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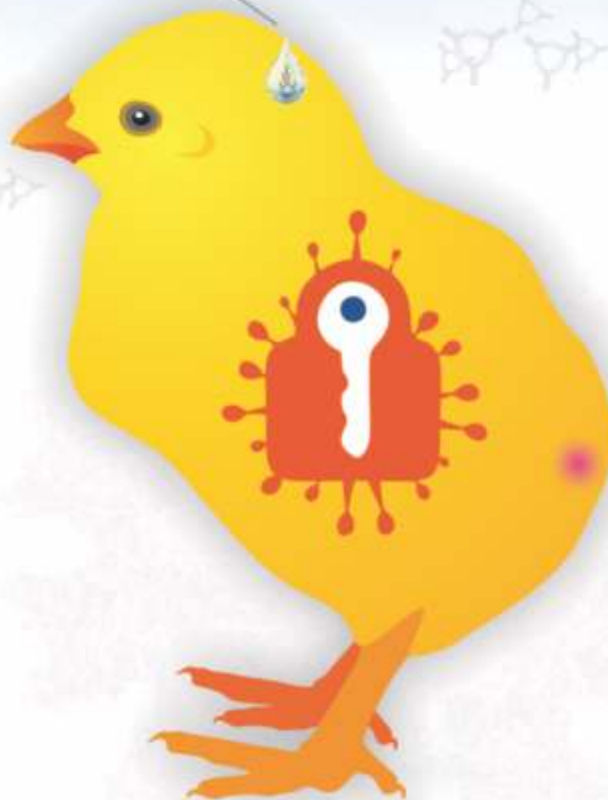
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From the Editor's Desk



Biosecurity Measures in Poultry Farm

Poultry farming is a successful industry. It does, however, come with some risks. The disease is one of the biggest dangers to poultry farms. Diseases can result in significant production losses and even death. Chickens are susceptible to numerous different diseases. Salmonella, coccidiosis, infectious bronchitis, Newcastle disease, and avian influenza are a few of these ailments. A highly pathogenic, contagious disease organism introduced into poultry flocks could have serious economic consequences for producers.

The best way to safeguard your flock is to prevent disease. Always keep your birds stress-free, and make sure their surroundings are secure and sanitary. Please get in touch with your veterinarian right away if you experience any illness symptoms. Feed your birds a balanced diet that includes protein, vitamins, and minerals.

Vaccination is another method of disease prevention that is given to your birds at various times throughout the year. This helps them develop immunity to certain diseases.

The reduction of disease risks and enhancement of bird health and productivity are made possible by bio-security. By lowering disease risk to the barest minimum, poultry production can be made as efficient and profitable as possible. Strict bio-security measures, in addition to vaccination, are used to control some contagious poultry diseases, as vaccination alone is insufficient to control diseases in the field. According to some studies, 90% of diseases are spread from farm to farm via contaminated people, poultry farm equipment, and farm vehicles.

While any level of bio-security is beneficial, the program will be more effective as a whole if all poultry producers in a given area use best management practices, which will help reduce the possibility of contracting a disease and the spread of disease in the event of an outbreak.

OUR TEAM

Bhavana Gupta

Editor-in-Chief
editor@pixie.co.in

Siddhi Gupta

Co-Editor
siddhi@pixie.co.in

Kudiarasu J

General Manager- Sales & Marketing
kudiarasuj@pixieexpomedia.com
M: 74199 93009

Priyanka Patlan

Co-Editor
editor.pcs@gmail.com
M: 999 170 5007

Prince

Graphic Designer
M: 9467147541

MANAGEMENT TEAM

Vishal Rai Gupta

Managing Director
vishal@pixie.co.in

Parth Rai Gupta

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Biosecurity as an Economic Security



Vishal Yadav^{1*} and Shivali Khandelwal²

1M.V.Sc. Scholar, Department of Veterinary Gynaecology and Obstetrics College of Veterinary and Animal Science, Bikaner Rajasthan University of Veterinary and Animal Sciences, Bikaner (RAJUVAS - Bikaner), Rajasthan – 334001, India

**Corresponding author:*

Vishal Yadav (M.V.Sc. Scholar), email: vishalyadav1131997@gmail.com

Impact of Diseases in Poultry Industry

In poultry industry, at least 8 to 12% of the total production cost is accounted by the disease and the total cost of specific diseases outbreak is very shocking. As we can learn from past that,

1. Avian Influenza outbreak in May 2000, in Italy costed approximately 210 million Euros and led to the death of more than 15 million birds.
2. Newcastle Disease outbreak in USA severely affected the economy and raised the prices of eggs and poultry.
3. Avian botulism killed over 20,000 birds in and around Rajasthan's Sambhar Lake, India.

Economic Challenges in Poultry Industry

The most challenging task in livestock and poultry industry is to recognize whether the disease is clinical or apparent. The major economic impact of disease is associated with subclinical and apparent form which most often remains hidden. To overcome the direct and indirect impact of disease is the major challenge for the poultry industry, nowadays. Basically, poultry farmers have two choices, first to produce more birds at the same price, second to produce the same

amount of birds at minimum price. The second option seems to be more beneficial financially because generating more at the same price overloads the market which causes downfall of margins and prices, on the other hand, generating the same number of birds at minimized cost maintain the prices with more profit.

Biosecurity and its Value

High efficiency is considered as a key element to produce the same number of birds at reduced prices and the most important limiting factor to high efficiency and better performance is disease. Hence, to raise the efficiency one should have to limit the disease. Biosecurity is considered as the most efficient method to protect against disease, especially for modern poultry farms (except diseases originated from the farm ecosystem). Biosecurity is a key to successful and profitable poultry farming. Birds in farm are under constant challenge from disease. Diseases may owe their origin from various sources



Fig.1 Triangle of Disease Control Methods



Balance is Important



- Prevention from the heat stress
- Maintain Optimum dEB
- Promote growth & development
- Protect dehydration & stress
- Heat stress makes birds more susceptible to
 - Coccidiosis
 - Mycotoxicosis Disease etc.

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like viruses, bacteria or fungi, and also it may spread through mechanical vectors which act as carriers. These include the birds themselves, workers and bird handlers, fomites, contaminated food and water, the housing and equipment and also the air inside. The critical key to successful disease control is to break this cycle of infection and transmission.

Disease Control Elements

Vaccination and medication can only treat and prevent diseases but, in isolation, cannot prevent losses due to diseases. Modern farming methods demand an all-encompassing holistic approach. Until and unless the background challenge from disease organism is regulated and good management practices effectively followed, vaccination and medication alone cannot adequately protect the stock. Birds must be given an ecosystem in which diseases and infections are controlled in such a way that vaccination and medication can achieve maximum positive effects.

Hence, in the triangle of disease control methods (Fig.1) biosecurity is considered as a major aspect. In protecting the health of the birds, each side of the triangle is important but also interdependent with the other two sides.

What is Biosecurity Assurance System (BAS)?

On the basis of Hazard Analysis and Critical Control Points (HACCP), governments are adopting an approach to food safety. Antec International's Biosecurity Assurance System (BAS) is not only entirely consistent with these principles but was developed significantly in advance of formal legislation. The trials conducted concluded a large beneficial effect of BAS on business in their results. Even taking into account the extra costs spent on Biosecurity Assurance System, the significant reduction in veterinary costs (an almost 50% reduction in overall veterinary bills was seen) together with large increases in egg production and feed efficiency

as a result of Biosecurity Assurance System resulted in an excellent cost/benefit ratio of 1:49. So, correct biosecurity is an input/output, cost-effective approach.

Economic Benefits of Biosecurity

As we know "the prevention is better than cure", biosecurity is a vital ingredient to control diseases in a best possible manner. Biosecurity system minimizes disease costs and outputs more profits and hence considered important and need of time for the poultry industry to grow and serve. The investment in establishing a biosecurity system is small as compared to economic and financial profit.

Conclusion

The diseases show a major impact on production cost in poultry industry and it's not new, as we had seen that there had been outbreaks in the history of the world which had broken even the economy of a country. Diseases directly and indirectly affect the economy of poultry industry. Biosecurity is considered as a key element and most efficient method to protect against diseases. Biosecurity occupies a central and main role in disease control triangle. Biosecurity Assurance System (BAS) by Antec International is based on Hazard Analysis and Critical Control Points (HACCP). There are economic and financial benefits associated with use of biosecurity. Hence, biosecurity can be considered as an economic security.



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Hen Reproduction



¹Akanksha Gupta, ²Shubham Thakur
³Krishna Nand Bansal ⁴Usha Yadav

¹Ph.d scholar Department of Dairy Cattle Physiology, National Dairy Research Institute Karnal, 132001., ² Ph.d Scholar Department of Animal Nutrition, ³ M.V. Sc Scholar, Department of Veterinary Gynecology and Obstetrics, Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar, 125004. ⁴ M.V. Sc Scholar, Department of Veterinary Gynecology and Obstetrics, Rajasthan University of Veterinary and Animal Sciences, Bikaner, Rajasthan, 334001

Embryonic development of the reproductive system

In contrast to the situation in mammals, the sex chromosomes in male birds are ZZ (homozygous) compared to ZW (heterozygous) in females. In males, the two testes are internal and accessory organs such as the prostate and seminal vesicles are absent. The testes develop due to gene dosing with increased expression of the Z-linked transcription factor gene, doublesex and mab-3-related transcription factor 1 (DMRT1). Anti-Müllerian hormone (AMH) is synthesized and secreted by the embryonic testis with greater expression in the embryonic testes than the ovaries. AMH directs the regression of the paired Müllerian ducts.

In females, only the left ovary and oviduct develop in all avian species and closely related dinosaurs; the latter based on fossil evidence from the early Cretaceous period. The avian oviduct is derived from the embryonic Müllerian duct; the former term encompassing the entire reproductive tract from infundibulum to the cloaca. Regression of the right oviduct is induced by AMH. Parenthetically, AMH also plays an important role in development of tubules in the testes. The embryonic female gonad expresses the rate-limiting enzyme for the production of estrogens, aromatase (CYP19A1) but expression is not found in the embryonic male gonads. In turn, the estrogens, such as estradiol, induce growth of the oviduct.

Egg development

The egg is comprised of the yolk, yolk membranes, egg white, shell membranes and finally the egg shell. Each of these components are developed along specific regions of the female reproductive tract together with the ovary.

Yolk

The egg yolk is a mature ovum (oocyte) that is produced by the ovary. The maturation of the ovum involves multiple processes including deposition of proteins/lipids. Yolk protein/lipoproteins/phosphoproteins were assigned to three categories based on

centrifugation of diluted yolk:

- Low-density fraction with a very high lipid composition
- Granules composed of heavy and light chain lipovitellins, phosvitin and a yolk glycoprotein.

Soluble proteins.

The soluble proteins consist of the following:

- α livetins (serum albumen)
- β livetins (serum α 2-globulin containing transport proteins)
- γ livetins (serum γ -globulin predominantly immunoglobulin Y).

Egg yolk livetins (α , β , and γ -livetins) have recently been shown to exert anti-inflammatory properties.

Yolk precursors: Yolk precursors are synthesized in the liver. Two major yolk precursors are very-low-density lipoprotein (VLDL) and vitellogenin. Very-low-density lipoprotein (VLDL) has the following characteristics:

- Globular micelle-like
- Non-polar core of triglycerides and cholesterol esters
- Coated with amphiphilic mix of phospholipid, free cholesterol (FC) and two apolipoproteins. Chicken vitellogenin has been purified from plasma of estrogen-treated adult male chickens. It is a dimer with a molecular weight 480,000. It is a dimer composed of two polypeptide monomers each with a molecular weight of about 170,000. There are about 220–235 phosphate moieties per monomer vitellogenin and the lipid component is about 20%. Hepatic expression of vitellogenin is induced by estrogens.

Yolk deposition: A specific receptor is responsible for transfer of vitellogenin and very-low-density lipoprotein (VLDL) across the oocyte plasma membrane to fill the oocyte with yolk. Within the oocyte, vitellogenin is cleaved proteolytically to form the yolk proteins, heavy and light chain lipovitellin (20% lipid), phosvitin and a yolk glycoprotein. These are incorporated into yolk granules. Deposition of γ livetins is very



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high in small follicles <200 mg, but decreases during development of large follicles. For the last four days of development of the follicles, yolk is being deposited at 2.5 cm³ or greater per day.

Once the ovum (egg yolk) has matured, ovulation is stimulated by the pituitary hormone, luteinizing hormone (LH). An extensive explanation of hormonal control of female reproduction follows. If ovulation is successful the ovum is normally received into the infundibulum.

Egg white

The egg white or albumin of the egg is produced by the magnum of the oviduct. The magnum is the longest section of the oviduct where the ovum spends approximately 4 h accumulating egg white proteins.

Among the constituents of egg white are the following proteins:

- Ovalbumen - 50% of egg white proteins
- Ovotransferrin (conalbumen) 12% (this chelates metal ions particularly iron)
- Ovomuroid -11%
- Lysozyme -3.5%
- Ovomucin 1–3%
- Avidin 0.05%.

Antimicrobial peptides and proteins are present in the egg white and include the following:

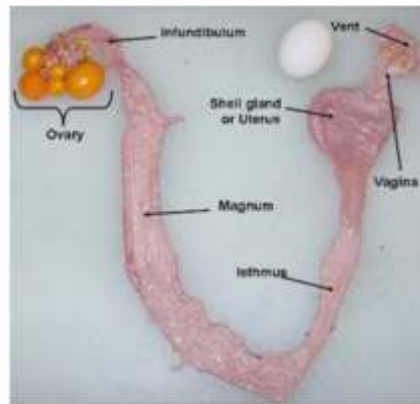
- Gallin or ovodefensin
- β -defensin 11
- Cathelicidin
- Cystatin - a cysteine protease inhibitor
- Lysozyme - a bacteriolytic enzyme
- Ovoinhibitor.

Eggshell membranes

Following albumin deposition and addition of water ("plumping fluid") to the developing egg, the eggshell membrane is added in the isthmus; this taking approximately 1 h. The eggshell membranes are 93% protein contains proteins including collagens, ovoalbumin, bacteriolytic enzymes such as ovotransferrin and lysozyme together with clusterin peptides and ovodefensins/defensins such as gallin. These are also glycosaminoglycans including galactosaminoglycan.

Egg shell

The formation of the egg shell in the uterus/shell gland is the final yet it is of longest in duration taking approximately 19 h. This is due to the extensive structure of the shell. The egg shell is 97% inorganic (calcium carbonate). Of the remaining 3% (the decalcified egg shell) is 79% protein with the matrix phosphoproteins including the following: ovocleidin-17, ovocleidin-116, ovocalyxin-32 and osteopontin. The fully formed egg is retained in the shell gland just distal to the vagina of the oviduct until oviposition.



