optimal acidification and maximizing growth performance.

FEATURES

Optimal feed and sustained acidification of gut.

Positively influences intestinal microflora balance.

Improves metabolism and nutrient digestion.

Non-corrosive and non-stringent properties.

+91 20 2729 1020 / 21
info@abtl.in
www.abtlenzymes.com

Scan for more details

ABTL

ENZYMES • NUTRITION • TECHNOLOGY

Physiological Role of Arginine in Growth Performance, Gut Health and Immune Response in Broilers: A Review

F. Hassan[a]*, M. A. Arshad[a]*, S. Hassan[a], R. M. Bilal[b], M. Saeed[c] and M. S. Rehman[a]

a Institute of Animal and Dairy Sciences, Faculty of Animal Husbandry, University of Agriculture, Faisalabad, Pakistan; b College of Veterinary and Animal Sciences, The Islamia University of Bahawalpur, Bahawalpur, Pakistan; c Faculty of Animal Production and Technology, Cholistan University of Veterinary and Animal Sciences, Bahawalpur, Pakistan

Summary

Arginine (Arg) is one of the metabolically versatile essential amino acids. Dietary supplementation with Arg has been shown to stimulate the secretion of insulin-like growth factor while improving growth performance and feed efficiency in broilers. In addition to its role in protein synthesis, Arg is also a precursor of nitric oxide, creatine, and polyamines. It also modulates lipid metabolism by reducing total body fat accumulation to improve meat quality and antioxidant defence. Moreover, it is considered as an essential amino acid for chicks due to the absence of a functional urea cycle in birds at an early age. Arginine plays a crucial role in metabolic pathways associated with immune-competence and growth. Dietary supplementation of Arg at 12 to 15 g/kg of diet resulted in linear increase in body weight gain from 7.5% to 17% in broilers fed soybean meal-based diets. Arg acts as a key vasodilator that opposes the onset of pulmonary hypertension in broilers and is particularly beneficial under high altitude and hypoxia conditions. Dietary Arg supplementation reduces ascites-related mortality under low ambient temperatures and attenuates adverse effects of heat stress and high stock density. Moreover, in ovo feeding of Arg increase levels of secretory immunoglobulin A revealing its potential to modulate immune barrier function leading to enhanced overall immunity and intestinal health of birds.

The NRC recommended levels of Arg are 1.25%, 1.10%, and 1.00% (of the broiler diet from 1-3, 4-6 and 7-8 weeks, respectively). However, other studies have reported 101%, 103% and 107% of NRC recommendation of Arg for maximum feed efficiency, growth performance, and optimal immune function, from 1-3, 4-6 and 7-8 weeks, respectively, under thermoneutral conditions. This review provides insights into the optimal supplementation of Arg above NRC recommendations to improve growth performance, meat quality, and immunity of broilers.

Conclusion

Arginine is an important essential amino acid with a major role in the growth and immune functions of birds due to its ability to produce NO, creatine, and polyamines. Being a trophic amino acid, Arg possesses an excellent ability to modulate gut development and enhance intestinal recovery after infection by substantially enhancing epithelial turnover rates. Moreover, L-Arg is an ideal candidate for early nutritional programming (in ovoand post-hatch) in poultry to enhance gut development and to improve overall health and performance of poultry. It is concluded that optimum dietary supplementation of L-Arg above NRC recommended levels should be considered in broiler production keeping in view the physiological stage and immune status of the birds.

Source : World's Poultry Science Journal

Lipid Metabolism and Body Composition in Long-term Producing Hens

L. M. van Eck[ab], H. Enting[a], I. J. Carvalhido[a], H. Chen[a] and R. P. Kwakkel[b]

a Cargill Animal Nutrition, Innovation Center Velddriel, Velddriel, The Netherlands; b Department of Animal Sciences, Wageningen University, Wageningen, The Netherlands

Summary

The lifetime egg production capacity of laying hens (i.e. laying eggs; metabolism; hen; feed persistency) has increased tremendously in the last 50 years from 220 eggs in 1960 to 300 eggs in 2019. To improve and support laying persistency, nutrition is crucial to support the hen and provide the correct nutrients for egg formation. Several organs are involved in this long-term egg formation process. The follicles produced in the ovary need to grow and ovulate to initiate egg production. The liver needs to supply the nutrients, mainly lipids, for proper follicle growth and liver fattening must be prevented to maintain liver health and function. Adipose tissue has an important role in maintaining the body energy balance, functioning as a reservoir for fatty acids provided by the diet or produced by the liver. Additionally, adipose tissue might mediate in ovulation through adipokine (hormone) production.

As such, body composition of laying hens might have an important role on laying persistency. This literature review discusses the interaction between these metabolic processes, the influence of diet and hormones and the effect on laying persistency.

Conclusion

Recent advances in egg production have focused on supporting laying hens for improved laying persistency. The proposed direct drivers for long-term egg production are (1) the oviduct and ovary, that produce the eggs, (2) the liver, that metabolises the nutrients for follicle growth and (3) the body fat reserves that supply (part of) the nutrients and might influence reproductive capacity through adipokine production. Feeding strategies essential to support long-term egg production and influence all of these processes. Diets should support liver functioning for follicle growth and prevent liver fattening.

Moreover, diets can be used to target a body composition for optimal egg production although the best body composition in different ages should be studied further.

Source : World's Poultry Science Journal

ZEUS BIOTECH

CHROMISAC™ -C vit

Chromium protienate with a natural Vitamin-C substitute for thermal stress

AN EFFECTIVE SOLUTION FOR HEAT STRESS

For any enquires please mail to : info@zeusbiotech.com

www.zeusbiotech.com

Article

Global Poultry Health by 2030 and Beyond: Emerging Challenges in their Diagnosis and Control

Prof. R. N. Sreenivas Gowda
Former & Founder Vice Chancellor, Karnataka Veterinary, Animal And Fisheries Sciences University, (KVAFSU) Bidar, Bangalore.
Former Director, Institute of Animal Health & Veterinary Biologicals, Bangalore.
Former- Professor and University Head: Dept. of Pathology, Veterinary College, UAS, Bangalore.

To meet the increasing demand for animal protein poultry is the main source of meat and hence there will be genetic manipulation to grow faster, reaching a body weight of broilers 1. 3 kgs in 20 days with an FCR of 1.3 and increase of breast meat by 36%. Similarly, the layer bird is exploited for production of 360 eggs with an average egg mass of 22kgs in 52 weeks. It is also expected for breeding for greener future, creating a bird that produces 15% lower carbon footprint than the earlier bird to preserve our planet's environment. Further, production of Transgenic "Super Chicken" fixing with desirable traits for egg, meat production, disease resistance, economic and sustainable. The "Pressure on productivity leads to more susceptibility to many diseases".

Poultry will face different health problems by 2030 vis a vis the present situation, as there is more exploitation of genetic and nutritional aspects of poultry breeds for more growth and production, adaptability to changing trends in management, climate change and animal welfare regulations.

Rearing poultry in different management systems such as free-range systems, cage system, cage cum litter, environmentally controlled sheds with increased density of birds leads to more concentrations of pathogens leading to health problems. Increase in large commercial farms in developed countries and increase in small / rural poultry farms in developing countries will create higher densities of poultry and such intensifying livestock and poultry production systems lead to the "evolution and spread of emerging infectious diseases" in animals and humans. Transfer of infection is common in high stocking (density) flocks. The aerobic bacteria, soil bacteria included Enterobacteriaceae, that include Salmonella, Escherichia coli (E. coli) Enterobacter, Comphylobactor and Parasitic infestations including Coccidiosis, are likely to remain forever. High density impact creates conducive atmosphere for survivability and spread of microbes and parasite and likely to cause emergence of new disease or modified virulence of existing infectious agents.

The current climate change, causing either drought or floods affect the crop production, especially soy and maize. There is always thinking about alternative feed ingredients. The increase in the cost of feed ingredients day by day, calls for more pressure on extraction of every unit of energy and nutrients from the available feed ingredients. The pressure on improvement of feed quality and nutritional management leads to gastro-intestinal and metabolic disorder which leads to more of "Nutrition Based Health" (NBH) problems. Further rapid growth and production also increase metabolic disorders such as Ascites, Sudden Death Syndrome, Cellulitis and many Skeletal defects. NBH alter 1) Respiratory health 2) Structural disorders (leg and joint deformities, e.g. tibial dyschondroplasia, valgus-varus deformities, spondylolisthesis), 3) Noninfectious Enteric diseases and 4) Impairment of Immunity leading to Immunosuppressive problems.

Disease Concerns and Challenges by 2030

Infectious diseases pose a constant risk on poultry health and production, with substantial consequences on welfare and economy by 2030. The following disease problems arise and impair production:

- Emerging novel viruses: Astroviruses causing Fatal Gout in Goslings, Chicken Circovirus, and diverse Avian Gyrovirus, which are found for the first time in poultry in recent years
- Novel variants: Reemergence of Variants of existing pathogens: IBvv, vvND, vvMD, vvIBD
- Existing pathogens acquiring resistance: the acquisition of "antimicrobial resistance" (AMR), E.Coli, salmonella, Streptococcus, Staphylococcus, Pseudomonas
- Zoonotic infections: AI, Salmonellosis, Comphylobacteriosis, Listeria monocytogens and Avian Influenza
- Acute respiratory infections: AI, IB, Avian metapneumovirus, vvND, ILT
- Transboundary animal diseases: HPAI (H5N1),ND widespread infection of poultry has raised concerns about the food safety and trade implications of this infection, necessitating revised international trade regulations
- Virus risk: with imported feed ingredients -IBD, CIA, BSE
- Infection with fowl adenoviruses (FAdVs) can result in a number of syndromes in the production of chicken, including Inclusion Body Hepatitis (IBH), Hepatitis-Hydropericardium Syndrome (HHS), and others, causing enormous economic losses around the globe, because of their vertical transmission

Challenges in Diagnosis of Poultry Diseases by 2030 and Beyond

With large poultry operations by 2030, we see the following challenges from an environmental and managemental point of view:

- Complex diversity of RNA viruses: High mutation and increased change

of recombination. Emergence of new strains AI, ND- serotype -II, IBvv

- Managemental: Enteric diseases in high density flocks
- Respiratory Disease Complex (RDC): AI, ND, IB, ILT, MG, MS & E. coli
- Immunosuppression: IBD complex withvvv MDV & CAA
- Sub-Clinical infections: Silent Killers- E. coli, Astro, Rota, Reo, Entero, Adeno, MS/MG, IBD, CIA, Coccidiosis
- Complex Vaccination Schedules: Poultry are more vaccinated than any other animal in the world

Most commonly used techniques in diagnosis of infections are: Postmortem diagnosis, Isolation using artificial media, Cell cultures, Inoculation of animals, Histopathological evaluation of tissues. Serological techniques and Molecular diagnosis.

Diagnosing Infectious Diseases in Poultry Requires a Holistic Approach. The production-integrated diagnosis consists of observations on:

- Population complex of the farm: different age groups, vaccine schedule
- Management systems: Cage, deep litter, slat, EC sheds, range system
- Flock morality pattern, survey
- Nutrition standards: Quality & Quantity
- Production standards as per the age and breed
- Sequential sampling over time: Health and disease
- Sound analysis: Change in the voice and respiratory rates
- Skeletal problems: Gait and foot pad assessment
- Necropsy findings: Lesion score quantitative, semi quantitative assessment
- Microbiome assessment of skin, respiratory, intestines and urogenital system

Future Technologies in Diagnosis of Poultry Diseases

The future technologies include use of "Biomarkers and Biosensors" capable of very specific detection.

1. **Biomarkers:** Or biological markers that measure or capture changes happening in a cell or an organism at a given moment. These are Metabolome, biological indicators of health that are valuable when there is a correlation with a disease. Any alteration naturally predicts the disease. Biomarkers indicate a bird's predisposition to stress that changes the bird's metabolism and immune function. Materials such as feathers, eggs, blood, serum, faces can be analyzed for health status of the bird.
2. **Biosensors:** Wide range of sensors are used for measuring body weight, temperature, feed and water consumption, humidity, ammonia levels, CO_2 level, sound and many more parameters are currently practiced in hi-tech farms. These devices can convert the presence of a biological element into a signal that is recognisable to the user. Biosensors have come up with a lot of promises in terms of detecting viruses and diseases connected with poultry production.

The development of various types of biosensors such as Affinity-based Nano-biosensors, Nano island affinity-based biosensors, Graphene affinity-based biosensors, Nanowires based biosensors, Optical Nano biosensors, Fiber optic Nano-biosensors, Surface Plasmon Resonance (SPR) based optical Nano-biosensors, Total internal reflection fluorescence, Surface-Enhanced Raman Scattering (SERS), Electrochemical Nano-biosensors had helped us in the rapid and sensitive detection of viruses. Aided by these Nano sensors, viral detection now becomes very sensitive, rapid and cost has come down to a significant low. These offer the potential to detect and differentiate between specific subtypes of infectious agents. (e.g., AI -sub types).

Modern technologies viz. Artificial Intelligence (AI), Robots, Sensor devices, Drones, Augmented Reality, Internet of Things (IoT) and mobile apps, etc. Platform for Research Integrated Surveillance and Management of Health (PRISM), Use of AI to predict disease outbreaks

By 2030, it is expected that a poultry farm would be able to generate 4.1 million data points through various sensors and other related devices connected through the internet of things (I0T) and Mission learning (ML)

Conclusion and Take-Home Message

By 2030 and beyond there will be more demand for poultry and poultry products to meet the demand of increased population world over. This will create more pressure on chicken production practices and create more opportunities for development of novel microbes or change in the pathogenesis of existing pathogens which cause severe economic loss in mortalities and production failures.

It is essential to produce diagnostic kits for early detection of such diseases. The research and development are a continuous practice to produce highly sensitive, accurate and cost effective methods. There is enormous scope for

development of newer diagnostics and development of cost effective newer vaccines utilising modern technologies will increase in future with the following guidelines:

1. As the spectrum of poultry diseases constantly expands with the identification of new pathogens it is essential to improve the knowledge on epidemiology and pathogenesis
2. New technologies are going to be devised to identify and characterise infectious agents, but classical methods remain crucial, especially the isolation of pathogens and their further characterisation in functional assays and studies
3. Overall, a common challenge is the increasing demand for infrastructure, skills and expertise
4. Development in recent technologies such as biosensors and biomarkers and human expertise is required in order to improve bird health, the production economy and to implement future intervention strategies for disease prevention
5. Controlling infectious diseases is vital for poultry health and diagnostic methods are an indispensable feature to resolve disease etiologies and the impact of infectious agents on the host
6. Poultry Diagnostics Market: Size to Surpass USD 1,752.4 million by 2030, exhibiting a CAGR of 9.6%
7. Food Safety Testing Market: Expected to grow to USD 50442.35 million
8. Poultry Vaccines Market: Forecast to grow to USD 3240.2 million at CAGR of 7.9 %. Byproduct- Attenuated Vaccine, Inactivated Vaccine, Subunit Vaccine, DNA Vaccine and Recombinant Vaccine
9. Newer vaccine technologies to produce mRNA technology against HPAI, Vector vaccines using NDV protect against both ND & AI and Coccidial vaccines.
10. There is scope for development, export and import of diagnostics and newer vaccines for diagnosis and protection against poultry diseases

Article

Influence of Organised Poultry Processing on Chicken Consumption in India

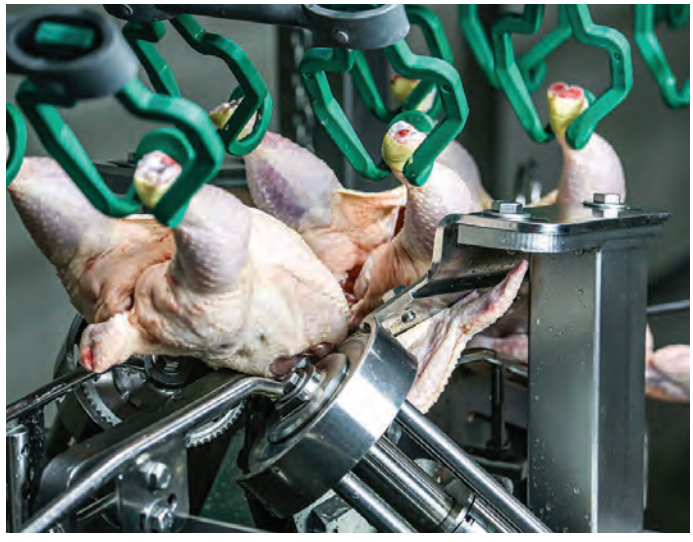
Dr. Narahari
Project Consultant,
Meat and Poultry
Founder NHProPOWER
Consultancy Services

Introduction

The impact of organised poultry processing and consumption connects with economic, social, and health aspects. Generally, poultry refers to rearing birds, including chicken, turkey, duck, geese, guineas, quail, and pheasant, specifically for food. However, chicken is widely accepted globally due to its versatility in cooking, affordability, and nutritional advantages. The market for processed chicken products in India has been steadily expanding, indicating a potential future for the poultry sector. This growth is expected to be driven by demographic trends, increasing incomes, and urbanisation. However, it is imperative to make investments in infrastructure, technology, and training to overcome current challenges. Some critical developments that shaped Indian poultry processing are automation and technological integration, the rise of ready-to-cook and ready-to-eat products, the focus on hygiene and safety standards, the expansion of cold chain infrastructure, market expansion and e-commerce growth.These developments exemplify the ever-changing character of the chicken processing business in India, which is positioned for expansion through innovation, enhanced standards, and a strong emphasis on meeting customer demands.

Evolution of Poultry Processing

In the early days, poultry processing was a manual, small-scale activity performed on farms or in local butcher shops. These traditional methods, though effective, were labour-intensive and limited in scope, often resulting in inconsistencies in product quality and safety. However, significant advancements occurred globally post-World War II. In this time, the industry was transformed by innovations such as automated de-feathering machines, evisceration equipment, and conveyor systems. Similarly, the chicken business in India has experienced a significant transformation in its structure and operations, evolving from a small-scale backyard activity till the 1960s to a large-scale commercial animal agriculture-based industry by the late 20th century. Since then, India is gradually embracing best practices and modernising its operations, benefiting from superior technology and strong regulatory frameworks that are prevalent in the global sector. The constant growth in the poultry industry in India can be attributed to several factors, including increasing purchasing power, evolving food preferences, the adoption of contract poultry farming (a model that integrates large integrators



with small farmers), rapid urbanisation, and government-backed infrastructure developments towards capital subsidies. As the sector developed, the focus turned towards improving food safety and complying with regulatory standards set by the authorities. The introduction of Hazard Analysis and Critical Control Points (HACCP) systems and increased scrutiny from regulatory organisations such as Food Safety and Standards Authority of India (FSSAI, operates under the Food Safety and Standards Act, 2006) effectively lowered contamination concerns and promoted consumer confidence in poultry products. Today, India is one among the world's largest poultry producers, with a highly organised sector comprising numerous large-scale processing units but processing industry as a whole is still handling less than 7% of the total broiler chicken produced in the country.At present, the industry continues to evolve with trends such as organic poultry, chemical residue-free products, and ready-to-eat meals, catering to health-conscious and convenience-seeking consumers.

Organised Poultry Processing

Organised poultry processing refers to the systematic, large-scale poultry production, slaughtering, and preparation using modern techniques. The processed products are packaged to ensure freshness, labeled with necessary information, and stored in cold conditions for distribution. Some of the critical features of organised poultry processing are standardised operations, automation, mechanisation, maintenance of hygiene/sanitation, and safety standards. Nowadays, all kinds of efforts

are being made to make the processing practice sustainable. Furthermore, continuous technological advancements have significantly enhanced poultry processing efficiency, safety, and product quality. In line with these developments, some of the retailers viz. Licious, FreshToHome, Nandus, My Chicken and More and many other online retailers utilise vacuum packing for their fresh and processed poultry products. This technique, coupled with integrated cold chain, has facilitated the expansion of their distribution networks by guaranteeing the preservation of their products for extended durations. With the rise in consumer awareness and regulatory restrictions, it is anticipated that an increasing number of Indian poultry processors will embrace the advanced technologies, resulting in a stronger and more dependable supply chain. It is evident that some of the biggest meat exporters viz. Allanasons is venturing into modern poultry processing and IB Group is entering in to modern poultry processing with a 12000 BPH plant.

By incorporating cutting-edge technologies, Indian poultry processors may more effectively address the issues of food safety, shelf life, and quality, hence improving processed meat consumption and products competitiveness in the worldwide market. India's poultry processing equipment market serves as a vital gauge of the industry's overall well-being and expansion. The increasing customer demand for high-quality poultry products necessitates using innovative technology to ensure manufacturing efficiency, hygiene, and uniformity. Adoption of sophisticated machinery indicates a transition towards more structured and extensive activities, departing from conventional, manpower-intensive approaches. Unfortunately, no specific information is available regarding the demand for equipment in India. However, it can be assumed that India's growth is equal to or greater than the global trend, increasing at a CAGR of 7.13% (Figure 1).

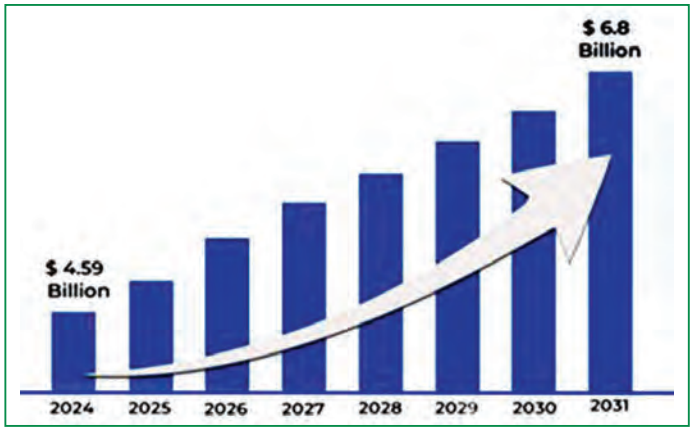


Figure 1. Global poultry processing equipment market forecast. India's growth is expected to be equal to or greater than the global trend. Source: www. verifiedmarketresearch.com.

Availability, Accessibility, Affordability, and Market of Processed Products

The implementation of structured poultry processing has greatly augmented the accessibility of chicken, guaranteeing a consistent provision to fulfill the requirements of consumers. In India, the market for enhanced processed poultry products has experienced significant expansion over the past decade due to the rise of various influential participants. Licious (founded in 2015) capitalised on the need for premium, sanitary meat products. Its premium products include marinated chicken wings, chicken kebabs, chicken ham, and salami. Their innovative strategy incorporates vacuum-sealed packaging to guarantee freshness, as well as gourmet offerings such as chicken breast filled with cheese and herbs, targeting sophisticated urban customers who appreciate both quality and convenience. Similarly, Suguna Foods, FreshToHome, Nandu's, and Venky's prioritises offering chicken meat and seafood. Their dedication to promoting well-being and openness has enabled them to cultivate a devoted clientele, particularly among health-conscious individuals in search of reliable food origins. These companies emphasise sustainability and traceability, ensuring a transparent supply chain from farm to fork. This approach has helped them to build a strong reputation for quality and consumer trust, particularly post-COVID when health concerns have become paramount. Chicken is a highly cost-effective source of protein because of the economies of scale produced via systematic processing. This helps to stabilise prices and promote competition in the market. This has a substantial influence on consumption, as it enhances accessibility, convenience, and diversity. Marketing and branding are pivotal for organised chicken processors. It enhances consumer trust, drives sales, and differentiates products. A strong brand identity emphasises consistent quality, traceability, and transparency and builds trust and loyalty. Chicken processing is the methodical breakdown of whole chicken into different components, where each cut is meticulously prepared to ensure exceptional quality, utmost safety, and impeccable presentation. This provides a selection of chicken cuts that are suitable for a variety of cooking techniques, recipes, and dietary preferences, enhancing customer contentment and consumption.

Health and Safety Considerations

Significant public health concerns are often posed alongside the rapid growth of the poultry industry. Consuming mishandled or contaminated poultry products can lead to foodborne illnesses, predominantly caused by bacteria such as E. coli, Salmonella, and Campylobacter. In addition, the inappropriate utilisation of antimicrobials contributes to the emergence of antimicrobial-resistant bacteria, which presents an additional risk to human health. Robust control systems, coupled with rigorous policies, are crucial to guarantee product safety and minimise dangers to human health. The FSSAI plays a crucial role in guaranteeing the safety and quality of poultry processing in India. FSSAI ensures adherence to rigorous standards in the business by providing comprehensive guidelines that encompass all elements of processing, including cleanliness, sanitation, labelling, and packaging. The Indian poultry sector is well-positioned to effectively meet both domestic and global demands due to its regulatory framework, as well as its efforts in training, consumer awareness, and international collaboration. Complying with international safety standards (ISO) and recommendations (Codex) in chicken processing helps prevent these risks. In India, FSSAI adheres to international norms and recommendations, promoting the use of HACCP plans and providing instructions for maintaining optimal temperatures to ensure the safety of poultry products. HACCP, which stands for Hazard Analysis and Critical Control Points, is a methodical and proactive strategy to maintaining food safety. It is particularly important in chicken processing since it plays a vital role in safeguarding the health and safety of consumers. This approach entails the identification of potential dangers that may jeopardise food safety at each stage of the production process, ranging from the acquisition of raw materials to the packing of final goods. HACCP guarantees that every stage of chicken processing complies with rigorous safety protocols by identifying crucial control points (CCPs) where hazards may be efficiently controlled or avoided. By implementing Hazard Analysis and Critical Control Points (HACCP) in chicken processing, the potential for contamination by pathogens such as Salmonella and Campylobacter, chemical residues, and physical hazards is significantly reduced. This, in turn, ensures the protection of customers from foodborne diseases (Russell 2010). Consistent surveillance, record-keeping, and validation protocols

guarantee that the process maintains its efficacy and adheres to regulatory mandates. In general, HACCP offers a well-organised system that improves the safety and quality of chicken products, promoting consumer trust and public health.

Quality and Consistency of Processed Products

Ensuring a long life of products while upholding their quality and safety is a primary objective in the poultry processing sector. The Food Safety and Standards Authority of India (FSSAI) enforces stringent regulations for poultry products to guarantee their safety, quality, and hygiene. These standards include rigorous hygiene protocols in processing plants, temperature restrictions for storage and shipping, and specific labelling regulations, which include product information and nutritional details. Poultry, whether fresh or frozen, must adhere to precise standards for microbiological and chemical residual levels while also keeping appropriate physical attributes. Poultry products that have undergone processing are subject to regulations regarding the use of additives and preservatives, the quality of ingredients, and the packaging materials that are safe for food. Ready-to-eat and ready-to-cook goods are required to comply with strict safety regulations and have well-defined expiry dates.

Standardisation of chicken products plays a pivotal role in ensuring consistent taste, texture, and overall quality, significantly influencing consumer preferences. With the growing demand for ready-to-eat and easy-to-cook options, standardised processing ensures these products are safe, nutritionally balanced, and flavourful. Consumers increasingly prefer products that offer convenience without compromising taste or quality, and standardisation effectively addresses this need. By maintaining high standards in production, processors can create value-added products that appeal to health-conscious and time-pressed consumers. In addition to health and safety, the organised processing units offer the added advantage of traceability. Traceability in the chicken processing industry is crucial for ensuring food safety, quality control, and consumer trust. It allows tracking each chicken from farm to table, facilitating quick responses to contamination or disease outbreaks. Traceability also supports regulatory compliance and helps verify humane and sustainable farming practices.

Processing Facilitates Market Segmentation and Targeted Marketing Strategies

India is one of the leading countries in the global processing equipment market. Enhanced automation indicates consumer demand for novel products that drive the markets. A comprehensive comparison of the global and Indian poultry processing equipment markets is showcased in Table 1, which highlights the differences and similarities between the global and Indian poultry processing equipment markets.