Reproductive tract of hen (Image by Dr. Jacquie Jacob, University of Kentucky)

Hormonal control of reproduction

Hormones are critically important to the optimal functioning of the gonads, the photoperiodic stimulation of reproduction, sexual and maternal behavior and induced molting.

Pituitary gland and reproduction:

The gonads are controlled by the anterior pituitary hormones, LH and follicle stimulating hormone (FSH). These gonadotropins play a critical role in the development and maintenance of the gonads. FSH increases proliferation of granulosa cells, expression of both steroidogenic acute regulator (StAR) and inhibin α genes in granulosa cells, and release of progesterone with the effect progressively greater with tissue from larger follicles. In addition, prolactin can exert an inhibitory effect on the chicken ovary.

Hypothalamic control of gonadotropin release: There are two gonadotropin releasing hormones (GnRHs) in the chicken (cGnRH-I and cGnRH-II) and two receptors for GnRH

(cGnRHR1 and cGnRHR3). GnRH-II is much more potent than GnRH-I in hens in stimulating LH release by 36 fold. However, GnRH-II is not detected in the median eminence. There is high expression of GnRHR3 in the pituitary gland. Therefore, the releasing hormone for LH is chicken GnRH-I and the receptor is cGnRHR3.

Chicken gonadotropin-inhibitory hormone (GnIH) is a peptide with 12-amino-acids. While GnIH inhibits both the synthesis and the release of gonadotropins in chickens, the physiological relevance of GnIH still requires clarification.

The ovary produces the following:

- Estrogens, primarily estradiol. Estrogens induce the following: development of the oviduct, production of yolk precursors (VLDL and vitellogenin) (see above) by the liver, production of egg white proteins by the oviduct and, with androgens, formation of medullary bone (a labile source of calcium). In addition, estrogens allow the expression of female behaviors and moderate the release of luteinizing hormone (LH).
- Progesterone. Among its roles are stimulating the production of a specific egg white protein (avidin) and stimulating the release of LH.
- Androgens, predominantly testosterone. Androgens are essential to the development of medullary bone.

Ovarian hormones and growth factors also play critical roles in follicular development. For instance, activin A increases the expression of both FSH and LH receptors but decreases cell proliferation of granulosa cells. Moreover, the development of small follicles is suppressed by epidermal growth factor receptor ligands such as transforming growth factor α . In contrast, bone morphogenetic protein 6 enhanced responsiveness to FSH.

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photoperiod in the temperate zone. Egg production increases markedly after the winter solstice and declines beginning prior to the autumnal equinox. The physiological basis of this annual cycle is photoperiodic stimulation of reproduction by long daylengths; these inducing the development of functioning gonads. Red light is detected by photopigments in the hypothalamus, with the most important photoreceptor influencing the hypothalamic release of GnRH-I being red opsin. The photoperiodic mechanism involves light coinciding temporarily with the light-sensitive (photo-sensitive) phase of a circadian rhythm. This leads to the release of GnRH-I, synthesis and secretion of LH and FSH and, hence, gonadal resurgence.

Chickens Pullets are reared under short daylengths (6L:18D or 8L:16D). They are transferred to longer daylengths (12L:12D) at breed-specific physiological ages so stimulate gonadal development. In studies where pullets were transferred to daylengths of 10L:14D or 11L:13D, plasma concentrations of LH did not increase, but marked increases in plasma concentrations of LH daylengths were observed with daylengths 13L:11D or greater. Perhaps surprisingly, daylengths were interpreted differently depending on the previous photoperiod. Transfer of pullets from photoperiods of either 4L:20D or 20L:4D to 12L:12D were followed by, respectively increases and decreases in plasma concentrations of LH. Thus, the same photoperiod can be interpreted as either photostimulatory or photoinhibitory.

Photorefractoriness and reproduction

Photorefractoriness is the loss of the ability to respond to the stimulatory effects of long photoperiods. Photorefractoriness can be "broken" by re-exposure to short day-lengths. This is seen in turkeys with prolonged exposure to long day-lengths with the signs of photorefractoriness being decreased egg production and molting. The decline in egg production during the production cycle of chickens might also be attributed to photorefractoriness.

Indeed, there is greater sensitivity of older hens to reduced daylength with an over 90% decrease in egg production in 105 weeks old hens compared to a 26% decline in 28 weeks old hens. Moreover, plasma concentrations of LH were only decreased in the older hens.

Light intensity and poultry reproduction

While, light intensities greater than 1 lux are required for photoperiodic induction of egg production, considerably higher light intensities are employed in commercial poultry production. For instance, in broiler breeders, light intensity is increased from before photostimulation about 6 lux in the pullet phase to >50 lux after photostimulation at 21 or 22 weeks of age.

Other effects of light intensity: Light intensity has other effects. For instance, increasing light intensity in immature pullets is associated with increased plasma concentrations of FSH. Moreover, the ability of a short pulse of light to photo stimulate chickens is influenced by light intensity. In addition, the ratio of the light intensity during the subjective day to that during the subjective night is important in entraining the rhythm of oviposition.

Nutrition and reproductive management

In poultry, nutrition is integrally linked to the hypothalamo-pituitary-gonadal axis. It has been known for 50 years that egg production in hens stops quickly following fasting. The administration of mammalian or avian gonadotropin restores, albeit partially, egg production in starved hens; this suggesting that underlying cause is the lack of pre-ovulatory LH surges. Fasting is followed rapidly by decreases in plasma concentrations of LH, body weight together with precipitous declines in ovarian and oviductal weights. Similarly, production of eggs and plasma concentrations of LH decrease quickly after reducing calcium or sodium in the diet of hens. In young chickens, protein deficiency also has been demonstrated to rapidly cause atrophy of gonads, decrease

circulating concentrations of LH and depress responsiveness to GnRH.

Induced molting or re-cycling to increase egg production


Hens can be induced (or forced) to molting at the end of their laying cycle resulting in improved egg production at a lower cost than using replacement pullets. In the USA, 19.7 % of laying hens are molted (re-cycled) each month. This process can involve severe nutritional restriction including starvation and/or withholding water and/or reduction in photoperiod. Alternate methods of induced molting include an extremely high zinc diet (20,000 ppm) followed by a conventional layer feed beginning at day 12 and sodium/chloride-deficient diets. The terms, forced or induced molt, are open to question as it presumes that molting (loss of feathers) causes rejuvenation of reproduction performance. Molting occurs after resumption of normal feeding and is temporally shifted from ovarian recrudescence. When feed is withdrawn for 8 days and water withdraws for 2 days, egg production had completely ceased by 6 days. Molting occurred after the resumption of feeding and there were concomitant increases in circulating concentrations of T3 and corticosterone. Circulating concentrations of LH, estradiol (E2) and progesterone were lower in molting hens than in laying hens or fully recycled hens. The physiological mechanism underlying induced molting included decreased release of GnRH from the median eminence and consequently lack of the pre-ovulatory LH surge. Ovulation completely ceased with 4 days of feed withdrawal. Plasma concentrations of LH and progesterone were decreased with 2 days of feed withdrawal. The GnRH content of the median eminence was similarly decreased but not until 4 days of feed withdrawal. There are also decreases in the number of gonadotropes expressing LH. Oviductal regression occurs due to lack of estrogens and is accompanied by increased expression of peptidases with, for example, expression of the peptidase, cathepsin L.

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Food Safety Risks & Their Control Strategies in Poultry Production



Dr. Himani Ravi

M.V.Sc Scholar, Department of Veterinary Microbiology, DGCN College of Veterinary & Animal Sciences, CSK Himachal Pradesh Krishi Vishvavidyalaya, Palampur (H.P) 176062
Corresponding author
mail id – himani111296@gmail.com

Introduction

Food safety is a key topic when it comes to commercial poultry production and over recent years this topic has quickly established itself. Food safety is concerned with the hazards which may be associated with poultry meat, eggs and other products which form part of the human diet. Food safety is not a discovery of recent times, it is a natural basic instinct of human survival. Food safety and quality of food are currently big issues of major concern in developed countries. In developing countries, however, efforts to produce sufficient food to meet the requirements of population increases, accompanied with bad economic situations often overshadow the need to ensure safe food products. Regardless, safe food is a fundamental requirement for all consumers rich or poor. Food should not be a health hazard either immediately after consumption or later. Food borne hazards may be of physical or chemical origin, but there is currently recognition that microbial food borne hazards are considered the greatest risk to consumers. Incidents of food borne diseases have increased considerably in the last few years world-wide. Although the source of infection is mostly unknown, poultry products have repeatedly been implicated as a source of food borne pathogens for humans. Food borne infections are mostly associated with diarrhoea in children, old as well as immune compromised persons with mortality. Hazards can be introduced either during the rearing, transport, processing, packaging, storage, distribution or preparation for consumption of the poultry products. Food borne infections are tremendously increasing due to inadequate health and bio-safety measures. As poultry producers are searching for tools to combat Salmonella in their birds and manage food safety risks. Not only

Salmonella, Campylobacter species is also in its way causing a massive destruction to the poultry production and leads to severe health problems in humans. Both Salmonella and Campylobacter infections are major concerns these days. The complete eradication of Salmonella from poultry production is an incredibly difficult task. Implementation of combination of strategies including proper management, bio security, vaccination protocols, nutritional feed additives are step in the right direction. Moreover, due to drug resistance to both Salmonella and Campylobacter species, researchers and scientists are actively finding additional tools & measures to assist in managing food safety risks.



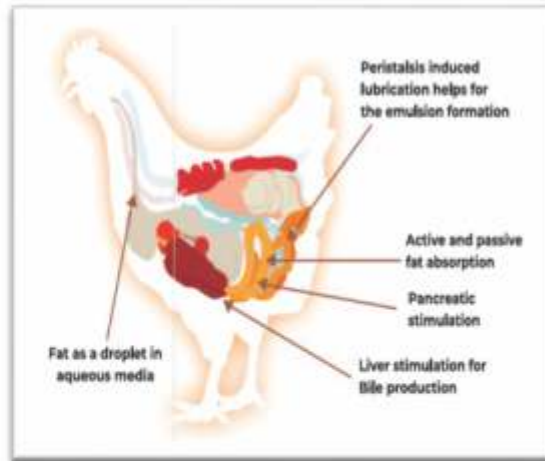
Food-Borne Pathogens

Poultry can harbour different food borne pathogens. Mainly Salmonella and Campylobacter are the most common causes of food borne bacterial diseases in humans linked to poultry. Recently, verotoxin producing Escherichia coli O157:H7 (VTEC) has surfaced as an additional food borne pathogen causing human illness. Several other microorganisms such as Clostridium, Aeromonas and Listeria can also enter the human food chain via contaminated poultry carcass. Information is limited regarding the incidence and number of other pathogens associated with raw poultry which might become a greater problem in the future such as Yersinia and Bacillus. In addition, the



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development of antibiotic resistance in bacteria which are common in both animals and humans is also emerging public health hazard. Infected birds move unrecognized to slaughter houses and considered as potential sources for food borne infection in human. To combat this problem strict actions should be taken like bio security measures to inhibit growth for each microbe and to prevent antibiotics resistance issues as soon as possible.

Strict Bio-security Measures to be Implemented

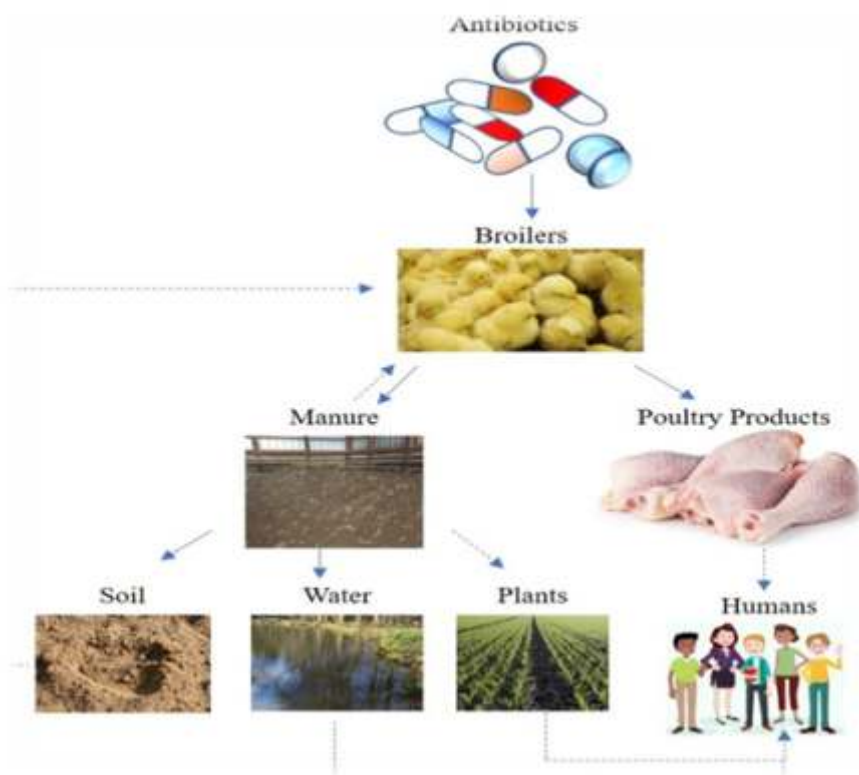
The most common species that are found mainly in chicken & turkey are Salmonella Gallinarum and Salmonella Pullorum. The most important source of Salmonella infection in poultry appears to be vertical transmission through infected eggs laid by infected carriers. Lateral spread of infection take place through contaminated feed, water, equipment and environment. Significant reservoirs for microorganisms are man, farm animals, pets, pigeons, water fowl and wild birds. Implementing a good bio-security is key in preventing the infections from outside getting into the farm. **Humans are the main carrier and source of typhoid infection so to prevent it these steps should be taken:**

- Restrict access to farm & flocks
- Limit the number of people in contact with birds.
- Sanitization facilities should be there.
- Proper security fencing to prevent stray dogs to enter the farm.
- There should be proper rodents and pest control schemes. Traps should be monitored daily.
- Effective bio-security and cleanliness go hand in hand.
- Clean and disinfect thoroughly between batches of birds,
- Replace bedding so as to prevent marek's disease & avian influenza that can survive for longer duration in beddings.
- Equipment like drinkers & feeders should be washed properly to prevent any kind of fungal infections.
- Isolation of new flock of birds before bringing them into the existing flock.
- Water supply should be free from pathogens and chlorinated.

- There should be batch method of rearing so that if there is any outbreak or any spread of infection that will not lead to destruction of whole slot.
- Proper vaccination should be there.

Zoonotic bacteria like Salmonella and Campylobacter.