Table 1. Comparison of the global and Indian poultry processing equipment markets

Key Aspects	Global Market	Indian Market
Market size (2023)	USD 5.1 billion	USD 250 million
Growth rate, CAGR (2023-2028)	6-7%.	8-10%.
Major players	Marel, JBT Corporation, Alfa Food & Poultry Projects BV, Meyn	RND Engineering, Storm Engineering, S.P equipment's, Mystique corporation etc.
Technological Advancements	High automation, AI integration	Gradual adoption of advanced techniques
Regulatory Environment	Strict global standards	Evolving national standard, aligning with global standards
Challenges	Competition, compliance, upgrades	Infrastructure, investment, regulatory
Opportunities	Emerging markets, tech innovations	Domestic demand, export potential

Segmentation in the chicken market involves categorising products based on product type (whole chicken, cut-up parts, processed chicken), distribution channels (retail, food service, online), and geographic regions. This segmentation aids market participants in tailoring their strategies to meet specific consumer demands and regional preferences, fostering a more targeted and efficient approach to the diverse chicken market landscape. Apart from this, market segmentation of organised poultry products can be categorised as demographic, psychographic, and behavioural. They are linked to consumers' age, income level, family size, lifestyle, health consciousness, ethical value, quantity requirements, etc. Demographic segmentation addresses the age, income level, and family size within the targeted region. Demographic segmentation focusses on the lifestyle, health, and ethical values of the customer. Similarly, behavioural segmentation targets occasion and consumer usage rates for the marketing. In the conventional market, this sort of segmentation-targeted marketing is exceedingly challenging. Therefore, processing adoption has a multitude of advantages that contribute to a better level of consumption. Firstly, product differentiation where distinct product

lines were developed to cater to meet the unique requirements of each customer segment. For example, a line of chemical residue free-range chicken for health-conscious and ethical consumers, and a line of budget products for cost-conscious consumers. Next, organisations adopt tailored messages that reflect each segment's specific interests and values. Also, they can utilise social media platforms for effective reach.

Modern poultry retailing in major Indian cities has seen a significant transformation, driven by consumer demand for convenience, quality, and hygiene made possible by organised poultry processing. In cities like Mumbai, Delhi, Bangalore, and Chennai, organised retail chains are leading the way by offering a range of fresh and processed poultry products through both physical stores and online platforms. In addition, multiple retail outlets sell fresh and branded processed poultry items that are branded and sourced from reliable sources, guaranteeing that buyers may obtain clean and top-notch products.

Challenges and Opportunities in the Poultry Processing Industry

Since structured poultry processing offers numerous advantages, it also confronts multiple challenges. Tackling these challenges is vital for the industry's ongoing expansion and its capacity to fulfill changing consumer expectations. Some of the critical challenges in the segment are as follows,

Environmental Impact

The poultry industry must confront and mitigate its environmental impact, which encompasses greenhouse gas emissions, water consumption, and waste disposal. It is necessary to allocate resources toward sustainable processes and technology to minimize the environmental impact of the sector. A key advancement in chicken processing is the transition from water chilling to air chilling, which greatly improves sustainability and overall efficiency. Air chilling reduces water consumption by eliminating the requirement for significant quantities of water for the chilling process, resulting in a decrease in the production of wastewater and its corresponding environmental consequences. Furthermore, the act of incorporating a circular economy approach is perceived as a chance or advantageous situation. In this approach, waste materials such as heads, feet, and trimmings undergo a transformation process to create valuable items such as by-product meals and chemical components.

Food Safety

The emergence of new diseases and contamination hazards presents significant challenges for food safety in poultry processing. Pathogens such as Salmonella, E. coli and Campylobacter are persistent hazards that require the implementation of stringent hygiene and monitoring protocols. These risks are further exacerbated by the proliferation of antibiotic-resistant bacteria, which complicates the process of prevention and treatment. Thus, strict regulatory standards, continual research, and industry-wide collaboration are required to combat these developing risks and ensure the consumer safety of chicken products.

Animal Welfare and Supply Chain Disruptions

The future challenges in poultry processing regarding animal welfare include meeting the growing demands of consumers and regulators for humane treatment. Poultry processing supply chains may be disrupted by global events such as pandemics, climate change, and geopolitical tensions. Disruptions in the provision of food, transportation, and labour can result in increased expenses, reduced production efficiency, and consumption. Hence, supply chains need to be made more robust and localised, technological integration should be enhanced to ensure traceability, and sourcing techniques must be diversified to mitigate these risks.

Influence on Consumer Preferences Due to Processed Products

The advent of organised processing has had a profound effect on eating habits in India since it has made chicken products more convenient, accessible, and varied. As a result, consumer behaviour has been influenced. Companies such as Venky's, Suguna Foods, Godrej Tyson Foods, Licious, and Zorabian Chicken have taken advantage of the market's desire for convenient and readily prepared food by producing products including nuggets, sausages, kebabs, and marinated chicken. These items are designed for individuals with busy lifestyles, offering convenient meal options that are both delicious and high in quality, leading to an increase in consumer confidence in these products and their consumption. The demand for these attributes significantly influences consumer behaviour, with a substantial number of customers prepared to pay a higher price for these features. This is especially true among younger demographics, buyers at specialist marketplaces, and individuals who emphasise ethical and organic choices. The appearance of modern retailers highlights the possibility of innovation and expansion in conventional sectors through contemporary business methods and customer-focused techniques. Furthermore, there is a growing trend among consumers to favour processed poultry products because of their improved digestion, absorption, and bioavailability advantages.

Conclusion

The establishment of organised poultry processing in India has transformed the consumption of poultry products, especially chicken, by guaranteeing a reliable, secure, and reasonably priced provision of superior goods. Technology improvements and strict safety requirements have facilitated the global accessibility and versatility of chicken as a protein source. Also, the industry's emphasis on efficiency, hygiene, and sustainability has bolstered customer trust, while inventive marketing and segmentation tactics have catered to a wide range of preferences, stimulating market expansion. The organised poultry processing industry in India will continue to be essential in meeting the demand for chicken products that are convenient, healthful, and ethically produced, thereby solidifying chicken's status as a fundamental component of modern diets despite the evolving preferences of consumers.

Figure 2. Graphical illustration demonstrates the functioning concept of the poultry processing unit as well as the benefits of processing that contribute to an increase in demand for the value-added products

Bronil

Tiamulin Hydrogen Fumarate 10%, 80%

immeureka
The art of science

IMMEUREKA ANIMAL HEALTH PVT LTD

Corporate Address: Ground Floor, plot No.9B, Near Tiny trees, Vasavi Colony, Vikrampuri, Secunderabad 500015

dey@immeureka.com www.immeureka.com

World No.1

Layer Bird Now Ready to Rule India

Local Breeding Program

Lowest Feed Per Egg

Highest No. of SaleableEggs

W-80 India

Srinivasa

Hy-Line

Unmatched Technical Services

Lowest Mortality

Ability to Recover From Diseases

Best Egg Shell Strength

Poultry Farmers' Flock Performances

Vaibhav Poultry Farm, Sangli, MH

Mr.Santosh Patil

Achieved **319 HHE** in **73 weeks** (95% Achievement of STD) with **107 g avg feed intake/day**

Cum Feed/Egg	:	125
Weeks Above 90%	:	37
Peak Weekly Production	:	96%
Feed Cost/Egg @Rs.26/KG	:	Rs.3.25

B. Venkata Reddy P.F, Krishna Dist, A.P

Mr. B. Venkata Reddy

Achieved **312 HHE** in **73 weeks** (93% Achievement of STD) with **100 g avg feed intake/day**

Cum Feed/Egg	:	119
Weeks Above 90%	:	25
Peak Weekly Production	:	96%
Feed Cost/Egg @Rs.26/KG	:	Rs.3.09

Since 1965

Srinivasa Farms

(CIN : U01222TG1983PTC003979)

For More Info

+91 91000 21340

www.srinivasa.co

Article

Phytogenics as Alternative Poultry Antibiotics: A Look Inside Nature's Pharmacy

Dr. Partha P. Biswas
Former Associate Professor & H.O.D.
Dept. of Zoology
R.K. Mission V. C. College

Poultry products, being more cost-effective compared to alternative animal meat sources and containing essential minerals and high levels of protein, play a crucial role in addressing nutritional deficiencies in various countries. Subsequent to the prohibition of antibiotic growth promoters (AGPs), natural substitutes such as probiotics, prebiotics, organic acids, and essential oils have gained popularity in the poultry sector. The Indian Council of Medical Research's 2020 report, 'Survey and Surveillance of Antimicrobial Resistance' highlights the increasing incidence of antimicrobial resistance across India. There is a necessity for stringent regulations limiting antibiotic use in livestock, necessitating collaborative efforts and consistent legislation, despite the existing regulatory framework encompassing India's livestock, poultry, and aquaculture sectors. In order to establish an efficient strategy against antimicrobial resistance, the Indian Council of Medical Research has convened stakeholders and outlined specific urgent objectives.

China, Brazil, India, the US, and Australia were the top five poultry products consumer nations in 2020. The increased resistance of bacteria and their residues in meat and eggs led to the implementation of the ban on antibiotic growth promoters. Since the use of antibiotics in poultry farming has been restricted, other methods have been promoted to provide the best possible yield of chickens. There are still issues with creating safe, affordable, and long-lasting plant-based antibiotic substitutes for animal husbandry.

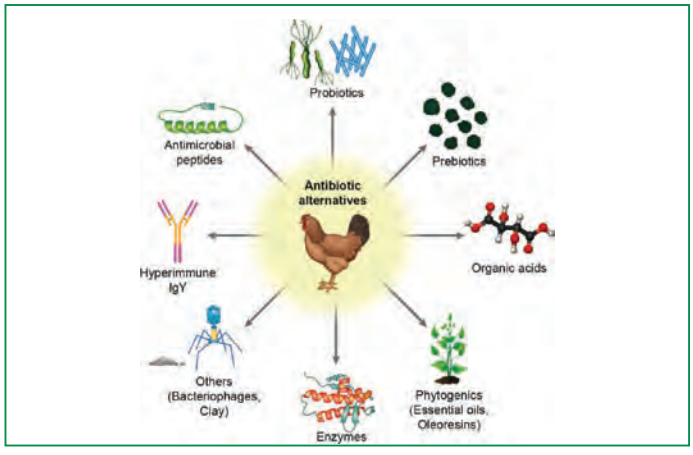


Fig. 1: Various classes of antibiotic alternatives available for use in poultry production.

The Poultry Sector Ranks Among the Biggest Globally

The poultry industry stands as one of the culinary giants on the global stage, poised to reach 121% of its 2005 production levels by 2050. This sector is not just growing; it's evolving, becoming more industrialised and widespread across various regions. The surge in global meat consumption has been nothing short of phenomenal, with broiler chicken production profits expected to skyrocket in the coming century. This boom can be attributed to chicken's lean profile, delectable flavor, rich nutritional benefits, swift production cycle, cost-effectiveness, rapid return on investment, and affordability for people from all walks of life. From a modest 9 million tons in 1961 to a staggering 132 million tons in 2019, production has soared. Leading the charge is the United States, contributing 17% of the world's chicken, with China and Brazil hot on its heels. Meanwhile, India has carved out its niche, ranking seventh in meat production and third in egg production according to the 2020 FAOSTAT figures. The country's egg production has seen a meteoric rise from 78.48 billion in 2014-2015 to an impressive 129.60 billion in 2021-2022.

What is the Purpose of Using Antibiotics on Farm Animals?

Antibiotics are commonly used in poultry farming for treatment, prevention, and growth promotion, leading to the development of antibiotic resistance. This poses a threat to the nutritional and economic benefits of poultry and other animals, with a report predicting that almost 10 million people could die from antibiotic-resistant bacteria by 2050. Mutations in genes allow bacteria to survive antibiotics and pass them on to their descendants, as seen in Nigeria. (1)

Chickens are growing twice as fast as they did 60 years ago (FCR 2.5 to 1.6) due to antibiotics, causing bone and joint problems. The Better Chicken Commitment encourages companies, including Burger King, Chipotle, Denny's and Subway to buy chicken from suppliers without fast-growing breeds, with over 200 companies signing the pledge. They are committed to providing customers with a sustainable supply of chicken that meets all 2024 animal welfare criteria, expressing a better chicken plan.

What Antibiotics are Used for Raising Chickens?

Chickens are fed a wide range of antibiotics, many of which are included in their regular diets of food and water. An overview of some of the more often used antibiotics in chicken farming as:

- Aminoglycosides (treat intestinal infections)
- Bambermycins (prevent the synthesis of the cell walls of bacteria)
- Beta-lactams (two types: penicillins and cephalosporins)
- Ionophores (prevent intestinal infections)
- Lincosamides (combat joint and bone infections)

- Macrolides (treat a fatal condition called necrotic enteritis, which is caused by overeating)
- Quinolones (broad-spectrum drugs that affect a wide range of bacteria)
- Streptogramins (prevent cell wall formation and protein synthesis, used to treat and prevent necrotic enteritis)
- Sulfonamides (prevent and combat Salmonella, E. coli, and other pathogens)
- Polymyxin antibiotics as Colistin (treatment of infections caused by Gram-negative bacteria)

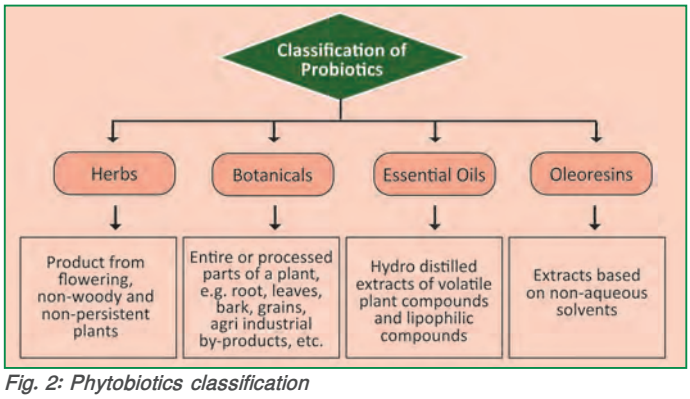


Fig. 2: Phytobiotics classification

Phytogenic Feed Additives - Alternatives to Antibiotics

Plant extracts, also known as phytobiotics or botanicals or phytogenics, are effective antibiotic substitutes due to their antibacterial, anti-inflammatory, antioxidant, and anti-parasitic properties. They have been used in chicken production for years.

Sweet wormwood (Artemisia annual)

Dried leaves of Artemisia have long been used in oriental medicine for their antimicrobial properties.
Active ingredients: Essential oils like camphene, β-camphene and β-pinene etc, sesquiterpenoids such as artemisinin, flavonoids, phenols, purines and lipids.
Effect: 2-4% of food as antiparasitic, antioxidant (2), coccidiostat (3) reduces the number of enterobacteria and increases the number of lactobacilli in the intestine.

Garlic (Allium sativum)

Garlic, a perennial bulb-forming plant, has been used for centuries as a flavouring agent, traditional medicine, and a functional food to enhance physical health.
Active ingredients: Components like sulphur containing compounds alliin, diallylsulphides and allicin, ajoene and allylcysteine. Garlic has at least 33 sulphur-containing substances, several enzymes, 17 amino acids, and trace minerals for example selenium. Allicin is unstable and poorly absorbable. On the other hand, garlic derivatives which are produced by means of heating or solvent extraction methods are usually contain alliin, however also are free of allinase; therefore, no allicin may be found in the final product.
Effect: Addition of up to 3% garlic improves weight, feed conversion, reduces mortality. It has anti- microbial properties and increases high-density lipoproteins which act as antibacterial, anti- fungal, antiviral and antioxidant. (4)

Anise (Pimpinella anisum)

Active ingredients: The seed contains trans-anethole eugenol, methyl-chavicol, anisaldehyde, estragole, coumarins, scopoletin, umbelliferone, estroles, terpene hydrocarbons, polyenes and polyacetylenes.
Effect: The inclusion of anise seed in the feed improves weight gain, feed consumption and feed conversion, increases the quantity of antibodies against avian influenza virus and increases the amount of immunoglobulins. (5)

Cinnamon (Cinnamomum zeylanicum)

Active ingredients: Many resinous substances, such as cinnamaldehyde, cinnamate, cinnamic acid, and other essential oils, make up cinnamon. It contains a variety of essential oils including trans-cinnamaldehyde, cinnamyl acetate, eugenol, L-borneol, L-acetate-bornyl, beta-caryophylene, E-nerolidol, alpha-cubebene, alpha-terpineol, caryophyllene oxide, terpinolene etc.
Effects: According to recent studies, cinnamaldehyde and cinnamon powder, alone or in combination with other essential oils, have a variety of advantageous benefits on chickens. It also gives protection against Escherichia coli, Enterococus faecalis, Pseudomonas aeruginosa, Staphylococcus aureus, epidermal Staphylococcus, Salmonella sp., Helicobacter pylori and Vibrio parahemolyticus. (6)

Coriander (Coriandrum sativum)

Active ingredients: C. sativum aqueous extract has relatively higher contents of total flavonoids and total phenolic acids, essential oil, tannins, terpenoids, reducing sugars, alkaloids, sterols and glycosides. The major compounds present in essential oil are linalool(67.70%); α-pinene (10.5%); γ-terpinene (9.0%); geranylacetate (4.0%); camphor(3.0%); and geraniol (1.9%).
Effects: Linalool is the main component that is characterised by antioxidant, antibacterial compounds. (7)

Chili (Capsicum annuum)

Active ingredient: Capsaicin represents 50% of the active compounds, capsaicin and capsanthin. It is also rich in vitamin C.
Effects: Several reports confirmed the activities of these compounds, including antimicrobial, anthelmintic, antioxidant, growth enhancer, and immune modulator activities, antioxidant capacity, increases weight gain, feed consumption and reduces feed conversion. Chili contains the terpenoid compound capsaicin, which has antibacterial properties. (8)

Black cumin (Nigella sativa)

Active ingredients: The seeds contain alkaloids, essential oils, thymoquinone, dithymoquinone, thymol, carvacrol, nigellicine, nigellidin and hederin.
Effects: It may be a viable alternative to replace the use of antibiotics, growth promoter, antioxidant and immuneregulator. Black cumin increases the quantity of antibodies against Newcastle, Gumboro and Bronchitis. It is an antibiotic alternative to promote growth and enhance health of broilers challenged with Eimeria maxima and Clostridium perfringens. (9)

Turmeric (Curcuma longa)

Active ingredients: Turmeric contains a high level of beneficial phenolic compounds (curcuminoids) and terpenoids (sesquiterpenes). The main curcuminoids of the rhizome are curcumin, demethoxycurcumin, and bisdemethoxycurcumin. Whereas α-turmerone, and β-turmerone are the major ketonic sesquiterpenes of turmeric essential oil.
Effects: Antioxidant, improves the immune response of chickens infected with Newcastle and Eimeria. Turmeric powder supplementation improves weight gain and feed conversion and decreases blood triglycerides. (10)

Eucalyptus (Eucalyptus globulus)

Active ingredients: It's phenolic compounds includes 1, 8-eucalyptol, a-pinene, a-tepineol, globulol, flavonoids, tannins and hydroxybenzoic acids.
Effects: These have several biological activities, including anti-carcinogenic, cardio protective, anti-inflammatory, antibacterial and antiviral properties. Extracts of leaves improve the intestinal microbiota and better immunity. The extract declines the bacterial growth and there was decline occurred in colony counting of S. aureus. (11)

Ginger (Zingiber officinale)

Active ingredients: It has gingerdiol, gingerol, gingerdione and phenolic compounds.

Effects: Antioxidant properties. The addition of 0.02 to 1.5% to the feed improves weight gain, feed conversion, reduces mortality in chickens and stimulates the immune system. Ginger root extract supplementation. Faecal and caecal concentrations of total bacteria count (TBC), Escherichia coli, Lactobacillus spp., and Bifidobacterium spp significantly decline and E. coli & the number of beneficial microorganisms such as Lactobacillus spp. and Bifidobacterium spp increases. (12)

Bay leaves, Laurel (Laurus nobilis)

Active ingredients: It contains about 1.3% essential oils, flavonoids, sesquiterpenes, alkoloids, glycosylated flavonoids, megastigmane and phenolic components. Its essential oil contains eucalyptol, α-terpinyl acetate, linalool, methyl eugenol, sabinene and carvacrol.

Effect: The essential oil contents have strong antibacterial activity against Gram negative and Gram positive pathogens as well as antifungal effects. By using 2 to 6 g kg-1 of bay leaves in feed, the total of bacteria and aerobic bacteria in the colon is inhibited. (13)

Moringa (Moringa oleifera)

Active ingredients: Polyphenols, vanillic-, ferulic-, melilotic- acids, vitamins A, E, C and complex B.

Effects: Extracts of the M. oleifera leaves have antimicrobial activities. The findings show that solvent extracts of M. oleifera components (leaves, flower, pulp, and seed) were effective against E. coli and S. aureus. The mycelia growth of Aspergillus flavus was shown to be suppressed by M. oleifera (bark seed and leaf) crude extracts. (14)

Neem (Azadirachta indica)

Active ingredients: Biologically active principles isolated from different parts of the plant include: azadirachtin, meliacin, gedunin, salanin, nimbin, valassin and many other derivatives of these principles.

Effects: The growth-promoting effect of neem leaf extracts (NLM) is supported by different studies. NLM can be a substitute of antibiotic growth promoter (AGP). (15)

Black pepper (Piper nigrum)

Active ingredients: The plant contains tannins, alkaloids, saponins, terpenes, steroids, flavones, flavonoids (catechin, myricetin, and quercetin), and piperine, among several others.

Effects: Black pepper improves the immune system through increasing the concentration of immunoglobulins in serum. A study reveals that black pepper as phytobiotic growth promoter has the potential to replace the prevalent antibiotic growth promoters in broiler chickens. (16)

Green tea (Camellia sinensis)

Active ingredients: Green tea has over 200 bioactive compounds and contains over 300 different substances . The chemical composition of tea is multifaceted, consisting of polyphenols (catechins and flavanoids), alkaloids (caffeine, threobromine, theophylline), volatile oils, polysaccharides, amino acids, lipids, vitamin C, minerals and other uncharacterised compounds.

Effect: Positive effects of green tea have been demonstrated in poultry diseases including coccidiosis and avian influenza. (17)

Oregano (Origanum vulgare)

Active ingredients: It has terpinen-4-ol most abundantly along with β-caryophyllene, germacrene D and α-humulene. Among the oxygenated sesquiterpenes, spathulenol is the most abundant in all oils and its content is greater in the dried samples. As for the phenol content, carvacrol is the main constituent.

Effect: Oregano essential oils have been shown to possess antioxidant, antibacterial, antifungal activity. (18)

Conclusion

Many herbal remedies can be used as natural antibiotics and antivirals, growth boosters, and alternative sources of antioxidants for growing broiler chickens. These chickens can be grown safely from whole or partial diet replacement for antibiotics. Numerous reports indicate that consumers prefer chicken that is fed natural ingredients over antibiotics. The four factors that millennial foodies consider most crucial when choosing a brand of chicken or meat are "raised with good animal welfare practices," "raised without antibiotics ever," "raised in ways that reduce environmental impact" and "locally raised." The benefits of feeding phytogenics to animals such as enhanced gastrointestinal health, up to a 50% reduction in ammonia emissions, and a track record of success in antibiotic-free farming support an engrossing tale geared at millennial foodies.

Refferences

1. F.O. Omoya and K. O. Ajayi (2016) : Antibiotic resistance pattern of pathogenic bacteria isolated from poultry droppings in Akure, Nigeria. FUTA Journal of Research in Sciences,Vol.12 (2): 219 -227.

2.Cherian G, Orr A, Burke IC, Pan W (2013): Feeding Artemisia annua alters digesta pH and muscle lipid oxidation products in broiler chickens. Poultry Science, 92: 1085-1090.

3. Ebiamadon Andi Brisibe et al. (2009): Nutritional characterisation and antioxidant capacity of different tissues of Artemisia annua, Food Chemistry. Volume 115, Issue 4,15, Pages 1240-1246.

4. Rees L.P.et al (1993): A quantitative assessment of the antimicrobial activity of garlic (Allium sativum) World J. Microbiol. Biotechnol.9:303–307.

5. Mehmet Ciftc et al. (2005): The effect of Anise Oil (Pimpinella anisum L.) on broiler performance. International Journal of Poultry Science 4 (11): 851-855.

6. Kaaviya A.V.et al (2023): Cinnamon as a potential feed additive: Beneficial fffects on poultry health and production performances – An Update. Journal of Experimental Biology and Agricultural Sciences, June;Volume – 11(3) page 444 – 446.

7. Revati B Shitole et al (2023): Impact of feeding powdered coriander seeds on broiler chicken growth and sensory attributes. The Pharma Innovation Journal; SP-12(12): 754-757.

8. Mohamed .E. et al. (2022): Hot red pepper powder as a safe alternative to antibiotics in organic poultry feed : an updated review.Poultry Science. Vol.101,Issue 4.

9. Vishal Manjunatha et al.(2023): Nigella sativa as an antibiotic alternative to promote growth and enhance health of broilers challenged with Eimeria maxima and Clostridium perfringens.Poult Sci. 2023 Aug; 102(8): 102831.

10. Lagua E, Ampode KM (2021):Turmeric powder: potential alternative to antibiotics in broiler chicken diets. J. Anim. Health Prod. 9(3): 243-253.

11. Assad Ullah et al.(2021): Activity of ethanolic extract of Eucalyptus globulus leaves against multi drug resistant poultry pathogens in broiler chicks. Cellular and molecular biology (Noisy-le-Grand, France) 67(1):153

12. George Dosu et al.(2023): Supplementation of ginger root extract into broiler chicken diet: effects on growth performance and immunocompetence. Poultry ScienceVolume 102, Issue 10, October 2023, 102897.

13. Nafea, H.H.et al.. (2018): Effect of dietary Melissa officinalis and Laurus nobilis on some microbial traits of broiler. The Eurasia Proceedings of Science, Technology, Engineering and Mathematics. 3: 121-125.

14. Rifat Ullah Khan et al.(2021): Potential applications of Moringa oleifera in poultry health and production as alternative to antibiotics: A Review. Antibiotics 10(12), 1540.

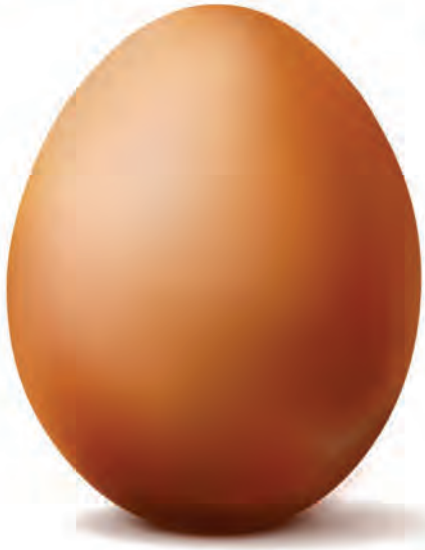
15. Sarker S.K et al.(2014): Effects of aqueous extract of Neem (Azadirachta indica) leaves as growth promoter and anti-colibacillosis in broilers. Bangladesh J. Anim. Sci.43(2):138–141.

16. Singh, J et al.(2018): Influence of supplementation of black pepper powder through feed in broiler chickens on their growth performance, blood profile, meat sensory qualities and duodenum morphology. Indian Journal of Animal Sciences 88 (2): 215–221. Indian Journal of Animal Sciences 88 (2): 215–221, February.

17. Khan, S.H.(2014): The use of green tea (Camellia sinensis) as a phytogenic substance in poultry diet. Journal of Veterinary Research 81(1), Art. #706, 8 pages.

18. Alagawany, M.et al.(2018): The usefulness of oregano and its derivatives in poultry nutrition. World's Poultry Science Journal, 74(3), 463–474.

Ganga
Best Quality Symbol GROUP



IDEAL EGGS:-

Clean, Free of cracks, correct shape, within acceptable weight range...

Better Uniformity (No runts/stunts)

GANGA HATCHERIES

We deal in only 430Y hatching eggs

Our Hatching eggs are free from vertically transmissible diseases like the Fowl Typhoid, Mycoplasmosis, Reo, Adeno, CAV etc.