Fluoroquinolones like Ciprofloxacin and Enrofloxacin is mainly used to combat these infections. Resistance to

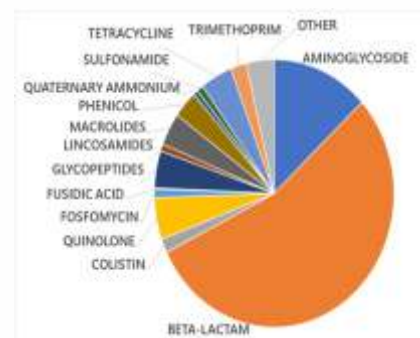


The main challenge is the fact that Avian diseases can be hard to properly diagnose. Thus, in order to monitor the flock, there should be proper data of water and feed intake, the mortality and production on the daily basis.

Antimicrobial Resistance

For several decades, the contribution of the food animal as a reservoir of antimicrobial resistance with impacts on human health has been controversial. Antimicrobial resistance (AMR) remains a growing threat for human and animal health, lessening the ability to treat bacterial infections and furthering the risk associated with morbidity and mortality caused by resistant bacteria. Ensuring the effectiveness of antimicrobials to treat bacterial infections remains a pressing issue for both veterinary and human medicine. Mainly non typhoidal Salmonella is considered to be the most dangerous when comes to human health. Regular use of antibiotics with modern intensives food-animal/poultry production has been considered the main driver for the development of antibiotic resistance in

fluoroquinolones requires only one point mutations in gyrA gene and resistance has increased rapidly among chicken and human Campylobacter isolates. Since, resistance to older drugs like ampicillin, chloramphenicol has been increasing so treatment options for Salmonellosis & Campylobacteriosis switched to fluoroquinolones. However, this is also showing resistance leading to increased severity, morbidity and mortality. Extended spectrum β lactamases has also been one of the leading problems these days. So to prevent further tremendous use of antibiotics we should be more focused on the biosecurity measures and farm management. As



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Antibiotic resistance ratio

Preventive measures

1. Proper hygiene during slaughter and proper washing and chilling of carcass decreases the chances of food borne infection.
2. The final consumer risk can be reduced by preventing cross contamination of ready to eat foods from cutting boards, knives and hands during food preparation as well as cook at temperature that kills the micro-organisms.
3. As farm is the preliminary site of Salmonella & Campylobacter entry into the production, the major intervention strategies should be targeted at farm levels i.e. biosecurity measures.
4. The farmers must be educated enough to implement the biosafety measures properly and effectively.

Future approach

Future efforts include: prevention of infection in live birds, development of monitoring programmes and rapid detection methods. On long-term approach, the development of breeds that are genetically resistant to colonisation by food borne pathogens should be progressed. In addition, further methods to prevent contamination and cross contamination during processing by further improvement of machine and techniques must be continue. Since the success of any safe food program on the farm and processing plant depends on personal sanitation, it is essential to incorporate education programs about microorganisms, modes of transmission as well as awareness of the reasons behind such control programs by all people involved throughout the poultry production chain. The weakest

point in establishing good sanitary procedures in poultry production is poor training of employees. So, proper training should be given to the workers. In the farm-to-fork concept, post processing food handling is very important in reduction of food borne infections. Proper cooking should destroy the microorganisms present on the poultry carcass. Cross-contamination of the foods which are not to be cooked contributes to the problems arising from unsafe food handling. Effective education programs must also be implemented to increase public awareness and the necessary measures to be taken for protection against microbial contamination in food products. Finally, development and application of acceptable methods for end-product decontamination and preservation must be progressed and/or re-evaluated.

Conclusion

It is evident that majority of infections can be attributed to poultry. Human Campylobacteriosis and Salmonellosis has been increasing in the past decades and poultry has been identified as the major contributor. Colonization of poultry occurs at farm levels where it is necessary to focus on enhancing the biosecurity and implementing it properly as whole world has come to realize the importance of biosecurity and quarantine during COVID 19 pandemic. And main area of concern is antibiotic resistance to the infection. So, the time has come to implement it strictly in farms to avoid any chance of outbreak of zoonotic diseases and thus, proper management and biosecurity measures play a beneficial role for healthy and safe meat production that will promote better health & overall the better growth of poultry industry.

Types of On-Farm Interventions

Pre-harvest, or on-farm, interventions fall into three general categories and include products (such as vaccines for animals) and management practices on farms and feedlots. By various means, these measures reduce the risk of microbial contamination of food animals, and the meat and poultry products derived from them, as well as the public health risk of foodborne infections.



Procommensal strategies indirectly inhibit the pathogen by favoring competition with nonpathogenic bacteria. Examples are probiotics and prebiotics in animal feed.



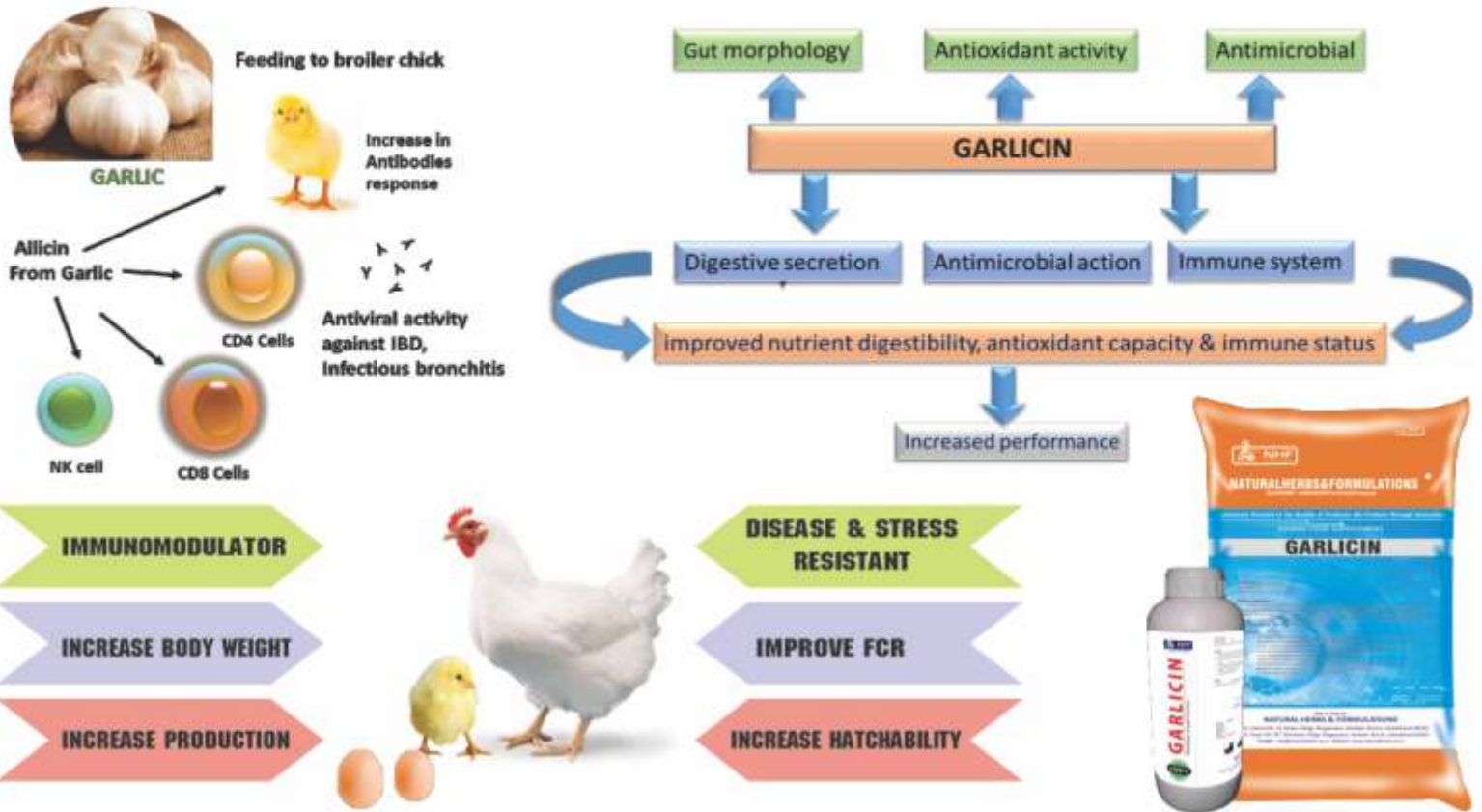
Anti-pathogenic strategies work through direct interaction with the pathogen or by priming the animal's immune response to fight it. Examples are vaccines, antimicrobials, sodium chlorate, and essential oils.



Exposure-reduction strategies decrease the risk that pathogens will be introduced or spread within the herd or flock by animals or people. Examples are biosecurity protocols that decontaminate workers' clothes and tools; limiting access of vermin, insects, and farm personnel to animal housing; feed and water hygiene; isolation of infected animals; and adequate housing.

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Dr. Suman Soni

Regional Agmark Laboratory
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Eggs are a good source of high-quality protein, fats, vitamins, minerals, and trace elements. Eggs contain all nutrition that is essential for the development of a chick. It also can be called super food present on the planet. It's a myth that an egg is a non-vegan product. Milk is synthesized from udder glands, utilizing nutrition from animal tissue. One egg is also produced by utilizing animal tissue. One who does not have an objection to drinking milk should not have an objection to eating eggs. Some vegan people think eggs have a life so should not be consumed. The eggs produced for consumption are lifeless and cannot be grown in a chick. The eggs are available on market at cheap rates when nutritional content is compared with other products. In India, malnutrition will subside in a short time if poor people start including eggs in their diet. Only one egg provides 80Kcal, vitamin A, D, and minerals like iron, and phosphorus in a good amount that is more than milk and other protein products on a weight and price basis. The egg protein contains all the essential amino acid that is needed for complete protein. Therefore, when the quality of protein is evaluated for any product the egg protein is taken as a standard. The egg is a source of protein and is available at an affordable price. Therefore, an egg should be utilized in such a way that it is available to all sections of society. The summer and humid season is the peak season of egg production. The shelf life of an egg is very short. The

most nutritious food also seems too sweet for microorganisms. Therefore, deteriorated quickly if attached to the invasion of microorganisms. The shell of the egg is a natural protection of its content, but sometimes it may get cracked or highly contaminated and microorganisms get a way to invade and spoil its nutritional quality. Moreover, the eggs in their peak season can be converted into different products. Even the shell of eggs can also be utilized.

Egg Quality- the egg quality does not depend on the color and size of the egg. The color and size of the egg depend on the breed of hen. The egg quality depends upon several factors given below.

1. External factors- the external factors mainly depend on the condition of the eggshell. The extremely dirty shell with a high microbial load, lower its shelf life.
2. Internal factors- the egg quality deteriorates as given below
 - As the size of air-cell increases
 - Egg albumin becomes thinner
 - Egg yolk tends to drift off from the central position
 - Egg yolk should be free from blood spots, embryonic development, and mold growth.

The egg quality can be evaluated at home by dropping them in water, if the egg sinks then the egg is considered good. Upon breaking the egg, the quality can be evaluated with the egg albumin and yolk index. The yolk should be centered and





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holds its position. Commercially, the egg quality is evaluated by candling. In candling, the egg is held up in a light source in a dark room and is viewed in silhouette while rotating. The candling reveals the crack in the eggshell, size of the air cell, firmness of egg albumin, position and mobility of yolk, and presence of foreign substances. Moreover, the grading of eggs is done, based on size and quality which are independent of each other.

Egg Products

The shelf life of eggs can be increased several times by making different products from the egg in its peak season.

1. Egg powder- egg powder is produced by spray drying and keeps best when the moisture content is low. Therefore, it should be stored in an airtight container below 50C. Egg powder shows objectionable changes in color, flavor, odor, and solubility if storage temperature exceeds 50C. it can be used in the preparation of different types of recipes.



glucose which might react with egg protein and cause undesirable browning in flakes.

3. Calcium tablet/powder- High-quality eggshell contains 27 essential micronutrients with calcium carbonates, a form/structure that is much similar to our bones and teeth.



2. Egg albumin flakes- the egg albumin flakes are prepared after the separation of egg white from the yolk. The separated egg white is further fermented with glucose oxidase to remove traces of

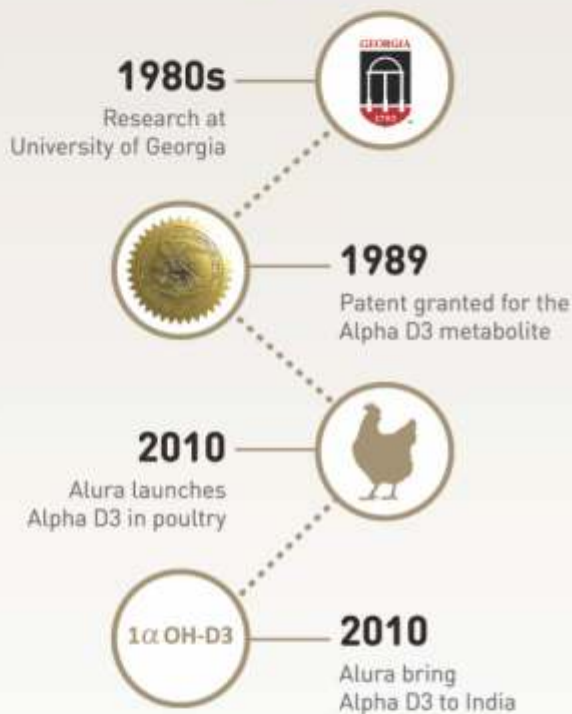
The eggshell calcium consumption shows increased bone density, less arthritic pain, and even cartilage growth.

4. Frozen egg products- these categories include egg white, egg

yolk, salted yolk, sugared yolk, salted whole yolk, sugared whole yolk, and many types of blends with or without sugar or salt. These products have a shelf life of one year under frozen conditions. These products are produced for commercial uses in the food industry.



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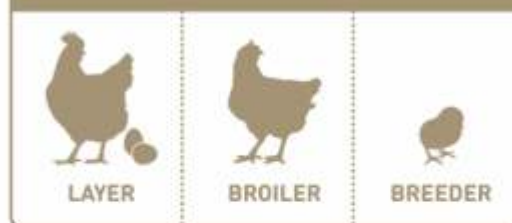
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Shivali Khandelwal^{1*} and Vishal Yadav²

¹M.V.Sc. Scholar, Department of Veterinary Microbiology and Biotechnology

²M.V.Sc. Scholar, Department of Veterinary Gynaecology and Obstetrics, College of Veterinary and Animal Science, Bikaner Rajasthan University of Veterinary and Animal Sciences, Bikaner (RAJUVAS - Bikaner), Rajasthan – 334001, India

*Corresponding author:

ShivaliKhandelwal (M.V.Sc. Scholar), email: shivalikhandelwal11@gmail.com

An Overview of Biosecurity & it's Application in Poultry Farm Disease Management

Biosecurity, which literally means safety of living things. The FAO and WOA (World Organisation for Animal Health) define biosecurity as the implementation of measures to reduce the risk of the introduction and spread of disease agents. Although ways of classifying these measures may vary, they all refer to the same basic principles of bioexclusion (i.e. preventing infectious agents from entering the farm) and biocontainment (i.e. preventing infectious agents from exiting) and were implemented via: segregation to raise barriers to infectious diseases, cleaning and disinfection.