Ganga
Best Quality Symbol GROUP

Corporate Office:
Village Bhalsi,
Near Ganga Filling Station (NAYARA)
Panipat 132113, Haryana (India)
Mob.: +91-94160-00350
E-mail: gangahatcheries@gmail.com
Web: www.gangagroup.org.in

Cobb

GLOCREST™
Pharmaceutical Pvt Ltd

Innovation for a Better Health

The Ultimate Choice to make Mycotoxin consequence negligible

TOXKIL

Maximize Nutrient Uptake with the Science of Glycine & Curcumin Chelation

Chelomix

Only Organic Trace Minerals

Complete glycine chelated Mineral Premix for Broilers, Layers & Breeders fortified with Curcumin extract

GLOCREST™
Pharmaceutical Pvt. Ltd

Off.: 2018, Solus Hiranandani Business Park, Hiranandani Estate, Thane (W) - 400 607. Maharashtra. India.

www.glocrestpharma.com
+91 22-46007565
info@glocrestpharma.com

Big Dutchman®

LAYER MANAGEMENT SYSTEMS

Optimizing Performance, Ensuring Quality


BIN/FILL SYSTEMS


FEED CHAIN


LAYER WATERING


CAGE SYSTEM


EGG COLLECTION


VENTILATION


CONTROLS

BD Agriculture (Malaysia) Sdn. Bhd.
Email: bd-asia@bigdutchman.com
General Line: +603 3348 3555

BD Agriculture India Private Limited
Email: bdindia@bigdutchman.com
Mobile: 91-9154080177 | Tel: 91- 40- 69074100

Scan for Layer Management Brochure
www.bigdutchman.asia

Article

Climate Change in Poultry Production: 5 Major Threats and What You Can Do to Mitigate the Impact

Dr. Ajay Bhoyar
Global Technical Manager
EW Nutrition

"Every single social and global issue of our day is a business opportunity in disguise." — Peter Drucker

Global livestock systems constitute an industrial asset worth over $1.4 trillion. Projections indicate that the global livestock population, now at 60+ billion, could exceed 100 billion by 2050 – more than ten times the expected human population at that time (Yitbarek 2019, Herrero 2009). Our industry bears an enormous responsibility: to feed the growing population, sustainably and consistently, despite increasing challenges. And one of the biggest challenges is already looming large. Animal agriculture, including poultry farming, is particularly susceptible to the adverse effects of climate change. Increased extreme weather events, farm fires facilitated by drought, thermal pressure on farmed animals, reduced availability or increased prices of water, raw materials, and electricity, and much more are already impacting the industry. This is, in all likelihood, just the beginning. How exactly will poultry production be affected in the future – and what can you do to future-proof your operation against the coming challenges?

Major impact areas of climate change – and what to do about them

1. Feed Quality

Excessive heat, droughts, or floods can reduce crop yields, decrease nutritional content, and increase the risk of pests, pathogens, and weed outbreaks. Plants with a C3 photosynthetic pathway such as wheat, rice, or soybean can benefit from increased temperature more than the so-called C4 plants such as corn or sorghum (Cui 2021). NASA projections show corn crop yields are expected to decline 24% in the next 30 years (Gray 2021). Moreover, increased temperature, shifts in rainfall patterns, and elevated surface greenhouse gas (GHG) concentrations can also lead to lower grain protein concentration (Godde 2010, Myers 2014), as well as affect mineral and vitamin concentrations in plants. Pollinator-dependent crops like soybean or rapeseed could also see decreased yield under climactic challenges (Godde 2020). Warmer temperatures and changes in precipitation patterns can create favorable conditions for the growth of mycotoxins, leading to reduced feed quality and health problems in poultry. Especially corn and sorghum are vulnerable to aflatoxin contamination in hot and humid conditions. On top of this, storage will become more challenging as pathogen growth will further erode feed quality.

Fast Fact
In 2020, 75% of soil in Mexico was declared too dry to cultivate crops. In 2021, 70% of the country was impacted by crop loss and water shortages caused by drought. Corn yield decreased by 18% in five years and is expected to fall further (Carlin 2023).

Action

- **Diversification of feed sources:** Exploring alternative feed ingredients that are less reliant on climate-sensitive crops can help mitigate the impact of changing weather patterns on feed availability and costs.

- **Mycotoxin mitigation:** Not all toxin mitigation solutions are created equal. Choose standardised toxins mitigation solutions based on their efficacy instead of upfront cost. The products that are regularly tested against undesirable and harmful impurities like dioxins, dioxins-like PCBs and heavy metals.

2. Genetics

Rising temperatures may lead to reduced fertility and hatchability, affecting the overall health and reproductive performance of chickens. Extreme heat can also impact the expression of genes related to growth, feed efficiency, and resistance to diseases. As a result, poultry breeders and geneticists face the challenge of developing more heat-tolerant poultry breeds to ensure sustainable production under changing climatic conditions.

Action

- **Genetic selection for thermotolerance:** Breeding programs can focus on developing more heat-tolerant chicken breeds that exhibit improved performance and resilience in challenging climatic conditions. producers need to pay attention to the specifics of the breed's genetic makeup

3. Farm Management

3.1 Solving for thermal comfort: Electricity costs

The thermal comfort of livestock is no longer a concern for tropical zones only. Temperate zones are also seeing sustained increases in ambient temperatures. High temperatures and prolonged heat waves increase electricity consumption as farmers rely on ventilation, cooling systems, and artificial lighting to maintain optimal conditions for chickens. Consequently, energy costs will rise, impacting the profitability of poultry farms.

3.2 Solving for water availability: Resource management

Water scarcity, changing precipitation patterns, and droughts can limit the availability of water resources, affecting poultry farms' water consumption and overall operational efficiency. The quality of water is also an increasing concern. The UN states that "higher water temperatures and more frequent floods and droughts are projected to exacerbate many forms of water pollution – from sediments to pathogens and pesticides". Reduced raw water quality "can decrease animal water intake, feed intake and health" (Valente-Campos 2019). Especially in Asia and Africa, which have seen massive increases in floods and droughts, respectively, water scarcity and quality will pose severe issues.

Action

- **Improved farm management practices:** Implementing energy-efficient systems, such as solar power and energy-saving technologies, can reduce electricity consumption and associated costs. Water management techniques, such as rainwater harvesting and efficient irrigation systems, can help mitigate the impact of water scarcity. As always, strict biosecurity will play a critical role.
- **Enhanced ventilation and cooling systems:** Upgrading ventilation systems and implementing efficient cooling mechanisms can alleviate heat stress on chickens, enhancing their overall health and productivity. Regular maintenance and sensor technologies also play an important preventive role.

3.3 Built-up and human capital risk

In high-risk areas, machinery, electricity networks, telecommunications, building infrastructure in general can be impacted by extreme weather events, rising sea levels etc. (Nardone 2010). Labour availability and productivity might, on the other hand, be impacted in many areas. Disease outbreaks, including new strains, as well as decreased air quality, extreme events etc. might in the future contribute to labour shortages. The number of unsafe hot workdays is expected to double by 2050, which will impact especially rural India, sub-Saharan Africa, and Southeast Asia (Carlin 2023).

Action

- **Climate-resilient infrastructure:** Investing in resilient infrastructure, such as elevated coops, flood-resistant buildings, or disease surveillance technology can minimise the risk of incidents from weather events and can support early action against disease pressure. Investments in smart farming can also relieve pressure on labour and improve speed of action.
- **Insurability and loan math:** Any future-looking business needs to work with the likelihood of increased insurance costs and higher insurability requirements. Also, a point will come at which non-resilient infrastructure will not be financed.

4. Animal Performance

Fast Fact

Heat stress reduces productivity, impacts fertility, and increases susceptibility to disease. It can also reduce the size of eggs and thickness of eggshells (Godde 2021).

While colder areas will benefit from reduced house heating and ventilation needs, warm areas will be at increased risk. A hot environment "impairs production (growth, meat and milk yield and quality, egg yield, weight, and quality) and reproductive performance, metabolic and health status, and immune response" (Nardone 2010, Ali 2020). The proliferation of pathogens in warm environments will pose further challenges. Antibiotic resistance from attempts to control these issues will only compound the problem. Additionally, as mentioned before, changes in weather patterns can impact crop yields, including the availability and affordability of feed ingredients for chickens. Producers will have to reformulate often to match availability, cost, and nutritional value.

Action

- **Stress and pathogenic impact mitigation solutions:** Phytogenic feed additives can support poultry gut health and strengthen the immune response when confronted with stress factors, including heat stress, humid environments, pen density, and pathogen pressure. With the added benefit of reducing dependence on antibiotics and other medication, they can naturally stimulate or support a healthy response to challenges.

5. On- and off-farm Logistics

Transportation is also affected all along the supply chain, from bringing feed or young stock to the farm to moving livestock to processing facilities and further distribution along the chain. Extreme weather events, such as hurricanes, floods, or heavy snowfall, can lead to power outages and/or disrupt transportation routes and infrastructure, hindering the timely delivery of chicks, feed, and other essential supplies to poultry farms. In addition to the challenge of transportation, packaging will soon fall under regulatory scrutiny. Sustainability requirements may be national, but compliance will have to follow across borders for any producers eyeing international markets.

Action

- **Data is your friend:** Transportation and logistics data can helps improve efficiency and reduce your environmental impact. Start tracking fuel consumption, carbon emissions, transportation costs, and other relevant metrics to identify areas for optimisation.
- **Think globally:** ESG (Environmental, Social and Governance) guidance will become a standard in many important markets,

including Europe and the US. Keep an eye on international regulations, especially for your target markets. Their ESG requirements are your ESG requirements.

The World Needs More Meat

The bad news is that climate change is coming at us fast. Animal agriculture will be among the most heavily impacted. Major adjustments will be needed to mitigate the effects and to embrace the long view. The good news is that livestock systems remain critical to our growing population. The world population is projected to grow to 9.8 billion by 2050 (UNDESA, 2017). Livestock products (meat, milk and eggs) account for about 30% of the population's protein supply, with large regional variations (FAOSTAT, 2022; Godde et al, 2021). To answer this growing demand, world meat production is expected to increase by 14% by the end of the decade, compared to current figures (Carlin 2023). The increase in meat demand might be as high as 76% compared to 2005/2007 (Alexandratos 2012).

Fast Fact

1.5% annual growth in livestock and fish production will result from improvements in per-animal productivity. Poultry will account for over 50% of meat production growth, due to sustained profitability and favorable meat-to-feed price ratio (OECD FAO 2022).

The Cost of Doing Nothing

We must look at the challenges of climate change, in the words of Peter Drucker, as a business opportunity. As always, those who act early will reap important rewards – not just through market differentiation but through economic resilience.

What Awaits Those Who do Not Take Action?

The United Nations Environment Programme warns of some foreseeable consequences of inaction, most of which can be grouped under three categories:

- **Rising costs:** Cost of decreased performance, increased cost of doing business, carbon taxes
- **Policy restrictions:** Once a few major markets have implemented restrictive labeling, packaging, or production regulations, anyone who wants to operate in these markets is subject to the same restrictions.
- **Reputational risk/Market and investor preferences:** The risk of falling behind or not taking action, in other words the opportunity cost, is hard to quantify until it's too late. Banks and investors may give up on unsustainable financing as soon as consumers and/or regulators show signs of concern. Acting ahead of the curve is also a market positioning win as well as economic win. The market rewards first movers. The impact of climate change on genetics, farm management, animal performance, farm logistics, and transportation necessitate proactive adaptation and mitigation strategies, in coordination with local and global expertise. Responses will vary depending on geography, production type, and more – but doing nothing is no longer an option. By implementing sustainable practices across the board and investing in resilient infrastructure, poultry producers can maintain a robust, high-performing, sustainable production system.

References:

1. *Alexandratos, N. and Jelle Bruinsma. "World agriculture towards 2030/2050: the 2012 revision". ESA Working Paper No. 12-03, June 2012. https://www.fao.org/3/ap106e/ap106e.pdf*
2. *Ali, Zulfekar et al. "Impact of global climate change on livestock health: Bangladesh perspective". Open Veterinary Journal. 2020 Apr-Jun; 10(2): 178–188. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7419064/*
3. *Bernabucci, Umberto. "Climate change: impact on livestock and how can we adapt". Animal Frontiers, Volume 9, Issue 1, January 2019, Pages 3–5, https://doi.org/10.1093/af/vfy039*
4. *Cheng, M. et al. Climate Change and Livestock Production: A Literature Review. Atmosphere 2022, 13(1), 140; https://doi. org/10.3390/ atmos13010140*
5. *Carlin, David et al. Climate Risks in the Agriculture Sector. UN Environment Programme, March 2023. https://www.unepfi.org/ wordpress/wp-content/uploads/2023/03/Agriculture-Sector-Risks-Briefing.pdf*
6. *Cui, Hongchang. "Challenges and Approaches to Crop Improvement Through C3-to-C4 Engineering." Frontiers in Plant Science, 14 September 2021, Volume 12 – 2021. https://doi.org/10.3389/fpls.2021.715391*
7. *FAO Statistics. Statistical yearbook world food and agriculture. 2022. https://www.fao.org/3/cc2211en/cc2211en.pdf*
8. *Godde, C.M. et al. "Impacts of climate change on the livestock food supply chain; a review of the evidence". Global Food Security, 2021 Mar; 28: 100488. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7938222/*
8. *Gray, Ellen. "Global Climate Change Impact on Crops Expected Within 10 Years, NASA Study Finds". NASA Global Climate Change. November 2, 2021. https://climate.nasa.gov/news/3124/global-climate-change-impact-on-crops-expected-within-10-years-nasastudy-finds/*
9. *Herrero, Mario et al. "Livestock, livelihoods and the environment: understanding the trade-offs. Current Opinion in Environmental Sustainability Volume 1, Issue 2, December 2009, Pages 111-120. https://doi.org/10.1016/j.cosust.2009.10.003*
10. *Nardone, A. et al. "Effects of climate changes on animal production and sustainability of livestock systems". Livestock Science, Volume 130, Issues 1–3, May 2010, Pages 57-69. https://www.sciencedirect.com/science/article/abs/pii/S1871141310000740*
11. *OECD FAO. Agricultural Outlook 2022-2031. https://www.oecd.org/development/oecd-fao-agricultural-outlook-19991142.htm*
12. *United Nations Climate Action. Water – at the center of the climate crisis. Retrieved 20 June 2023. https://www.un.org/en/climatechange/science/climate-issues/water#:~:text=Water%20quality%20is%20also%20affected,pathogens%20and%20pesticides%20 (IPCC).*
13. *United Nations Department of Economic and Social Affairs (UNDESA). "World population projected to reach 9.8 billion in 2050, and 11.2 billion in 2100". 2017 Revision of World Population Prospects, 21 June 2017. https://www.un.org/development*

OptiPhos® Plus

HUVEPHARMA

www.huvepharma.com

Follow us at: Huvepharma SEA

HUVEPHARMA NV • UITBREIDINGSTRAAT 80 • 2600 ANTWERP • BELGIUM
P +32 3 288 1849 • F +32 3 289 7845 • Email: customerservice@huvepharma.com
HUVEPHARMA SEA • 42 • HARIDWAR • ROAD 2 A/B • KALYANI NAGAR • PUNE-6 • INDIA
P +91 20 2615 4193 • F +91 20 2615 3973 • Email: salesindia@huvepharma.com

Article

How to Compare Different Phytases for Use in Poultry Feed

Lode Nollet
Global Product Manager
Huvepharma

Exogenous phytase is added to poultry feed to liberate phosphorous (P), bound as phytate in raw materials, with the aim of lowering feed costs by reducing the amount of inorganic P added to the diet and having a degradation of phytic acid, known as an anti-nutritional factor in feed. Both actions lead to an improved poultry performance.

Comparing Phytases: Bone Ash and Digestibility Studies

In order to compare different phytases on their potential to release P from phytate, trials are often conducted by adding the phytase at different inclusion levels to a P deficient diet. Technical performance is measured alongside parameters related to P digestion by the animal. This can either be the measurement of bone ash or by calculating a P digestibility value.

In the bone ash method, a feed deficient in P is fed to the animal. This leads to poor bone formation, substantiated by a low bone ash content. Adding inorganic P to the feed (MCP or DCP) leads to a reduction of the P deficiency, resulting in a better bone formation & higher bone ash in the bird (Fig. 1).

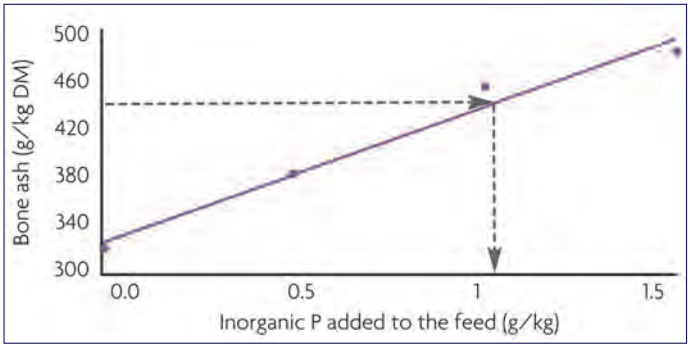


Fig 1 : Correlation between phosphorus in feed and bone ash, and estimation of P equivalency for a phytase based on bone ash (arrows)

This way, a 'calibration curve' between P added to the feed and bone ash is produced. Adding a phytase at a certain level to the P deficient feed will also reduce its P deficiency due to the liberation of P from phytate, leading to a higher bone ash content. With the latter value, and using the calibration line, the equivalent P (from MCP or DCP) value can be estimated for this phytase (see arrows in Fig. 1).

Alternatively, P values of a phytase can be estimated from digestibility studies, similar to trials conducted for protein digestibility.

In brief, P intake in the bird is measured, while P excretion (in manure) or P levels in the end part of the intestine are also determined. Based on these values, and using an indigestible marker in feed, the amount of P retained or digested by the animal can be calculated.

Adding a phytase to this feed will reduce the P level at the intestinal level and in faeces, which allows the calculation of a digestible P value for the phytase.

Biased Comparisons Based on Equal FTU per kg of Feed Inclusion

The way to determine the levels of different phytases to be included in the feed in order to compare them can already skew the outcome of the trial. In comparative trials, it is often seen that the activity of the different phytases is 'quantified' using the official method (ISO 30024:2009) expressed in FTU per gram pure phytase product.

Based on this analytical result, the different phytases are then dosed to reach a certain inclusion level, for example, 500, 1000 or 1500 FTU per kg of feed. However, this is not the correct way, as explained below, as every phytase has its own pH profile.

The ISO method is measuring the activity of the phytase at pH 5.5, while it is common knowledge that phytases need to work at levels between pH 2 and pH 4 (Fig. 2). The phytase indicated in blue in Fig. 2 has a pH optimum at 5.5, while the phytase indicated in green has pH optimum around 3.5, meaning that the latter will perform better in the animal.

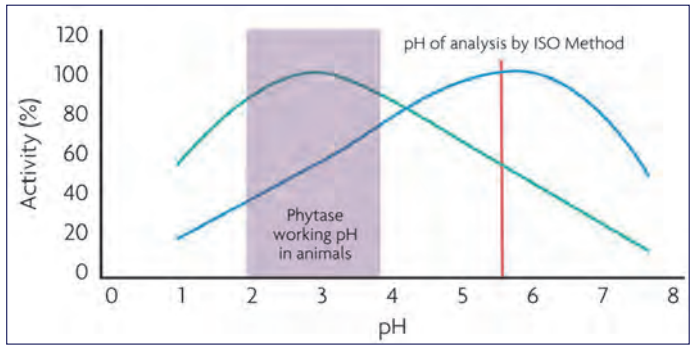


Fig 2 : pH profile of two phytase - pH area at which phytase needs to work in the animal, vs pH at which phytase activity is measured using the ISO method

When the activity of both phytases is determined by the ISO method (at pH 5.5) it can be seen that the blue phytase will have a higher activity (for instance 10,000 FTU/g), while the green phytase has a lower activity at this pH (for instance 5,000 FTU/g).

According to this trial protocol, one should then add 50g of the blue phytase, but 100g of the green phytase per kg of feed in

order to reach 500 FTU/kg (pH 2 to 4; this is the green phytase) and a lower activity measured at pH 5.5.

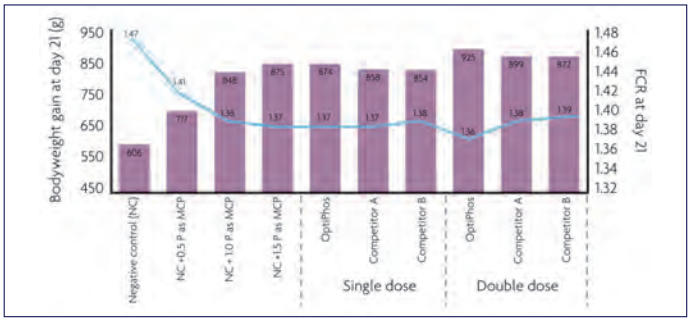


Fig 3 : How to set up a phytase trial with the appropriate inorganic controls and different phytases at inclusion levels proposed by the

How to Do it Better

From a commercial point of view, the main question for the feed industry is: how many grams of a commercial phytase product, with a certain declared activity, with a certain claim for P and with a certain price, are comparable?

Indeed, every phytase has its own phytase unit based on its own analytical method, and this phytase unit corresponds to a certain P or dig. P value declared by the supplier. For instance, a trial could be set up in which a feed, not deficient in P(=positive control) is reduced in P by 0.5,1.0 and 1.5g/kg (negative controls). To these feeds, each of the phytases is included at the supplier recommended inclusion levels to compensate for the 0.5,1.0 and 1.5g reduction.

By doing so, it can be validated, based on technical performance, bone ash analysis and/or P digestibility, if the matrix value for P proposed by each phytase supplier is correct. At the same time, all phytases can be compared on technical performance, including economic performance, as these are the drivers for the correct choice of a phytase.

It should, of course, also be clear that when comparing phytases, the same form (liquid, granular of coated) should be used. It is well known that coatings might hinder the release of a phytase, which can impact its P release from phytate. As phytate degradation needs to take place in the first part of the intestine (gizzard), a reduced release of phytase might impact its effect.

Conclusion

It is quite clear that the set-up of trials to compare different phytases needs to be done properly in order to provide practical answers to the nutritionist.

This means comparing different phytases at their recommended inclusion levels, taking into account their proposed matrix values for phosphorous and their price, and not based on their FTU activity measured at pH 5.5. In this way, an easier and more correct comparison can be made based on the technical and economic performance obtained.

trouw nutrition
a Nutreco company

Smart minerals, Smart nutrition, Smart decision

THE BENEFITS

- Increased stability
- Improved palatability
- Low solubility
- Increased bioavailability
- Improved digestibility

Minerals are an essential nutrient for production animals. It is very important to feed a stable and highly bioavailable source of trace mineral, in order to optimise health, wellbeing and performance, as well as minimising environmental impact. Our

IntelliBond, Optimin and IntelliOpt

products offer a full range of Organic and Hydroxy Trace Minerals sources.

Scan the code for latest updates

Trouw Nutrition India Pvt. Ltd
Unit no. L4 04, SLN Terminus, Beside Botanical Garden,
Gachibowli, Hyderabad, Telangana – 500032 T. +91 40 2988 0258
E: customercareindia@trouwnutrition.com W: www.trouwnutrition.in

Article

Unveiling the Hidden Power of Trace Minerals in Animal Nutrition

Dr. Maloshrie Bora
Program Manager – Minerals
Trouw Nutrition South Asia

In the intricate world of animal nutrition, the significance of supplementing trace elements like Zinc (Zn), Copper (Cu), Manganese (Mn), Iron (Fe), Iodine (I), and Selenium (Se) cannot be overstated. These elements play a pivotal role in ensuring the health and performance of livestock. However, the basal amounts of these trace elements found in standard commercial feeds simply fall short of meeting the animals' requirements.

The key to unlocking the full potential of these vital trace elements lies in its bioavailability. Bioavailability refers to the retention of a trace element within the gut intestinal tract and is profoundly influenced by antagonistic interactions, particularly in poultry where phytate emerges as the arch-nemesis of essential trace minerals. Phytate forms stubborn complexes with these minerals, rendering them insoluble and thus unavailable for absorption. To combat this antagonism, numerous trace mineral sources have been developed based on solubility and chemical bonding.

But that's not all; the timing and level of trace mineral delivery also come into play. This realisation has led to a groundbreaking concept in trace mineral solutions – the fusion of organic and hydroxy minerals. This innovative approach has the potential to not only maintain but also elevate animal performance under various farm conditions. It's imperative to emphasise that the proper timing and dosage of trace elements are paramount for ensuring optimal animal performance.

In today's world, livestock producers face immense challenges due to stringent governmental regulations aimed at addressing environmental concerns. The novel ideas discussed above offer a glimmer of hope, promising improved absorption and reduced trace element supplementation, all while preserving production performance.

In Bonds We Trust: How Bonding Revolutionises Trace Mineral Bioavailability

Commonly used trace mineral sources in animal nutrition include sulfate-based and oxide-based minerals, primarily chosen for their affordability. Sulfate trace minerals form ionic bonds with sulfate ligands, readily dissolving in water at a neutral pH, but their instability leads to complexation with phytate, reducing bioavailability. Conversely, oxide minerals form covalent bonds, rendering them insoluble in neutral pH and partially soluble in low pH, further hindering absorption.

To overcome these challenges, organic trace minerals and hydroxy trace minerals have emerged. Organic trace minerals shield metal centers with amino acids or proteinate ligands, limiting the formation of phytate complexes. Hydroxy trace minerals, with their unique covalent crystal structure, prevent phytate complexation and gradually dissolve at low pH, enhancing absorption. Additionally, hydroxy minerals boast cost-effective hydroxy and chloride ligands.

Comparative studies reveal that both organic and hydroxy trace minerals significantly outperform sulfate sources, with hydroxy and organic trace minerals yielding similar results. For instance, in broilers, hydroxy Zn and organic Zn show 144% and 142% improved bioavailability compared to Zinc sulfate (Figure 1).

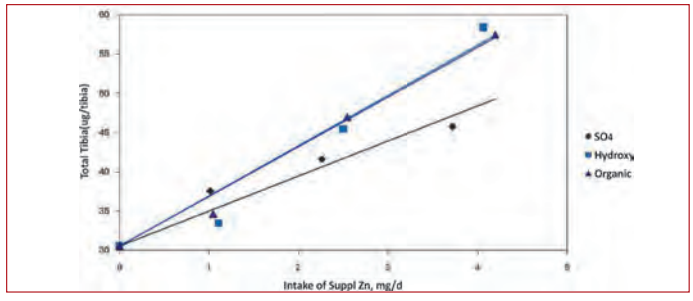


Figure 1. The tibia recovery of Zinc, of birds fed different sources of Zinc (Linear P<0.001).

Precision Matters: The Power of Optimal Particle Size and Density

Particle size and density often go overlooked when selecting trace mineral sources. Ideal particle size and density minimise feed segregation and ensure proper mixability during production. These considerations are crucial, particularly for animals with low feed intake, as it guarantees that their limited consumption contains all vital nutrients, including minerals. This improved mixability can be done through a patented process (Optisize technology) of creating optimal particles that ensures particle size consistency and highly uniform. Confirmed through laser diffraction analysis, the process results in the ideal particle size (150-300 μm) with the ideal density (0.8-1.0 g/mL), whether it is zinc, iron or manganese, for improved blending/mixing, flowability, and reduce the carry-over risk.

Studies conducted with different trace element sources, such as $MnSO_4$ and Hydroxy Mn, indicate improved mixing in complete feeds, enhancing feed quality and nutrient distribution. This is measured through an improved coefficient of variation or CV (lower % CV indicates better mixing, Figure 2). The mixability of trace elements in a diet is of particular importance to young animals, as they have a lower feed intake and, therefore, more

important to get all the required nutrients, especially minerals, despite the low feed intake. Moreover, spherical particles in hydroxy minerals reduce dust potential, reducing mineral source losses during handling.

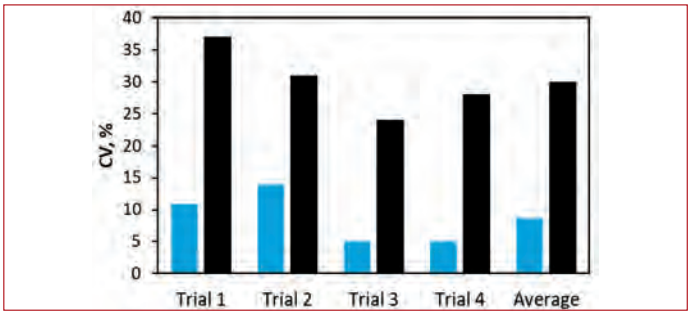


Figure 2. Coefficient of variation of Manganese within complete feeds (Hydroxy Mn and $MnSO_4$ shown in the blue and black colour bar, respectively). 10 feed samples were analysed per batch and difference to expected levels is determined.

Furthermore, hydroxy minerals with spherical particles reduced "dustiness" of the product, leading to a lower dust potential (a lower number of dust potential indicates a lower loss of mineral source, see Figure 3) and this also lessens the chance inhalation of the product by workers in the feed mill or premix facility. Although a larger mineral particle size is preferred in feed or premix production, within the animal, it is the other way around. With a smaller particle size, this will lead to a larger surface area, allowing for an improved availability of the mineral.