The two principles (bioexclusion and biocontainment) of biosecurity encompasses the notions of

isolation, traffic control and sanitation, which are described below:

- (i) Isolation, which ensures no contamination of flocks through housing and personal protection equipment.
- (ii) Traffic control, which restricts the movement of products, stocks and persons.
- (iii) Sanitation which includes methods for farmers to maintain disinfection and cleanliness in flocks.

Biosecurity is the cheapest and at the same time most effective means of disease control available without, which no disease prevention programme will work well. Biosecurity is a defensive health



plan and hygienic procedure that can help to keep your farm disease free. Biosecurity is therefore one of the integrated part of farm operations. As the poultry operation becomes more and more efficient, however, they also become a threat to themselves and their neighbours and the concentration of more birds in limited space. Poultry farmers should take time to eliminate as many disease causing organisms as possible.

Classification of Biosecurity

There are three distinct types of biosecurity needed to provide the highest level of defence to your poultry farm. A three-pronged approach which provides layers of security, considers the specifics of your farm and is both enforceable and sustainable is the only way to ensure that there are no gaps in the safeguarding of your poultry, staff and livelihood.

- **Tier 1: Conceptual biosecurity:** considerations related to your farm's location.
- **Tier 2: Structural biosecurity:** considerations related to the physical design and layout of your farm and its buildings.
- **Tier 3: Procedural biosecurity:** The processes and procedures you follow during normal day-to-day operations.

A. Conceptual Biosecurity

- It is best to build farm in an isolated area, atleast three km away from nearest poultry in the case of breeder farm and 1.6 km in the case of commercial layer and broiler farm.
- In the case of breeders, the farm should be away from the major road ways that may be used to transport commercial and backyard poultry.
- Maintain enough distance between breeders and grow-out farms and facilities such as

hatcheries and feed mills.

B. Structural Biosecurity

- Fencing of farm perimeter to prevent unwanted visitors.
- Test water source for minerals, bacteria, chemical contamination and pathogen load.
- Concrete stage with suitable water and power supply for sanitation of vehicles.
- Suitable location for storage of bagged feed.
- All-weather roads within the farm to ease cleaning and to prevent spreading of microbes by vehicles and foot wear.
- Facilities for safe scientific disposal of dead birds.
- Safe housing, with suitable wild birds and rodent proofing.
- Feed, litter and equipment should be stored in a section separated from live bird area to prevent contamination.
- A three metre boundary of land around the building must be kept free of all vegetation to prevent rodent and wild life activity.

C. Operational Biosecurity

- Operation manuals should be developed for day-to-day activities carried out in feed mills, hatcheries, breeding and grow-out facilities incorporating emergency plans.
- Proper decontamination and disinfection of equipment, houses etc., following depletion of flock.

- In breeder farms, all visitors and workers require to shower and use clean farm clothes to prevent cross contamination between them.
- Maintain record for visitors and their purpose.
- In the case of breeders, no vehicles or equipment should be allowed within the farm area from the time of delivery of flock until disposal.
- In commercial broiler unit, a minimum inter flock interval of two weeks is recommended. Use an effective integrated pest management program to control pest and rodent through biological, chemical and mechanical means.
- Appropriate program of disease diagnosis and proper vaccination schedule should be implemented.
- In small scale egg production unit, follow all-in-all-out system. If it is not possible, pullets should be obtained from a source free of vertically transmitted diseases.
- Recycling of egg packing materials etc. should be decontaminated at the point of entry of farm.
- Routine disease monitoring procedures like postmortem examination and periodic serum antibody assay to determine immune status of the flock.
- Regular culling of unhealthy, unproductive and diseased birds.



O. P. Singh
 Managing Director - ABTL

CONSUMER: DRIVING CONSIDERATIONS IN ANIMAL PROTEIN PRODUCTION

All this while the focus of the animal protein industry has been to 'produce food'. The when, where and how of it weren't discussion points. The industry, has taken its time to acknowledge the changing considerations of the end user-the consumer.

The end consumers have benefitted from the consistent growth in productivity and efficiency of animal protein production, choosing to spend their disposable income on

purchase of meat and its derivatives. The consumer is also 'aware' and 'conscious' of what's happening around the world. How food choices and preferences are changing, what considerations are driving that change, so on and so forth. Slowly but certainly it was bound to influence how the Indian consumer viewed animal protein.

This has been long coming: the industry- producers, processors and marketers of animal protein, is at an inflection point where it is compelled to think beyond productivity and efficiency. And that 'beyond' is understanding the shift in cultural and market expectations for animal protein. There is a lot of lost ground to cover.

Consumer priorities : globally have undergone an important shift. During Covid many lost means to livelihood, others faced uncertainty about income and illness. In this period of heightened anxiety, post COVID, feeding their families and keeping them healthy are a higher priority. Instead of being concerned about what's in the environment that might harm the planet, the concern today revolves more around what's in the environment that might harm me or my family. It's definitely a step down from concerns associated with sustainability and so on and looking more towards survival and self preservation.

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Affordable, Healthy Nutrition : Consumers are counting on food industry innovation to provide affordable, healthy options with an eye toward immunity and how processed foods can play a new role. They are also re-thinking their opposition to "processed foods" if there is a nutritional benefit to the processing. Fortifying processed foods with vitamins and minerals may now be back in vogue as consumers look for more opportunities to enhance immune health. This is a clear win for the protein sector.



Alternative Proteins : Plant protein is evolving – it is giving meat eaters an alternative to feeling guilty about the health and environmental impacts of animal protein by providing a passable alternative that is perceived to be "better for me" and "better for the planet". 'Veg meat' options in India from producers like Greenbird, Blue Tribe, Good Dot etc are slow making inroads.

However, the initial perception of 'better for me' is now being questioned by a growing awareness that most plant-based meat alternatives are highly processed with a long list of ingredients, not to mention the added sugar. This provides an opening for animal protein producers to spotlight its nutritional attributes while continuing to innovate as well as to highlight clean labels and nutritionally dense protein.



Engagement with Gen Z and digitised information delivery : Gen Z generation of consumers embraces technology, expects innovation and demands engagement. Direct to consumer (DTC) processed food producers have a definite advantage where they can use consumer feedback to continuously improve product formulations. Giving people an impression that their voice is being heard , gives them a new reason to try a product again, even if they didn't like it the first time. This model - digital feedback loop for ongoing product innovation will create an opportunity for animal protein companies to improve their engagement and products.

Online shopping : COVID-19 is a pivot point for consumers that marks the shift of in-person supermarket shopping as the dominant retail channel to consumers buying food and meat online. Research shows consumers now spend 30 minutes or less on preparation, rely more on online shopping with delivery and/or pick-up. Technology in food shopping is here to stay. This is an opportunity for the animal protein sector to meet (or create) unmet needs through innovation. Is animal protein center of the plate, a meal stretcher or a snack? The answer is yes to all three and more. The real question is, which animal protein companies will be innovative enough to capture this opportunity.

As food producers, a key area is communication with the end consumer. And that will be possible only if there is an understanding of where the consumer is coming from.



Fresh and High Quality : Aware consumers, from their research and reading have formed a belief that the fat profile and vitamin content of organic, grass-fed or free-range products are better, hence the demand for organic eggs and dairy from grass-fed cows. They are also willing to pay a premium for this.



Ethically-Raised Animals : Consumers are concerned about how the animals are being raised at farm level. They are vocal about their expectation of improved welfare standards for food producing animals.

Plant-Based Alternative Proteins : Even in the case of consumers looking to reduce meat consumption, they have conflicting feelings about plant-based proteins. For one, its taste and another, the high level of processing involved in manufacturing of plant based protein.

Food producers need to actively work to meet consumer expectations with products that give consumers the animal protein they crave, give them assurances that they're making the right decisions for themselves and their families – that they're providing high quality, affordable protein produced in an ethical manner.

Communication is key: Food producers need to deliver a message to the consumers. For e.g. leverage “locally grown” so on and so forth. Animal protein production has to become more consumer-centric by taking feedback, and factoring it in product development will bring them closer to the consumer.

Food labels should contain information that talks about the measures food producers adopt to ensure animal well-being, environmental impact and other issues that could drive animal protein consumers to alternatives.

Essential Nutrients and Health : Egg is the cheapest protein and as such accessible to all for desired nutrient delivery. Role of animal protein in immune health has to be highlighted to drive home the point.

Engage Emerging Audiences : Develop a specific Gen Z strategy.

COVID-19 has shaped consumer attitudes regarding their food and how it's produced, shaping the future of animal protein. Consumers are clearly in the driver's seat and following their lead provides the food system with the best chance for long-term success as consumers adopt new – and perhaps long-lasting – behaviours.



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Mycoplasma: a never ending story in commercial poultry production

WOUTER DEPOND, HUVEPHARMA, BULGARIA

Mycoplasma spp., identified up to now, (*M. gallisepticum*, *M. synoviae*, *M. iowae*) have been negatively affecting commercial poultry production for many years. The poultry industry and scientific community have made great strides in increasing the knowledge of the biology of these bacteria since they were first identified, but much is still to be revealed.

Mycoplasmas are small bacteria that lack a cell wall and certain metabolic pathways, both important targets for antibiotics. This is important to remember when choosing an antibiotic for control or treatment. Mycoplasmas were often considered to have a limited survival time outside the host.

However, some recent data show that animal mycoplasma species can survive for variable time periods outside the host, depending on the species, moisture, pH, presence of organic material and temperature. Some species have been shown to survive for 50-150 days at 4 °C in liquid media and from 7-14 days under dry conditions at 30 °C. Recently *M. synoviae* was shown to survive for nine days on synthetic materials.

The presence of persistently infected populations (backyard and wild birds) ensures that the biosecurity of surrounding flocks is continually challenged. These are important reasons why mycoplasma is still a major problem in the poultry industry. Secondly, antigenic variation and intracellular location of *Mycoplasma* spp. help the pathogen to evade the immunity system, leading to chronic infected animals and the fact that vaccines can only help, in the best case scenario, to reduce production losses and clinical symptoms.

The current approaches to control avian mycoplasma include continuous surveillance and quarantine measures, medication, vaccination and/or elimination of infected breeding flocks. To maintain mycoplasma-free flocks it is important to use only negative replacements, use single age farms (isolated if possible), depopulate and disinfect between flocks, maintain good biosecurity and set up a monitoring program.

Elimination of a positive breeder flock is the surest way to eliminate the shed of *M. gallisepticum* or *synoviae*, but this is not always feasible. Positive flocks should be isolated as much as possible; the eggs and chicks should also be segregated. Once a flock is infected or vaccines are unable to control mycoplasma, antibiotics are still required.

Pathogen		Number of isolates	MIC 50	MIC 90	Range
<i>Mycoplasma gallisepticum</i>	Tiamulin	20	0.001	0.025	0.0005-0.25
	Tylosin	7	0.015	0.015	0.0078->0.015
	Tilmicosin	5	0.12	0.12	0.12
<i>Mycoplasma synoviae</i>	Tiamulin	28	0.1	0.25	0.05-0.5
	Tylosin	10	0.015	0.12	0.15->0.5
	Tilmicosin	17	0.03	0.125	0.015->0.125

Table 1. Antibiotic susceptibility surveys showing limited resistance to *M. gallisepticum* and *synoviae* for tylosin (Pharmasin), tilmicosin (Tilmovet) and tiamulin (Vetmulin).

The clinical outcome of this antibiotic treatment depends on three crucial steps in the decision process of the veterinary surgeon: Selecting the correct antimicrobial, considering: Known or suspected antimicrobial susceptibility of the pathogen.

Ability of the antimicrobial to sufficiently reach the site of infection.

- Other features.
- Correct dosing and administration.
- Product choice, with a bioavailable/potent active compound and an appropriate formulation.

Selecting the correct antimicrobial

The susceptibility of a pathogen can be based upon susceptibility testing, which is, unfortunately, rather complicated and time demanding for *Mycoplasma* spp. For this reason, the clinical experience of the veterinarian, farm history and antibiotic susceptibility surveys (Table. 1) are also of importance.

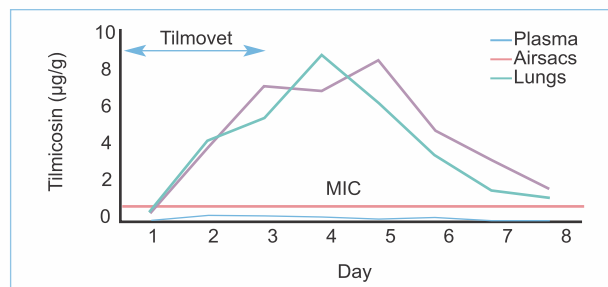


Fig. 1. Pharmacokinetic behaviour of Tilmovet 250mg/ml after three days of treatment (day 1, day 2 and day 3) at 15mg/kg bodyweight. Levels in lung and airsacs stay above MIC 0 for at least eight days.

In addition to the susceptibility outcome, the antibiotic needs to reach sufficient concentrations in the respiratory tract and preferably also be present intracellularly (as mycoplasmas are located intracellularly). Pharmasin (tylosin), Tilmovet (tilmicosin) and Vetmulin (tiamulin) not only deliver high concentrations in the respiratory tract (Fig. 1), but also show beneficial intracellular/extracellular ratios of up to 75.

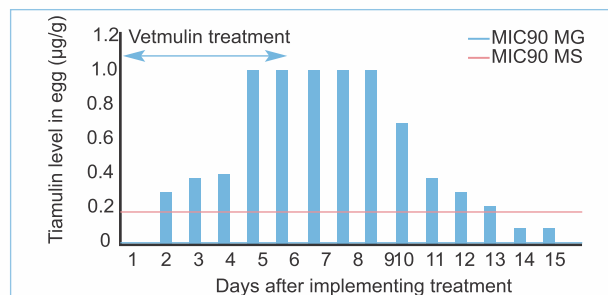


Fig. 2. Concentration of tiamulin (Vetmulin) in the egg, during and after treatment.

Other features are also of importance when choosing the right antimicrobial to treat and control mycoplasma. Some products are better suitable for layers (Pharmasin), whilst others are more suited for breeders (Vetmulin) or for start-up (Tilmovet). Pharmasin, for example, does not have any negative effect on water intake, is very safe and with no known incompatibilities. Moreover, Pharmasin has a zero

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withdrawal time for eggs in the EU, which makes the product ideal for the control and treatment of *Mycoplasma* spp. in layers. Vetmulin has a very unique feature: it ensures that concentrations in the eggs remain above the MIC₉₀ for both *M. gallisepticum* and *M. synoviae* for several days, which is the reason why excellent results are achieved to control vertical transmission in breeder stocks in the field. The slow elimination phase of Tilmovet (Fig. 1) results in prolonged continuous tissue concentrations, making it less dependent on variable feed and water intake. Some antibiotics are known to have a negative influence on the immunity build-up, possibly interfering with vaccination response. On the contrary, the macrolides and specifically Tilmovet, have been shown to have a positive effect, making the product ideal for start-up and for pullets.