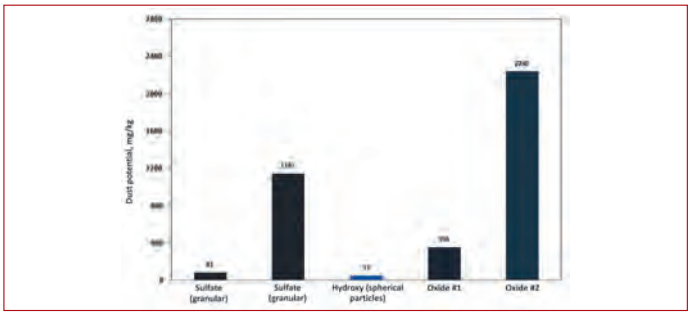


Figure 3. Dust potential of different Manganese source.

The Strength of Synergy: The Power of Combining Organic and Hydroxy Trace Minerals

While the practice of combining different trace element sources is not new, recent developments have brought forth a game-changing concept: the 70:10 ratio of hydroxy to organic minerals. This innovation stems from the collaborative efforts of leading industry experts and academic professionals dedicated to optimising animal productivity and well-being.

Research demonstrates that the combination of hydroxy and organic minerals far surpasses sulfate, hydroxy, or organic-only sources, as well as combinations of sulfate and organic minerals in terms of animal performance (Figure 4).

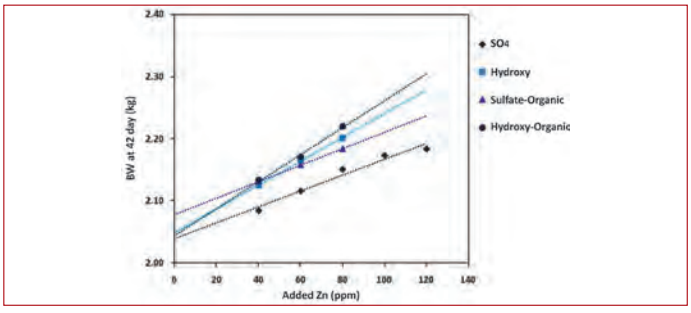


Figure 4. Effect of different zinc sources on end weight of broilers at 42 day.

In another study, the results clearly showed that a combination of 70 ppm Zn from hydroxy mineral plus 10 ppm Zn from organic mineral was superior in terms of end body weight as well as improving feed conversion (Figure 5).

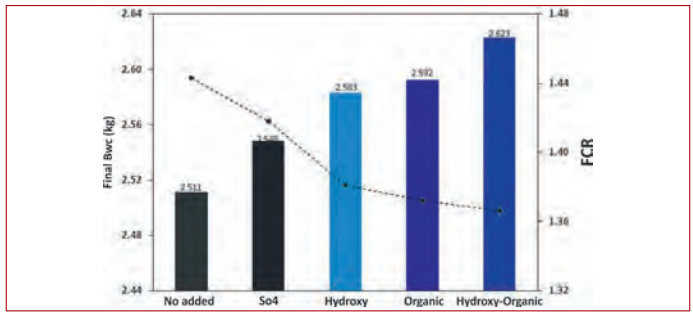


Figure 5. Effect of different zinc sources (80 ppm Zn from $ZnSO_4$, Hydroxy, Organic, or combination of 70 ppm Zn Hydroxy plus 10 ppm Zn Organic) on end weight (P = 0.003) and FCR (P< 0.001) of broilers. Different labels (a,b,c) indicate significant differences. p < 0.05 indicate significant differences.

This synergy results from the complementary release profiles of the two technologies, allowing animals to absorb trace minerals efficiently throughout their intestinal tract. Thus, once hydroxy minerals reach the area of low pH they slowly begin to release the small molecules of soluble metals one layer at a time while organic minerals maintain their structural integrity. Given the different molecular structures of the soluble metals from hydroxy and organic minerals, their absorption is extended further down the gut intestinal tract (Figure 6).

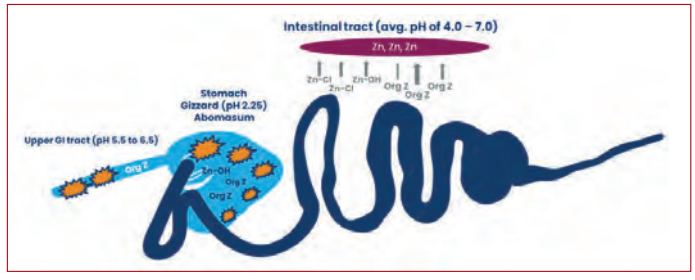


Figure 6. Illustration of the complementary release profile of the combination of hydroxy and organic trace minerals throughout the intestinal tract.

In conclusion, the choice of a trace mineral source is pivotal for supporting productivity, animal health, and environmental sustainability. When choosing the right minerals, remember that the bonding type determines bioavailability, the particle size, density and synergy between two sources enhances efficacy. The combination of organic and hydroxy trace minerals presents a revolutionary solution, offering precise trace element delivery and enhanced absorption, ultimately leading to optimal animal performance. In a world with ever-increasing challenges, these innovations provide a beacon of hope for the future of animal nutrition.


Alltech®
MYCOTOXIN MANAGEMENT
MYCOSORB A+®
One of the
most researched
mycotoxin binders on the market
Uniquely backed by a peer-reviewed meta-analysis, Mycosorb A+ offers superior binding capabilities. By reducing mycotoxin absorption within the animal, it helps to optimize poultry health and performance.
Find out more at knowmycotoxins.com
Alltech Biotechnology Pvt. Ltd.
No.3; 6th Cross, HAL 2nd Stage, Kodihalli,
off Old Airport Road | Bangalore 560 008

POWER OF

The evolving landscape of poultry consumption in India is a reflection of

Prof. (Dr.) P.K. Shukla, Department of Poultry Science, College of Veterinary

develop, how poultry is likely to remain a crucial component of the Indian diet,

Several key factors have driven the phenomenal evolution of poultry growth and consumption in India.

Economic Growth and Rising Incomes

As India's economy has grown, so have disposable incomes, especially among the middle class. This increased purchasing power has enabled more people to afford a greater variety of foods, including poultry, which is seen as a nutritious and relatively affordable source of protein.

Urbanisation and Changing Lifestyles

The rapid urbanisation of India has led to changing dietary habits. Urban dwellers tend to have less time for cooking and prefer convenient, ready-to-eat foods. Poultry, particularly chicken, is versatile and quick to prepare, making it a popular choice for busy urbanites.

Health and Nutrition Awareness

There is a growing awareness of health and nutrition among Indian consumers. Poultry is often considered a healthier alternative to red meat due to its lower fat content and higher protein levels. This health consciousness is encouraging more people to incorporate poultry into their diets.

Cultural Acceptance and Dietary Preferences

Historically, certain communities in India have abstained from meat for religious or cultural reasons. However, these attitudes are gradually changing, particularly among younger generations. Chicken is now widely accepted across various cultural and religious groups, contributing to its increased consumption.

Industry Growth and Supply Chain Improvements

The poultry industry in India has seen significant advancements in terms of production capacity, technology, and supply chain logistics. Improved breeding practices, better feed, and enhanced disease control measures have led to higher productivity and quality. This growth has made poultry more accessible and affordable.

Consumption Trends

Chicken: The most popular poultry meat in India, chicken is used in a variety of traditional dishes such as curries, biryanis, and kebabs, as well as in fast food items like fried chicken and burgers.

Eggs: Consumption by their affordability used in both traditional Ho Ya Monday, Roz Khao Coordi nation Commit consumption.

POULTRY

broader socio-economic changes, cultural shifts, and industry advancements. Science and Animal Husbandry, Mathura, highlights, as the country continues to catering to the diverse and dynamic needs of its population

Expansion of the Food Service Industry

The rapid expansion of the food service industry, including fast food chains, restaurants, and street food vendors, has also boosted poultry consumption. Chicken-based dishes are staples on many menus, catering to the diverse tastes of the population.

Government Policies and Support

The Indian government has implemented various policies and programs to support the poultry industry. Initiatives aimed at improving rural livelihoods through poultry farming have not only boosted production but also created employment opportunities, further integrating poultry into the food economy.

The historical context and trends of poultry consumption in India provide a fascinating lens through which to understand the country's socio-economic transformation. The historical and evolving landscape of poultry consumption in India mirrors the country's broader socio-economic developments. From traditional backyard farming to a highly industrialised sector, the journey of poultry in India reflects increased prosperity, urbanisation, and changing consumer preferences. As India continues to grow, poultry is set to play an even more significant role in the national diet, driven by its affordability, nutritional value, and versatility. Here's an overview of how poultry consumption has evolved over time.

Pre-Independence Era

Traditional Diets: Traditionally, Indian diets were largely vegetarian, influenced by religious and cultural practices. Hinduism, Jainism, and certain sects of Buddhism promote vegetarianism, which significantly shaped dietary habits.

Limited Meat Consumption: Meat consumption, including poultry, was limited and generally confined to non-vegetarian communities and certain regions.

Post-Independence to 1980s

Agrarian Economy: Post-independence India was primarily agrarian, with a focus on self-sufficiency in staple foods like grains. Poultry farming was not yet industrialised and was practiced on a small scale. Poultry farming was typically a secondary activity, with chickens reared in backyards for personal consumption and local markets.

of eggs has also risen, driven and nutritional value. They are widely and modern recipes, and the "Sunday Ande" campaign by the National Egg tee has played a role in promoting egg

Other Poultry: While chicken dominates, there is a growing interest in other poultry such as turkey, Japanese quails and duck, although these remain niche markets.

1980s to 2000s

Economic Reforms and Liberalisation: The economic liberalisation of the 1990s marked a significant shift. Increased foreign investment and economic growth led to rising incomes and urbanisation.

Emergence of Commercial Poultry Farming: The poultry industry began to commercialise, with improvements in breeding, feed, and disease management. Companies like Venkateshwara Hatcheries, Kegg farms, Suguna, Indian Broilers, Pioneer Hatcheries played a pivotal role.

Government Initiatives: The government supported the poultry sector through various schemes and subsidies, promoting rural employment and poultry production.

2000s to Present

Rapid Urbanisation: Continued urbanisation has led to changes in dietary patterns, with more people incorporating poultry into their diets due to its affordability and convenience.

Health and Nutrition Awareness: Growing awareness of health and nutrition has driven people to prefer poultry over red meat. Chicken is considered a lean source of protein, suitable for various diets.

Expansion of the Food Service Industry: The growth of the fast food and restaurant industry has popularised chicken dishes like fried chicken, tandoori chicken, and chicken biryani. Chains like KFC and McDonald's have expanded their presence.

Technological Advancements: Innovations in poultry farming technology, including better breeding practices, better nutrition, better health coverage to birds and automation, have increased production efficiency and output.

Consumption Patterns and Statistics

Rising Per Capita Consumption: Per capita poultry consumption has steadily increased. In the 1980s, it was below 1 kg per person per year, but recent estimates suggest it has risen to around 4-5 kg in the urban areas.

Popularity of Chicken: Chicken dominates the poultry market, accounting for the majority of consumption. Its versatility in various cuisines makes it a staple.

Egg Consumption: Egg consumption has also risen significantly. Campaigns like "Sunday Ho Ya Monday, Roz Khao Ande" have promoted eggs as a nutritious and affordable food option. The average per capita consumption of egg has increased to 96 eggs per capita per annum.

Regional Variations

North India: Known for dishes like tandoori chicken and butter chicken, reflecting Mughlai and Punjabi culinary influences.

South India: Chicken is integral in dishes like chicken curry, biryani, and Chettinad chicken.

East and West India: Regional specialties include Kolkata's chicken rolls and Goan chicken Xacuti.

The industry faces challenges such as fluctuating feed prices, disease management (e.g., avian flu), and regulatory issues. The outlook remains positive due to ongoing investments in technology, infrastructure, and marketing. There is a trend towards organic and free-range poultry, reflecting global consumer trends.

Economic Drivers

The economic drivers of the evolving poultry consumption landscape in India are multifaceted, encompassing rising incomes, urbanisation, health consciousness, price competitiveness, technological advancements, government support, organised retail growth, and export opportunities. These factors have collectively contributed to making poultry an integral part of the Indian diet, reflecting broader socio-economic trends and transformations in the country. As these drivers continue to influence consumer behaviour, the poultry industry in India is poised for sustained growth and development. The evolving landscape of poultry consumption in India is significantly influenced by various economic drivers. These factors have collectively transformed poultry into one of the fastest-growing segments of the Indian food industry.

Rising Incomes and Economic Growth

Economic growth has led to higher disposable incomes, especially among the burgeoning middle class. With more financial resources, consumers can afford to diversify their diets, including more poultry products. Higher incomes often lead to a shift from carbohydrate-heavy diets to more protein-rich foods, with poultry being a preferred option due to its affordability and versatility.

Urbanisation

Rapid urbanisation has brought significant changes in lifestyles and food preferences. Urban dwellers tend to prefer convenient and quick-to-cook food options, making poultry an attractive choice. The expansion of the food service industry, including restaurants, fast food chains, and street food vendors, has boosted poultry consumption. Urban areas, with their higher concentration of such establishments, have seen a corresponding rise in demand for poultry products.

Health and Nutrition Awareness

There is growing awareness about the importance of protein in the diet. Poultry, especially chicken, is viewed as a healthy source of lean protein, which has driven its increased consumption. Concerns over the health implications of red meat consumption, such as higher cholesterol levels, have led consumers to seek healthier alternatives like chicken and other poultry products.

Price Competitiveness

Poultry is generally more affordable than other types of meat, making it accessible to a larger segment of the population. The cost-effectiveness of poultry relative to red meat and fish has contributed to its popularity. Advancements in poultry farming have led to economies of scale, reducing production costs and, consequently, retail prices. This has further enhanced the affordability of poultry.

Technological Advancements

The adoption of modern farming techniques, such as better breeding practices, efficient feed utilisation, and advanced disease control measures, has significantly increased poultry production and quality. Improvements in cold chain logistics and distribution networks have ensured that poultry products reach consumers in fresher conditions and at lower costs, facilitating wider availability and consumption.

Government Policies and Support

The government has implemented various subsidies and incentive schemes to support poultry farming. These initiatives have lowered the barriers to entry for small and medium farmers, increasing production capacity. Government programs aimed at rural development have promoted poultry farming as a means of livelihood. This has not only boosted poultry production but also improved rural incomes and food security.

Expansion of Organised Retail

The expansion of organised retail formats, such as supermarkets and hypermarkets, has increased the accessibility of poultry

products. These stores offer a variety of poultry items, including processed and ready-to-cook options, catering to diverse consumer needs. Organised retail provides better storage and refrigeration facilities, ensuring the quality and safety of poultry products, which encourages more consumers to purchase them.

Export Opportunities

Increasing global demand for poultry has opened export opportunities for Indian poultry producers. The growth in exports has incentivised domestic producers to enhance production capabilities and standards. Favourable trade policies and agreements have facilitated the export of poultry products, contributing to the growth and modernisation of the industry.

Product and Supply Chain Innovations

The poultry industry in India has undergone significant transformation through product and supply chain innovations. These advancements have not only improved the efficiency and quality of poultry production but have also catered to the evolving preferences of consumers. As the demand for poultry continues to grow, ongoing innovation in products and supply chains will be crucial in sustaining this growth and meeting the diverse needs of the Indian market. These advancements have improved the efficiency, quality, and accessibility of poultry products, meeting the growing consumer demand.

Product Innovations

Processed and Value-Added Products

There has been a surge in the availability of ready-to-cook (RTC) and ready-to-eat (RTE) poultry products. These include marinated chicken, chicken nuggets, sausages, and kebabs, catering to the convenience-seeking urban population. Companies are introducing health-focused poultry products, such as low-fat and organic chicken, to appeal to health-conscious consumers. Products enriched with additional nutrients, like Omega-3 eggs, are also gaining popularity.

Enhanced Packaging

Improved packaging techniques such as vacuum packaging and modified atmosphere packaging (MAP) extend the shelf life of poultry products while maintaining freshness, which is crucial for both domestic consumption and export. The use of eco-friendly and biodegradable packaging materials is on the rise, addressing environmental concerns and appealing to environmentally conscious consumers.

New Product Forms

Poultry companies are offering a variety of cuts and portion sizes to cater to diverse culinary preferences and ease of cooking. This includes pre-cut pieces, boneless options, and portion-controlled packaging. There is growing interest in specialty poultry products such as free-range chicken, organic chicken, and turkey, which cater to niche markets looking for premium and ethical options.

Supply Chain Innovations

Advanced Farming Techniques

Breeding programs focused on genetic improvement have resulted in poultry breeds with better growth rates, feed conversion ratios, and disease resistance, leading to higher productivity and better-quality meat and eggs. The adoption of automation and precision farming technologies, such as automated feeders, climate-controlled housing, and data-driven management systems, has enhanced efficiency and productivity in poultry farming.

Feed and Nutrition Management

Innovations in feed formulations, incorporating balanced nutrients and supplements, have optimised poultry growth and health. This includes the use of probiotics, enzymes, and organic minerals. The development of cost-effective feed production methods, including the use of locally sourced ingredients and agricultural by-products, has reduced feed costs, which constitute a significant portion of production expenses.

Disease Control and Biosecurity

Comprehensive vaccination programs and biosecurity measures have been implemented to prevent and control disease outbreaks, such as avian influenza, ensuring the health and productivity of poultry flocks. Advanced diagnostic tools and monitoring systems allow for early detection and management of diseases, reducing mortality rates and enhancing overall flock health.

Cold Chain Logistics

The development of efficient cold chain logistics, including refrigerated transport and storage facilities, ensures that poultry products remain fresh and safe from farm to fork. Real-time temperature monitoring systems are used throughout the supply chain to maintain the required temperature conditions, preventing spoilage and ensuring quality.

Integrated Supply Chains

Many poultry companies have adopted vertical integration, controlling multiple stages of the supply chain, from breeding and hatching to feed production, processing, and distribution. This integration improves coordination, reduces costs, and ensures consistent quality. Closer collaboration with retailers and food service providers ensures a steady supply of poultry products, tailored to market demand and consumer preferences.

Digital and E-Commerce Platforms

The rise of e-commerce platforms has made it easier for consumers to purchase poultry products online, with options for home delivery and subscription services for regular supply.Digital

traceability solutions, including blockchain technology, are being used to track poultry products throughout the supply chain, providing transparency and assurance of quality and safety to consumers.

Consumers' Preference and Behaviour

Consumer preferences and behaviour in the evolving landscape of poultry consumption in India are shaped by a combination of health consciousness, convenience needs, quality and safety concerns, cultural influences, price sensitivity, modern retail influence, taste diversity, and ethical considerations. The poultry industry must continue to adapt to these trends by offering products that meet the changing demands of Indian consumers, ensuring quality, affordability, and convenience while addressing health, ethical, and environmental concerns. The evolving landscape of poultry consumption in India reflects significant shifts in consumer preferences and behaviour, influenced by various socio-economic, cultural, and technological factors. Understanding these preferences and behaviours is crucial for stakeholders in the poultry industry to cater to the market effectively.

Health and Nutrition Awareness

As awareness of health and nutrition increases, more consumers are turning to poultry as a source of lean protein. Chicken, in particular, is perceived as healthier compared to red meat due to its lower fat content. There is a growing demand for nutrient-enriched poultry products, such as Omega-3 enriched eggs and vitamin-fortified chicken, driven by health-conscious consumers.

Convenience and Time-Saving Solutions

Busy lifestyles, especially in urban areas, have led to a surge in demand for RTC and RTE poultry products. These products save time and effort, catering to the needs of working professionals and young families. Consumers are increasingly opting for pre-portioned and pre-marinated chicken, which simplifies meal preparation and ensures consistent taste and quality.

Quality and Safety Concerns

With rising concerns over food safety and quality, there is a growing preference for organic and free-range poultry. These products are perceived as healthier and more ethically produced. Consumers are seeking transparency regarding the origin and production practices of poultry products. Digital traceability solutions, such as blockchain technology, are becoming popular for providing detailed information about the product journey.

Cultural and Regional Preferences

Poultry consumption patterns vary across regions, influenced by local culinary traditions. For example, tandoori and butter chicken are popular in North India, while chicken curry and biryani are favoured in South India. Poultry consumption spikes during festivals and special occasions, where traditional dishes involving chicken are prepared. This trend influences seasonal demand and purchasing behaviour.

Price Sensitivity and Value for Money

Price remains a critical factor for many consumers, especially in rural and semi-urban areas. Poultry is often chosen as a cost-effective source of protein compared to other meats. Consumers are responsive to promotions, discounts, and value packs offered by retailers and brands. Bulk purchasing during sales events is a common practice.

Influence of Modern Retail and E-Commerce

The growth of supermarkets, hypermarkets, and organised retail chains has made poultry products more accessible. These outlets offer a wide variety of poultry products, including fresh, frozen, and processed options. The rise of e-commerce platforms has facilitated online shopping for poultry products, offering convenience and home delivery services. Consumers are increasingly using digital platforms to purchase poultry, influenced by the ease of comparison and availability of customer reviews.

Taste and Variety

Indian consumers enjoy a wide range of poultry-based dishes, from traditional recipes to modern fast food. The availability of diverse poultry products that cater to different taste preferences is essential. Exposure to global cuisines through travel, media, and the internet has encouraged consumers to experiment with new poultry recipes and cooking styles at home.

Ethical and Environmental Concerns

A segment of consumers is becoming more concerned about animal welfare and is willing to pay a premium for products that are certified humane or ethically produced. Environmental

concerns are influencing purchasing decisions, with some consumers preferring poultry products from producers who adopt sustainable farming practices.

Nutritional and Health Considerations

Nutritional and health considerations are central to the evolving landscape of poultry consumption in India. As consumers become more health-conscious, their preferences are increasingly driven by the nutritional benefits of poultry, such as its high-quality protein content, low fat levels, and richness in essential vitamins and minerals. The industry is responding by offering a variety of health-focused products, including organic, antibiotic-free, and nutrient-enriched options. These trends highlight the importance of poultry as a vital component of a healthy diet in India's changing food landscape. As consumers become more health-conscious and better informed, their dietary choices, including poultry consumption, are significantly influenced by nutritional content and health benefits.

Protein Intake

Poultry, especially chicken, is recognised as an excellent source of high-quality protein, which is essential for muscle growth, repair, and overall body function. This makes it a preferred choice for many, including fitness enthusiasts and those looking to maintain a balanced diet. Chicken provides a complete amino acid profile, which is crucial for various bodily functions and contributes to its status as a valuable dietary component.

Low Fat Content

Compared to red meat, chicken is lower in saturated fat, making it a healthier option for those concerned about heart health and cholesterol levels. This aspect is particularly appealing to individuals aiming to reduce their intake of unhealthy fats. Skinless chicken breasts are particularly popular among health-conscious consumers due to their minimal fat content.

Vitamins and Minerals

Poultry is a good source of essential vitamins and minerals, including B vitamins (such as niacin, B6, and B12), phosphorus, selenium, and zinc. These nutrients play critical roles in energy metabolism, immune function, and overall health. While poultry is not as rich in iron as red meat, it still contributes to the dietary iron intake, which is important for preventing anaemia, especially in women and children.

Functional Foods and Nutrient-Enriched Products

There is a growing market for eggs enriched with Omega-3 fatty acids, which are beneficial for heart health and cognitive function. These eggs are produced by altering the diet of the hens. Some producers are offering poultry products fortified with additional vitamins and minerals to cater to the health-conscious segment of the market.

Health-Conscious Trends

With rising health awareness, there is an increased demand for organic poultry and products labelled as antibiotic-free. These options are perceived as healthier and safer, addressing concerns about antibiotic resistance and pesticide residues. Free-range and pasture-raised poultry products are gaining popularity among consumers who believe these options are not only more humane but also nutritionally superior, with higher levels of certain nutrients like Omega-3 fatty acids.

Weight Management and Special Diets

For individuals on low-calorie diets or those looking to manage their weight, poultry is often a staple due to its high protein and low-fat content, which helps in maintaining satiety and muscle mass. Poultry fits well into popular diets like keto and paleo, which emphasise high protein and low carbohydrate intake.

Disease Prevention and Management

For people with diabetes, managing carbohydrate intake is crucial. Poultry, being low in carbohydrates, is a suitable protein source that helps in blood sugar management. The lower saturated fat content in poultry compared to red meat makes it a better choice for individuals looking to maintain or improve heart health.

Consumer Education and Awareness

Increasingly, consumers are seeking detailed nutritional information about the products they purchase. Transparent labelling and information about the nutritional benefits of poultry products help consumers make informed choices. Government and non-governmental organisations are running campaigns to educate the public about the benefits of consuming lean proteins like poultry. These campaigns promote poultry as a nutritious and healthy component of a balanced diet.

Addressing Nutritional Deficiencies

In regions where protein-energy malnutrition is prevalent, poultry is promoted as an affordable and rich source of protein to help address this deficiency. Poultry products, including eggs, are encouraged to combat deficiencies in micronutrients such as iron and B vitamins, which are critical for overall health and development.

Regulatory Environment

The regulatory environment in India's poultry industry is comprehensive and dynamic, addressing multiple aspects from farm management to food safety and environmental sustainability. It aims to ensure that poultry products are safe, high-quality, and ethically produced while supporting industry growth and sustainability. Continuous updates and enforcement of these regulations are essential to adapt to changing consumer demands and global standards. As the poultry consumption landscape evolves, regulatory frameworks will play a pivotal role in shaping its future trajectory. The regulatory environment plays a crucial role in shaping the evolving landscape of poultry consumption in India. It impacts various aspects of production, safety, quality, and distribution of poultry products.

Food Safety and Standards Authority of India (FSSAI)

The FSSAI sets comprehensive standards for poultry products, including regulations on hygiene, handling, processing, and labelling. These standards ensure that poultry products are safe for consumption and of high quality. FSSAI mandates clear labelling of poultry products, which must include nutritional information, expiry dates, and details of any preservatives or additives used. This transparency helps consumers make informed choices.

Animal Husbandry Practices

Prevention of Cruelty to Animals act governs the humane treatment of poultry during farming, transportation, and slaughter. It sets guidelines for space, feeding, and care to prevent cruelty and ensure animal welfare. Regulations under the framework of Livestock Health and Disease Control aim to control and prevent livestock diseases, including avian influenza. They include vaccination protocols, quarantine measures, and monitoring systems to maintain flock health and biosecurity.

Environmental Regulations

Poultry farms must comply with environmental regulations that limit pollution from waste products. These norms are enforced by the Central Pollution Control Board (CPCB) and include guidelines on waste management and disposal. There are increasing regulatory incentives for adopting sustainable and eco-friendly farming practices, such as reduced antibiotic use and organic farming methods.

Antibiotic Use and Residue Control

The use of antibiotics in poultry farming is strictly regulated to prevent antibiotic resistance. The FSSAI and other bodies monitor antibiotic residues in poultry products to ensure they are within permissible limits. Regulations specify mandatory withdrawal periods before slaughter to ensure that antibiotic residues in meat are minimised. Compliance with these periods is crucial for food safety.

Import and Export Regulations

Imported poultry products must meet FSSAI standards and are subject to rigorous inspection to ensure they comply with safety and quality requirements. To promote exports, the government offers incentives and ensures that Indian poultry products meet international standards. Compliance with international standards such as those set by the Codex Alimentarius and specific country regulations (e.g., USDA for the United States) is mandatory.

Certification and Traceability

There are specific certifications for organic and free-range poultry, which require adherence to defined standards regarding feed, space, and animal welfare. These certifications are increasingly sought after by health-conscious consumers. Regulations are encouraging the adoption of traceability systems that allow tracking of poultry products from farm to fork. This ensures transparency and can help in quick response to any food safety issues.

Smallholder and Backyard Poultry Regulation

The government provides guidelines and support for smallholder and backyard poultry farming, focusing on improving productivity and ensuring biosecurity. Regulatory frameworks often include provisions for training and extension services to educate small farmers on best practices in poultry farming and disease management.

Infrastructure and Cold Chain Development

Regulations support the development of cold chain infrastructure to ensure the proper storage and transportation of poultry products, maintaining their quality and safety from farm to consumer. The government provides subsidies and incentives for building and upgrading cold chain logistics, which are critical for the poultry industry.

Market Regulation and Price Control

Regulatory frameworks aim to ensure fair market access for poultry farmers and prevent monopolistic practices. Price controls or support prices may be implemented to stabilise the market and protect farmers' interests. As online sales of poultry products increase, specific regulations govern e-commerce platforms to ensure they comply with food safety and quality standards.

Research and Development Support

The government supports R&D in poultry farming through various programs and institutions. This includes funding for research on disease control, feed efficiency, and sustainable practices. Regulatory frameworks encourage public-private partnerships to foster innovation and improve practices across the poultry industry.