Correct dosing and administration

After choosing the ideal antibiotic based upon susceptibility, pharmacokinetic behaviour and additional features, a correct administration is features, a correct administration is also of critical importance. Dosing should be done in grams per kilogram live body weight, independently of the application form. By doing so, misdosing will be avoided by taking into account the changing ratio of body weight/water; or feed intake, which is especially important in fast growing birds, such as broilers. Correct dosing in mg/kg body weight can easily be achieved with the Huvepharma Dose Calculator, freely available for iPhone and Android mobile devices.

In addition to the dosage per kg body weight, the dosage regimen is also of importance. A daily dose can be administered in different ways, either continuously or as a pulse. For time-dependent antimicrobials, such as Pharmasin (tylosin), Tilmovet (tilmicosin) and Vetmulin (tiamulin), the efficacy is determined by the period during which the bacteria are exposed to the antimicrobial at a concentration just above the MIC (T>MIC).

The most important parameter is the time period in which the concentration is higher than the MIC (T>MIC) at the site of infection. For this reason, the highest efficacy can be expected if these antimicrobials are administered continuously over 24 hours, for a sufficiently long period.

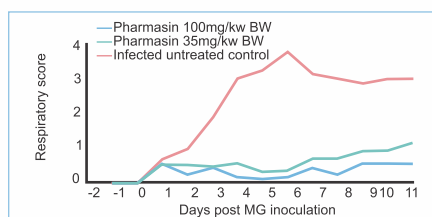


Fig. 4. Mean respiratory score of *M. gallisepticum* challenge study with different dose levels of Pharmasin.

Classification	Antibiotics	Goal of therapy	PK/PD Parameter
Concentration dependent	Apramycin, Paromomycin, Polymyxines	Maximise concentrations	C _{max} /MIC
Time dependent	Tylosin, Tilmicosin, Tiamulin, Penicillins, Cephalosporins	Maximise duration of exposure	T>MIC
Mixed properties	Doxycycline, Quinolones, Florfenicol	Maximise amount of drug	24h-AUC/MIC

Table 2. Classification of antibiotics based upon their ideal dosing regimen.

The most important parameter is the time period in which the concentration is higher than the MIC (T>MIC) at the site of infection. For this reason, the highest efficacy can be expected if these antimicrobials are administered continuously over 24 hours, for a sufficiently long period. For concentration-dependent antibiotics, for example apramycin, a high concentration (C_{max}) several times higher than the MIC of the targeted pathogen at the site of infection, will result in a faster and better response. For these antimicrobials, the most important parameter is the C_{max}/MIC.

Consequently, a pulse medication will work better for these types of antimicrobials. *Mycoplasma* efficacy studies with Pharmasin, Vetmulin and Tilmovet indicate that therapeutic levels for a minimum of five days are appropriate. For this reason, a minimum treatment period of five days is recommended for Pharmasin and Vetmulin and of three days for Tilmovet. Depending on the risk of exposure, the treatment can be repeated every four weeks (low risk) up to every two weeks (high risk, like multi-age farms).

Product choice

The formulation of the veterinary product will also influence the clinical outcome of an antimicrobial treatment. Stability, solubility and bioavailability of the active compound can be optimised by the choice of a correct product (brand). The absorption and distribution rate of a product in the body has a direct and critical impact on the clinical outcome of the treatment.

Often, veterinary products containing the same amount of active substance are considered as equivalent. However, the behaviour of a pharmaceutical product depends on several product features such as:

- Quality of the active (crystal form and size, impurities, presence of undesired substances such as heavy metals).
- Choice and quality of the salt (for example: tartrate, phosphate or hyclate).
- Formulation: used excipients and type of formulation (simple mixture, carrier or granulated).

In vivo studies, although time consuming and expensive, can confirm the efficacy of the products at different dosing regimens after challenge with the pathogen.

Results from these trials allow for a more cost-efficient, more efficacious and more sustainable use of products, which is especially important when justifying antimicrobial therapy. The efficacy of Pharmasin to control mycoplasma was tested at different dosing levels (Fig. 4). Broilers (n=45) were kept in isolators and challenged with a *M. gallisepticum* isolate (Italy, 2012, MIC value <0.015µg/ml).

The treated groups were given 35 and 100mg tylosin/kg body weight respectively for five days, starting one day post-challenge. The control group was infected but did not receive treatment. Monitored parameters were, amongst others, clinical scoring of respiratory disease, macroscopic scoring of the respiratory tract, weight gain, mortality and *M. gallisepticum* recovery from trachea, airsacs and lungs.

Both dosing levels were efficacious in protecting against the detrimental consequences of *M. gallisepticum* infection as indicated by the difference with the infected untreated control group. Despite fine-tuning of management, vaccination schemes, feeding, housing and biosecurity, animals can still become diseased. This is why antibiotics are, and will stay, essential for protecting animal health and welfare as well as the safe production of food of animal origin. However, a responsible and wise use of medicines is mandatory to safeguard the use of veterinary medicines in the long term. This means targeting the pathogen with the right product and administering it correctly.

One such major pathogen is mycoplasma, for which Huvepharma can offer the right tools and the right advice based upon extensive field experience and product specific efficacy trials.

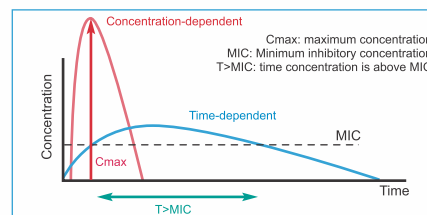


Fig. 3. Two types of antibiotics with an ideal pharmacokinetic profile in regards to efficacy.

To know more, please contact Huvepharma technical team



HUVEPHARMA

Huvepharma SEA (Pune) Pvt. Ltd.

42, 'Haridwar', Road 2 A/B, Kalyani Nagar, Pune 411006

Customer Care Contact: +91 20 2665 4193

Email: salesindia@huvepharma.com

Website: www.huvepharma.com

Mycotoxins a big Threat to poultry

Mycotoxin is hidden enemy for poultry farming. Mycotoxin become worldwide problem due to high incidence and level of occurrence in animal feed. Increase in feed cost has just aggravated this problem. Mycotoxin have high potential risk to public health as well. According to the FAO approximately 25% of the world's agricultural products is contaminated with mycotoxins, and this contamination maybe due to saprophytic fungi before harvest of these crops while they are still in the field, during the process of harvest, and even after harvest during the storage of these. The most common poultry feed ingredients contaminated by mycotoxins include - Maize, Wheat and wheat by-products and Soybean meal. Storage condition of grains and environment factors are major factors for development of mycotoxicosis. Aflatoxins (AF), zearalenone (ZEN), ochratoxin A (OTA), fumonisin (FUM), trichothecenes such as deoxynivalenol (DON), and T-2 toxin are some of the mycotoxins that can significantly impact the health and productivity of poultry. In general, contaminated feeds usually contain more than one mycotoxin.



Extreme weather conditions, heavy rain and drought lead to plant stress

making them more susceptible to fungal infections. Mycotoxins are small and stable metabolites produced by fungi which can contaminate a wide variety of crops. The contamination of food and feed by mycotoxins is a global safety issue due to their adverse effects on human and animal health. In livestock & poultry, mycotoxins lead to important decreases in performance (growth, feed efficiency or reproduction issues) and consequently losses of revenue for farmers. Common effects mycotoxin in poultry are reduced feed intake, poor weight gain, poor feed efficiency, poor growth performance, immuno

suppression and poor hatchability along with increased mortality.

Mycotoxins vary in their chemical structures, which results in vast differences regarding their chemical, physical, and biochemical properties. While considering the great variety of mycotoxin structures there is no single method, which can be used to deactivate mycotoxins in feed. Therefore, different strategies have to be combined in order to specifically target individual mycotoxins without impacting the quality of feed. The best-known method for mycotoxin deactivation is "binding" with the use of binding agents, which are referred to as mycotoxin binders, adsorbents.

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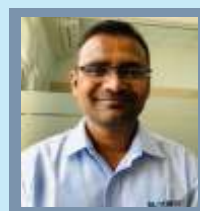


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protection. **TOXK/L** contains -MOS, PVPP, Copper oxime, Choline chloride and Sodium butyrate, Humic acid, Activated charcoal and HSCAS. It binds polar and non-Polar mycotoxins e.g., Aflatoxins, ochratoxins, Ergot poisoning, Deoxynivalenol, zearalenone, T2 toxin, Fumonisin, etc. **TOXK/L** is safe and efficient and economical toxin binder.

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Fortify yourself against Avian Influenza

Essential tools

The threat of Avian Influenza is yet again upon us and is rapidly circulating in not only wild and migratory birds, but also severely affecting domestic flocks all over the world. Aside from causing severe losses from high mortality, these dangerous viruses cause respiratory issues such as sneezing, coughing, mucus-filled airways and sinus congestion. The best protection against this devastating disease is to tighten biosecurity measures on the farm as well as provide respiratory support for the birds especially when they are suffering from respiratory distress.



Get yourself the essential tools and follow these steps to fight against Avian Influenza from the range of Intracare products:

Step 1 Efficiently remove biofilm from the drinking lines with Intra Hydrocare!



Did you know that viruses can hide in the biofilm in your waterline? Biofilm not only acts as a protective layer for bacteria but also viruses such as Avian Influenza. As common disinfectants like chlorine cannot penetrate biofilm, it is important to remove the biofilm with Intra Hydrocare, an efficient biofilm removal and water disinfection product approved for use in drinking water (PT05 registered). Official EU-standard studies have proven the effectiveness of 3% Intra Hydrocare against AI virus in challenging conditions.

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Test virus:	influenza A virus H3N8 (avian)
Method:	based on EN 14675:2015 (10 °C) (low-level soiling) Quantitative suspension test for the evaluation of virucidal activity of chemical disinfectants and antiseptics used in the veterinary area – Test method and requirements (phase 2, step 1)



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Step 2 Clean the poultry house well with Intra Foam Cleaner!



Ensuring absolute hygiene is the first step in fighting Avian Influenza. These viruses are most indestructible when they are encased in organic soiling such as leftover faeces and dirt, thus efficiently removing all organic material by a strong detergent like Intra Foam Cleaner can already remove 99,9% of the risk!

Step 3 Disinfect and kill all the viruses and prevent them from entering the house with Intra Multi-Des GA



Don't let Avian Influenza viruses hide and avoid disinfection! Viruses are extremely small organisms and can hide in the smallest of cracks and spaces. It is important to ensure that your disinfectant is not only effective against viruses, but also that they have excellent flowability and ability to penetrate deep into the areas where these viruses are. Intra Multi-Des GA has tested against worst-case-scenario veterinary viruses and is effective at 0.75% and a 30 minute contact time. Thanks to the long-lasting residual action of Intra Multi-Des GA the poultry house remains protected until the new flock arrives.

Step 4 Support and help to reduce respiratory distress with Intra Aerosol!



Symptoms of respiratory distress is a significant cause for not only reduced performance of poultry, but also eventual economic losses for the farm. As there aren't any treatment options for this viral disease, it is necessary to support the affected individuals by providing respiratory relief. The unique ingredients of Intra Aerosol help to reduce infection pressure, refresh the airways and support the birds in recovery from influenza. Intra Aerosol can be dosing simultaneously with the Intra Hydrocare maintenance programme.

Together, this combination of products can help you not only prevent Avian Influenza from entering your farm, but also support the birds and help to reduce economic losses from this highly infectious and difficult to manage disease.

EMULSIFICATION: AN ELEGANT WAY TO PROMOTE GROWTH



Numerous studies have shown the benefit of nutritional emulsifiers in poultry. In order to better understand their effects and application in swine, four trials were carried out by Orffa in coordination with research institutes around the world.

Emulsifiers and their function

The global use of nutritional emulsifiers has been increasing fast in the animal feed industry due to their efficacy in improving energy and fat digestibility.

Their application, 'on top' or included in the formulation in energy reduced diets, has been extensively studied in poultry. Broiler feed is considered the largest market for nutritional emulsifiers today.

Although fat digestion and metabolism differ among animal species, the principle remains the same. The key to absorption of fatty acids in monogastrics, ruminants and aquatic

species is the formation of micelles in the intestine which are being stabilised, among others, by bile salts (which are natural emulsifiers).

As the digestion of fat and other nutrients is never complete and a remnant can be found in the faeces, the addition of a nutritional emulsifier is therefore of interest to enhance nutrient digestibility and improve animal performance.

The other monogastric: the pig Swine have a similar digestion as poultry as they are both monogastric, and therefore a similar positive effect of the

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nutritional emulsifier can be expected. Four trials in fattening pigs were performed in coordination with research institutes worldwide.

The first trial (Meza et al. 2018) was performed in Lima, Peru, in collaboration with a local university. A total of 54 male pigs (Yorkshire x Landrace, 70 days old, 29.5kg), followed for 29 days, were divided into two groups (control and treatment) of six repetitions each. Diets were corn-soy-based with added soy crude oil (1.8%).

The diet in the treatment group was reduced by 50 kcal/kg (by taking out a portion of soy crude oil) and supplemented with a nutritional emulsifier. Results showed an increased performance when supplying the nutritional emulsifier.

The body weight (BW) in the treatment group significantly surpassed (+1.5%) the BW of the control ($p < 0.05$) and the FCR was numerically reduced by four points. Although a rather conservative energy reduction was applied, the economical evaluation showed a 4.53% increase in profit per animal.

A second trial was performed under practical conditions in the Philippines. A total of 270 mix-sexed pigs (PIC CA25 x

410 sire, 63 days old, 17.4kg), followed for 77 days, were divided into two groups of six repetitions each. Diets were corn-soy-based with added palm oil.

In the supplemented group, the final BW was significantly ($p = 0.01$) increased by 6.65kg and the FCR was reduced by 22 points ($p = 0.06$) compared to the control (2.44). The application 'on top' resulted in a big benefit to the farmer.

A third trial, in Belgium, focused on the effects of nutritional emulsifier applied 'on top' in West-European type diets (wheat/barley/soya). A total of 256 mix-sexed pigs (Danbred x Piétrain, 24kg), followed for four months, were divided into two groups of eight repetitions each. Diets were supplemented with animal fat (pig) and pure distilled fatty acids.

In the nutritional emulsifier treated group, the final BW was increased by 1.04kg and the FCR was reduced by 10 points compared to the control (2.67). The cold carcass weight of the animals in the treated group were, on average, 2.46kg bigger. When calculating the economical aspect, a return on investment of 5:1 could be noted. A fourth trial focused on the digestion of fats and energy. A metabolic, double Latin square design, study was



performed in Mexico with four ileal cannulated barrows (25kg, four pigs x eight diets). The animals were fed a simple diet based on corn with the addition of soybean oil or acidulated fat or animal fat (pig).