Challenges and Opportunities

The poultry industry in India is at a crossroads, facing several challenges but also significant opportunities. Addressing issues such as disease management, supply chain inefficiencies, and environmental sustainability requires concerted efforts from industry stakeholders, government agencies, and technology providers. At the same time, the growing consumer demand for health-focused and convenient poultry products, coupled with advancements in technology and favourable government policies, presents immense growth potential. By navigating these challenges and leveraging the opportunities, the poultry industry in India can continue to evolve and thrive in the coming years. The evolving landscape of poultry consumption in India presents a mix of challenges and opportunities for the industry. These dynamics are shaped by various factors including economic growth, changing consumer preferences, technological advancements, and regulatory frameworks. Understanding these challenges and opportunities is crucial for stakeholders to navigate the complex market environment effectively.

Challenges

Disease Management

Poultry farms are vulnerable to outbreaks of diseases such as avian influenza, which can lead to significant economic losses and consumer fear. Managing these outbreaks requires robust biosecurity measures and effective vaccination programs. Overuse of antibiotics in poultry farming has led to rising concerns about antibiotic resistance. This poses a challenge in terms of both public health and regulatory compliance.

Supply Chain Issues

Inadequate cold chain infrastructure leads to challenges in maintaining the quality and safety of poultry products during transportation and storage. This is particularly problematic in rural areas with limited access to modern facilities. Poor logistics and transportation networks can result in delays and increased costs, impacting the timely delivery of fresh poultry products.

Environmental and Sustainability Concerns

Managing waste from poultry farms, including manure and processing waste, poses environmental challenges. Improper disposal can lead to pollution and health hazards. Poultry farming is resource-intensive, requiring significant amounts of water, feed, and energy. Sustainable farming practices are needed to mitigate environmental impact.

Regulatory Compliance

Navigating the complex regulatory environment can be challenging for poultry producers, especially smallholders. Compliance with food safety, animal welfare, and environmental regulations requires significant resources and expertise. Obtaining certifications for organic, free-range, or antibiotic-free poultry products can be expensive and time-consuming, posing a barrier for small and medium-sized enterprises.

Market Volatility

The poultry market is subject to price volatility due to factors such as feed cost variations, disease outbreaks, and changing consumer demand. This volatility can affect profitability and long-term planning. Intense competition from both domestic and international players can make it difficult for smaller producers to maintain market share.

Opportunities

Growing Consumer Demand

Increasing awareness about the health benefits of poultry as a lean protein source is driving demand. Consumers are looking for nutritious and high-quality poultry products. Rapid urbanisation and changing lifestyles are boosting demand for convenient, ready-to-cook, and ready-to-eat poultry products.

Technological Advancements

The adoption of precision farming technologies, such as automated feeding systems and climate-controlled housing, can improve efficiency and productivity in poultry farming. Implementing digital traceability solutions can enhance transparency and build consumer trust by providing information about the origin and quality of poultry products.

Market Expansion

There is significant untapped potential in rural markets where rising incomes are increasing demand for poultry products. Expanding into international markets presents a substantial opportunity for growth. Meeting international standards and leveraging trade agreements can help Indian poultry producers access new markets.

Product Diversification

Developing and marketing value-added products such as marinated, pre-cooked, and specialty poultry items can cater to diverse consumer preferences and increase profitability. There is growing demand for organic, free-range, and antibiotic-free poultry products. Producers can capitalise on this trend by obtaining relevant certifications and promoting these attributes.

Government Support

Government schemes and subsidies aimed at modernising poultry farming infrastructure and supporting smallholders can drive industry growth. Government and non-governmental organisations providing training and extension services can help farmers adopt best practices and improve productivity.

Sustainable Practices

Implementing sustainable and eco-friendly farming practices can address environmental concerns and appeal to environmentally conscious consumers. Converting poultry waste into biogas or other forms of renewable energy can provide an additional revenue stream and reduce environmental impact.

Impact of Global Trends on India

Global trends are significantly shaping the poultry consumption landscape in India, driving changes in production practices, consumer behaviour, regulatory frameworks, and market dynamics. By aligning with these trends, the Indian poultry industry can enhance its competitiveness, meet evolving consumer demands, and tap into new growth opportunities. Embracing technological advancements, sustainable practices, and ethical standards will be key to navigating the challenges and maximizing the potential presented by these global influences.

Health and Wellness Trends

The global shift towards healthier diets has led to a higher demand for lean protein sources like poultry in India. Consumers are increasingly aware of the health benefits associated with chicken and other poultry products. Inspired by global health trends, Indian consumers are showing a growing preference for organic and antibiotic-free poultry products. This has led to more farmers adopting organic farming practices and reducing antibiotic use.

Technological Advancements

Global advancements in precision farming technology, such as automated feeding systems, climate control in poultry houses, and health monitoring systems, are being adopted in India. These technologies improve efficiency, reduce costs, and enhance product quality. The global trend towards transparency and traceability in the food supply chain has influenced Indian poultry producers to adopt digital traceability solutions. Blockchain technology, for instance, helps in tracking the entire journey of poultry products from farm to fork, ensuring quality and safety.

Sustainability and Environmental Concerns

There is a growing global emphasis on sustainable and eco-friendly farming practices. In India, this has led to the adoption of practices such as waste-to-energy conversion, reducing carbon footprints, and better waste management in poultry farms. Global environmental concerns are influencing Indian regulations related to poultry farming. Stricter environmental guidelines are being implemented to ensure sustainable farming practices and reduce pollution.

Global Trade and Market Access

Global trade agreements and the demand for high-quality poultry products have opened up new export opportunities for Indian poultry producers. Compliance with international standards such as those set by the Codex Alimentarius and specific countries' import regulations is essential for tapping into these markets. The global poultry market is highly competitive. Indian producers must focus on improving productivity and efficiency to compete with international players in terms of pricing and quality.

Changing Consumer Preferences

Global culinary trends are influencing Indian consumer preferences, leading to increased demand for diverse poultry products such as turkey, duck, and processed chicken items like nuggets and sausages. The global trend towards convenience foods is evident in India as well, with a rising demand for ready-to-cook and ready-to-eat poultry products. This shift caters to urban consumers seeking quick and easy meal solutions.

Animal Welfare and Ethical Farming

Global awareness about animal welfare has led to higher standards and better practices in poultry farming in India. This includes more humane treatment of birds, better living conditions, and adherence to welfare guidelines. Ethical considerations are driving the demand for certified products such as free-range and pasture-raised poultry. Indian producers are increasingly seeking certifications that assure consumers about the humane treatment of animals.

Impact of Pandemics and Health Crises

Global health crises, such as avian influenza outbreaks and the COVID-19 pandemic, have underscored the importance of robust biosecurity measures in poultry farming. Indian farms are adopting stricter hygiene and disease prevention protocols to safeguard poultry health and ensure uninterrupted supply. Health crises have heightened consumer awareness about food safety. Ensuring the safety of poultry products through stringent quality checks and transparent practices has become crucial to maintaining consumer trust.

Economic Globalisation

Global economic trends have led to increased investment in poultry farming infrastructure in India. This includes advancements in cold chain logistics, processing facilities, and distribution networks. Indian poultry producers are forming partnerships with global companies to leverage expertise, technology, and best practices. These collaborations help improve efficiency, quality, and competitiveness in the global market.

Future Prospects

The future prospects of poultry consumption in India look promising, driven by several factors including economic growth, urbanisation, changing dietary preferences, and advancements in production and supply chain technologies.

Continued Growth in Demand

Rising Income Levels

As India's middle class continues to grow, disposable incomes increase, leading to higher consumption of protein-rich foods like poultry. Urban areas are experiencing rapid growth, leading to changes in dietary habits with more people opting for convenient and protein-rich foods such as chicken.

Health and Nutrition Trends

Increased Health Awareness

With rising health consciousness, consumers are likely to continue favouring poultry over red meat due to its lower fat content and high protein value. The market for nutrient-enriched poultry products, such as Omega-3 enriched eggs and vitamin-fortified chicken, is expected to grow as consumers seek health benefits from their diet.

Technological Advancements

Precision Farming and Automation

The adoption of precision farming techniques, including automated feeding and climate control systems, will enhance productivity and reduce costs. Use of big data and analytics will help optimize operations, improve disease management, and enhance supply chain efficiency.

Digital Traceability

Increasing implementation of blockchain for traceability will ensure food safety and build consumer trust by providing transparency about the origin and handling of poultry products.

Sustainable and Ethical Practices

Eco-Friendly Farming

There will be a greater emphasis on sustainable farming practices to reduce environmental impact, such as improved waste management and the use of renewable energy sources. Demand for organic and free-range poultry is expected to rise, driven by consumer awareness of animal welfare and environmental sustainability.

Market Expansion

Domestic Market

There is significant growth potential in rural markets where poultry consumption is currently lower but increasing due to rising incomes and changing dietary patterns. Producers will cater to regional tastes and preferences, developing products that align with local culinary traditions.

International Market

With improvements in quality standards and compliance with international regulations, Indian poultry products will find increasing acceptance in global markets. Leveraging trade agreements and partnerships will open up new export opportunities for Indian poultry producers.

Product Diversification

The segment for ready-to-cook and ready-to-eat poultry products is likely to expand, catering to the convenience needs of urban consumers. Growth in processed poultry products such as nuggets, sausages, and deli meats will continue as consumers seek variety and convenience.

Regulatory Environment

Stricter enforcement of food safety standards by the FSSAI and other regulatory bodies will ensure the quality and safety of poultry products. Enhanced regulations on animal welfare will lead to better farming practices and improved consumer perceptions of poultry products.

Consumer Education

Increased efforts to educate consumers about the nutritional benefits of poultry will drive higher consumption. Campaigns to inform consumers about safe handling and cooking practices will enhance trust and consumption of poultry products.

Economic and Policy Support

Continued government support through subsidies and incentives for modernising poultry farming infrastructure will boost productivity and growth. Extension services and training programs for farmers will improve practices and efficiency in the poultry sector. The future landscape of poultry consumption in India is poised for robust growth, supported by favourable economic conditions, health and nutrition trends, technological advancements, and evolving consumer preferences. By addressing challenges such as disease management, environmental sustainability, and regulatory compliance, the industry can capitalise on these opportunities. Innovations in production, supply chain management, and product offerings will be crucial in meeting the increasing demand and maintaining the growth trajectory of the poultry sector in India.

Avimatrix®

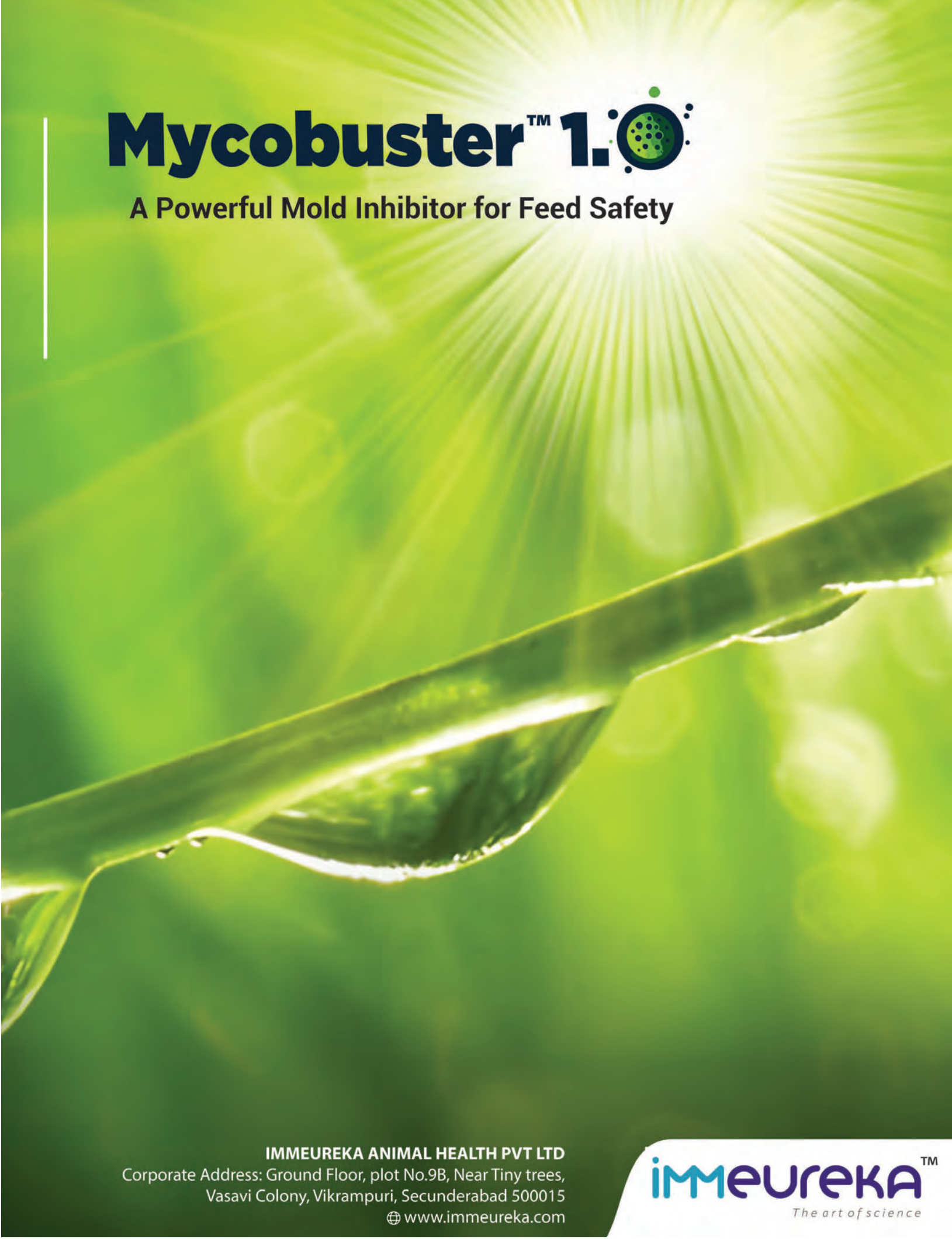
AVIMATRIX® FEED SOLUTION IS MADE OF MORE

A stable lower gut is powerful support for your birds' health. AVIMATRIX® Feed Solution employs a unique blend of organic acids to stabilize gut microflora and improve growth and feed conversion. Plus, our Premium Blend Technology uses intelligent nutrition to ensure every molecule is delivered right where it makes the greatest impact. Produce birds that are made of more at **novusint.com**.

NOVUS
Made of More™

Novus Animal Nutrition (India) Private Limited | 2nd Floor, Industrial site No.46, KHB Industrial Area Yelahanka New Town | Bengaluru 560064 | Karnataka. India | +91 80 6768 2323


SLOW
AND
SUSTAINED
RELEASE



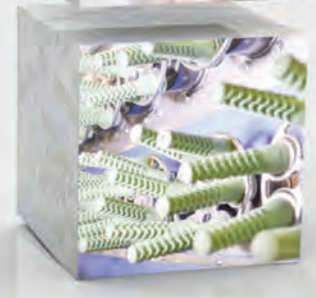
IMMEUREKA ANIMAL HEALTH PVT LTD
Corporate Address: Ground Floor, plot No.9B, Near Tiny trees,
Vasavi Colony, Vikrampuri, Secunderabad 500015
www.immeureka.com

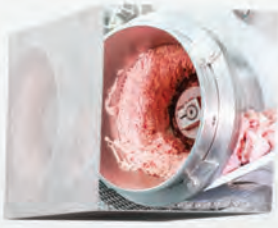
immeureka™
The art of science

BAADER

Complete Poultry Processing Solutions

Scale Your Business to Grow





BAADER is a leading global provider of complete poultry processing solutions, tailored to your capacity and processing needs.

Whether you require small-scale solutions or high-speed processing factories, we collaborate with you to design a production flow that aligns with your present and future requirements, empowering your business growth.

Explore our website: www.baader.com

Or contact the local
BAADER Asia office on
+65 9127 0244
ba-asia@baader.com

Article

Embark on a Transformative Poultry Processing Journey with BAADER

Kate Jørgensen
Head of Marketing, Poultry
BAADER

Over the decades, poultry meat has become increasingly popular among consumers worldwide. This popularity shows no signs of waning, with global consumption and production rising steadily. The reasons for this trend are manifold. Poultry meat is not only a high-quality source of protein, but it also tastes good, is easy to prepare in various ways, and is permissible under most religious dietary laws. The lifestyle changes of recent decades, with a focus on fast food and high convenience for busy families, have made chicken products even more popular.

In poultry processing, convenience starts with accurate and flexible cut-up systems. Picture Courtesy: BAADER

The Necessity of Inline Poultry Processing

Poultry processors have capitalised on this popularity to ramp up production and develop poultry products that cater to the growing demand for convenience. Inline poultry processing has become essential for running a profitable business, with line speeds continually increasing to meet the rising demand. Inline production offers numerous advantages. It minimises human contact with the product, significantly reducing the risk of contamination. Higher production throughputs are achieved through automation and streamlined processes. With advanced machinery taking over many tasks traditionally performed by humans, the dependency on manual labour decreases. Additionally, inline processing ensures consistency in product quality and uniformity, which is crucial for meeting customer expectations.

BAADER processing solutions are designed to meet each processor's specific requirements, offering the highest degree of processing reliability. Picture Courtesy: BAADER

Investing in Poultry Processing

Many farmers are considering investing in inline poultry processing as a logical vertical step to diversify their businesses. By controlling the raw material input to the slaughterhouse, farmers can ensure the quality and consistency of their products.

Investing in poultry processing can also open new revenue streams for farmers over time. By processing their poultry, farmers can move up the value chain, producing packaged and branded poultry products that can be sold directly to consumers or through retail outlets. However, transitioning from farming to processing is extensive and requires careful planning and execution. The investment can be phased, with processing speed and automation gradually increasing as the business grows.

Compact 'Plug and Process' Solution

To best support farmers and industry players looking to start a small-scale poultry processing plant, BAADER offers the Compact Plant, a 'plug and process' solution that is easy to set up. This solution includes comfortable shackling, electrical stunning, scalding, picking, manual evisceration, and bird washing along the overhead conveyor. The delivery of the Compact Plant is designed to simplify startup and minimise customer supplies. The complete system is transported in a 40-foot high cube container, shipped fully assembled and prepared for connection to the main electric, water, and gas/oil supplies, with all internal hoses and electrical cables pre-installed in cable trays. Starting poultry production doesn't get any easier than this.

The Compact Plant from BAADER offers a straightforward entry into poultry processing with its 'plug and process' slaughter and evisceration solution.
Picture Courtesy: BAADER

Customised Solutions for Higher Line Speeds

Higher line speeds require customised solutions to best fit production requirements. The extensive BAADER portfolio is designed to meet these demands, allowing for the creation of tailored solutions that perfectly align with specific needs. Our modular designs enable continuous business growth, providing the flexibility to scale operations whenever required.

Working with BAADER ensures receiving advice based on a thorough analysis of farm characteristics, transportation facilities, and production requirements. Whether starting a first processing plant or expanding existing production, comprehensive guidance is provided on all aspects of poultry processing. This includes live bird handling, bleeding, scalding and picking times, and the appropriate levels of automation. Our expert team ensures that every solution is tailored to meet specific needs, optimising efficiency and product quality.

BAADER's scalding and picking solutions are modular, allowing for easy expansion as processing needs grow. *Picture Courtesy: BAADER*

Adjustability to Process Varying Flock Sizes

Poultry processing plants face challenges due to the natural variation in shape and weight among chickens. To effectively manage this variability, processing plants require adaptable systems that can handle different bird sizes efficiently. The evisceration process is critical in poultry processing, serving dual purposes of ensuring high-quality bird production and harvesting giblets for further processing and packaging.

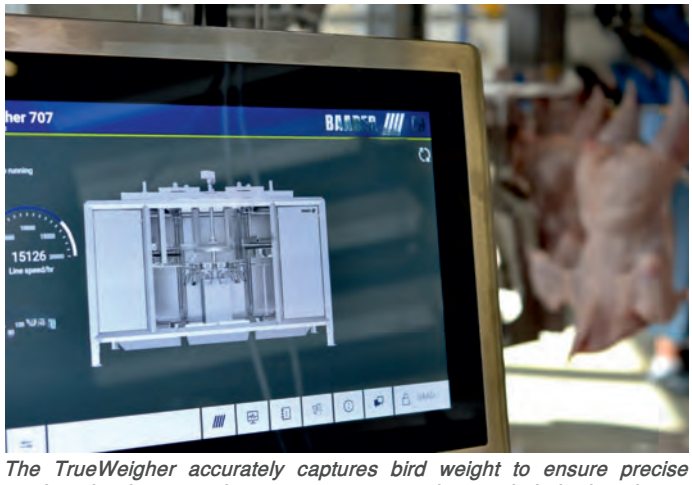
Automatic evisceration systems must be highly flexible, with machines adjustable to accommodate varying flock sizes and meet local inspection standards. The giblet handling process must manage all edible parts delicately yet efficiently. BAADER offers a diverse range of evisceration and giblet handling solutions tailored to meet the specific needs of every market. Whether placing the viscera package on the bird's back or automating the organ harvesting process, BAADER ensures precise and efficient poultry processing solutions for all requirements.

Evisceration equipment should be adjustable to fit the flock size being processed to protect the product quality and minimise contamination.
Picture Courtesy: BAADER

Flexibility to Produce a Variety of Products

When designing a poultry processing plant, it is crucial to incorporate flexibility to accommodate variations in incoming products and meet diverse market demands. The processing equipment must be highly adjustable to effectively handle different products. Stunning parameters, the killing machine, and evisceration machines must all be easily adjustable to fit varying flock sizes; otherwise, animal welfare and product quality will be compromised.

To optimise production, the weight and quality of each incoming bird are crucial for fulfilling sales orders and delivering the promised quality. Weight can be measured using simple inline weighing bridges, but to minimise give-away in whole bird packing, the advanced TrueWeigher is recommended. The TrueWeigher employs a static weighing principle to achieve the highest in-line weighing accuracy after water chilling, enabling processors to allocate whole products to the most suitable downstream destination. Accuracy is essential for correct decision-making.

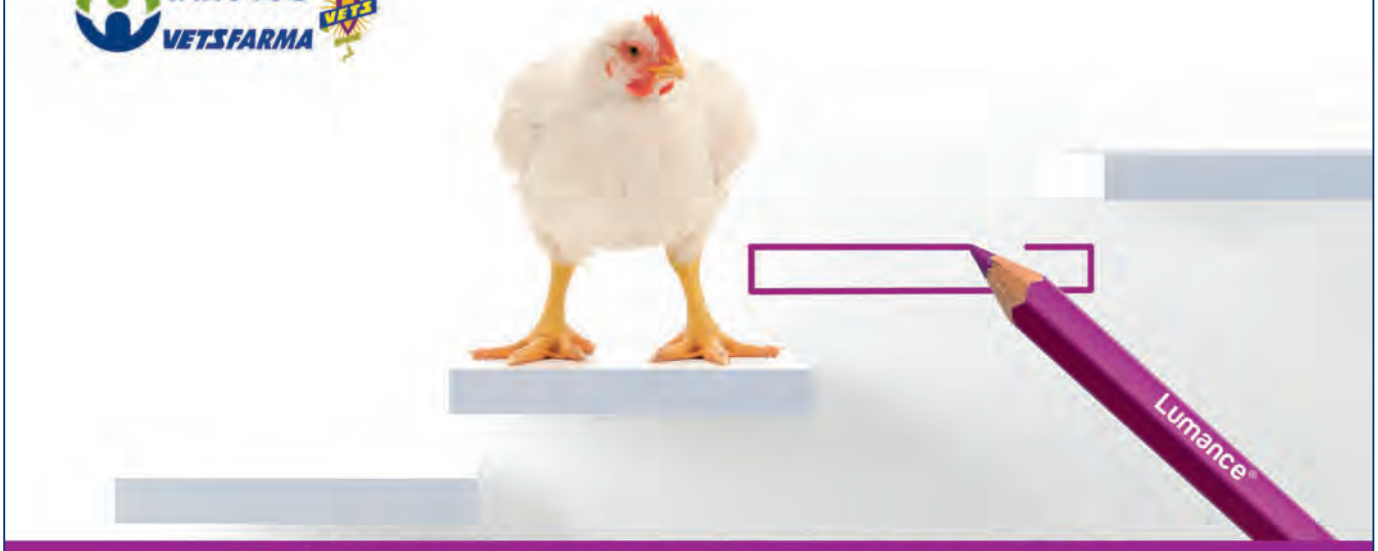


The TrueWeigher accurately captures bird weight to ensure precise product distribution and minimise give-away during whole bird packing.
Picture Courtesy: BAADER

End-to-End Solutions That Add Value to the Final Product

Whether a processor aims to produce whole chickens or enhance the product's value through portioning, skinning, or deboning, BAADER offers tailored solutions to meet these needs. BAADER provides an array of equipment for weighing, cutting, grading, and packing, enabling even small-scale processors to efficiently meet the demands of their local markets. Our tailored solutions and modular approach ensure that your processing plant can adapt and expand seamlessly, supporting your business as it grows and evolves.

innovad VETSFARMA

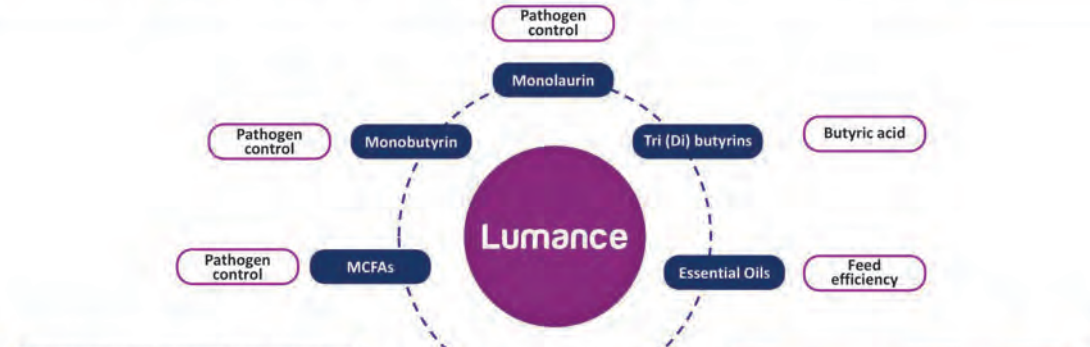


Bridge the performance gap

Lumance

Unleash the potential hidden by chronic gut inflammation

Lumance Holistic & Sybergistic mode of action



REINFORCES INTESTINAL INTEGRITY

BALANCES INTESTINAL MICROBIOTA

REDUCES INFLAMMATION

PROTECTS AGAINST ROS

Anti-inflammatory and Optimal Intestinal Protection

Article

The Crucial Role of Life Skills Training in the Poultry Sector

Dr. G. Gopal Reddy
Life Coach – P3
Bengaluru

Introduction

Human beings are full of potentials which manifests in our ability to do exemplary things. Life skills help in realisation and utilisation of our potentials. Sometimes, with all the capacities, goals and determinations, we fail in realising our dreams because of the hindrances created by poor life-skills.

The World Health Organisation defines life-skills as, "abilities for adaptive and positive behaviour that enable individuals to deal effectively with the demands and challenges of everyday life." Thus, life skills are basic skills that help individuals in leading a meaningful life and better adjustment in the society. They involve myriad of positive aspects of our life such as the values and ethics we possess, the proactive attitude that we keep towards the society we live in and various interpersonal and psychosocial skills that we have.

Core Life-skills

The World Health Organisation has proposed a set of life skills. These are:

- Self-awareness
- Empathy
- Creative thinking
- Critical thinking
- Problem solving
- Decision making
- Coping with stress
- Coping with emotions
- Healthy interpersonal relationship
- Effective communications

Going by the list of these skills, it is obvious that they are global in nature, encompassing both interpersonal and intrapersonal skills. These skills are usually clubbed into three major categories:

- Thinking skills (critical thinking, creative thinking, problem solving, decision making)
- Personal skills (self-awareness, self-management)
- Interpersonal skills (communication skills, empathy, cooperation etc.)

In today's rapidly evolving world, life skills training has become an essential component of personal and professional development. This is particularly true in the poultry sector, which plays a pivotal role in global food security and economic stability. As the poultry industry faces increasing challenges, life skills training is not just a tool for individual growth but a vital asset for sustainable industry development.

The Poultry Sector: A Complex Ecosystem

The poultry sector is a significant contributor to global nutrition, providing a critical source of protein through meat and eggs. It also plays a crucial role in the livelihoods of millions of people, especially in developing countries where small-scale poultry farming is often a primary source of income.