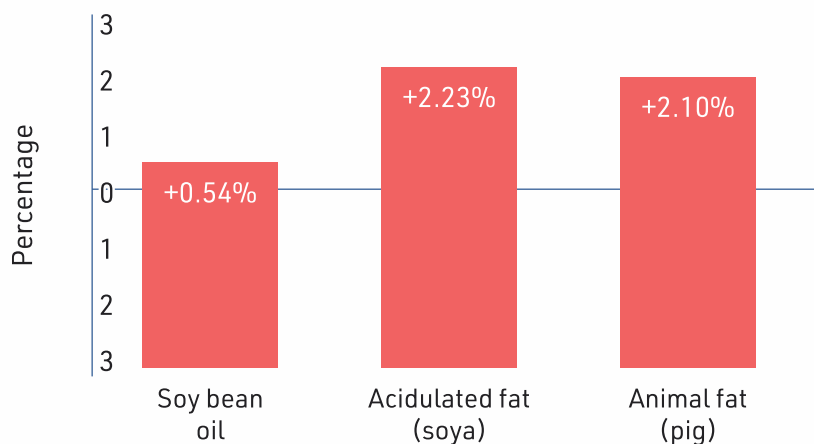
For the treatment groups, nutritional emulsifier was added. After four days of adaptation, one day of sampling was applied. Analysis of the faeces revealed an increased fat digestion in the nutritional emulsifier groups for all fats applied.

Fat digestibility was increased by 0.54%, 2.23% and 2.10% for soybean oil, acidulated fat and animal fat (pig), respectively (Fig. 1).

Emulsification as a way to move forward

The research project set up by Orffa shows that the positive effects of nutritional emulsifiers, extensively proven in poultry, can also be replicated in swine. Orffa dedicates itself to engineer your feed additives now and in the future, and is strongly committed to further increase knowledge on nutritional emulsifiers in different diets and different animal species.

Fig. 1. Effect of a nutritional emulsifier on fat digestibility in swine (Mexico).



Debeaking in Laying Hens and its Impact on Future Performance

Dr. Yogendra Gaur

Freelance Poultry Consultant
Mob. +91 90413 33683



“Debeaking” is the process of trimming or cutting sharp ends of hen’s beak.

In most of the laying flocks debeaking is an important operation to control:

- The feather, comb or vent pecking / cannibalism.
- To avoid feed wastage.
- To avoid egg-eating vice.
- To reduce frightened and aggressive behavior.



Age of debeaking

The common ages for debeaking:

- Day old
- 7-12 days
- 4-6 weeks
- 10-12 weeks

Methods of debeaking

The different methods of debeaking are:

- **Heat blade method** : In this method a blade is heated with gas or electricity and beak is cut and cauterized. It requires temperature of 650-750 degree Celsius for 3 sec.
- **Cold/mechanical method** : Beak is cut by scissor or clipper without cauterization.



Heat blade method (most common)



Trimming position

- **Bio / electric beak trimming** : It used a high voltage, 1500 Volt AC electric current across 2 electrodes to burn a small hole in the upper beak of birds in 0.25 second.
- **Infra-red beak trimming (IRBT)** : In this method a non-contact, high intensity infrared laser beam is used to cut the beaks for the period of 15 sec.

Care should be taken at time of debeaking

Debeaking is one of the best important and most stressful operation in a hen’s life, so it should

be done very carefully. Following points should be kept in mind at the time of beak trimming:

- Age and body weight of debeaking.
- Climatic conditions.
- Sharpness of blades.
- Temperature and timing for beak cutting and cauterization.
- Voltage should not be fluctuating.
- The person who is going to perform this operation should be well trained and experienced.
- Light intensity should be adequate over the debeaker machine.
- Length of beak is to be trimmed should be accurate, neither too less nor too more. Otherwise it results in faulty debeaking.



Incorrect debeaking

- Handling of birds prior and after the debeaking should be gentle.
- Grading weak and underweight birds.
- Use of Vitamin K, Vitamin C, Turmeric powder and any pain killer during and after the debeaking.
- Make sure that feeders and drinkers should be filled full at maximum to avoid the injury of trimmed beak by touching through any hard surface of feeders and drinkers.
- Provide proper floor space after the beak trimming.

Impact of good debeaking on future performances

Debeaking is very important and stressful operation in a bird’s whole life span. A farmer’s maximum profitability depends on the day of debeaking. A good debeaking is responsible for a well grown flock.

If there is correct debeaking, then bird’s feed intake will be proper, so body weight and uniformity will be good, means immune system, digestive system and all body systems will work properly. Ultimately this all impact on the performance of the bird and profitability of the farmer.

If there is an incorrect debeaking, flock’s uniformity and body weight will be poor. In this type of flock daily depletion is always more than a proper debeaked flock. A poor beak trimming is responsible for a poor flock’s livability. This type of flocks are more



susceptible to any viral infections as well as bacterial and fungal infections also. There will be more expenses in these type of flocks which includes the medicines, vaccines, nutrition and labor costs.



Community Outreach: A Hester Biosciences initiative

HESTER

Hester has a strong Corporate Social Responsibility (CSR) Policy in place, embracing sustainability through action. From plantation drives to immunization program, Hester believes in giving back to society and the environment.

Hester believes in the 4A principle, which states that "aware smallholder farmers can achieve great heights if appropriate products and services are made available to them at affordable prices."

With the assistance of GALVmed, a Scottish NGO, Hester has established a unique distribution and vaccine administration network in India's backward districts. The program began in rural Chhattisgarh, Jharkhand, and Odisha and has now expanded to include UP and Bihar. So far, more than 80 million vaccine doses have been distributed, with over 9,45,000 households benefiting from the world's largest backyard poultry immunization program.

The initiative's main advantage is its long-term self-sustainability without dependence on donors or other support bodies.

As a direct result of their efforts under the Veterinary Social Business Division, poultry stock mortality in smallholder rural farms has decreased, and farmers have been able to earn higher incomes. As part of this program, over 2000 rural youth and women were trained in vaccine administration techniques for poultry, providing



HESTER



them with a new source of income and a stable financial future.

In this regard, the GALVmed-Hester initiative is a one-of-a-kind endeavor for rural backyard farmers, as it promises not only infrastructure, but also preventive medicine and healthcare for poultry and livestock - the virtual lifelines of India's villages.





Zeus Biotech – Rediscover the power of nature

Established in the year 1991, Zeus Biotech is one of the leading animal feed supplement manufacturing companies in India providing all-natural feed supplements to various sectors of livestock like poultry, ruminants, piggery, and aquaculture for more than 30 years. The company which specializes in the use of biotechnology; the science of exploring living organisms to make or modify products, plants, and animals or to develop microorganisms for specific purposes, provides solutions which can improve the efficiency of feed and performance of animals through a safe and natural way. Through their core expertise in feed specific Solid-state fermentation (FS-SSF), which is a green technology with zero waste generation, Zeus Biotech produces some of the leading product lines including, Fermented Organic Trace Minerals, Feed Specific SSF Enzymes, Yeast Culture, etc., exclusively for animal supplementation. Organomin Forte, Microguard, Polyzyme and Rumiyeast are some of the leading brands from Zeus Biotech. The unique FS-SSF technology exploits the matrices and conditions prevailing in feed and feed processing, to produce speciality products with high stability and efficacy required to improve animal health, performance and farming profitability. The organisation also produces unique line of Bacillus based probiotic strains at their submerged fermentation facility for some of their leading probiotic product brands including Microguard and NE-Guard.

Zeus Biotech Research and development centre, the research and analytical division of Zeus Biotech Pvt Ltd, is now accredited for ISO/IEC 17025 by National Accreditation Board for Testing and Calibration laboratories (NABL). Under the accredited scope the laboratory will be able



to carry out and issue reports of proximate analysis of feed and feed materials. The analytical facility which is already catering topoultry and other livestock farmers, integrators and feed manufacturers across India and overseas, will now be able to issue analytical reports with global acceptancy.

The research and development centre which is one of the most modern animal nutrition dedicated biotech facilities in India, hosts multiple departments including Microbial Culture Collection, Research & Development as well as Quality Control. The centre which is spread over an area of 10,000 square feet is skilled in microbial culture handling and processing, quality testing of feed, feed raw materials and feed supplements, determination and efficacy evaluation of enzymes, microbial strains, toxin binders and detoxifiers, organic acids, quantitation of various mycotoxins, evaluation, profiling and characterization of proteins and amino acids, quantitation of nutritional trace elements and toxic heavy metals, as well as testing of water parameters.

The centre also houses an exclusive and extensive microbial culture collection centre with numerous feed targeted fungal and bacterial strains with area of application including production of probiotics, feed specific enzymes, yeast culture, organic minerals, and other related applications. Many of these inhouse strains which have been isolated from various natural sources by the research team has been successfully used in various animal nutrition related applications.

Another major highlight of the Research centre, the inhouse Quality Control Department which monitors, maintains, and controls the critical control points of the entire production facility is equipped with infrastructure and instruments qualified for analysing, determining and measuring analytes and parameters including minerals, enzymes, probiotics and pathogenic microbes, mycotoxins, toxic heavy metals, etc. The department thus ensures quality at various levels including raw material entry, material handling, during fermentation and other production related processes and finished product release. The department which follows European Feed Safety Authority guidelines and other international standards for its Quality system, analyses and confirms 25 – 30 quality and safety parameters in each product before release from its facilities and thus ensures optimum quality and efficacy to its customers.





Contact:
Dr. Manish Chaurasia,
 Marketing Manager, South Asia
 mchaurasia@alltech.com
 +91 8130890989



Scan the QR code below to view the complete documentary covering the Alltech Rabi Corn Quality Assessment Survey.



Alltech's Corn Quality Assessment Reveals High Moisture and mould challenges

After rice and wheat, corn is India's third-most important field crop. Accounting for 10% of total food grain production in the country, India ranks sixth largest in corn production and fourth largest in terms of acreage in the world.

The ever-growing human population, rising income and consequent growth in meat consumption have demanded more cereal production. The ability of new corn varieties to produce higher yield and their capacity to grow in different seasons has led farmer's interest to divert field for corn production rather than other cereal grains in many parts of country. Globally corn is referred as "Queen of Cereals" due to many positive attributes in agricultural production.

Corn was initially cultivated during the "Kharif" season. An experiment with "Rabi" corn in Bihar and some southern states during the early 1960's brought higher yields and fewer pest attacks and thus gradually popularising cultivation of "Rabi" corn in many states.

Corn is principal energy source used in poultry diets because of its high metabolizable energy, palatability, presence of pigments and essential fatty acids.

In early May month, Alltech conducted corn crop quality assessment survey by collecting samples from field, farms and mandis in several districts of Bihar, one of the major Rabi corn producing states.

The assessment revealed that the samples tested had an average moisture percentage of 15.56, with a relatively bigger corn size but an average crude protein of 7.46%. It is

suggested that feed producers must check protein level of corn consignments and adjust feed formula to get desired protein levels in complete feed.

It was also observed that all samples were very high in mould count and producers must have a close watch during storage of current corn crop.

The mycotoxin testing revealed that 72% of samples were positive for all five mycotoxins tested - Aflatoxin, Ochratoxin, Fumonisin, T2, DON and Zearalenone. 100% samples were positive for four mycotoxins.

"The high mould count is alarming for producers and survey enables them to foresee the challenge of mycotoxins in their feed," said Dr. Aman Sayed, Managing Director - India, Regional Director - South Asia. "Producers are advised to pay attention to mould and mycotoxin management with the help of quality solutions."

Emphasizing the fact that "multiple mycotoxins is a reality", Dr Lokesh Gupta, Sr. Regional Technical Manager-Poultry (South Asia) said, "Hundreds of mycotoxins have been identified and most animal feedstuffs and feed are likely to be contaminated with multiple mycotoxins under practical farming and storage conditions. Moulds and mycotoxins are major threat for productivity even in best-run livestock production systems and their detection as well as control should be every feed producer's priority". He recommended Alltech® Rapiread™ for effective detection of various mycotoxins.

About Alltech:

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

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

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

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

Vets In Poultry Concluded Innovative Chicken & Eggs Cooking Competition & Festival in Pune

Vets In Poultry, an association based in Pune, has more than 1000 members actively working in Poultry Farming. Vets In Poultry association always put relentless efforts into promoting the health benefits of eggs and Chicken in an innovative and scientific way, and as a part of this journey team Vets In Poultry has organized Chicken Cooking Competition & Chicken Festival on 23rd July 2022 at Krushna Sundar Lawns in Pune. This event was one of its kind because, during it, only Chicken and eggs cousins were allowed to be prepared and consumed.

The prime objective of the competition was to offer a professional platform to individuals and students who want to display their skills and creative talent and get opportunities to learn and share experiences in the competitive environment. This event was attended by contestants, Veterinary Animal Health Company employees, distributors, poultry farmers, and other industry associates.

Mr. Devvrat Jategaonkar marked his presence as a Chief Guest and Judge for this event. He is a renowned Chef holding Guinness Book record and represented India in various culinary competitions across the globe. He also won the first Silver Medal for India In 2012 during Culinary Olympics held in Frankfurt, Germany. He has served as Executive Chef to various leading hotel chains in India. Dr. Monjeeta, a food blogger and Veterinarian, was also on the panel as a judge.

Dr. Jeevan Sonawane anchored this event and explained the event's theme to the audience and contestants. The event was formally inaugurated by the lightening of the lamp and Gas stove by Chief Guest Mr. Devavrat Jategaonkar along with Dr. Ajay Deshpande, President of Vets In

Poultry (VIP), Dr. Sanotsh Ire, Secretary VIP, Dr. Prasad Kulkarni, Treasurer VIP and other executive committee members of Vets In Poultry Dr. Chandrakant Pathak, Dr. Sujit Kulkarni, Dr. Pankaj Tuptewar, Dr. Jeevan Sonawane, and Dr. Sachin Patil.



During the inaugural speech, Dr. Ajay Deshpande expressed his views about the importance of eggs and Chicken in

countering malnutrition, employing millions of agricultural farmers directly and indirectly. He also described the Vets In Poultry team's relentless efforts to promote protein consumption through eggs and Chicken.



Mr. Devvrat, during his speech, expressed his views about this unique competition and emphasized the importance of eggs and Chicken in the hotel industry in India. He said that eggs and Chicken constitute around 50 % of hotel industry cousins and play a vital role in business. He also agreed that eggs and Chicken are essential protein sources and should be part of our regular diet. The chief guest set the perfect stage for all contestants by boosting their confidence with some practical tips for competition.

The top 20 contestants were selected for the event. Judges interacted with all contesting chefs to find out the ingredients of the recipes, nutritional value and historical significance of the dishes, etc., prepared by them. Food



items displayed were a visual treat and were presented in an artistic and aesthetic style. Dishes were judged based on creativity, hygiene, taste, texture, and appearance by esteemed

judges Mr. Devvrat Jategaonkar and Dr. Monjita.

Judges were overwhelmed by the efforts of the participants. It was great to see the participants' energy, enthusiasm, and creativity.

The event has provided a platform for the household wives, gents, and students to foster their creativity and helped them to explore their hidden talents and discover new dishes. It was a challenging task for judges to choose a winner among innovative and delicious dishes.



Finally, three winners and two consolation prize winners were declared and awarded with an attractive trophy and cash prizes.



The cooking competition was followed by Chicken Festival, where many contestants and commercial houses sold their preparations to the visitors. Industry brands like.

Venky's Express, Shalimar, Godrej, KGN, Power Eggs, Chicken Vicken & Belchick exhibited their stalls and served delicacy. Every visitor to the event was delighted to taste authentic Chicken and egg recipes at the event. Visitors also appreciated this event for tasting various chicken and egg dishes under one roof.

The cooking competition was formally closed with a Vote of thanks by Dr. Sujit Kulkarni. He thanked everyone who supported the event, directly and indirectly, contestants, participants, visitors, volunteers, event managers, members from Vets In Poultry, Producers, Feed millers, Animal Health distributors & everyone who supported this program wholeheartedly.



During event various Vets In Poultry members expressed their views about Chicken and Eggs.



Dr. Ajay Deshpande, President of Vets In Poultry, expressed that the poultry industry plays a vital role in fighting against protein energy malnutrition. There is a massive gap between per capita consumption and actual recommendation by the National institute of nutrition in India and the need to create more awareness to enhance chicken and egg consumption. His speech expressed the health benefits of white meat vs. red meat.



Dr. B A Pawar, Life Time Member of Vets In Poultry, said there are rumours about broiler chickens that many antibiotics and hormones are used to grow chickens which is not valid. He assured audience that broiler birds are produced scientifically, and if anyone has any doubt, they can connect with us, and we will help them understand this phenomenon.

Dr. Monjeeta Barrowa, a food blogger and Veterinarian who was also one of the judges for this event, appreciated the initiative taken by Vets In Poultry. She said that eggs and chicken are economical and readily available protein sources and have multiple benefits for all ages. She highlighted the health benefits of eggs and chicken, particularly for middle age people, due to its richness in vital nutrients like zinc.



Dr. Chandrakant Pathak, Executive Committee Member of Vets In Poultry, expressed an important message about the health benefit of eggs and chicken to diabetic people, aged persons, and small kids. He said Vets In Poultry would continue such innovative activities in the future.

Dr. Sadanand Undegaokar, Life Time Member of Vets In Poultry, expressed that he is actively involved in the production and assured that chicken is organically produced using corn, soya, and other scientific additives and appealed to society to stay away from rumours. He also emphasized eating chicken and eggs for more health benefits.



Dr. Anju Deshpande, Life Time Member of Vets In Poultry, expressed that the poultry farming community is raising poultry birds scientifically. She also appealed to homemakers not to withdraw protein from their diet during certain festival seasons because it may hamper the family's health.

Dr. Jeevan Sonawane, an Executive Committee member, explained the objective of the event is to boost chicken and egg consumption. He also stated that India is a protein-deficient country, and many people don't even know how much protein they should consume. He appealed to consume 1 gm per kg body weight protein, and eggs and chicken can help us to achieve this goal.



Dr. Pankaj Tuptewar, the Executive Committee member, explained the importance of protein for everyone and appealed that everyone should consume two eggs and 100 gms of chicken on a daily basis to fulfil their daily protein requirement.



Dr. Sujit Kulkarni, the Executive Committee member, said after the covid pandemic, eggs, and chicken got a lot of significance as protein sources. Indian medical association also recommended eating eggs and chicken to boost protein intake for good immunity. He also said eggs and chicken are rich in protein, vitamins, and minerals, which play a vital role in children's and sportsman's health.

Dr. Praksah Babu, the Chief Geneticist at Venkateshwara Egg Laying unit, said that egg is the most economical, readily available, and most importantly, affordable source of protein. He emphasized that egg is the most balanced food, which is near to mothers' milk having all nutrients including vitamins, and can give us good disease resistance power.



Dr. Santosh Ire, Secretary of Vets In Poultry, explained the event's theme and thanked everyone who supported and participated in this event directly and indirectly. He said that all poultry industry goals are common, and we should all work together to promote our two products, eggs and chicken.

The event was formally closed at 3:30 pm with the promise of organizing more and more such events in the future by team Vets In Poultry.

QPER India and Numega Nutrition Singapore visit Kasetsart University in Bangkok, Thailand

Press Release

Qper India and Numega Nutrition Singapore has arranged visit of Kasetsart University on 9th Sep,2022 for Indian poultry nutritionist, aqua doctors, broiler integrator and broiler breeders.

Dr. Theerawit has given presentation on NTPB "The new mile stone in poultry nutrition". Mr. Phon also explained about "The new hope for reducing energy cost & increasing more muscle mass" by NTPB (active GAA & transferase enzyme complex). Mr. Samir Patel, MD, Qper India Pvt Ltd has also explained about Indian trials.



Left to Right: Mr. Kuna, Mr. Phon, Ms. Keya, Dr. Theerawit, Mr. Samir, Dr. Vijay, Mr. Ashok, Mr. Sahoo, Mr. Omkar, Dr. Atul, Dr. Rais, Dr. Sanjeev, Dr. Hariharan



DSM Receives FDA Approval of First U.S. Mycotoxin Degrading Ingredient for Poultry

DSM Animal Nutrition and Health — a global science-based company focused on nutrition, health and sustainable living — announced the FDA approval of a novel enzyme, fumonisin esterase, to help poultry producers manage mycotoxins in feed.

Paige Gott, Ph.D., DSM mycotoxin and Hy•D® category manager, said fumonisin esterase is for the degradation of fumonisins present in poultry feed, and this approval expands DSM's commitment to innovation in mycotoxin management.

"This is the first mycotoxin degrading ingredient to go through FDA's Food Additive Petition (FAP) process and will be the first product ever to be approved for degrading fumonisins in feed in the U.S.

market," said Gott. The enzyme is now approved for use in both poultry and swine diets.

"Mycotoxins can have various negative effects on poultry production," Gott continued. Since 2014, fumonisins have been detected in 50 to 80% of corn samples screened as part of our annual mycotoxin survey. And with high corn prices, it's imperative right now that feed is working without concern of performance-related losses."

DSM will offer two new products using the fumonisin esterase enzyme and the brand name FUMzyme®. Biofix® Plus with FUMzyme® and Biofix® Select with FUMzyme® will now be a part of DSM's mycotoxin product portfolio. More information will be available in the coming weeks.



Stallen – 25 Years Celebration/Technical Conclave



Company Brief

Stallen South Asia Private Limited was founded in 1997 by Mr Amit Parikh. Mr Parikh started out in the human pharmaceutical manufacturing industry, and a result of consequential events and lineage, he founded Stallen – a veterinary company with a focus on poultry. In 2010, Stallen and FATRO, from Bologna, Italy entered a joint venture to promote their products in India which also led to the launch of their avian vaccines. Today Stallen manufactures, markets and distributes: feed additives, pharmaceuticals, biosecurity solutions and vaccines for poultry in India, Nepal, Bangladesh and Sri Lanka. In addition our products are exported to over 60 countries in 6 continents globally. Collectively, the Stallen group employs more than 200 people across the Indian subcontinent.

Leadership

Stallen is currently led by Mr Aniket

Parikh – by education a chemical engineer, but has grown up right alongside Stallen. He holds a BSc and MSc in Chemical Engineering along with a Master's in Biotechnology, from Johns Hopkins University USA – he is responsible for the development, manufacturing and expansion of the company. He is ably supported by Mrs Jagruti Parikh who oversees the management and financial control of the group. Along with them is Dr Sanjay Singhal, COO, a veteran in the veterinary business with an extensive experience in this industry. Apart from the team at the head office in Mumbai, Stallen has a robust field force led by managers who have been with the company for multiple decades. There are more than 20 employees with more than 15 years at the company, and some with more than 40 years!

Facilities

The Stallen group is probably one of the





Stallen



only companies in the Indian animal health marketplace who doesn't do any 3rd party manufacturing. Every single product they sell – they sell proudly as self made. Stallen has 3 facilities in Maharashtra – 2 for feed additives and 1 for formulations. All vaccines are imported from FATRO, Italy. In addition, they have a feed additives manufacturing plant in Alexandria, Canada. All manufacturing facilities are GMP, FDA and ISO compliant. They have been audited and approved by the various countries we export to as well. The FATRO facilities are all EU-GMP and EU-GLP certified adhering to the highest quality standards.

Distribution

Stallen's products are distributed via our channel partners across the sub-continent who have been with the company for many years as well as direct to customer. Stallen is one of the only companies that strongly focuses on serving our customers directly with a large percentage of direct-to-customer sales which allows them high flexibility and liberty for service and quality.

Milestone – 25 years

In August, 2022 Stallen completed and celebrated 25 years of excellence in the poultry industry with an event in Goa. They conducted a technical conclave and celebration from 7th to 9th August at the Hyatt, Goa. This was attended by the head office team, sales team, as well as key customers, consultants, veterinarians and industry leaders. It was an event to remember with a company overview, musical evening with comedian. Everyone participated in the fun and frolic by singing and dancing to popular Bollywood songs. The next day session had two technical sessions and a gala night. Representatives from FATRO, Italy were present to offer an introduction to FATRO and their global presence along with their product range. The first technical session was an engaging but yet extremely insightful one on mycoplasma, its problems and its prevalence in India led by Dr Sanjay Raj Anand. The session detailed the conditions and symptoms of this disease and its prevention using MS-VAC (MS, inactivated vaccine) and MYC-VAC (MG, inactivated vaccine) as well as CORIVAC



(Coryza inactivated vaccine). The session also highlighted and busted common myths on the disease and the truth on medication Vs vaccination. The

second session was an informative one that highlighted the respiratory complex problems in poultry with specific reference to Infectious Bronchitis virus conducted by Dr Mahendra Chaudhari. Stallen-FATRO's solution to these problems were presented via IB-OLVAC and OLVAC B+G+R. The gala dinner was an elaborate affair at a venue at Anjuna beach and had local entertainment and performers which enthralled the participants with their dance movements. Through the 3 days, with the coordinated outfits and planned entertainment, the industry was on one platform – customers became friends, and staff celebrated being family! The event capped out the 25 years in the same fashion Stallen has completed 25 years in the industry – being friendly, being genuine, being honest and most of all putting their stakeholders first!

Future

The past 25 years have seen several cycles of the avian influenza along with the unexpected pandemic – but Stallen has survived it all and come out on top. This is a testament to its quality and promise of service – Stallen has a big pipeline of products it is looking to launch. On the immediate front they will be launching 3 new vaccines along with a range of bio-security products. Within the next 6 months Stallen will also start production at its new pharmaceutical factory that is constructed with the US-FDA standards and to be EU-GMP compliant with a view to export veterinary drugs world over while also supplying our flagship products like Cleantab and Binodox.

Like Mr Amit Parikh often said, 'The show much go one'.....even after him, his vision and mission for Stallen continues as the team believes in what was started and they are energized to make it a reality.





GLAMAC Holds its Annual Conference and Marks its Fifth Anniversary with a Sales and Distributors Meet and Award Ceremony at The Cordelia Cruise, Chennai



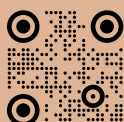
Glamac International Pvt Ltd, the fastest growing company in the poultry health and nutrition sector. On the 5th of August 2022, it held its annual conference at the Pride Hotel in Chennai, and on the 6th and 8th of August 2022, it celebrated its 5th anniversary with a Sales and Distributors Meet at the Cordelia Cruises in Chennai. This was an event to celebrate not only the organization's successful journey, but also the motivation, warmth, and optimism of the channel partners, distributors, and employees who have contributed to the company's growth over the last five years. The programme saw the participation of 32 delegates from different parts of India and neighbouring countries.

In his opening remarks at the Cordelia Cruise, Mr. Abir Mukherjee, Managing Director, Glamac, welcomed all

dignitaries and stated that it is a proud moment for all of us on this special day. He specifically thanked the distributors and customers for their early support of Glamac. He recalled his desire: COURAGE TO REACH HORIZON, and especially the strength of team Glamac to make it truly BIG. He went on to explain Glamac's core strengths and how it differs from competitors. Mr. Mukherjee also introduced the audience to his daughter, Mrs. Meghana Mukherjee Salvi, the newly appointed Director and the next-generation Glamacian.

The guest of honour Mr Sahil Deepak Salvi, Advocate- Mumbai High Court was felicitated and welcomed by team Glamac and requested to initiate the cake cutting ceremony.

The main attraction of the evening was the award function in celebration of talent, success & achievement. Amongst



the most prestigious awards Dr Sumon Nag Chowdhury, Group Technical Manager won the Best Employee award for his exemplary performance and Mr Pintu Das of PP Trading/ Das Drug Centre, Distributor- West Bengal bagged the Top Distributor award FY 2021-2022 in acknowledgement and appreciation of distinguished sales performance. Mr. Vinod Mishra, Business Manager earned the Most Promising Employee and Mr Sujit Jadhav, Sr. Manager Finance & operations earned the Most Versatile Employee awards respectively. Mr Ramakrishna Amancha, Jr. Manager- Warehouse & Accounts was awarded the Most Paramount Employee. Mr Sourav Nath,

Area Manager-West Bengal and Mr. Rohit Gulati, Area Manager-Barwala& Punjab got the Excellence award for their outstanding sales achievements.

All participating Distributors were presented with a Certificate of Appreciation in acknowledgement & gratitude for their patronage. All employees of the poultry and aqua teams were presented with a Certificate of Participation.

The event concluded with the vote of thanks expressed by Dr Gopal Potdar, Product Manager followed by a gala cocktail & dinner, a DJ and a wonderful show in the Cruise.



A series of technical meeting has been conducted by Ventri biologicals in North India



A series of technical meeting has been conducted by Ventri biologicals div. of VHPL for breeders at Jind, Panipat & Kaithal and for layer at Krukshetra. Meeting is well organised by Shashi bhushan kumar (Zonal manager) and his team Sandeep Saini RSM & Sunil saroya RSM under the guidance of Mr. H S Padda DGM .

Dr. S P Singh (GM North) & Mr. Satbir Lakra (GM venco sales) spoken about the current challenges and corrective measures.



Deepak Khosla addressed the gathering over challenge the poultry industry is facing related to Poultry immunity, health, and production. The emergence and re-emergence of diseases will continue to be major challenges to the current situation and the strategic future of the industry. Disease control, high production, product quality, and reasonable production costs have been the recent main goals of the poultry industry. Hence, meeting per capita consumption and welfare to humans necessitates continuous efficient and goal-oriented healthcare to control disease spread and decrease the application of antibiotics. These endeavours will include the launch of programs to control infectious diseases in broiler breeders influencing the broiler performance.