However, the sector faces numerous challenges:

1. **Disease Outbreaks:** Diseases such as avian influenza can devastate poultry populations, leading to severe economic losses and food shortages
2. **Market Volatility:** Poultry farmers must navigate fluctuating prices of feed, livestock, and products, which can impact profitability
3. **Environmental Sustainability:** The industry must balance production with environmental concerns, including waste management and resource use
4. **Technological Advancements:** Rapid changes in technology require producers to continuously upgrade their skills and knowledge

In this context, life skills training becomes a critical asset for individuals and communities involved in poultry farming.

The Role of Life Skills Training in the Poultry Sector

Enhancing Problem-Solving and Decision-Making

Poultry farming involves complex decision-making, from choosing

the right breed to managing feed and health care. Life skills training in critical thinking and problem-solving can help farmers make informed decisions, reduce risks, and increase productivity. For example, a farmer trained in critical thinking is better equipped to evaluate the cost-effectiveness of different feed options or to develop strategies for disease prevention and control.

Improving Communication and Collaboration

Effective communication is essential in the poultry sector, where producers need to interact with suppliers, veterinarians, and customers. Training in communication skills can help them build better relationships, negotiate more effectively, and market their products more successfully. Moreover, collaboration and teamwork are crucial for community-based poultry projects, where shared resources and collective action can lead to better outcomes.

Promoting Self-Management and Resilience

The poultry sector is subject to unpredictable challenges, from disease outbreaks to market fluctuations. Life skills training in self-management helps individuals manage stress, stay organised, and maintain a positive outlook. This resilience is critical in navigating the ups and downs of poultry farming, ensuring that farmers can recover from setbacks and continue to thrive.

Encouraging Adaptability and Lifelong Learning

As technology and market demands evolve, adaptability becomes a key asset for poultry farmers. Life skills training encourages a mindset of lifelong learning and flexibility, enabling farmers to adopt new technologies, practices, and business models. This adaptability is essential for staying competitive and sustainable in a rapidly changing industry.

Fostering Entrepreneurial Mindset

Life skills training can also foster an entrepreneurial mindset. Skills such as risk assessment, financial management, and innovation are crucial for developing new business opportunities and expanding into value-added products, such as processed poultry or organic eggs. This entrepreneurial spirit can lead to greater economic resilience and growth in the poultry sector.

Case Study: Life Skills Training in Action

A notable example of the impact of life skills training in the poultry sector can be seen in a program implemented in rural Uganda. The program aimed to enhance the livelihoods of small-scale poultry farmers by providing training in critical life skills alongside technical poultry management.

Participants received training in problem-solving, communication, and financial management, which complemented their technical skills in poultry farming. As a result, farmers reported significant improvements in productivity and profitability. They were able to better manage poultry diseases, negotiate better prices for their products, and diversify their income sources by exploring new market opportunities.

One farmer, Grace, shared her experience: "Before the training, I struggled to manage my poultry business and often faced losses due to disease outbreaks and poor market prices. The life skills training helped me learn how to plan better, communicate effectively with buyers, and make informed decisions. My business is now thriving, and I am able to support my family and contribute to my community."

Challenges and Opportunities

While the benefits of life skills training are clear, there are challenges to implementing such programs in the poultry sector. These include:

1. **Access to Training:** Many small-scale farmers, particularly in rural areas, have limited access to training resources and opportunities
2. **Cultural Barriers:** In some communities, traditional practices and beliefs may hinder the adoption of new skills and practices
3. **Resource Constraints:** Effective training programs require investment in resources such as trainers, materials, and facilities

Despite these challenges, there are significant opportunities to expand life skills training in the poultry sector. Partnerships between government agencies, non-governmental organisations, and private sector players can help to develop and deliver comprehensive training programs. Additionally, leveraging technology, such as online courses and mobile learning platforms, can make training more accessible and scalable.

Conclusion

Life skills training is a powerful tool that can transform the poultry sector, enhancing the capacity of individuals and communities to navigate challenges, seize opportunities, and achieve sustainable growth. By equipping poultry farmers with critical skills such as problem-solving, communication, and adaptability, we can foster a more resilient, innovative, and prosperous poultry industry. As we look to the future, investing in life skills training will be key to ensuring the continued vitality and success of the poultry sector worldwide.

Dr. G. Gopal Reddy can be reached at gopalreddy374@gmail.com

Venworld®
THE BEST IN ANIMAL HEALTHCARE

Emulso-V®

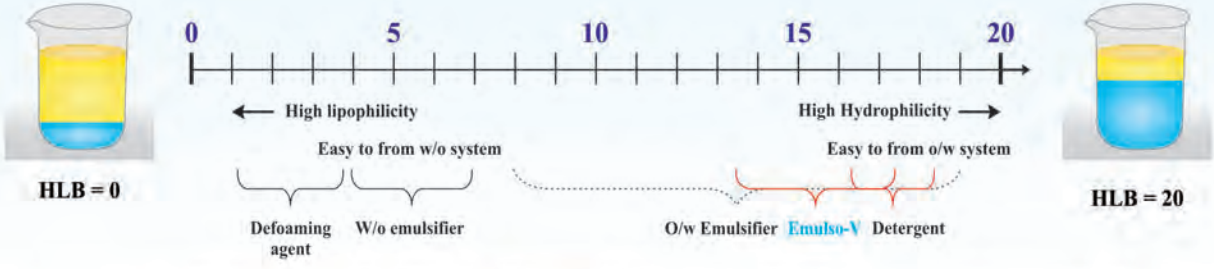
A Unique Nutritional Emulsifier

Unique Booster for Digestion and Absorption of Fat

- **Emulso - V** is the key solution for oil / fat emulsification and it's absorption.
- **Emulso - V** promotes energy utilization of oils / fats
- **Emulso - V** possesses high HLB value hence capable of emulsifying fat / oil in water (O/W).
- **Emulso - V** improves FCR
- **Emulso - V** has good Bio-Surfactant activity and synergistically act with bile salts.

Composition:

- Glyceryl Polyethylene Glycol Ricinoleate
- Blend of Phytogenic Hydrophilic Emulsifiers

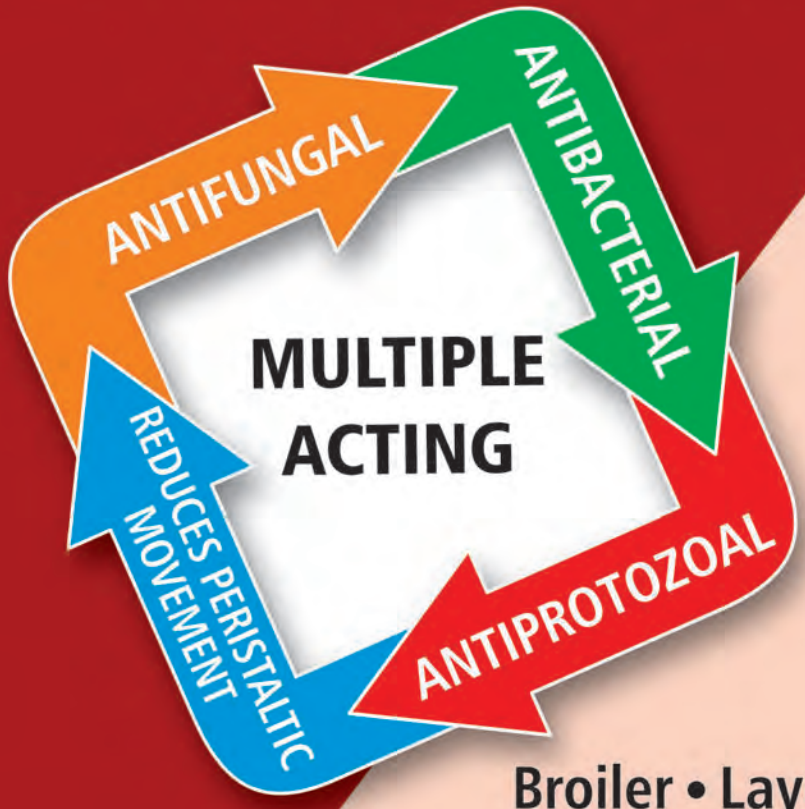


For further information please contact :
VENKY'S (INDIA) LIMITED
ANIMAL HEALTH PRODUCTS DIVISION
An ISO 9001 Certified Company
"Venkateshwara House", S.No.: 114/A/2, Pune - Sinhagad Road, Pune - 411 030 (India)
Tel : +91- 20-24251803 Fax : +91-20-24251060 / 24251077 www.venkys.com e-mail : ahp@venkys.com

Ayunol 60%

(Halquinol)

Non Antibiotic Performance Enhancer



Broiler • Layer • Breeder

- For total gut health
- Better digestion and absorption of nutrients
- Better performance

AYUGEN® PHARMA PVT. LTD.
(An ISO 22000:2018 & GMP Certified Company)

Corporate Office: Ayugen Pharma Pvt. Ltd.
Aranya, 202, 203, Aamachi Colony, Behind Venky's Express,
Bavdhan Pashan Road, Pune - 411021.
Contact No. +91 7387006250
E-mail : info@ayugenpharma.com

Article

Black Soldier Fly Larvae– A Sustainable Alternative Protein

Dr. S.S. Pattabhirama
Group Nutritionist
Nanda Group

With increasing demand for animal feeds globally, it is important to explore sustainable alternative protein sources to soybean meal and fish meal. Insect protein is one of the most promising feed ingredients. Among these, Black Soldier Fly Larvae (BSFL) is getting popular very fast. BSFL is rich in both protein (about 45%) and fat (about 25-30%) with very good amino acid as well as fatty acid profile.

Black Soldier Fly (BSF) is a black coloured, harmless, non-poisonous insect which naturally exists in the environment. The eggs of BSF hatch and develop into fully grown mature larvae in just 14-18 days. These BSFL are voracious eaters, grow very fast feeding on wastes like agriculture by-products, vegetables, fruits, wet wastes like kitchen/restaurant waste. They are the efficient converters of waste into high quality, protein rich ingredient. The eco-friendly growing of BSFL is an important sustainable solution for waste disposal especially in the growing urban areas.

Fully Grown Adult Larvae

An adult fly lays an average of 500-900 eggs in her life cycle (5–8 days) which hatches in 3-4 days. These larvae need reasonably good feed initially for 3-4 days and then can be fed on

Life Cycle of Black Soldier Fly

Adult
1 to 2 Weeks
Females lay about 600-800 eggs.

Eggs
4 Days
The eggs hatch after four days once they have been laid in a dry, safe space.

Larvae
2 Weeks
The larvae consume food waste with amazing speed, converting it into body mass.

Pupae
1 Week
The larvae stop eating and turning to pupae. Waiting to emerge become flies.

any agricultural by-products or food scraps. The conversion ratio is approx. 4:1, the larvae attain full size in about 14-18 days. These mature larvae are harvested by separating from frass by sieving, washed with hot water and then dried. Wet larvae to dry larvae yield is about 30%. We can use them as whole larvae or in powdered form in feed formulations. It can also be defatted where protein goes up further (up to 60%) in the meal and the oil thus obtained is very rich in medium chain fatty acids which has many other applications in industries such as pharmaceuticals and biodiesel. The frass thus obtained serves as a very good organic fertiliser.

There are more than 100 companies producing BSFL globally out of which about 60% are located in Europe. Major Asian countries producing BSFL are Thailand, Malaysia and Indonesia.

Comparative Nutritive Value of Different Ingredients

Nutrient%	SBM	FM	MBM	BSFL
Crude protein	45-47	55-65	42-45	40-42
ME.K.Cal/Kg	2300-2400	2200	2200	4200
Crude fat	1	8-10	5-10	28-32
Crude fibre	7	3-4	3	4-5
Lysine	2.9	4.5	2.3	3.1
Methionine	0.6	1.8	0.55	4.4
M+C	1.28	2.4	0.91	4.8
Threonine	1.8	2.6	1.3	0.95
Valine	2.2	3.1	1.9	2.25
Arginine	3.5	3.5	3.2	1.5
Triptophan	0.6	0.7	0.25	0,65
Leucine	3.5	4.5	2.5	0.6
Isoleucine	2.1	2.6	1.2	

India too has a few startups.

BSFL has many other advantages apart from protein, fat and ME.

Other functional benefits are: Palatable, highly digestible, antimicrobial and antioxidant property, prebiotic effect. It is also free from mycotoxins and heavy metals.

Antimicrobial peptides (AMPs) and Lauric acid: Help develop resistance against pathogens, support probiotic proliferation in gut

Chitin Fiber: Enhances digestion, has prebiotic effect. It is a source of Glucosamine which is essential for bone and joint health, helps calcium accumulation and has antimicrobial property

Medium chain fatty acids(MCFs): Play a role in various metabolic processes, pathogen control, gut health and immune response.

Recommended Usage Levels in Various Feeds

Feed	Usage Level
Poultry	5%
Aqua	5%
Swine	5%
Pet Foods	20%

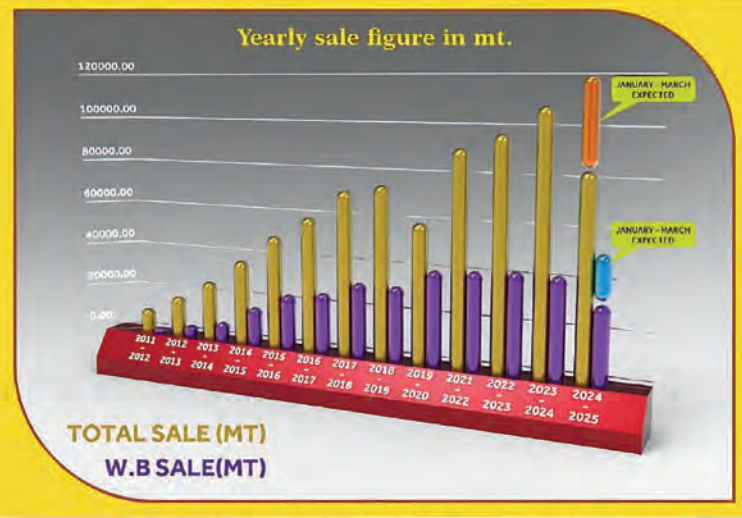
Conclusion

BSFL is a novel protein-rich ingredient for poultry, aqua, pig and pet foods which promotes sustainable animal agriculture, reducing the carbon foot print. There are challenges in scaling up the productions which, if addressed, can make BSFL affordable.

Ref : gauri@nutrition-technologies.com

Bhandari®
Group of Companies

- One of the best feed conversions (FCR) in the region
- Most consistent quality year after year
- We are committed to produce best appearing birds
- One of the best colour and texture of the birds
- High quality packaging
- 100% effort for prompt and fast despatches
- Our feeds ensures least expenses on medicine
- We provide effective technical support to control diseases
- We arrange training programs for farmers to upgrade farm management



BHANDARI FEEDS PRIVATE LIMITED
Regd. Office : Bhandari Enclave, City Crown 2nd Floor, Malviya Marg, Hazaribag, Jharkhand, Pin - 825301
Corporate Office : ABACUS, Plot No. 11E/23, New Town Kolkata - 700156
Mobile : +91 9874118222, +91 9771429694
E-mail : bhandarifeeds@gmail.com, **Website :** www.bhandarigroups.in

ROSSARI
making you more competitive

PROTOXY FC ADVANCE

New paradigm to protein world

Minimum Quantity, Maximum Results

Multi-protease with the catalytic triad of Serine-aspartate protease priming cleaving ability with Maximum Matrix Nutrition

Best suited for pellet feed production

- Speeds-up protein digestion
- Highly efficient performance on pellet feed
- Optimises bioavailability of proteins & peptides
- Maximises carcass yield ROI
- Targets ANF's in protein meals & maintains gut integrity

ROSSARI BIOTECH LIMITED
(An ISO 9001:2015 & 14001:2015 & GMP Certified Company)
201 A - B, 2nd Floor, Akruti Corporate Park, L.B.S Marg, Next to GE Gardens, Kanjurmarg (West), Mumbai-400 078, India.
info@rossari.com +91 22 6123 3800 www.rossari.com

FAMIbs

Article

Food and Nutrition Security: A Hazy Landscape

"Your problems pale in comparison with those of the millions of people in the world who do not have enough to eat," aptly said the world renowned athlete Michael Johnson; and there are more than 860 million people in the world currently suffering from hunger, one in every nine people on this planet. Another two billion, a staggering figure from all counts, are afflicted by different forms of malnutrition.

The global population is projected to reach upto 10 billion by mid-century and peak at more than 11 billion by the end of it. Can we sustainably feed a world population of 11 billion? And how? At the core is the question whether today's agriculture and food systems are capable of meeting the needs of this burgeoning population? Can we achieve the required production increases, even as the pressures on already scarce land and water resources and the negative impacts of climate change intensify? The consensus amongst the experts is that the current systems are capable of producing enough food, but to do so in an inclusive and sustainable manner is a challenge which will require a significant shift in approach and structural transformation. This triggers further questions.

Can agriculture meet the unprecedented demand for food in ways that ensure that the use of the natural resource base is sustainable? Can the world secure access to adequate food for all, especially in the low-income regions where population growth is the most accelerated? Can agricultural sectors and rural economies be transformed in ways that provide more and gainful employment especially for youth and women? Can agriculture be made attractive enough to help stem mass migration to cities with limited labour absorption capacity?

Can public policies address the burden of malnutrition by promoting food systems that give affordable access to food for all, eliminate micronutrient deficiencies and redress the overconsumption of food? Can the huge problem of food losses and waste, estimated at as much as one-third of the total food produced for human consumption, be tackled? Can national and global regulatory structures protect producers and consumers against the increasing monopoly power of large, multinational, vertically integrated agro-industrial enterprises? Can the impacts of conflicts and natural disasters, both major disruptors of food security and the causes of vast migrations of people, be contained and prevented?

While we should surely attempt an answer to these critical and daunting questions, let us assess where we stand and how the scenario of food and nutrition is evolving in the world.

Goal 2 of the Sustainable Development Goals (SDGs) proclaims, "End hunger, achieve food security and improved nutrition and promote sustainable agriculture." The proclamation is further elaborated as follows: 2.1 "By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round; and 2.2 "By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons."

The United Nations' Food and Agriculture Organisation (FAO) in its latest report on 'The State of Food and Nutrition in the World' admits that "six years from 2030, hunger and food insecurity trends are not yet moving in the right direction to end hunger and food insecurity" by the targeted year i.e. 2030. The indicators of progress towards global nutrition targets similarly show that "the world is not on track to eliminate all forms of malnutrition" and goes on to concede that "billions of people still lack access to nutritious, safe and sufficient food." The report does express optimism by stating that "nevertheless, progress in many countries provides hope of the possibility of getting back on track towards hunger and malnutrition eradication." The hope comes with a disclaimer which advises that "implementing the policies, investments and legislation needed to revert the current trends of hunger, food insecurity and malnutrition requires proper financing for food security and nutrition. Despite a broad agreement on the urgent need to increase financing for food security and nutrition, the same cannot be said for a common understanding regarding how this financing should be defined and tracked." The report does provide a definition of financing for food security and nutrition as also some guidance for its implementation. There are recommendations too regarding the efficient use of innovative financing tools and reforms to the food security and nutrition financing architecture. Beyond this academic exercise, there is little to actually provide a roadmap to eliminating hunger and malnutrition, if not by 2030, at least at a nearby date thereafter.

In fact, the assessment of global hunger in 2023, measured by the prevalence of undernourishment in accordance with the SDG indicators, reveals a continuing lack of progress towards the goal of Zero Hunger. The situation is not just worrying, it is alarming. At 20.4% Africa is the region with the largest percentage of the population facing hunger, followed by 8.1 percent in Asia. However, Asia is home to the largest number, 384.5 million, nearly half of the populace facing hunger in the world. Updated projections of the FAO show that 582 million people will be chronically undernourished in 2030, pointing to the immense challenge of achieving the goal of Zero Hunger. This is about 130 million more undernourished people than in a scenario that reflected the world economy before the COVID-19 pandemic. Going beyond hunger, the global prevalence of moderate or severe food insecurity also remains far above pre-pandemic levels, with little change in four years, after the sharp increase from 2019 to 2020 during the pandemic. In 2023, an estimated 28.9 percent of the global population, i.e. 2.33 billion people, were moderately or severely food insecure, meaning they did not have regular access to adequate food. These estimates include 10.7 percent of the population or more than 864 million people who were severely food insecure, meaning they had run out of food at times during the year and, at worst, gone an entire day or more without eating. The prevalence of severe food insecurity at the global level rose from 9.1 percent in 2019 to 10.6 percent in 2020 and has remained "stubbornly unchanged" since then.

Turning to the trends for the global nutrition targets outlined in the SDGs, FAO report confirms that "virtually no progress has been made for low birth weight among newborns." A prevalence of 15 percent in 2012 was reduced, insignificantly, to 14.7 percent in 2020, and now it is projected that 14.2 percent of newborns will have low birthweight in 2030, falling woefully short of the 2030 global target of a reduction of 30 percent. Such a status quo which defies the efforts of the entire global community calls for serious introspection.

Among children under five years of age, the global stunting prevalence declined from 26.3 percent in 2012 to 22.3 percent in 2022. Sadly, it is projected that still 19.5 percent of all children under five will be stunted in 2030. The global wasting prevalence declined from 7.5 percent in 2012 to 6.8 percent in 2022. With 6.2 percent of children under five projected to be wasted in 2030, more than double the 3 percent global target, the world remains off track for this indicator also. The global prevalence of overweight has stagnated and stood at 5.6 percent in 2022. By 2030, 5.7 percent of children under five are projected to be overweight, almost double the 2030 global target of 3 percent.

The assessment of global hunger in 2023, measured by the prevalence of undernourishment in accordance with the SDG indicators, reveals a continuing lack of progress towards the goal of Zero Hunger

Globally, the prevalence of anaemia in women aged 15 to 49 years increased from 28.5 percent in 2012 to 29.9 percent in 2019 and is projected to reach 32.3 percent by 2030, far from the 2030 target of a 50 percent reduction. This is a real cause for worry. New estimates of adult obesity show a steady increase over the last decade, from 12.1 percent in 2012 to 15.8 percent in 2022. More than 1.2 billion obese adults are projected to populate our planet in 2030.

Most countries are off track than on track for most of the 2030 global nutrition targets, concludes the FAO.

The double burden of malnutrition, the co-existence of undernutrition together with overweight and obesity, has surged globally across all age groups; a sure indicator of stark disparity in the food and nutrition status of people in different zones of economic development. Investment in the sector is expected to address these burning issues too rather than focusing merely on profitability.

"Food is national security. Food is economy. It is employment, energy, history. Food is everything," so has been wisely said.

IPR Espresso

INTERNATIONAL

Poultry Demand Approaching Historic Level

According to Rabobank's Global Poultry Quarterly Q3, 2024, more normal conditions are what much of the global poultry industry is entering, thanks to a combination of rising poultry meat consumption and greater discipline in supply growth.

The bank forecasts that consumption should grow by 1.5-2% this year close to historic levels, after four years of disruption. However, not everything will be easy for poultry producers, and it cautions that trade will become more competitive due to altered trade flows, and that feed prices are on the rise.

Staying with the positives, higher beef and pork prices are helping to make chicken meat more competitive and more attractive for consumers. Beef and pork prices have risen by 4% and 5% respectively, but chicken prices are up by only 2%. That chicken continues to be the most economical choice in not the only reason to be cheerful; demand for processed products has also been rising is some regions.

That consumers want more and higher value poultry meat bodes well for producers, but demand, of course, is not the whole story. Rabobank points out that after two years of falling feed prices, the cost of feed is once again rising. This, it says, is due to weaker than expected harvest predictions for the Americas and Europe and the poultry industry will need to focus on careful procurement and feed formulation to remain competitive.

Global growth is being driven by strong local conditions and not trade. So far this year, emerging markets in Southeast Asia and Asia have been performing well and the same can be said for E.U. and U.S., where there is relatively strong demand, production is controlled and prices are rising.

There are, however, exceptions, and most noteworthy are China and Japan where the industry has expanded by over 3% this year, impacting profitability. Where China is concerned, producers are now addressing this over expansion, which should restore to balance, while in Japan, high inflation is expected to keep demand subdued.

Brazil has also been heading towards over supply, but recent production cuts are expected to restore balance as the year progresses, however, as avian influenza risks return to the Southern Hemisphere the country will need to remain on high alert.

NATIONAL

Tamil Nadu Government Introduces 50% Subsidy for Small Scale Poultry Establishments

The Tamil Nadu government has introduced a 50% subsidy scheme for small-scale poultry establishments, targeting rural areas in Tiruvannamalai district for the year 2024-25. Three beneficiaries have been allocated in Tiruvannamalai district to implement this scheme, which supports the establishment of small-scale poultry farming units (250 chickens per unit).

Interested and skilled individuals in domestic poultry farming are encouraged to apply to the nearest veterinary dispensary or veterinary assistant in their village provided they meet the government regulations. The state government will cover 50% of the total expenditure, amounting to Rs. 1,56,875/-, for the establishment of domestic poultry farms. This includes the cost of constructing a chicken shed, purchasing equipment (feed tray and water tray), and covering feed costs for four months until the chickens grow.

Beneficiaries are required to raise the remaining 50% of the costs through bank loans or personal resources. Each beneficiary will receive 250 four-week-old country chicken chicks from Hosur district livestock farm free of cost. They must have a minimum of 625 square feet of land to construct a chicken shed, which should be situated away from human habitation.

To qualify, applicants must be permanent residents of the village. Preference will be given to widows, destitutes, trans-genders, and differently-abled persons. The beneficiary and their family should not have previously benefited from the Country Poultry Scheme in 2022-23 and 2023-24. The responsibility for construction work, and purchasing feed and equipment lies with

the beneficiary.

Applicants must provide a copy of their Aadhaar Card, Chitta of the farm location, a copy of Enclosure, and supporting documents for payment of the 50% amount (Bank Balance Details, Bank Loan Approval Details) for three years. Additionally, they must submit an undertaking to maintain the farm with certificates indicating non-benefit under the Country Poultry Scheme for 2022-23 and 2023-24.

District Collector D.Bhaskara Pandian has stated that the application can be submitted to the veterinary assistant at the nearest veterinary clinic.

www.gartech.co.in

Grow your business with Gartech's state-of-the-art advanced poultry technology

GARTECH
ENGINEERING POULTRY

GE ULTIMA Air
MULTI TIER COLONY COOPS FOR COMMERCIAL LAYERS

GE Royal Plus
MULTI TIER COLONY COOPS FOR COMMERCIAL LAYERS

GE ULTIMA
MULTI TIER COLONY COOPS WITH ACCU-FEED WITH QDTS FOR BREEDERS

GE MAXXIMA
MULTI TIER COLONY COOPS FOR COMMERCIAL BROILERS

GE APEX
NEST WITH AUTO EGG COLLECTION SYSTEM

GE MAXX PRO
PAN FEEDING SYSTEM

GARTECH EQUIPMENTS PVT. LTD.

Gat No. 137 & 138, Vill. Chale,Tal. Mulshi, Dist. Pune – 412 108. Maharashtra, India.
EMAIL: sales@gartech.co.in **CALL US:** +91 7447798692

Follow us on GartechEquipmentsPvtLtd gartech-equipments-pvt.-ltd gartechindia gartechindia

GE CLASSIC GE Eco-PRO GE MAXXIMA GE MAXX PRO GE Royal Plus GE ULTIMA Air GE ULTIMA GE APEX

Chattha Group

VTNEST

A new generation source of Esterified Butyric Acid :

* Better Daily weight gain
* Better Growth
* Best Control of Diarrhea

PHYTASE RANGE

Microtech 5000 (Mini Granular)
New Strain , New Technology , Better Heat Resistance

Microtech 5000 PLUS (Mini Granular)
Withstands upto 90-95 Degree C pelletising temperature

SUMO-CHOL GOLD

Choline Chloride 60% Corn base

* Promotes the formation of egg yolk.
* Avoids perosis and enlarged hocks.
* Imporves meat quality.

VIRU CLEAN

Triple-Salt Disinfectant

Effective against all known classes of Virus and all types of Bacteria and Fungi

IODINE CLEAN

Powerful Iodophore based disinfectant

Indian Trading Bureau Pvt. Ltd.

Importers & Distributors of Feed Additives, Supplements, Vitamins & Disinfectants

28, Dr. Sundari Mohan Avenue, Kolkata - 700 014
sales@chatthagoup.com Mob : +91 98303 42888

JAPFA®

MAKE GOOD. ALWAYS.

FEED | FARM | FOOD

A HOLISTIC RANGE OF ANIMAL FEED FROM ASIA'S LEADER IN LIVESTOCK'S NUTRITION.

We offer a carefully curated range of animal feeds that cater to the specific needs of poultry, cattle, swine, and aqua species. Our products are developed using advanced technology and precise nutrition based on extensive research, ensuring superior returns for your livestock.

Poultry Feed I Cattle Feed I Fish Feed I Swine Feed

ECHOLC 2023

Japfa Comfeed Indian Pvt. Ltd, Sakore Nagar, Viman Nagar. Pune – 411014

96077 77008 customercare.jcipl@japfa.com www.japfaindia.com

ASIA'S FINEST AGRO-INDUSTRIAL FOOD COMPANY

MAITY POULTRIES PVT. LTD.

LARGEST EGG PRODUCER IN WEST BENGAL.

www. maitypoultries.org

Eggs Available in 210 CT Pack.
Culled Birds in Wholesale,
Poultry Manure use for Pisciculture,
Agriculture, Tea Garden use for Cultivation
of Betelvine also used in Rose Sapling.

Egg Producer for Designer Egg
Ordinary Egg
Vita Plus
Sel Plex Egg
Carofil Egg
OVN Egg
In 6 Egg Pack

MAITY POULTRIES GROUP OF COMPANIES

Maity Poultries Pvt. Ltd. ★ Kumarpur Agro Poultries Ltd.
Sankrail Agro Poultries Pvt. Ltd. ★ Medinipur Agro Poultries Ltd.

Regd. Office :- Kumarpur, P. O. - Panchkhuri, Dist. - Paschim Medinipur

City Correspondence Office :
1/40, Rabindra Nagar, Paschim Medinipur, W.B. - 721101
Ph.:- 03222 274344, Fax- 03222 263970, Mob.- 9933333013, 9933333014
E-mail : maitypoultriesgr@gmail.com www. maitypoultries.org

For
Business Contact No. : 9933333015/16, 9933344754

SANDIMET® DL-Methionine

Fast and effective methionine for supporting animals' growth

Boost growth and reduce feed costs with NHU's DL-methionine for animals. Good to know NHU offers SANDIMET ® DL-methi - onine, your easy cost control that gives you the comprehensive solution you need-anywhere, anytime.

Follow us on:
Visit us on: www.cnhu.com/en
Telephone: +86-575-86296976 / +91 9848 046 244
Email: Marketing@cnhu.com / Selvan@valueconsultants.co

NHU®

Exploring Chemistry, Improving Life

Company in Focus

ZHEJIANG NHU CO., LTD.

With robust global presence, strategic leadership, and comprehensive product offerings, Zhejiang NHU Co., Ltd. makes significant contributions to various industries, enhancing the quality of life and promoting sustainable development worldwide. IPR gives an account of their unwavering commitment to innovation, quality and sustainability in the fine chemicals industry

Headquartered in Xinchang, Zhejiang, China, Zhejiang NHU Co., Ltd. (NHU) stands as a prominent leader in the fine chemicals industry. Founded in 1999 and publicly listed in 2004, NHU has consistently pushed the boundaries of chemical and biological technologies to deliver superior products and solutions to a global clientele. The company boasts state-of-the-art production facilities located in Xinchang, Shangyu, Weifang, and Suihua. Expanding its global footprint, NHU has established sales channels in most regions of the world such as Europe, North America, South America, and the Asia Pacific region.

Visionary leadership of Chairman Hu Baifan has helped NHU achieve remarkable milestones. Hu Baifan's strategic direction has propelled NHU to be recognised among China's top 100 fine chemicals companies and top 100 listed companies.

THE BUSINESS

Since its inception, NHU has been driven by a mission to excel in the fine chemicals industry. The company's core technology platforms, "Chemical +" and "Biological +", reflect its commitment to innovation and technological advancement. NHU's product portfolio is integral to numerous industries, enhancing the quality of life through improved nutritional support for livestock and other applications.

NHU's extensive product range caters to diverse industries including feed, food, daily chemicals, pharmaceuticals, and equipment manufacturing. The company's products, especially vitamins, amino acids and flavour products, are exported to more than 100 countries, forming robust partnerships with leading companies worldwide.

The company keeps striding with a bold objective of developing through innovation and thriving in competition. Specialised in functional chemicals with an emphasis on nutritional chemicals, aroma chemicals and polymers, NHU devotes itself in the stages of R&D, production, sales and services of the products. The company offers integrated solutions to customers in over 100 countries and regions in a wide range of domains including nutrition and health, personal and home care, transportation, environmental protection and new energy. Capitalising on its quality, healthy, green and low carbon products, the group is committed to improving quality of life for all and generating lasting values for its stakeholders.

In 2023, NHU achieved a turnover of USD $2.1 billion, with over 50% of revenue generated from exports. The company employs over 11,000 people, reflecting its significant impact and scale of operations. Currently, NHU is doubling its efforts to rise to the top of the world's functional chemicals industry.

VISION

Renowned for its innovation and technological prowess, NHU is dedicated to providing optimal nutritional support across various species including poultry, swine, ruminants, and farmed fish. The company aims to transform the animal husbandry industry through efficient nutrition systems, ultimately improving quality of life.

The company alligns with its direct Mission: Exploring chemistry, Improving life and strives for a Vision: Creator of better life.

THE USP

NHU has been lauded for its technological innovation, holding 558 patents and receiving numerous awards including the second prize for national technological innovation. The company's dedication to quality and innovation has solidified its reputation globally.

The company's commitment to innovation, comprehensive product range, and adherence to high-quality standards outlines NHU's unique selling proposition. This makes NHU a trusted partner in the global market, known for delivering reliable and advanced chemical solutions.

Driven by market demand and based on its core technology platform of "Chemical+" and "Biology +", the company carries out targeted research, gains insights into the market trends, develops forward-looking R&D pipeline and pursues innovation at multiple levels of science, "science+technology" and "technology+application". Meantime, based on bulk raw materials, they build an integrated industrial chain, structured product network and a coordinative industrial ecology to constantly expand the family of fine chemical products. Leveraging the progressive list of cost-effective products and service solutions, NHU creates lasting value for its worldwide clients.

And in spite of facing market demand fluctuations and environmental sustainability challenges, it continues to see opportunities in expanding its biotechnology platform, optimising existing products, and developing new ones to maintain its competitive edge.

NHU ensures quality through rigorous standards and certifications such as, Industry Standards: ISO 9001:2008, ISO 14001, and FAMIQS (including HACCP). Also through, Food Industry Certifications: ISO 22000:2005, BRC, Kosher, and Halal. And in Social Responsibility: Ecovadis and Sedex certifications.

The group offers comprehensive technical and client services, including customised product development, analytical testing services, targeted solution plans. Product application solutions like raw material selection, premix technology and equipment guidance. And nutritional solutions for livestock, aquaculture, and ruminants.

A dedicated team meticulously monitors production processes to maintain high standards in quality control.

In the field of animal nutrition, NHU provides a range of high-quality products designed to enhance the health and productivity of various livestock. The current product range mainly covers vitamins, amino acids, pigments, and other products. Specific products include vitamin E, vitamin A, vitamin C, methionine, vitamin D3, biotin, coenzyme Q10, carotenoids, vitamin B5, vitamin B6, vitamin B12, etc. These products are mainly used in feed additives, food additives, and nutritional health fields.

THE STAMP OF INNOVATION

NHU's innovation strategy includes substantial R&D investments, advanced instruments, a robust R&D team, global research institutes, and strategic collaborations with renowned universities and institutions. These efforts drive the industry towards more sustainable, efficient, and high-value-added chemical solutions.

In the nutrition market, NHU focuses on essential vitamins and amino acids, crucial for human and animal growth. The company continuously invests in process optimisation and product development, positioning itself strategically in cutting-edge biotechnology to maintain competitive advantage.

Making constant breakthroughs in key technologies and undertaking 50 national, provincial and ministerial projects, NHU won the prestigious second prize of the National Award for Technological Inventions two times and the first prize of Provincial and Ministerial Industry Associations eight times and Special Award of China Petroleum and Chemical Industry Federation.

ENVIRONMENTAL IMPACT

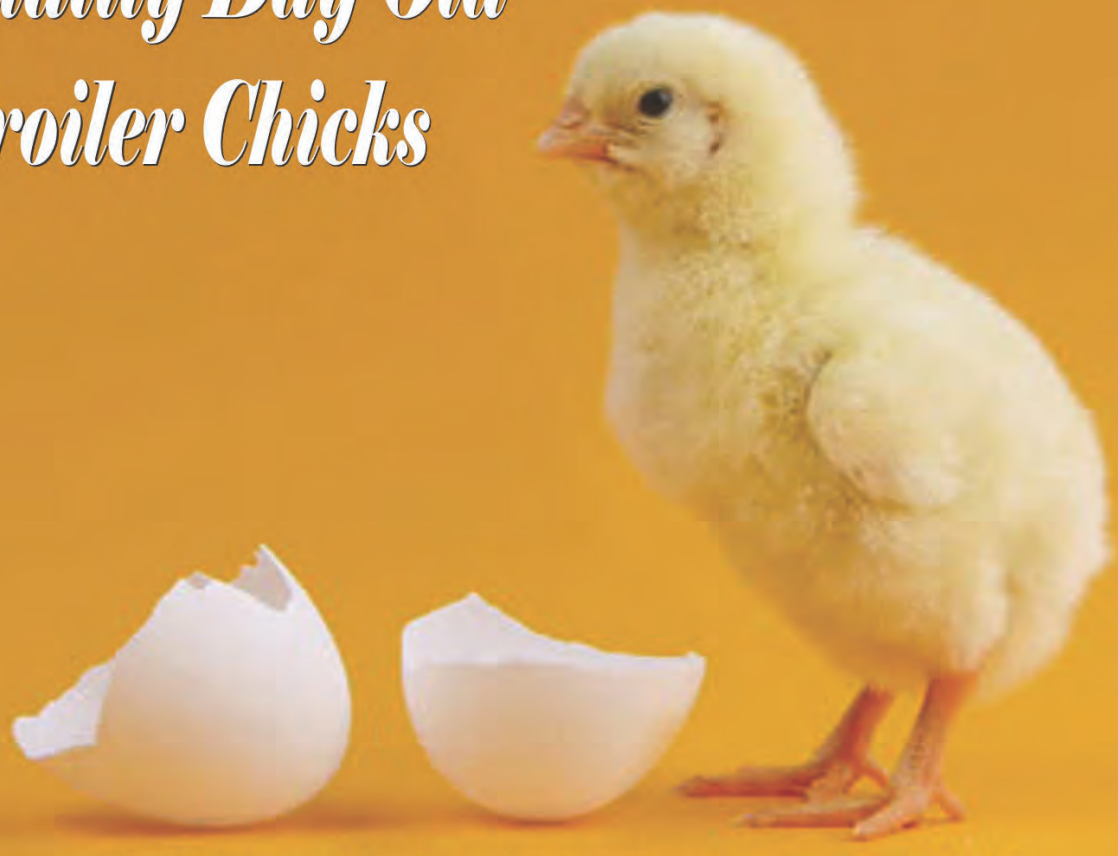
NHU is committed to sustainable development and environmental protection through initiatives like the Clean Production Projects, Reduction in Wastewater Discharge, Water Conservation, Carbon Footprint Management, Energy Efficiency Improvements, Reduction in COD Emissions, Economic Benefits from Energy Saving, Low-Carbon Production etc.

These actions align with NHU's corporate mission and contribute to global sustainability goals, particularly carbon peaking and carbon neutrality.

NHU is committed to continuously improving product energy efficiency and reducing carbon footprint throughout the product lifecycle. Studies show that low-protein diets can significantly reduce fecal nitrogen excretion. Every 1% reduction in the intake of crude protein can reduce the excretion of ammonia by 10%, dietary crude protein by 2%, and nitrogen by 16%. Adding methionine products to animal feed can balance daily ration of amino acids and reduce crude protein level. It helps to significantly reduce nitrogen excretion, cut greenhouse gas emmission and effectively improve the breeding environment without compromising animal production performance.

KOHLI CUSTOM HATCH

Producer of
Quality Day Old
Broiler Chicks



Chicks with best performance result

We installed all new Karamsar machines with highest hatchability result.

Corporate Office:
20, J. L. Nehru Road, Lindsay Street, Kolkata 700 087
Production Unit:
Madral More, Barrackpore Kalyani Express Way,
P.O.: Dogachhia, P. S.: Jagaddal, W. B. 743 130
Phone: +91 98314 25251 / 98302 25251

PRO - MaXYL®

Profit Maximizer

FLEXIBILITY + EXCELLENCE = PERFORMANCE

- Special enzyme premix for commercial broilers & layers
- Enhances energy utilization by reducing the viscosity of feed
- Improves the digestibility of protein & minerals
- Reduces the anti-nutritional factors present in feed ingredients

+91 20 2729 1020 / 21
info@abtl.in
www.abtlenzymes.com

Scan for more details

ABTL

ENZYMES • NUTRITION • TECHNOLOGY

In Conversation with...

Comprehensive Environmental Sustainability & Zero Carbon Footprint

With the global order continuously changing, food production decentralisation in the globe will emerge most dynamically and many new challenges will be thrown at mankind. **IPR** meets **O. P. Singh**, Managing Director, Huvepharma SEA to understand how every stakeholder has to respond towards these emerging challenges with utmost responsibility and carefully chosen favouring strategies to strengthen the global environment

In an era where environmental stewardship and sustainability are paramount, Huvepharma stands at the forefront of the global movement towards responsible and eco-friendly food production. Recognising the urgent need to address climate change and its impact on our planet, Huvepharma is pioneering a comprehensive approach to environmental sustainability with an ambitious goal, achieving a zero carbon footprint.

As a leading pharmaceutical company specialising in the development of animal health and nutrition products, Huvepharma is uniquely positioned to drive significant change across the agricultural and food production sectors. By integrating innovative technologies, sustainable practices and a deep commitment to environmental preservation, Huvepharma is setting new industry standards and paving the way for a greener, more sustainable future. This commitment is not only about mitigating environmental impact but also about fostering a culture of sustainability within the industry, actively collaborating with stakeholders, including farmers, suppliers and regulatory bodies to implement best practices and innovative solutions that enhance the sustainability of food production systems worldwide. Through this commitment, Huvepharma is setting an inspiring example of how industry leaders can drive meaningful change and contribute to a more sustainable and resilient global food system.

IPR What is the connection between business sustainability and environmental safety?

OPS Business sustainability and environmental safety are closely intertwined. As businesses strive to become more sustainable, we need to take into account the impact of our operations on the environment. This means that businesses must consider how our activities affect air quality, water resources, wildlife habitats, and other aspects of the natural environment. At the same time, businesses must also ensure that our operations are financially sustainable in order to remain competitive in the long term. Therefore, it is essential for businesses to develop strategies that both protect the environment and ensure a profitable future.

IPR How can businesses balance environmental safety and business sustainability?

OPS With the rise of global warming and climate change, businesses are increasingly looking for ways to balance environmental safety and business sustainability. The challenge is that these two goals often conflict with each other. While on the one hand, our businesses need to ensure our operations are profitable and sustainable, on the other hand, we need to make sure that our activities don't damage the environment in any way. Fortunately, there are several measures that our businesses can take to achieve this balance. By investing in renewable energy sources, reducing our carbon footprint through efficient

production processes, and implementing sustainable practices such as recycling and waste management, our businesses can both protect the environment and ensure our long - term success.

IPR How do production processes need to be adapted in order to be more environmentally friendly?

OPS With the world's population becoming increasingly aware of the need to protect our planet, it is important to make sure that production processes are adapted in order to be more environmentally friendly. This can be done by using more sustainable materials, reducing energy consumption, and making sure that waste is recycled or reused. Companies should also look into ways of reducing our carbon footprint, such as using renewable energy sources and investing in green technology. By implementing these changes, our businesses can help reduce our environmental impact and contribute to a greener future.

IPR What are the long-term benefits of sustainable product manufacturing?

OPS Sustainable product manufacturing is an important step towards a greener and more sustainable future. It offers many long-term benefits that go beyond just the environmental impact. From reducing resource consumption to creating a healthier and safer working environment, sustainable product manufacturing can have a positive impact on the overall economy. For food businesses, investing in sustainable product manufacturing can help us reduce costs in the long run by using fewer resources and eliminating hazardous chemicals from our production process. Furthermore, it also helps us build trust with our customers by demonstrating our commitment to sustainability and social responsibility.

IPR What strategies can be implemented to ensure efficient delivery of safe products?

OPS Ensuring the delivery of safe products is a major challenge for the food sector. This is especially true when it comes to food products that are used by consumers and require a high level of safety and quality standards. To ensure the efficient delivery of safe products, our businesses need to implement strategies that focus on quality assurance, risk management, and process optimisation.

Quality assurance involves identifying potential risks in the production process and taking corrective action to prevent them from occurring. Risk management involves assessing potential risks associated with the product or service before it goes into production. Process optimisation involves streamlining processes to ensure that they are as efficient as possible while still meeting safety standards. By implementing these strategies, our businesses can ensure the efficient delivery of safe products.

IPR How does Huvepharma ensure safe production processes and food safety?

OPS Our products are developed and manufactured to ensure their quality. Monitoring and control are carried out at each step of the manufacturing processes enforced by company-wide procedure standards. We use raw materials consciously, applying circular economy principles to efficiently manage different types of material flows. In terms of production and sales, we are guided by technological progress and innovation. We have the in-house capacity to ensure that we produce and deliver safe products. We follow the principles of GMP (Good Manufacturing Practice) and HACCP (Hazard Analysis and Critical Control Point). Packaging is also developed in accordance with the GMP standard, which ensures that the product remains stable in accordance with the label and is consequently safe to use in animals. All production facilities are certified in the international ISO 9001 quality and ISO 14001 environmental systems, and many of our operating procedures are in line with these systems. Internal and external audits are carried out annually on each of them. In the event of an irregularity or violation, an impromptu audit takes place. All these high standards that we use and adhere to safeguards high product quality. This, in turn, ensures the health of animals and consequently food safety for consumers at the end of the food chain.

IPR What are the potential long-term impacts of not investing in environmental safety on business sustainability?

OPS As businesses continue to grow, we must consider the potential long-term impacts of not investing in environmental safety. Without investing in environmental safety, our businesses are taking a risk that could lead to decreased sustainability. The effects of not investing in environmental safety can be seen in increased costs, decreased customer trust, and damage to the environment.

Investing in environmental safety can help our businesses save money and increase customer trust by showing that we are committed to protecting the environment. Additionally, it can help protect the environment from further damage due to human activity. By investing in environmental safety now, our businesses can ensure sustainability for years to come.

IPR How can businesses ensure their sustainability by taking measures for environmental safety?

OPS As our businesses strive for growth and profitability, it is essential that we adopt measures to ensure our sustainability in the long run. This includes taking steps to protect the environment by reducing our carbon footprint and ensuring that our operations are eco-friendly. Businesses need to understand that environmental safety is not only beneficial for the planet but also for ourselves as it helps us remain competitive in the market and reduces costs associated with waste management. By investing in renewable energy sources, efficient waste management systems, and green practices, our businesses can ensure sustainability while also contributing to a healthier planet.

IPR How does Huvepharma ensure compliance with environmental legislation?

OPS Our facilities, procedures and management systems are levelled with international best practice in environmental management.

We transfer these best practices to our operations in other entities, amplifying them with country specific laws and standards. Our production facilities operate in accordance with ISO 14001. Each of our entities has a management system in line with international systems reducing the carbon footprint through energy recovery of organic waste through our partnership with Greenburn®, we recover waste from the production process (biomass).

We have built photovoltaic power generation systems with a capacity of 150MW.

We have achieved an annual emission reduction of 25,000 tonnes of CO_2.

We also have reduced noise pollution and the impact on the local population by constructing noise-muffling facades on the production buildings in Biovet Peshtera and other projects.

Within three years, we have introduced a new energy monitoring system for the production processes at Biovet Razgrad.

In Conversation with...

Revolutionary Digital Livestock Marketplace

The world's first comprehensive livestock input marketplace, dedicated to empowering farmers by providing easy access to essential products and services, PrraniGanga has been launched. **IPR** gets into animated conversation with **Amit Saraogi**, Managing Director, Anmol Feeds Pvt. Ltd., whose brainchild it is

PrraniGanga is a pioneering online portal designed to transform the livestock farming industry. Founded with a vision to support farmers, leverage technological advancements, and promote sustainable farming practices in the fields of dairy, poultry and aqua farming, it stands at the forefront of agricultural innovation.

The primary mission of PrraniGanga is to create an inclusive platform that addresses the diverse needs of livestock farmers. By offering fair prices for essential inputs and ensuring direct market access, PrraniGanga aims to empower farmers economically. The portal envisions a future where technology bridges the gap between farmers and consumers, enhancing efficiency, reducing costs, and promoting sustainable agricultural practices.

The portal offers a wide range of products including animal feed, supplements, vaccines, veterinary medicines and equipment. One of the standout features of PrraniGanga is its commitment to affordability. By offering high-quality products at approximately 50% lower prices than the market, available 24x7, the platform ensures that farmers can access necessary inputs from the comfort of their homes.

IPR **What inspired you to start PrraniGanga and what was the initial vision behind the platform?**

AS The inspiration behind starting PrraniGanga stemmed from a desire to create a supportive and efficient ecosystem for farmers. The initial vision encompassed several key objectives:

1. Support for Farmers: Our goal was to provide a platform that supports farmers by offering fair prices for their required products and direct market access, thereby empowering them economically.
2. Technological Advancements: We aimed to leverage advancements in technology so that farmers can directly connect with consumers, enhancing efficiency and reducing costs.
3. Educational Platform: We envisioned serving as an educational resource for consumers about farming practices, animal welfare, and sustainable agriculture.
4. Promote Local and Sustainable Farming: We sought to encourage and promote local, small-scale farming practices that prioritise sustainability and animal welfare.
5. Ease of Access: Our aim was to create a user-friendly platform that makes it easy for consumers to browse, purchase, and receive farm products conveniently.

IPR **Please explain the key features and services offered by PrraniGanga**

AS PrraniGanga proudly stands as the world's No.1 input livestock marketplace, associated with top brands to ensure the highest quality for our users. We offer high-quality products available 24x7, allowing farmers to purchase from the comfort of their homes at approximately 50% lower prices than the market. Our services include free farm check-ups over voice or video call, ensuring that farmers receive expert advice without any hassle. We also provide free doorstep delivery, making the process even more convenient. With the trust of over 10 lakh farmers, a network that includes 70+ brands, 120+ feeds, and more than 1500 products delivered across 15,000+ pin codes, we ensure widespread accessibility and reliability. Additionally, we offer the facility for cash on delivery, making transactions smooth and secure for our customers.

IPR How do you educate and inform potential users about PrraniGanga's offerings?

AS We educate and inform potential users about PrraniGanga's offerings through a variety of channels and methods. Our online platforms and websites provide detailed descriptions of products or services, farming practices, benefits, and customer testimonials. We develop and share educational content such as blog posts, articles, infographics, and videos related to livestock farming to enhance knowledge and awareness. Social media engagement is key; we use these platforms to share updates, success stories, tips, and educational content while engaging with followers through comments, Q&A sessions, and live videos to build a community and address inquiries. Additionally, we offer a dedicated customer support team to address common questions and concerns about our offerings and maintain an FAQ page that covers essential information. Lastly, we share case studies and success stories from other users who have benefited from PrraniGanga to build trust and credibility among potential users.

IPR Can you elaborate on the process of sourcing and vetting suppliers for PrraniGanga

AS The process of sourcing and vetting suppliers for PrraniGanga is comprehensive and meticulous. We begin by identifying the specific needs for animal inputs, such as feed, medicine, and equipment, along with services like veterinary care. Leveraging industry contacts, trade associations, and other forums, we identify potential suppliers. We then review supplier credentials, examining licenses, certifications, and regulatory compliance to ensure legitimacy and quality. On-site visits to supplier facilities or farms allow us to observe conditions firsthand, assessing cleanliness, animal welfare practices, and compliance with safety standards. Quality control measures are evaluated to ensure products or services meet our high standards. Regular evaluations monitor supplier performance against agreed-upon metrics and standards. We build positive relationships with suppliers through open communication, collaboration on improvements, and recognising good performance. Lastly, we ensure that suppliers adhere to environmental sustainability practices and the ethical treatment of animals, aligning with our commitment to social responsibility.

IPR How do you handle logistics and delivery for orders placed on PrraniGanga, especially in remote areas?

AS Handling logistics and delivery for orders placed on PrraniGanga, especially in remote areas, involves a strategic and ethical approach. We select experienced delivery partners with strong rural logistics capabilities to ensure efficient and reliable service. Compliance with animal welfare laws and clear contractual terms are strictly maintained, and we leverage technology for monitoring and communication to keep the process transparent and accountable. Our primary delivery partner, Xpress Bees, is instrumental in reaching rural areas, and we also utilise the services of India Post to ensure our products can be delivered to even the most remote locations. This dual approach ensures that our logistics are robust and capable of meeting the diverse needs of our customers.

IPR What are some of the most popular products or categories on PrraniGanga, and why do you think they stand out?

AS Some of the most popular products and categories on PrraniGanga include animal feed, supplements, vaccines, and veterinary medicines and equipment. These products stand out for their essential role in ensuring animal health, productivity, and welfare. By providing high-quality inputs that are crucial for maintaining the well-being of livestock, these products support sustainable farming practices and enhance overall farm profitability. The reliability and effectiveness of these products make them highly sought after by farmers who aim to achieve optimal results in their livestock operations.

IPR How do you see the role of PrraniGanga evolving in the next five to ten years?

AS In the next five to ten years, PrraniGanga envisions evolving by focusing on sustainable solutions and leveraging advanced biotechnology to improve our product offerings. We aim to integrate advanced technologies such as AI and IoT, along with digital tools for precision farming, to enhance efficiency and productivity. Our strategy includes fostering collaborations with farmers and researchers to address emerging challenges in animal health, welfare, and productivity. Additionally, we plan to forge strong partnerships to optimise animal health and farming efficiency globally. Our goal is to expand our reach to over 50 countries and establish PrraniGanga as a multi-billion dollar company within this timeframe, making a significant impact on the global agriculture and livestock industry.

IPR What have been your most significant learnings as the founder of PrraniGanga?

AS As the founder of an online livestock farming company, my most significant learnings include the importance of deeply understanding customer needs to provide tailored solutions. Navigating logistical challenges effectively has been crucial for ensuring timely and efficient delivery of products and services. Maintaining high standards of animal welfare has been fundamental to our operations, reinforcing our commitment to ethical practices. Additionally, continuously adapting to market demands and regulatory requirements has been essential for sustainable growth and building customer trust. These learnings have shaped the strategic direction and operational excellence of PrraniGanga.

Shivshakti Agro (India) Private Limited
Amrit Breeder Farms Private Limited

Aqua Feed

Cattle & Pig Feed

Poultry Feed

Day Old Chicks

Samastipur • Kolkata
Guwahati • Udumalpet

Growing Profits is now in **your Hands.**

Why Choose us?

Made with superior ingredients and using world class technology. We believe that the foundation of a great product lies in its ingredients, and we go to great lengths to source the best.

Poultry Feed Aqua Feed Cattle Feed

Head Office : Chitrakoot,
7th Floor 230-A AJC Bose Road,
Kolkata 700020

info@shivshaktiagro.com
www.shivshaktiagro.com

Call for more information
033 - 22881 7846/47

VETNOVA
Redefining Animal Health & Nutrition

West Bengal Chemical Industries Ltd.

PIONEER MANUFACTURER OF

GLYCINE CHELATED TRACE MINERALS

HIGHLY BIOAVAILABLE TRACE MINERALS

Products

- ZINC GLYCINE SULPHATE
- COPPER GLYCINE SULPHATE
- FERROUS GLYCINE SULPHATE
- MANGANESE GLYCINE SULPHATE
- CHROMIUM GLYCINE SULPHATE
- CHELATES SELENIUM

15% GLYCINATES

GLYCINE CHELATES WITH 15% METAL CONTENT

Products

- ZINC GLYCNATE 15%
- COPPER GLYCINATE 15%
- FERROUS GLYCINATE 15%
- MANGANESE GLYCINATE 15%

BISGLYCINATES

PURE CHELATES OF TRACE ELEMENTS

MOST BIOAVAILABLE MINERALS FOR LIVESTOCK & POULTRY

Products

- ZINC BISGLYCINATE
- COPPER BISGLYCINATE
- FERROUS BISGLYCINATE
- MANGANESE BISGLYCINATE

HICLEAN

WORLD CLASS DISINFECTANT & SANITIZER

Composition	
Ingredients	Quantity
Hydrogen peroxide	26.5%
Peroxyacetic Acid	4.9%
Inert Ingredients	68.6%

KILLS ALL VIRUSES,VEGETATIVE BACTERIA FUNGI MYCOBACTERIUM AND BACTERIAL SPORES

Benefits

1. WATER SANITIZER PROVIDES BROAD SPECTRUM BIOCIDAL ACTIVITY.
2. REMOVES ALL ORGANIC CONTAMINATION, INCLUDING BIOFILMS AND MANGANESE DEPOSITS.
3. COMPLETELY BIODEGRADABLE AND DECOMPOSES TO WATER, OXYGEN
4. WITHOUT HAVING TOXIC RESIDUES.
5. EFFECTIVE AGAINST FIN ROT, TAIL ROT, DROPSY, CLOUDY EYE CONDITION
6. AND OTHER PARASITIC AND PROTOZOAN DISEASES OF FISH.