Dr. Prakash Reddy, spoke with a topic on “EXTENDED IMMUNITY IN BREEDERS: INFLUENCING BROILER PERFORMANCE”.

In the meetings, several factors were discussed which can hasten and/or prompt the emergence of animal diseases including:

- The development and structure of the poultry farming, amplify global competition and cost of production, and increase the poultry and poultry products movement worldwide.

- The increased movement could also raise the hazard of introducing infections to specific regions that are free from such diseases.

- Various infectious pathogens, including bacteria and viruses contribute to infectious diseases in poultry and can be transmitted and subsequently spread in farms via horizontal and/or vertical transmission. In India, the most common poultry diseases are Infectious bronchitis virus, Avian flu, Newcastle disease, Infectious bursal disease, Avian Adenovirus (IBH/HPS), Chicken Astrovirus, Avian encephalomyelitis, *Mycoplasma gallisepticum*, Colibacteriosis, Infectious Coryza, Coccidiosis and Infectious laryngotracheitis (regional Vaccinal laryngotracheitis).

- For proper understanding of disease control, these poultry diseases were categorised as: **Category 1: Disease with high**



problem in breeder productivity with high production drop and mortality with poor quality hatching eggs, low hatchability and poor quality chicks. The herd immunity with high and uniform humoral immune response is very important during the entire life cycle.

Ex: Avian flu, Newcastle disease, Infectious bronchitis virus.

Category 2: Diseases with less impact on breeder productivity, but when transmitted vertically to progeny can have huge impact on hatchability and broiler performance

Ex: Avian Reovirus, Avian Adenovirus, Chicken Astrovirus, Avian encephalomyelitis,

Salmonella Enteritidis, Salmonella Typhimurium and Mycoplasma gallisepticum.

Category 3: Diseases with age resistance in long lived birds, with no impact on egg production and hatchability, but the maternal antibody transmitted can protect against early sub-clinical infection / immunosuppression.

Ex: IBDV- Early diagnosis of the source and route of virus spread help to control the disease and develop an effective vaccine for emerging variant diseases. In a future study, improvements in laboratory diagnosis will offer sensitive, fast, and precise disease diagnosis, and early mediations will be a reality.





- Vaccination has had and will continue to have a major influence on the development and strategic growth of the industry, allowing economic and effective control and eradication of diseases. However, the vaccine and vaccination strategies varies based on the geographical variations happening locally. So, there is a need to "Think globally and Act Locally", based on the strain variations happening in India, which includes prevalence of - Avian infectious bronchitis virus variants GI-24 lineage (Novel Indian variants)

- Local variants of Avian Reovirus causing Malabsorption, Tenosynovitis and Brittle bone disease.

- Avian Adenovirus serotype 4 and 11

- Chicken astrovirus variants subgroup Biii causing visceral gout (nephritis) and Malabsorption (enteritis)

- Several pathogens are implicated as potential reasons for poultry diseases, either individually, in synergy with different other microorganisms (multi-causal), or facilitated by non-infectious causes. Any stress-causing agent can hinder poultry disease resistance, increase the susceptibility of chickens to infections, and decrease the effectiveness of vaccinations. Ex: CRD complications with Mycoplasma.

- Comprehensive approach for Mycoplasma control programmes with VH-MGK was discussed extensively with data around the country with both single and multi-age breeder flocks.

- **Causes of Vaccine Breaks:** In most cases, the use of vaccination creates a false sense of biosecurity and hygiene. Generally, vaccination does not prevent infection; rather, it only leads to a reduction in the number of outbreaks. Several factors can lead to the so-called vaccine break: incorrect transport and storage of the vaccines, faults or deficiencies of the administration, and high infectious pressure in an area.

- The occurrence of unanticipated and new diseases and new legislation will also remain essential issues. Restricted use of a vaccine, such as the epidemiological situation, cost-benefit analysis, availability of the vaccine, and governmental regulations.

- As a general rule to finalize the vaccination program, adequate immunity is an obligatory need in order to manage infectious pressure on the farm, thus providing proper vaccination programs for disease control is essential to ensure the health status of poultry. Furthermore, there could be subclinical infections within the flock, and other immunosuppressive diseases or infections with field strains could occur shortly before or after the vaccination, and/or there could be infection with mutant strains. Finally, the quality of the vaccine is affected by the number of antigens, poor storage conditions, improper handling, and administration.

Launch of VIPx (IBD immune complex vaccine), a hatchery vaccine as a complete solution to the current issues related to the cross protecting strains and gaps in IBD vaccination procedures at the field.

- VIPx vaccine includes Ventri's Intermediate plus strain bound with specific homologous antibodies,
- The Ventri's Intermediate plus vaccine strain was most effective in controlling vvIBDV in India since two decades, with superior cross protection against the Novel variants of IBDV emerging in India.
- Early immune response to the low maternal antibody chicks, preventing subclinical IBDV infections.
- Reduced vaccination stress with the farm vaccination
- Uniform distribution of the vaccine dose. Minimal interference of neutralizing Maternal antibodies

Vaccine virus competes with the field virus to reach the bursa at the earliest and stimulate active immune response. Less bursal damage and good immune response to ND, IBH, IBV etc. vaccinations in broilers

Large scale outcomes research data in >20 million broiler chicks, conducted across the country were discussed. Vast comparative data within the same farm and branches with the controls vaccinated at the field on day-12 were discussed. Improvement in the performance with reduced incidence of IBD leading to economic benefits were seen with VIPx hatchery vaccination. Along with less handling stress at farm level, resulted in the good uniformity of birds were noticed. Farmers were happy, since their vaccination work got reduced and chances of vaccination failures due to improper maintaining of cold chain, usually encountered at farm level was getting avoided.



IPJA Created another Milestone While Conducting Technical Seminar in Rajasthan



Indian Poultry Journalists' Association (IPJA) conducted yet another milestone while conducting a first ever successful Technical Seminar in its series of seminars in Poultry segment in Ajmer, (Rajasthan) at hotel Paradizzo on August 20, 2022.

The Technical Seminar was attended by more than 350 farmers from different part of the city and nearby areas of Ajmer, including other districts i.e; Bhilwara, Udaipur, Kota, Bewar, Sekar, Jodhpur and Jaipur of Rajasthan state.

The technical seminar in Ajmer was selected with a view that Ajmer is a growing market and it has the layer population of over 80 lakhs birds producing close to 70 lakhs eggs per day. Ajmer and its surrounding areas are also fast turning in to a broiler producing center in Rajasthan. That was the basic reason that Indian Poultry Journalists' Association arranged this technical seminar on poultry segment to encourage the profitability of Poultry farming in this region.

The Technical Seminar programme was initiated by the President of Indian Poultry Journalists' Association, Mr. B. S. Rana. In his welcome address he spoke about the activities of IPJA and the purpose of conducting technical seminars in different part of the country. While addressing the gathering, he told that though Rajasthan is mostly a vegetarian state but the efforts done in producing the eggs in this region is highly appreciable. "IPJA has chosen the best speakers for this technical seminar and their experience will be widely beneficial to the poultry farming

community of this region, he added."

The Chairman & Managing Director of ABTL Limited & Huvepharma SEA (Pune) Pvt. Limited; Mr. O. P. Singh steered the exhibition show with his commendable speech and received thumping response from the gathering, who spoke on the current status of Indian Poultry Industry in a different manner. The beauty of his speech was the pin drop silence adopted by the farmer fraternity till he completed and after that a two minutes thumping response on clapping moved on.

In his an hour address he touched almost all the subject concerning the poultry farming community in Rajasthan. He told that there is no point in starting poultry farming unless you have clear goals in your mind. He told that this is the high time that poultry farmers reduce their dependence on traders and work towards marketing of their products. He cautioned the poultry farmers that there is no point in keep on producing the eggs without a proper marketing setup. He also stressed upon the unity among the poultry farmers by forming a cooperative to market their products.

The Event Partner of the Seminar and Managing Director of Interface Pharma Products Pvt. Limited, Dr. S. K. Malhotra made his brief presentation about his company's products and also supported Mr. O. P. Singh's verdict among the gathering of farmers.

Dr. Irshad Ahmad, Technical Consultant of Aviagen, another Sponsor of the seminar, displayed his program and spoke on the importance of Biosecurity in poultry. Dr. Irshad Ahmed in his power point presentation said that it is very

important to have proper biosecurity in poultry farm to prevent the outbreak of disease and also control the spread of disease in farm. He said that disease can spread through people, vehicles, litter, manure, poultry equipment's, rodents, feed contamination and also due to lack of cleanliness and to prevent one must follow the strict biosecurity procedures.

From the waste to wealth, a very important presentation was made on Effective Poultry Waste Management by another well-known personality in the poultry industry, sponsorer of the seminar; Managing Director of Dhopeshwar Engineering Pvt Limited, Mr. ShirishDhopeswar.

Mr. Dhopeswar in his power point presentation said that presently due to several environmental regulations the old method of disposal of poultry waste is not acceptable and there is a need to manage the waste in scientific way. He said that through proper poultry waste management t of farm mortality,

Manure, hatchery and slaughter waste could be converted in to wealth. He further told that Dhopeswar Engineering works; the pioneer in manufacturing of such poultry waste rendering plants of different capacity eliminates waste and makes additional profit for poultry farmers.

Another prominent speaker, Dr. Someshwar spoke on the Feeding challenges- A possible solution in poultry industry.

Last presentation was made by a renowned poultry consultant of Ajmer district, Dr. AlokKhare on the Importance of management in successful poultry farming. Dr. Khare touched almost all the points of poultry management right from the construction of sheds to arrival of chicks and from brooding to molting. He also stressed upon the importance of biosecurity in poultry farm and regret that in this region people are not taking care of this aspect.

Dr. Raj Kumar Jaipal, President NECC Ajmer Zone, Mr. O. P. Singh, Managing Director HUVEPHARMA and ABTL, Mr. Hemraj, Managing Director- Lokesh Oil Mills Private Limited, Mr. NeerajGoyal, Managing Director- ZEON Pharma, Mr. Vijay Raj Pareekh, Proprietor- Sahaydri Poultry Medicines including Mr. Bindu Khan- a Poultry Farmer; all were felicitated by Team IPJA.

Mementoes were also presented to all the speakers including Mr. O. P. Singh, Mr. ShirishDhopeswar, Dr. Irshad Ahmad, Dr. AlokKhare and Dr. Someshwar for their lightening presentation on different subjects.

Mementoes were also presented to all sponsors- Poultry India and Interface Pharma Private Limited (Event Partner), Aviagen India, ABTL (Gold Sponsor) and ZenonPharma from Ajmer, Dhopeswar Engineering Works, Chakra Group of Companies and VH Group (Sponsors).

Indian Poultry Journalists' Association will conduct its next technical seminar in RAIPUR- Chhattisgarh on October 8, 2022 and IPJA Global Award on November 24, 2022 at Hotel Avasa in Hyderabad.



Glamac is excited to declare and embrace the appointment of Mr. Amit Debnath as **“Zonal Manager East- Poultry & Aqua”** effective August 1, 2022.

Amit has nearly 8 years of experience in the segment of poultry health & nutrition and his last assignment was with Neospark Drugs & Chemicals Pvt Ltd. Amit will be based at Kolkata and will look after the Sales operation of East & Nepal.

We wish Mr. Amit all success and a prosperous career in Glamac.



Moving On

GLOCREST™ Pharmaceutical Pvt Ltd Conducted Farmers Meet & Get Together at Mysore- Karnataka-

GLOCREST™ Pharmaceutical Pvt. Ltd. Conducted "Farmers Meet and Get Together " at Hotel Le Ruchi -The Prince dated Aug 25, 2022. Meeting was well organised by Dr. Ramdas Kambale CEO and Board member of GLOCREST and his team. Farmers meet was attended by all key stake holders from poultry industry from and around Mysore which included poultry farmers, Members of breeder farms, integrators and veterinarians. GLOCREST family welcomes all the delegates.

Dr. Ramdas Kambale – CEO and Board Member of GLOCREST has introduced about the specialities of the company and its future plans based on its tagline 'INNOVATION FOR BETTER HEALTH'. Company has robust pipeline of the projects which will be of the highest quality and still an affordable for the farmers & stake holders. Eventually, it was company's first regional get together after its mega launch in June.

Company's Chairman Mr. Rajesh Babu honoured farmers and addressed gathering related current scenario of poultry industry in India and new challenges in poultry industry and role of GLOCREST Pharmaceutical Pvt. Ltd.



Dr. Ramdas Kambale
(CEO and Board Member) addressing the gathering



Mr. Rajesh Babu – Chairman – GLOCREST
Pharmaceutical Pvt. Ltd (from Left Second) interacting with farmers.



Farmers Group Photo

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

GLOCREST™ launch innovative Pharma products in poultry division. Company's product range includes

Chelomix - Organic trace mineral fortified with curminextract,

CocciCare -Anti-coccidial feed additive, **Enzi-rob** - Perfect combination of essential enzymes and probiotics, **Feedacid** -Acidifier Mould inhibitor and antifungal poultry feed additive, **GLOPROMIN** -Growth promotor & stress control, **GLOZOL Plus** complete blend of vitamins & amino acid , **GROX** -Early chick mortality & stress control, **TOXK/L** -Broad spectrum 3 way action toxin binder, **Vitomix** - 5th generation, coated branded vitamin premix for broilers/layers/breeder.

For Technical Queries Please contact: - **Dr. Mahesh Rajurkar** mahesh@glocrestpharma.com
Dr. Ramdas Kambale Ramdas@glocrestpharma.com | Mo 9820393342

October 2022

1. Sommet-elevage, France

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

2. VIETSTOCK 2022

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

3. The Poultry Expo @ The Livestock & Agri Expo

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

November 2022

1. EuroTier

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

December 2022

1. Agri Livestock

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

DSM completes acquisition of Prodap

Royal DSM, a global purpose-led science-based company, today announces the completion of its acquisition of Prodap, a leading animal nutrition and technology company in Brazil, which was first announced on 7 June 2022.

Prodap is an animal nutrition and technology company that combines technology offerings, consulting services, and customized nutritional solutions to drive efficiency and sustainability in animal farming.

By harnessing the power of Prodap's digital solutions, DSM will take another step forward in its Precision & Personalization journey. DSM will strengthen and further develop its digital solutions to reach more markets globally, enabling smarter nutritional decision-making thanks to artificial intelligence and other tools. Prodap will complement DSM's deep animal nutrition knowledge and advisory capabilities with its extensive consultancy experience, facilitating an even higher level of customer experience.

Additionally, by supporting more efficient farming, the acquisition contributes to DSM's commitment to enabling a double-digit reduction in on-farm livestock emissions by 2030 as part of its 2021 food system commitments.



Editorial Calendar 2022

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

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