DOSAGE:

Application	Dilution in water	Method
Water sanitization • Routine sanitization • During viral or bacterial diseases • In acute cases of bacterial infection like E. coli	1ml in 10 Liter 2ml in 10 Liter for 3 days 5ml in 10 Liter for 3 days	All drinking water
Pipe line flushing	20ml in 10 Liter	Keep pipe lines filled for 30 min to 1 hour
Hatching eggs disinfection	2.5ml in 1 Liter	Spray method
Incubators and hatchers	20ml in 1 Liter	Spray and mop
Incubator tanks	2.5ml in 1 Liter	Rinse and mop
Terminal disinfection of empty sheds	20ml in 1 Liter	Spray using high pressure pump
Disinfection of sheds in presence of birds/ animals	10ml in 1 Liter	Spray method keeping nozzle towards ceiling
Plastic equipments	20ml in 1 Liter	Soak for 30min
Metal equipments	10ml in 1 Liter	Soak for 30min
Feed rooms and stores	10ml in 1 Liter	Spray method
Foot bath/ vehicle wheel dips	10ml in 1 Liter	Add daily
Fishery	1 Liter in 1 bigha	Add homogeneously

Organic Acids Salts

FORMATES

POTASSIUM FORMATE POWDER
POTASSIUM DIFORMATE POWDER

PROPIONATES

SODIUM PROPIONATE POWDER
CALCIUM PROPIONATE POWDER
AMMONIUM PROPIONATE LIQUID/POWDER
AMMONIUM DIPROPIONATE LIQUID/POWDER

BUTYRATES

SODIUM BUTYRATE POWDER (98 %)
SODIUM BUTYRATE COATED (30%,60% & 90 %)
CALCIUM BUTYRATE POWDER (98 %)
CALCIUM BUTYRATE COATED (30%,60% & 90%)

Manufatured By:
West Bengal Chemical Industries Ltd.
145/1 Jessore Road,Lake Town.
Kolkata 700089,India
email:enquiry.vetnova@gmail.com
Conatct:033-4025-1700
M:8697714093

Provet
Excellence through Innovation

AVINOVA™

BAMBERCIN® PLUS

The Novel & Potent TRIBIOTIC

- Healthy birds
- Optimal gut microflora
- Reduction in FCR
- Better immunity & disease resistance
- Wholesome meat & eggs
- Improvement in profits

Provet Pharma Private Limited
No. 9, 1st Floor, Chakrapani Street, 2nd Lane,
Narasingapuram Extension, Maduvankarai, Guindy,
CHENNAI - 600 032. INDIA
Telefax: +91 44 2244 2124 / 27 | E-mail: info@provet.in

www.provet.in
provetppl provetppl provetppl

The Originator of Veterinary Ayurveda

Since
1951

INDIAN HERBS
Pioneer and Global Market Leader Since 1951

Nature's Way to Animal Health

Established in 1951, **Indian Herbs** is the originator of the concept of Modern Veterinary Ayurveda. **Indian Herbs** was the first company to harness the rich treasure of herbs by developing phytogenic products on modern scientific lines. With more than seven decades of experience moulded into world class research expertise, **Indian Herbs** is the leading herbal animal heath company having a global footprint in over 50 countries. **Indian Herbs** is the pioneer and market leader having a steadfast commitment to providing efficient, cost-effective, environment-friendly and sustainable phytogenic solutions for animal well-being.

Our Credential and Global Knowledge Sharing

50+ Countries we market our solutions in

11+ Species we care for

200+ Herbal Medicines for animals

30+ Herbal Medicines for humans

30+ Countries with global research collaboration

1250+ Research papers of high impact factor

250+ Master and PhD thesis

22+ Patents for innovative research

- PIONEER OF THE CONCEPT OF HERBAL ANIMAL HEALTH CARE PRODUCTS. Maintaining NO.1 POSITION in this Industry in India since 1951 and one of the top 4 companies in total AHP market including allopathic MNCs.
- FIRST ISO 9001 Certified Company for Research and Manufacturing of Herbal Animal Health and Human Health Care Products (Awarded by DNV, The Netherlands).
- FIRST GMP CERTIFIED COMPANY for manufacturing of Ayurvedic Veterinary and Human Products (Awarded by the Director of AYUSH, Govt. of U.P., INDIA).
- GMP+ Certification from GMP Plus International, The Netherlands.
- MODERN R&D CENTRE equipped with state-of-the-art facilities including HPLCs, HPTLC, GC-MS/MS, ICP-MS, UV-VIS scanning Spectrophotometer, Spectroflurometer, Atomic Absorption Spectrophotometer etc., RECOGNISED AND APPROVED BY MINISTRY OF SCIENCE AND TECHNOLOGY, Govt. of India, since 1986.
- More than 250 SCIENTISTS AWARDED Ph. D./M.V.Sc./M.Sc. for Research on the "Indian Herbs" products.
- 1250+ RESEARCH PAPERS published in leading national and international journals on the "Indian Herbs" products.
- STANDARDIZATION & Quality Control based on bio-actives and finger printing technology.
- RECIPIENT OF MANY PATENTS in USA & other countries for innovative research on herbs and herbal formulations.
- EXPORT HOUSE Status accorded by the Ministry of Commerce & Industry, Govt. of India.
- CERTIFICATE OF APPROVAL from Export Inspection Council of India, Ministry of Commerce & Industry, Govt. of India since 2014.
- **Some AWARDS FOR OUTSTANDING ACHIEVEMENTS:**
  - National Awards (2007, 2008, 2010,) for Outstanding Entrepreneurship, Outstanding R&D Achievements, Outstanding Quality Products by Govt. of India.
  - Certificate of Merit for outstanding export performance at All India Level by Chemexcil, Mumbai.
  - State Export Awards (First Prize) in 1995-96, 2004-2005, 2008-09 and 2018-19 by State Govt. of U.P.
  - AIMA - Dr. J.S. Juneja Award in for Creativity and Innovation by All India Management Association, Delhi.
  - State Award for Product Quality Excellence by State Govt. of U.P.
  - The 2016 "ASIA BRANDS TOP 500" orgainsed by Asia Brands Organization, China.

INDIAN HERBS SPECIALITIES Pvt. Ltd.
SHARDA NAGAR, SAHARANPUR - 247 001 (U.P.)
Phones: (0132) 2615010 (30 lines), Fax: (0132) 2726288, E-mail: info@indianherbs.org, Web: www.indianherbs.org

IPSACON 2024

The Orange City of India, Nagpur, is gearing up to host IPSACON 2024, the 39th Annual Conference & Symposium of Indian Poultry Science Association from 16th to 18th October.

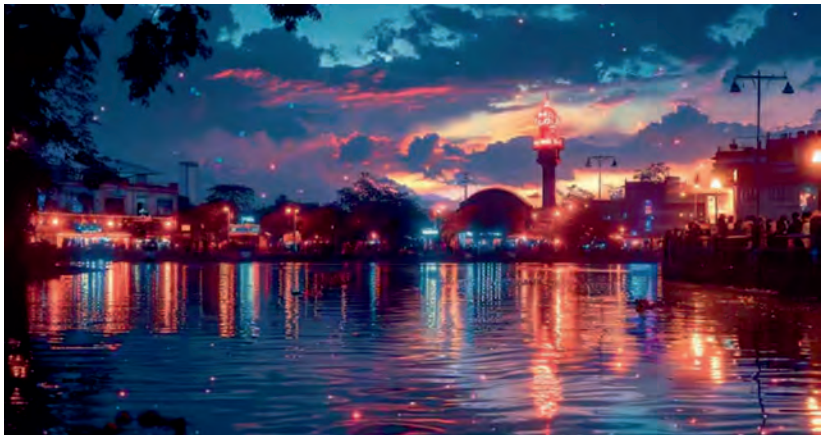
The theme for this year's symposium is "Shaping the Indian Poultry Sector for Sustainable Growth" and is being organised jointly by the Department of Poultry Science, Nagpur Veterinary College, MAFSU and Indian Poultry Science Association.

The conference will feature key discussions on poultry-related lead papers and e-poster presentations of research conducted by various scientists. It will also include meetings among industry professionals, scientists, farmers, and students. Distinguished national and international experts will address emerging issues and challenges faced by the Indian poultry sector, proposing scientific and technological solutions.

For the first time, participants will experience a poultry judging and egg recipe competition. Students will have the opportunity to participate in a national quiz, campus placement activities, and industry visits during the event. This conference will provide a wonderful platform for students, industry professionals, farmers, academicians, scientists, and policymakers. Additionally, poultry entrepreneurs from the Nagpur Veterinary College Alumni will share their experiences.

Schedule for IPSACON 2024

Date	Schedule
16th October 2024	Inauguration & IPSA Awards Ceremony
	Keynote Address
	Lead Paper Presentations
	E-Poster Presentation
	Cultural Programme
17th October 2024	Lead Paper Presentations
	E-Poster Presentation
	Poultry Judging Competition
	National Quiz Competition
18th October 2024	Industry-Farmers-Students-Scientists Meet
	Lead Paper Presentations
	NVC Poultry Entrepreneurs Meet
	Placement Opportunity for Students
	Egg Recipe Competition
	Closing & Awards Ceremony



Hitech's

Creating Values

Poultry of the Highest Quality!

HITECH HATCH FRESH PRIVATE LIMITED

Metropolitan Co-Operative Housing Society Ltd., Sector - B, Plot No. - 28, Canal South Road, Kolkata - 700 105
Ph. : 91-33-40638301 | Fax : 91-33-40638315 | E-mail : hitechhatchfresh@rediffmail.com | Website : www.hitechhatchfresh.com

Integration Office :

BHALUKA • NATAGARH • KATWA – 9734148253 | BASIRHAT – 03217 263744 | BADURIA – 033217 238444
BURDWAN • BHATAR • SURI • SALAR • PLASSEY • BANKURA – 8582891213 | BHADRESHWAR (HOOGHLY) • MALDA • BARUIPUR – 2633 6973, 9903614062

Alltech's Poultry and Layer School

Alltech organised its Poultry and Layer School series in July at Namakkal, Panchkula and Karnal. These seminars attracted nearly 400 attendees including farmers, nutritionists, veterinarians and other professionals from the poultry sector.

The sessions provided a platform for participants to engage with Alltech's research and innovative solutions in poultry nutrition and health. Topics included the role of organic trace minerals in enhancing performance, advancements in feed efficiency, pathways for healthy poultry farming, and maximising poultry profitability through innovative solutions.

Dr. Aman Sayed, Alltech's Managing Director for India and Regional Director for South Asia, initiated the interactive session by discussing the company's global footprint, acquisitions, global feed survey, and upcoming customer service laboratories. "Our goal is to support poultry producers in enhancing their operational efficiency and sustainability. Through these seminars, we aim to share the latest insights and technologies that can drive the industry forward," he said.

Dr. Lokesh Gupta, Alltech's Technical Director for Poultry, South Asia, focused on poultry profitability, presenting Alltech's solutions such as enzymes, mycotoxin binders, and mineral treatments. He also explained alternative raw material sources.

Renowned poultry consultant Dr. Jayaraman Krishnarajan delivered an in-depth talk on pathways for healthy poultry farming, emphasising signs, management, and prophylactic measures of poultry diseases. He covered topics including low-pathogenic influenza, variable strains of infectious bronchitis (IB), the respiratory disease complex, genotype 13 Newcastle Disease (ND), heat stress management, and the roles of organic chromium and selenium in immunity and shell strength.

Steve Elliott, Alltech's Vice President of Corporate Accounts and Companion Animals, discussed the importance of organic minerals in reducing stress and improving poultry performance. "Our continued research at Alltech aims to enhance the bioavailability and efficacy of minerals in poultry diets, ensuring that producers can achieve better results with more sustainable practices," he stated.

The success of this seminar series spotlights Alltech's dedication to advancing poultry production and ensuring a sustainable future for the industry.

With best complements from

CALCIMILK®

DINOSOL®

DIGECON™

KLOTINEX-K®

LIVOLYSIN (Vet)®

ELECTROCON®

FEROLVET

LIVCON B_{12} FORTE®

VITAPROTIN-DS®

EBECON-E®

COUGHCON

PRIVITA (Powder)

PIPER-VET

BSCIC

NABCB
QM 030

PHARMACON VET PVT. LTD.

2 G.M. ROAD, KOLKATA-34

ISO 9001-2008 CERTIFIED ORGANISATION

E-mail : pharmacon_vet@rediffmail.com, Addl. Address : 526, G. M. Road, Kolkata 700 034, Mobile : 9831176077 / 6290126380

Himalaya WELLNESS SINCE 1930 | Alembic Touching lives over 100 years | provimi | Vétoquinol a Sign of Passion

trouw nutrition a Nutreco company | Vamso Biotec Pvt. Ltd. | JAYSONS Agritech | PRANAV BiTEK AGROTECH PVT. LTD. Redefining Feed Additives

INDIAN HERBS | SynkroMaX | MICRO LABS LIMITED | chembond | RAVIOZA Biotech

RR ANIMAL HEALTH CARE LTD. | Venky's | India Gelatine & Chemicals Ltd. | VARSHA | Brihans Laboratories Pvt. Ltd. | NGL | JUBILANT INGREVIA | ZEUS

Advance Animal Nutrition
Anthem Biosciences
Brihans Laboratories Pvt. Ltd.
Credence Remedies
Himalaya Wellness Company
Indian Herbs Overseas
Jayson's Agritech Pvt. Ltd.
Jubilant Ingrevia
Narmada Gilatine Ltd.
Natural Herbs & Formulations
Pranav Bitek Agrotech
Provimi Animal Nutrition
Ravioza Biotech Pvt. Ltd.
R K Phosphates Pvt. Ltd.
RR Anima Health Care Ltd.
Stallen South East Asia Pvt. Ltd.
Sunbio Tech Pvt. Ltd.
Sunbiotic Pvt. Ltd.
Synkromax Biotech Private Limited
Trouw Nutrition
Vamso Biotec
Vasha Multitech
Venkey's
Ves-Spa
Vetoquinol India Ltd.
Vet Farma Ltd.
Zeus Biotech Ltd.
Soozwin & Company
C&F, Consignee Agent
Super Distributors of:
Chembond Chemicals Ltd.
Himalaya Wellness Company
Micro Labs Ltd.
Nature Herbs & Formulation
Provimi Animal Nutrition
Vamso Biotec

An ISO 2001-2015 Certified
Debco Pharma Pvt. Ltd.

PRODUCTS

Amino Acids
D. L. Methionine
L. Lysine
L. Threonine

Anti Bacterials
C. T. C.
Enrofloxacin
Neomycin
Doxycycline
Enramycin

Anti Diarrhoeals
Halquinol
Herbal Anti Diarrhoeal

Anti Flys
Cyromazine
Larvacidal
Proporus 2%

Antioxidants
Emulsifier
Toxin Binders

Choline Chlorides
Choline Chloride 60%
(Imported corncobb)
Chloine Chloride 60%
(Cereal)
Chloine Chloride
(Herbal)

Enzymes
Cocktail Enzymes
Cocktail Enzymes
With probiotics
Phytase
Xylanase
Protease

Growth Promoters
B.M.D.
Colistin with Doxycycline
Lincomycin
Neomycin with Doxycycline
Probiotic
Roxarsone with Probiotic
Furazolidone

Liver rotectants
Liver Protectant Power
(Herbal & Synthetic)
Liver Tonic Liquid

Minerals & chemicals
Calcium Propionate
Copper Sulphate
Manganese Sulphate
Pellet Binder
Sodium Butytrate
Trace Mineral (S/D)
Trace Mineral (Oragnic)

Perforamance Enhancers
Acidifier
Tylosin Phosphate

Quaranting Products
Water Sanitizer
Disinfectant

Treatment Products
Tiamulin Hydrogen
Fumerate
Amprolium
Levamisole
Hydrochloride BP
Piperazine Hydrate

Dicalcium phosphate
Bone-base (DCP)
Rock-base (DCP)

Lime Stone Powder (L.S.P.)
Sodium Bi Carbonate

Vitamins
Vitamin Ab2 D3 K
Vitamin AD3
Vitamin B12
Vitamin B-Complex

(Powder & Liquid)
Vitamin C (Herbal & Synth.)
Vitamin E (Herbal & Synth.)
& Vitamin Premixes

Coccidiostas
Meduramycin
Salinomycin
Robinedin
Diclazuril
Dot with Ethapobate

An ISO 9001-2015 Certified Company

DEBCO PHARMA PVT. LTD.

48C, GARCHA ROAD, KOLKATA-700 019, WEST BENGAL, INDIA
Phone: (033) 2486-3681/4065-8168, 2486-8981 Mobile: 9331230674, 9875373568 E-mail: debcopharma@yahoo.co.in Web: www.debcopharma.com
ensures prompt & quality services

eXolution
Bacterphage F

We took an already great product and made it even better.

eXolution is now Xcelsio.
Our relentless effort to make the world a safer and healthier place has led us to create Xcelsio. After years of cutting-edge research in Korea, we have come up with an advanced formulation to make Xcelsio more potent than before.

Xcelsio comes with a more concentrated cocktail of bacteriophage and is fortified with more Bacillus subtilis. This new and improved formulation, created specifically for use in poultry, is simply unmatched in controlling pathogenic bacteria– giving you Total Gut Control.

Each of our bacteriophages is painstakingly selected using our proprietary Bacterphage F technology to target and eliminate specific bacteria; leaving other beneficial bacteria completely unharmed. This natural surgical strike on disease-causing bacteria is the safest, non-toxic, and most effective prophylactic alternative to antibiotic growth promoters.

xcelsio

Natural Feed Additive

BENEFITS TO THE FLOCK

Natural:
No Toxins, No Residues, No Side-effects, No Withdrawal Time

Surgical:
Targets and eliminates specific bacteria, even those resistant to antibiotics

Protective:
Maintains gut bio-balance by retaining beneficial bacteria

Probiotic:
Enriched with Bacillus Subtilis

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

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

FOR USE IN
BROILERS, LAYERS
& BREEDERS

MADE IN KOREA BY:
CTCGLOBAL INCORPORATION

MADE IN SOUTH KOREA

100% NATURAL & EFFECTIVE ALTERNATIVE TO AGPS

MARKETED BY:
Sapience Agribusiness Consulting LLP
328 HRBR Layout, 4th A Cross
3rd Block, 3rd Main, Kalyan Nagar
Bangalore 560043, Karnataka (KA), INDIA

sapience

PLAYING WITH THE PALATE

Time is of the essence and food is the fuel that our body needs to get going and sustain itself throughout the day. But how does one balance their life in a way that provides it with healthy food? Meal planning and eating good, clean, healthy food is the answer.

Since the moment we wake up to the alarm in the morning, it's just running on the wheel of life. There's family to take care of, work to complete and life to deal with. Amidst all of this where is the time think about what to eat everyday?

Meal planning, simply put, is the method of planning what to eat throughout the day or the week, much ahead of time, and then ideally preparing the meal for the week.

A healthy body requires both weight management and nutritious food. But between exercise and healthy food, which one is more important? In an ideal world, one should be able to accomplish both throughout the week. Healthy meals and exercising are interdependent. Exercise is the catalyst that enhances the desired output when combined with a healthy meal. Some experts suggest that dedicating a whopping 75% to a wholesome, home cooked meal and the remaining to physical activity is a winning combination.

In a world dominated by digital skills and AI supported lifestyle, customised meal planning is a pivotal aspect of a nutrition professional's role in facilitating healthy living goals. While creating manual meal plans is time-consuming and sometime boring and does not even facilitate tracking progress, it can often be challenging to manage all the details involved in maintaining a balanced, nutritious diet every week. Meal planning apps can be the missing link, providing a cost-effective and efficient way to customise an appealing weekly menu and help to stay on top of the game.

Meal planning apps help save time and money and provide necessary variety and nutrition in a diet. In India, apps like Amiyaa, MealPe, HealthifyMe, Reddit, Paprika, BetterMe, My Diet Meal Plan, StrongrFastr are most useful to Indian diets and make life much easier on your fingertips on a smart phone for free or at a nominal monthly subscription. They often not only plan your daily meal, but assist in customisation options with editable grocery lists and comprehensive recipe library. Some of the well-known CNN recommended apps are Eat This Much Premium, BigOven Pro, Mealime Pro, Meal Prep Pro, Paprika Recipe Manager 3.

This annual issue is dedicated to a highest level of consumer connect with a dynamic topic like "Evolving Landscape of Poultry Consumption in India," and our recipes for this issue are also a part of beginners' meal plan for including poultry for the highest protein intake.

MONDAY BREAKFAST: EGGY CHEESY MUFFINS

Serves: 3 **Time:** 18 minutes **Effort:** Super Easy
Nutrition Per Serving: 545 kcal **Protein:** 26g

Monday mornings need excitement and energy. No mundane toast and sunny side up, instead surprise your family by swapping the toasts with delicious egginess and ample balanced nutrition. Enjoy cherry tomatoes and sliced avocados just for some fun and perkiness.

INGREDIENTS

- 3 Vita-rich eggs
- 50ml milk
- 6 Store-bought whole wheat muffins
- 250gms cherry tomatoes, halved
- Slight drizzle of vegetable oil
- 40gms Cheddar, grated
- 2 Small ripe avocados, sliced

METHOD

1. Heat the grill to medium. Beat the eggs and milk together in a wide soup dish. Submerge the muffins one by one in the egg mixture, turning side once, then set aside for a few minutes.
2. Arrange the cherry tomatoes cut side up on a baking tray and grill for a few minutes, till the top is a bit charred. Cover the tray with foil and keep aside to keep the tomatoes warm.
3. Drizzle oil in a frying pan and cook the muffins just for a few minutes on each side until the egg has set – best to do this in batches of three.
4. Once all muffins are cooked, top with the grated cheese and grill for 1-2 minutes until the cheese is bubbling and golden.
5. Serve with the tomatoes and fresh avocado slices.

WEDNESDAY LUNCH:
CHICKEN NOODLE SALAD

Serves: 4 Time: 20 minutes **Effort:** Super Easy
Nutrition Per Serving: 588 kcal **Protein:** 30g

A wonderful tiffin lunch, cooked in a jiffy and packed for the whole family including kids, full of zesty wholewheat noodles, balanced with nutritious chicken and greens – edamame and broccoli, dressed with a marvelously moreish tahini and soy dressing. Easily prep ahead and enjoy cold, sprinkled with nutty goodness of toasted sesame seeds.

INGREDIENTS

- 2 Chicken legs, cooked
- 1½ Tbsp. sesame seeds
- 4 Whole wheat noodle nests
- 160gms Edamame beans, frozen
- 160gms Fresh cut florets of broccoli
- 1 Tbsp. Tahini
- 2 Tbsp. sesame oil
- 2 Tsp. honey
- 1½ Tbsp. low sodium soy sauce
- 1 Tbsp. rice wine vinegar

METHOD

1. Remove the chicken skin if required and shred the cooked chicken into 1" pieces. Discard the bones. Set aside.
2. In a large pan, toast the sesame seeds for one minute until golden and then tip into a large bowl (big enough to hold all the cooked noodles).
3. Boil hot water in a kettle. Fill a cooking pan with the kettle water and bring it back to boil. Add all 4 nests of noodle and cook as per cooking instructions on the packets. Throw in the edamame beans and broccoli for the last two minutes of boiling noodles.
4. Meanwhile, mix the Tahini, sesame oil, honey, soy sauce and vinegar into the toasted sesame seeds. Drain the noodles, saving one cup of cooking water. Run the noodles under cold water immediately to cool. Drain again and toss through the sauce in the big bowl along with the shredded chicken. Add a splash of cooking water to make the sauce thin enough to coat the noodles with it. It will thicken as it cools.
5. You can transfer to tiffin boxes and chill if you want cold salad or re-heat in a microwave for a minute and half in case you want it hot at lunchtime.

FRIDAY DINNER:
ANDA PANEER BHURJI ROLLS

Serves: 4 Time: 15 minutes **Effort:** Super Easy
Nutrition Per Serving: 498 kcal **Protein:** 19g

Dinners become complicated by the end of the week. Fridays are perfect playdays to experiment with delicious, protein-packed Indian dinners. When cooking becomes a chore, families, especially children rant for exciting food to begin their long weekend, time saving and high protein fast food replicas are the way to go.

INGREDIENTS

- 4-6 Free range eggs
- 200gms Paneer, crumbled
- 1 Onion, finely chopped
- 2 Tomatoes, coarsely chopped
- 1 Tsp. cumin seeds
- 1 Tsp. ginger garlic paste
- ½ Tsp. turmeric powder
- 2 Green chillies, chopped
- ½ Tsp. garam masala
- 2 Tbsp. vegetable oil
- Salt to taste
- A bunch of fresh coriander leaves, chopped for garnish
- 4-6 Hand rolled wholewheat rotis

METHOD

1. Heat oil in a pan and add cumin seeds. Once they splutter, add chopped onions and sauté until golden brown. Add ginger-garlic paste and cook for a minute. Then, add the chopped tomatoes and cook until it turns soft.
2. Beat eggs in a bowl, you may add a splash of water and milk, add them to the pan. Stir well and cook until the eggs are scrambled.
3. Once eggs are cooking, add the crumbled paneer, turmeric powder, garam masala and salt. Mix everything well and cook for a few minutes, before adding chopped green chillies and coriander leaves and switch off the heat.
4. For seasonal variation add vegetables like capsicum, fresh peas. Also for creamy consistency you can add 2 Tbsp. of fresh cream or milk.
5. Lay a roti and spoon out a generous layer of egg paneer bhurji as filling, before rolling the bread and sealing it with butter paper. Serve hot and see your family smile!

Venworld®
THE BEST IN ANIMAL HEALTHCARE

VH NBD GUARD

VACCINE THAT SHIELDS

NEWCASTLE DISEASE AND INFECTIOUS BURSAL DISEASE VACCINE INACTIVATED

(1000 Doses/200ml)

Highlights

- Protection against indigenous genotypes of ND
- Protection against very virulent pathotypes of IBD
- Full antigen dose in low volume
- Helps developing age resistance against certain immuno suppressive diseases (CAV, IBH)
- Low volume with full antigen ensures complete immunity
- Provides high & uniform level of antibodies that persist for longer periods

VENTRI BIOLOGICALS
(Vaccine Division of VHPL)
'Venkateshwara House', S. No. 114/A/2, Pune Sinhagad Road, Pune 411030. **Tel.:** +91 (020) 24251803, **Fax:** +91-20-24251060 / 24251077.
VENTRI
Email: ventri.biologicals@venkys.com
www.venkys.com

SEN

Touching Lives

Celebrating 75 Years of Excellence in Poultry Industry

Sen Group, one of Eastern India's oldest and most trusted poultry house, has been a cornerstone of the industry for 75 years. As a pioneering value-driven organization, the Group encompasses poultry farming and Integrator farming, feed manufacturing, and breeder farming with day-old chicks production. Committed to excellence and social empowerment, Sen Group supports local farmers, provides employment, and ensures trust and quality through superior products and ethical practices. By fostering rural development through sustainable farming and community initiatives, Sen Group has been your trusted partner since 1950.

75 SEN SINCE 1950

West Bengal | Bihar | Uttar Pradesh | Jharkhand

Chhattisgarh | North East | Madhya Pradesh

SEN FEEDS | SEN BROTHERS PVT LTD | URBAN HI BREED FARM LTD

HI BREED AVIAN RESEARCH & INTERGRATORS | HI BREED INTERNATIONAL SALES & SERVICE

22 R.N. Mukherjee Road, Kolkata - 700001

www.senindia.co.in mail@senindia.co.in (033)40070525

ew | nutrition

ventar D

Powering gut health

Higher body weight

Improved feed efficiency

Better livability

Reliable performance improvements in all field conditions

Functional Innovations backed by Science

ew-nutrition.com